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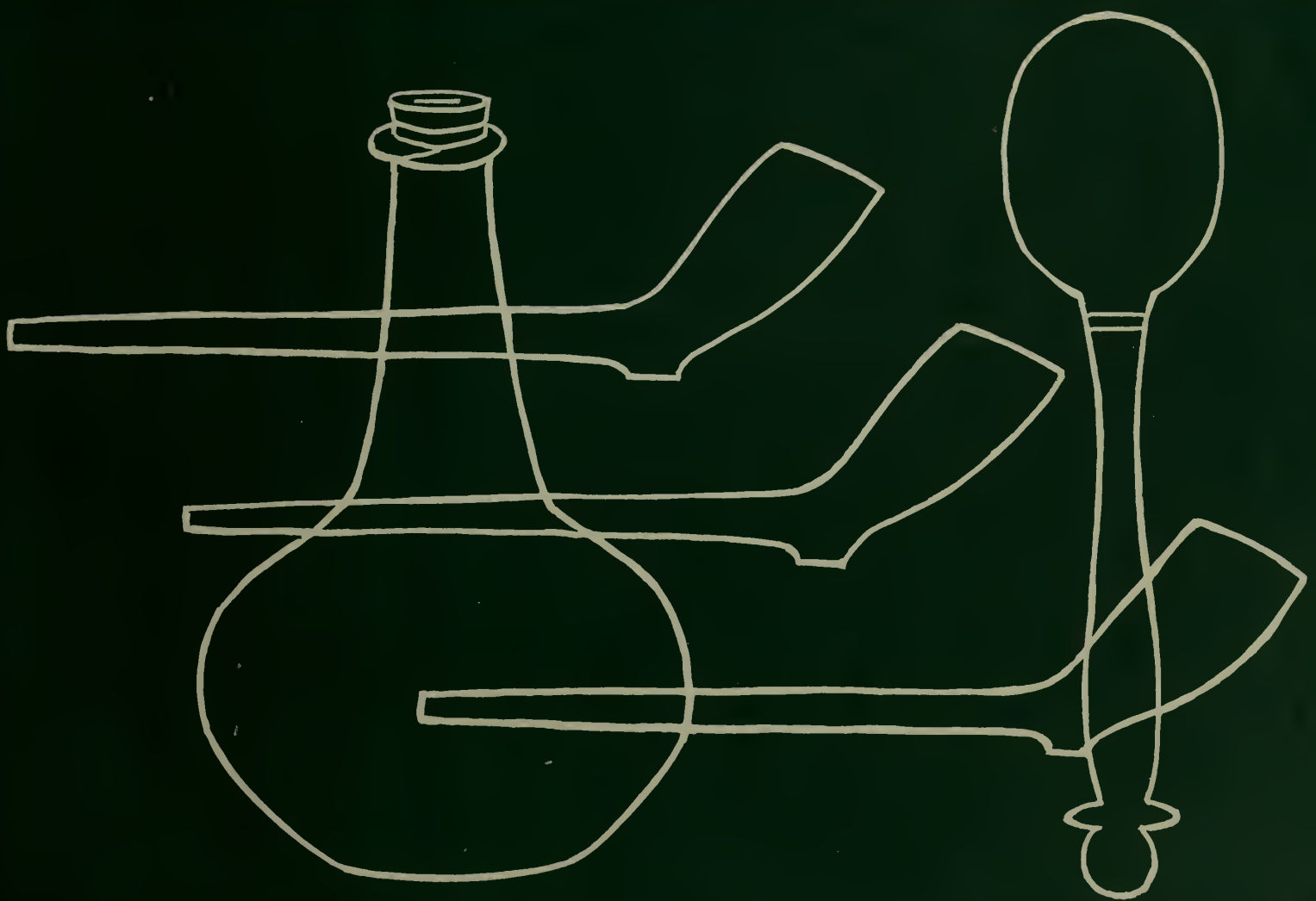
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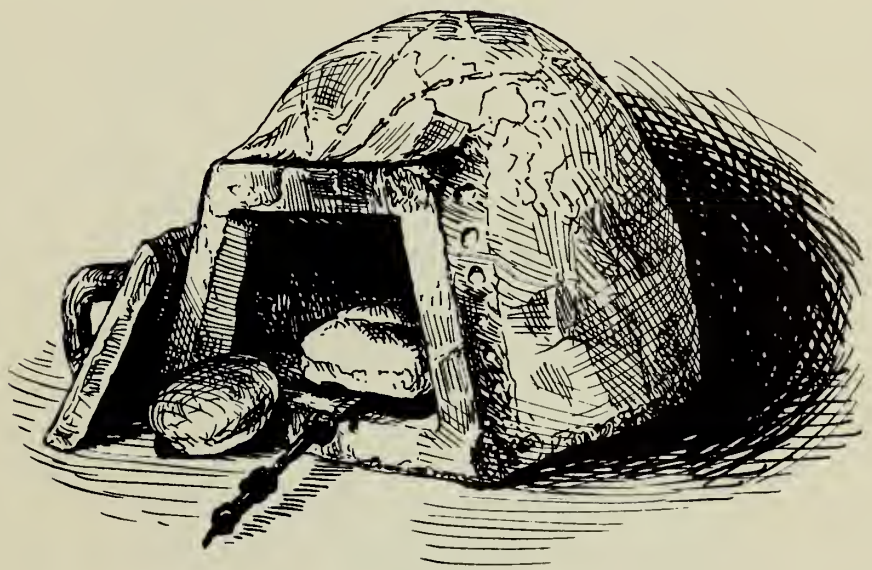


ARCHEOLOGICAL EXCAVATIONS AT

JAMESTOWN

COLONIAL NATIONAL HISTORICAL PARK AND JAMESTOWN NATIONAL HISTORIC SITE

VIRGINIA



By John L. Cotter

ARCHEOLOGICAL RESEARCH SERIES NUMBER FOUR

NATIONAL PARK SERVICE • U. S. DEPARTMENT OF THE INTERIOR • WASHINGTON • 1958

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

NATIONAL PARK SERVICE
Conrad L. Wirth, *Director*



THIS PUBLICATION *is one of a series of research studies devoted to specialized topics which have been explored in connection with the various areas in the National Park System. It is printed at the Government Printing Office and may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D.C. Price $2.75 (paper cover).*

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THE NATIONAL PARK SYSTEM, *of which Colonial National Historical Park is a unit, is dedicated to conserving the scenic, scientific, and historic heritage of the United States for the benefit and inspiration of its people.*

The Jamestown National Historic Site is administered by the Association for the Preservation of Virginia Antiquities. By virtue of a cooperative agreement between the Association and the United States, there is a joint program of development and interpretation for all of Jamestown and Jamestown Island.

Acknowledgments

An archeological project of the size and complexity of that carried out at Jamestown is, of necessity, a cooperative venture calling for advice and assistance from a host of people. In the National Park Service a great many persons rendered assistance, both professional and administrative. The list is too long to include here, but appreciation is expressed to Supt. Stanley W. Abbott and to the entire staff of Colonial National Historical Park. Special acknowledgment is made to J. Paul Hudson of the park staff for his assistance in identifying and dating excavated objects, and for compiling the bibliography.

The author wishes to express his great appreciation to Col. H. K. Roberts, Administrative Director, and to the entire Jamestown-Williamsburg-Yorktown Celebration Commission for their support throughout the project, particularly for making possible the publication of this report.

Also notable was the cooperation offered by the State of Virginia 350th Anniversary Commission.

It is impractical here to try to credit all individuals and institutions outside the National Park Service who have at one time or another abetted archeological investigations and research at Jamestown. The final campaign and the present study were particularly facilitated by the following:

The Association for the Preservation of Virginia Antiquities for permission to carry out investigations on their property and for data from their records.

Dr. Leonard Carmichael, Secretary, Smithsonian Institution, for assistance of members of his staff in consultation, notably Malcolm Watkins for ceramic identifications.

Dr. John T. Hack, geologist, U. S. Geological Survey, for helpful suggestions regarding the erosion summary in this report.

A. Lawrence Kocher, architect, for his enthusiastic interest and advice in the architectural phase of the investigations. His, in large measure, is the creation, through artist Sidney E. King, of the pictorial concept of the most important Jamestown structures.

Dr. Alfred Kidder, II, University Museum, Philadelphia, for reading the text and suggesting improvements.

Virginia T. Cotter, the author's wife, for proofreading, clarifying, and for indexing.

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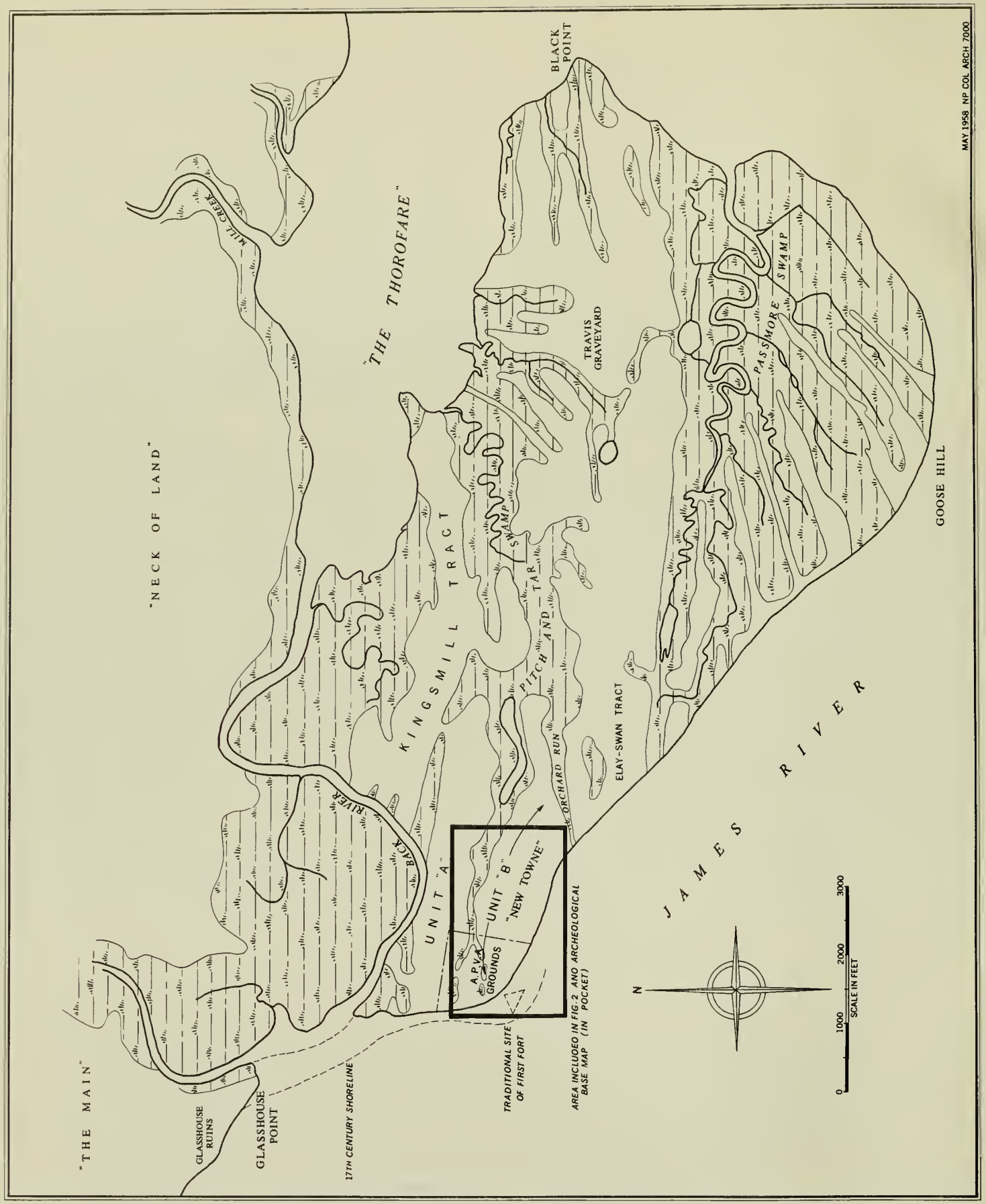


FIGURE 1—*Jamestown and Adjoining Mainland*

Jamestown and adjoining mainland showing townsite and outlying tracts in which archeological explorations were carried on

Introduction

[Archaeology] turns into history whenever it remembers that the objects it studies embody the thoughts and intentions of human beings and societies. But in its own transformation, archaeology has revolutionized history. It has enlarged the spatial horizon of history in much the same degree as the telescope enlarged astronomy's vision of space. It has extended history's view backward in time a hundredfold, just as the microscope revealed to biology beneath the surface of gross bodies the lives of infinitesimal cells. Finally, it has altered the content of historical study in much the same sort of way as radioactivity affected chemistry. For one thing, archaeology is largely concerned with practical everyday things, contrivances and inventions like houses, drains, axes, and internal-combustion engines that in themselves have affected the lives of far *more* people, and that far more profoundly, than any battle or conspiracy, but that formerly seemed beneath the dignity of scholarly history.

V. Gordon Childe
Progress and Archaeology

This report is a summary of all recorded explorations in the ground at Jamestown to 1958. The objectives here are: (1) to arrange a comprehensive, synthesized record and interpretation of archeological findings so far accomplished at Jamestown; (2) to provide basic field data for further specialized research on architecture, arts, and crafts, and on the community and society of Jamestown at large; and (3) as a final objective, to summarize these data so as to indicate the way of life which was developing in Virginia during the 17th century.

In discussing archeological findings, this report makes certain historical and architectural observations. However, it does not attempt to present a comprehensive historical survey of Jamestown, which has been the subject of research by several notable historians. Nor can it treat in a definitive and analytical manner the topic of architecture. In fact, an adequate report on any one structure at Jamestown could well command an entire volume.

The first organized effort at conservation was made possible by the donation of 22.5 acres of the site of Jamestown to the Association for the Preservation of Virginia Antiquities (APVA) in 1898 by Mr. and Mrs. Edward E. Barney. From 1898 to 1934 the association was thus the agency which, with the cooperation of the last owners of Jamestown Island, the Barney family, maintained the site of Jamestown for public use. Most of Jamestown Island came under the protection of the National Park Service as part of Colonial National Historical Park in 1934 when the United States Government acquired all but the ground held by the APVA. The APVA ground was designated a National Historic Site in 1940. By means of this park and site comprising Jamestown and Yorktown, connected by a parkway through Williamsburg, the beginning and close of the story of the English colonial period in this country could now be told.

Although the pioneer investigators at Jamestown did their work before the techniques of modern archeological field work had been devised, they recorded much valuable information. Therefore, it is with appreciation that we cite the work of Engineer John Tyler, who excavated the church site east of the standing tower in 1901; the Barney family, whose members partially explored two house structures (Structures 17 and 117 —see page 33 for detailed listing of structures and related features); Col. Samuel H. Yonge, Corps of Engineers, who built the 1901 seawall and found the Ludwell-Statehouse row; and George C. Gregory who partly tested Structure 17 in 1932.

From the beginning, the archeological project of the National Park Service was conceived as a coordinated research effort, utilizing the skills of archeologists, historians, architects, and engineers in their respective disciplines. These specialists made notable contributions. The fruit of a portion of their efforts is reflected in the present study. Had it been possible to provide uninterrupted, coordinated research in these fields for 24 years, the result would have been many reports extending far beyond the scope of the work at hand. But the end of the Civilian Conservation Corps cut the labor supply; the Second World War, the Korean War, and other factors intervened to defer the completion of site reports, museum recording, and the integration of data gathered by archeologists and historians.

Nevertheless, while the amount of historical and specialized research at Jamestown has not been vast, it has been substantial, as the published and unpublished reports of personnel listed in the bibliography will testify. While far less has been written on the settlement of Virginia than on that of New England, Jamestown has had the benefit of research by several outstanding scholars. It is hoped that the impetus of new archival and archeological data, together with many completed and planned specialized studies of various phases of 17th-century settlement here will encourage further efforts to describe the remarkable adaptation of these early settlers to the New World.

As in most initial efforts in the research field—and appropriately at this star-crossed settlement—fulfillment at Jamestown

has often fallen short of hope. Yet, very definite progress has been made, and Jamestown can rightfully take its place as the pioneering project in the field of American Colonial Archeology.

A great many people participated in the various phases of the Jamestown studies since the National Park Service began its active program of research in 1934, and no attempt will be made here to review the history of the project, or to name the many persons who had a part in it. Particularly notable, however, is the work of J. C. Harrington, who directed the combined research program for Jamestown from 1936 through 1941; the outstanding historical research carried on by Charles E. Hatch, Jr.; and J. Paul Hudson's contributions to our knowledge of colonial artifacts.

In the course of this program, a great many reports were prepared. Most of these, particularly the detailed archeological reports, were never published. They are all available, however, in manuscript form at Colonial National Historical Park, Va. These reports, along with published articles on the Jamestown research, are listed in the bibliography.

In 1954 a concentrated drive to complete essential field work was organized by the National Park Service with financial assistance of the Federal Jamestown-Williamsburg-Yorktown Celebration Commission and the State of Virginia 350th Anniversary Commission. In all, 13 acres of the townsite were systematically explored by means of 6 miles of trenches, 3 feet wide, on a 50-foot interval grid. The grid system at Jamestown Island was based upon true north and tied to the corner of the bottom northeast step of the old base of the Tercentenary Monument at the North 10,000- East 10,000-foot juncture. Since the 0-0 point was located well off the island to the southwest, every point on the island can be located so many feet north and east of this prime reference. Thus, Lot 100:000 is the 100-foot square north of North 10,000 and east of East 10,000 in which Ditches 82 and 86 are located. Lots excavated before 1936 have whole numbers.

Although the exact extent of what could be called the townsite boundaries of Jamestown has never been determined, it is reasonable to assume from what is now known that the 20 acres explored since 1901 (the date when the Association for the Preservation of Virginia Antiquities initiated excavations at Jamestown) cover most of the area of occupation. Approximately half of this tested acreage has not been fully uncovered, so that it may be said that the Jamestown area has not been more than half-excavated, at best, and much evidence remains for later checks and controls.

The 1954–56 projects and their locations were as follows:

Project No.	*Location*	*Area*
100	Jamestown Island	First Fort (APVA Grounds)
102	Jamestown Island	"James Citty"—south
103	Jamestown Island	"James Citty"—southeast
104	Jamestown Island	"James Citty"—northeast
105	Jamestown Island	Ludwell-Statehouse
108	Jamestown Island	Tour Road
110	Mainland	Glasshouse Point (Parkway Salvage)
114	Mainland	Neck of Land
116	Mainland	Parkway (other than 110)
194	Jamestown Island	"James Citty"—north
232	Jamestown Island	First Fort (underwater search)
235	Jamestown Island	Elay-Swann tract (First Fort)

This work included the early cemetery area of the third ridge, beneath and around the Ludwell-Statehouse row, tests offshore on the hypothetical First Fort site of 1607, and again, for First Fort evidence beneath the southern portion of the 1862 Confederate Fort, near the church tower. The balance of these explorations was located north and south of the Tercentenary Monument between Pitch and Tar Swamp and the James River,* and east across the known extent of Jamestown to Orchard Run.** These tests were all in Unit B, south of Pitch and Tar Swamp. Minor tests were conducted east of Orchard Run and in Unit A, north of Pitch and Tar Swamp, in order to complete data obtained in previous National Park Service explorations.

---

* Ditches 82, 83, 85, and 86 and one partly defined structural indication (Structure 114), possibly a burned frame house, were recorded.

** The late 19th-century second Barney homesite (Structure 137) north of Orchard Run has been noted on the master map at Jamestown but is not cited here.

Jamestown Island

GEOLOGICAL SETTING

During early Pleistocene days, the level of the sea at Tidewater Virginia was at least 200 feet lower, relative to the land, than it is today (1957). This fact is attested by the basal gravels that can be traced in borings for footings of bridges such as the Chesapeake Bay Bridge and the Yorktown Bridge across the York River. Thus, the James and York Rivers flowed in deeper and more sharply cut channels and emptied into the sea at locations now far beyond present shores.

As the level of the sea rose and the river mouths became drowned by tidewaters, the channel mainly followed the ancient river course. Shallow water spread wide over the lower beaches. Tides and wave-generated currents pushed sandy sediments along the shoals. Typically, the shoals developed sandy bars which progressed slowly eastward, eroding at the head and depositing at the foot. Beginning probably in late Pleistocene times, a series of these shoals or sandy bars formed Jamestown Island considerably upstream from its present location.

Within the last few thousand years, the shore-hugging shoals had developed to a point where they "captured" the channel of Powhatan Creek at the point where it entered the James River and carried the flow down between the north bank of the James and the shoals. The stream then emptied into the main river 3 miles farther down.

As shore erosion continued, the shoal became a peninsula extending downstream from the mainland of the York Peninsula with Powhatan Creek on its north side and the James River on the south.

By 1607 the neck of this shoal-peninsula had narrowed to a near breakthrough due to continuous erosion of the upstream exposure which was met by strong currents and winds. The main portion of the peninsula was a continuous strip of firm land based on more than 300 feet of fine sand and topped with a few feet of clay and silt merging into topsoil at a maximum elevation of less than 20 feet above mean low tide. The strip extended southeast from Glasshouse Point, widened past the narrow isthmus neck at the old mouth of Powhatan Creek and turned east at Orchard Run, where it extended in almost a straight line to Black Point. South of the older peninsula escarpment, deposits were building up in new sandbar formations. These extended like fingers northeastward from a sandy beach. Between these fingers marshes gathered into a sluggish, meandering outlet (Passmore Creek) at the foot of the formation.

On the Powhatan Creek side of the subpeninsula, other marshes developed. In these marshes, the largest of which was "Pitch and Tar Swamp," bog iron was deposited. Tall Virginia pines and a preponderance of mature, deciduous trees grew on firm land between the marshes. The marshes were filled with reeds and tall marsh grasses. Along the edges and at the mouths grew cypresses, always the last to yield to the inevitable erosion cycle.

The settlers selected the Jamestown "Island" location because the channel of the James River passed close to shore on the northwestern (upstream or headward) end. Thus, ships were able to lie in deep water while moored to the trees on shore. This projection of land was bounded on the north by Pitch and Tar Swamp which entered the river to the west through "The Vale" and on the southeast by an inward (north) curving of the shore. On this projection the settlers built the first fort. However, the fort site eroded rapidly and by the time the modern seawall was finished, in 1903, the river had claimed approximately 500 feet of land. This left only a slight promontory known as Church Point opposite the present brick church tower.

In the 17th century when the fort (later Church Point) promontory was intact, the shore downstream from it was gently curved and largely protected from the most erosive river currents. However, during hurricane seasons and later, when large steamers plied the river creating waves, a certain amount of erosion did occur here. This is shown by photographs taken in the early 1900's and in 1934 before the construction of the present granite boulder riprap was completed. In these pictures and in reports made by engineers and archeologists in the early 1930's, the toppling of trees onto the beach is noted, and the riprap itself testifies to the considered need for shore protection. Therefore, erosion below Church Point to Orchard Run was not less than 150 feet from the 17th to the 20th century.

PROBLEMS OF EROSION

It has been pointed out that erosion at the head of the island has been most severe. The maximum destruction has been on the northwest exposure where the First Fort was built on a projection of the main island scarp as it extended almost to the channel in 1607. This projection—400 to 500 feet beyond the present seawall opposite the Confederate Fort—was the northwest arm of a crescent-shaped shoreline that continued a



PLATE 1—*Shore Erosion—South Shore*

Upper.—The south shore from the ferry pier. Photo taken before the riprap wall was erected in 1935.

Lower.—South shore in 1935, before start of riprap shore protection project by Civilian Conservation Corps and National Park Service. Note the fallen tree and other evidence of severe erosion. Camera was on the ferry pier, located in Lot 95:100.

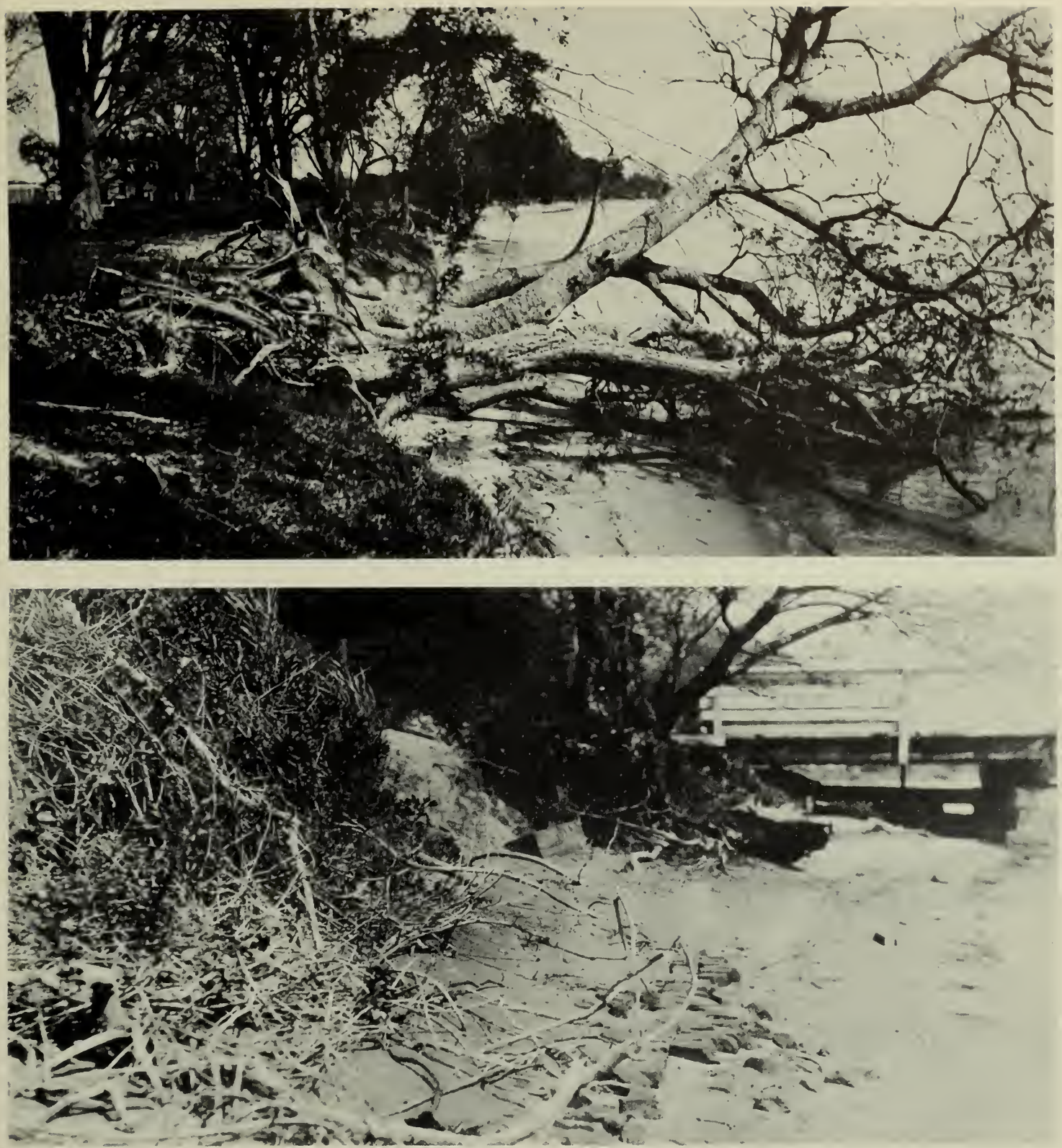


PLATE 2—*Shore Erosion—Hurricane Damage*

Upper.—This hurricane damage justified the need for the riprap shore protection which was carried out in 1935 (location near Structure 17).

Lower.—Hurricane damage to the south shore of Jamestown in 1926, just upstream from the ferry pier. View shows a brick flooring at, or slightly east of, Structure 26 which was excavated in 1935. The picture is copied from a print supplied by Mr. Clyde Holmes of Williamsburg, Va.

quarter of a mile down-river beyond Orchard Run. Thus, the embayment was protected from the prevailing wind and down-river ebb tide acceleration as long as the arm on which the First Fort stood remained intact.

Erosion at the waterfront between the churchyard and Orchard Run was probably at a minimum in the 17th century. A shallow shelf between the shore and the channel was covered with 3 to 6 feet of water, depending on tidal extremes. Numerous wharfs, extending from shore toward the channel were clustered on this shelf. In fact, these wharf pilings were so numerous toward the end of the 17th century that they were considered hazardous.

It is even possible that the projecting northwest arm continued to protect the crescent shoreline by slowing down the water with its sedimentary burden so as to make it deposit, rather than erode, along the shallow shelf. Likewise, the piers had an effect of slowing down the water. However, as the First Fort site disappeared into the river in the 18th century, this protective arresting of wind and wave action grew less and less. The gently curving shoreline was increasingly exposed to wash waves from passing steamers as well as the usual wind and ebb currents. The former was noted by Yonge, although he minimized the erosion of the crescent shoreline of "James Citty" (Yonge, 1903).

By 1906, when the seawall was completed, the last remnant of the projecting northwest arm (known as "Church Point") had been removed to give a continuous unbroken line to the seawall. Before 1906 there had been at least 200 years of steadily increasing erosion of the south shore between Church Point and Orchard Run. After 1906, with the removal of the northwest arm, the erosion was completely unchecked for almost three decades.

Hurricanes which visited the island periodically in the first third of the 20th century created erosion which has been documented with photographs and commentary. Views taken in the mid-twenties and early thirties, after storms, show trees toppled into the river at points easily identifiiable from opposite Structure 26 to opposite Structure 21. Earlier photographs taken by the Barneys about 1900 show an eroding shoreline at that time as well. In 1934 a study was made which convinced the National Park Service that a riprap must be built without delay from below Orchard Run to the east end of the seawall. Even after this riprap of granite boulder rubble was finished, an April storm in 1935 caused great slumping behind the riprap which had to be stabilized with a fill of concrete debris.

Here are some illuminating accounts from National Park Service records at Colonial National Historical Park in the mid-thirties:

August 19, 1932—Gerard Banks, ranger-naturalist, in "Memorandum on the Erosion at Jamestown Island":

> Along the shore southeast of the pier, there are many small ravines. They have eroded the banks 10 to 15 feet back from the beach. This type of erosion is due to surface elements such as run-off water and organic agencies.
>
> At frequent intervals trees have fallen over on the beach. The soil in which the trees stood was weakened by ground water or was entirely removed by wave action. The caretaker at Jamestown relates an incident concerning the position of a tree about midway along the island shore, observed in 1914 and later in 1918—a period of 4 years—and his estimate is that the strand line moved inward about 15 feet during that time. Such erosion, of course, is exceptional. The rate of erosion varies from year to year according to the heights of the tides and to the frequency of storms. A close estimate would be that the strand line creeps inward along the entire river front an average of 5 inches a year. Less than an inch of this erosion is due to river current. The remainder is caused by wave action and run-off water.

January 2, 1935—Charles E. Peterson, historical architect, in "Memorandum for The Director":

> I was very much surprised to note that Mr. Gregory (George C. Gregory, who originally identified Structure 17, center, as the First Statehouse.) feels the shore line below the ferry slip is still on the 1607 location. I had always understood that this section of shore line was retreating rapidly and that every storm carried away several more feet of earth.

Final construction report for Section A, Riprap Shore Protection Wall, Jamestown Island, Virginia, F. P. 609, Contract No. I-1P-3110:

> p. 5. . . . along Section A on the James River the water had encroached on the mainland from 7 to 11 feet during the same storm. [i.e., storm of August, 1935].

The only contrary evidence unearthed during archeological investigations is that of Structure 26 foundation, which can be interpreted as having been built on the actual sloping bank of the river (see more detailed discussion under Structure 26). The southern (riverward) footing of this 50 by 16 foot structure is considerably lower in base course level than the north wall—in fact, the lower footing (1935) was below the high-water mark. Since much sandy filling has taken place behind the riprap, it is difficult to tell today just how the original land sloped to the river and how it may have been interspersed with erosional depressions.

THE ABORIGINES

It is an interesting fact that man antedated Jamestown Island itself. Evidence exists on the York Peninsula at Indian Fields Creek that the ancient Indian was there with his delicately-chipped blade shaped like a laurel leaf, and atlatal or spear, quite probably in excess of 7,000 years ago. Before 1607 the Algonquians had certainly frequented the island. At the time of discovery, they had recently become the Powhatan Confederacy in the York Peninsula and adjacent mainland to the north. The fact that the settlers did not find Indians encamped on the island indicates that the campsite discovered beneath the 17th-century soil zone, and in turn covered by the Confederate Fort near the church, had been abandoned some time previously. However, soil evidence indicates the occupation was within 100 years previous to 1607.

This Jamestown Island Indian site was characterized by



PLATE 3—*Indian Trade Artifacts*

Artifacts from Jamestown 17th-century contexts which relate to the Indian trade. Shown here are beads, bells, hatchet, brass pan, scissors, knives.

pressure-flaked, stemmed projectile points made of quartzite (large and small), together with shell- and sand-tempered pottery, all cord impressed. The cultural evidence may be characterized as "Late Woodland," a term of singular terminological vacuity applied by archeologists in reference to the latest prehistoric evidence on the Atlantic coast north of Florida. We may confidently suppose that culturally these Indians were nearly identical with the southern Algonquians of the early settlers' acquaintance.

Both archeologists (i.e., anthropologists) and historians pay tribute to the debt generated by the European immigrants in North America to the native Indians and their culture. Rarely, however, has this debt been spelled out and given proper recognition—certainly not in the Jamestown annals. In this archeological report, it is necessary only to observe that, despite the best efforts of the Indians to exterminate the settlers—and their reasons are easily understandable—the economy of the Indians at times saved the settlers and contributed to the economic foundation of Virginia. Corn, and the aboriginal method of planting and cultivating it, kept the settlers alive during the first years and thereafter provided a continuing staple food. Tobacco later became vital to trade. (See Hallowell, 1957.) The widespread use of mobile, lightly armed infantry in warfare in 17th-century Virginia placed the colonists a hundred

years ahead of Europe in military armament—thanks to the Indian.

FLORA AND FAUNA AS FIRST OBSERVED BY THE SETTLERS*

Jamestown Island lies near the southern border of the North Temperate Zone. Some geologists believe that the climate was perceptibly cooler in 1607 than it is in mid-20th century. If the climate was cooler, it is probable that there was more ice in polar regions. The sea level then would have been slightly lower, leaving somewhat less marshland and more meadow than at present. Then, as now, the violence of seasonal change characterized the late spring and the autumn months of September and October. The destructive force of hurricanes, already familiar to Europeans in the West Indies, was soon recognized by the settlers in Tidewater Virginia. The summers were hot and humid, and the winter months of January and February were often bitter.

Flora

The chief difference between the days of discovery and today lay in the ecological balance which had been relatively little affected by the presence of aboriginal man. Probably less than 9,000 aborigines occupied all of tidewater Virginia at the time of discovery. These aborigines burned off tracts of timber for cultivation of corn and other crops and occasionally they would start an animal stampede by a trap of fire in the dry fallen leaves of autumn, for hunting purposes. Although these practices reduced the forests and their underbrush here and there, the effect was minor on the mature virgin forests. John Smith and other early narrators commented on the openness of the forests, the mature trees standing at relatively great distance from each other, but with such dense crowning cover that underbrush was nearly absent. The Indians depleted the forests where they settled, but they frequently moved to new land. Archeological observation quickly attests that at no one place did occupation last long enough to leave deep deposits of human detritus. The generally humid tidewater Virginia region was characterized, more than now, by broadleaf forest cover which also permitted pine, redcedar and other evergreens. For detailed listing of flora, see Appendix E.

Fauna

The fauna of Tidewater Virginia has certainly changed since early American times, as well as the abundance of many food fishes. These conditions make identification of species difficult because common names in use today often differ considerably from those used in the 17th century. Without factual data in the form of descriptions, illustrations, or specimens, we can only surmise in certain instances. Following is a general discussion of the fauna known to the Jamestown settlers. Additional commentary and detailed listings are in Appendix E.

The bounty of fish in the tidewaters was impressive in the days of settlement, especially in spawning season. Shads and sturgeon threatened nets and the latter were even killed with axes near Jamestown (Rolfe, 1951, p. 36). John Smith was impressed by a pneumatic fish (perhaps the spiny boxfish) and fancied himself lost when stung by a stingray.

Important items of food for prehistoric and historic inhabitants were mollusks and crustaceans. Oysters were impressively large and numerous and were especially fancied by the settlers. Of the crustaceans, the succulent blue crab (one species having great size and much meat) was abundant.

Archeological evidence at Jamestown shows that oysters were used not only for food, but for building purposes. Shells are usually present in fills of all types, and in the very mortar and plaster and pargetry of the houses. Oyster shells were the common source for lime from the founding days of the settlement to the abandonment of Jamestown.

In contrast to the abundant archeological evidence showing the use of oysters, traces of fish are rare because of the acid soil and the perishability of fish bones.

Of reptiles and amphibians then common in the Tidewater, most important economically were the turtles. Especially common was the land tortoise. Its carapace is frequently encountered at Jamestown and in prehistoric aboriginal sites. Strachey mentioned the latter as eaten daily by the settlers (Strachey, 1953, p. 128). Oddly, frogs (bull and tree) are not recorded as items of diet. If they were not eaten, it was because of cultural aversion, not gustatory choice. At least they should have been appreciated during the Starving Time, 1609–10.

On the debit side, Jamestown did have some poisonous snakes, notably the copperhead, rattlesnake, and water moccasin. But most of the snakes—puff adder, corn snake, black snake, and horn snake—were harmless and beneficial. (Neither these snakes nor any other natural enemy could control the European brown rat—this hardy rodent, arriving with the settlers, quickly established itself in Virginia and did grievous damage. It still does!)

Of all the fauna, possibly birds most impressed the settlers. Wild fowl, like fish, were present in the Tidewater in truly fabulous numbers, especially in migratory seasons. They were drawn to the rivers, marshes, and sounds by the abundant crustacea and lush aquatic vegetation such as wild celery and oats.

Mammals also roamed in great numbers in the Tidewater region. A prime source of meat for Indians and Jamestown settlers was the Virginia or white-tailed deer. In 1610, the author of the True Declaration of Virginia (Force, 1836–46, Vol. III, p. 13) stated that "hard by the fort, two hundred in one herd have been usually observed." Despite the depredations of civilization and astronomical numbers of ticks, this incredibly

* The observations on flora and fauna are taken largely from Philip A. Bruce's *Economic History of Virginia in the Seventeenth Century* (Bruce, 1895), and from the observations of John Smith (Smith, 1884) and Thomas Hariot (Hariot, 1951).





PLATE 4—*Woodland and Marsh*

Upper.—A young, even-aged stand of pine near the large Confederate Fort located in the upper reaches of Passmore Creek on land which was once the southern side of the Travis Tract. Most of the dry land which would support a crop was in cultivation up to 1925. This view was taken about 1934.

Lower.—Typical marsh grass in the middle and eastern reaches of Pitch and Tar Swamp. Note muskrat houses in the middle background.

persistent animal is still numerous on the York Peninsula and on Jamestown Island. Other land mammals mentioned in early 17th-century references are elk, eastern bison, wolf, black bear, dog, gray fox, and cougar.

Little descriptive material on insects is available. Plainly, the insect which most concerned the settlers was the indigenous mosquito which smote them early and often, when the season was on. It doubtless carried the principal fever—more likely yellow fever than malaria, because the settlers became "seasoned" to it if they survived.

The tick (not an insect but an arachnid) is presumably a recent import. Had it been present, the settlers would certainly have described this greatest present threat—with mayflies a close second—to human comfort at Jamestown.

Archeological Excavations

THE SEARCH FOR THE FIRST FORT (PROJECTS 100, 232, AND 235)

During the 1955 excavation season, Dr. Joel L. Shiner, under the direction of John L. Cotter, completed three projects designed to find traces of the First Fort of 1607.

Project 100

The work of this project encompassed the area of the Confederate Fort of 1861 to the seawall west of the Church, where testing was done in the interior of the fort and beneath the south embankment. No recognizable trace of the First Fort was found, although many data of interest relating to early 17th-century occupation were recorded. A 17th-century soil zone overlay an Indian occupational zone (now displayed in an *in place* exhibit). Also recorded were several ditch traces and an armorer's forge pit dating from the first quarter of the 17th century.

Following is an abstract of Shiner's report on Project 100, which is available in manuscript form at Colonial National Historical Park (Shiner, 1955). For many years the leading question at Jamestown was whether or not a trace of the First Fort still existed on land, possibly beneath the Confederate Fort of 1861. The problem in 1954 was to find if such traces remained beneath the 17th-century soil zone protected by the later earthwork. (It was already known that artifact and burial traces were uncovered when Confederate troops built the fort and accumulated earth for the embankments from within the fort enclosure and from the moat which surrounded the embankments.)

Historical records state that the First Fort was built entirely of logs, timber, and earth. Shiner writes:

> There was a ditch on the exterior and behind the ditch, on the inside, a log palisade. Each of the 3 corners had a raised bastion. These features made it imperative that excavation techniques be designed to detect ditches and post holes. The best way of doing this seemed to be to clear the soil to the old soil zone, or to native clay, and smooth the floor and walls of the trench. This would show horizontal and vertical profiles of ditches and post holes. [Fortunately, local soil conditions made differentiation of zones and soil types practicable.]
>
> *Test pits 1 through 10* gave information on the native clay, the sea cliff, that was cutting into the island and the fill that had been thrown in behind the seawall.
>
> *Test pits 11 and 12* encountered the first undisturbed strata of Colonial trash. They appeared at the edge of the Confederate earthworks on the west side of the Confederate Fort. Colonial trash, where undisturbed, was usually about 1 foot thick. It was preserved under the Confederate earthworks and was usually destroyed at most points away from them. After a number of pits and trenches had been excavated in the vicinity of the Confederate Fort it became apparent that earth for the construction of the earthwork was obtained from both inside and outside the Fort. The interior of the (Confederate) Fort was scraped down to the native clay and the dirt thus obtained was piled on the earthworks. Colonial artifacts (pipestems, ceramics and brick fragments) are to be found throughout the soil of the Confederate earthwork. Even so, it was never a problem to distinguish between Colonial trash and the earthwork.
>
> *Test Pit 11:* The corner earthwork near the Relic House [modern APVA Structure standing in 1955] had been considered by some of those interested in the problem as the north bastion of James Fort. Test Pit 11 was a trench cut through the earthwork down to sterile clay. The cross section showed a number of interesting features, but none of them related to the James Fort. The height of the mound was due to earth piled on in 1861. Beneath the Civil War earth was a stratum of Colonial trash between 12 and 18 inches in thickness. Also, beneath the earthwork was a small ditch [Ditch 89]. It was slightly more than two feet wide and about one foot deep. . . . The ditch . . . seems . . . to have been a property line ditch since it was on high ground that did not need draining and later had a fence built along it. [Four post holes were found in the fill of Ditch 89.]
>
> A terminal date for . . . [Ditch 89] might be obtained by dating the trash that accumulated in the ditch. Since few of the artifacts had been sufficiently preserved to warrant close dating, only a tentative date can be given to the trash. It appears to be about the second quarter of the seventeenth century.
>
> *Test Pit 12:* Test pit 12 extended to the southeast across the center of the Confederate Fort. A probable property line ditch [Ditch 90] was found about 20 feet to the east of the west earthworks. In position as well as direction, the ditch conforms to a boundary of a parcel of land acquired by Edward Clinton in 1683. [East of Ditch 90 the Confederates had removed the Colonial topsoil to build the earthwork.]

STRUCTURE 139: This was the most important find made within the area of the Confederate Fort. It was a forge pit dug into native clay and encountered 90 feet from the west earthwork. Shiner reconstructs the evidence to show that this feature was a forge pit with probably a building over it in existence by 1620. By the end of the 17th century, the structure had fallen into ruins, and by 1861, what may have remained in the 17th-century soil zone was scraped away into an earthwork so that only the pit remained.

In the pit were found many separate parts of guns and swords along with charcoal, cinders, slag, and runlets of lead and brass. The type and profusion of the gun fragments indicated the process of converting matchlocks to the newer flint arms and permitted the accurate dating of the feature.

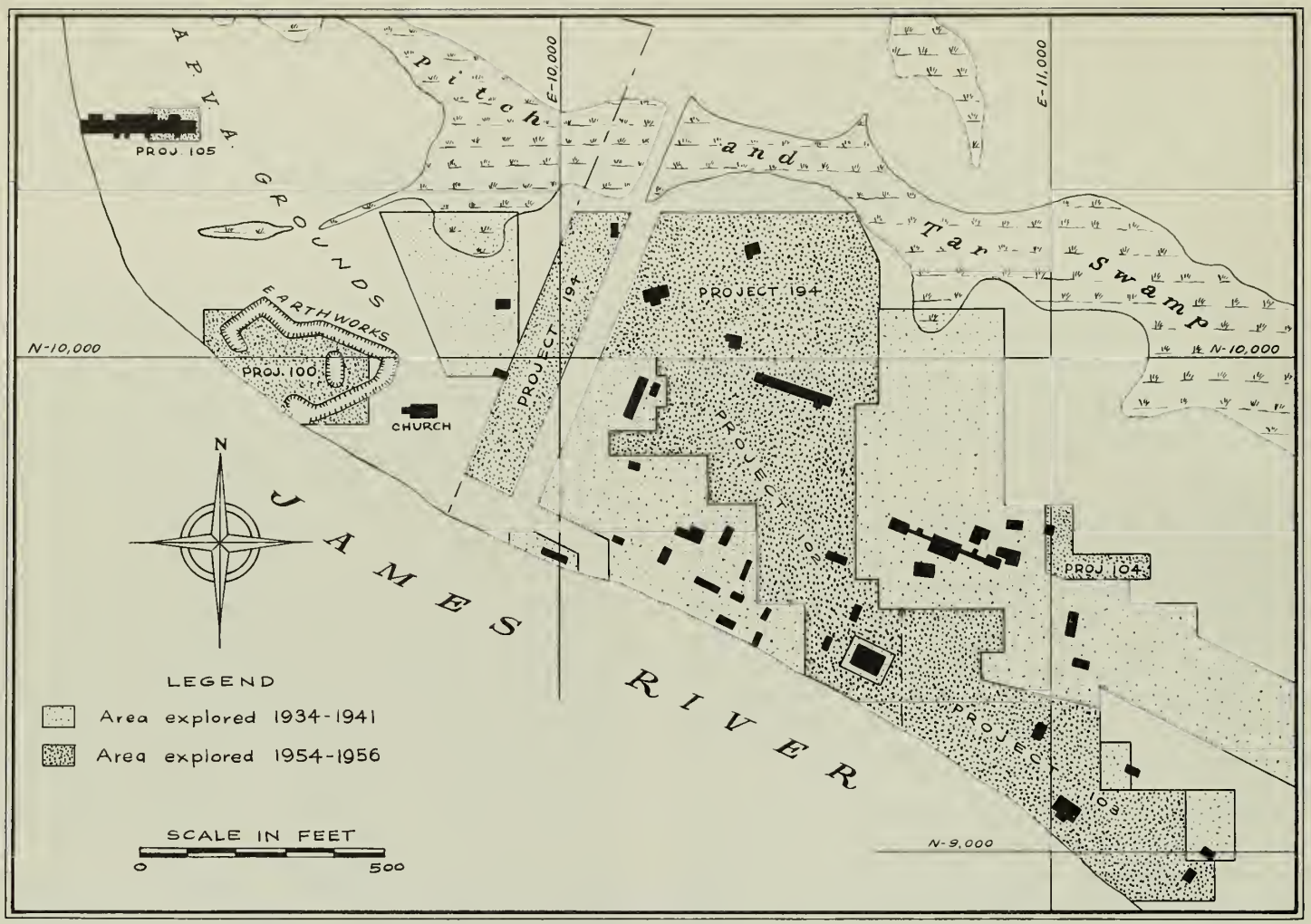


FIGURE 2—*The Site of Jamestown*

The site of Jamestown showing areas explored during two major periods of archeological activity.

TEST PIT 18: A test opened in the south side of the Confederate Fort in Lot 98:95 provided data on 3 sharply contrasting occupational zones: *Confederate Fort fill, a 17th-century humus zone* and, beneath this, *a well-defined earlier humus zone* containing Indian artifacts. Two intersecting ditches were also revealed: Ditch 93, L-shaped, adjoining Ditch 94, a straight ditch. The colonial zone was excavated in 3 arbitrary levels designated "late" (top), "middle," and "early" (the lowest). Shiner could observe no internal stratigraphy here, but it was hoped that some artifact differentiation might result from the 3-part division. The results showed that the upper stratum had a thin veneer of 18th-century materials, but the majority of the following artifacts date from the latter half of the 17th century:

UPPER LEVEL

(all evidence in fragments)

Dutch gin bottle
Oriental porcelain
Delftware
Sgraffito (English) ware
Slip decorated ware
Delft wall tile
Roofing tile (local?)
Lead-glazed earthenware (local?)
German stoneware, salt-glazed
White tobacco pipes
Local brown clay pipes
Wrought-iron nails
Copper tubing
Iron lock spring

The following middle level artifacts represent the interval of about 1640 and 1670. No 18th-century materials occurred. The change from late to middle level was barely perceptible.

MIDDLE LEVEL

North Devon coarse-tempered ware, lead-glazed
Local earthenware, lead-glazed
Delftware



PLATE 5—*1903 Shoreline Erosion Pattern at Confederate Fort*

View from off shore prior to the erection of the seawall in 1903. Estimated date is about 1900-1901 when the first attempt at stabilizing the shore (here shown) had failed. The erosion pattern clearly shows the line of the original or pre-1861 humus layer (above the vertical erosion scars). Beneath this surface lay the colonial deposit and beneath that, an Indian occupational zone, showing that deposition had continued through the 17th century on a natural eminence which once stretched into the river toward the channel as Church Point.

Sgraffito (English) ware
English slate
English flint
Wine bottles
White tobacco pipes
German salt-glazed stoneware
Dutch gin bottle
Window glass
Locally-made pipes, brown clay
Wrought-iron nails
Iron fragments

All of the following early zone material could be early 17th-century—none definitely late or middle 17th-century:

LOWER LEVEL

(just above Indian Zone)

North Devon coarse-tempered, lead-glazed ware
Lead-glazed earthenware (local?)
Delftware
English flint
Dutch gin bottles
White clay tobacco pipes
Locally made brown clay pipes
Building hardware fragments
Wrought-iron nails
Brass spoon

Shiner records some observations for a small ditch in the No. 18 test which is undoubtedly Ditch 93, although he does not place it exactly. A profile of this ditch showed that it had been dug after some colonial refuse had accumulated above the zone of Indian debris. The refuse through which the ditch had been cut was that designated "early" in the test. In general, the ditch artifacts corresponded closely to those of the "middle" test zone, with several exceptions, some being of the early 17th century. The ditch artifacts included a cannon ball which could have been used in a 4½ inch demiculverin; a lock from an early musket; an early sword guard; and a brass counter, the last of the type used in monetary calculations and tentatively dated between 1550 and 1650.

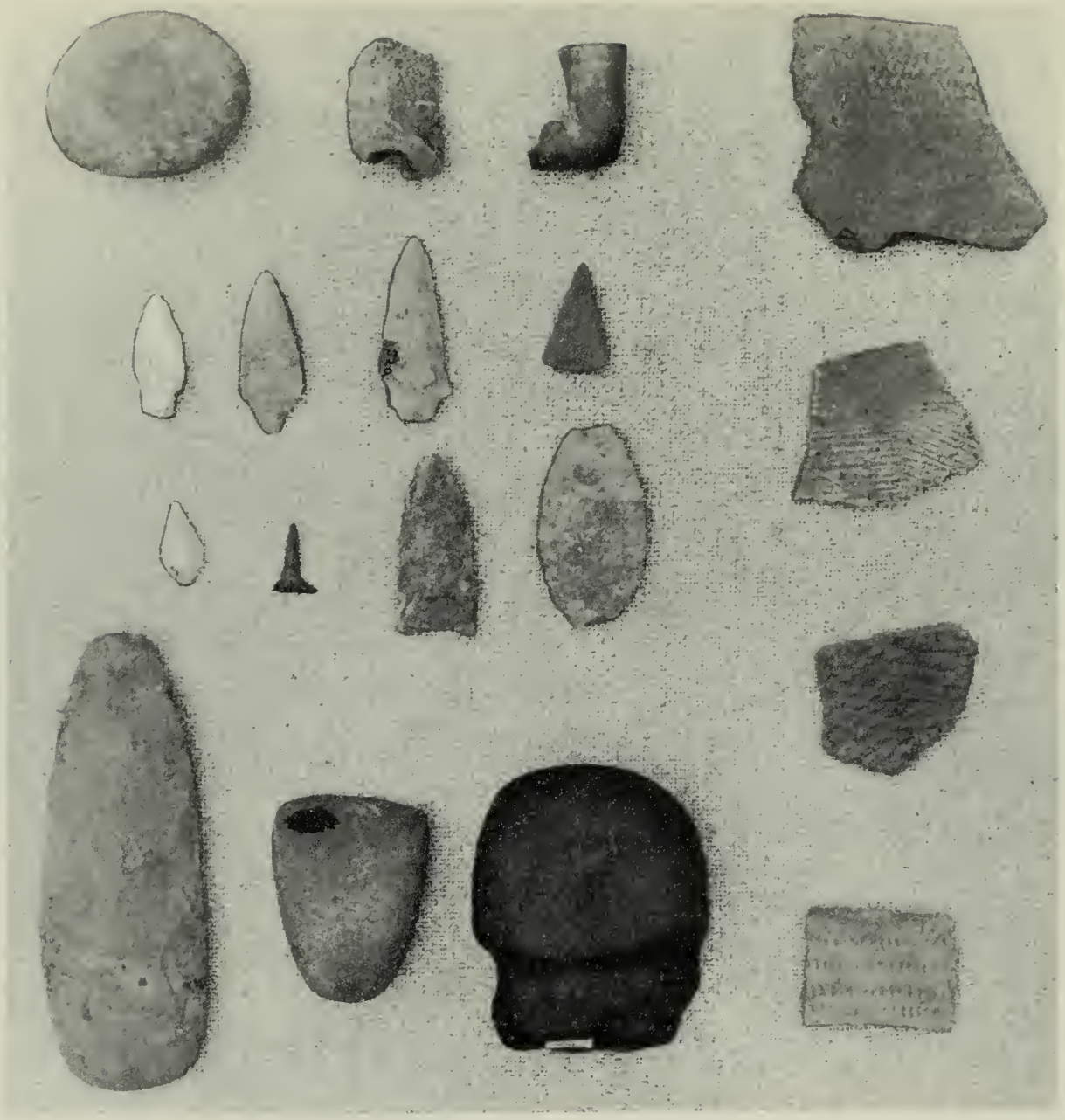


PLATE 6—*Indian Artifacts from East of the Church*

A selection of Indian artifacts found at Jamestown during excavations carried out between 1934 and 1954, mainly in the area east of the church. The pottery is woven fabric and cord marked.

Shiner concludes:

> Evidently the ditch had been filled in first with relatively early trash and later with more recent trash. As has been recorded several times at Jamestown, the upper part of the ditch had been filled in with brick rubble. This was not part of a building, but rubble brought in to finish filling the ditch.

INDIAN HABITATION ZONE: On the basis of several small test pits east, west, and north of Test Pit 18, the Indian habitation site was estimated to be at least 110 feet long and at least 70 feet wide. Probably it was considerably larger. Ostensibly the prehistoric Indians selected this location for a campsite. In addition, no other comparable Indian site has been found in the extensive excavations on Jamestown Island. These facts give significant support to the assumption that the settlers also picked the most favorable land upon which to begin their occupation, namely Church Point, prior to erosion. As for the Indian occupation itself, Shiner observes:

> Since no Indian site was recorded for Jamestown Island, and John Smith had been carefully recording villages, the year 1607 would be a terminal date for the occupation. The lack of any hint of a disconformity between the Indian and Colonial strata makes it appear that the occupation must have terminated not more than 10 or 20 years earlier than 1607.

Ceramic evidence is based on 306 sherds, of which 255 (83.8 percent) were shell-tempered, 49 sherds (16.2 percent), sand- or crushed rock-tempered. In general, the paste of the pottery was quite soft and the surface decoration had eroded somewhat. This made it difficult to tell cord marking from fabric marking, so that 164 sherds only could be classified as to surface treatment. A tabular summary from Shiner's report follows:

	Shell temper Sherds	*Sand temper Sherds*	*% (based on type of surface treatment)*
Fabric impression	45 sherds ...	14 sherds	36
Cord marked	71 sherds ...	12 sherds	50
Smooth	8 sherds ...	5 sherds	8
Incised	8 sherds ...	1 sherd	5
Totals	132	32	99

Presumably the shell-tempered pottery could be assigned to the Chickahominy series described by Evans (1955, pp. 1–164). The sand-tempered sherds cannot be assigned, as yet.

Lithic flaked blades are both triangular (small) and stemmed (various sizes). The material is mostly quartzite, brown to reddish in color, and some white quartz float. The smaller triangular pieces are easily assigned to the late period, into the historic horizon. The stemmed pieces, some of which are of good size (originally over 5 inches long), may suggest certain archaic types known in the Appalachian area. Stanley South, archeologist with the North Carolina Department of Archives and History, informed the writer that one specimen of the larger, pointed stem type with wide, subtriangular blade of quartzite is called the Morrow Mountain Point. This type came from excavations conducted by Dr. Joffre Coe, of the University of North Carolina, in which this point is in a very early context. The Morrow Mountain type in North Carolina is known stratigraphically to be located below a deposit containing the Halifax point type which has a Carbon 14 date of 5,440, plus or minus 200 years, before the present.

Jamestown Island, in all probability, did not exist at all in either its present or in its 1607 form and location 5,000 years ago. Also, the Jamestown point is in a deposit demonstrably close to the contact period. Therefore, we have here a reminder that typological definitions of culture and dating are tricky, at best. We strongly suspect that archaic types of lithic artifacts can often be found in use by much more recent groups of Indians, even up to the contact period. To reason that these later Indians picked up the archaic artifacts and kept on using them is possible. It seems more probable, however, that archeologists must not rely too strongly upon typological dating and cultural association of "archaic" flaked stone points.

Shiner observes, in concluding his account of Test 18, that 3 postholes were found in a line running north-south through the apex of the triangle made by Ditches 93 and 94. These postholes appeared to have nothing to do with the early ditches since at least one of them had been dug after Ditch 94 had been excavated. Ditch 94 penetrated and partly destroyed Ditch 93, the right angle ditch. It has not been possible to regard these features as part of James Fort.

Forty feet east of Test Pit 18 and just north of the John Smith Monument, an exploratory trench, Test Pit 22, revealed a small ditch (Ditch 92) running north-south and extending beneath the Confederate Fort. From the few artifacts found in Ditch 92, it would seem to date very close to the Civil War period. This test demonstrated that the low lying area between the Old Church and the Confederate Fort was not a marsh.

THE CONFEDERATE FORT. The Confederate Fort is a critical factor in the area thought to be the first occupied by the settlers. Hence, a résumé of the salient observations in Shiner's report concerning this feature is in order:

1. The moat ditch now (1957) visible on the north and northeast sides was tested and appears contiguous with Ditch 95. This is a small ditch trace which extends around the river (or south) side of the Confederate Fort. There are no postholes in the fill, and there is evidence of silting, indicating that the ditch stood open for some time. There is no record of diagnostic artifacts in the ditch fill.

2. In areas covered by Confederate earthworks, there is always a stratum of 17th-century cultural evidence *in situ*.

3. There is every reason to believe that the river side of the Confederate Fort was deliberately scraped away, probably in an effort to stop erosion late in the 19th century.

4. In the southern portion of the Confederate Fort is evidence of a well-developed earthwork with gun ports and a terreplein. Three test pits, Nos. 20, 24, and part of 18, were excavated into the terreplein which had been surfaced with heavy timbers held together with spikes. Some 8-inch spikes were still standing upright in the soil.

5. A drainage ditch (No. 91), probably framed with wood, ran under the northeast embankment of the fort.

6. Well 24, inside the fort (Lot 100:93), restored in the last 50 years, was excavated and found to be 17th century in origin. The top of the original brick masonry had fallen in and the well had been filled with earth to within 3 feet of the surface of the present ground. Excavations continued to a depth of 12 feet below the present surface, the lower 5 feet having the original brick masonry preserved. Parts of a barrel were found between 8 and 9 feet from the present surface. Artifacts recovered from the lower part of the well included an early goose wing axe, ca. 1600; part of an iron kettle; fragments of wine bottles (not datable, but presumably post-1640); German stoneware; and a large piece of sheet lead, possibly from a pumping device.

7. Ditch 92 found outside the Confederate Fort on the southeast side may or may not be precedent to the fort. Objects here seemed to be entirely 19th century. The ditch could not be traced inside the fort.

8. A central feature of the Confederate Fort was a dugout with a slight horseshoe-shaped earthwork around it. The dug-

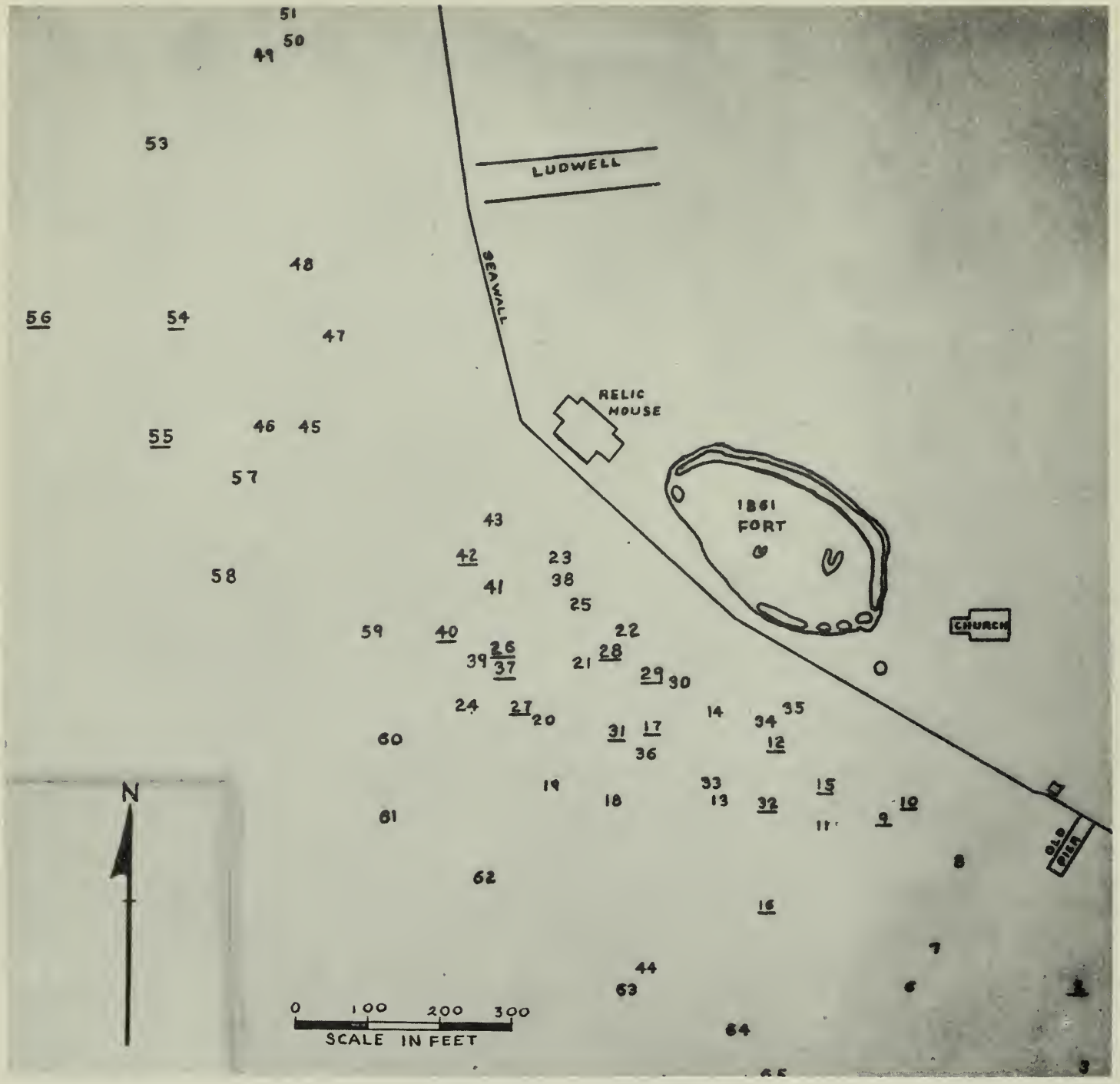


FIGURE 3—*Map of Underwater Search*

Map showing tests (clambucket drops) in the underwater search for the First Fort at Jamestown.

out was tested and found to have been 4½ feet deep. There were no artifacts here.

9. Artifacts from the Confederate occupation were scarce and limited chiefly to a spoon and some ironstone pottery in Test Pit 6 on the river side, plus some glass fragments and iron spikes.

Project 232

This project involved an underwater search carried out on the shallow shelf between the seawall and the river channel, from the old ferry wharf at West 100 to North 107, north of the Ludwell-Fourth Statehouse row. Testing was from a barge on which was mounted a power-operated clam bucket to dredge

"bites" of the offshore shelf and deposit them on the deck for observation and separation of artifact material. Although evidence of the First Fort was not found, other significant findings were made.

Sixty-five "drops," or clam bucket tests, in a given location were made, each being 2 to 8 feet into the mud (see Figure 3). Most of the "drops" were 2 to 4 clam bucket loads, averaging a depth of 4 feet. Locations were planned in lines parallel to the shore at 50, 100, 150, and 200 feet from the shore. Along these lines drops were intended for 50 foot intervals. In practice, however, the pattern was irregular, due to difficulty in controlling the barge, but the drops were uniformly scattered. Each time the bucket was let down for a drop, Edward B. Jelks recorded the position using a transit along given locations on the shore. He recorded angles from a base line and stadia readings on the barge for distance. The transit operator estimated compensation for discrepancy between the distance from the transit to the stadia rod and the drop, and J. L. Cotter on the barge assigned a number to the drop. Afterward, the transit man recorded each drop from a flash card held on the barge. Thus the artifact lot from each drop was given the same number as that assigned to the drop and recorded on a plat after transit computations were made.

Each drop brought several bucketloads of material, mostly mud, with some underlying sand and pockets of gravel from the underwater shelf. These bucketloads were deposited on the deck and inspected by raking and scattering the material while it was being sluiced with water from a low-pressure hose. Screening was impractical.

Artifacts of the 18th, 19th, and 20th centuries were found over the entire area tested. Artifacts of the 17th century were found in 19 drops, most of which were close to the shore, but well scattered. Almost nothing was found beyond 200 feet from the seawall. Nearly all of the material was found on or near the surface of the clay-and-sand bottom. No cultural material whatever was found in the deeper clay and sand, indicating that artifacts did not sink into the river shelf formation.

The artifacts (other than brick, tile, and questionable ceramic and iron specimens) were unmistakably 17th century. From Drop No. 2: Glass bottle neck, 17th-century Dutch gin bottle. Drop 10: Leg of 17th-century, 3-legged pot, lead-glazed earthenware. Drop 26: Salt-glazed stoneware fragment, brown glaze on gray body. Drop 55: Fragment of lead-glazed earthenware bowl, German salt-glazed stoneware fragment, blue-heart design on gray body. These drops were well-spaced from 100 to 200 feet from the seawall and from West 97 to West 89.

Project 235

Dr. Joel L. Shiner directed work on this project. He completed tests in the Elay-Swann tract, an area east and downriver from Orchard Run from which a 19th-century wharf had extended. On this tract had stood some 19th-century structural facilities. Carl F. Miller, under the direction of J. C. Harrington, had begun the "Elay-Swan Tract" tests in 1937. Shiner's evidence supported Miller's tentative conclusions that no 17th-century occupational evidence exists in this area, either structural or artifact. This proved beyond reasonable doubt that the First Fort did not stand here, contrary to the opinions offered by George C. Gregory and Dr. Henry C. Forman (Forman, 1938, p. 331). Forman cited evidence of 17th-century cartography which appeared to place the fort in the area of the mid-southern shore of the island.

Conclusions On The First Fort Search

Dr. Shiner's concluding statements regarding the search for the First Fort are quoted:

> The primary objective of the digging in the vicinity of the Confederate Fort was not realized. No trace of James Fort was found. However, the excavations did not prove that the Fort had not been there. There may be a remnant under some part of the Confederate earthwork. In view of the early seventeenth century artifacts found in the vicinity, there is good reason to believe that the Fort may have been nearby. In all probability, it stood on ground that has been washed into the James River.
>
> Other excavations on Jamestown Island give room for speculation on the location of James Fort. Some historians have advanced the hypothesis that James Fort was located, not at the traditional site near the Old Church, but about half a mile to the southeast on the Elay-Swan tract. Excavations at the latter site encountered no traces whatever of seventeenth century materials, proving that the Fort could not have been located there. Now that the Elay-Swan tract has been effectively eliminated, that increases the probability that the Fort once stood near the Old Church. The discovery that an early Colonial graveyard (Project 105) was under the Ludwell-Statehouse buildings on the "Third Ridge" might be interpreted as evidence that James Fort may not have been far away. The "forge" with its emphasis on arms and weapons may have been associated in some way with the Fort.
>
> An underwater salvage program (Research Project No. 232) attempted to find traces of the First Fort by dredging the underwater shelf offshore from the Church area to the "Third Ridge." Although seventeenth century materials were recovered, they were badly scattered and mixed with later artifacts. The results of the search were inconclusive.
>
> Although the First Fort was not found, some new data are available as a result of the digging. Many artifacts, both Colonial and Indian, have been added to the collection, and information has been gathered about an area hitherto unexcavated.

CHURCHES

Beyond recovery by archeological techniques are the first two churches that were built at Jamestown within the fort area (now possibly offshore in the James River). According to John Smith, the first church service was held under a sail stretched between trees. This first structure was a rude shelter which Smith described as set on cratchets, that is, on upright forked logs, or—a less logical possibility—on crucks after the English medieval mode by then in disuse. This church burned with the First Fort in January 1608. A second church was built, fell into ruin and later was rebuilt in 1610 by Sir Thomas Gates. Ultimately the 1610 church decayed and was supplanted by a barn which served temporarily for divine services.





PLATE 7—*Foundations of Early Church*

Left.—Remnant of the north wall of the precedent frame church, presumably of 1617, based on cobblestones and at least two courses of brick above the cobblestones for a footing. The footing of the original brick church appears to the left beneath the standing wall of the memorial church erected in 1907 by the Society of Colonial Dames. (An in-place exhibit.)

Right.—Foundation evidence along the interior of the south wall of the memorial church, APVA tract, Jamestown. The line of stringer bricks next to the lights marks the foundation of the presumed frame church of 1617. The foundation footing beneath the wall of the memorial church (1907) is presumably that of the first brick church, ca. 1647.

The next or third church to be referred to as specifically constructed dates from Captain Argall's administration in 1617. This structure was "50 foote in length by 20 foote in breadth." Its dimensions and identity appear very plausibly those of the earlier of two foundations at the present site. They were situated a short distance inland from the location of the First Fort. Engineer John Tyler, Jr. discovered these foundations in 1901 inside the foundations of the first brick church. Tyler explored the church site under the auspices of the APVA. According to his brief report to the APVA dated June 8, 1901, the foundations appear to have extended eastward beyond the chancel of the brick church. Lyon G. Tyler in his *Cradle of the Republic* (Tyler, 1906), and Samuel H. Yonge in *The Site of Old Jamestown* (Yonge, 1903) recorded similar observations. Thus the length could have been about 50 feet. The old cobble and brick footings extend only about 25 feet on the south side and less on the north side. The width is 21½ feet, outside measurement. The inside measurement is 19 9/10 feet.

That the earlier church was a frame structure is demonstrated by the character of its foundations. These consist of a footing of cobblestones and rubble on which 1 to 2 courses of brick were laid. It is interesting to note that these bricks, when the writer cleared them for exhibition in 1957, averaged more than 9 inches long, 4⅜ inches wide and 2¼ inches thick. This would make the bricks average ½ inch longer and ⅛ inch broader than the bricks of the first brick church. It is also worth noting that the bricks of the church of 1617 were not as well-fired as those of the later structure. They ranged in color from orange-red to red, whereas those of the brick church ranged from dark-red to purple. The brickwork of the 1617 church was a single header course (a little over 9 inches wide). It was set in rather soft and crumbly mortar in which large pieces of oyster shell occurred. The mortar of the first brick church foundation also contained oyster shell but was considerably harder and better constituted.

Lyon G. Tyler describes the chancel of the 1617 church as being 22 by 5½ feet (Tyler, 1906, p. 122). This chancel was paved with tiles. Above the tiles lay an interval of earth



PLATE 8—*The Church Tower Before Stabilization*

The church tower before stabilization, looking west from the churchyard. The embankment of the Confederate Fort appears behind the church. View taken prior to 1900.

and the tiles of the chancel of the fourth (first brick) church. Tyler also mentions a third, superficial layer of chancel tile which he believed related to the church reconstruction from the wall of the fourth church following the fire of Bacon's Rebellion. However, the records of John Tyler and the APVA do not clarify this assumption.

The fourth (or first brick) church, excavated by Tyler, stood on a foundation 55 feet long, outside measurement, and 50 4/5 feet, inside measurement. The walls of the foundations vary in width from 2 to 3 feet. Outside and attached to the north and south walls are brick buttresses 2 feet 6 inches wide extending from the wall 3 feet 1 inch. There are 3 of these buttresses attached to each wall and spaced respectively approximately 14 feet apart. The chancel of this brick church was paved with square tiles measuring 8½ on a side by 1⅛ inches thick. A door 3 feet 9 inches wide opened at the east end of the south wall onto a transverse aisle paved with brick and situated in front of the chancel. The door was slightly farther east of an indicated door in the south wall of the 1617 church. A brick aisle 5 feet 2 inches wide, extended from the transverse aisle to the door. (The aisle coincides with the width of the west door.)

In his report to the APVA Tyler made an important observation regarding the first brick church, namely:

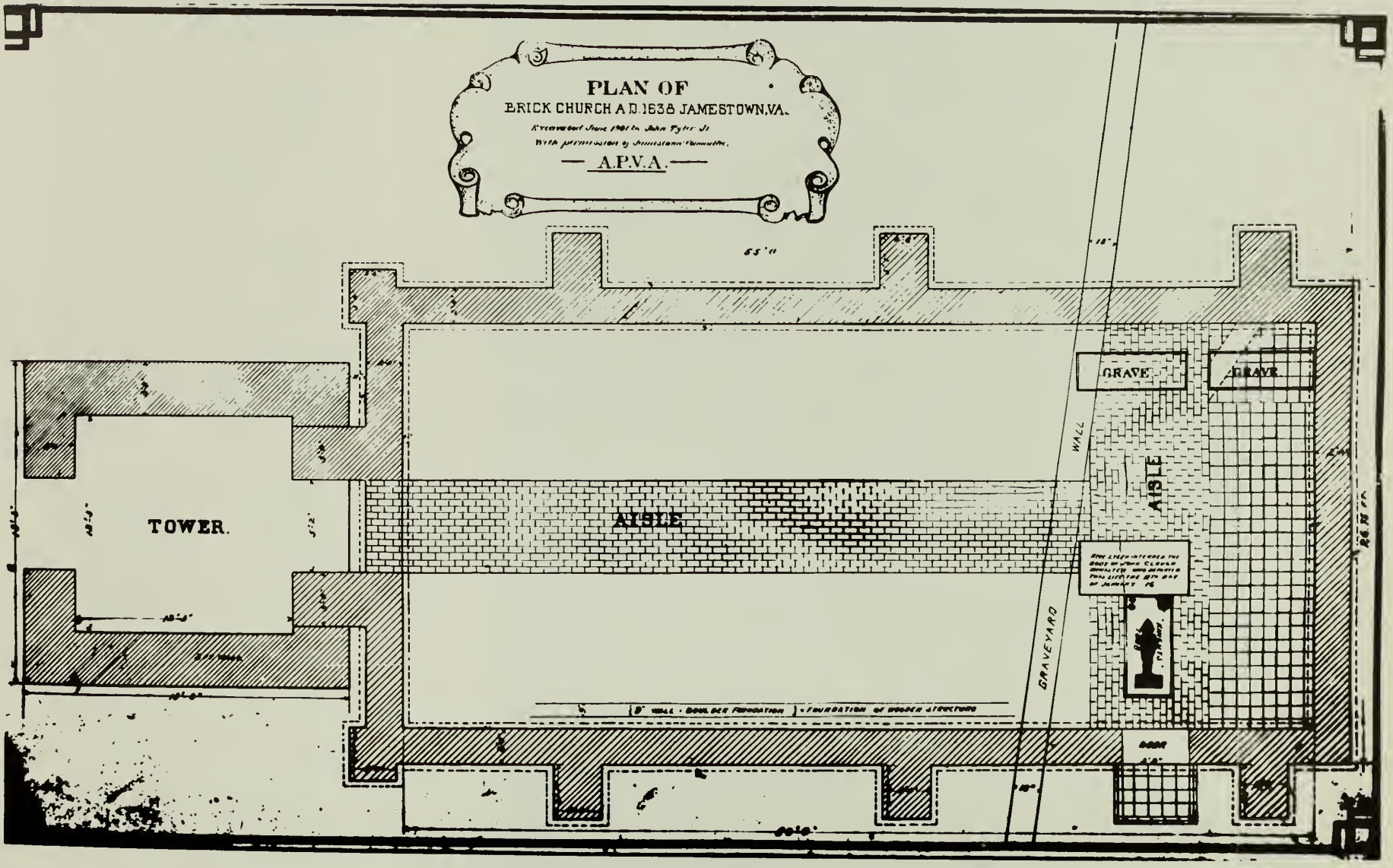


FIGURE 4—*Plan of Brick Church*

Plan of the brick church in the APVA tract. Engineer John Tyler, Jr., excavated the site adjoining the church tower to the east in 1901 and recorded his findings on this plan. *Courtesy, Association for the Preservation of Virginia Antiquities.*

The west wall of the church [is broken] by two transverse walls running 5 feet 2 inches apart and on either side of the eastern arch of the tower. The connecting walls between tower and church are 3 feet thick and run from the church under the tower, evidently showing the tower to have been built after the completion of the church.

Thus the brick church appears to have been built with a west door whose opening extended somewhat beyond the west wall but with no tower. This doorway extension would have had to be destroyed before the tower was constructed inasmuch as a clear space 11 inches wide now exists between the tower and the west foundation wall of the church. Yonge, while not mentioning this fact, states that "Judging from the brick bond of the church tower it belonged originally to the fourth of the five churches, all of which except the latest one are more or less briefly referred to in the available annals of the colonists."



PLATE 9—*Brick Church Foundations*

Brick church foundations excavated by John Tyler, Jr., for the APVA in 1901, looking east from the church tower.

Tyler notes that the fourth (or first brick) church had been provided for in January 1639, by contributions from the council, the governor, and the wealthiest colonists (Tyler, 1906, p. 123). He further states that it was still unfinished in November 1647 when Southwark parish in Surry was assessed tithes and dues "for and toward the finishing and repairing of the church at James Citty." Tyler then adds: "Last to be completed was probably the tower situated at the western end of the church."

Therefore we may assume that the church tower was constructed sometime after 1647 and quite possibly after the burning of the church in 1676. In any event it is an historical fact that the towers of rural English churches of the medieval period were constructed after the churches were built. This would argue against Yonge's suggestion (Yonge, p. 73) that the openings in the north, south, and west walls of the top story of the tower were for defense, since fear of Indian attack ended after the defeat of Opecancanough in 1644.

The tower is approximately 18 feet square with walls 3 feet thick at the base diminished by offsets on the inner faces of each floor to approximately 17 inches at the top. The masonry is English bond with occasional glazed headers. The present height of the church tower is 36 feet. The original height was estimated by Tyler to have been about 46 feet. The first of three stories had arched doorways through the front and back walls. The second story presumably had a window above a round arch that finished the doorway and was itself decorated with a round arch which is still intact. Traces of the lower arch are still visible in the original masonry of the first story. There appears to have been a door, likewise above a circular arch, in the east wall at the second story. This east wall door opened into a gallery across the western end of the nave of the church. The third story had 6 small windows or ports, 2 in front and 2 in each of the side walls. These openings may have served for defense. In any event, they were needed to release the sound of the church bell.

In 1907 The Society of Colonial Dames erected a memorial church directly upon the north and south foundations of the first brick church, so that the original foundations are matched above with modern masonry, even to the buttresses. At the rear of the chancel, however, a remnant of a brick wall, presumably that of the brick church, lies inside the east end wall of the memorial church. This remnant has been re-set with modern (1907?) masonry, and we can only assume that the present memorial church varies from the original outline at the east end by the thickness of this wall. The memorial church construction lies on a steel or iron plate placed on the first brick church foundations.

The foundations of the 1617 and 1639–47 church were dressed in April 1957 for a lighted display inside the memorial church nave. While dressing these foundations the writer made brick measurements and noted three pieces of wall plaster in the earth and detritus between the walls. The plaster, made of oyster shell and sand, had been laid on brick, indicating that the brick church—or churches—had been plastered inside.

A note on brick sizes:

For tower	Average	8½ to 8¾ inches long
		3⅞ to 4⅛ inches wide
		2¼ to 2⅜ inches thick
For chancel (floor)	Average	7 11/16 to 8⅝ inches long
		3 9/16 to 4 5/16 inches wide
		2⅛ to 2½ inches thick

These sizes are within the range of bricks in buildings built about the middle of the 17th century at Jamestown, but noticeably smaller than those representing the last quarter, as seen in Structure 125.

CHANCEL AND CHURCHYARD BURIALS

During the June 1901 exploration of the foundation area of the church, engineer John Tyler, Jr., reported that the old graveyard wall, 18 inches thick, was built across the nave 16.8 feet from the southeast corner and 13.1 feet from the northeast corner, in front of the chancel.

We may infer from the records of the APVA (see Appendix C) that a number of burials were discovered beneath the chancels of the 1617 and 1639 churches and possibly beneath a subsequent chancel floor. There may have been as many as 20 such burials, 10 being located beneath each of 2 sets of tiles. Beneath the aisle bricks, two flat tombstones were found. One of these tombs once had brass plates set in carved recesses of the face. This tomb lies directly in front of the door of the original brick church, and is oriented north-south, rather than in the conventional east-west position.

At right angles to the tombstone with the brasses missing is a tombstone bearing the inscription:

> Here lyeth interred the body of John Clough, minister, who departed this life on the 11th day of January 16—.

Several graves were located in the ground on either side of the central aisle of the brick church, but the number of these tombs and their associations with their respective churches is uncertain.

Near and parallel with the north wall were 2 graves, 1 across the chancel and the other across the transverse aisle. It is certain that they belong to the last church at the site because of their position beneath the brick and tile floorings, and because they were not intrusive from a later period.

Members of the Association for the Preservation of Virginia Antiquities under the direction of Mary Winder Garrett and Annie Galt made further explorations in June 1902. Mr. William Leal, caretaker and stonemason, assisted them. The Misses Garrett and Galt rendered a report to the Association on December 15, 1905. In their report they described removing the 9-inch square tiles in order to dig below the chancel. Below this tile flooring they found what they believed was another chancel composed of tiles 7 inches square and 2 inches thick. Only the center portion of the older pavement was intact. However, they found a bed of mortar that stretched from the east wall of the buttressed church westward into the nave 4 feet 5 inches beyond the limits of the upper chancel. Tile impressions appeared in the surface of the mortar to show that they had once extended the full width of the older chancel, 21 feet. Thus, the lower chancel corresponded in width with the inside measurement of the cobblestone foundation discovered by Tyler in 1901. The chancel of the buttressed church was 22½ feet wide.

Although the report does not state the interval in depth between the earlier and later chancel floorings, there was sufficient clearance to accommodate 10 burials, all oriented east-west. Beneath the tile and mortar flooring of the lower chancel was room for more burials interred closer together than those above. These varied slightly in orientation from the higher burials in relation to the axis of the cobblestone foundation which was slightly north of west and south of east. One of the burials beneath the older chancel extended 1 foot 6 inches east and beneath the east wall of the buttressed church. This demonstrated that the chancel of the earlier church was considerably deeper from front to back and that the earlier church was longer.

The report is not clear as to whether or not 10 burials were excavated and identified beneath each chancel floor.

Excavations were carried on in the churchyard where a number of unidentified graves were found. The association placed markers to these graves and continued the excavations in an effort to establish the extent of the churchyard. Through these excavations, conducted by William Leal, graves were found extending on the south to the river. On the north and east, nothing was found beyond the enclosure. Memories were cited to give evidence that human burials were exposed when the Confederate Fort of 1861 was thrown up. While no burials were found in 1955, in testing done beneath the fort, 2 burials were found east of the cemetery wall at that time. If the observation that the burials extended to the river is correct, we have here a significant clue, since property boundaries are cited with reference to the churchyard.

CEMETERIES AND SCATTERED BURIALS

Until 1955 the only known cemetery of the first settlers was the one that lies about the standing tower of the 1639–47 church. Although the full extent of this burial ground is not known, we may say confidently that its limitations were the low ground to the southwest, the "greate road" to the north and east, and the limit southward of the original shoreline.

As stated earlier, the church stood on slightly rising ground some 100 to 200 yards from the First Fort site, the present church ruins representing three distinct superimposed structures. The first of these was probably the third church, 20 by 50 feet inside measurement, erected of wood on a brick foundation in 1617. About this church (and probably inside its walls) lay burials of an early cemetery which occupied this piece of relatively high ground. Prior to 1617 the first and second wooden churches respectively, were standing within the First Fort area, and burials could have been deposited on the third or fourth ridge, or on both. The foundations of the present church reconstruction lay outside those of the third church, and probably represent the fourth of five churches, having been built at the time of Bacon's Rebellion in 1676. The fourth church foundation definitely overlies graves of a cemetery, but the exact date of its building is not known—probably between 1639 and 1647. The fifth and last church was built on the foundations of the fourth, possibly using the standing walls after the interior was destroyed by fire in 1676.

A second cemetery, also dating from the early part of the 17th century, was discovered on the third ridge in 1955 by accident, during excavations under joint auspices of the National Park Service and the Federal Jamestown-Williamsburg-Yorktown Celebration Commission. This work was to reveal the foundations of the Third and Fourth Statehouses for measured drawings. It was carried out under the direction of Archeologist Louis R. Caywood. Five burials were noted beneath the level of the bottom courses of brick, implying that this burial ground had been abandoned and forgotten by the time the Ludwell House and the Third Statehouse were built, shortly before 1665 and about 1665, respectively.

The National Park Service arranged a supplementary project in 1955 to determine the extent of this burial ground. Dr. Joel L. Shiner directed this additional testing in and around the foundations of the entire building group on the third ridge. Seventy burials in all were located in selective tests. The tests revealed that the cemetery had extended generally over the ridge from an undetermined point on land now eroded by the river, east to the present frame building, "The Yeardley House."

Of these burials, which may have been as many as 300 originally, only 10 were exposed fully. Evidence here indicated hurried interment, probably without coffins in most cases.*

Whether or not this find was made after the original clearing of the foundations in 1903 is uncertain. Yet it is probable that at some time Colonel Yonge actually excavated one of the burials underlying the Ludwell-Statehouse group. However, no further exploration was made at the time and the burial evidence was left unreported.

This suggests that the third ridge cemetery, as well as the one around and below the existing church site, dates from the first quarter of the 17th century. Between December 1606 (when the first vessels of the Virginia Company left England) and February 1625, 7,289 immigrants came to Virginia. During this period 6,040 died. Between December 1606 and November 1619, Alexander Brown estimates 1,640 immigrants out of 2,540 died (Brown, 1898, pp. 285–320). Allowing for a proportion of these settlers to have been buried on plantations and settlements on the mainland, it is evident that more persons were buried on Jamestown Island during the first few years than lived there at any one time thereafter.

Four burials within 100 feet of the present confines of the churchyard (lot 98:98) are probably associated with the old burial ground and present no unusual aspects. The only artifacts found in 1 of these burials were 2 bronze straight pins, 1 at the throat, the other on the right parietal—presumably part of a cloth adornment or bandage. All four burials undoubtedly represent the 17th-century settlers. The bones were exposed and recorded, but not removed.

Soil shadows indicate that the bodies were placed in some kind of box, although more tangible evidence of coffins is lacking.

Excavation in 1938 revealed the Travis graveyard, located 1½ miles from the church tower. This cemetery, which was once a private tract belonging to an 18th-century planter, contains at least 62 burials.

Although legal steps were taken early in the history of the colony to provide each parish with a public cemetery (usually the churchyard), it was customary from the beginning for many to bury their dead in the vicinity of their homes (Bruce, 1895, Vol. 2, pp. 237–239). The law did not permit interment of any servant in a private spot (Hening, 1823, Vol. 2, p. 53). A servant had to be buried in a public cemetery, with witnesses. This also protected from scandal those who might be suspected of illegality.

We may note in this regard that archeological search has revealed scattered burials at Jamestown. For instance, two skeletons, a young male and female, respectively, were discovered in a ditch (D–76) 70 feet south of the workshop, Structure 110 (lot 101:103). Neither appears to be typically European, rather Indian or part Negro. Another burial, a heavily deteriorated, syphilitic Indian (see Appendix B) lay in the intersection of Ditches 8 and 10, 50 feet north of the frame structure, Structure 116 (Lot 96:106). A disarticulated "bundle" burial was found at the exterior (southwest) corner of the brick fireplace of Structure 116. The bones were lying in a compact pile 1.1 feet deep, just below the humus line at the level of the base course of masonry. A refuse area 1 to 2 feet below the surface surrounded the burial and the corner of the fireplace. This refuse area contained cow bones; brick fragments; 14 white pipestems, indicating the last half of the century; 6 pieces of local, lead-glazed earthenware; 1 piece of English, lead-glazed earthenware; 4 pieces of stoneware (both brown and gray-mottled, probably English); a piece of Chinese porcelain; a wine-bottle fragment; 11 handwrought nails; and a brass pin. Significantly, perhaps, the fill also contained a large white glass bead, an Indian quartzite flaked knife, and an unworked flake of quartzite. This burial, removed en bloc to the Jamestown museum storage room, has not yet been fully examined. It is designated Burial 1 of Project 102.

Therefore we may presume that the surrounding refuse in the humus represented a superficial mixture of 18th- and 19th-century ceramics, although the burial itself contained no direct artifact inclusions. Yet the lower humus contained house refuse generally signifying the last half of the 17th century.

Any supposition, therefore, that the burial is prehistoric Indian seems open to question. Moreover, it is not probable that this burial represents one of the native or white victims of cannibalism in the Starving Time of 1609–10. It is more plausible that an Indian burial was disturbed by the excavation for the brick fireplace and redeposited at its corner.

* A small box of human skeletal fragments, representing a young adult, is in the possession of the APVA and bears the following notation:

> Teeth and small parts of bones found 5 feet below the ground in trench along south wall of the Ludwell House Cellar, Statehouse foundations. June 5, 1930.
>
> S. H. Yonge
> from Mrs. Ayers

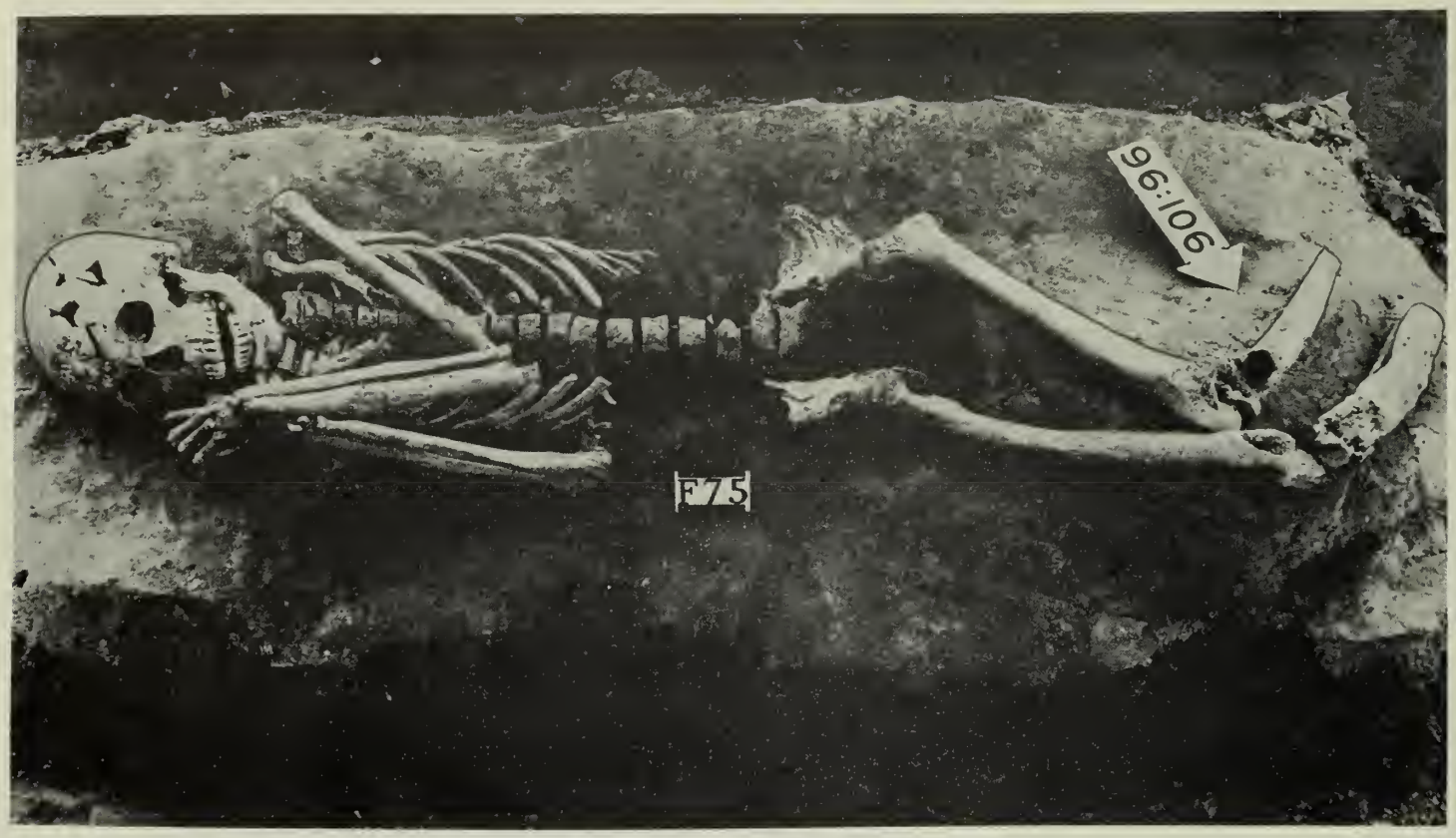


PLATE 10—*Skeleton from Indian Burial*

Burial "Feature 75" of Lot 96:106 was located in the crossing of Ditch 10 and Ditch 8. The body was oriented with head to the east. Indications of advanced syphilis (osteomyelitis) are conspicuous, especially in the frontal bones of the head and the tibiae. The excavator (Archeologist Conrad B. Bentzen) reported in August 1940, that in his opinion the skeleton was that of an American Indian, male, about 30 years old, not buried in Christian manner. A piece of window glass beneath the 3rd lumbar vertebra and the deposition in a ditch indicates 17th-century dating.

Several burials have been discovered outside the confines of the cemeteries (Third Ridge beneath the Ludwell-Statehouse group and the churchyard between the "greate road" and the river). Some can be assumed to be those of settlers, possibly servants, who, for some reason, were buried outside of consecrated ground. Bruce mentions at least one settler who preferred to be buried in his own garden! (Bruce, 1895, Vol. II, p. 238.)

A definite category of burial, however, can be designated for Indian skeletons deposited in ditches, of which there are at least three reliable examples: Feature 75 of Lot 96:106, a burial in Ditch 10 at the intersection with Ditch 8, and Burials Nos. 1 and 2 of Project 194, deposited nearly head-to-head in Ditch 76 in Lot 101:103. Happily, Burial No. 1 had a clay pipe in good preservation directly associated with it. Therefore, this burial can be dated with confidence in the 1680 period, and, by analogy, the same would hold for Burial 2.

The burial (Feature 75) found in 1940 (Bentzen, 1941), had a piece of window glass deposited beneath a vertebra, and, by this and other association, is pretty surely within the Jamestown 17th-century era, probably last half of that century. The skull of this burial has been the subject of a meticulous study by Dr. George K. Neumann who sent his report to Mr. Bentzen June 19, 1942, for the Jamestown files. His report is included in this report where it supplements archeological data on the Indians associated with Jamestown.

THE POTT AND KNOWLES TRACT
1955 INVESTIGATIONS
(LOTS 95:110, 95:111, AND 96:110)

During the 1955 field season, an effort was made to locate significant structural evidence relating to the tract east of Ditch 1 and owned at various times by Dr. John Pott (1624), John Phipps (ante 1663), John Knowles (1665), Jonathan Newell (1668), Stephen Proctor (1679), William Sherwood (1681), and Jeffrey Jeffreys (1697). None was found.

This tract, lying north of Ditch 2, had been heavily used by the Barneys in the late 19th and early 20th centuries, and by the CCC camp facilities in the 1930's. Barns, sheds, shops, and miscellaneous frame structures had been spread over the ground for a distance of 600 feet east of the Ambler House.

Results of testing in lots 95:110, 95:111, and 96:110 were largely negative. Although the tests were limited and did not extend north of N 97, they were concentrated in the area which could have bordered "the back streete"—either north or south of Ditch 2. Three extra trenches were dug in the northwest quadrant of Lot 95:110 to determine if Ditch 2 turned north and if so, how far it extended. It was proved that Ditch 2 did not turn north. Further examination of the original field plats showed that evidence of its turning north had not been found. Early archeological references at Jamestown show that there was a turn, and this was recorded on the original base map—since corrected.

The artifacts of Project 104 test trenches, in these 3 lots, represent the 18th century almost exclusively, with only a few pieces of Dutch delftware and gin bottles to suggest 17th century. Certainly if Dr. Pott and his contemporaries from the first half of the 17th century were established here, they failed to leave as much as a clay pipe bowl behind them—which is stretching probability to the vanishing point. Of 4 ditch traces (Ditches 57, 56, 55, and 54) all extending nearly north-south between E 110 and E 112, only Ditch 55 was explored beyond the test section. Ditch 55 was tested its full length and found to be only 42.8 feet long, 4½ to 5 feet wide and with a bottom 2.4 feet below the surface. The nature and purpose of this ditch is hard to interpret, but the fact is evident that it was ultimately filled with refuse. This refuse, which was notable in quantity and variety, gives a clear time association from 1720 to 1760. It included English delftware; Chinese porcelain; salt-glazed Staffordshire; last-half-18th-century wine bottles (fairly numerous); salt-glazed utility stoneware jugs; English slipware of 1700–60; pipebowls of mid-1700's or a little later; a broad iron hoe; and miscellaneous other iron items, including cannonball fragments.

No other features, structural or otherwise, were found except the brick floor of a superficial, small (8 by 12 feet) outbuilding, Structure 133, possibly associated with a garden of the late 18th or early 19th century.

THE COUNTRY HOUSE—LUDWELL HOUSE—THIRD AND FOURTH STATEHOUSE

The Country House-Ludwell House-Third and Fourth Statehouse group consists of four distinct units which were evidently built at different times, although mutually joined. These units, designated A, B, C, and D, will be associated as logically as possible with historic references—bearing in mind that these references are not always precise.

Unit A

The initial core unit comprises 4 apartments: the westernmost apartment, cut at the west end by the seawall, is the front half of the Country House; the other 3 are taken to represent the front halves of "Philip Ludwell's 3 houses." These 4 apartments ostensibly were units of a single row house 160 feet long, between the extreme western and eastern walls, inside measurements, according to Yonge's scale diagram (Yonge, 1903, p. 87). Each apartment was slightly less than 40 feet long and 20 feet wide. The 4 subunits were separated by party walls. Only the easternmost house had a cellar, which was paved with brick. The 2 western rooms had central fireplaces which were double and detached from the walls. The 2 eastern rooms had interior fireplaces in the end walls, and semipartitions in each room faced a porch placed in the center of the respective southern walls. These porches were nearly identical and measured approximately 10 by 10 feet, inside dimensions. A third porch, slightly less than 8-feet square, is attached to the west end of the south wall in the middle of "Philip Ludwell's 3 houses." The porches have no cellars beneath them and the 2 larger ones are clearly entranceways.

The remarkable similarity of Unit A of this group to Structure 115 is instantly evident. Like Unit A, Structure 115 is a long, multiple dwelling situated between Pitch and Tar Swamp and "the back streete." Both structures have an inside length of 160 feet; both are approximately 20 feet inside width; both have the double apartments averaging a little more than 38 feet inside in length, separated by party walls and, interiorly, by massive double fireplaces nearly 8 feet wide. Both structures have cellars beneath the easternmost apartment. Structure 115 has only 1 attached unit corresponding to the porches of Unit A of the Ludwell Houses. This unit is somewhat larger and has a cellar. The arrangement of the fireplaces in Unit A and Structure 115 has several important points of correspondence, if we except the large exterior fireplace of Structure 115, east side. Artifact evidence from Structure 115 indicates occupancy extending to the end of the 17th century.

Unit B

Yonge assumes that the westernmost apartment of Unit A was the "Country House," or Governor's mansion, and that the remaining 3 apartments were "Philip Ludwell's 3 Houses" (Yonge, p. 87). If Yonge's assumption is true, then the Statehouse was probably completed about 1666 as 2 additional apartments attached to the east end of Ludwell's 3 houses, or the Unit A row.

Unit B had 2 compartments, the smaller one adjoining Ludwell's house 30 by 20 feet, and the easternmost compartment, 40 by 20 feet. A 10-by-10-foot porch was located midway in the south wall of the Statehouse. A slightly larger porch, or attached room, 15 feet square, was placed midway in the north wall. Significantly, no fireplaces appear to have been built into the Third Statehouse. This leaves us to assume that here began the tradition of building statehouses without heating facilities in order to reduce the fire hazard, a characteristic of the Fifth Statehouse, built at Williamsburg. It may be noted, however, that a pair of 8-foot-wide recesses, 3 feet deep, midway in the north wall of each statehouse room may represent either fireplaces or window bays. The statehouses had no cellars. The Third Statehouse was burned in Bacon's Rebellion, and it is

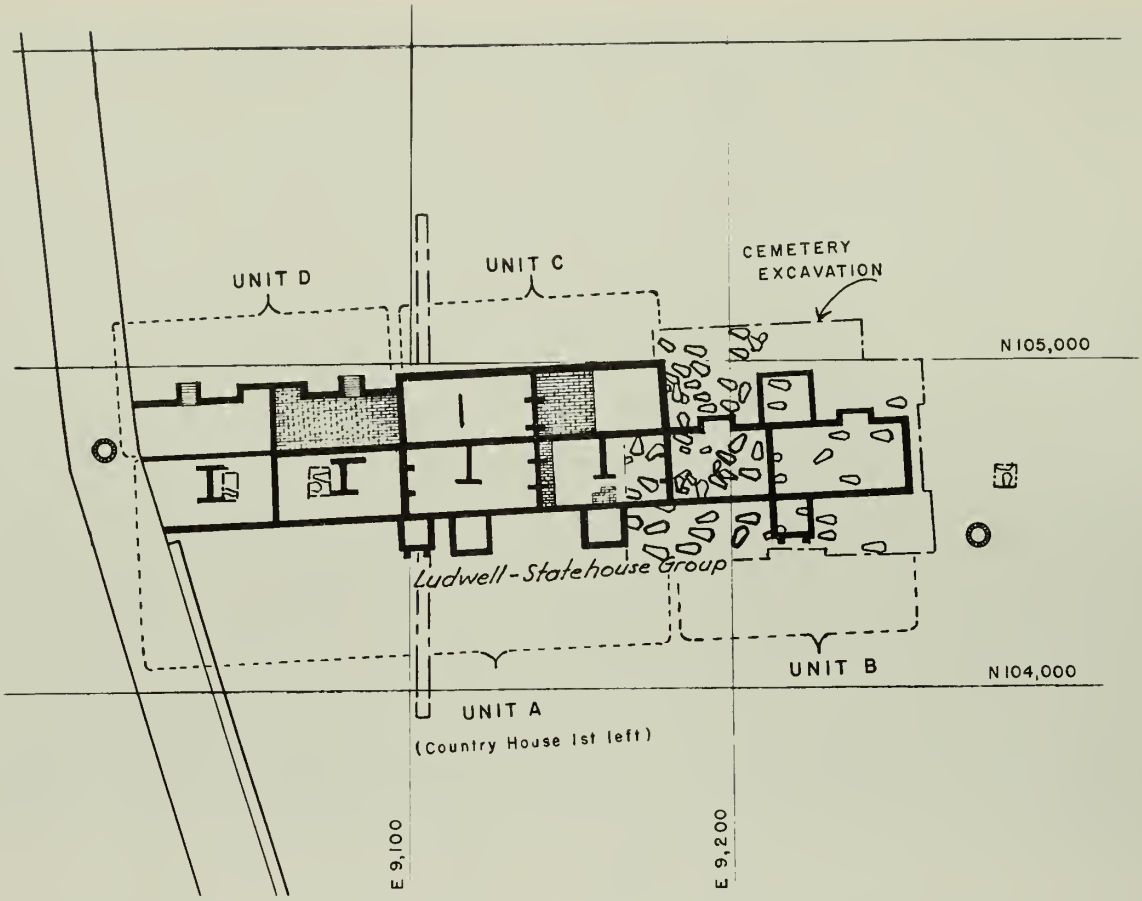


FIGURE 5—*Plan of Ludwell-Statehouse Group*

assumed that the Fourth Statehouse was built directly upon the foundations of the Third, or, that its masonry shell was used.

Unit C

This unit is reported by Yonge to have a small proportion of the underpinning at the northernmost wall made up of granite rubble. With this exception the rest of the walls are laid on a bed of mortar about 2 inches thick. The cross walls of Unit C are markedly out of line with the corresponding walls of Unit A, with which they are contiguous. To Yonge, these discrepancies indicated that Units A and C were built at different periods, and Unit C was possibly later. The only cellar in Unit C is a half-cellar in the eastern room. Unfortunately, no study can be made of the artifacts from this or other unit cellars. The brickwork of Units A, B, and C, insofar as it was briefly observed beneath its capping in 1954–55, appears fairly uniform and characteristic of the 17th century. The homogeneous row house aspect of Unit A, seems to support Yonge's contention of the later addition of Unit C.

Unit D

Yonge regarded Unit D, in its eastern room which contained a cellar, as representing one of Philip Ludwell's three houses. "Under the northern half of the westernmost Ludwell house was found a cellar 20 by 40 feet by about 6 feet deep, filled with the brick of fallen walls" (Yonge p. 89). The size of the bricks suggests the possibility that Unit D was added to Unit A at a later date. The bricks are slightly larger than the typically 17th-century bricks of the A and B units. Also, the two cellar rooms of Unit D are markedly dissimilar in design from the adjoining rooms of Unit A (see Figure 5).

The western room of Unit D had an unpaved cellar; the eastern room had a cellar paved with brick. Yonge (p. 90) describes this brick floor and the contents of cellar fill:

> In the floor is a pit three and one-half feet square by three feet deep, with brick-lined sides. Leading from the pit to what was apparently formerly a hole about a foot in diameter is a shallow drain. It is possible that the pit was for draining the cellar, but it is far more probable that it was a well. On the floor of the cellar were several sheets of melted lead, and among the brick debris were a "sacar" shot, also two bombshells—one of the calibre of a demi-culverin, the other of a sacar —and fragments of exploded shells. The above warlike relics may have been fired in 1676 from Bacon's trench near the north end of the isthmus. The cellar is entered by a flight of steps on its northern side. A pipe, scissors, steel sewing-thimble, copper candle stick, ladies' riding-stirrup, and an old bottle, all of quaint and antique shapes, found in the cellar, form additions to the Association's relics.

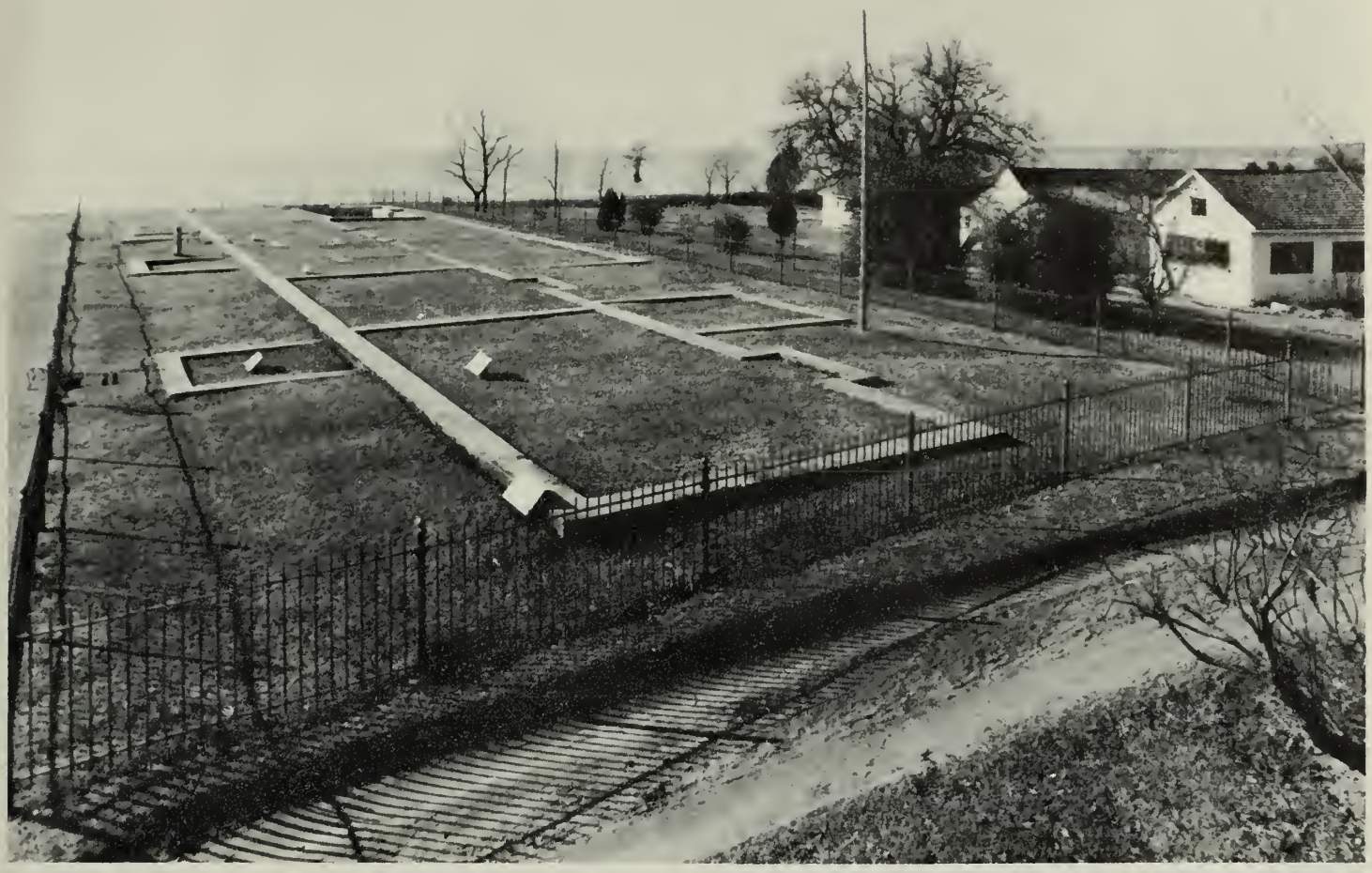


PLATE 11—*The Ludwell-Statehouse Foundations*

The Ludwell-Statehouse foundations after excavation and capping. The capped walls of the largest continuous row of joined houses so far found at Jamestown, the 4th Statehouse (nearest the camera), the Ludwell House, and, at the far end, the presumed "Country House." These foundations, consisting of 10 major units, were located and partly excavated by Col. Samuel H. Yonge in 1903 following preparations for the building of the seawall, which he directed. The integral portion of this structural series (Unit A) closely resembles Structure 115.

Unfortunately, the identity and provenience of some of these objects are now a matter of conjecture, since no specimens were systematically catalogued. We may wonder at the "exploded shells" assumed to have dated from the 1676 rebellion. Yet some of these objects are undoubtedly among the miscellany of 17th-century objects in the Relic House collection of the APVA at Jamestown. In this collection is a bottle seal not mentioned by Yonge which bears the date 1710 and the letter B intertwined with a merchant's mark (ornamental device). This seal is associated with the label "Found in the Country House." The best evidence, then, is that this seal did come from the cellar of the Unit D, west room.

It is interesting to speculate if the thimble mentioned in Yonge's description was indeed steel because the 2 thimbles in the relic house collection, provenience unknown, are bronze and brass respectively. A steel thimble would be at variance with other thimbles found at Jamestown, which are characteristically of bronze. Steel would indicate more probably a late date. One can also assume that a brass or bronze thimble was mistaken for steel, or that a steel thimble was not preserved in the collection.

Yonge reasoned that the attached westernmost rooms of Units A and D were the Country House, i.e., the residence of the governor. If either or both of the north rooms of Unit D are to be associated with the "Country House," it is evident from the character of the ground plan that both are alike in design and purpose—both are cellars. Yet, the westernmost room is unpaved and each room has a stairway in the north wall, center, leading to ground level. The only feature which would suggest a unity for the two end rooms is the somewhat



PLATE 12—*Conjectural Drawing of the Country House-Ludwell House-Statehouse Group*

Conjectural painting of original building group. The row of attached houses including the Country House, Ludwell House and, at the right or north end, the Third Statehouse (N104; E 90, 91, 92). This row is located on the Third Ridge, over an early cemetery estimated to have contained at least 300 burials (possibly from Starving Time, 1609-10). Research by Hudson, Kocher, Forman, Yonge, Caywood, and Shiner. *Painting by Sidney E. King.*

thinner wall between them. This could indicate possibly that the room at the west end of Unit A may have been entirely rebuilt when the north cellar portion was added.

THE AMBLER HOUSE COMPLEX

The most conspicuous ruin on Jamestown Island today is that of the Ambler House, probably built between 1710 and 1720. This structure burned three times—once during the Revolutionary War, once during the Civil War, and again in 1898. During the Civil War, Federal soldiers were said to have torn down the wings to provide materials for bivouacs. For a history of this house, see Forman (1938, pp. 116–133) and Tyler.

The Ambler House was a typical large river plantation mansion, with central unit (Structure 101) and flanking dependencies, or wings, (Structures 30 and 87), connected by walkways (Structures 98 and 99), and small structures (Structures 32 and 97), adjoining the walkways. The central unit measures 54 by 38 feet, and is divided by walls running front to back into 2 lateral units, each 16 by 33 feet, with a central hall 13 feet wide. The house has a full basement with outside stairways in both east and west walls. It was built of typical 18th-century bricks, and was stuccoed in the 19th century.

The area east of the standing ruins was excavated in 1935, and the section to the west in 1940, but no detailed archeological report was ever prepared on the entire Ambler House complex. Although their association with the Ambler House has not been demonstrated conclusively, certain structures, because of their orientation, may well be remains of Ambler outbuildings, Structures 54, 59, and 73, (see p. 80). The brick drain (Structure 89) connects structurally with the corner of the Ambler House cellar, and the brick drain in Ditch 1 (Structure 56) and the short brick drain behind the house (Structure 90) may likewise date from the Ambler period.

The gravel road (R-3) definitely belongs with the house, and obviously dates from the period when the two wings still stood. The road extending straight out to the river (R-4) is a later approach to the house, and shows in late 19th-century

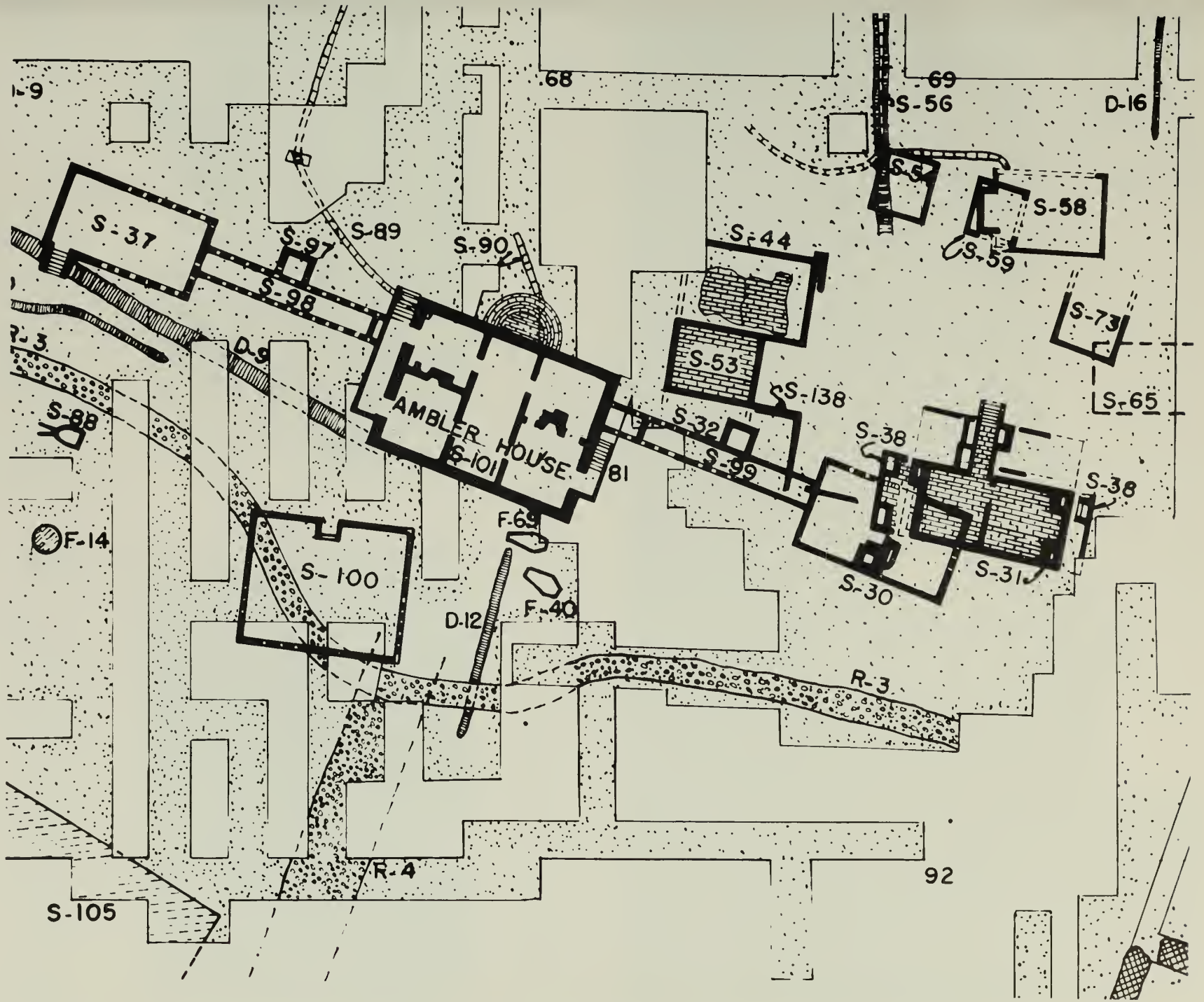


FIGURE 6—*Plan of Ambler House Complex*



PLATE 13—*The Ambler House*

The Ambler House as it appeared in the early 1950's. It had been stabilized with masonry capping and steel struts in the early 1940's.

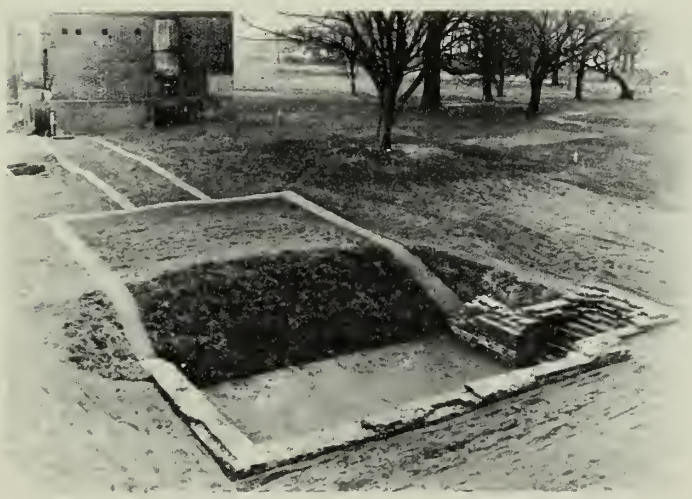


PLATE 14—*West Wing of Ambler House*

The west wing (Structure 87), the walkway (Structure 98), and the addition (Structure 97) were all exhibited after investigation as a phase of the interpretive program for the 1941 travel season. These structures, since they are post-17th century, have since been re-covered.



PLATE 15—*Structure 32*

Structure 32 (Lot 96:108), a small rectangular addition to the north side of the runway between the east wing of the Ambler House (Structure 30) and the main house. A comparable structure on the west side of the Ambler House is Structure 97.

photographs (Tyler). The large formal garden, with brick walks, in the May-Hartwell Tract, also are part of the Ambler complex. Other problematical structures may likewise belong to this period, as the Amblers would surely have had extensive slave quarters and other plantation structures.

NECK OF LAND

Project 114 encompassed the Jamestown utility area prior to its construction. It was authorized in 1954 on the premise that a portion of an early 17th-century community might be disturbed. This general locality is described with notable lack of precision in historical records as "Neck of Land."

Historian Charles E. Hatch, Jr., of Colonial National Historical Park, in his report entitled, *Summary of Data Relating to "Neck-of-Land neare James Citty"* (Hatch, 1954) was able to cite definite references to occupation at Neck of Land in the 17th century only as far as the Virginia census of 1624–25 in which 25 persons are listed as resident here. By comparison, "The Main" had 88 persons, Glasshouse 5, Archer's Hope 14, and Jamestown itself 182 persons, not counting another 39 occupying farmland on the island. After 1625 "There is only an occasional glimpse . . . of life as it was lived" at Neck of Land, writes Hatch.

"The later history of Neck of Land seems even more obscure than its early phase. No significant settled sites grew into plantations of note and no famous incidents, or happenings, appear to have marked the area." The French military map by Desandroüins of 1781 does show 1 house standing in the approximate utility area location, marked "Neck Lands" (see Figure 8). Nothing was listed in the Hatch report for the 19th and 20th centuries, except the fact that a house was standing south of the utility area tract in 1954. With this information, the work began.

The field operations began between the parkway and Back River. A 100-foot interval grid oriented on magnetic north was laid out with the 0–0 point located beyond range of major operations to the southwest so that the main references read north and east. Station 1078 plus 00 on the parkway center line was located at North 1,020, East 1,380. East of E 800 was designated Area A, west of E 800, Area B. Area B was subdivided into B-1 (parkway to N 1,000), B-2 (N 1,000 to N 500), B-3 (N 500 to N 0), and B-4, the end of the Neck of Land promontory into Back River. Ground and site plans of all features at Neck of Land are on file at Jamestown.

Features

Eleven features, all representing structure foundations, were recorded. Of these, Numbers 2, 5, 8, and 10 (obviously 19th- or 20th-century buildings connected with farm operation) were, respectively: a pig pen, shed or barn, a tool shed, and a barn. Features 1, 3, 4, 7, and 9 all suggested early 19th- or late 18th-century association, although all could have been utilized through the 19th century. Numbers 1, 3, and 7 were small outbuildings, indicating possible use, respectively as a milkhouse, smokehouse, and kitchen. Features 4 and 9 were nearly identical and represented frame houses on masonry pilings each with a large central fireplace foundation. The No. 9 house was farthest east from an abandoned late 19th-century house still standing in 1954 and was presumed to be earlier than the late 19th century house. Destruction by fire is indicated by charcoal and fused glass in the soil within and near the foundation. All bricks at Feature 9 house were large and thick, a standard sample measuring 9 by 4½ by 2¾ inches. No old mortar was observed to adhere to the exposed brick; therefore presumably it was not salvaged. The bricks of Features 4 and 9 were uniformly large, but those of Feature 4 walkway were mixed sizes, half being of a smaller size more comparable to those of Features 1, 3, and 7. The foundations of Features 4 and 9 alike measured 20 by 40 feet.

The only 17th-century house, Feature 11, was discovered in the Neck of Land Area B-1, Lot North 1,000 East 500, squares 6, 7, 16, 17, 26, and 27. This structure was 500 feet west of the abandoned house and its nearby precedent archeological features. Evidence consisted of a rectangular brick masonry foundation measuring 17.1 feet east-west by 14.8 feet north-south, and 15.0 by 12.5 feet inside. The walls were 1.1 foot thick or the width of a header and a stretcher brick.

Within the walls of Feature 11, the footing of which was only 2.5 feet from the top of the plow zone, was a brick flooring laid in a regular pattern, east to west, except that a stringer line was laid next to and parallel with each wall. The east-west pattern of the floor brick ran counter to a single stringer line. This stringer extended from the midpoint of the south wall northward down the middle of the floor to a remnant of a shallow well located in the north portion of the cellar floor. Apparently this well was not bricked and measured 1 foot by 1.5 feet. An annex to the south wall exterior opened into the cellar. This rectangular annex was made up of a single header of masonry 8½ inches thick. It extended 3.5 feet from the wall and was 4.5 feet wide, overall. The annex interior dimensions were 3 feet east-west by 3.5 feet north-south. In the southeast corner of the cellar was a block or pier of masonry four bricks high. All walls were of English bond.

Brick sizes for the Feature 11 foundation averaged, in inches, 8½ by 4½ by 2⅛. Of the 4 representative bricks recorded, 3 are tan and soft and 1 is red and fairly hard:

8½ by 4¼ by 2
8½ by 4½ by 2⅛
8¼ by 4⅛ by 2¼
8¼ by 4⅛ by 2

Artifacts

From the fill of the shallow cellar of Feature 11 the artifacts between the bottom of the plow zone and the floor appeared to have uniform type and dating characteristics. These are summarized as follows:

Ceramics:

Earthenware:

Fragments, lead-glazed, locally made pots, ca. 1650 plus—16
Fragments of lead-glazed, English utility-ware—3
Fragments of English or Dutch Delftware, blue-on-white —8

Tobacco pipes:

White bowls, 1640–70—1, 1650–75—3
White stems, Est. 1640–80—17 (5 decorated)
Brown (local) bowls, molded 1650?—4, modeled (date?) —1
Brown (local) stems—17 (2 decorated, including 1 marbled)

Stoneware:

Blue-on-gray—3
Brown mottled—7

Glass:

Bottle, gin—17
Bottle, wine (early)—2
Square apothecary-type bottle with screw top—1
Venetian wineglass stem fragment—1
Window glass—2
(Note: 1 fragment of a 19th-century wine bottle was found in the plow zone and is intrusive.)

Iron:

From the tops of the walls to the plow zone, and from the interior fill the following items were found:
Handwrought nails and spikes, 2 lbs., assorted and various-sized (not cleaned for examination).
Spur—1
Triangular file—1
Riveted strap iron fragments, possible barrel hoops.
Ax blade fragment—1

It can be said that the terminal date for occupation of house structure, Feature 11, must be about 1675. No exploration was made beneath the bricks of the floor and no evidence determined the initial occupation. By implication, however, this brick structure is probably not older than 1640. The occupation is roughly comparable to that of Structure 112 on Jamestown Island, Area B. It is possible, but not probable, that this is one of the houses of, say, Richard Kingsmill in 1625.

Other Neck of Land Tests

Strip tests were made at intervals in Areas A and B between the old Rolfe Highway (formerly State Route 31, now obliterated) and the parkway. These tests yielded no feature data and only a sparse scattering of 17th-century artifacts, none of note. Testing at intervals was continued to the southwest between Rolfe Highway and the parkway beyond Area B to Back River without disclosing any evidence of occupation.

Tests at 50-foot intervals were continued in Areas B-2, B-3, and B-4. Tests on B-2 and B-3 indicated only sparse scattering of 17th-century and more often 18th- to 19th-century detritus, with no structural evidence except an occasional brick fragment. At B-4 on the end of the promontory into Back River, a trash area (FS 36) was located in a step-sided pit 3.5 feet deep, maximum, which yielded considerable detritus including iron artifacts late 18th- or early 19th-century. No structure was found, but some brick fragments indicated a house was close by. Random tests failed to locate this structure.

Summary

Of Neck of Land, it can be said that limited tests showed that considerable sheet erosion has reduced the topsoil here, leaving it uniformly thin above undisturbed clay. This evidence is further supported by the shallow aspect of the cellar of the 17th-century house, Feature 11. Probably most of the occupation associated wtih Neck of Land in 17th-century references was actually farther east along the Rolfe Highway (Old State Route 31), which is itself a very old road, perhaps dating as far back as the 17th century. In fact, at least one resident on this road a quarter of a mile east of the Jamestown utility area found artifacts on his property, offering considerable indication of late 17th-century type. This material was inspected and verified in 1955 by John L. Cotter. However, the specimens were not given to the National Park Service.

The right-of-way of the parkway between the utility area and Glebe Gut (downriver) was also carefully inspected. But no evidence of 17th-century occupation was found.

The complex of structures located between the utility area and Back River represented occupation only from the late 18th through the 20th centuries.

Structures and Related Features

From the description of recent excavations and tests, we now shift to a detailed, catalog treatment of the 141 structures and related features excavated at Jamestown since 1934.

For easy reference, the following list locates individual structures or features by page number.

Structure	Page	Structure (*Con.*)	Page	Structure (*Con.*)	Page
1	33	45	86	89	28
2	35	46	88	90	28
3	36	47	88	91	94
4 (Well 1)	153	48 (Well 4)	153	92	94
5 (Well 2)	153	49	91	93	94
6	36	50	92	94 (Well 14)	156
7	40	51	92	95	94
8	40	52	92	96 (Well 15)	156
9	40	53	74	97	28
10	40	54	80	98	28
11	40	55	92	99	28
12	40	56	28	100	94
13	40	57 (Well 5)	153	101	28
14	41	58	74	102	96
15	42	59	80	103	98
16	42	60	93	104	98
17	45	61 (Well 6)	155	105	98
18	51	62	93	106	98
19	53	63	93	107 (Glass-house)	100
20	58	64 (Well 7)	155		
21	57	65	74	108 (Glass-house)	100
22	60	66 (Well 8)	155		
23	62	67	93	109 (Glass-house)	100
24	62	68	93		
25 (Well 3)	153	69 (Well 9)	155	110 (Feature 2)....	102
26	63	70 (Well 10)	156		
27	63	71	83	111 (Feature 3)....	110
28	63	72	81		
29	150	73	80	112 (Feature 4 & 5).	112
30	28	74	83		
31	74	75 (Well 11)	156	113 (Feature 12)...	121
32	28	76 (Well 12)	156		
33	68	77	83	114 (Feature 16)...	2
34	68	78 (Well 13)	68		
35	68	79 (Well 14)	156	115 (Feature 42)...	121
36	68	80 (Well 15)	156		
37	68	81 (Well 16)	156	116 (Feature 3)....	129
38	74	82 (Well 17)	158		
39	81	83	68	117 (Feature 36)...	131
40	81	84	68		
41	83	85	68	118 (Feature 10)...	135
42	86	86	68		
43	86	87	28	119 (Feature 4)....	135
44	74	88	88		

Structure (*Con.*)	Page	Structure (*Con.*)	Page	Wells	Page
120 (Feature 24)...	86	135 (Well 22)	158	W-1	153
		136 (Well 23)	158	W-2	153
121 (Feature 25)...	136	137	2	W-3	153
		138	74	W-4	153
122 (Feature 18)...	137	139	11	W-5	153
		140 (Well 24)	159	W-6	155
123 (Feature 55)...	137	141	150	W-7	155
		Refuse Pits		W-8	155
124	140	RP-1 (Feature 7)	150	W-9	155
125 (Feature 72)...	140			W-10	156
		RP-2 (Feature 17)	151	W-11	156
126 (Feature 79)...	145			W-12	156
		RP-3 & 4 ...	152	W-13	156
127 (Feature 82)...	145	RP-5 (Feature 36)	152	W-14	156
				W-15	156
128 (Ice Pit)	147	Ditches		W-16	156
129 (Well 18)	157	D-2	68	W-17	157
130 (Well 19)	157	D-3	68	W-18	157
131 (Well 20)	157	D-4	68	W-19	157
132 (Well 21)	158	D-5	68	W-20	157
133 (Feature 57)...	25	D-6	68	W-21	158
		D-7	68	W-22	158
134 (Feature 100)..	150	D-9	152	W-23	158
		D-66	152	W-24	159
				Other Wells..	159

STRUCTURES 1 AND 2

Structure 1

The foundation of a single house, Structure 1, was discovered in 1934 partly beneath former State Route 31 in an area designated Unit A, north of Pitch and Tar Swamp. This house had a full cellar with indications of an attached portico or room. The main structure is oriented to face south. The additional room, which had no cellar beneath it, was attached to the eastern three-fifths of the south wall. The excavation was done under the direction of John T. Zaharov, an architect. The plans were recorded by Architect Fred P. Parris for Historic American Buildings Survey records (Parris, 1934).* Since no archeological records, as such, were kept, the available sampling of certain artifacts recovered from the excavation can only be studied in the aggregate.

* Historic American Buildings Survey drawings are listed in the Bibliography under the names of the architects who produced them and under dates produced. Some of these drawings are used as illustrations in this publication. Others are available from the Library of Congress, Washington 25, D. C.



PLATE 16—*Structure 1—General View*

Structure 1 in Unit A, north of Pitch and Tar Swamp. General view from east of the structure.

The cellar portion of the foundation, which constitutes virtually all we know of Structure 1, is rectangular. Overall it measures 25 feet 4 inches north to south by 36 feet 2 inches east to west, and has a brick-paved floor in the entire inside area. A 9-inch brick partition runs from north to south dividing the cellar into 2 units, each approximately 16 feet 3 inches by 22 feet 4 inches, with no circulation between them. The western unit is divided again by a similar brick partition running east to west through which there is a doorway. The resulting 2 small rooms are approximately 10 feet 9 inches by 16 feet 3 inches. All walls were bonded at the corners, and the partitions were bonded to the walls and to each other. The width of the main walls varies from 1 foot 6 inches to 1 foot 7 inches. The walls have no footings and are laid in English bond with one exception: in the south wall a soldier course is laid as the base. The top courses range from 7 feet 7 inches to 8 feet 11½ inches above mean low tide. The level of the flooring varies from 5 feet 5 inches to 5 feet 8 inches above mean low tide, making the existing cellar depth about 3 feet, average.

The floors of all three cellar rooms were paved with flatlaid brick on a mortar base in varied patterns. A shallow brick channel 4 inches wide and 1 inch deep runs the length of the large east room in the middle, then angles toward a brick drain pit, 7¾ inches by 11 inches and 1 foot 3 inches deep. The drain pit is located at the southeast corner of the room. A bricked channel 6¾ inches wide and 6 inches deep was found at the foot of the first step of the basement entrance in the south end of the east wall. In the western two rooms of the basement the south room is paved in a continuous pattern, and the floor slopes toward a brick drain pit in the southeast corner. The north room has paving in a row pattern with stretchers breaking joints at the foot of the steps. The rest of the room is paved with bricks laid flat in a continuous pattern.

Stairways appear in the west wall of the main structure in the northwest room and in both the south and east walls of

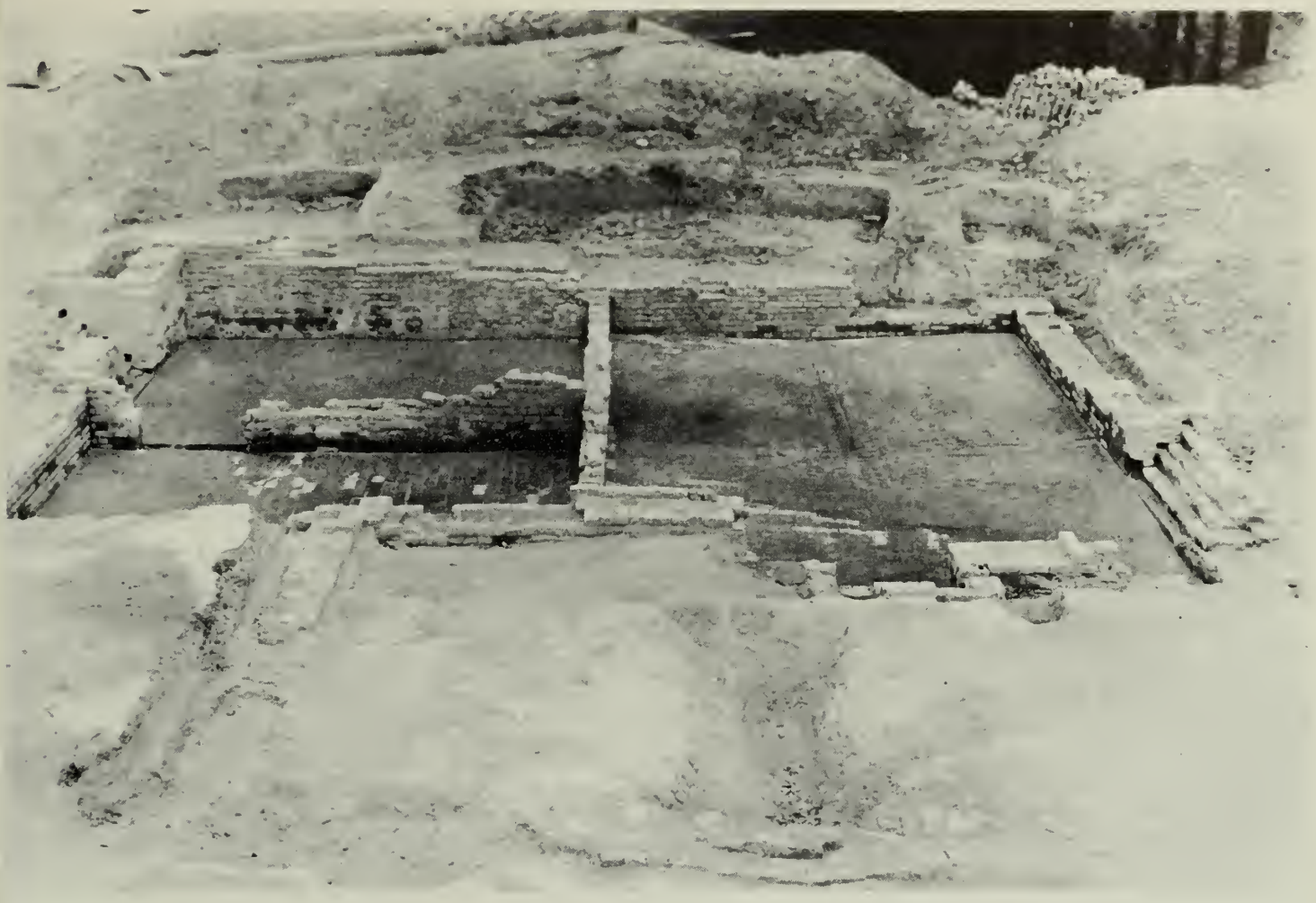


PLATE 17—*Structure 1 Showing Associated Wall Remnants*

Structure 1, brick structure with brick-paved cellar areas. In the foreground are wall remnants of Structures 1 and 2, closely associated with Structure 1.

the large east room. The stairway in the south wall of the east room retained charred wood in square holes where the treads of the steps met side walls, showing that a wooden bar or nosing had once protected the edges of the treads. The walls of the northwest room were plastered, including the jambs of the partition doorway and entrance stairway in the west wall. Recessed header courses in the north wall of this room conveyed the idea that a cellar window may have been located there.

Conclusive evidence of charring was noted during the excavation, wherever wooden sills and nosings were observable, and there is no doubt that the structure was destroyed by fire.

Structure 2

This was a light structure foundation of brick in English bond which was undoubtedly an addition to Structure 1. This second structure was badly disrupted by the building of State Route 31 some years previously. Therefore, its dimensions can only be estimated at 11 feet 6 inches by about 21 feet 6 inches. At its one junction with the main south wall of Structure 1, the English bond masonry of Structure 2 is not bonded. Probably Structure 2 was an additional room which was not originally planned. This is evident from the fact that a cellar door in the south wall of Structure 1 opened into it.

The bricks of both Structures 1 and 2 are comparable in color and size, averaging 9 by 4¼ by 2⅜ inches and having a color range from orange-red (soft) to purple-red (hard). The color and texture variation is due probably to the position of the brick in the local kiln during firing. Those in the upper portion are lighter in color and softer. Some Dutch bricks were found in the fill, but their use is uncertain.

Although no quantitative count of roofing tiles and slates was made at the time of excavation, evidence is reported of pantiles, flat tiles (both similar in clay to the brick and presumably locally made), and roofing slate, presumably British. The flat tiles were apparently the Elizabethan statute size of 10½ by

6¼ by ⅝ inches. The slate was about 12 by 8 inches, with 2 holes drilled at 1 end for mounting.

The presence of floor tiles is also noted, and the size given (8¼ by 8¼ by 1½ inches). However, the provenience is not stated. Presumably they were found in the fill, since the drawings do not illustrate them on the cellar floor. The floor tiles were undoubtedly locally made and correspond in texture and color to the brick.

The mortar in Structures 1 and 2 is composed of oyster-shell lime mixed with yellow sand containing too much clay. The texture is soft and coarse. Samples of plaster made of oyster-shell lime mixed with white, sharp sand applied directly to the brick wall or on wooden lath were noted, but no examples of colored plaster were found.

Hardware

A number of wrought iron spikes with large square heads and beveled corners were found in and near the foundations. Presumably these were used in outside doors. Nails, also hand-wrought, were found in 4 different sizes, 1½, 2, 2½, and 3¾ inches. A hasp, pintle, trivet, chimney-crank hook, cabinet or chest pulls, staple, and catch are also represented.

A fine example of a wrought-iron casement, measuring 2 feet 1⅛ inches by 1 foot 1 5/16 inches, was discovered a few feet to the west of Structure 1, and doubtless belonged to it.

Three types of hinges were discovered near the foundation: H-shaped with perforated ends, butterfly, and strap.

Artifacts (general)

Mentioned in the report on these structures, but not represented in the catalogue, are Dutch delftware cups, jars, and plates, and locally made pottery. Specimens from the adjacent ground are present in the collection and are also locally made, mainly lead-glazed, rough, red, earthenware. At least 2 complete blue on white Dutch delftware tiles, 5 inches square and beveled, were found in brick debris 4 inches above the paving of the east side of the east cellar room where there was an indication of part of a fireplace jamb. The tiles were each decorated with single representations of soldiers.

Other artifacts located in Structure 1 and now in the Jamestown collection include a pricket-type brass candlestick, 8 brass tacks, 1 iron knife blade, and 175 pieces of glass, all from gin bottles.

Conclusions

Most of the essential data have been preserved from Structure 1. At least, it is sufficient to give us excellent HABS drawings, certain artifacts, and the ground plan of the structure as well as that of the addition, Structure 2. Zaharov believed that the main house was of frame construction on the brick foundation. He based his conclusion on the large amounts of charcoal in the foundation fill and surrounding area, and on the number of handwrought iron spikes used for large wooden members (Zaharov, 1935). He guessed that the house was intended for two families because of the solid cellar partition down the middle of the building. However, whether or not this member continued above the cellar is anyone's guess. Likewise, the evidence accepted by Zaharov for two end chimneys depends entirely on inferential evidence of a fireplace jamb in the brick debris, together with some Dutch tile fragments, along the east main wall, inside. Harrington, however, was convinced that the structure was of brick (Harrington, 1941). We can conclude only that the foundations were adequate to support at least one brick story.

Unluckily, the identification of clay pipes, if they survived from the Structure 1 and Structure 2 excavations, is lacking in the Jamestown collection. Zaharov mentions only "broken 17th century clay pipes and fragments of crude earthenware dishes, probably of local origin" from Structure 2. The best remaining datable artifact evidence is both positive and negative: a quantity of gin bottle fragments was found in Structure 1, but no wine bottles. Since wine bottles were not introduced until after 1640, and gin bottles were common before that date, it appears likely that Structures 1 and 2 date from the first half of the 17th century, probably before 1640. The balance of artifacts reported from these structures would tend to support this inference.

Wells No. 1 and 17, respectively, were located 112 and 103 feet from Structure 1 to the west and north. It is logical to assume that these two wells were associated with the house. Artifacts from these wells, the first excavated by the National Park Service, were not catalogued separately from those of the lots in which they occurred; therefore, they cannot be examined for dating.

STRUCTURE 3

Structure 3 was a brick masonry wall fragment lying 50 feet south of Structure 1 in Unit A, north of Pitch and Tar Swamp. It was not definitively explored in 1934, and no archeological data or artifacts are recorded for it.

STRUCTURE 6

This house did not have the advantage of a methodical archeological excavation whereby all the artifacts and data might have been preserved and recorded for analysis. Nevertheless, Architect H. C. Forman has furnished the necessary minimum information (Forman, 1935c) in excellent Historic American Buildings Surveys records. Fred P. Parris made these HABS drawings in 1935 following Forman's uncovering of Structure 6 foundations (Parris, 1935c). Basically, the structure is a simple rectangle, 48½ by 21½ feet. It has substantial walls, 18 inches wide, constructed of brick laid in English bond with closers used at the outside corners and on the west of two opposite interior fireplaces. The long axis is east-west. Brick steps 4½ feet wide with 9 inch risers and wood nosings adjoin

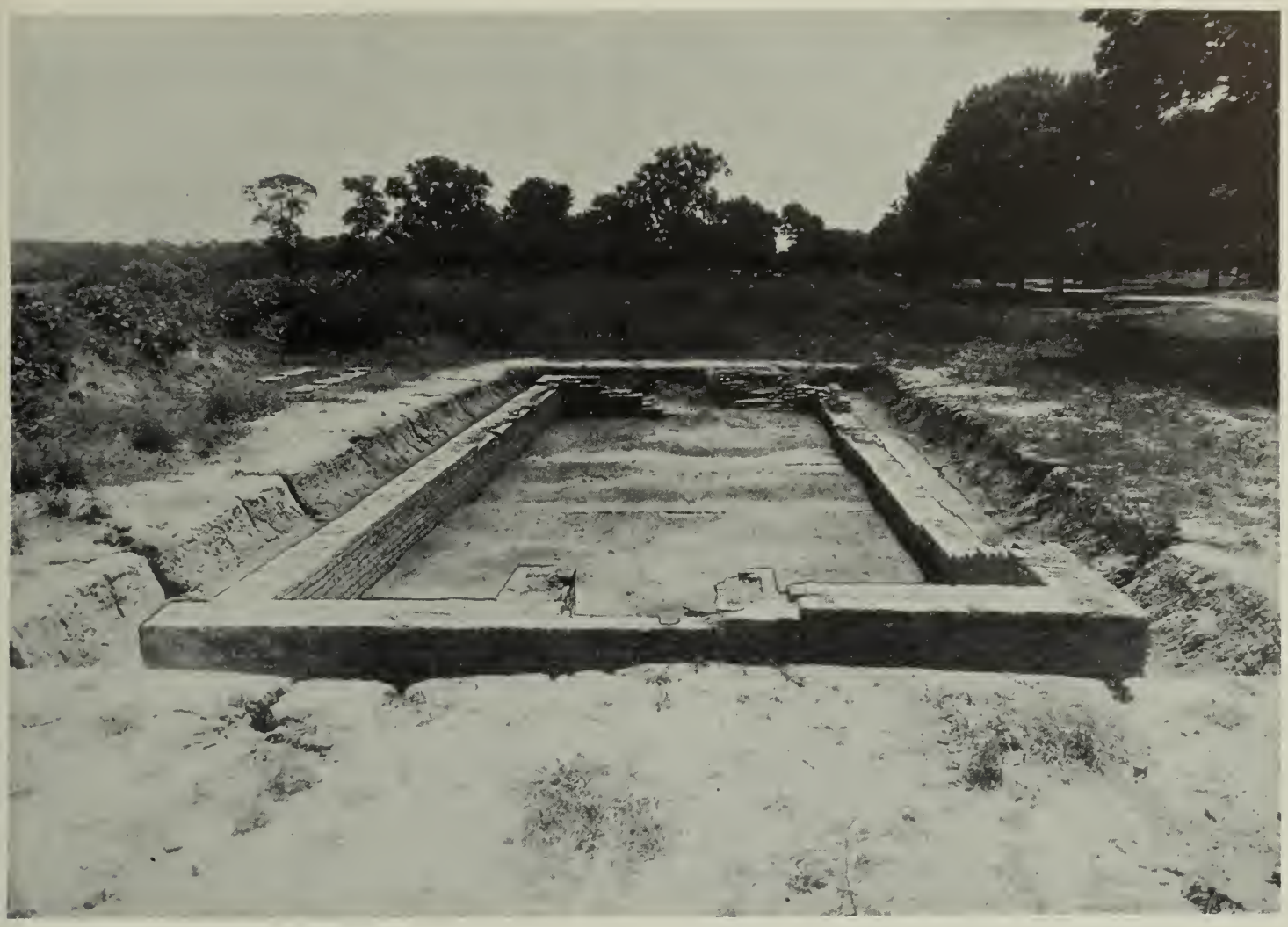


PLATE 18—*Structure 6 Foundation after Excavation*

Structure 6 foundation viewed from the west, shortly after excavation. At the upper left may be seen the superficial foundation remnant of Structure 7, presumably an addition.

the east fireplace leading to the outside. The foundation enclosed a cellar area a little over 3 feet below present ground surface. Beyond the foundation are fragmentary remains of two parallel brick walls (Structure 7). These walls, in turn, are parallel to the main north wall of Structure 6. The 2 parallel walls are only 2 brick courses high and may be considered representative of a less substantial structure, probably a wood addition to the main house.

The cellar was unpaved and possibly had a dirt floor. It had two parallel brick footings along the middle mark, north to south. The wall tops range from 9.12 feet to 8.72 feet and the cellar floor from 7.03 feet to 6.23 feet above mean low tide. The latter figure represents a trace of brick paving at the east end of the east room.

On the basis of typical early house plans of Virginia and Maryland, Forman concludes that Structure 6 had a room on either side of a central partition, and fireplaces flush with the gable ends, the whole structure being brick, 1½ stories high (Forman, 1935c). The water-table bricks were chamfered and laid in the Flemish bond pattern since there are headers and stretchers. Lawrence A. Kocher's reconstruction sketch, which furnished the pattern for Sidney E. King's painting of the Structure 6 house, agrees substantially with Forman's reconstruction. The house turns out to be strikingly comparable to the Smith's Fort Plantation (Rolfe family) house across the James River from Jamestown Island, in Surry County. According to tradition the Rolfe house dates from the first half of the 17th century. Forman pictures the 2 partitions forming a hallway in the first floor 10 feet wide, with the larger room on the west about 20 by 8½ feet, and the smaller room 14½ by 18½ feet.

Since no ownership data and plats are known for the Structure 6 area, nothing is known of the identity of this house. However, it is not difficult to arrive at a reasonable dating

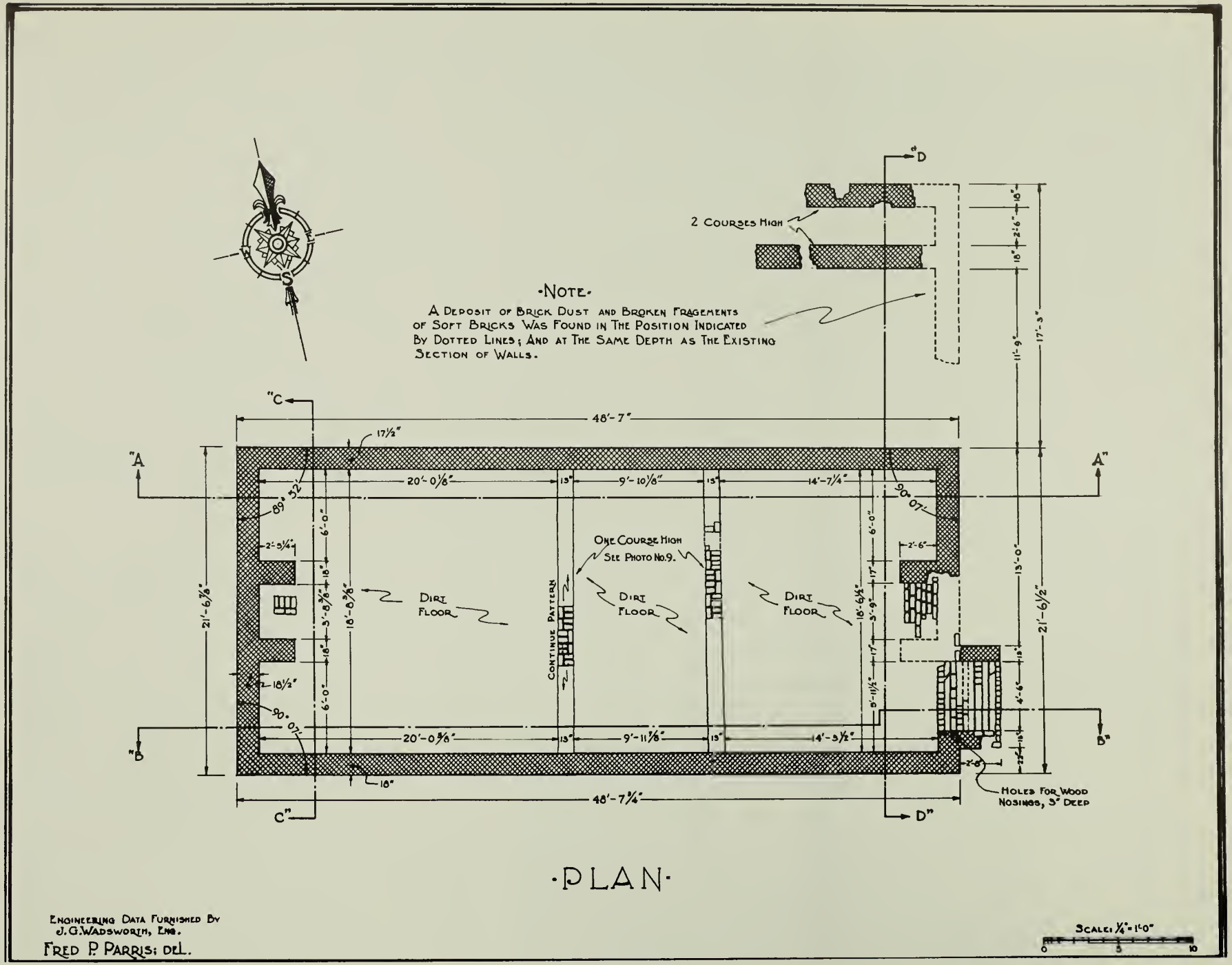


Figure 7—*Plan of Structure 6*

Historic American Buildings Survey drawing. Courtesy, Library of Congress.



PLATE 19—*Structure 6—A Conjectural Drawing*

Structure 6 (Lot 96:102), a substantial brick foundation with enclosed end fireplaces, fronted upon the James River. Structural evidence indicated a central, front-to-back hall. On the east end was a stairway access to the cellar. To the rear was an addition on a light brick foundation—possibly a frame lean-to. A brick walkway approached the front from the south. Structure 6 history is unknown. Archeological evidence places it in the last half of the 17th century, and possibly into the 18th. The structure appears to interrupt Ditch 25 which is therefore probably precedent to the structure. Interpretation by Sidney E. King after research by Hudson and Kocher.

hypothesis. The size of the brick (relatively small, 8¼ inches long) and the relatively small size of the fireplace openings (3 feet 8 inches) indicated to Forman that the building was not built early in the 17th century. Glass and ceramic artifacts were, unfortunately, catalogued as coming from Lot 62 generally, without specifying structure association. There are 3 other small structures besides Structure 6 here. The preponderance of wine-bottle fragments, with only a scattering of gin bottles (the wine bottles represent every date from the latter half of the 17th century to the 19th century), together with Dutch and English delftware and locally made earthenware, and the types of stoneware, all indicate that the house dated probably between 1650 and 1676. In fact, the house could have been reconstructed to serve through the end of the 17th century.

In the 1940's elaborate pains were taken to preserve the foundation and cellar of Structure 6 *in situ,* but frost and other weathering attrition has taken a steady toll. Much of the brickwork has been replaced, and will continue to be replaced, as long as the fragments of masonry remain exposed.

Structure 6, Artifacts

Forman recorded only a sampling of artifacts recovered in the excavation. Since his interest was architectural, only bricks, tiles, slates, and hardware are included. The remainder of the objects, ceramic and glass mainly, was recorded only by the 100-foot lot, and has been mentioned above. The hardware included wrought nails, an ornamental latch bar, hasps, hasp fragment, a strap hinge with circular enlargement near the pintle end, a wedge-shaped padlock, mushroom-headed spikes, finial, pintles of several sizes, a key, a hook, staple, and some lock fragments—all of iron. A brass tack and a brass hinge fragment were recorded. The tiles were: 1 pantile fragment, some

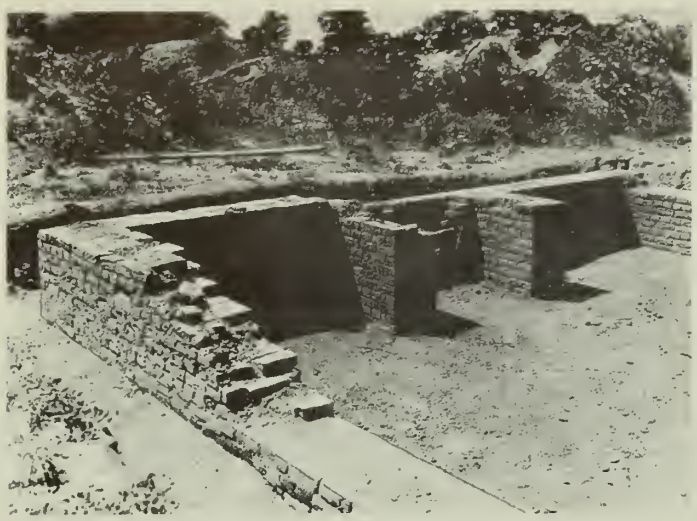


PLATE 20—*Chimney Base of Structure 6*

The west end chimney base of Structure 6 at completion of excavation.

plain tiles, and a floor tile 7¼ inches square by 1⅞ inches thick. These artifacts are summarized below:

Ceramic:

Brick: Samples of 4 representative bricks measure as follows, in inches:

8¼ by 4 by 2¼
8⅜ by 4¼ by 2¼
8¼ by 4¼ by 2¼
8 by 4 by 2 1/16

Water-table headers and stretchers were noted, and a flat arch brick was reported.

Tiles: Flat tiles and 1 fragment of pantile with nob were reported by Forman.

Delft: Several hundred blue delft fragments were recovered from Lot 62.

Earthenware, general: Mostly local, lead-glazed, from Lot 62.

Metal:

Iron:

⅝-inch wrought-iron ornamental latch bars	9
¾-inch hasps	3
3-inch hasp (broken)	1
¾-inch S-hook	1
Strap hinge	1
Wedge-shaped padlock	1
Spikes, mushroom-head	3
Finial, wrought-iron	1
7-inch pintle	1
5-inch pintle	1
4¼-inch pintle	2
4½-inch pintle	3
2⅞-inch key	1
Lock fragments	9
2⅛-inch staple	1
3¼-inch hook	1

Wrought-iron nails noted

Brass:

Round-headed tack	1
⅝-inch hinge	1

Slate:

Roofing slate fragment	1

STRUCTURES 7, 8, 9, 10, 11, 12, AND 13

Structure 7 comprises 2 parallel wall fragments, 2½ feet apart, and oriented parallel with the north wall of Structure 6. The walls are 11½ feet from Structure 6 and appear to be a frame addition to that house. This hypothesis is based on the fact that the walls are only 2 brick-thicknesses deep, although they are 2 header bricks (17 to 18 inches) wide, the same as in Structure 6, and likewise in English bond. Apparently they were not meant to support a heavy structure.

No associations of artifacts are recorded for Structure 7. However, the observations made on the collection from Lot 62, including Structures 6, 7, 9, and part of 8, would presumably apply in this case. (See artifact listing for Structure 6 above.)

No archeological record (1934–35) was kept of Structure 8, although a rough measured drawing was made which allows sufficient detail for estimating the dimensions and essential character of the house. The evidence shows that this was a simple rectangular foundation approximately 30' by 20 feet overall, the long axis oriented on magnetic north and south. The walls were made up of whole bricks and fragments of bricks. At the corners, except the northwest, the masonry was made of river stones set directly on undisturbed clay. No wall is more than 2 courses of bricks high, and the width is approximately 1 foot, or a stretcher and a header. The bond is English. The elevation of the base course is an average 9.5 feet above mean low tide.

A single partition 8 inches (1 header) wide divides the foundation into a south room 17½ by 10½ feet and a north room 17½ by 15 or 14 feet, depending upon the location of the north wall of which only a trace is recorded. In the southwest portion of the north room is a closet or fireplace base approximately 9 by 5 feet. Some of the floor bricks of this area were observed to have been burned. The bricks of Structure 8 were very poorly preserved a year after exposure.

No artifact associations are reported for Structure 8, but it is reasonable to assume that this was a domestic structure of 2 rooms and a fireplace, constructed of wood on a light brick and stone foundation.

Structure 9 was a very tenuous trace of disintegrated brick masonry. Presumably, it represented a single course 5 feet long and 15 inches wide. This wall lay at right angles to the north wall of Structure 8 from 2 to 4 feet to the north. It probably represented an addition to Structure 8.

A line of closely associated structural fragments (Structures 10, 11, 12, and 13) extends 59 feet in an east-west direction in Lot 96:103. Whether or not these fragments were actually

integrated into 1 or 2 buildings is uncertain, the more so since the exploration of this lot in 1934–35 was partial and scantily recorded.

Structure 10 was recorded simply as a brick fireplace foundation situated 4 feet 7 inches from the west wall of Structure 11 and opening away from it, to the west. No house foundations were recorded to enclose this fireplace, but its proximity to Structure 11 and the fact that it is oriented parallel with that structure, suggests strongly that the two were related, and therefore contemporaneous. The back wall of Structure 11 is nearly 18 inches wide and the side walls are 13 inches wide. The opening is 4 feet wide and 3 feet deep. The bond is not described.

Structure 11 may be considered the nuclear and most complete foundation trace, indicating a rectangular building oriented north-south (magnetic). Its overall dimensions are 32 feet 2 inches by 16 feet. The walls are the width of a single header and are measured as 9 to 9½ inches, possibly indicating a rather long brick. However, absence of any definite brick measurements makes this observation tentative. A wall fragment projects at a right angle beyond the east wall.

The central portion of the building contains what was most probably the base of a fireplace with 18-inch walls, opening into the south room (5 feet 10¼ inches by 3 feet 6 inches interior measurement) and possibly having had a closet 3 feet 5½ inches by 3 feet 1¼ inches, interior dimensions, between the fireplace and west wall of the house. North of this fireplace appears a rectangular brick pavement 4 feet 3 inches by 9 feet 5 inches. The south portion of the interior of the building contained a hole 2 feet deep and measuring nearly square, 5 feet 7 inches by 5 feet 2 inches. The hole, dug into undisturbed clay, was filled with "glass ware, pipestems, etc."

The light foundation indicates a frame structure. The large, substantial central brick feature presumably was a fireplace with a closet or possibly an oven at the side.

Structure 12 was a brick pavement 12 feet 3 inches square. It lies at an elevation of 9.3 feet above mean low tide, 12 feet from the east wall of Structure 11. This pavement was probably connected with the fragmentary wall and extended from it at right angles. The nature of the side wall foundations, about 9 inches wide, suggests a frame structure over a subsidiary structure connected to Structure 12—possibly a storehouse, milkhouse, or smokehouse. It is significant that a 1 foot square central well, 1 foot deep with a brick bottom, is shown on the architectural plan. It is noted as a drain, although it may have had another use. A typical brick of this structure is described as 8¼ by 4 by 2¼ inches, red in color. The bond of the walls is English and the floor bricks were laid flat in regular parallel pattern.

Structure 13 is a small fragment of a brick foundation wall 8 to 9 inches wide lying 7 feet east of Structure 12. Most probably Structure 13 was part of the single building or closely integrated buildings which lie immediately west and in parallel orientation. Its use is unknown.

STRUCTURE 14

This structural remnant of brick masonry was partially excavated in 1934 and left undescribed except for a measured plan which shows it to have been a simple U-shape with parallel arms 6 feet 1 inch long joined together by a straight connecting wall 12 feet long, overall measurements. The width of the walls is 16 inches and the elevation of the top of the masonry is 9.7 feet. The number of courses and type of bond are not described. The inside dimensions are 9 by 4½ feet. Although this feature is referred to in the Jamestown records as a fireplace, there is no supporting evidence except the shape, which is right for a fireplace but extraordinarily large.

Possibly the most significant thing about Structure 14 is that it is oriented considerably east of north, so that it is not in exactly the same alinement as the other structures of Lots 96:102 and 96:103, namely, Structures 6, 7, 8, 9, 10, 11, 12, and 13. Hence, it may be inferred that Structure 14 was of a different period.

Nothing can be said of the artifacts associated with Structure 14 except what has been described for the lots cited above. (See Structure 6 and Structures 10, 11, 12, 13.)

The artifacts associated with Structures 10, 11, 12, 13, and 14, all lie within Lot 96:103. When this lot was excavated in 1934–35, artifacts were catalogued as having been found in this lot. No further provenience by location or depth was recorded. Hence, it is not possible to determine what artifacts were directly associated with the complex of foundations which may represent a single structural group. However, some significance may be attached to these artifacts, since these are the only structures occurring in this lot, and it naturally may be assumed that they were concentrated among these foundations. A summary follows:

Earthenware: Several hundred stem and bowl fragments of tobacco pipes were found, including 2 LE- and 1 RN-initialed bowls. Bowl shapes range from 1670 to 1750 and are borne out in dating by the shape and apertures of the stem fragments. Numerous earthenware sherds were found. The majority of these are definitely 18th-century in rim shape and represent lead-glazed utility vessels, mostly wide-mouthed pots. Some of the coarse-tempered earthenware sherds may be from North Devon. Other examples of light and dark lead-glazed wares are undoubtedly imported from England. Locally made earthenware is probably represented, but the proportion cannot be determined at this time.

Delftware: This pottery is well represented, and is characteristically 18th-century English in type, with a few sherds of 17th-century Dutch admixed.

Glass: Large quantities of wine bottle glass were found in Lot 63, but only a few fragments of gin bottles and possible window glass. It is significant that the wine



FIGURE 8—*French Military Map of 1781*

Military map drawn in 1781 by Colonel Desandroüins of the French Army.

bottle shapes range mainly in the 18th century, with a few 17th- and 19th-century shapes represented.

Metals: Metals cannot be singled out of the collection at Jamestown at this time.

It is worthy to note that 20 houses appear on Colonel Desandroüin's French Army map of 1781, scattered from the beginning of the disrupted isthmus to Orchard Run and clustered east of the church. It is not likely that these houses were all ruins or foundation holes, since such information would have been useless on a military map at that time. If they were indeed houses, they were probably habitable, or certainly were so during the half century preceding. Thus, it can be recorded that at this particular location several 18th-century houses are definitely recorded on a contemporary map. Furthermore, it is not improbable that the foundations considered in Lot 96:103 and adjacent lots may themselves be 18th century—especially if they were made of reclaimed brick. That they were frame is fairly certain.

STRUCTURE 15

This feature, reported in 1934 as a brick fireplace foundation, consisted of a single course of masonry laid in English bond on a bed of mortar which in turn rested upon loam. The loam or old humus was half a foot thick above undisturbed clay; hence, the fireplace had a very shallow footing. The back of the fireplace was 7 feet 11 inches long overall, and both arms were approximately 5 feet long. The inside dimensions were 5 feet 5 inches (back) by 3 feet 6 inches from front to back. The elevation of the top of the masonry was 9.6 feet. The bricks varied from 8⅞ to 9⅛ inches long, averaging 9 inches. The width of the bricks ranged from 4⅛ to 4⅜ and averaged 4¼ inches; thickness was from 2¼ to 2⅝, and averaged 2½ inches. The color was dark orange, the texture was fine, and the bricks were relatively soft.

Although the whole of Lot 95:103, in which Structure 15 lies, was excavated, no definite indication of a frame building was noted, except for a single, square posthole 3 feet southwest of the fireplace. Nevertheless it must be assumed that the structure was frame.

As in the case of the other structures in Lot 95:103, namely Structures 16, 71, 72, 74, 77, and 41, only a few records of provenience within structures were kept. However, we do know that a shallow refuse deposit lay 10 feet to the south. In it were found several wrought-iron pintles, a keyhole escutcheon, 2 rings which may be doorknockers, 4 strap hinges, and other wrought-iron objects. The artifacts for the lot taken in the aggregate are of the late 17th century extending well into the 18th century.

For example, the bulk of the stoneware is definitely 18th-century English, plus a smaller proportion of German stoneware possibly 17th century. An enormous quantity of wine-bottle debris designated only by lot and depth is uniformly 18th century, some probably reaching the end of the century. These fragments are listed only by lot number and depth, viz: old catalogue No. 6609—6,000 fragments, 0–12 inches; No. 6610—6,000 fragments, 1–2 feet. Old catalog number 6612 includes a number of fragments clearly from 1700 to 1720 which were recovered from a depth of 32 to 42 inches—obviously in cellar or pit locations. Tobacco pipes are listed as 3,000 from this lot. They are clearly 18th century, mostly in the first half, and include the following initials: LE—4 examples, WE—6, R—2, IF—19.

In the light of this evidence, it can only be said that the brick sizes suggest the foundation of Structure 15 fireplace was constructed late in the 17th century or early in the 18th, and that artifacts in the vicinity—not in the building proper—indicate 18th-century occupation.

STRUCTURE 16

Structure 16 (Lot 95:103) is well represented by HABS architectural drawings (Parris, 1936). More notes on provenience of artifacts within the foundation and area were kept than on most structures excavated in the mid-1930's. By its singular shape, Structure 16 undoubtedly had a specialized use. It was

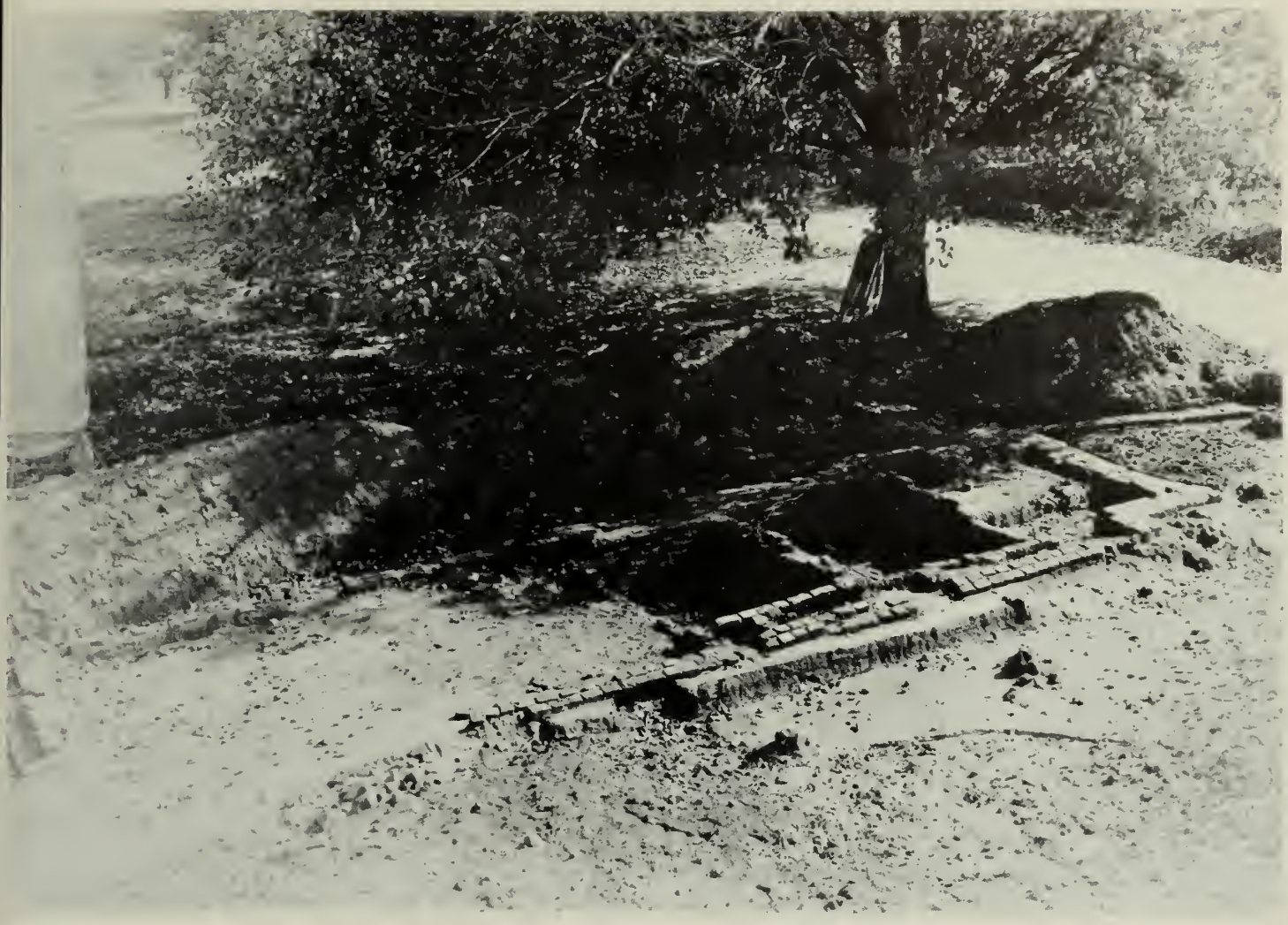


PLATE 21—*Structure 16—Frame Structure with Brick Chimney*

Structure 16, an elongated frame structure with a large brick chimney at the south end and a small double cellar in part of its area. The brick drain, Structure 39, is in the background. (See Lot 95:103.)

a long, narrow rectangle, 35 feet 9 inches long and 11 to 11½ feet wide overall, oriented north-south. It had a large fireplace foundation slightly inset at the south end. The lateral and north walls are 9 inches (or 1 header) wide, and are superficially laid on humus in a single course of fragmentary bricks. The fireplace is 1 foot 2 inches thick and 4 courses deep, resting on undisturbed clay. Coursing is English bond.

The most notable feature of Structure 16 is a pair of joined, rectangular bins that are lined and floored with brick. This is a single course of brick all around except for the partition dividing the bins. This partition is 1 header (8 to 9 inches) thick. The depth of the bins was 2 feet from the top of the remaining side walls to the surface of the brick floor. The north bin measured 7 feet by 4 feet 8 inches, and the south bin, 8 feet 3 inches by 6 feet 8 inches. The south bin wall was only 2 feet from the opening of the presumed fireplace foundation at the south end of the whole structure. The bin sides were coated with rough plaster.

Bricks vary in color and hardness from salmon-color (softer) to red-orange, red, and purple (progressively harder). Bricks from the south fireplace average 8½ by 4 by 2$^5/_{16}$ inches. Cross-wall bricks average 8¾ by 4¼ by 2$^5/_{16}$ inches. Bin bricks average 8⅝ by 4⅛ by 2$^5/_{16}$ inches. North end and side walls are brickbats.

It seems evident then that Structure 16 was built for some specialized use. The few artifacts for which the location within the structure is clearly indicated give evidence of 18th-century dating. Twelve fragments of wine bottles were located between and under two courses of brickwork at the bins, according to the excavator's record. Therefore, we may assume that this evidence was truly contemporary with the construction of the building. The fragments indicate the early 18th century. Again,

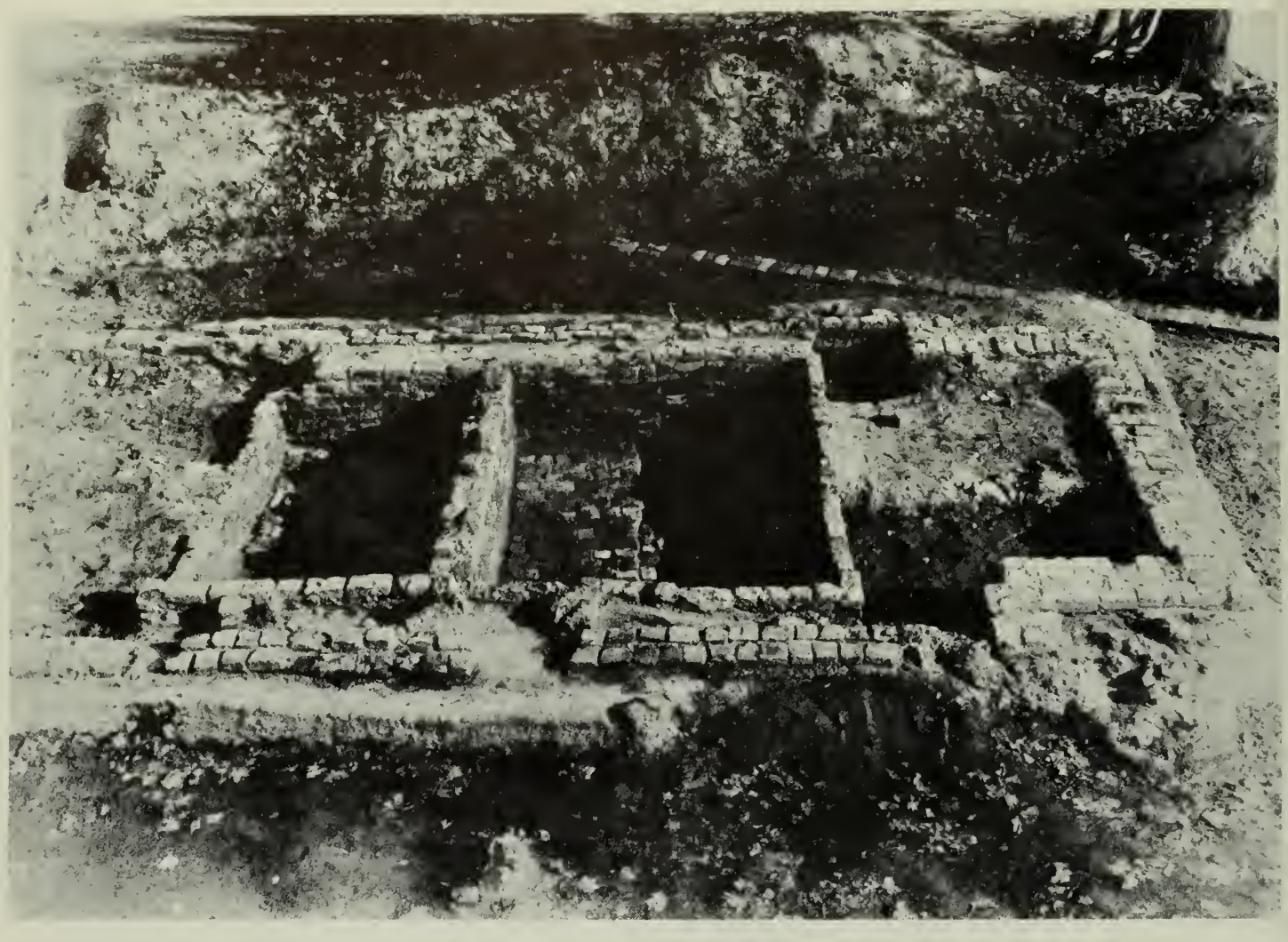


PLATE 22—*Structure 16 in Detail*

South end of Structure 16 in detail, looking east. The massive masonry of the south end fireplace contrasts with the light, narrow footing of east and west sides, composed of scrap brick halves—obviously indicating a wooden structure above. A small partitioned cellar occupied only a part of the area of this narrow structure. The diagonal line of bricks at the upper right is the brick drain, Structure 39, probably subsequent to Structure 16 as well as to Structure 40-72.

inside the foundation at a depth of 12 to 14 inches and below the top of the brick wall, a nearly complete wine bottle was recovered and is now restored. This bottle, with its straight sides and neck shape, is clearly 18th century, characteristic of the first half and possibly as late as the third quarter.

Time does not allow a careful separation by provenience of several thousand stoneware and earthenware sherds known to come from Lot 95:103. Thus we cannot relate directly the sherds which came from in and near the foundation. However, the great majority of both stoneware and earthenware pieces from the lot are definitely 18th century. Only 4 pipestem fragments are available at this time from the collection. These are related definitely to the fill within the foundation of Structure 16, at a depth of from 2 to 6 inches. For what this superficial evidence is worth, 2 white pipestems have diameters of $\frac{6}{64}$ and $\frac{7}{64}$ of an inch, respectively, and are thus characteristic of the period 1680–1750. Two clay stems have hole diameters of $\frac{8}{64}$ of an inch, but as such, like other locally made pipes, are characterized by larger hole diameters than the English-made kaolin pipes.

Of the remainder of artifacts, chiefly metal, one is of prime significance, namely a coin described by the excavators and catalogued as "Virginia 1773" (old catalogue number 831). This coin was screened from the fill of the south bin. Unfortunately, it cannot be located in the collection at this time, but the data of its finding are reliable. Thus we may place the filling in of the foundation not earlier than 1773. Excellent HABS drawings have been made of the foundation and sketches



PLATE 23—*Structure 17 after 1934 Excavations*

At the completion of the 1934 excavations by the National Park Service. View from the south (Lot 93:106).

of wrought-iron artifacts accompany these sheets; however, upon checking the records, it has been determined that many of the latches, pintles, a pot hook, strap hinges, H-hinges, butterfly hinge, nails, and spikes were not found in the foundation, but elsewhere in the same lot. It can only be said that 2 iron hasps, 1 iron hook, 1 iron wing nut, 8 iron buckles, 23 pieces of miscellaneous iron, not described, and 1 brass buckle were found within the foundation of Structure 16. A finely decorated pipe (deer in punctate lines) locally made, possibly Indian, was found in the fill.

As for the interpretation of data available on Structure 16, a fairly definitive dating of building and use suggests itself: The structure was built late in the 17th or early in the 18th century of salvaged bricks and brickbats. It probably survived until the Revolutionary War period, when it may have been among the cluster of buildings recorded in this area on the French military map of 1781.

STRUCTURE 17

Structure 17 (Lots 93:106 and 94:106) is described by Hatch in *America's Oldest Legislative Assembly* (Hatch, 1956, p. 18) and is well represented in the HABS records (Parris, 1935). It was originally identified in 1932 as the First Statehouse by George C. Gregory, of Richmond, Va., an ardent researcher into Jamestown historical records. Gregory's reasoning was based on the premise that the building fits in general a ground plan description in existing documents, and because it appeared to be in the general area where he thought the First Statehouse should be. Gregory was responsible for clearing the easterly unit and exposing the tops of the main walls of the entire structure which he measured and sketched. No useable artifact data, however, have been preserved from his, or previous, digging at Structure 17. Yonge, almost 30 years previously, had placed the First Statehouse along the shore some 600 feet north-



PLATE 24—*Structure 17 Viewed from West*

After excavation, from the west.

west of Structure 17. This placement was conjecturally based on documentary evidence. In 1901 Mr. and Mrs. Edward E. Barney, owners of the island, actually discovered the easternmost room of Structure 17 and exposed the cellar.

Henry C. Forman offers a categorical assumption that Structure 17 is the First Statehouse (Forman, 1938, pp. 102–115). However, Forman is less positive in his 1935 report on Structure 17 for the National Park Service (Forman, 1935). In the report he says:

> These three facts [hardware types, bonding of brick walls of the basement, and general house plan] point to the erection of this building in the 17th century, but do not prove that it was built then. . . . Any conclusions herein as to the old design of the building are extremely hypothetical. . . . Whether the building above the foundation was frame or brick is unknown. No check on the amount of brick taken from the foundation during the first government excavation was ever made, and even this check, if made would not prove the building was of brick. [He observed definite evidence that the entire building had burned.]

On the basis of improved knowledge since 1935 of the dating of artifacts, notably ceramic, it is now possible to analyze the objects found in the excavation of Structure 17 more confidently as to period. An inspection of clay tobacco pipes found in the fill of the foundation reveals that all but a few are definitely last quarter 17th century, or early 18th century. Since clay pipes were quickly expended and were not ordinarily regarded as heirlooms, we may assume that these bowl and stem fragments truly represent the final stage of the use of the house, just prior to destruction. However, we cannot overlook the possibility that some pipe fragments may represent fill tossed into the open foundation cellar. In this case they would represent a certain time lag and a more recent date.

Actually, the great number of pipestems—approximately 2,200—and over 200 pipe-bowl fragments together with the numerous fragments of wine bottles from this excavation, suggest that Structure 17 may well have been a tavern in its later use. Indeed, since there is a uniform age grouping, it is not likely that all were thrown into the cellar after the destruction of the house. Of special interest is a reddish-brown locally molded pipe of third quarter appearance which was found beneath the floor of the center section. A pewter basin, 13 inches in diameter and 3½ inches high, now in the collection at Jamestown, is described by Col. E. E. Barney as having been found by him in the cellar of the eastern unit of Structure 17. The basin is a characteristic 18th-century product.

Out of the glass evidence from this structure, it may be noted that 11 trays of fragments are chiefly of wine bottles dating from about 1650 to 1720. A small proportion is from gin bottles. However, it is significant that bottle seals are of great importance to the identification of Structure 17. Curiously, not one bottle seal was reported found in the ruins or vicinity of Structure 17. However, on August 9, 1935, Charles S. Marshall, historian at Colonial National Historical Park, entered in the park records that the cluster of 13 "HG" seals, centered 260 feet northwest of Structure 17 and 80 feet from the present shoreline, could have special significance:

> . . . I have just found what proves to be the connecting link in the identification of one of the most important foundations at Jamestown.
>
> Because of its importance in itself and also because we know its exact distance from the 17th century shore line, we have been very anxious to locate and identify the foundation of the so-called "first brick state house." We have quite a lot of data on it, including the fact that part of it later belonged to and was the home of George Marable but we have been unable to determine its exact location. The foundation, officially designated as Structure 17, is thought by Mr. George C. Gregory to be the state house. In many ways it answers the description but several of the Jamestown workers have felt that Structure 17 was too far east to fit the conditions perfectly.
>
> Last week, while working in the Surry County Clerk's office examining the 17th century court records, I found the following order under date of July 3, 1683: "mr Hen: Gawler who married the Exex of mr George Marable not appeareing to prosecute his accon agt Tho: Sowerby agt the said Gawler Damadge according to Law with Costs als Exec. [Orders 1671–1690, Page 409.]
>
> Although we have never located Marable's will and hence cannot say positively that his executrix was also his widow, still when we consider the customs of the times and all the facts of the case we can feel reasonably sure that this was the case. Since we know that prior to his death Marable owned and lived in what had previously been the state house it is reasonable to assume that Henry Gawler lived there after marrying his executrix. We have definite proof from other sources that Gawler had a house in "James City" but there is no reference anywhere in the land records, yet located, to Gawler's either buying or selling a house. Hence it is logical to assume that he lived in a house which he treated as his own but which, in the strict letter of the law, belonged to some one else. This assumption fits perfectly with the facts as stated.
>
> At this point the archeologists gave me the final piece of evidence. Mr. Day tells me that they have located a number of bottle buttons [seals] with the initials "HG" about 60 or 70 yards west of Structure 17.
>
> In the case of Henry Hartwell, one of the most prominent residents at Jamestown, the location of bottle buttons with the letters "HH" definitely proved that our tentative location of his land was correct.
>
> If, upon further examination of the area around the location of the "HG" buttons, the archeologists locate a foundation which fits the known description of the state house, then the bottle buttons will complete the story, establish the location of the first brick state house in America and give us one of the most definite clues possible as to the exact location of the 17th-century shore line.

The early enthusiasm of the historian for the new-found evidence did not, however, prove entirely justified. Excavation in the area where the First Statehouse was assumed to have been gave no structural evidence which corresponded to physical descriptions. Yet several houses of modest size, mostly frame on brick foundations or with brick fireplaces, are represented in the area by Structures 21, 71, 41, 40, 16, 8, and 51. Thus, if the HG seals are at all significant, it would appear that they lay beyond 100 feet north of the First Statehouse, and that this foundation has been washed away.

It is equally notable that no bottle seals at all appear to have been recovered from the foundations of Structure 17. This is especially significant since the bottles clearly represent the latter part of the 17th century to 1720 when bottle seals were beginning to become fashionable.

A résumé of the pottery material from Structure 17 recovered by the excavators of 1934–35 indicates that considerable earthenware and stoneware is present representing the middle of the 17th century. Most specimens clearly belong to the last half. For Foundation 2, the center section and the presumed First Statehouse, the ceramic evidence is nearly all middle to late 17th century. There is only a trace of 18th century which would be an expected intrusion in any case. Foundation 3 ceramic evidence is preponderantly 18th century. Roofing tiles are present, probably locally made. (These tiles are not datable because tile sizes, by statute, were uniform since the 15th century, and Jamestown does not appear to have made innovations.)

It is interesting to record the observation of Malcolm Watkins. He noted that at least 2 sherds of local lead-glazed earthenware from Structure 17 bore all the characteristic marks of paste, firing, and design idiosyncracies of the potter who made the Green Spring lead-glazed earthenware. Besides these sherds at Structure 17 are half a dozen sherds of earthenware which are extremely overfired and which appear to be wasters. These overfired sherds, however, bear the same manufacturing characteristic of rim, base, and surface striation noted in Green Spring earthenware. The inference is that both groups of specimens represent the work of the Green Spring potter in the third quarter of the 17th century. A pottery kiln (Sructure 27) has been discovered 680 feet upstream from Structure 17, near the present shoreline.

At least another pottery kiln (Structure 111, near Pitch and Tar Swamp) has been proved at Jamestown. Both of these local kilns were probably in operation before mid-century. Unfortunately, in the absence of definite waster piles associated with them, it is not possible to be sure of the potter's handiwork.

From the brief narrative report submitted on the excavation of Structure 17 by Henry C. Forman, May 4, 1935, to the National Park Service (Forman, 1935a), supplemented ultimately by excellent HABS drawings and artifact renderings, the following data has been extracted:

Foundations, Dimensions, and Interior Features

The overall foundation size is 43½ by 64 feet, divided into 3 almost equal rectangular sections, with long sides adjacent. Each section measures inside 20 by 40½ feet, approximately. The cellar walls average 4 feet in height. Observing that the west wall of the middle section is only 1 brick thick (9 inches approximately) and is bonded into the north and south walls of the western section, Forman believes that the western section

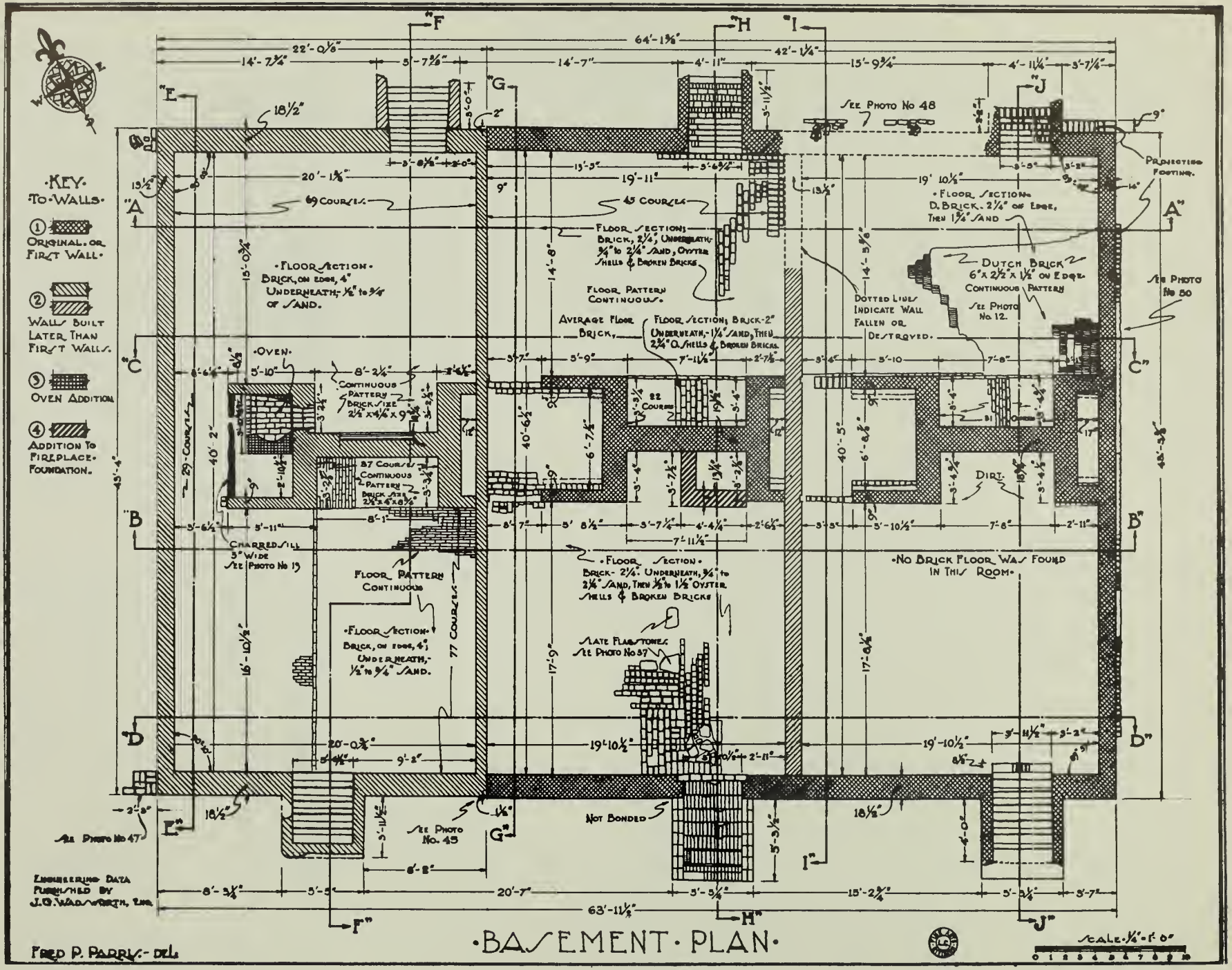


FIGURE 9—*Plan of Structure 17*

Historic American Buildings Survey drawing. Courtesy, Library of Congress.

of the 3-unit house is of a later period than the combined eastern and middle sections.

Six cellar rooms, 2 to each of the 3 sections, are separated by double fireplaces. The south room of each section is approximately 3 feet longer than the corresponding north room. On the western side of each double fireplace foundation is an access between north and the south rooms, with enough additional space for a closet. No doorways were made in the cellar partitions. Wooden sill traces were noted in the doorways of small passageways of the middle and western sections.

Stairways

Each of the six rooms has an entrance stairway in the outside wall. Each stairway is placed near the eastern ends of each wall section, except for the stair in the south wall of the western section, which is in the middle. The south stairway of the middle section and the north stairway of the western section do not bond with the main walls. These stairways were probably added at a later time, according to Forman's observations. Stair width averages 3 feet 6 inches to 4 feet, and there are 7 or 8 risers in each stair. The risers average 8 inches and the treads vary from 8 to 11 inches. Traces of wood nosing were found on every stair except the one on the south side of the middle section which had brick nosings.

Walls

English bond is used throughout the foundations. Wall thicknesses vary: north and south, 18½ inches; east, 14 inches; west, 13½ inches; eastern partition, 13½ inches; western partition, 9 inches. The excavation report mentions that what little remained of the original plaster on the walls was composed of oyster-shell lime and marl applied directly to the brick. However, photographs show such mortar only on the partition walls. The mortar is composed of oyster-shell lime and sand. In the western section and in the eastern inner partition the mortar was softer and more crumbly and made with fewer oyster shells than the exterior walls of the middle and eastern sections.

The average size of the brick in the exterior walls of the middle section is 9 by 4¼ by 2⅜ inches. Four courses make 1 foot. The joint is ⅝ of an inch wide. Brick in the exterior wall of the western section is typically 8¾ by 4 by 2⅜ inches. Four courses make 12¼ inches and the joint is ¾ of an inch. The median color of the brick is orange-red. The joints are trowel-struck so that each joint face slopes back from top to bottom.

The footings rest on undisturbed clay, as far as observed. Projected or spread footings were found in part of the exterior east wall, in the north wall of the eastern section, in the wall between the fireplaces of the middle section, and in the facings of the west side of these fireplaces. It is significant to note that the footing of an older wall was discovered beneath the eastern interior partition, separated by a zone consisting of broken brick, mortar, sand, and oyster shell, 2½ to 4½ inches in thickness.

Forman notes that the eastern interior partition does not bond with the exterior walls and has an older footing beneath it. Also, it has the same kind of mortar as that in the western section. It may thus be supposed that, if the western section is later, as Forman thinks, the eastern partition may have been rebuilt at the same time the western section was added.

Floors

Flooring in each of the 3 main units differs. The floor of the eastern section appears to have been unpaved except for a portion of the floor of the north room which was laid with Dutch brick set on edge in a continuous pattern. In the middle section the north room has a continuous pattern of local colonial brick laid flat, whereas the southern room of this section has a varied but continuous pattern of whole bricks and fragments of brick laid flat and mingled with irregular fragments of slate flagstone. The floor of the western section is of local brick laid on edge, continuously. The bricks of the western and eastern sections were laid on sand, but those of the floor of the central section were set on a thin layer of sand which overlays a deposit of oyster shells and broken bricks averaging an inch thick. Below the latter layer was undisturbed sand.

Fireplaces

The foundations of double fireplaces, placed back to back between the north and south rooms of the respective 3 sections of Structure 17, were observed to have fire evidence only in the north halves. Hence, it is assumed that the southern halves were only for the support of fireplaces in the rooms above. In the south rooms of the middle and western sections, the arch springs of the foundation remain, the arches having collapsed. An oval-shaped brick oven is built into the west side of the fireplace in the north room of the western section. A square brick addition 3.7 by 4.4 feet is built into the foundation of the fireplace in the south room, middle section. The use of this addition is unknown.

Neither Forman nor other excavators at Structure 17 attempted to study or utilize data from the ceramic and glass objects found in excavating. Even so, the Forman report in the files of the National Park Service offers a general description of "architectural fragments." Since Forman's study of the structure was entirely from the architectural standpoint, his observations of this material are valuable, even though they are not comprehensive and provenience is rarely recorded.

Hardware

HINGES include 32 strap hinges, 1 pair of which has a slight circular enlargement near the pintle end, possibly the result of Dutch influence. Half a "cock's head" hinge was discovered in the area outside the foundation, but possibly associated. Two H-hinges with rounded ends were recorded.

PINTLES were numerous, some fitting into the eyes of strap hinges.

CASEMENTS: Two fragments of a wrought-iron lattice case-

ment with 4 pieces of saddle bars were located on the inside of the north wall of the middle section. The stiles and rails are 1 inch wide and 5/16 of an inch thick. Size of the casement is 18¼ inches wide by 32¾ inches long (estimated). A fragment of a corner of another casement was also found with stiles or rails 1⅜ inches wide and 5/16 of an inch thick. A possible casement latch or fastener 8½ inches long was found, but not in association with the above casement.

LOCKS AND KEYS were fragmentary. Eight locks were represented, some with works attached but very badly deteriorated. One lock is heart-shaped. All are of iron. At least one 12-inch lock bolt was also found. Five keys are represented, all of iron.

SPIKES AND NAILS were numerous. Eleven square spikes range from 6 to 9¼ inches long. Large quantities of hand-wrought nails are represented in the collection.

FOOTSCRAPERS, HOOKS, STAPLES, HASPS were also found.

Leaded Glass

Quantities of leaded glass were found in the form of broken fragments of quarrels of diamond shape 3⅞ inches on a side, with an acute angle, top and bottom, of about 77°. Thickness varies from 3/64 to 3/32 of an inch. The lead cames were noted to come in three sizes from the area of the foundation, all having held the panes in place by means of the typical "H" section.

Slate

Slate was found in the foundation indicating some use of this material in roofing. One blue slate measures 8¼ by 5¼ inches and has 2 small nail holes close together at one end. Another slate, broken, is dark green and measures 8¾ by 5 by ¼ inches. A nail hole ¼-inch wide is 1¼ inches from the top center. Some fragments of blue slate are thought by Forman to have been used for paving or copings. These are ½ to 1¼ inches thick.

Tiles

Found were pantiles and flat tiles, each type, especially the pantiles, very often having oystershell mortar attached. Nibs for locking with roof strips were noted. The color is reddish-orange, and the bottom is typically sanded, the top, smooth. Some tiles of the pantile type were light chocolate brown and others light yellow and very porous. The flat tiles are also sanded on one side. One flat tile, originally about 5 inches wide, ½ inch thick, had 2 handpunched holes about 1 inch from the edge and 2¼ inches apart.

Conclusions

It appears that archeological evidence does not finally prove or disprove identity of Structure 17 as the First Statehouse. No evidence was reported from the excavation of the middle house (Foundation 2) of Structure 17 to date it before 1640 at the earliest. Ceramic and other evidence points to occupation during the second half of the 17th century and possibly after 1700. Clay-pipe evidence and wine-bottle shapes range preponderantly in the early 18th century, but may represent post-occupation deposition in the cellar areas.

Foundation 1, the western house, contained artifacts more uniformly early 18th century. This supports Forman's estimate of its having been added on to the middle section. In his official report to the National Park Service, Forman records that "certain sections of the floor were taken up in order to investigate what lay underneath. All the brick thus removed were carefuly replaced." And again, "On March 30 the brick floor was removed along the west wall of the middle section. A layer of sand covering brick thrown in any fashion was found." (Forman, 1935a.) Beneath the bricks of the paving of the center section (Foundation 2), a nearly complete red-brown locally molded pipe appears to be of 1650–75 date.

Late in 1955 the southern half of the center section of Structure 17 was excavated for partial display. At that time the writer and Jelks took up some floor bricks to examine what lay beneath. This test was located within 4 feet of the south wall. A thin deposit of detritus did remain beneath the bricks and above the undisturbed sand which formed the basal member. The only specimens recovered here were as follows:

Five pipestems, 3 white, with holes 7/64 to 8/64 of an inch, characteristic of 1650–80. However, the size of stem holes in such a small sample is by no means a reliable indicator of dating.
Two locally made, brown stem fragments, 9/64 and 11/24 of an inch.
A piece of slag—evidence of a fire, but not necessarily the burning of a house—possibly from a fireplace.
Pieces of slate, presumably English.
Fragments of plaster and mortar with calcined shell.
A lead calme or came for holding window glass.
A wrought-iron nail.
German, salt-glazed, blue-on-gray stoneware, ca. 1640–60.
An earthenware roof tile fragment (flat) with nail hole.
A nodule of English flint.
A small fragment of wine bottle, too small to determine shape.

These specimens suggest, but do not prove, that before the brick flooring of the last-used cellar was laid down, a sand floor existed on which some detritus accumulated. The dating of this old deposit would have been the earliest possible at the house site, assuming that the center and eastern sections were almost contemporaneous, and older than the western, as Forman believed. Because of the wine-bottle fragment, we have a definite lower limit to the dating—namely about 1640. Thus, we have to conclude that the original structure on this site was erected after 1640.

The Virginia Magazine of History and Biography (Gregory, 1935) July 1935 quotes data on ownership. It gives the owners of the western section of the actual First Statehouse group of three houses as Richard Bennett from William Berkeley, March 30, 1655; Theoderic Bland, son-in-law of Bennett and Speaker of the Assembly; Berkeley (again); Henry Randolph; Thomas Ludwell and Thomas Stegg, before January 1, 1667. For the middle and eastern sections: The colony from John Harvey, April 7, 1641; Thomas Woodhouse, ordinary keeper, October

17, 1655; Anne Talbot, September 1, 1657; George Marable, February 25, 1663; Henry Randolf of Henrico; Nathaniel Bacon and the executors of Miles Carey (middle structure); and Thomas Swann of Surrey (eastern structure), April 7, 1671. Finally in the Ambler Papers is recorded in 1696 that George Marable sold "one-half acres more or less on which a brick house did formerly stand, where my said father George Marable lived abutting on and joyneing Easterly to the brick howse and land now in possession of John Jarrett, . . . Westerley on the ruins of the brick howse and half acre of land belonging to Phillip Ludwell Esqr southerlye on James' River and Northerlye towards the howse and land belonging to John Harris Taylor."

From this it may be taken that by 1696 the middle and western units of the First Statehouse were destroyed and that the eastern unit alone still remained standing. We know from the records of the National Park Service excavations of 1934–35 that in the fill of the middle unit, designated "Foundation 2" at the time, some 1,808 pipe fragments were recovered, representing most of the pipe fragments from Structure 17. These pipes were characteristically of the last quarter of the 17th century and extend into the 18th at least 20 years.

In 1935 a search was made by National Park Service archeologist H. Summerfield Day for remains of two houses (Day, 1935). One was a Mr. Fitchett's house and the other, a 15-by-15-foot house. Both are located with precision on old survey records in reference to the First Statehouse. The report of these excavations, dated July 1, 1935, states:

> No evidence of any structure was found in this area (Fitchett's house area) although about 1,100 square feet were excavated down to the undisturbed clay.
>
> The very meager number of artifacts found in this area also indicated that the section was not in any close proximity to a former habitation.
>
> The failure to find either the 15 by 15 foot house or Fitchett's house does not definitely prove that Structure 17 is not the Statehouse, but indications are that it is not.

It may be added that area tests in the vicinity of Structure 17 in 1955–56 also failed to produce house residue in these locations. It must always be kept in mind, however, that structural evidence from the first half of the 17th century, especially if timber, was subject to almost total obliteration by subsequent building and plowing.

Another note of caution in identifying Structure 17 as the First Statehouse concerns the factor of erosion. The measured distance from the First Statehouse to the river in 1667 was 67 feet. (Richmond Land Office Patent Book 6, p. 223, "Ludwell, Thomas and Stegg, Thomas, Esquires".) In 1935, just before construction of the riprap seawall along the southern shore, the distance between Structure 17 and the river's edge was measured and found to be 64 feet. There is considerable evidence to support the hypothesis that the southern shore in this area has eroded more than 3 feet in the last 300 years, in which case it appears possible, at least, that any remains of the original First Statehouse may have vanished long ago under the waters of the James, leaving Structure 17 simply the ruins of a comparable but unidentified structure.

We must not overlook that the First Statehouse was originally presumed by Lyon G. Tyler and others to have consisted of three 40-by-20-foot units arranged in a row, with the long axis continuous. This description also fits the Ludwell-Third and Fourth Statehouse group and the long house south of Pitch and Tar Swamp Structure 115.

Finally, we must consider the original clue that prompted Yonge to assume that the First Statehouse was several hundred feet west of Structure 17. In the State Land Office Patent Book 2, pp. 10–11, is entered the following:

> Now know ye that I the said Richard Kemp Esqre doe by these presents according to ye Act of Assembly give and grant and Confirm unto Mr. John White one Acre of Land lyeing in James Citty bounded west upon the Church Yard East upon the Land [Philip Ludwell's] apprtaining to the State house North towards the Land of mr Thomas Hampton, and south upon James river the Length being twenty three poles and the breadth seaven poles almost.

This would place the tract (the one including the middle section only) upon which the First Statehouse stood, not less than 380 feet downriver from the churchyard as it extended riverward from its present walled enclosure, and perhaps 500 feet from the location of Structure 17.

Thus, historical evidence to establish the identity of Structure 17 is no more conclusive than the archeological evidence. But there is always a chance that a clue some day will be recognized which will settle the question conclusively.

STRUCTURE 18

Structure 18 lies in the north portion of Lot 89:113, and is known only as a small brick foundation 18 by 14 feet, outside measurement. It is oriented with the long axis approximately east-west. No chimneys, cellar, or other features are recorded, and nothing but the barest mention and an outline on the base map can be derived from the scanty notes left by the foreman who supervised the excavations in 1935. Nothing is known historically of the identity of this structure. For the most part, the artifacts recorded for the 100-foot lot can be assumed to belong to the structure. This is true since only one building was on this lot, and the artifacts are typical house refuse. Ditch 15 and Well 3, within 20 feet, are undoubtedly associated.

For Lot 89:113 the artifacts tell a meaningful story and cast valuable light upon the structure and the associated Ditch 15 and Well 3. Refuse from these appears to belong to the period of the rest of the lot and Structure 18. If there had been more than these three features discovered in this lot, and if the lot had not been completely excavated, we should be less certain of the association of these artifacts with Structure 18. The location of a small proportion of the artifacts is recorded, and some depths are given. Although most depth notations read from the surface to a given measurement, they are not very significant.

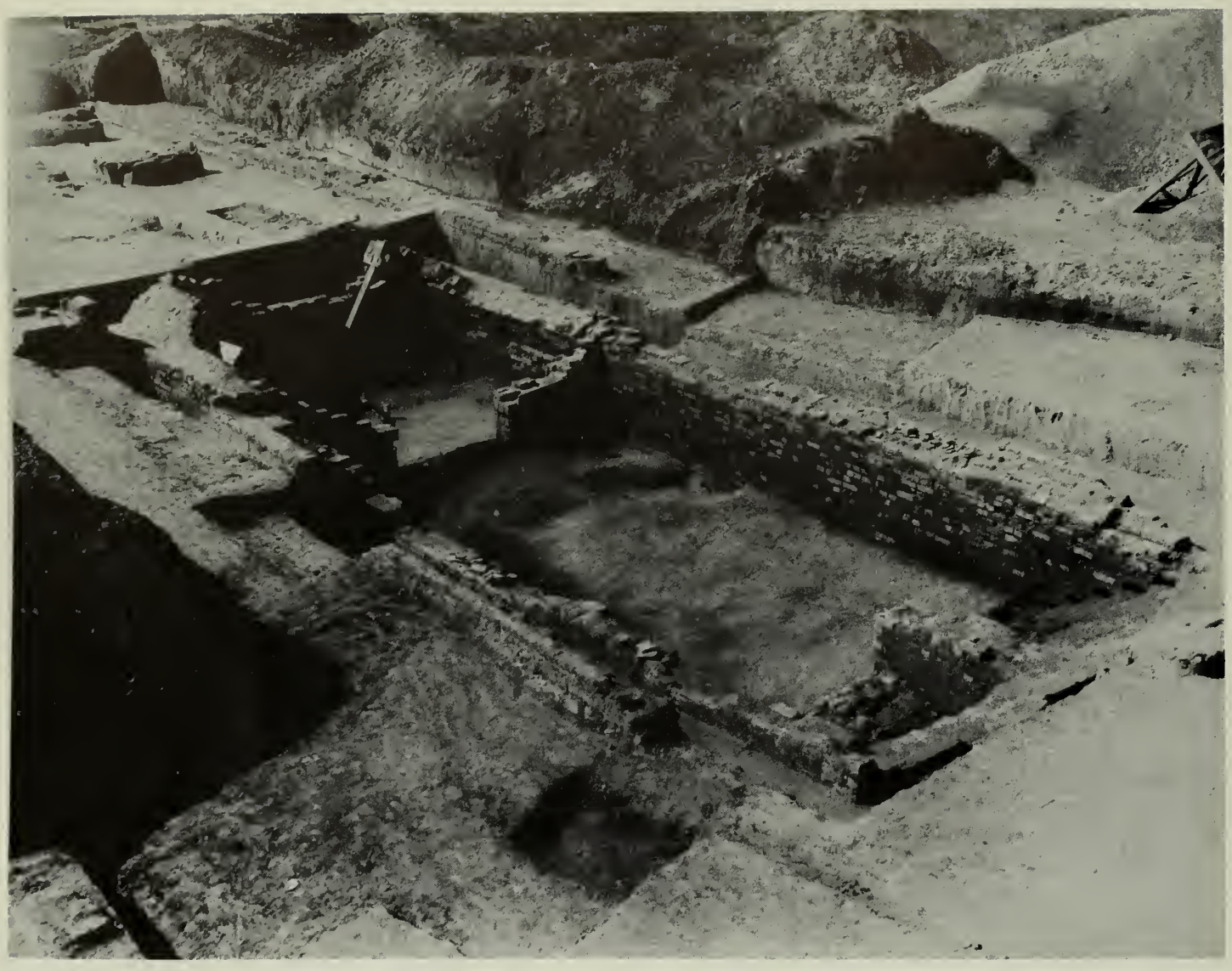


PLATE 25—*Structure 19A from the Northeast*

The vaulted room at the far (south) end probably represented the wine cellar of the tavern. The walls of Structure 19B which enclose and extend south from 19A may be observed (Lot 98:101).

Tiles

Structure 18 was undoubtedly fitted with a roof of pantiles, since approximately 200 fragments were recovered. About 20 fragments of flat roofing tiles were found, none of which appear to have been used for leveling, since mortar does not adhere.

Stoneware

German stoneware, the majority blue-on-gray, and brown mottled vessels are well represented. The latter included a bartman and jug fragment with medallions, all of which suggest the second half of the 17th century. There is a residue of evidence representing English white salt-glazed Staffordshire, which appears to indicate an occupation on this lot, or at least a deposit of refuse from the 1760's.

Earthenware

Locally made lead-glazed ware, English lead-glazed, both light and dark, and some coarse-tempered utility ware from Devonshire are all represented, definitely suggesting the second half of the 17th century, probably mostly third quarter. Delftware is predominantly English-Dutch blue-on-white, with some English Delft (1640–50) in plates, vessels, and porringers. There are a few sherds of Spanish and Lisbon majolica, the latter indicative of the first half of the century. Tobacco pipes are represented in great numbers of fragments, and it is here that another definitive dating range can be obtained. The imported stems clearly indicate a dating from 1650 to 1680 and somewhat beyond. The white bowls also are last half of the century, the majority, last quarter. Brown pipes constitute a quarter of all

pipe specimens. These brown pipestems and brown bowl fragments, presumably locally made, suggest by their shapes the last half of the 17th century. Some 35 out of 300 white stems were roulette-decorated, and 4 are initialled "*LE*," 1 "*WG*," and 1 "*R*."

Iron

Large numbers of wrought-iron nails, spikes, tacks, many with mushroom heads, were found in this lot. Among the iron objects are fragments of strap, plate, knife blades, small bars, a key, and scythe blade. At a depth of 1 to 4 inches, directly above Structure 18, were found a wrought-iron spearhead, 3-tined culinary fork, without handle, a flint lock pistol spring, and a fragment of the lock from a flint lock pistol.

Brass

In the vicinity of Structure 18, tacks, a spoon fragment, and unidentified object fragments were found, as well as two unidentified objects of brass and lead.

Lead

A bale seal with undecipherable markings, a fragment of came, and a shot were located in this lot; the seal came from the vicinity of Structure 18.

Glass

Over 700 fragments of wine bottles from the lot are characteristically 1660–75, and some are probably representative of the end of the century. About 50 gin-bottle fragments were found, showing proximity to the first half of the century. One bottle seal with a fleur-de-lis decoration was recorded.

In addition, a pewter flagon fragment was recorded from the lot and a silver token was found in the Structure 18 area.

In summary, the artifact evidence indicates that the house was used in the last half of the 17th century, possibly somewhat past 1700. It is probable that the English Staffordshire evidence is intrusive and subsequent. The structure was undoubtedly a small house, probably of brick, without a cellar. Associated with the house were Well 3 and Ditch 15. The brick kiln, Structure 127, 50 feet to the southwest, was earlier in the 17th century, possibly first quarter.

STRUCTURES 19A AND 19B

Excavation of lots 99:101 and 98:101 was carried out between December 1934 and August 1936 under the guidance of various archeologists, architects, and field foremen with labor supplied by the Civilian Conservation Corps. In that excavation, Structures 19A, 19B, the associated Structure 45, and 2 wells, all occur in close relationship. The work was not uniformly integrated, and the notes and HABS drawings were never completed. The following data are presented on the basis of extant observations and drawings, plus a complete review and analysis of the photographs and artifacts (except those of metal) by the writer.

Structure 19A is the nuclear house with complete cellar and the only intact foundation in the group. It measures 43 feet 3 inches by 15 feet 10 inches to 16 feet 6 inches, outside dimensions. The house is oriented with long axis approximately on magnetic north-south.

Structure 19B is a subsequent building which envelops 19A cellar portion completely beneath its north half. It has no cellar beneath the south half. The walls are not completely preserved north of the central partition, but the indicated length of the complete structure, ouside measurement, is 88 feet 9 inches north-south and 23 feet 2 inches east-west. When Structure 19B was erected, the south room of Structure 19A cellar was vaulted over. Thus, a use for the old foundation hole for a wine cellar is indicated, and artifact evidence also supports the assumption that the structure then served as a tavern.

Structure 45, oriented identically with 19B, with respective north walls approximately in line, lies 10 feet 6 inches east of the larger building, and is clearly a subsidiary structure, presumably a kitchen. Structure 45 is represented by a brickwork foundation including a large fireplace and an adjoining oven. No structural evidence survived for the remainder of the building except postholes 8 to 10 feet apart. These indicate a house approximately 28 feet long north-south and 18 feet wide, without cellar. There is an irregular pit 2 feet 6 inches below the top of the undisturbed clay, lying 10 feet south of Structure 45. This pit has possible significance as an associated refuse deposit.

Well 11 lies 22 feet west of Structure 19B, and Well 4 lies 15 feet north of the midpoint between the north walls of Structure 19B and Structure 45. Well 11 was possibly wood-cased, but no structural evidence remained except the wooden barrel at the bottom. Well 4 was brick-lined.

Four ditches are associated with these structures in Lot 99:101. Ditch 20 is probably subsequent to Structure 19B and Ditch 18 is probably subsequent to Structure 19A and 45. Ditch 17 does not apparently intrude on structures. Artifact evidence of the ages of these ditches will be discussed later.

Structure 19A

The north room of this 2-room structure has 4 walls standing, in English bond, with clear indication of destruction above ground level and subsequent rebuilding. The mortar is composed of sand and oyster shell throughout. However that of the original courses is white and superior in quality to that of the rebuilt courses which is yellow and soft. At the north end of this room is a dividing wall extending south at right angles 5 feet 3 inches from the north wall. On the left of this divider is a flight of steps consisting of 7 risers of brick approximately 7½ inches high, topped with wood, indicated by nosings at the sides of the steps. The north wall is continuous behind this stairway. On the left a fireplace foundation is indicated. A remnant of brick paving lies within the fireplace base, but the remainder of the cellar, as well as the vault to the south, had



PLATE 26—*Structure 19A—Conjectural Drawing*

A conception of Structure 19A in its original aspect before development of the additional 19B to the south. Behind (east) is Structure 45, assumed to be a kitchen. Actually, Structure 19A is the cellar and vault beneath and enclosed by Structure 19B. Although the first may have been an independent structure once, the ensemble of Structure 19, undoubtedly a tavern, and Structure 45, the kitchen, must go together. Structure 19, including A and B, was approximately 90 feet long—far longer than the house in this view, even including the frame lean-to at the south end. Interpretation by Sidney E. King. Research by A. Lawrence Kocher.

a dirt floor. The footings of the north wall are up to 6 inches deeper than those of the other walls of the room, and spread out wider at the bottom.

In all 4 walls of the north room soldier courses were observed, sometimes in 1, sometimes in 2 courses. This is to say that bricks were laid dry on edge in the sand above which the bonded bricks were laid with mortar. Above the soldier course appear 2 projecting courses. The bricks of the original basal wall members average 8⅞ by 4½ by 2½ inches. Those added to the original wall average slightly shorter and nearly ½ inch thinner. All bricks range from salmon color (soft) through the reds to purple (very hard), and some headers are glazed. The bricks, like those of 19B and Structure 45 are undoubtedly locally molded and fired. The bricks of 19B average ¼ inch thicker and longer than those of the old and added masonry of 19A and of Structure 45.

The ends of the partition wall between the north and south rooms were bonded to the west and east walls of Structure 19A, and a central door opening 4 feet 10 inches wide was placed above 3 basal footing courses. A wooden sill 8 inches wide lay on the brick footing. The sill was recessed into the wall, 17 inches on the east side of the opening and 13 inches on the west side. The threshold was thus 11 inches above the floor line. (Similiar examples of door framing were found in Bacon's Castle, Isle of Wight County, built in 1655, and Sweet Hall, New Kent County, built in 1703.) Originally, this partition wall was 1 header brick (8⅜ inches) thick with the footing (1 soldier course) projecting south from the wall 4 to

6 inches. Some time later, probably when the vault of the south room was added, an additional 4 inches were added to the south side of the wall in common bond. This made the wall 14 to 15 inches thick. The addition was not bonded to either east or west wall. To hold this 4-inch addition, 2 more courses were laid on the soldier course and projected out from the original wall 7 to 9 inches. Bricks forming the junction with the vault (not a true arc) were bonded to the vault only by mortar, pieces of flat roofing tile, and broken pieces of brick used to chink in between the wall top and vault.

The remarkable feature of the south room of Structure 19A is the unplastered brick vaulting which was preserved from the spring line for a distance of 2 to 3 feet. The spring line itself was approximately 2 feet 6 inches above the sand-and-clay floor. The east and west walls below the spring line were of English bond, and the vaulting is of English bond; however, the wall proper above the spring line was somewhat irregular in bond. It is noteworthy that the vault starts 1 to 1½ inches back from the vertical surface of the lateral walls. Also at the spring line of each of these walls were 4 recesses averaging 5 by 7 inches and 4 to 6 inches deep, spaced evenly. These recesses may have held wood members which held the centering for the vault. If so, they explain the setback of the vault face which would represent the false work covering of 1½-inch boards on which the brick vault was built. Projecting the vault curve indicates a maximum room height of 6 feet at the center.

Structure 19B

This structure is represented by intermittent remains of walls averaging 18 inches wide set just above the undisturbed clay, at the bottom of the humus zone. The top of the maximum of 4 preserved courses lay just below the 1934 plow line, or 6 inches below the surface. The portion of Structure 19B which envelopes and overlies the walls and cellar of Structure 19A probably contained 2 rooms on the first floor. A chute, indicated by an exterior sloping course of flat-laid bricks 3 feet wide, evidently gave access through the east cellar wall beneath the north room. This provided access for heavy barrels or chests to be stored in the vault and cellar.

The inside measurements of the indicated 2 rooms of the southern half of Structure 19B are 40 feet 5½ inches by 20 feet ¾ inches. The type footings used for Structure 19A were not used for Structure 19B. The first course was laid directly on the clay in English bond with a good grade of oyster-shell lime mortar. The north partition wall is 14¾ inches wide, bonded into the west wall and built from the same sort of bricks as the east and west walls. These bricks average 2½ by 4⅝ by 9⅛ inches and range in color and hardness from salmon (soft) to purple (very hard). Thus the bricks of 19B were slightly thicker and longer than the bricks of Structure 45 as well as those of the old and added masonry of 19A.

Between the two southern rooms of Structure 19B, a clearly-indicated double fireplace foundation extended in a T-shape from the east wall providing nearly identical fireplaces. Their inside measurements were 8 feet 3 inches wide and a front-to-back depth of 3 feet 6 inches.

Artifacts from Structures 19A and 19B (General)

As previously stated, Structure 19A was destroyed and its cellar portion subsequently incorporated as a cellar for the larger and longer Structure 19B, with the addition of a vault. Aside from this obvious inference, it is not probable that much light can be cast upon the relative datings of these two structures from the artifacts. When Structure 19B was destroyed by fire, the artifact evidence within and around its location would most likely reflect the current or recent usages and artifacts associated with the late period of occupancy. The excavators reported no definitive objects sealed in the earth beneath the dirt floor surface of Structure 19A or beneath the steps at its northwest corner.

Ceramic

BRICK. The building bricks, previously described, indicate no essential difference between the bricks of Structure 19A and B; all are locally made in the latter half of the 1600's and range in hardness and color according to their position in the kiln. The numerous fragments of pantiles indicate a tile roof. The flat roofing tiles, few in number, were used mainly for leveling masonry courses.

SALT-GLAZED STONEWARE. Both German brown-mottled and blue-on-gray are present in fair quantity, predominantly late 17th century, but a fair proportion—about a quarter of each—are 18th century. A graybeard jug fragment is a definite 17th-century item which could be third quarter. There is a blue-on-gray jar. A single sherd of Staffordshire dates after 1750. As with all other stoneware and earthenware items—except the blue-on-gray jar, which was in Structure 19A fill—these items are from Lot 99:101 at large. The excavators did not leave a definite record of pottery occurrence except by the lot area.

EARTHENWARE is well represented in Lot 99:101. It also indicates the latter part of the 17th century with some 18th. Most common types are the locally made, lead-glazed type, and English-Dutch delftware. There is a large number of English, lead-glazed, light utilityware sherds, but a minor number of the dark, lead-glazed, English ware. Coarse-tempered, Devonshire utilityware is present in small proportion, as are marbled slipware, creamware (after 1750), and a few sherds of English sgraffito and Italian sgraffito. White English delft is present. Earthenware here represents the two structures 19B and 45 principally and shows that occupation may have extended beyond the 17th century.

The best earthenware criterion is, of course, the tobacco-pipe collection, and fortunately, the provenience of most of these specimens was kept specifically. Here the significant observation, to begin with, is the sheer number of pipes from the house area. There are over 500 white stem fragments alone, many brown stems, and white and brown bowls. This pipe evidence, the good representation of wine-bottle fragments, the building

of a vault for the Structure 19B cellar, all plainly testify to the logic of assuming that the structure was a tavern.

Tobacco pipe evidence shows conclusively that Structure 19B, speaking of the entire structure, including the cellar in its final use, was in use in the last quarter of the 17th century.

Indications of the 18th century artifacts suggest two possibilities, namely: that use of the building did indeed reach well into the 18th century, or that various pieces of refuse were deposited in the ruined foundation area standing open in the 18th century. The 18th-century refuse may have been deposited from houses in the vicinity, notably to the south toward the James River. These are known to have been standing in 1781. (See Figure 3.)

Tobacco pipe evidence is also significant in pointing out the relationship of Structure 19B and other related features: Structure 45, the presumed kitchen, appears somewhat closer to the third quarter of the 17th century, with use into the last quarter. This suggests that it may have been destroyed before the main house was destroyed. Well 11 pipe evidence shows that the refuse lost deep in the well is definitely third quarter 17th century, with no 18th-century refuse included at all. This simple well with barrel at the bottom was undoubtedly constructed, used, and abandoned during the first period of Structure 19A occupation, and possibly after Structure 19B was built. More probably it served only 19A. Well 4, on the other hand, was brick-lined and was in use certainly in the last quarter of the 17th century, probably not before.

Glass

Glass evidence is particularly significant for an indication of the character of Structure 19B. At least 560 pieces of wine bottles from in and around this building were collected. All appear to be clearly last quarter 17th century except 20 pieces from the third quarter. At least two pieces of wine bottle from the fill of 19A are definitely 18th century. Melted wine bottle fragments were amid the debris of charred wood and other fire evidence on Structure 19A. It is significant that only two fragments of Dutch gin bottles were found for the entire lot area, pointing to the probability that this ground was not in use for habitation during the first half of the 17th century. Window quarrel fragments numbering over 60 in the fill of 19A, together with casement fragments, offer conclusive evidence of the fitting of windows in Structure 19B in its final phase. Two goblet fragments were found outside of Structure 19B as was one "HG" (Henry Gawler?) bottle seal. (Henry Gawler was known to have kept an ordinary in 1684 near the site of Structure 17, near the river bank.) One "GL" seal was found in the fill of Structure 19A cellar.

Wrought Iron

Wrought iron found in the Structure 19A cellar fill and in and around the Structure 19B foundations consisted, for the most part, of nails, spikes, pintles, hinges, hasps, staples, keys, locks, latches, bolts, escutcheon plates, drawer or door pulls, and parts of a casement window frame.

Nails and Spikes were found in quantity, varying in length from ½ to 8 inches. However, such evidence is insufficient to indicate that Structure 19B was constructed of wood. Interior finish casings, floors, lath and moldings, hinges, hasps, and other wrought-iron fixtures were held in place with wrought-iron nails which varied in size according to their function. (Lath evidence comes from lath-marked plaster from Well 4, near Structure 19A.) Two large-headed spikes were found at the threshold of a probable door in the south end of the east wall of Structure 19B which may have been used on the portal itself. One of the spikes, 5¼ inches long, is bent at a point 2 inches from the head, indicating the thickness of the door.

Strap Hinges were of 2 types: (1) pintle, hinged at the end on a pintle, and (2) a double strap, hinged at the center. Of the pintle hinges there were 4 sizes, 3 of which had rounded, enlarged ends showing, perhaps, a Dutch influence. The largest pair (Cat. No. 1651) was found inside Structure 19A near a probable door location in the central part of the west wall. It can be assumed readily that it belonged to an entrance door. One of these hinges is 30 inches long—3 inches longer than the other. Both are made from ⅜-inch iron, 2⅛ inches wide, and taper in thickness to ⅛ inch at the rounded ends. The door on which the pair of hinges fitted was, inferentially, about 36 inches wide and 2 inches thick.

Another strap hinge (Cat. No. 1652) found close to this same portal and the first pair, is 20½ inches long and 1⅞ inches wide at the pintle end. It was wrought from a strap $^{3}/_{16}$ of an inch thick. This hinge was essentially Dutch in character and probably was used on a door or shutter. The other strap hinges found were similar to this type but smaller, presumably used on small doors elsewhere in the house. Center-hinged straps were probably used on chests or on cupboard doors.

An unusual pair of wrought-iron ornamental H hinges with chamfered, foliated ends (Cat. No. 1653) was found in the cellar debris at the floor level of a burned area near the doorway between the vault and north room of Structure 19A. The hinges, measuring 8¾ by 3¾ inches, are a loose-joint type which made it possible to take the door down without detaching the hinges. This pair was large enough to have been used on a door at this passageway, or for a door in the floor or floors above.

Casements. All surviving evidence of window fittings from 17th-century Jamestown indicates the use of diamond-shaped quarrels and lead cames in wrought-iron casements. J. E. Chandler in his book *The Colonial House* states that the glass sheets were probably imported and cut to the size needed and the lead cames were heavier (almost an inch wide) in the early examples (Chandler, 1916, pp. 126–127). The Jamestown examples of cames do not indicate clearly a wide type. Examples here at Structure 19 average from ¼ to ⅜ inch wide and vary in thickness from ⅛ to $^{5}/_{16}$ inch according to

the place used in the window. Casements at Jamestown were small, judging from the only complete example (Cat. No. 604) which was found in Structure 17. This casement is 13½ by 25 inches, outside measurements. It was a hinged pintle type with saddle bars and a fancy latch. (See Figure 9.)

Part of a casement (Cat. No. 1703) was found in the burned area above the cellar floor in front of the fireplace, in the northwest corner of Structure 19A. This casement has a slightly larger frame section than the one from Structure 17. The window was probably slightly larger than 13 by 25 inches.

LATCHES, LOCKS, KEYS, STAPLES, AND PULLS are represented here, directly or indirectly. The locks are absent but are represented by three different types of keys with staples indicating the thickness of the wood members to which they were attached. It is worth noting in this connection that we have traces here and elsewhere at Jamestown of the 17th-century wrought-iron locks classified by Joseph Moxon (Moxon, 1703):

Street-door locks, called *stock locks* (made for imbedding in a wooden door, requiring a key with a collar smaller than the keyhole in the door)

Chamber-door locks, called spring locks (a cased lock, which required a key with a collar to keep it from penetrating the keyhole too far beyond the metal plate)

Cupboard locks

Chest locks, trunk locks, and padlocks

Other Metal Objects

Associated with Structure 19A fill are other metal objects including a brass spoon bowl, a brass thimble, a brass and silver button, a copper pot lid, lead came fragments, and two fragments of a unique lead tobacco pipe (marking one unhappy experiment which we know was not again repeated at Jamestown and we hope never again in America!). Also included are a pewter spoon handle of the *pied-de-biche* type characteristic of the latter half of the 17th century, and a silver spoon bowl.

Stone

A rarity at Jamestown, stone is represented only by observed bits of English slate and an Indian arrowhead (from Structure 19A fill—as evidence that one object need not date a house).

Historical Note on Structure 19

(Data by Charles S. Marshall, former historian, Colonial National Historical Park)

There are 3 possible claims of title which may be applied to the area on which this structure is located. The simplest in all respects is that of John White. . . . White took out a patent for an area . . . which was bounded on the river and located in the general vicinity of Structure 19. It is not stated in the patent whether the length or breadth is along the river. For the purpose of argument we may assume that the breadth is along the river. Although the shoreline is uncertain we may take the outermost possible location for the shoreline and locate the White tract from here. In this case the northern side of the White tract bisects the building. Thus we may see that when all doubts are resolved in favor of White owning the land we find that it is still a physical impossibility for the building to be inside the lot, to say nothing of the well which is northeast of the building.

The second possibility is that the building may have been included in the land which belonged to Richard Lawrence and later to "President" Nathaniel Bacon. There is no adequate description available of Lawrence's land. We know that he had land and a very pretentious house in the town, which was burned during Bacon's Rebellion. As a result of his participation in the rebellion Lawrence forfeited his land. (State Land Office Patents VII, 300.) In 1683 Nathaniel Bacon, "the Elder," some times known as "President," patented 3⅜ acres which was part of the land formerly owned by Lawrence. (State Land Office, Patents VII, 300.) This land may be plotted with reasonable accuracy. A survey in Ambler Papers . . . shows a road which was the western limit of Robert Beverly. See Ambler Papers #51. Beverly's eastern line was the western limit of Bacon tract. The entire question here hinges on the location of the northwest corner of the Beverly tract. This point is variable within certain limits. If, for trial purposes, we assume the easternmost possibility and plot the 2 tracts accordingly we find that Structure 19 is east of Bacon's eastern limit. This still leaves, however, the possibility that Lawrence owned a larger tract which may have extended further east and consequently included Structure 19. This structure may easily be the building mentioned as having been burned in the Rebellion.

There is still left the latter building to be identified. No positive identification is possible but one possibility may be raised. The patent to William Sherwood in 1694 mentions the fact that Thomas Woodhouse owned land west of Sherwood (State Land Office Patents VIII, 384). There is only a mention but it raises possibilities. It is known from other sources that Woodhouse owned and operated an inn in which government business was transacted from time to time.

Since no other building as large as Structure 19 has been located in this vicinity, we may seriously consider this structure the Woodhouse Inn.

STRUCTURE 21

By its aspect, as presently preserved, the foundation evidence of Structure 21 (Lot 94:103) indicates that it could have been a modest frame cottage with a brick foundation. It had a paved floor, a fireplace with an adjoining oven, glazed windows (no cames discovered), and a tile roof. It did not have a cellar. Although the artifacts hardly indicate anything but domiciliary purpose, the puzzling fact remains that brick wall footings were no longer clearly defined at the time of excavation. If side wall footings did originally exist, they may have been taken up for salvage after the abandonment of the house.

Indeed, the large size of the fireplace (7 feet 11 inches wide, 3 feet 5½ inches deep, inside measurement) would seem disproportionate for a very small cottage. The curving back wall remnant floored with brick which partly adjoins the fireplace at the north would suggest an oven of some type—possibly for baking or brewing. Six courses of the fireplace and four of the curved "oven" structure were recorded; both were in English bond. The curving wall of the problematical oven fragment was 8½ inches or a single-header-brick thick, while the straight side was only the width of a half brick (approximately 4 inches). Two sizes of brick are described by the excavators of 1935: 9 by 4½ by 2⅜ and 8½ by 4 by 2¼, both applicable to Structure 21.

The nature and purpose of the rectangular brick addition



PLATE 27—*Structure 21—Conjectural Drawing*

Structure 21 (Lot 94:103) was probably a small frame house on a brick foundation with a large fireplace and an adjacent oven at the west end. The brick walk to the north was traceable. This house dates probably in the first half of the 17th century. Interpretation by Sidney E. King, research by J. Paul Hudson and A. Lawrence Kocher.

attached to the northwest wall of the fireplace is unknown. This foundation remnant may represent a small drying room designed to utilize the heat of the fireplace masonry. Or it may have been a shed for tools or some other purpose that can only be guessed. The walls of this addition extend 5 feet from the main wall with an interior width of 3 feet 4 inches.

The brick paving of the floor and the structure's elevation (8 feet above mean low tide—original ground level perhaps slightly higher) suggests no more than a slightly depressed floor to the structure, certainly never a true cellar. This flooring extends in a fairly regular pattern of flat-laid bricks in the central portion of the structure. It takes on variant patterns of flat-laid brick in the hearth of the main fireplace (where it is raised 1 inch) and to the north and south of the chimney walls. At a distance of 16 feet 3 inches east of the backwall of the fireplace, the brick floor pattern, oriented roughly east-west, is broken by a single line of brick running roughly north-south. This facilitated drainage and was a practice familiar in Jamestown brick flooring (note Structure 123).

A walkway of flat-laid brick (Structure 20) extends from the northern side of Structure 21 roughly parallel to it, and curves gently northward after proceeding approximately 20 feet beyond the northwest corner of the fireplace. The walkway and Structure 21 floor are nearly the same elevation, the walkway rising slightly as it extends away from the house.

A lime kiln (Structure 46) in excellent preservation was found 15 feet west of Structure 21 suggesting a possible relationship. A second lime kiln (Structure 47) was also found in 1935 along the shoreline 120 feet upriver (NW) from Structure 21.

Some time after abandonment of Structure 21, a ditch, 1 foot 6 inches wide and 2 feet 1 inch deep, was dug through the center of the floor from northeast to southwest. In this ditch a brick drain was laid. The drain consisted of a line of headers



PLATE 28—*Structure 21—Detail of Fireplace*

Structure 21 showing a detailed view of the fireplace from the east. The brick floor of this structure was relatively superficial, suggesting that here may have been an example of a ground floor paved with brick, rather than the usual cellar pavement.

at the bottom, stringers at either side, overlapping the basal bricks slightly, and another line of headers at the top. This drain, designated Structure 39, served a purpose which has not been fully determined at this writing.

Artifacts

One extremely important object found between 1 and 2 feet below the surface in the area of Structure 21 was the noted Copeland spoon (Cat. No. 9—*old series*) manufactured at Chuckatuck and dated 1675. This dated spoon points clearly to the post-1675 dating of pipestems with holes predominantly $\frac{7}{64}$ inch in diameter, as well as pipes bearing the initials "LE." These tobacco pipes as well as other evidence indicate late 17th century occupancy; yet in this regard it is interesting to note that the pipestem evidence as estimated by Harrington's method ranges in the 1650–80 bracket while the evidence of 4 pipes from the fill behind the hearth and 4 from the second foot below the surface uniformly suggest the years from 1675 into the first quarter of the 18th century. The pipestems are conspicuous for the presence of 7 "LE" and 1 "IF" initials.

Taken as a time marker, the Copeland spoon also provides correlated dating evidence of last quarter 17th-century use of flat roofing tile; local lead-glazed and English lead-glazed dark and light earthenware; as well as blue-on-white English-Dutch delftware, plus a bit of Lisbon majolica.

The remainder of the artifacts are not especially distinctive or indicative of purpose. They include a small number of local and English earthenware fragments, a few wine bottle and fewer gin bottle fragments. Outside Structure 21, but in the vicinity, many artifacts were recovered (see Artifact Table 13, Appendix F), the most noteworthy being the following bottle seals: "IR," "FN," "GL," and 2 "HG."



PLATE 29—*Structure 20—Curving Brick Walk*

Structure 20—a curving walk of brick extending westward from the north door of Structure 21 house. This walk is approximately the same level as the brick flooring of the house (Lot 94:103).

It may or may not be significant that some 20 feet to the east of Structure 21 a trade token was found at a depth of 2 feet 4 inches, dated 1656, plus the word "PORCHMOUTH," and the letters "S. H." / I. The other side has the name "HENRY IENNER" and a star. A few feet closer to the structure and in the same direction, a coin of George III dated 1773 was found at elevation 3.4 feet. In August 1935 a power shovel working on the seawall just riverward of Structure 21 had deposited earth on the approximate location of the house. The excavators removing this loose earth (originally taken from the shoreline) found in it a coin stamped "CHARLES II" and dated 1672.

In all, Structure 21 evidence demonstrates the presence of small houses, probably of wood on brick floorings and with brick chimneys. These could have served either domestic or industrial purposes, or both.

STRUCTURE 22

One of the few clearly defined frame houses with a brick chimney at Jamestown is Structure 22 in Lot 97:101. Although this house evidence was never fully recorded, and provenience of artifacts is missing, an adequate lot plan was made at the time of the original excavation in 1934. At least sufficient data are available to show that the sills originally were set on posts, apparently wood, which were set in dug holes spaced approximately 22 feet east-west and 19 feet north-south. In parallel lines, 4 of these posts supported the north side and 4 supported the south side of the house. They were respectively spaced a little less than 8 feet apart. The brick fireplace extended beyond the east house wall line approximately 4 feet.

The fireplace was constructed of some whole bricks and a majority of brick halves and larger fragments in a basic English bond. The width overall was a little over 9 feet (originally



PLATE 30—*Structure 21 Overlooking the James River*

closer to 10 feet). The more intact south wing of the fireplace was 4 feet 10 inches overall, east to west. The inside measurements were 6 feet 1 inch wide and 3 feet 5 inches deep, front to back. There was no brick flooring to either fireplace or house. Bricks from the fireplace range in color from salmon (soft) to red (medium hard) and from 9 by 4¼ by 2½ to 8½ by 4 by 2¼ inches.

Structure 22 was situated in the northwest corner of a partial rectangle formed by Ditch 27 to the east, Ditch 28 to the west, and Ditch 29 to the north. The plan of Lot 97:101 does not conclusively demonstrate that Structure 22 was built after Ditches 28 and 29 were abandoned (therefore encroaching slightly upon them) or, alternatively, that the ditches were dug after the house was destroyed. One postmold in the north side of Structure 22 is definitely shown superimposed a few inches into the fill of Ditch 29, but the profile drawing of ditch and postmold is inconclusive as to which intrudes on the other. The remaining 2 postholes of the north side of the structure are shown exactly coinciding at their south borders with the north edge of Ditch 29. However, the excavators did not record any trace of a posthole at the northwest corner of the house which would have coincided with the juncture of Ditch 28 and Ditch 29. This may be explained by the notation "recent fill," indicating disturbance which may have destroyed posthole evidence at this crucial place. But there is no sign that a posthole was found in the fill of Ditch 28 where it coincides with part of the west wall of Structure 22. This absence would leave us to assume that a floor sill stretched 18 feet from corner post to corner post at the west end of the house—not a likely manner of building.

Unfortunately, it is not possible at this time—if ever—to extract from available notes the complete artifact content of the fill of Ditches 28 and 29. Notations on the lot plan designate only a wrought-iron hoe found in Ditch 29, and in Ditch 28, some delftware, 2 pieces of iron, a broken pipestem, "bones" (presumably animal), and brickbats. These ditch artifacts cannot be extracted from the collection, although from the lot at large are a number of wrought-iron nails, flat roofing tiles,

2 pantiles, and some Dutch brick. However, it has been feasible to identify a collection of pipes from Ditch 28, Ditch 29, and Lot 97:101 which are worth noting:

Ditch 28 pipes: White stems are 3—6/64 of an inch; 9—7/64; 8—8/64, dating indicated first half 17th century. White bowls show 1 definite first quarter.

Ditch 29 pipes: White stems are 1—6/64; 14—7/64; 3—8/64, dating indicated 1650–80. White bowls show 3 third quarter, 3 fourth quarter.

The average for Lot 97:101 (old lot 47) in the non-feature area is as follows: White stems, 1650–80; white bowls, 2 first quarter, 1 fourth quarter.

Thus, we may conclude that if Structure 22 intruded upon Ditch 29, it could be later than the third quarter of the 17th century. On the other hand, if Structure 22 has been partly obliterated by Ditch 28, it could be first quarter of the 17th century. There were no specimens in the collection positively associated with Structure 22 itself. It would appear from the character of the house design, plus the best circumstantial evidence of associated artifacts and features, that the house is relatively early 17th century.

STRUCTURE 23

Most of Lot 98:100 (old Lot 34) in which Structures 23, 49, and 55 lay, was inadequately excavated in 1934. By the time the excavations were recorded in 1936, two parts of this lot had been erased of features by roadbuilding, parking lot, and landscaping. Structure 23 may or may not represent a brick foundation trace. It was observed and recorded merely as a shallow ditch with a discernible depth of from 2 to 7 inches. The loose brick lying in this ditch was interpreted in the 1936 record as representing remains of a definite structure. The depth of the ditch in 1936 was only 0.7 foot below the surface, although previous disturbances may have rendered this measurement meaningless. From the vantage point of 1957, having observed the tendency for ditches to have brick debris in them (Ditches 66 and 30), the writer is willing to consider the evidence still tentative. This is based on the writer's observation of a photograph of the line of brick debris and the proximity of other small ditches—Ditches 18, 19, 20, and 21 to the north and east. Also a ditch trace in the lot to the north of Structure 23 appears continuous with it.

The presumed wall trace of Structure 23 extends 35 feet 4 inches north-south and averages 1 foot 2 inches wide and 2 feet 7 inches deep. The wall appeared to turn west at the south end for a traceable distance of 3 feet, according to the plan record. The field record, however, suggested that the trace proceeded several feet farther where it was cut by a new road. Inside of this angle, a quantity of fragmentary material, such as glass, pottery, and nails, was recorded as being found. Unfortunately, this material cannot be identified now in the collection, except in part and by lot. Brick evidence from the presumed structure is described as predominantly brown with some purple (hardest) and some soft, salmon-colored pieces. The one complete brick measured 9 by 4¼ by 2⅜ inches. In all, 330 fragmentary bricks were recorded.

Artifacts

While no artifacts were recorded in specific association with Structures 23, 49, or 55 within Lot 98:100, there is considerable tobacco-pipe and glass evidence from this lot which must serve as the only available clue to age. This evidence, however, is significant, inasmuch as it appears to be remarkably homogeneous as to dating, and, if it is a true sample, would pertain to all three structures inferentially.

Out of 126 pipe fragments, 24 are locally made, brown, with stem apertures measuring 7/64 and 8/64 of an inch. The white stem fragments range as follows: 5—5/64, 21—6/64, 45—7/64, and 26—8/64. The initials "LE" and "WE" are represented, with one each. This sampling definitely places the pipestem evidence in last half of the 17th century, with the fourth quarter and a little beyond, probably. The five white bowls found are all in the last quarter, possibly even past the century.

Glass evidence is represented by two full trays of wine bottle glass (no gin bottles), uniformly representative of the end of the 17th century.

The only other evidence available in the collection from this lot is a drawer of roofing tiles which are both pantiles and flat tiles, the pantiles predominating by 4 to 1.

Thus, it can be concluded that Structures 23, 49, and 55 all represent the end of the 17th century, or possibly a little beyond, there being no evidence within the lot to indicate an earlier dating for any artifacts.

STRUCTURE 24

The first building to be encountered (as a result of posthole tests) in the "New Towne" area in the autumn of 1934 was never excavated completely. In 1955, when the final drive to complete area testing was under way, a trench was dug within a few feet of this structure. Refuse Pit 5, containing much early 17th-century artifact evidence was located 15 feet to the east. Since it was felt that no feature could be reinvestigated before the current explorations were completed, Structure 24 was never relocated and fully excavated.

A detailed review of exploration data of the 1930's, together with additional information gathered in 1955, shows that Structure 24 was an early 17th-century feature of considerable significance. Well 20, situated 25 feet to the north and Refuse Pit 5, closer to the east, are both related to this structure.

Fortunately, data are sufficient to establish the fact that a very early occupation occurred here, that Structure 24 is probably a trace of a first-quarter brick house, that Well 20 is related to it, and that Refuse Pit 5 was its refuse depository.



PLATE 31—*Structure 26 Viewed toward the Southeast*

Structure 26 looking southeast over Lot 95:100. This structure is sometimes taken as evidence that no erosion has occurred at the south shore below Church Point because the south wall footing is lower than the north wall footing, being almost at high tide level at the time of the excavation (1934-35). However, the soil profiles of this excavation indicate that there was a definite slope riverward from some distance north of the present shore, and that much fill was added at the time the two wharfs were placed here at the end of the 19th century. The author believes, however, that Structure 26 was built on the scarp of an erosional depression leading to the 17th-century shore an unknown distance away.

Artifacts

The single, most significant object which definitely identifies Structure 24 with the early 17th century is entry No. 1 in the old catalog: A gin bottle restored from fragments found in testing the foundation. This bottle is of the exact shape and nearly the same dimensions as the complete and undamaged gin bottle recovered 25 feet to the north from the fill of Well 20. Since gin bottles were blown in molds, so that individual differences appear only at the pontil end and at the neck, it is not difficult to recognize bottles blown in the same or a similar mold. These two bottles are obviously of a uniform date and origin. This specimen and the balance of artifacts in Well 20 clearly establish both structure and well as belonging to the period 1620–50.

A collection of 54 utility vessel sherds almost entirely represents lead-glazed earthenware, probably of local manufacture. There is a single sherd of North Devon coarse-tempered, lead-glazed earthenware.

Five sherds of English delftware are known to have come from the Structure 24 tests, three of which are apparently early 17th century. The remaining two, a plain white Lambeth delft type, could also be mid-century or earlier.

STRUCTURES 26, 27, AND 28

Structure 26

The brick and stone foundation of this rectangular building runs roughly east and west through Lots 96:99, 95:99, and 95:100. Structure 26 lay on the river bank, only a little over 1 foot above mean low tide when excavated in 1935. The foundation, measuring 52 by 16 feet, lay with its long sides



PLATE 32—*Structure 26 During Excavating*

Excavated foundation shows the problematical stepped-down base course, indicating that the structure was built on an original slope. The lower footing is almost at the high tide line. Photographs made in 1926 show an apparent cellar flooring immediately south of this point in the original shore. (See Plate 2.)

parallel to the river. The bottom of the northern wall was some 3 feet higher than the bottom of the southern wall, showing that the building was constructed on a slope.

The following description of the foundation is condensed from a report on the structure prepared by H. C. Forman (Forman, 1935b).

The lower or south wall measured 13¾ inches in width and averaged 3 courses in height. The wall rested directly on the yellow sand and clay mixture on the beach. The eastern end of the wall formed a corner. A few feet farther west the wall was missing; it was present again farther on and disintegrated finally at the western end. Each gap in the wall was characterized by areas of brick fragments or brick dust.

The upper, or north wall had the same width as the lower one and averaged six courses in height. The bottom course on the north side was brick, but on the south side it was field stone (sandstone and granite) which projected 1 or 2 inches from the face of the brick. The bonding of the north wall was very irregular, with many brick fragments used, but the south wall was in regular English bond.

The western wall was entirely disintegrated except for 33½ inches at its northern end. The bottom course of the remaining western wall made a step-down to conform with the slope. At the point where the step-down began, the wall broke out 1½ inches, with no apparent reason.

The eastern wall had several feet missing at the southern end. The remainder of this wall also made two steps down to conform with the slope of the ground.

The bricks from the two long walls of the foundation differed in size and those of the upper wall, in general, were harder. The lower wall bricks ran from 8½ to 9 inches long, 2¼ to 2½ inches thick, and 4 to 4½ inches wide. Those of the upper wall averaged 8½ to 8¾ inches long, 2½ inches thick and 3¾ to 4½ inches wide. No traces of mortar were found in the joints.

Roofing tile in great quantity was recovered from Structure 26 (these tiles now fill 25 drawers, 24 by 20 by 1½ inches). Both flat tiles and pantiles are in the collections and most were apparently used for roofing. A small percentage of flat tiles have mortar adhering to them, evidence that they were used for leveling the foundations. The flat roofing tiles have two holes at the upper end. They average 5½ inches in width and ⅝ inch in thickness. No length measurements are available. One floor tile fragment and a Dutch brick were also found, as were 3 fragments of brown-glazed tile, 1⅛ inches thick.

Iron hardware items from the structure were recorded and some of them were drawn on HABS sheets (Parris, 1935b). The iron material is listed below.

No pottery is noted as being directly associated with Structure 26, but 395 sherds were recorded, by lot and square designation, from close by or in the foundation. These sherds are of a wide variety of types and represent dates from the early 17th century to the 19th century. Pipestem fragments were also kept only by lot and square designation. On this basis those listed below are considered as being from in or near the foundation. Pottery may best be described in 3 groups: that with no data on depth (Group 1); that from 0 to 3 feet (Group 2); and that from 18 to 40 inches (Group 3). Pipestems are in 2 groups: no data as to depth, and 15–36 inches. One lot of glass, 15 inches to 3 feet depth, is from close by the foundation.

EARTHENWARE: 105 white pipestems from near this foundation would indicate a range in time from early in the 17th century until well past the middle and possibly on toward the end of the century. Eight white pipe bowls corroborate this conclusion, since 2 are 1625–50, 1 is 1650–75, and 5 are 1675–1700 or later. There are also 90 brown pipestem fragments, probably locally made, with hole diameters ranging from 7/64 inches to 12/64 inches. Nothing can be said at present about the dating of these brown stem fragments.

Locally made, lead-glazed earthenware sherds are by far the most numerous at Structure 26. In group 1 there are 46 sherds of this kind, 39 sherds in Group 2, and 15 sherds in Group 3. Three sherds of the same general type, but lacking any glaze, are in Group 1. English lead-glazed earthenware is also numerous in this collection. The light-bodied, green-glazed type is represented by 22 sherds in Group 1, 26 sherds in Group 2, and 16 sherds in Group 3. Dark lead-glazed sherds number 5 in Group 1, 20 in Group 2, and 7 in Group 3, while there are 9 hard-fired redware sherds in Group 1, and 11 in Group 2. Seven unglazed Spanish olla sherds are located as follows: 2 in Group 1, 3 in Group 2, and 2 in Group 3. Group 1 contains 6 sherds of the North Devon coarse-tempered ware, and Groups 2 and 3 contain 5 sherds each. There is 1 sherd of English combed slipware and 2 sherds of marbled slipware in Group 1. Group 2 contains 3 sherds of the latter. English sgraffito is sparsely represented, having only 5 sherds, all in Group 3. Italian sgraffito and an Italian green-glazed ware are present (5 and 2 sherds, respectively) in Group 1. Other earthenware is of American 19th-century manufacture. There are 2 sherds of Rockingham ware in Group 2, and Group 1 has 5 sherds of a dark-blue delftlike earthenware. There is one 19th-century sherd with blue glaze and blue body in Group 2.

DELFTWARE: Group 1 has 17 sherds of English-Dutch blue-on-white delftware. Group 2 has 36 sherds and Group 3 has 2 sherds of the same type. English white delft is present also: 9 sherds in Group 1, 11 in Group 2, and 2 in Group 3. English manganese-purple-on-white is represented by 1 sherd in Group 1 and 3 sherds in Group 2. Lisbon majolica is present in surprising quantity, there being 4 sherds in Group 1 and 7 sherds in Group 2.

STONEWARE: There are 10 sherds of German brown-mottled stoneware, 9 from Group 2 and the remaining 1 from Group 3. German blue-on-gray stoneware is present in all levels: 2 sherds in Group 1, 9 sherds in Group 2, and 1 sherd in Group 3. Of English gray stoneware there are 6 sherds in Group 1, 4 in Group 2, and 1 in Group 3.

PORCELAIN is represented by a single sherd of Oriental ware in Group 2.

GLASS: There are 6 window-glass fragments for which there is no depth data. The following glass fragments occurred in the 15-inch to 3-foot level: 4 gin-bottle fragments, 11 wine-bottle fragments, and 1 piece of 20th-century white glass.

METAL: No depth was recorded for the following iron fragments: 3 lock plates, 6 wrought spikes, 1 staple, one 5-inch key, 1 chest lock, 1 strap hinge, 1 V-shaped padlock, and 1 drawer handle. One lead came is also in the collection.

H. C. Forman said that A. L. Ayers, a former superintendent of the Jamestown property of the Association for the Preservation of Virginia Antiquities, made note in 1927 that during February of that year he saw a foundation wall of cobblestones and tumbled brick in the water immediately in front of, and parallel to, the long sides of this foundation (Forman, 1938, p. 144). If this was so, the building had two rooms (exclusive of possible wooden partitions) in its lowest story. No trace of the southern "room" remains today.

It was Forman's opinion that Structure 26 represented the remains of a warehouse. Several facts tend to bear out his conjecture. There is no evidence of fireplaces or of interior partitions in this structure. Very little window glass was recovered from the area. The shape is unlike that of other Jamestown buildings. The fact that it was built on a slope, perhaps the river bank, would place it in a desirable location for a storehouse.

The use of cobblestones in the foundation (found in only

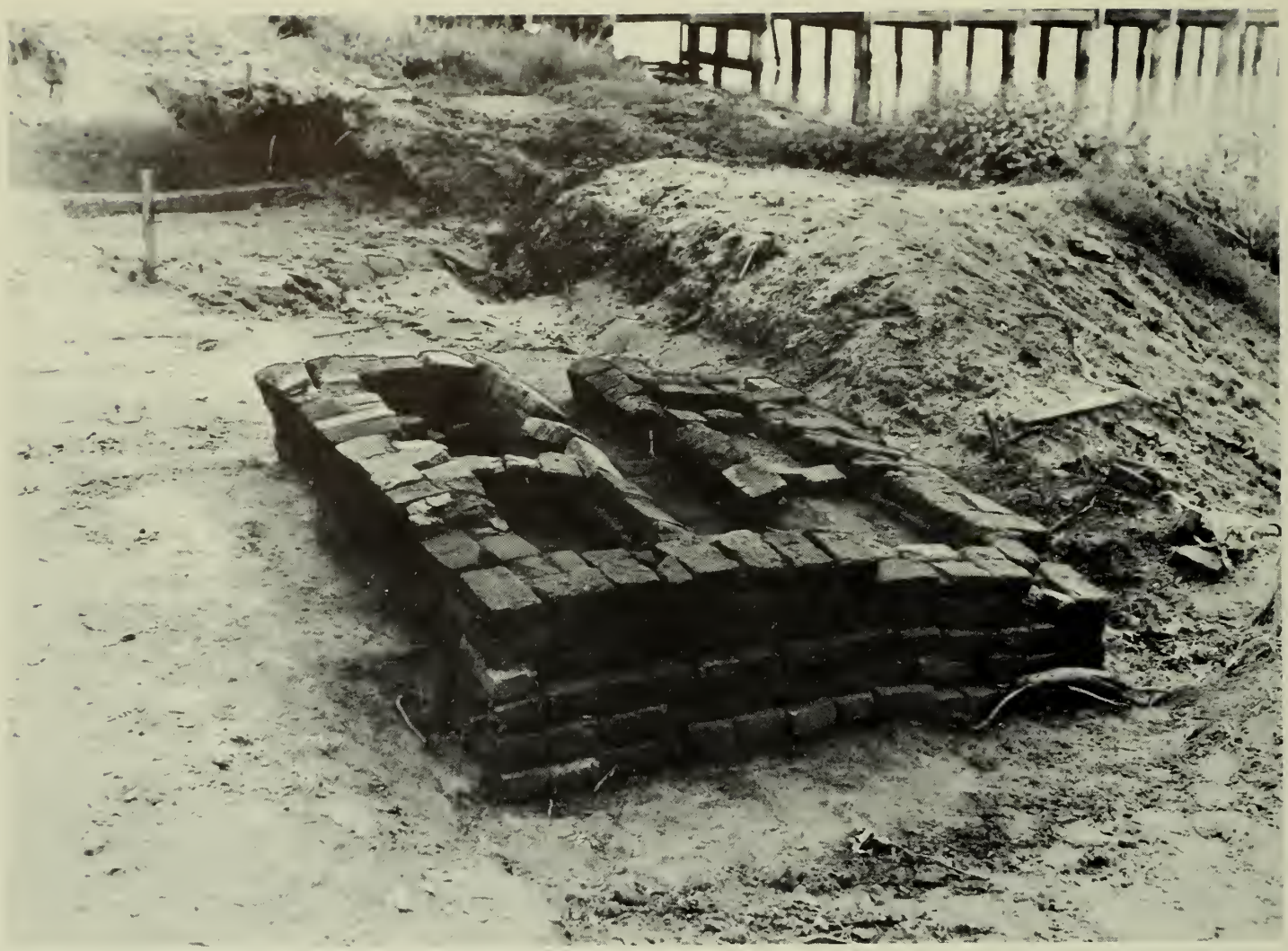


PLATE 33—*Structure 27 Pottery Kiln*

Structure 27, a pottery kiln near the 1934 shore in Lot 96:99. The spring of the arch above the central fire chamber remains.

1 other structure at Jamestown, the earliest remaining church foundation), the pipestem evidence, and the presence of such early and middle 17th-century pottery types as Italian sgraffito, Lisbon majolica, North Devon coarse-tempered ware, Spanish olla forms, and locally made types, would indicate that Structure 26 (or its site) was in use early in the century. The date of destruction cannot be determined with any certainty, but from the pottery evidence it appears that the building remained in use until near the end of the 17th or possibly into the 18th century.

Structure 27

Located in Lot 96:99 this structure was originally excavated in 1935 and erroneously reported as a flight of steps on the HABS sheets for Structures 26 and 27 (Parris, 1935b). Since then, more detailed observations have proved that the structure was definitely a rectangular pottery kiln of brick, oriented roughly east-west, 6 feet 3 inches long and 5 feet 6½ inches wide. The central firebox opened to the east and was 14 inches wide and extended 5 feet 1 inch, front to back. On either side of the firebox was a pair of chambers from 1 foot 7 inches to 1 foot 10 inches long, by 1 foot to 1 foot 3 inches wide. Near the opening, on either side of the firebox, was a small chamber 1 foot 1 inch by 7 feet 6 inches. There was enough of the wall structure intact to indicate clearly the arched opening of the firebox. The opening was estimated to have been approximately 9 inches from floor to apex. Presumably the kiln was loaded from the top.

The bricks of Structure 27 ranged from 7⅛ to 9 inches long, with the average near 8½ inches. Width was 4 to 4¾, average, 4½; thickness, 2 to 2⅜, average 2⅜. The color varied from orange (soft) to blue-gray (very hard). Most

were common brick; a few, however, were tapered. The whole area of the kiln was floored with 1 course of brickbats. A sandy mortar was used evidently throughout the structure, with no lime being preserved. The kiln was placed on a 7-inch bed of sand. Many of the bricks were fragmentary, but an attempt at English bond was visible on the east side. The joints were $\frac{3}{8}$ of an inch.

The north wall of the kiln was the most deeply footed, having been placed on the top of the undisturbed earth from which it rose 15 inches. The wall top was approximately 2.5 feet below the surface. Charcoal and ashes stained the soil on the kiln floor.

Evidence that this structure was a pottery kiln is implicit not only in the design, with well defined firing chambers and firebox, but also in associated artifacts, found in and near the structure. These include 3 fragments of floor tiles, all with glazed top and bottom surfaces, and 1 with glaze having run down the side. Clearly these tile fragments were used as kiln props. Fifteen brown pipestems and 10 brown pipebowls were found; 2 matching pieces—a bowl and a stem—were from a pipe obviously a waster, having been overfired. It was warped in the stem and had the clean, rough aspect of an unused article. A second bowl of brown clay was decorated with a punctate figure of a deer—a familiar motif used in decoration of locally made clay pipes at Jamestown and also reported from Indian sites in Virginia (Stewart, 1954). Although shapes of bowls and diameters of stem holes in locally made pipes are not yet adequately studied to permit relating them to periods of manufacture, these 2 brown pipes correspond to second-half 17th-century white pipes in shape. The waster is possibly third quarter, the decorated bowl, fourth. By analogy, the locally made pipes are probably second half of the century, since the majority of white pipestems range in the second half.

The white-pipe evidence indicates a considerable spread of dating from the second quarter to the last. (The greatest proportion of stems fits into the 1620–50 category, and the rest, 1650–80; i.e., $\frac{8}{64}$- and $\frac{7}{64}$-inch diameters, respectively.) One white pipebowl is of the 1625–50 shape, and 3 are 1675–1700 plus. The balance of artifact evidence consists of 39 sherds of blue-on-white delftware, one piece of English white "delft," and 2 pieces of Spanish majolica. The absence of locally made pottery at the kiln itself is indicated in the records here, but there is a fair variety of lead-glazed earthenware of utility type from the lot area, including some locally made.

Conclusion: At Jamestown there were two foci of industry identified through archeological exploration. One borders Pitch and Tar Swamp to the north. It includes Structure 111, a pottery kiln and possibly a lime kiln and metal-working or smelting pit. This area also includes Structure 110, a building in which brewing, distilling, or other industry was carried on. Also bordering Pitch and Tar Swamp to the west of Structure 110 and 111 is the large brick and tile kiln, Structure 102. The second location favored for industry appears to have been the shore area between the churchyard and Orchard Run. This area includes Structure 27, under discussion; Structure 76, a probable warehouse; Structure 47 and 46, lime kilns; Structure 119, a problematical furnace building; Structure 126, a possible workshop; and Structure 127, the small brick kiln which is the earliest structure of its type at Jamestown.

The industry bordering Pitch and Tar Swamp was active in the second and third quarters of the 17th century. The industrial features lying along the James River probably range from the first to the third quarter. Structure 27 cannot be dated with certainty, but it is highly probable that it was in operation by mid-century, at least, and that it represented the type of kiln in which clay vessels were made. The presence of the probable clay pipe "waster" and a quantity of locally made clay pipes from the surrounding lot suggest strongly that clay pipes were fired here, as well. It is interesting to observe that a number of locally made clay-pipe fragments were also found around and in the small brick kiln, Structure 127, near Orchard Run. This suggests the possibility that pipes were made there, as well as at the pottery kiln, Structure 27.

The Structure 27 kiln was definitely intended for firing earthenware objects, since the glaze on the kiln props is lead in origin, and no evidence of salt-glazed stoneware or heat sufficient to make stoneware is present. In fact, it can be said confidently that no stoneware was ever made at Jamestown.

Structure 28

This structure, a trace of brick masonry wall on Lot 95:100, was encountered 8 feet 3 inches slightly south of east and extending parallel to the north wall of Structure 27, the presumed warehouse, on the 1934 shoreline.

Nothing is reported on Structure 28 in the notes of 1935 except that a portion of wall 18 inches wide was observed to extend beneath the ferry wharf approach road. For this reason it could not be explored further at that time. Unfortunately, this road was in use until January 1957, and no opportunity for further excavation of this structure has presented itself. Not even brick size is known.

A search in the collection for artifacts found above this structure fragment and in the immediate vicinity (10 feet square) has yielded a surprising amount of information concerning tobacco-pipe dating. A total of 59 white pipestem fragments shows a range from 1620 to 1680, with the major portion probably before 1650. However, of 14 white bowls, 12 were 1675–1700 plus shapes and 2 were 1650–75. Eighteen brown pipestems of local manufacture were found.

In summary we can only say at this time that the trace of masonry designated Structure 28 represents a structure which could have been an adjunct of Structure 27—perhaps even a structural part of it.

Artifacts Pertinent to Structures 26, 27, 28, and 67

The shoreline area excavated between the former wharfs in 1934–35 is principally in Lots 96:99 and 96:100. Therefore data from artifacts found within these lots, but not in or close

to structures, are of interest. (The northeast portion of Lot 96:100 containing Well 7 and Structure 60 is not included.)

The significance of tobacco pipes and other ceramic evidence from the two lots is readily apparent from the aritfact tabulation: in this location there was a definite concentration of early occupation, probably from the first quarter of the 17th century. This fact is attested by 18 white pipebowls dating from 1600 to 1625, approximately. Of the remainder of the 54 pipe bowls, 29 were late 17th century, from 1675 to 1700 plus (including 9 with no heel, but rather a rounded bottom to the bowl); 1 had a partly obliterated mark showing an "L" (probably "LE") on the bowl; and 1 had a "W" on the bowl. Thus, there was a concentration of early 17th-century cultural evidence here, as well as a second concentration of late 17th-century cultural evidence. The 156 fragments of locally made brown clay pipestems and 10 bowls, 5 punctate decorated, indicate considerable usage (perhaps manufacture of these pipes in the vicinity).

The balance of ceramic evidence is not especially significant except to bear out in a general way the inference gained from the tobacco pipes. Dutch blue-on-white delft (54 pieces) and Lisbon majolica (1 piece) are probably from the first half of the 17th century, for the most part.

English white delftware is probably from the second half of the century. Among 43 sherds, probably locally made, 1 appears to have been part of a waster. There are fewer English-made vessels represented, and only parts of two Hispanic amphora.

It would seem strange that a distinct waster pile was not discovered in the vicinity of the pottery kiln, Structure 27. It may be logical to assume that this material was accumulated aboveground, since there is no depression or made hole in which waster products could be collected. In this case, the refuse of the kiln may have been dispersed by being carried considerable distances and used for ballast or fill. To date, however, waster piles have not been identified at Jamestown and waster products are not recorded archeologically for roads or paths, whether 17th or 18th century.

In 2 drawers full of bottle glass, 4 pieces are from Dutch gin bottles, and the rest from wine bottles. Of the glass from wine bottles only one piece is recognizably third quarter. The remaining wine-bottle glass is fourth quarter 17th century or a little later.

STRUCTURE 35

Structure 35 is associated in Lot 91:111 with Ditch 14, Well 9, and Well 10. The brick masonry trace consists of a probable chimney foundation 12 feet wide of undetermined front-to-back measurement. The wing or side walls appear to be 2 feet 8½ inches wide and the main back wall is 2 feet wide, according to the record of the Civilian Conservation Corps foreman, T. C. Miller. Miller's field notes are all the data that survive for this lot, excavated in advance of constructing a field laboratory in 1935. Unfortunately, a road in use during excavation ran across the east side of this structure trace, probably above the remainder of the house, and formed the boundary of the excavation. The top of this "wall of bricks" was found 8 inches below the surface.

Miller's notes (the only written report of the excavation) continue, "The wall we are at present uncovering extends in a south by southwest direction to E 60, S 20 and at this latter end has a rounded appearance. Pipes, pieces of bottles, pottery, glass, nails, part of scissors, bones, all have been found in this area." Brickwork was 10 inches below the surface.

A search of the collection yielded three white pipebowls found here, each of which clearly represented a dating of 1620–40. White pipestems from the vicinity were all characterized by relatively large holes. The locally made brown clay pipestems were extraordinarily thick, with large holes, short, and modeled.

Also associated with Structure 35 were a spigot cock (old Cat. No. 135), miscellaneous pottery (not searched from the collection), a roofing slate, 3 roofing tile fragments, 2 floor tiles, and a Venetian glass goblet (Old Cat. No. 1771). This goblet was taken from a depth of 1 foot 7 inches to 2 feet 9 inches. It has been restored and dates in the 4th quarter of the 17th century by apparent type.

In summary, evidence is too inconclusive to permit description of Structure 35. However, we may surmise that it belongs to the early association of Wells 9, 10, and 21 in the first half of the 17th century, if we assume the goblet to be either intrusive or of earlier date. The evidence is inadequate but suggestive, and this interesting area should have a complete excavation in the future. It could well demonstrate the presence of structures contemporaneous with the early settlement near Orchard Run.

STRUCTURES 34-37, 86, 83, 84, 85, 36, AND 33, WELL 13, DITCHES 2, 3, 4, 5, 6, AND 7

(Résumé: Structures and Features of the "May-Hartwell" Tract)

J. C. Harrington has reported exhaustively upon the May-Hartwell tract area. His reports cover research, explorations, and excavaitons carried out in 1935, 1938, and 1939 by H. Summerfield Day and J. C. Harrington. These reports are models of their kind. They are limited only by lack of basic and definitive research in artifact types and dates and by deficiencies in field data gathered prior to Harrington's work. Thus, the reader is referred directly to the reports for complete data (Harrington, 1940a) (Day, 1935). Only a brief summary and comment is offered here.

Historical Data

At the end of his "Summary of Documentary Data" (p. 17) Harrington concludes:

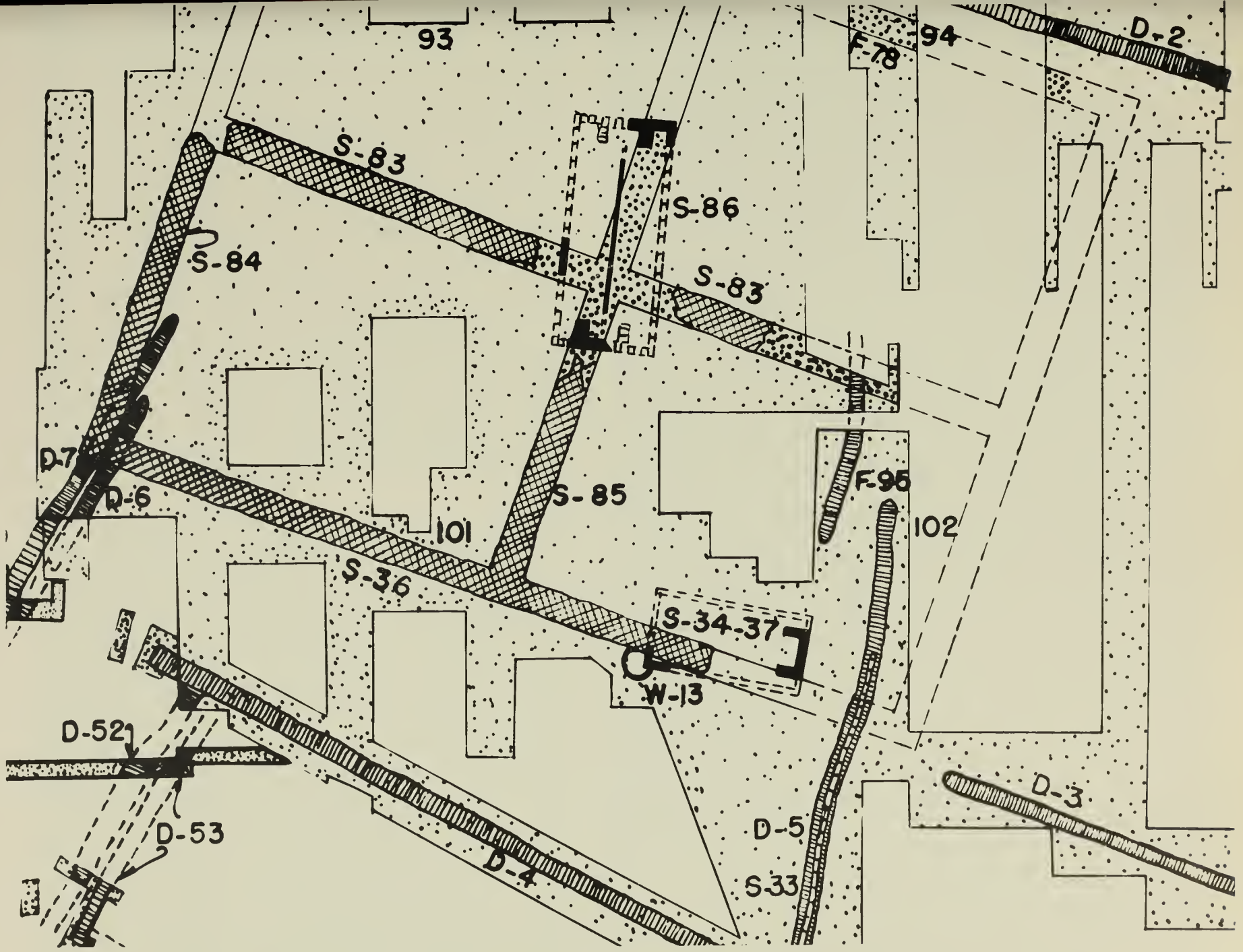


FIGURE 10—*The "May-Hartwell" Tract*

a. William May built a house, probably in 1661 or 1662, size and material not known, located . . . [approximately in Lot 94:109].

b. After Bacon's Rebellion William White rebuilt this house, or erected a new one nearby.

c. Henry Hartwell occupied the White house from 1689 until 1695.

d. The house was probably not occupied after that date, and no buildings are known to have been built there subsequently.

e. Structures are not likely to have occupied this area prior to William May's time.

Structures 36, 83, 84, 85, and Feature 2

These structures (Lots 94:110 and 95:110) denote a rectangular layout of late 18th- or early 19th-century garden walks associated with the Ambler House (see base map in pocket). (These walks are stratigraphically placed later than most post holes, the ditches, Well 13, and both Structures 34–37 and 86.) The walks average 6 to 7 feet wide. They are filled with brick rubble and are sometimes bounded by header or stretcher courses of brick. If they were paved with brick on top, the top courses have disappeared. The brick sizes range from 8 to 9⅝ inches long, 4 to 4⅞ inches wide and 1¾ to 2¾ inches thick. The average brick size is 8⅞ by 4⅜ by 2 7/16 inches. The conclusion is that the bricks are definitely salvaged from 17th-century ruins. Adhering mortar and the broken condition of the bricks substantiate this observation.

Well 13

This well underlies the southwest corner of Structure 34–37 (a single unit house erroneously given separate numbers for the west and east ends in 1935). The house and the well must be considered together. The well was found to be a simple circular hole, 5 feet in diameter, dug about 9 feet below the old ground line. Since no siding or barrel could be traced in the well, the lining must have been removed when the well was abandoned, for no such hole would have remained a week without caving in. It can be assumed that this well and all similar "earth" wells at Jamestown once had wooden sidings, if no masonry was present.

The fill of Well 13 indicated that the hole had been filled at one time by relatively clean earth, without lying open to slow accumulation. At the bottom (7 to 8 feet below the original ground surface) lay an accumulation of bricks (probably from a surface housing). Also at the bottom were several artifacts. These included a large wooden dish (probably a trencher or oblong scoop such as a baker uses for gathering flour); an earthenware jug (handle missing); fragments of two small slipware mugs; an iron brush knife; an iron bar which may have been an auger; a bone covered with blue paint; and several pieces of wood. Of these only the wooden trencher and one small slipware jug could be located in the collection at this time (1957). This small slipware mug or pitcher is an example of slip-decorated American redware, featuring wavy lines and bands of cream slip. It is probably of local manufacture and representative of the middle 18th century.

Before a thorough study had been made of the material Harrington (1940a) commented:

> Although the objects recovered were whole, or nearly so, they are of such a type that no very limited age can be assigned to them. The 3 earthenware objects might have been made any time during the 17th century, or even later. The wooden dish and the two iron objects may prove to be diagnostic of a definte period, but the writer is unable to assign a date to them. The bricks would seem to offer one of the best means of dating this well.

The bricks from the well are described as unique in shape, uniformly of a light, salmon-orange color, very soft (underfired), and with the "struck" surface, pock-marked as if by rain, before firing. The size averaged 8½ by 4⅛ by 1 13/16 inches. The thinness is the distinctive feature, almost approaching that of tile. The present writer knows of no early 17th-century analogy in brick type at Jamestown. The salmon-orange color is simply due to underfiring. In this respect, bricks of the earliest-known kiln, Structure 127, located near Orchard Run and dating in the first quarter of the 17th century, were a "fire red," except where they were unfired, near the earth wall of the pit. The size of these early bricks ranged from 8½ by 4 by 2⅛ inches to 9 by 4¼ by 2½ inches—clearly not manifesting the thin characteristic. Similarly, the salmon-colored bricks of Structure 112, while as thin as 1⅞ inches were not unusually thin. They were in the average range of 8½ by 4⅛ inches to slightly larger.

The iron brush knife is a handwrought iron specimen, excellently preserved, with a sleeve haft through which a rivet hole was made. Its dating is uncertain at this time.

The most definitive specimens from the well fill, however, are a collection of 10 white pipebowl fragments, 16 white stems and 8 locally made brown stems and 2 brown bowl fragments. The white bowls, distinctively of the heelless type, are long, of good capacity, and date from the end of the 17th century well into the first half of the 18th. Stem holes of white pipes would also appear to range in this time interval. The locally made pipes cannot be dated, as yet, but the appearance of bowls and stems does not suggest early manufacture.

Good dating evidence from the fill also comes from over 100 wine-bottle fragments. These illustrate a globular shape associated with the last quarter of the 17th century and the first quarter of the 18th. Half a dozen gin-bottle fragments were noted.

Thus, Well 13 bottom fill—probably laid down when the well was in use or shortly after abandonment—appears to be early 18th century. Most of the objects of the remainder of the fill are from the last quarter of the 17th through the first quarter of the 18th century. Therefore, it is probable that Structure 34–37, built above the well, dates no earlier than the end of the 17th century, and is probably 18th century.

Structure 34-37

This was a single house traced by an east chimney base and a southwest corner, both of brick masonry. The bricks uni-

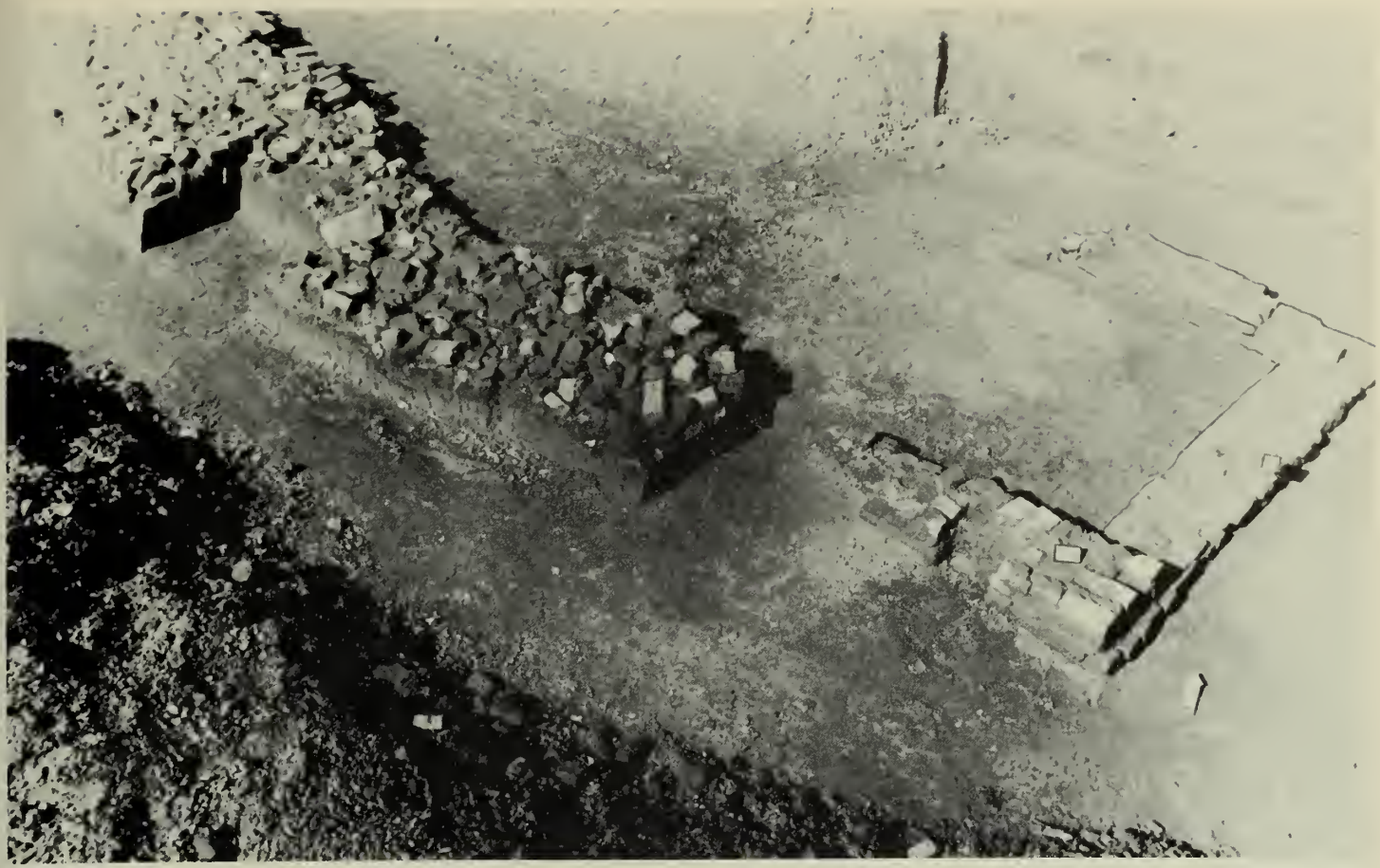


PLATE 34—*Structure 34-37*

Structure 34-37 in Lot 93:110. Structure 34 is the large fireplace foundation at the right. The remaining foundation traces of this house, originally frame on a brick footing, had been obliterated except for a small remnant (Structure 37) of the southwest corner footing preserved beneath the Ambler garden path (Structure 36). The brick rubble of this path appears upper left, but the Structure 37 remnant is not visible.

formly average 9⅛ by 4½ by 2⅜ inches. The mortar shows oyster shell content. The house was presumably frame on a light brick foundation, approximately 16 by 32 feet. Harrington observes, "Lacking artifacts definitely associated with the structure, the only means of dating it, or of reconstructing its original appearance is by stratigraphic relationship with other structures and features, and . . . by architectural evidence." However, it has since been possible to relate a wealth of artifacts listed in the catalogue of 1935 to the exact structure area on the base map.

Approximately 1,000 pipe fragments are recorded and at least half that number were observed to remain in the collection. The pipes were uniformly of the 1680–1720 period, and possibly later. Significantly, not one pipe fragment of earlier 17th-century bowl form was found. Less than ⅕ of the pipe fragments were locally made. Roofing tile fragments (not specified as to type) were numerous. The most interesting ceramic evidence lay scattered a short distance north of Structure 34–37. This consisted of fragments from an entire earthenware oven and door which has been reconstructed (now on view at the Jamestown visitor center). Two wine bottles could be reconstructed from fragments within the structure area. One is typical of the fourth quarter, the other of the third quarter of the 17th century. Three goblet fragments, one sealed, were here. At least one "HH" seal came from the area, and several nearby. Brass objects—pins, wire, turncocks, pulls, buckles, etc.—were numerous. In sum, the artifact evidence indicates that most of the refuse in the soil that covered the foundation below the sod zone was of the 1680–1720 period, and not earlier.

Structure 86

Like Structure 34–37, Structure 86 was precedent to the Ambler House garden walk of brick which originally overlay a portion of each structure. This conclusion is accepted by Harrington, who marshalls good reasons for it. Structure 86 was excavated under Harrington's direction. Meticulous notes and observations were made showing that this was a frame structure resting on shallow brick footings, approximately 47½ feet by 21 feet in overall dimensions. The central longitudinal



PLATE 35—*Structure 86 After Excavation*

Viewed from the southwest. The central (north-south) footing of masonry was presumably to help support floor sills. A fragment of the south-end chimney appears right of center. The northeast corner of the house is above and left of center. The brick walk of the Ambler garden (Structures 83 and 85) was built over Structure 86 as shown by preservation beneath the masonry remnants of Structure 86 (Lot 94:110).

footing suggested that the first floor was constructed of wooden joists. The absence of cross walls (in contrast to Structure 6) indicated that the house contained one large room on the ground floor. Two chimneys were located respectively at the gable ends, which were probably of brick. The east and west, or front and rear walls were more probably frame. No evidence of destruction by fire was observed. Bricks were within the range of 17th-century Jamestown sizes:

Length, 8¼ to 9¼ inches—average 8⅞ inches.
Width, 4 to 4⅝ inches—average 4 5/16 inches.
Thickness, 2 to 2¾ inches—average 2 7/16 inches.

The notable archeological observation in respect to Structure 86 is that its walls were preserved only beneath the garden walks. This shows that the plow *could have completely destroyed any and all evidence of prior and other* structures in the vicinity except for Structure 34–37.

Artifact notations for Structure 86 are very limited. The only stratigraphically significant (protected) level, C^b, "contained few actual artifacts with the exception of a large quantity of bottle glass." The bottles were globular and short-necked like those at Structure 34–37 and Ditch 5; i.e., last quarter 17th cenutry or a little beyond. A trace of lead cames, but no window glass; a few fragments of window tiles and slate; some delft wall tile and lath-marked plaster; a large, iron door key and very few nails are all the artifacts encountered. (No "HH" seals were found.) On frankly speculative evidence but with some confidence, Harrington concludes that Structure



PLATE 36—*Conjectural Painting of Structure 86*

Structure 86 (Lot 94:110) somewhat fancifully viewed presumably through the window of Structure 38, the "Country House," 130 feet to the northwest. Structure 86 is assumed by Harrington to have been the Hartwell House and Structure 34-37 (right, distance) to have been the Hartwell kitchen. Research by Kocher and Harrington. *Conjectural painting by Sidney E. King.*

86 was the May-Hartwell, or at least, the Hartwell House. Structure 34–37 (with the "HH" seals found nearby, mainly in Ditch 5) was the Hartwell House kitchen, if not the May House.

Ditch 5 and Structure 33

These two features, a ditch and a brick drain in the ditch, are considered concurrently. In these features lay the greatest concentration of artifact material from any one location at Jamestown Island. Certainly most of it is directly attributable to Structure 34–37, where comparable material lay scattered. The most significant and most numerous of the identifiable ceramic pieces, whole and fragmentary, are sgraffito, or yellow, lead-glazed earthenware of the same paste and slip, without scratched decoration. At the present writing (1957) sgraffito from the Barnstaple area is thought to represent the interval, 1640–60. If this dating is correct, it would seem supported by the presence also of items derived from delftware, such as probable Bristol, 1650–1700; Lambeth (pre-1680 and perhaps as far back as 1600); a gin bottle; two wine bottles from the third quarter of the 17th century; and a Venetian wine goblet of about 1675. All this evidence may indicate that structural features earlier than Well 13, Structure 34–37, and Structure 86 once existed in the Lot 93:110 vicinity. In this vicinity they could have been destroyed by the Ambler garden development. But there is a notable lack of evidence that this tract was occupied during the first half of the 17th century—certainly not in the first quarter.

The obvious conclusion from the evidence from Ditch 5 and Structure 33 is that the ditch and the drain were constructed about mid-17th century and later filled with trash chiefly representing the fourth quarter of the 17th and first quarter of the 18th century. The dating coincides very well with the Hartwell occupancy (1689–95) in the vicinity, perhaps in Struc-

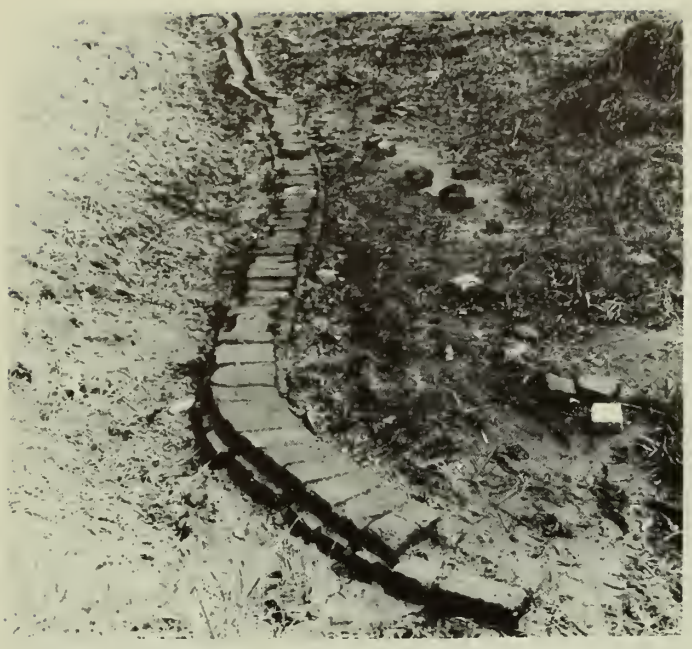


PLATE 37—*Structure 33 Brick Drain*

Brick drain, Structure 33, looking north. This drain lies in Ditch 5 and ends opposite the east wall of Structure 34-37, and appears to be in the Hartwell Tract. In this ditch and above the drain were found many artifacts, notably the major portion of the sgraffito whole vessels in the Jamestown collection (Lot 93:110).



PLATE 38—*Baking Oven*

This oven (J-7777) was restored from fragments found scattered over an area north of Structure 34-37 in the presumed tract of Henry Hartwell, supporting other evidence that this building was a kitchen.

ture 34–37 itself. However such an early dating could be disputed by what appears to be an early 18th-century American redware pitcher discovered in the bottom of precedent Well 13. It may be necessary to consider the dating of this object again, closely. The mass of detritus in Ditch 5 easily points to Structure 34–37 as a kitchen, *and suggests this ditch no longer marked a boundary.* But the identity of Structure 86 as Hartwell's house will probably remain, as it has been, a reasonable hunch.

Ditches 6 and 7

Nothing diagnostic is recorded for Ditch 6. Curiously enough, no pipe fragments could be located in the collection to cast light on the dating of the fill of Ditch 7, although 19 such fragments are recorded. However, window glass, a goblet fragment, some glass and tile fragments, undescribed, are recorded. A possible fragment of a brass pricket candlestick (old Cat. No. 3135) is also reported.

Ditches 2 and 3

These ditches extend parallel to each other eastward from the Hartwell tract toward Orchard Run. Ditch 2 makes a somewhat puzzling V-shaped projection southward at 91:116, but its relationship to property tracts here is uncertain. The final and indefinite course of Ditch 2 is northward. Ditch 3 was traced almost to Orchard Run, where contours at the edge of the run suggest that here may have been an early crossing of this marshy ground, corresponding to the crossing by an historic road, intact here to 1956.

Of Ditch 2 artifacts, nothing definitive is recorded, except for a salt-glazed, brown-mottled stoneware jug (Cat. No. J-7529) of the late 17th century.

Oven Evidence

One complete oven of coarse, gravel-tempered earthenware (Bideford?) was found in the vicinity of Structures 34–37, mostly within 50 feet north, in Lot 101. The complete door was also here.

A door-handle fragment to such an oven was found in Lot 93 to the north and west, and of the same earthenware.

A piece of oven, represented by a large sherd of this same ware was found in Lot 63.

Another fragment of door handle to such an oven was found in Lot 35.

STRUCTURES 31, 38, 44–53–138, 58, AND 65

The entire complex of structures in the vicinity of Structure 31 must be considered together in order to understand their possible relationship (see Figure 12). First the 18th- and 19th-century Ambler structures must be grouped and separated—these are: Structures 30, 99, 32 (all parts of the east wing of the Ambler mansion); and Structures 73, 59, and 54, all oriented approximately the same as Structure 30 and lying to the north where they probably served as outbuildings. These structures associated with the Ambler House are discussed in a separate section (pp. 28–31)

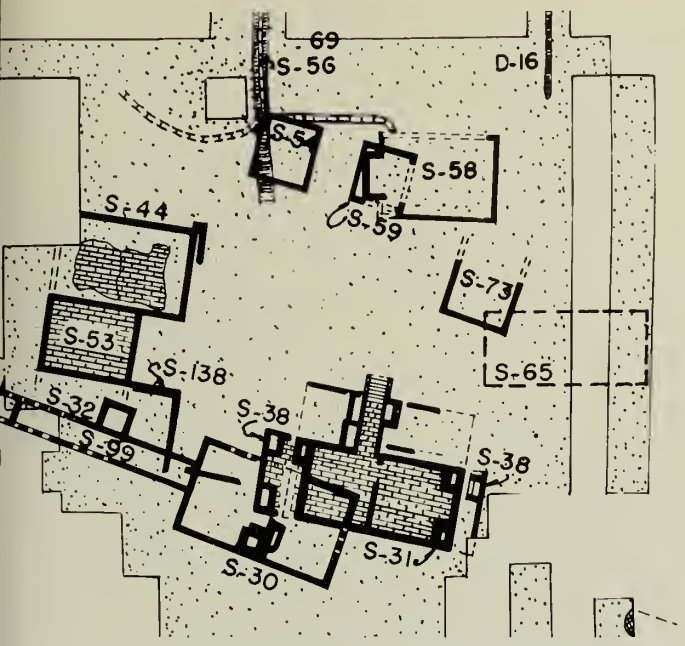


FIGURE 11—*Area in Vicinity of the Ambler House*

The area north of Structures 31 and 38 was explored only superficially in 1935 and backfilled before the foundations could be completely uncovered and recorded.

Structure 31 must be regarded as subsequent to and within the east and west ends of Structure 38. Structure 31 is overlain in turn by the frame east wing of the Ambler House—the last, fortunately, having no cellar. Whether or not the earliest of these 3 structures—No. 38—had a cellar is not evident; but if it had one, it was usurped by the cellar of Structure 31. Structure 38 appears to have been 53 feet by 20 feet. Structure 31 was 43 feet 9 inches by 20 feet and at an unknown period was extended some 12 feet north of the north wall of Structure 38. The fate of Structure 38 is not evident, but observations made at the time of the excavations formed the conclusion that Structure 31 did not burn.

The relationship of Structures 31 and 38 to the nearby 17th-century structure (44–53–138) to the northwest is interesting. This 17th-century structure is designated Structure 44 (north wing), Structure 53 (center), and Structure 138 (south wing). It was a large house with two wings situated on either side of a central square room. The central juncture was built above a 6-foot, brick-paved cellar. This 3-part house was situated at right angles to Structure 38 and 20 feet west, extending 40 feet to the north. Unfortunately, the excavation of this important structure was not completed and data remain fragmentary. Although lots 68 and 69 on the old grid encompassing this entire area were extensively excavated in 1935, Ditch 1 could not be traced south of Structure 44. Had this significant ditch extended farther south it would have divided Structure 44–53–138 from Structure 31–38 and could possibly have intercepted the latter at the west end. Since it did not, there must have been a jog in the original west boundary of the Country House tract and in the subsequent Knowles and Sherwood tracts, to accommodate Structures 31 and 38.

Forman confidently assumes that Structure 38 was "The Country House" of the Governor between 1619 and 1669, and that Structure 31 was William Sherwood's house recorded on the Ambler plat of 1680. Forman identifies Structure 44–53–138 as the house of Colonel Walter Chiles, Sr., or his son Walter, who erected a brick house prior to 1671 (Forman, 1938, pp. 120–127). One thing is certain. This interesting house unit was a structure of considerable importance since a large number of quality artifacts were found in the excavations above the brick flooring and about the side walls. Among these artifacts were a seal-top spoon handle and latten spoon handle of brass, a brass candle snuffer, thimbles of bronze, and a glass goblet. Also a large quantity of ornamental plaster appears in the collection from these foundations.

Of particular significance is an "RW" bottle seal found in the Structure 44 foundation which has been identified as from the same die as an "RW" seal from a building burned by the London Fire of 1666. (Identification is by Ivor Noel Hume, glass specialist, archeologist and formerly of Guildhall Museum, London). In Hatch's citation of "An Unidentified Structure" in the Wyatt tract at Jamestown, which may have been bounded on the east by Ditch 1, he writes the following (Hatch, 1940, p. 57):

> When William Sherwood sold one half acre of the Wyatt tract to John Harris on May 11, 1696 for £35 sterling it included "one dwelling house in & upon ye same erected wth a brick chimney . . ." A further statement "late in ye occupation of Mr Secretary Wormley" points out that the building had been in use before 1696 and was used by Ralph Wormley, secretary of state for the colony . . .
>
> [A related footnote follows:] Could this house with a brick chimney mean a frame house with a brick chimney? One comment on the burning of Jamestown during Bacon's Rebellion stated that "The Towne consisted of 12 new brick Houses besides a considerable number of Frame houses with brick Chimneys . . ."
>
> Ralph Wormley, son of Ralph Wormley, burgess and councilor, was born about 1650. Educated in England he returned to spend the rest of his life in Virginia. In 1674 he was a member of the House of Burgesses, in 1677 received appointment to the council, and in 1693 became secretary of the state for the colony and president of the council. "His home, *Rosegill* (on the Rappahannock River in Middlesex County), was for many years the centre of a lavish hospitality, and from him descended a long line of men who stood at the forefront of the economic, social, and political life of the Commonwealth."

Structure 58, probably a frame structure on a slight brick footing, was oriented with Structure 31 and is probably a 17th-century dependency. Structure 65 was a brick kiln, and very probably was related to the building of Structure 31 near which it lies and with which it is oriented.

Structure 133 is an 18th- or 19th-century superficial brick pavement, probably the remnant of a small subsidiary building of the Ambler establishment.

Observations on Structure 31 by archeologist H. Summer-

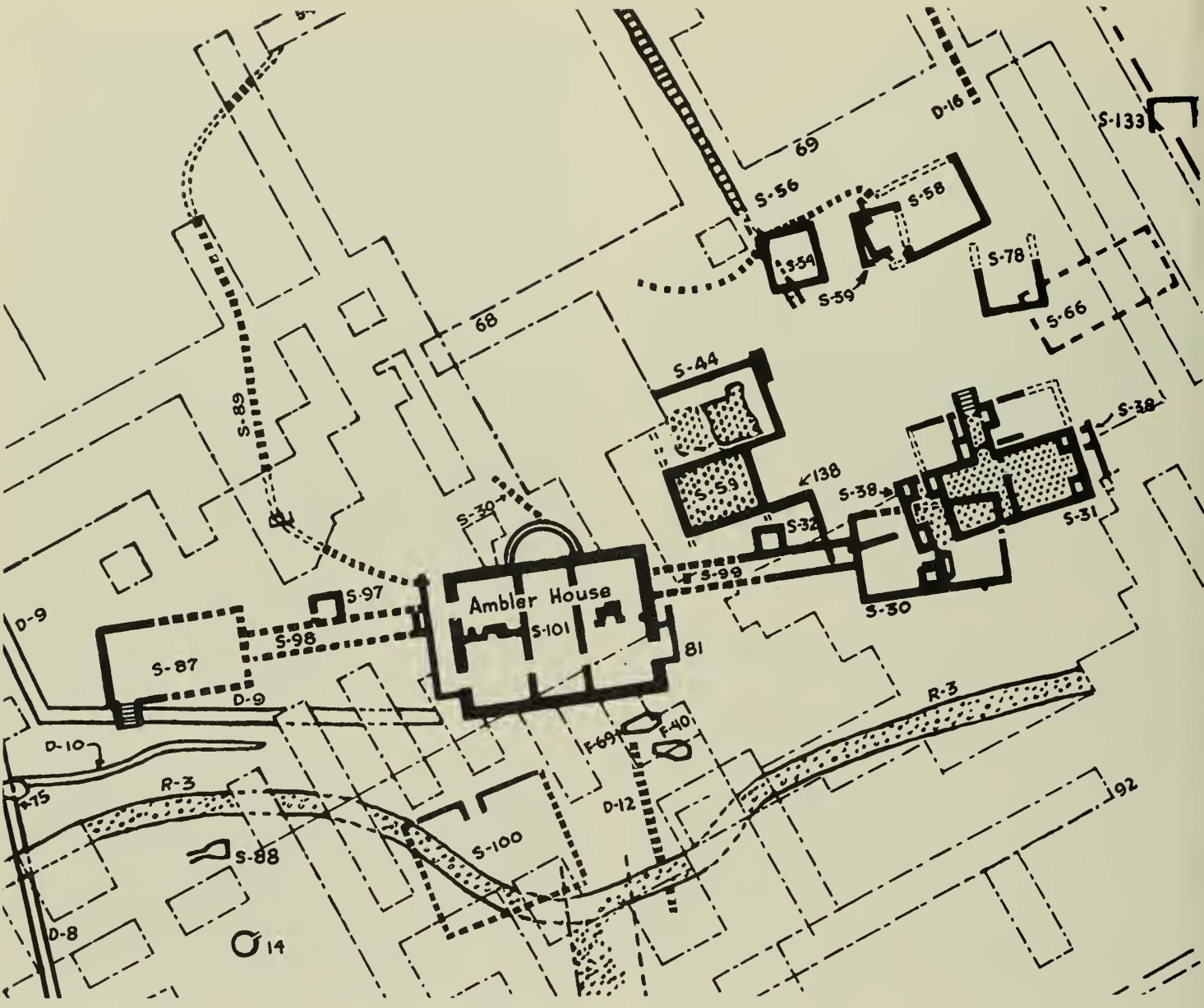


FIGURE 12—*Plan of Structures East of the Ambler House*

field Day (Day, 1935)* are as follows: The thick walls (1 foot 6 inches) presumably support brick walls above ground. The building had a fireplace certainly at the east end, and probably a second one at the west end, although evidence of the latter had been partially destroyed by removal of that section to make way for a wall footing for Structure 30. A brick partition wall divided the basement into two almost equal-size rooms connected by a doorway. On the north side of the west room, a stairway led from the outside. The floor

* In his report, Day does not mention that Henry Chandlee Forman worked at this excavation. Forman in his *Jamestown and St. Mary's* (p. 118, footnote) states that he identified "Sherwood's House" (Structure 31) as "The Governor's residence," and that he "began excavations there May 15, 1935." He does not mention Day.

Upper.—Cellar foundation walls (Structure 31) from the east. Wall footings of Structure 38 extend beyond each end. The L-shaped wall intrusion in the southwest corner, and the walls at upper left of photograph, are part of the east wing of the Ambler House, Structure 30.

Lower.—Structure 31—the substantial foundation of a brick house—had a cellar paved with brick laid in a "herringbone" pattern. A great number of pieces of ornamental plaster were found in this cellar. This view, from the west, shows in the foreground traces of Structure 38, the presumed west end of an earlier house whose east end may be seen just beyond the cellar wall. An extension of Structure 31 to the north, probably frame, may be traced in a superficial footing at the left. If Structure 38 is not merely an extension or addition to Structure 31, it may be the "Country House." (The L-shaped wall intruding into the cellar is the east wing of the Ambler House, Structure 30.)

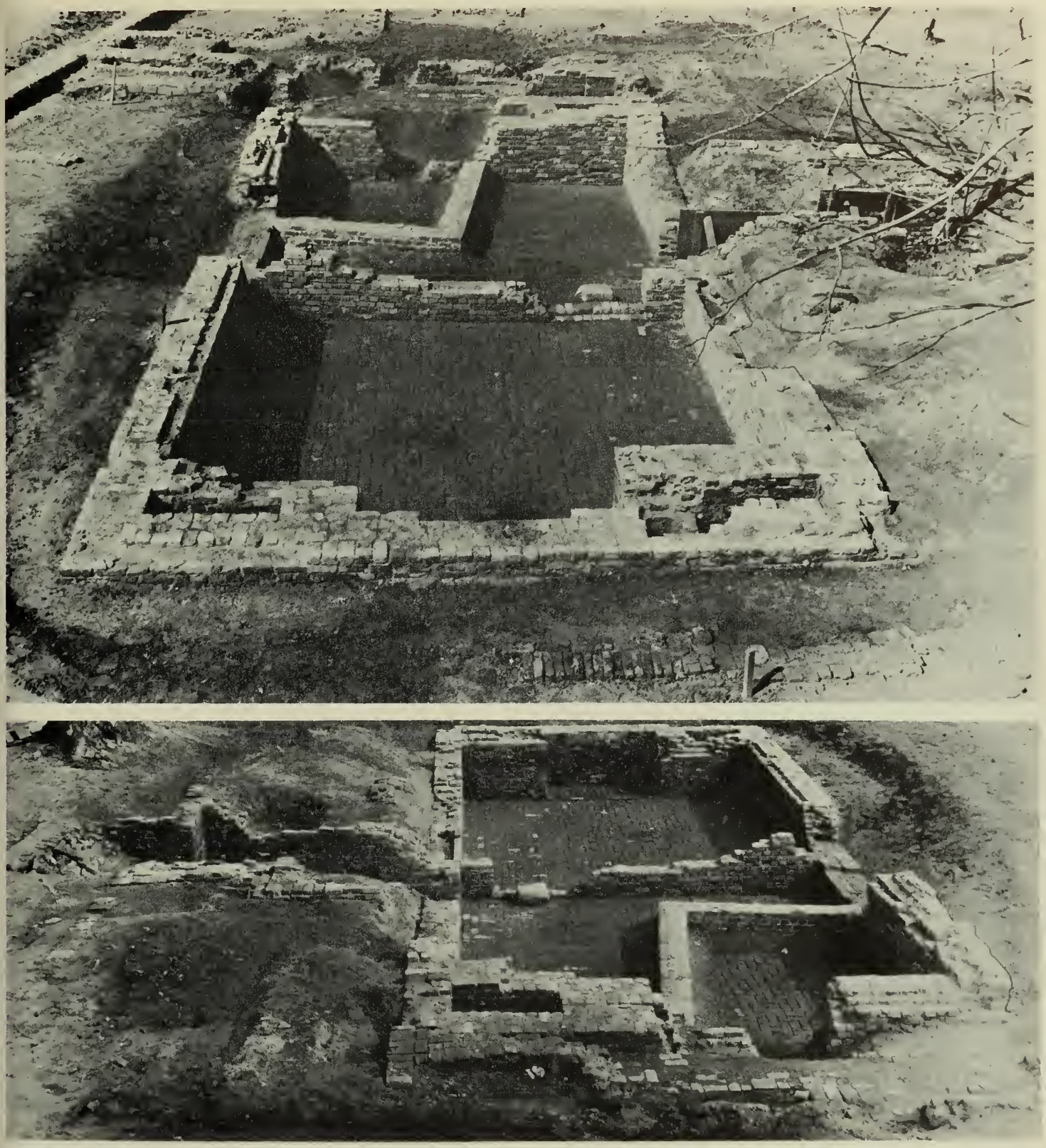


PLATE 39—*Structures 30, 31, and 38*

Upper.—Cellar foundation walls (Structure 31) from the east wall footings of Structure 38 extending beyond each end. The L-shaped wall intrusion in the southwest corner, and the walls at upper left of photograph, are part of the east wing of the Ambler House, Structure 30.

Lower.—Structure 31—the substantial foundation of a brick house—had a cellar paved with brick laid in a "herringbone" pattern. Approximately 50,000 pieces of ornamental plaster were found in this cellar. This view, from the west, shows in the foreground traces of Structure 38, the presumed west end of an earlier house whose east end may be seen just beyond the cellar wall. An extension of Structure 31 to the north, probably frame, may be traced in a superficial footing at the left. If Structure 38 is not merely an extension or addition to Structure 31, it may be the "Country House." (The L-shaped wall intruding into the cellar is the east wing of the Ambler House, Structure 30.)



PLATE 40—*Conjectural Reconstruction of Structure 38*

This structure (Lot 95:109-96:109) has been considered possibly to represent the "Country House," or Governor's residence. Research by Kocher and Forman. *Painting by Sidney E. King.*

of the cellar was paved with brick laid in a herringbone pattern.

Within the basement the fill consisted of a large quantity of brick, tile, and roofing slate intermingled with the dirt, indicating that the walls were brick and that the roof was of tile with some slate. There was no evidence in the basement fill and the surrounding area that Structure 31 was destroyed by fire. The assumption is that it was probably abandoned and fell into ruin from disuse. The brick chimney of the east wall had fallen into the cellar and lay partially intact so that the use of common bonding could be observed. The brick averaged 8¾ by 4¼ by 2½–2⅜ inches (Forman, 1938, p. 121).

Forman relates that "more than fifty thousand" fragments of plaster were removed from the fill of Structure 31 (Forman, 1938, p. 121). Both Forman and Day observed that most of it was flat wall plaster laid directly against brick, the balance being fragments of ornamental plaster or pargetry. Some of the ornamental plaster is a molding that served as a decorative trim around a panel or as a cove molding in the ceiling. Certain pieces appear to have leaves from part of a floral design. Forman noted the motifs of the garter and the rosette and also a hand and book, and believed that the Royal British coat of arms was represented in pargetry, the last *VI* and *Y* suggested motto *Honi soit qvi mal y pense.*

Day mentions that "Practically no artifacts have been recovered from this or the associated foundations." This led Day to assume that the building was deserted before it was destroyed (Day, 1935, pp. 23–24). However, the artifacts listed in the catalogue as having been found here are numerous and significant.

Structure 31 Artifacts

CLAY PIPES. The "Country House" area collection of clay pipes from all depths and from the general site generally indicates dating in the second half of the 17th century. The majority of pipebowls and pipestems pertain to the last quarter of the 17th century and the first quarter of the 18th century. Many of the 1680–1720 clay pipebowls are without heels.

Only a few white bowls are earlier than the third quarter and only two bowls are recognizable as second quarter of the 17th century. About a quarter of the bowls and stems were reddish and orange clay, and of local manufacture. Most of these locally made pipes are made with a mold, and one has the initials "RR" stamped on the heel. There are at least eight early 19th century decorated bowls and partial stems, forming the familiar L-shape. White bowl initials, on the heels, are "RT"; "EL" (1675–1700 bowl type); "TS"; and an indeterminate example which appears to be "PG." The pipebowl and pipestem fragments upon which these general observations have been made, and which pertain to the general Structure 31 site, total between 400 and 500 fragments.

Clay pipes selected exclusively from detritus below the fallen east chimney of Structure 31 and in the lowest portion of the fill of the cellar are uniform in dating. They clearly indicate that Structure 31 was in use well into the 18th century, quite possibly into the last half.

Glass. After clay pipes, the next most reliable criterion of age relating to the last occupation of Structure 31 is glass, particularly wine bottles, located in the cellar fill. From what must have been originally a larger number of glass specimens, 5 fragments of wine bottles were late 17th to early 18th century, 13 were late 18th century, and 70 were indeterminate small fragments. Ten window-glass fragments were preserved from this fill. Several miscellaneous fragments of pressed glass found in the Structure 31 fill are early 19th century, or at the least, late 18th.

Plaster. According to Forman (1938, p. 121) more than 50,000 pieces of oyster shell plaster were collected from the cellar of Structure 31. Excavation records bear out the evidence that a large quantity of this material was found, and that a considerable number of the pieces were ornamental in nature (pargetry). The implications derived by Forman from the pargetry have already been noted. However, it is certainly obvious from the archeological record and from Forman's own comments that the pargetry and plain plaster (laid on both wood and brick surfaces) belonged to Structure 31. Forman and later interpreters at Colonial National Historical Park refer to this structure as "Sherwood's House" on the assumption that it was the structure built by 1680 on the ruins of the "Country House." Therefore, the plaster cannot belong to the "Country House," which would be Structure 38, on which Structure 31 intrudes. So the question of whether or not the pargetry graced the original residence of the Governor need not be raised—it was definitely in the later, intrusive Structure 31.

Brick and Tile. The brick of the fallen east chimney of Structure 31 is recorded by Forman as averaging 8¾ by 4¼ by 2½ to 2⅜ inches. This description could not be checked from the collection since time (1957) does not allow all brick samples to be located and verified with the catalog. However, 3 random samples were located and checked, the range of which was from 9 by 4½ by 2¼ to 8 by 4 by 2. These bricks were fired well to medium, and one was a glazed header. Undoubtedly, they are locally made, possibly in a nearby kiln, Structure 65, a large brick kiln incompletely excavated and recorded, which lies only 20 feet northeast of Structure 31.

Earthenware, Including Dutch Tile. From the fill of Structure 31 a fair sampling of earthenware was checked. This indicated that lead-glazed utility earthenware, both local and imported, was present. However, the definitive ware was delft, which included both Dutch and English, and ranged in the late 17th century into the 18th century. Some Dutch tile was observed.

Metals. Objects of brass were most numerous in Structure 31 fill, including thimbles, buckles and buttons, a candle snuffer rings or grommets, a tack, spur, and miscellaneous unidentified fragments in the vicinity. From the lower portion of the fill came a brass spigot, a latten spoon bowl, a candlestick fragment, a skillet fragment, a chafing dish, a clock wheel, a tack, and miscellaneous fragments. These objects bespeak 18th-century usage, and, for the most part, 18th-century manufacture, although some may be earlier.

Objects of Iron. Iron objects recovered from Structure 31 and vicinity merit close and detailed study. At this writing, the objects which have been catalogued after preparation have not been related to structures on the base map. However, one item of significance, an andiron, is readily identified as having been recovered from a depth of 3 feet in the fill. This is of English make, a 17th-century type, probably about 1650, and is decorated with a cherub's head.

Artifacts of Structure 44–53–138

Although Structure 44, the north wing, is represented in the scanty field notes as having had a brick floor, presumably that of a cellar, the artifacts recorded from this area in the catalogue come from depths of less than 2 feet from the surface. Water-table brick is well represented by 42 pieces. Unfortunately, of 400 pieces of miscellaneous pottery listed in the catalogue for Structure 44, nothing could be located in the collection. Nor were 300 additional pieces of miscellaneous pottery available. Pipe fragments which could be found in the collection are only about a quarter of those listed in the catalogue. One white bowl dated from 1680 to 1720. A distinctive floral relief pattern decorated two fragments of white stems. Metal objects in the north wing included a brass button and buckle, a candle snuffer, a seal-top spoon handle, an andiron fragment, and 4 tacks, all brass. Some 55 pieces of ornamental plaster from Structure 44 indicate that the focus of use for pargetry was not here but rather in the south wing and center where 965 pieces were found (unless all was derived by scattering from Structure 31). The significance of the "RW" bottle seal has been cited above.

Structure 53, the central connecting portion of the three-part structure, was a deep central cellar from which only a few artifacts are recorded. Eight pieces of roofing tile may suggest a roof type. (A field photograph, No. 3132, shows sections

of masonry wall collapsed into the cellar—all English bond.) Three white pipebowls date from 1675 to 1700 and 1 from about 1750. Of the wine-bottle fragments recorded at a depth of 4 to 5 feet (close to the cellar brick floor), at least a dozen bottles are represented which date from the early 18th century into early 19th century. Here was the best evidence that the structure site was accumulating 18th-century refuse well through that century, probably mostly Ambler House trash scattered above in the fill that covered the precedent triple structure. Little metal was recorded for Structure 53; however, one candle snuffer was noted with the initials "PF."

Structure 138 is sufficiently known only to identify it as a wing of a three-part structure. For this area the catalogue yielded only a few significant types of artifacts. A fragment of cutglass goblet and 2 pieces of enameled glass obviously belong to Ambler House occupation long after the close of the 17th century. However, a large quantity of pargetry—674 pieces—was recorded, and enough could be located in the collection to corroborate this evidence. This would seem a large representation of ornamental plaster to have all come fortuitously from Structure 31 cellar where a vast quantity of this material was found, but since Structure 31 is only 40 feet to the east of Structure 138 and 50,000 pieces of pargetry were allegedly found in the former, derivation from Structure 31 wreckage is not impossible. The only other evidence of importance from Structure 138–44 area consists of 72 white pipestems suggesting datings from 1625 through 1750— obviously a mixture, attested by the depth from which it comes (surface to 1 foot). However, 3 white pipebowls in this collection represent a dating of 1620 to 1650. A brown pipebowl and 7 brown stems suggest dating in the first half of the 17th century. Thus, it appears that the Structure 138 wing originated in, or at least overlay, an occupation dating from the first half of the 17th century, although its use may have lasted until the Ambler House was built.

In summary it may be said that Structure 44–53–138 logically must have been destroyed by the time the encroaching Ambler House main unit was constructed in the first quarter of the 18th century. Debris from the first half of the 18th century would logically have been deposited in the fill which directly overlay the ruins of the older structure. Due to lack of adequate excavation and observation, the building date of Structure 44–53–138 cannot be determined, although artifacts from the first half of the 17th century are mixed in the general fill above this ruin. The probability is that Structure 44–53–138 was standing in the second half of the 17th century.

Artifacts of Structures 58 and 65

Structure 58 is recorded only by a 1/8-inch scale plan which indicates a frame structure approximately 30 feet long east-west by 20 feet wide, resting upon a brick foundation 13 inches thick. At the west end was a brick chimney foundation 11½ feet wide by 6 feet deep (outside measurements), with walls 18½ inches thick. The interior depth, front to back, was 4 feet 5 inches; width, 8 feet 4 inches. There was no basement.

Artifacts associated by catalogue reference to the location of Structure 58 were all from necessarily superficial deposits and, therefore, inconclusive as evidence to be used in dating. Sixty-nine fragments of roofing tile (not specified as to type in the catalogue) indicated that the roof was probably of tile. Of approximately 400 fragments of pottery described in the catalogue as "miscellaneous," scarcely a representative sampling could be located. However, 6 white pipebowls from the fill above Structure 58 dated 1680 to 1720, and since no earlier material was observed here, the inference is that the structure probably dates in the last half of the 17th century, possibly into the 18th. It may have served as an auxiliary structure to Structure 38, 31, or 44–58–138. However, the presence at this house site of a lead came and 100 pieces of window glass (an additional 50 nearby) would indicate that it was of some importance. Also associated were 96 pieces of pargetry, so that Structure 58 may have been a distinct, unrelated residence.

No artifacts associated with Structure 65, the brick kiln, could be located. However, it may be significant that two fragments of a definite brown clay pipestem "waster," (old Cat. No. 7279) covered with glaze drippings, were found near Ditch 16, 60 feet to the north. This bit of evidence supports indications that pipes were fired in local kilns (see Structures 27 and 127 artifacts).

Artifacts of Related Structures 59, 73, and 54

So far as artifacts are concerned, Structure 59, a small (14 by 14 feet) square building, probably frame on a brick foundation (comparable to Structure 54) cannot be separated from the older Structure 58, which it partially overlies. Archeological data could do no more than show that a considerable quantity of roofing tile, possibly indicating the roof type, was located in the area of both structures. Six white pipebowls of 1680–1720, 100 window fragments, thimbles, buttons, and spoon parts also indicate this dating for the superficial fill. The assumption that Structures 59 and 54 are related to the later Ambler complex is based entirely upon orientation. No artifact evidence can be offered from investigation thus far made.

Structure 73 evidence is difficult to assess with respect to artifacts, provenience, and significance. The artifacts from this area are, principally on the basis of 10 pipebowl fragments, related to the period 1680–1720. A relatively large amount of roofing tile and ornamental plaster may be due to proximity of Structure 31, rather than to the use of these materials in Structure 73. (Ornamental plaster was also associated with Structures 58 and 59 to the north.) However, were Structure 73 a late 18th- or early 19th-century structure, we should expect to find a quantity of refuse so dated from the area. This is not the case.

The relationship of Structure 73 to the brick kiln, Structure 65, at least is clear. Structure 73 is intrusive above the northwest corner of the kiln. If Structure 73 had been longer than

wide—it is 18 feet on the one measurable side to the south—it would have intruded upon Structure 58. However, since it does not, the best guess is that Structure 73 was probably a square structure, without a fireplace. The artifacts do not suggest a use.

It is most probable that the drain from Structure 54 is actually the undesignated brick drain extending 30 feet westward from the northwest corner, and that Drain 56 made a right-angle turn from Ditch 1 eastward and proceeded to Structure 58, more likely a 17th-century structure. The bricks from the foundations of both Structure 54 and 59 are not described in the archeological plat of Lot B–69 dated December 9, 1935. Even so, it is reasonable to assign them both, in default of conclusive evidence, to such uses as a washhouse, milkhouse, or smokehouse, probably connected with the Ambler establishment. (Structure 54 plat shows an apparent rectangular floor recess bordered with brick, although the brick does not extend over the entire floor. The whole structure was square, 16 by 16 feet.)

Structure 54 artifacts are limited to 6 white pipestems which indicate from their apertures that they probably belong to the first quarter of the 18th century. The drain (Structure 56) led from Structure 54 and extended northward in Ditch 1. Unfortunately, artifacts from this drain and from Ditch 1 are difficult to locate in the collection, if they have been preserved. However, inspection of the items in the catalogue identified from Ditch 1 and the drain show that one "GL" bottle seal and one "HH" bottle seal came, respectively, from these features. In addition, 2 goblet fragments also came from each of the features. Such evidence suggests late 17th-early 18th century dating, at least for the refuse with which the ditch and drain areas were filled. This, of course, does not date the two features this early. The fill could easily contain artifacts far earlier than the date of use for drain and ditch.

STRUCTURE 39

Structure 39 is a brick drain (Lots 94:103 and 95:103). It was found in 1935, 1.2 to 2 feet below the 1935 surface. The drain extended from just east of Structure 16 in a southwesterly direction across Structure 40–72; across Structure 20, a brick walk; and across Structure 21, a frame house, to the bank of the James River. The drain cut across all of those structures and is therefore subsequent to them. The ditch in which the drain lay was 3 feet wide at the plowline and 2 feet deep below the modern surface. In 1955 the drain was found to end a few feet south of the N–9600 line.

The bricks of the drain are arranged with a line of headers at the bottom of the ditch, the sides ranged as stringers on edge slightly projecting below the base course to leave an opening of 5 inches on the interior. Another line of headers tops the drain.

It can only be supposed that this drain, the bricks for which average 8½ by 4 by 2⅜ inches, was built in the 18th century,



PLATE 41—*Structure 39 Brick Drain*

Detail of drain, cutting through the floor of Structure 21 in Lot 94:103. This drain also interrupts Structure 40-72 to the north. The origin of the drain has not been found in any tests to date, but may indicate a structure north of Structure 121 brick walkway.

probably out of salvaged materials. There is a record of plaster on the sides of some bricks and they have been laid so that the softest (yellowish) bricks are on the base course and the harder bricks (red to purple) are at the sides and on top.

STRUCTURE 40–72

Structure 40–72 is a single unit in Lot 95:103 composed of a cellar lined and floored with brick. It had a stairway to the west and a fireplace based on the top of the undisturbed earth

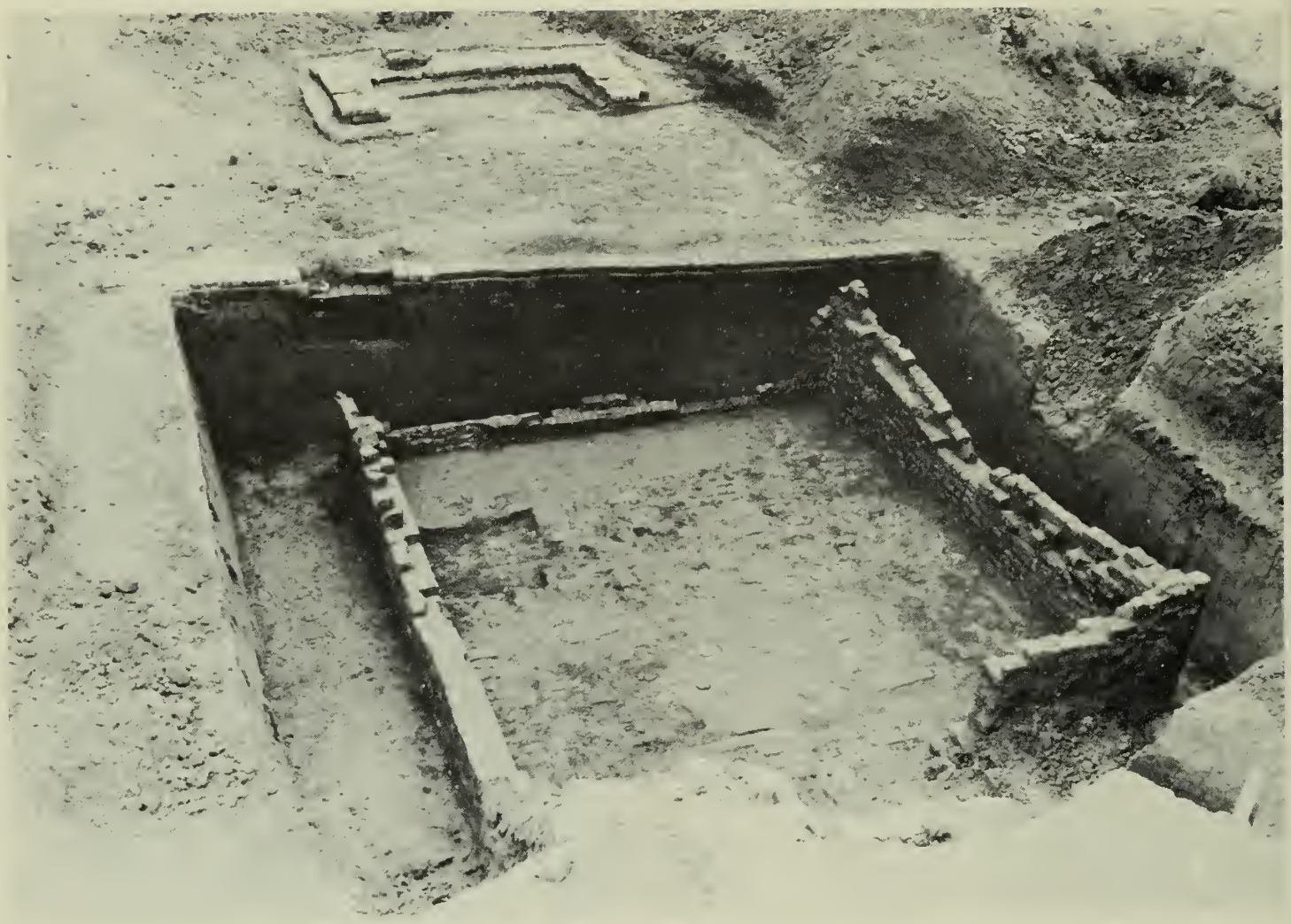


PLATE 42—*Structure 40-72*

Structure 40-72 looking east at Structure 72—a brick-paved cellar with cellar steps on the west (lower right). Beyond (center above) is the subsequent brick drain, Structure 39, which crosses from northeast to southwest, and (top) the chimney foundation (Structure 40) originally at the east end of the single frame house known as Structure 40-72. No brick footings for the walls were found except those of the cellar. (See Lot 95:103.)

which lies directly east of the cellar. The fireplace has been designated Structure 40, and the cellar is 72. The two halves of this single structure are divided by Structure 39, which is a brick drain above the east wall of the cellar. This drain extends from slightly south of the N–9600 line to the river, a little less than 160 feet. It crosses Structures 20 and 21 at the river's edge. The drain is subsequent to all of these structures.

The cellar, Structure 72, measures 14 feet 8½ inches east-west and 13 feet 2¾ inches north-south. It has a brick pavement slightly more than 5 feet below the 1935 surface and 3½ feet below the highest remaining wall remnant. The 1935 surface was 10 feet above mean low tide. The walls were of English bond but included many brickbats. On the north, west, and south, they averaged 9½ inches thick, but they were only the width of a single brick, or slightly more than 4 inches. This indicated that the east wall was not structural. Hence, the building included Structure 40 beyond. All cellar walls were surfaced with $\frac{3}{16}$ of an inch plaster. A brick-lined well-box was sunk into the floor against the north wall. This box, possibly a wine cellar, was slightly over a foot deep and 20½ by 24½ inches, inside dimensions. Fragments of 8 wine bottles all indicative of the last quarter of the 17th century; a white pipebowl and stem partly intact dating from 1700 to 1720; 3 pipestem fragments, 2 of which are $\frac{5}{64}$ and one $\frac{6}{64}$ (1670–1720); and 2 shoe buckles of iron, all came from the brick-lined box. The excavators believed that bricks fallen from the wall above had broken the bottles. Streaks of charcoal indicated a wood cover. This well fill most accurately dates the terminal occupation of this structure.



PLATE 43—*Cooling Pit in Structure 72*

Detail of a vault or wine cellar, sunk in the brick floor of the cellar. This vault measures 24 inches square by 12 inches deep, and is similar to other wine storage or cooling pits at Jamestown such as in the floors of Structures 1, 123, and 125.

The stairway shows evidence of 5 steps and was 4 feet 6 inches, inside width, with recesses in the side walls for wooden treads. The bricks of the steps were laid up in yellow sand, when excavated, and at that time it appeared that no mortar had been used. (It is possible in some cases at Jamestown that almost all lime has leached out of the poorer mixtures of sandy mortar.) However, a large area of white plaster covered the third step, and a conglomerate deposit of clay loam, tiny fragments of brick, and oyster shell may have been a kind of mortar used to patch the stairs.

Artifact evidence beneath the center of the stairs includes 3 white tobacco pipestem fragments, all $\frac{6}{64}$ of an inch in hole diameter, which suggests a dating around 1700. Three wine-bottle fragments of indeterminate character at least bespeak the last half of the 17th century and possibly the first quarter of the 18th. A fragmentary iron window casement lay on the bottom step.

Artifacts for the remainder of the cellar are recorded from the top half and bottom half of the fill, and certain objects are recorded from the floor level. However, all indicate in general the last quarter of the 17th century and the first quarter of the 18th century. White tobacco stems range from $\frac{4}{64}$ to $\frac{8}{64}$ in hole diameter, giving a range of 1670 to 1720. Of 45 pottery sherds recorded, only 1 piece of salt-glazed stoneware and 1 English lead-glazed, light-colored earthenware sherd could be identified from the collection at this time. Wine-bottle fragments in the fill total 450. All of these represent a range in shape from late 17th into the first quarter of the 18th century. Bodies were globular, but not excessively so, and the necks were of moderate length. Split lath-marked plaster fragments indicated plastered walls above, and 76 pieces of pargetry are mentioned in the catalogue, although these were evidently not preserved and now cannot be located. The presence of 100 flat roofing tiles suggests definitely a tile roof to this structure. Yet some of the tiles have mortar adhering and it is probable that the practice of using flat tiles for leveling masonry courses was followed. One floor tile and three Dutch tiles in the fill may be chance inclusions.

For Structure 40, we may assume definitely that this fireplace foundation formed most of the east end of the house unit represented by Structure 72 and Structure 40. The bricks of both structures are of comparable size, averaging nearly 9 inches long, $4\frac{3}{8}$ inches wide, and $2\frac{1}{2}$ inches thick. The color range is the same, from orange (soft) to purple (very hard), through shades of red. The dimensions of the fireplace foundation are 7 feet $1\frac{3}{4}$ inches wide by 3 feet $3\frac{1}{2}$ inches to 3 feet 8 inches deep at the respective arms, inside measurements. The walls are between 1 foot 4 inches to 1 foot $6\frac{1}{2}$ inches thick and are of English bond, 1 to 2 courses high. The elevation of the base course is 9.35 feet, and the foundation lies above the undisturbed soil contact. No cellar was excavated between the fireplace and Structure 72 by the original builders. No artifacts are listed as associated with Structure 40.

STRUCTURES 41, 71–77, AND 74

A line of associated structural fragments, probably the remains of 2 separate buildings, extended for 56 feet in a northwest-southeast direction (Lots 95:102 and 95:103).

Structure 41

This was apparently the footing of a fireplace 10 feet $5\frac{1}{4}$ inches wide and approximately 5 feet 6 inches deep. Three courses high in some places, this structure was made entirely of brick fragments, no whole bricks having been recovered. The bricks displayed the full range of color and hardness and their width averaged $4\frac{3}{16}$ inches while the average thickness was $2\frac{5}{16}$ inches. This fireplace constituted one end of an approximately 20-by-53-foot frame structure which was built after, and over, the remains of a smaller building represented by Structure 71–77.



PLATE 44—*Structures 41, 71, and 74*

Structures 41, 71, and 74 looking eastward. The view shows the fragmentary remains of 2 structures with their chimney footings (Structures 41 and 71) in background. At the right is a trace of brick foundation (Structure 74), possibly the remnant of a structural support for the floor. The 2 frame houses rested on wood posts, represented by the square postholes in the floor of the trench (Lot 95:103).

Seven postholes delimited the northern edge of Structure 41. But along the southern edge all except possibly one posthole have been lost. The postholes, roughly 3 feet square, were intrusive into some of the postholes of Structure 71–77.

The archeological drawings indicate that some artifacts were recovered from the postholes, but it has been impossible to identify any of them in the collection. A bale seal dated 1659 or 1689 was found at the northeast corner of the area of Structure 41, 6 inches below the surface.

Structures 71–77

Structure 71 was the eastern end of a building represented by Structures 71–77. This fireplace footing, smaller than Structure 41, measured 9 feet 10½ inches by 4 feet 4 inches. It too was made up mostly of brick fragments, but 6 whole bricks gave the average dimensions of 9 by 4¼ by 2⅛ inches. Color and hardness were the same as for Structure 41. No artifacts were recorded from this structure.

Structure 77 formed the western end of building 71–77. This was still another fireplace footing and was 4 courses high. It was approximately the size of Structure 71, measuring 9 feet 6 inches by 5 feet 1 inch. Most of the bricks were fragments, but 1 complete brick measured 9 by 4½ by 2¼ inches. No other brick analysis was made. Structure 71–77 was a frame building approximately 18 by 40 feet. Five postholes, approximately 4 by 3 feet, and 7 feet apart, marked the northern wall. No postholes were apparent for the southern wall. As noted above, several of the postholes were cut by those of Structure 41.

Fortunately, the artifact collection from Structure 77 is available. Provenience was kept for 2 levels—0 to 1 foot and 1½ to 2 feet.



PLATE 45—*Structures 41 and 71—Two Chimney Foundations*

Structures 41 and 71—two chimney foundations in Lot 95:103, looking southwest.

EARTHENWARE: The lower level contained 12 flat roofing tile fragments and 1 pantile fragment. Fifty-one white clay pipestems from the 0–1 foot level indicate 1650–80, and 1 white pipebowl is of the period 1650–75. Sixty white pipestems from the lower level would date from 1620–50, and 1 white bowl dates from the second quarter of the century. Both local and English lead-glazed earthenware pottery, made after 1640, is present in the lower level. Other earthenware sherds present were: In the upper level, 1 sherd of Lisbon majolica (first quarter), 1 sherd of English marbled slipware (second quarter), and 1 sherd of Italian sgraffito (1625–60); and in the lower level, 1 sherd of English sgraffito (1640–1700).

DELFTWARE: Each level contained 8 sherds of English-Dutch blue-on-white delftware and 2 sherds of English white delft.

STONEWARE: The upper level contained 10 sherds of German salt-glazed stoneware and 1 sherd of English, white, salt-glazed stoneware (1740–80). The 1½-to-2-foot level had 1 sherd of German blue-on-gray stoneware.

PORCELAIN: The 0–1 foot level had 2 sherds of Chinese porcelain.

GLASS: Nine fragments of gin bottles were recovered from the lower level along with 58 wine-bottle fragments, including 1 bottle neck from the period 1680–1700.

MISCELLANEOUS: Other artifacts recovered included a brass clasp, a brass hasp and tuck, an unidentified brass object, 3 pieces of miscellaneous iron, a piece of slate, and a nodule of English flint.

Structure 74

A fragment of a brick pavement, Structure 74, spread irregularly over an area some 14 feet long and 10 feet wide approximately midway between Structure 71 and Structure 77. It may well have been the remains of the floor of Structure 71–77. There is good evidence of burning in the area, so we may

surmise that the earlier building on this site was destroyed by fire. No artifacts were recorded or measured drawings made of Structure 74.

Structure 71–77 was probably built and occupied during the second quarter of the 17th century, as evidenced by the artifact collection from Structure 77. The similarity of the structural features would indicate that 41 replaced 71–77 soon after the latter's destruction by fire, but it is difficult to say when Structure 41 was built over it.

STRUCTURES 42, 43, AND 120

Structures 42 and 43 lie adjacent to each other and to Structure 120 in the northwestern corner of Lot 94:104. The first 2 were excavated in the autumn of 1935 by a Civilian Conservation Corps foreman, T. C. Miller. His notes are all that remain from the original excavation except for certain artifacts traceable to this location in the old catalogue. Structure 120 was excavated in 1955 at which time Structures 43 and 42 were reexcavated in order to establish a relationship, if possible, between the 3 structures. However, this objective was not met.

Structure 43, when reexcavated, proved to be a rather massive, brick masonry foundation suggesting a chimney or chimney end of a house. The chimney back measured 11 feet across and had an unbonded projection 4.3 feet long extending midway 1.2 feet from the main wall. Wing projections extend nearly 4 feet northward—away from the river. The inside of the problematical chimney base measured 7.6 feet wide and 5.8 feet deep front to back. The rear projection was offset by 1.2 feet indentation in the back of the chimney interior. The masonry was a maximum of 5 courses high in 1935 (4 in 1955). The top course was 11 inches below the surface of the ground. The bricks were characteristically orange-red with an occasional brick fired to purple-blue when glazed. Unless glazed, the texture was friable and soft. The bricks ranged from 8¼ to 9⅛ inches long, from 4 to 4¾ inches wide, and from 2 to 2⅜ inches thick, with the average 8½ by 4⅜ by 2¼ inches. Although this is a considerable size range, it is not beyond that for bricks made in the early 17th-century brick kiln, Structure 127.

Structure 42 could not be identified from the entry on the base map of 1941, which in turn was unlike the note by T. C. Miller of 1935. However, what its assumed to be Structure 42 or a related structure appeared as a single line of half-bricks, 1 brick deep, at a depth of about 10 inches, in a rough U-shape with the arms oriented eastward.

Structure 120 was a single wall foundation of brick on a soldier course of headers on edge and some brick scraps, overlain by traces of a second course evidently laid in English bond. The length was 28.5 feet, the average width, 1.3 feet. Unfortunately, the bricks of this structure were not measured at the time of excavation, nor were those of Structure 42 when it was reexcavated. Therefore, no comparison can be made regarding sizes.

From a structural standpoint, it is difficult to regard these three structures as representing a single unit, and it seems more likely that they represent a fortuitous association.

Artifacts

No diagnostic artifacts were found associated with Structure 120, and none appear in the catalogue associated with Structure 42. However, for Structure 43 and the immediate vicinity, the old catalogue does offer considerable associated artifact evidence. Structure 43 artifacts are uniform in type with those from Lot 94:104 at large (old Lot 87) in that they represent the first half of the 18th century. Clay pipes for this structure area, which remained in the collection (only a fraction of those listed in the old catalog), included only 1 white bowl which could be as early as third-quarter 17th century. The rest represented the period 1680–1740. One wine bottle (J–7561) was reconstructed from a number of wine-bottle fragments, and clearly represents 1680–1700 dating. The bottle was well-buried, from 1 foot 10 inches to 3 feet 6 inches. Other artifacts included 3 roofing tiles, 1 Dutch brick, some lead cames, and a brass button. The pottery evidence was not extracted from the collection in time for this report.

STRUCTURE 45

Structure 45 was clearly a kitchen associated with Structure 19A or 19B, or both. Its structural identification was a brick masonry foundation for a fireplace and probable oven, side by side, at the north end and exactly in line with the north wall of Structure 19A. A series of postholes indicated that the remainder of Structure 45 was entirely frame. Two of the postholes retained traces of the mold of posts set in them. The indicated dimensions of the whole house were 18 feet east-west and 28 feet north-south. The masonry was laid 6 inches into undisturbed clay with a maximum of 6 courses. The bond was English.

Fireplace interior dimensions are 9 feet 7 inches wide by 3 feet 10 inches from front to back; interior dimensions of the oven adjoining to the east are 3 feet by 3 feet 6 inches. The bricks of Structure 45 average $2\frac{14}{32}$ by 4 by $8\frac{29}{32}$ inches. Thus they are comparable in thickness and length to bricks of the old masonry of Structure 19A. In width they are comparable to the brick of the newer masonry of Structure 19A. The bricks of 19B are slightly wider and longer than those of all portions of 19A and Structure 45. This suggests that Structure 45 was probably built while Structure 19A was in use, unless it was built later from bricks salvaged from that structure. There is no clear evidence to indicate the type of roof furnished Structure 45, except the pantiles present in the general area, which are assumed to have been used on Structure 19B.



PLATE 46—*Structure 45—North Wall and Presumed Fireplace*

Structure 45—north wall and presumed fireplace foundation, viewed from the west. This structure, directly east of Structure 19, is believed to have been a kitchen attached to that building, a possible tavern. The other walls of Structure 45 were presumably of wood (Lot 99:101).

Artifact evidence relative to the dating of Structure 45 is limited almost exclusively to clay tobacco pipes and wine bottles; both clearly indicate last quarter of the 17th century, and perhaps a portion of the third quarter. No 18th-century evidence was noted here.

A few wrought-iron objects were associated with Structure 45. Half of an ornamental H hinge (Cat. No. 1655) or possibly a strap hinge with side members, 5¾ inches long, was found in the fill of one of the footing holes 20 inches below the surface. A fragment of a butterfly hinge (Cat. No. 33) and a very small pintle hinge (Cat. No. 51) were found in the vicinity, but not in direct association with the structure.

Significant features associated with Structures 19A, 19B, and Structure 45 include: 2 wells, Nos. 4 and 11, described in detail elsewhere; 4 ditches, Nos. 17, 18, 20, and 21; and a refuse deposit, unnumbered but described by the original excavators as lying directly south of Structure 45 and east of the midsection of Structure 19B. There is a clear inference from the excavation records that Structure 19B was erected subsequent to Ditch 20 and probably also subsequent to Ditch 21 which closely parallels Ditch 20 to the east. Likewise, Structures 19A, 19B, and 45 interrupt Ditch 18. Such scanty artifact evidence as we have concerning these suggests third-quarter 17th century for Ditch 18. It is impossible, however, to date any of the 4 ditches confidently, and the only relative observation is their relation to the construction of Structures 19A and 19B.

Of the two wells, the earlier one is undoubtedly Well 11,

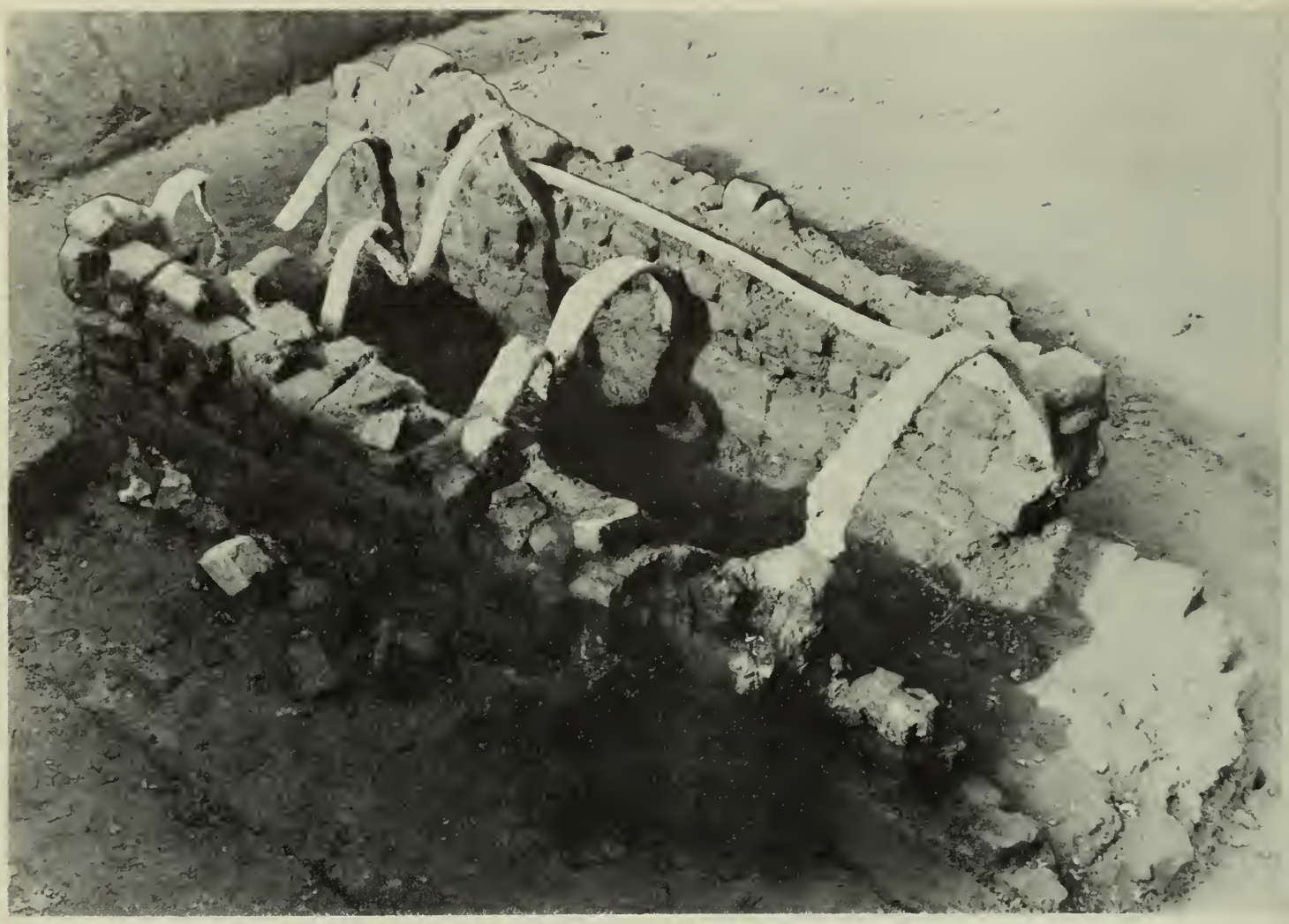


PLATE 47—*Structure 46 Lime Kiln*

This lime kiln is viewed from the charging end with the brick lining exposed inside the pit dug to receive it. Over the kiln firing chamber, iron hoops (all collapsed but one) originally supported the charge of oyster shells. The kiln was located 100 feet down the shore from the lime kiln, Structure 47, and within 20 feet of the west wall of the house, Structure 21 (Lot 94:103).

uncased (or wooden casing obliterated) with a barrel at the bottom. The lower levels of this well are definitely third-quarter 17th century. The well probably served Structure 19A. Well 4, which was brick-cased in header bond, is definitely last-quarter 17th century—by wine bottle and tobacco pipe evidence. We may assume that it served Structure 19B and perhaps Structure 45. Two pintles and a strap hinge and pintle found in Well 4 are not diagnostic except as 17th century.

A shallow but definite refuse deposit of irregular shape, about 8 feet long and 6 feet maximum width, lay 5 feet south of Structure 45 and 6 feet east of Structure 19B. Refuse from this depression included an interesting wrought-iron butterfly hinge, an iron key, 2 lead cames, 55 window-quarrel fragments, 6 pantiles, and some paving-tile fragments. Tobacco pipe evidence includes 1 bowl initialled "LE" and places this pit in the last quarter of the 17th century.

STRUCTURES 46, 47, AND 88: LIME KILNS

Worth Bailey has published a definitive and scholarly descriptive analysis of Structures 46 and 47, the closely associated lime kilns on the 1935 riverbank (Lots 94:103 and 95:102, respectively). Therefore the reader is directed to this reference (Bailey, 1938a) and only a summary is offered here.

The archeological crews originally excavated Structures 46 and 47 and began tentative field sketches in 1935 but never completed them. Fred P. Harris made a fairly complete sketch of Structure 47 from notes of F. Farthing, an engineering aide.

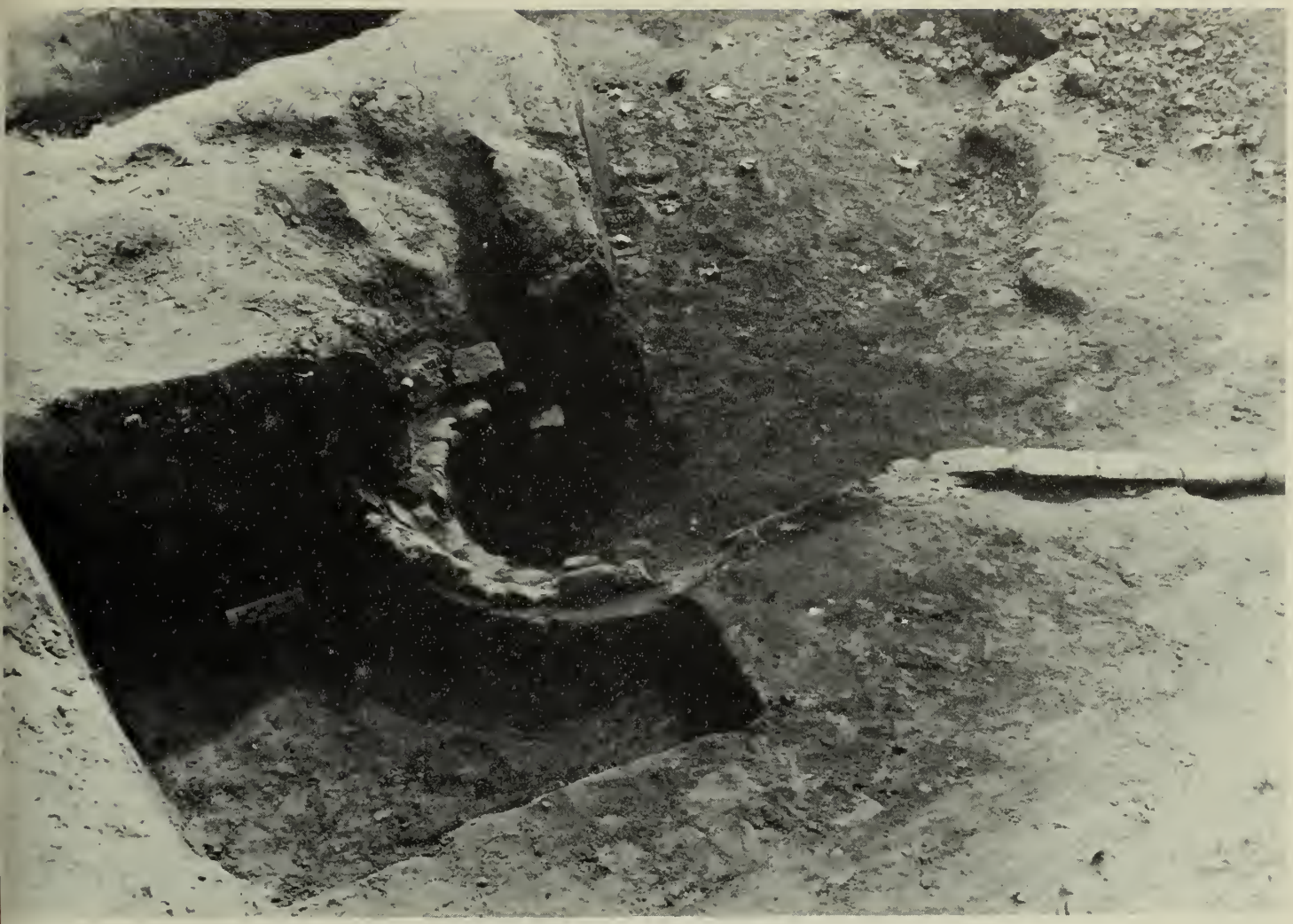


PLATE 48—*Structure 47 Lime Kiln*

This lime kiln in Lot 95:102 had an outline like a loop hinge. Here the kiln is seen with the brick lining indicated. The kiln was located nearly on the bank of the James River at the time of its discovery (1934).

In November 1936, Carl F. Miller reexcavated Structure 46 and J. C. Harrington reexcavated Structure 47. Both men made detailed drawings of the respective kilns. From these data Worth Bailey wrote his excellent interpretation.

Structure 46 kiln was located in an oval pit and consisted of a remnant of brick masonry wall, the extant top of which was 7.2 feet below the 1936 surface (Elevation 10.31 feet above mean low tide). Originally the top of the kiln had been approximately 5.5 feet below the surface. Although the kiln itself lay almost on the shore scarp in 1935, the kiln mouth opened eastward toward Structure 21 and away from the shore. An access for fueling the kiln was present but apparently quite limited, the space being only 4.5 feet from opening to pit wall. The overall length of the kiln was 8.5 feet and the width, 4 feet. The walls average 8.5 feet wide, and were made up of half bricks, for the most part. The interior firing chamber was 2.2 feet wide and extended the whole length of the kiln. There was no brick wall at the back. Above the firing chamber 4 iron hoops had been embedded transversely in the masonry walls and iron bars had been laid across them longitudinally to support the charges. Both back and floor were fire-burned clay, and within the chamber was a heterogeneous mass of loam, brick-dust, and burned oyster shells, interspersed with lime, charcoal, and fragments of coal.

Structure 47 kiln was oriented with its opening to the river scarp of 1935 which made it appear to be a hillside kiln at that time. However, the probability is that it was originally in a pit, an undetermined distance from the shore in the days of its operation. The fire area was oval, 5 courses maximum height, lined with a single course of stringers and half bricks, reinforced to a width of 2 feet at the end of the kiln, and 5 feet beneath the ground surface of 1936. The kiln bottom was a little less than 5 feet below the 1936 ground surface which was 7.5 feet above mean low tide. The inside axes of the

fire chamber measured 4 and 2 feet respectively. The mouth opening was constricted to 10 inches. Above the brickwork the burned clay sides of the kiln tapered upward. In this simpler kiln, says Bailey, "in conformity with English precedent, a fire was built on the floor beneath a rough arch of large stones or oyster rock so constructed as to leave sufficient passage for air. A charge of shells was heaped on this support until the shaft was completely filled, the intervals between the stones and shells forming flues through which the heat ascended."

Bailey points out that such a kiln would have been operated by continuing firing until the shells were completely calcined, after which the kiln was allowed to cool spontaneously and the burnt lime removed. This was a delicate operation, requiring experience and care that the charge was not ruined by uneven heating, since it could not be heated twice. Bailey thinks that both kilns used coal, as evidenced by traces of that fuel in the fills. This was already the practice in Staffordshire probably since the Tudor period. Wood could have been—and doubtless was—also used. The kiln with the ironwork grates was charged in alternate layers of oyster shells and fuel, more layers of fuel and shells being added as the calcined lime accumulated in the firebox. The evidence of admixture of carbonaceous and ash contamination in the calcined lime and subsequent mortar mixtures in 17th-century masonry is conspicuous. In the case of the simpler kiln of Structure 47, a dry masonry vault supported the alternate charges. After the shells had burned, the arch was broken down, the product removed, and the supply of fuel and shells renewed from the top.

An interesting possibility of the use of storage areas is indicated by "significant layers of hard packed soil containing numerous complete shells" nearby. To Bailey this suggested the classical practice of storing thoroughly slaked lime (the water being readily accessible) in pits covered with sand to prevent hardening in the air.

Lee S. Trainer, Chief Engineer of the National Lime Association, Washington, D.C. made the following analysis for Bailey in 1936:

TABLE 1—*Analysis of Lime from Structure 47*

SiO	8.1
R_2O_2	1.1
CaO	49.9
MgO	0.4
SO_3	0.2
CO_2	36.6
H_2O (Free)	0.6
H_2O (combined) and organic matter	2.8
	99.7
$CaCO_3$	83.2
$CaOH_2$	4.2
MgOH	0.5
$CaSO_4 \cdot 2H_2O$	0.3

Artifacts for Structure 47 are unknown. However, Structure 46 kiln yielded a slate flagstone and 2 pieces of roofing slate, 1 of which was in the kiln wall. Associated with the fill at a depth of 6 feet to 6 feet 8 inches was a white pipebowl of the 1680–1720 period in type. Higher in the fill from 1 foot, 3 inches to 4 feet, 11 white bowls were all dated about 1700–1720. Five large, brown, locally made bowls were indeterminate but presumably about 1700–1720.

Bailey's conclusion (p. 11) is quoted here verbatim:

> The evidence regarding the preparation of lime so far uncovered at Jamestown (1938), points to the end of the 17th century as a period of trial and experimentation with newer methods and techniques. It marked in addition the stage of gradual adaptation of ancient craft traditions to the materials and requirements induced by local conditions. Attempts to forward continuous operation represent the primary approach to an efficiency of operation, rendered fully possible by the mechanical accomplishments of the nineteenth century. The free-standing kiln of the flare type evolved at Jamestown seems to have been the prototype of the field kiln destined to reappear in later years in answer to the needs of the rapidly expanding building activities of a new nation. . . . In all probability field kilns were often set up convenient to brick kilns enabling both to be fired under the same supervision. From this point it was but an easy transition to the actual consolidation of the two and there is good reason to suspect the employment of this method of lime making in Tidewater Virginia during the succeeding century.

Strikingly enough, this observation is freshly illuminated by evidence that the kiln, Structure 27, which Bailey regarded as a lime kiln of brick on the surface, was undoubtedly used as well, if not exclusively, for pottery firing (see Structure 27). The following notes on dual use of Structure 88 kiln are also relevant. So are observations on Structure 111, Kiln A, where slaked lime from oyster shells and rock with glaze marks were both found. At Structure 127, brick kiln, and at Structure 27 as well, clay pipes may have been fired.

Structure 88 was found and recorded on plats by Harrington in 1940. It was referred to, but not described, as a lime kiln. This is an interesting example of a kiln which may have had a dual purpose as a lime-burning and pottery-firing device. The structure is located on the southern edge of Lot 96:106—50 feet west of Structure 100 and 100 feet east of Structure 116. In outline this kiln was flask-shaped or bulbous at the east end, terminating at the back with a brick wall, and constricted at its western access which also terminated in a brick threshold. The kiln was set in a scorched pit approximately 4 feet below the 1940 surface (10.8 feet above mean low tide). It was approximately 11 feet long, 4 feet wide, and the pit in front of the firing access was 11.5 feet long. The bricks were a maximum of 4 courses high, those at the rear being stringers of partial bricks. Those of the access were headers on edge.

Happily, the collection of artifacts from this kiln had been kept intact. The collection was examined and certain significant facts were immediately apparent. First, a quantity of burned oyster shell in masses of slaked and hardened lime was recovered. The bricks of the kiln included many fragments of



PLATE 49—*Structure 88 Lime Kiln*

The lime kiln in Lot 96:106, from the west. The view shows the arched access for firing, the draft closure of brick, and the kiln itself beyond. The kiln was located south of the west wing of the Ambler House and west of Structure 100. Oyster shells were burned here.

both regular bricks and coping bricks, all of soft texture, and a quantity of fragmentary flat roofing tiles of unused appearance. There were also a number of square- or wedge-shaped floor tile fragments. These had been covered on one surface with dark greenish-brown lead glaze which had run down over the sides in places and even over fractured surfaces. Artifacts from the fill included early 17th-century, white clay-pipe fragments, notably a complete bowl of the 1620–40 period. There were some gin-bottle fragments, but no wine-bottle evidence. In striking contrast, the more superficial deposits in the area included typical 18th- and 19th-century detritus from the Ambler House, the west wing of which was located 50 feet north of the kiln.

Thus, the artifact evidence suggests strongly that Structure 88 may have been used both for lime burning and pottery firing. The latter was further attested by very fresh-appearing sherds of typical locally made red earthenware pots, glazed on the interior, with finger-marked fillets of clay around the neck. The dating is very possibly early in the 17th century, before 1640.

STRUCTURE 49

Structure 49 lay in the eastern edge of Lot 98:100, 40 feet east of the fireplace of Structure 55. The nature and purpose of this brick remnant is not certain. However, its relationship to Structure 55 is definitely reminiscent of Structures 71 and 77 which were undoubtedly the respective east and west end fireplaces of the same frame structure. In the case of Structures 49–55, the distance of 40 feet between the 2 brick remnants

would seem quite appropriate for the length of such a house unit. (The orientation of the respective units in Lot 98:100 cannot be determined definitely from the original notes, except that both are approximately north-south on the long axis of each remnant.) The slightly askew placement of Structure 49 on the base map is possibly misleading.

No mortar was used in laying the bricks of Structure 49, although some mortar, which had been made of fine oyster-shell lime and sand, adhered to the bricks. This indicated that the bricks had been salvaged from previous use and laid dry. Bricks were described as salmon-red to purple, burned hard, and with some glazed headers. Since the bricks were probably salvaged, the absence of softer salmon-colored examples is logical. In size, the bricks range from 8¾ by 4 by 2¼ inches to 9¼ by 4½ by 2½ inches, the average being 9 by 4¼ by 2⅜. The only original dimension observable on Structure 49 was the width—23½ inches. The extant length of the presumed backwall was 5 feet 11½ inches at the time of excavation, but it was at least 10 feet originally, if proportionate to the width of the wall. The bond was English.

The only inference to be derived from artifacts collected from the entire lot is that Structures 23, 49, and 55 are all late 17th century. (See section on Structure 23.)

STRUCTURE 55

Structure 55 (Lot 98:100) is a fireplace remnant excavated originally in 1934. It has been described as a single course of brick resting on the older humus zone 8 inches above the undisturbed clay. No brick fragments were observed in this mixture of loam and sandy clay, and it can be presumed that no brick structure had occupied the ground prior to the erection of Structure 55. The fireplace was oriented to open to the east and the remnant measured 8 feet 11 inches north-south along the back wall, although sufficient pattern remained in the brick to show that the original overall measurement had been approximately 9 feet 3 inches. The side walls of the fireplace are only remnants, and the original depth from front to back could not be determined. However, the interior width of the fireplace was 6 feet 6 inches. The back wall was 14¼ inches thick, or 1 stretcher and 1 header; the sides were approximately the same thickness.

The detailed notations on Structure 55 may be summarized as follows: Bricks were the same size, color, texture, and hardness as those of "Structure 23" (possibly a ditch with brick debris on top). The bricks ranged from salmon-colored and soft through the reds to purple and very hard, with some glazed headers. Largest brick was 9¼ by 4⅜ by 2⅝ inches—almost 18th century; the smallest, 8¾ by 4¼ by 2¼; average, 9 by 4¼ by 2¼. The mortar was white, made of well-burned oyster shell and clean sand.

Unfortunately, the original excavators of 1934 made no observations of features in the earth surrounding Structure 55. When the area was resurveyed in 1936, and additional notations recorded, the places where postholes of a frame superstructure may have existed were obliterated. Thus, we surmise that Structure 55, like Structures 22, 41, and 116, was a frame house on post footings set in postholes, with a brick chimney.

Although no artifacts were recorded as associated with this structure, the data for Lot 98:100 has been summarized under Structure 23. The conclusion is that all 3 structures in this lot—Nos. 23, 49, and 55—are late 17th century.

STRUCTURES 50, 51, AND 52

Structures 50, 51, and 52 (all Lot 94:104) were located in 1935 but were never completely excavated or annotated. The only artifact data are those which can be compiled from lot and square locations entered in the old catalogue book, and these will be summarized.

Structure 50 appears to have been a brick footing fragment in an L-shape, representing the northwest corner of a probable frame structure. The long arm of the L, approximately north-south, was traced for 20 feet until it was cut by the excavation for the riprap shore protection. Presumably this arm had extended some additional distance south or riverward. The short arm of the "L" was 9 feet long and extended westward, parallel with the shore. Structure 50 was apparently oriented upon the shore, as were all the other buildings found within 100 feet of the seawall, from Structure 26 to Structure 125.

Artifacts from the immediate vicinity of Structure 50 are exceedingly numerous in the old catalogue, relatively speaking. They range from the sod zone to a maximum of 5 feet on the site of the structure itself. The 5-foot depth suggests either that the foundation may have had considerable depth or that it had been built on a riverward slope. The latter is indicated by a section Lot 87 drawing by F. P. Parris dated October 8, 1935. The fill of this indicated slope is listed in the drawing as consisting of clay, sand, bricks, charcoal, plaster, and a few oyster shells. The slope appears to rise just before it is cut by the riprap excavation. The most significant artifacts are the clay pipes. An excellent sampling of over 150 specimens of white and brown stems and bowls survives in the collection. The 38 white pipebowls are all representative of 1700–40 except 2, which may be as early as 1680. Locally made, brown pipebowls, 10 in number, were all made in molds and were well finished; they were presumably of the post-1700 dating comparable to the white bowls. No survey was attempted of the many brown and white stem fragments.

Other ceramic fragments from this vicinity include English slipwares and range through the second half of the 17th century past the second half of the 18th. A small Lambeth delftware bowl (J–7499), early to middle 1600's, and a coarse-tempered, North Devon milk pan (J–7478) were close by. Over 40 roofing tiles and a Dutch brick were present. A plaster ornament lay between Structure 50 and Structure 21.

Metal objects, buckles, wire, thimble, a pierced lead ball, a possible shoemaker's last of iron, lead cames, a brass lockplate,

a pewter flask neck of the screw type, pewter spoon handle and a pewter spoon bowl are listed for the Structure 50 vicinity. An iron hoe is listed at a depth of 4 feet 3 inches within the foundation itself. No less than 307 pins and pieces of wire were found at the site. Few glass fragments seem to have been found here, but among them are an "HG" (Henry Gawler?) bottle seal and 4 goblet fragments beside some miscellaneous and unspecified glass pieces.

Thus Structure 50 lay in an area of concentrated refuse ranging from 1650 to 1750, with the majority of objects early 18th century, although nothing definitive can be said about the structure itself.

Structure 51 appears to have been a chimney foundation of brick masonry located with the back to the river, the opening to the north. Presumably the remainder of the house was frame. Well 5, a brick-cased structure, was located 10 feet southeast of the southeast corner of this fireplace.

Artifacts on the site of Structure 51 and nearby are fairly diagnostic of age. In the present collection, 6 white bowls were observed to be in the 1700–1740 range. A tripod pot of earthenware (J–7308) and a small jug (J–7509), probably Lambeth delftware of 1690, were found nearby. The earthenware pot was 5 inches high and covered inside with green lead glaze. Other related objects were a pewter spoon bowl, brass buckle, brass pot leg, wire and pins of brass, and a goblet fragment.

Structure 52 was only a 5-foot-long remnant of brick wall, probably the footing of a frame structure. The wall was parallel with the shore. Nothing more is known of this structure except for a few artifacts from the vicinity. These include early 18th-century white clay pipes and a few brown stem fragments, a Dutch brick, a roofing tile, a brass buckle, button, and thimble.

STRUCTURES 60, 62, 63, AND 68

Structures 60, 62, and 68 (Lot 96:100 and 96:101) were incompletely excavated because they lay, for the most part, beneath the road to the ferry slip and the shore road leading east of the original temporary museum located a short distance to the west of the building group. The chief remaining field reference is a plan of the excavation of part of Lot B-61 prepared by F. P. Parris from engineering data by F. G. Farthing and notes of T. C. Miller, foreman in charge of the crew which did the excavating. (Lots B-61 and 96:101 are coincident roughly.)

Although indicated on the base map, Structure 63 is almost certainly not a unit, nor is there adequate evidence for considering the southern feature to have been a square of masonry. Parris has fully recorded this structure in a field sheet rendering which shows the northernmost unit to be 7.3 feet east-west by 6.5 feet north-south. This is a footing of 2 courses, 1 foot or a header and a stringer wide, of English bond. The top of the masonry was at an elevation of 10.02 feet above mean low tide or 0.5 feet below the surface of 1935. Bricks were salmon to purple, soft to very hard, and ranged from 8¼ to 9 inches long, 4¼ to 4½ inches wide, and 2 to 2⅝ inches thick, the average being 8½ by 4¼ by 2¼ inches.

The middle feature of Structure 63 was a single fragment of a masonry wall of 2 courses in English bond, 1 foot wide and 3½ feet long. This fragment extends north-south, but not in exact alinement with either the northern or southern features of Structure 63. An irregular line of brickbats which may or may not have been the remains of a wall extended to the north and east of this middle fragment. The elevation of the top of the middle feature bricks was 10.5 feet above mean low tide, comparable to that of the northern portion.

The southern feature of Structure 63 as shown on Parris' detailed rendering is somewhat more suggestive of a rectangular structure, but the shape is conjectural. The one intact side is 6½ feet long, 1½ feet wide, and is composed of brick halves and fragments laid in 2 courses. The bricks of the middle and southern features are in the same range of size and color as those of the northern feature.

The only artifacts noted in the catalogue for the Structure 63 area are 31 tile fragments, a brass vessel handle, and 56 pipe fragments.

The only purpose for these structural unit features would seem to be outhouses, such as a smokehouse and a milkhouse.

Structure 60 appears to be the northeast corner of a brick foundation for a frame house. More evidence may exist beneath the former ferry-slip road. Of the limited number of artifacts associated with this tiny spot, it may be significant that 50 roofing tiles, 5 tile fragments (unspecified), and about 250 bottle-glass fragments are recorded. It also may be significant that Structure 60 was situated approximately midway between Wells 6 and 7. Well 6 was not excavated, but Well 7 fill had white clay-pipe evidence indicating 1680–1720. Four white pipebowls from the location of Structure 60, at a depth of 1 to 1½ feet, date from 1700 to 1720. Thus the evidence here and that at Well 7 are comparable in date.

Structure 62 is only approximately located on the lot plan and no details are shown. A frame structure on a brick foundation oriented with the river and close to Well 6 is indicated. The only artifacts associated with Structure 62 in the old catalogue were 15 pipe fragments.

Structure 68—10 feet east of Structure 62—is indicated only by a course of brick which also extends under the 1935 road. The northern arm of the "L" of the structure's northwest corner appears to have been 8 inches wide, or 1 header, approximately. The western arm is 1½ bricks or 1 foot wide. Eight items of glass and pipe fragments were found, but were not significant.

STRUCTURE 67

This structure (Lot 96:99), like Structure 28, was a wall remnant which extended beneath the ferry approach road. For

this reason the structure was incompletely explored in 1934. Since the road was in service until 1957, no opportunity presented itself to complete the investigation and trace out the wall, if more of it exists.

A plat of the lot shows Structure 67 as a narrow 1-course wall, 1 header-brick wide (estimated 9 inches), running a little east of south, 18 feet north of Structure 26. The top of the masonry was 9.5 to 9.9 feet above mean low tide or 1.3 feet below the surface of the ground. The bricks were set about 2 inches into the top of the undisturbed clay. The masonry is not described in the original notes and brick size was not recorded on the plat.

Some specific data exist in the records of 1934–35 which permitted study of a collection of ceramic objects found in the 10-foot square in which Structure 67 occurred. The 24 white pipestem fragments appear to range chiefly in the second half of the 17th century. Three of 6 pipebowls date from 1650 to 1675 and 3 from 1675 to 1700. Four brown stems were from this square. The remainder of the evidence consists of 3 blue-on-white delftware fragments and 2 local, lead-glazed sherds.

Thus we may conclude, tentatively, that this was probably a light-brick footing for a frame building of the second half of the 17th century.

STRUCTURES 91, 92, 93, AND 95

Structures 91, 92, and 93 designate brick footings for 3 tombstones in the Travis Graveyard, located in Lot 81:182. These footings were excavated and a portion of the Travis Graveyard was tested by J. C. Harrington in 1938. Structure 91 footing was restored and the flat tombstone of Edward Travis, dated 1700, was reset. The same restoration was done for Structure 93 (Susanna Travis, dated 1761). In general, the Travis tract is 1½ miles east of the church.

Structure 95 was not a vault, but a rough lining for a grave.

No attempt was made to find and excavate the site of the Travis House. This house burned in 1857, according to a Miss Armistead of Williamsburg, elderly descendant of the Travis family. However, Forman says that the Travis House burned before 1816 (Forman, 1938, p. 325). A clipping from the *Richmond Times Dispatch* of May 25, 1922, quoting that paper as of 100 years ago, printed an article datelined Jamestown, May 25, 1822. The reporter, after a day of oratory and festival honoring the "Virginiad" of that year, observed, "Heavens! Just as I am writing this, the old brick building belonging to Colonel Travis' estate has taken fire and the roof is already in a blaze. It was an uninhabitable ruin, to be sure, but I am sorry, as it is one of the few remaining monuments of antiquity here, to see it disappearing from the scene."

Apparently, the Travis house burned as frequently as the Ambler House, but was not as reliably reported.

STRUCTURE 100

Structure 100 in Lot 95:107 was excavated by archeologist Conrad B. Bentzen under the direction of J. C. Harrington in 1940. Fortunately, the plan drawings for this very important structure, together with artifacts left associated in the collection by square and depth, provide accurate and reliable data for description. Structure 100 is important especially because it is the oldest building in the Page (or Wyatt) tract for which we have any reliable archeological data.

The only structural evidence for No. 100 was the assumed north wall consisting of 8 to 9 courses of English-bond brick masonry, spread 2 to 3 inches on the south (interior) side of the base. The wall above the spread footing was normally a little in excess of 8 inches thick, or the length of a single header, indicating that the structure above was essentially frame. The exterior or north side of the wall had evidence of 3 small buttresses of masonry placed at 6-foot intervals. These consisted of simple 8½-inch-square columns mortared but not bonded to the wall. In the center of the wall was a stair wall inset extending south, or inside of the structure, a distance of 4 feet overall. The stair wall was 5.8 feet wide, outside measurement. The inside dimensions of the stair wall inset were 4 feet wide by 4 feet deep, front to back. The stair wall was of the same thickness as the main wall, but lacked spread footing except for a line of stringers on edge on the north side of the inset wall. A small area had been cut out of the east stair wall after the wall had been built and was presumably intended as a footing for a post. No description of the mortar was left.

The north wall remnant of Structure 100 was 34.8 feet long, including the stair wall inset. The west end was fragmentary and possibly not the original terminus of the wall. The east end, however, was finished with closure bricks both inside and out, and was out of plumb, the end brick at the top being an inch to the east beyond the base. Inasmuch as the butt-joint was used in connecting the stair walls and the outside wall of the foundation, it may be supposed that a butt-joint could have joined the north wall with the east wall, if an east wall originally existed. However, the only evidence of the east and west walls of Structure 100 are trench outlines and fill. The east trench was 1.8 feet wide at the top (visible 1.5 feet below the surface at elevation 11.1 above mean low tide) and 1.5 feet wide at the squared and leveled bottom. The bottom was 3.2 feet from the surface at an elevation of 9.5 feet. The top of the trench was well-buried beneath the old topsoil. Thus, this squared trench would seem definitely to have been intended for a masonry footing. The footing either was never laid, or if it existed, was removed entirely, possibly for brick salvage. At the northeast corner the trench makes a westward bend to join the masonry wall. This east trench was traced from the northeast corner for approximately 33 feet to the estimated southern corner.

Unfortunately, data in the field notes exist only for a minor

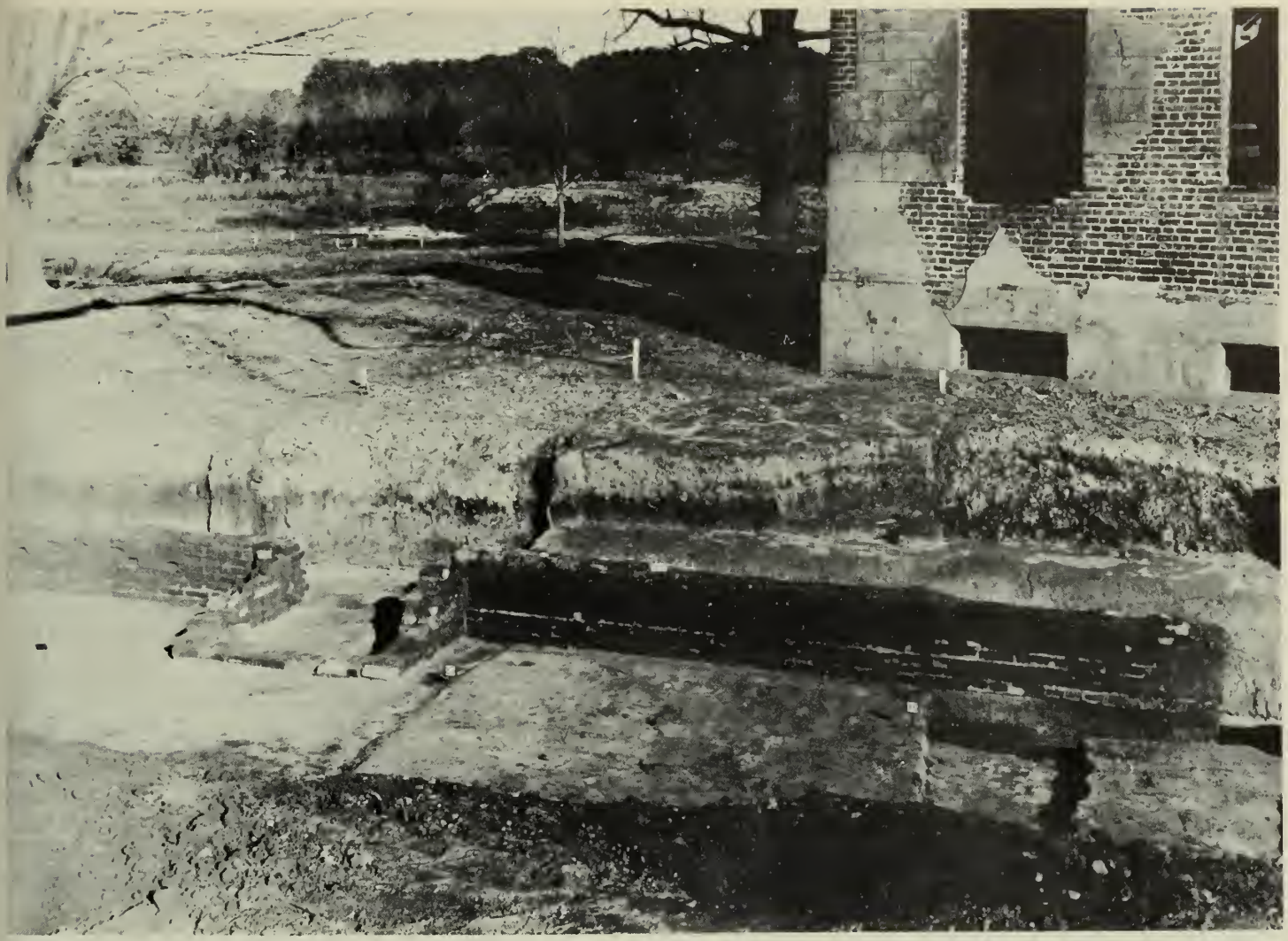


PLATE 50—*Structure 100*

Structure 100 looking north toward the presumed north wall of a rectangular frame structure (in Lot 95:107) in front of the Ambler House (background).

portion of the east wall trench. None of the field notes covers the south end of the east wall trench and none appears for the south wall trench. Yet these wall locations are estimated on the base map so as to imply a complete structure. The trench of the east wall was traceable only for 10 feet to the west where it was protected by Road 3. This road is a subsequent feature which curved in front of the Ambler House to the south as it proceeded in a generally east-west direction. Curiously, a second wall-footing trench appears within the angle of the east and north walls of Structure 100, as if another structure were involved. This second building trace shows only on the lot map. Within the estimated rectangle of Structure 100 there was no cellar, paved or unpaved.

Artifacts

Ceramic and other artifact evidence in the Structure 100 foundation area is of great significance. The evidence largely bears out Bentzen's original estimate in the single paragraph of his report for the 1940 field work which constitutes the only written description of the building. In this report, Bentzen states that Structure 100 dates from the early part of the 17th century (Bentzen, 1941).

To support this assumption, nearly all of the artifacts from the old soil zone to undisturbed clay date from 1640 to 1660. Presumably locally made building bricks are rather large and usually orange-red and soft (9 by 4⅜ by 2⅛ inches is the only description given). There is a striking quantity of Dutch brick of uniform greenish-yellow but of various and irregular sizes. Many pieces of flat roofing tile were noted, probably also local, but none is complete. Floor tile, while sparse, is interesting in that there are 2 types: a larger square tile, 7 inches on a side and 1½ inches thick, and some smaller tiles which have a dark-green glaze on the top surface. Significantly, this glazed tile matches those pieces found 50 feet east,

in the kiln (Structure 88) where they were possibly chance inclusions, used as kiln props for glazed ceramics, or may even have been fired themselves.

Earthenware is represented by a delftware pot fragment which is blue-on-white inside and has a green glaze on the exterior at the base. White clay pipes are significant in that 19 bowls represent 1640–60 and 6 represent 1660–80. Locally made brown pipes are also present, though less numerous. A majority were molded rather than modeled. One modeled bowl was roulette decorated and initialled "AT." One stoneware sherd was noted, either German or English, of salt-glazed blue-on-gray.

Dutch gin bottle evidence was conspicuous and at least 50 pieces were found. No wine bottle sherds were found. Metal is represented by numerous handwrought nails of various sizes and some traces of barrel hoops.

Since the fill above Structure 100 yielded artifacts ranging from 1640 to 1680, with emphasis on the first half of the century, it is probable that the structure stood around 1625.

STRUCTURE 102, BRICK KILN

Structure 102 (Lot 101:98) was excavated in 1941 under the direct supervision of J. C. Harrington. Excellent and complete plans of this large and well-preserved brick and flat roofing tile kiln are on file at Colonial National Historical Park, Va. A comprehensive descriptive, analytical, and comparative account has been published by Harrington entitled "Seventeenth Century Brickmaking and Tilemaking at Jamestown, Virginia" (Harrington, 1950, pp. 16–39). In view of this available reference material, a brief summary description will suffice here.

The wall tops of the kiln were encountered from 8 to 12 inches below the surface and 6 inches below the top of a secondary, or underlying humic zone. This possibly represented a long period of tobacco cultivation prior to the recent plow zone. The kiln had been prepared by excavating a level place in sloping ground the width of the kiln structure, with the opening on the downhill side.

The overall dimensions of the outside walls were roughly 24½ feet wide by 19 feet front to back, with inside dimensions 22 by 15 feet. Rear and side walls averaged 14 inches thick and the front wall with its 5 segmental arched openings measured 34 inches at the bottom—a necessary increase in thickness to provide strength for the archways. The arched openings or fire holes (single row-lock segmental arches) varied in width from 20½ to 23½ inches and in height from 20 to 26 inches. Three of the arches still had closure bricks laid without mortar from 1 to 3 courses high, a feature noted also in the smaller and earlier kiln, Structure 127. The kiln walls averaged 10 bricks from base to remaining top.

The fire chambers, same width as the arches, were straight and extended to the rear wall of the kiln, with remaining base courses of bricks stacked on permanent benches between the fire chambers. This permanent brick base was intended to prevent moisture from rising from the earth, thus preventing the soft bricks from hardening. In Structure 127 the absence of fired brick sidewalls and base left the bricks in that early, small kiln unfired and soft at the kiln sides and glazed at the firebox bottom. At the bottom, the potash derived from the consumed fuel served as a flux to fuse the silica in the brick exteriors. However, in Structure 102 the bricks found in 1 to 5 layers on the bases were incompletely fired. The bottom 4 layers were stacked on edge at a slight angle, above which corbelling began and closed the arch over the firing chamber at a height of 7 bricks or about 28 inches.

No archeological evidence denoted the exact original height of the kiln, but Harrington estimates it to have been from 12 to 15 feet high and to have held about 50,000 bricks.

Harrington cites no conclusive historical or archeological evidence of ownership or of the period of operation of the Structure 102 kiln. He does mention, however, that a patent to Nathaniel Bacon, Sr., recorded in 1683 for the tract to the east of Beverley's property makes no mention of a brick kiln on the adjoining land. Thus, it may be assumed that the kiln had been abandoned when Beverley acquired the property in 1694. The best clue to the dating of the operation of this kiln may be identification of bricks made in the kiln with those of a dated house at Jamestown. The most common brick size at the kiln is 9 by 4¼ by 2⅜ inches, closest to the statutory size (9 by 4¼ by 2¼) in England before 1625. The Jamestown structure which does have the same average-size brick as Structure 102 is Structure 17—but the identity of the bricks with the kiln is not conclusive. Structure 102 tiles were fairly uniform, about 10 by 6⅛ by ⅝ inches, or close to the 1477 statute size in England. Harrington concludes that in his opinion this brickyard was in operation about the middle of the 17th century.

The only feature associated significantly with Structure 102 was a pit located to the north and west covering about ⅓ acre. From this pit an estimated 825 to 850 cubic yards of earth had been removed, probably for brick clay, enough for half a million bricks.

It is also of interest to note that Harrington mentions in his 1941 field progress report (Harrington, 1942b, p. 11) that he found, but did not develop, a rectangular pit 4 feet from the southwest corner of the brick kiln, Structure 102. In this pit were 4 circular deposits of pitch (or tar) about 2 feet below the 1941 surface. Each of these tar deposits was approximately 20 inches in diameter, but their depths were not determined.

Upper.—The large 5-arch brick kiln in Lot 101:98, viewed from the south. This kiln, presumably mid-17th century, is immediately east of the present visitor center and the Tercentenary Monument.

Lower.—Detail of the kiln (Structure 102) showing alignment of bricks between the firing chambers.

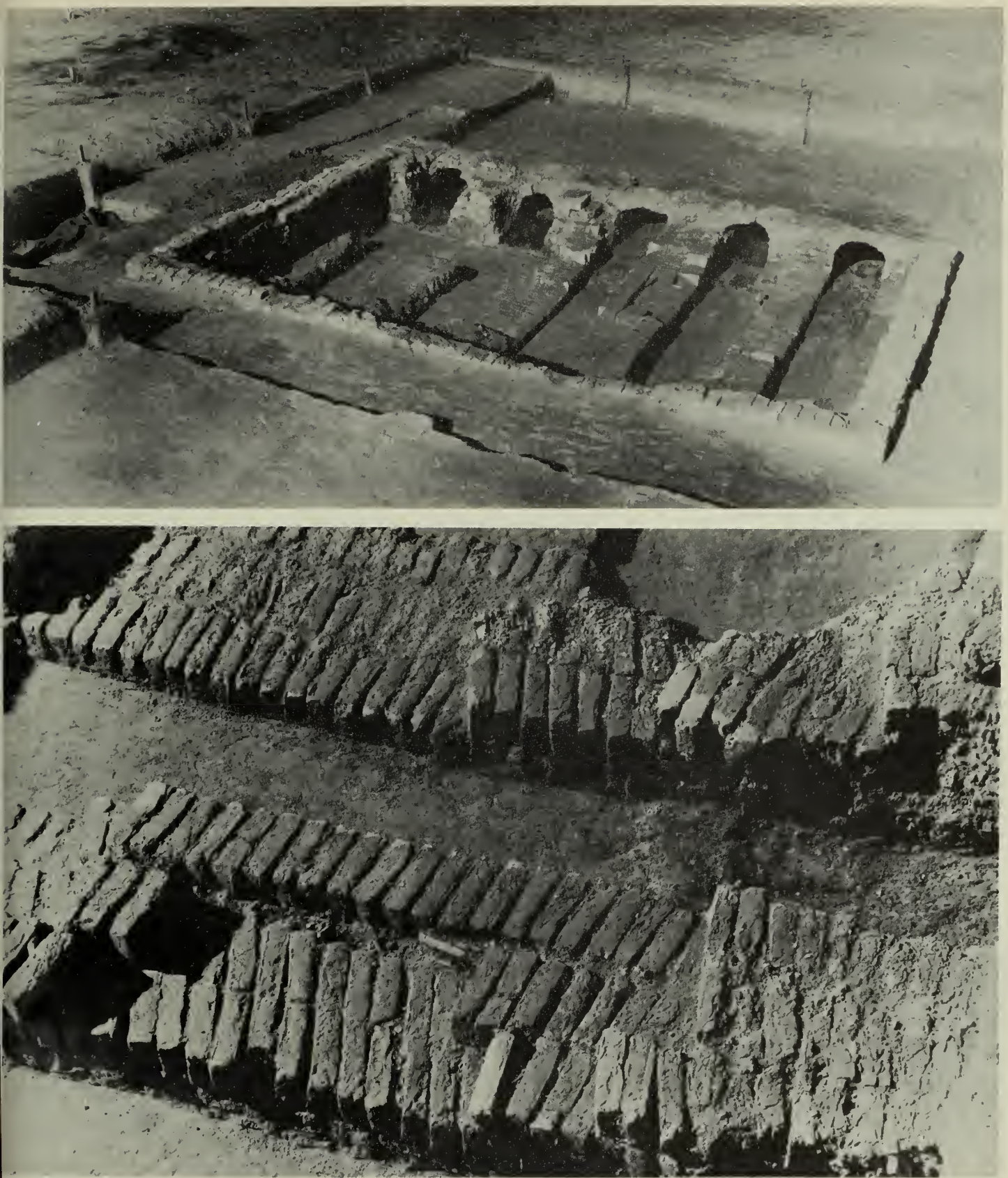


PLATE 51—*Brick Kiln, Structure 102*

A whole glass bottle found in the level on top of these deposits could not be found in the collection, but in the field drawing its shape is that of a late 18th-century wine bottle.

STRUCTURES 103 AND 104

Both Structures 103 and 104 were encountered in 1941 by J. C. Harrington in the course of testing by means of 10-foot trenches immediately west of the Tercentenary Monument. Neither structure was developed and recorded, and only brief notations were made as to the first evidence encountered, after which the excavations were stopped and the fill replaced.

Structure 103 (Lot 99:98) is merely identified in the field notes as an indicated earth cellar with a maximum depth of 4 feet from the 1941 surface. It was encountered beneath a seal of old humus which lay beneath the present sod line. Within the cellar, beneath the earth floor level from 4 feet to 4.8 feet below the surface, was a pier of brick masonry 1.8 feet wide and of undetermined length, made up of 3 courses. An indication of the character and dating is given by the following field observation:

> The fill in this "cellar" is made up of definite loading strata of varying materials, all being convex on their top surfaces, showing that this fill was dumped in fairly large quantities, probably all at the same time. There is more building debris near the bottom. These loading layers are not being shown on the drawings, since it is obvious from the artifacts that the fill is all 18th century or later.

Structure 104 was encountered just as the 1941–42 field season closed in midwinter. The structure was not even drawn on the field plat and does not appear on the archeological base map. The sum of information on this structure appears in field notes as follows:

> Three squares (Lot 100:98, squares 19, 29 and 39) were not excavated completely. At a surface depth of about 0.6 to 0.8 feet several disturbed areas and brick from a structure were encountered. A layer of sand was spread on the floor of the trench before backfilling. (This structure has been given Structure No. 104.)

Harrington gives a more expanded commentary (1942b, p. 12), the substance of which follows:

The remains of a probable brick structure were found in a trench west of the monument. Excavations stopped at a depth of about 6 inches, but sufficient evidence was noted to show a structure had stood there, either a brick building or a frame building with brick footings. Harrington adds: "This may be part of the structure reported by Mr. Arthur Ayres [A.P.V.A. grounds maintenance man] as having been found when building the cement walk along the west side of the Monument. Also, it is located in approximately the position indicated on Col. Yonge's map as 'Traces of house foundations' " (Yonge, 1903, p. 17).

Structure 104 was located just south of Feature 1, Lots 100: 98 and 100:99, at the east end of the latter, which appears to have been a burned area 10 feet wide ranging east-west for over 90 feet.

Undeveloped evidence of Structure 103 and probably 104 suggests that 18th-century occupation and construction are represented in this locality. A cursory review of the artifact evidence now in the collection for these related lots and squares confirms this hypothesis fairly surely.

STRUCTURE 105

Undoubtedly Structure 105 was the most enigmatic building evidence discovered at Jamestown (Lots 94:106, 94:107 and 95:106). Bentzen reported this structure as "the house that was never built." (Bentzen, 1941, p. 3.) All that remained was a rectangular pit, apparently excavated for a cellar of a house that would have had the same dimensions as Structure 17. The pit measured 65 feet by 45 feet, with the long axis parallel to the river, and was from 4 to 4.5 feet below the surface of 1940.

From the plan and profile we may infer that the accumulation of fill began after a brief period of wash which left a laminated deposit devoid of cultural material at the pit bottom. The primary fill was evidently deposited quickly. It contained little cultural material (none at all survives in the collection) and consisted of clean sand and clay with large lenses of darker earth. This deposit settled toward the middle of the pit. Above this deposit and beneath the old humus was an old fill zone which was general over the area, not over a foot deep, on the average. A few objects in the collection ostensibly from this old fill zone include sgraffito, Dutch gin, early wine bottles, and window glass.

The most logical assumption, of course, is that another unit of 3 joined houses was planned north of Structure 17, in which case a lane must have existed between. Another implication here is that, if a 3-unit house matching Structure 17 was projected, Structure 17 itself may have been built as a 3-part house rather than a structure which began as the central unit ("The First Statehouse") to which was added first east, then west units. The idea that this structure at first had been only a third or two thirds its final size is an architectural improbability.

STRUCTURE 106

Structure 106 (south-east corner of Lot 99:100) was one of the early excavations (1936). It is entirely possible that this

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Upper.—Overall view of Glasshouse site ruins uncovered in 1948. Structure 107 is at the right, 108 in the background, 109 at the left. The pile of stones at the left was accumulated during excavating, all having come originally from the glass furnaces.

Lower.—Structure 107 at Glasshouse Point as it appeared, completely uncovered, looking southwest. This is the main working furnace, showing details of construction and pieces of slag at the rear of the fire chamber.



PLATE 52—*The Glasshouse Ruins*

rectangular pit area represents an excavation in which a house foundation, possibly with cellar, was once placed. However, an equally plausible alternative is that this excavation was a pit intended for a cellar, but never completed. Also it may have been a borrow pit from which clay was obtained, possibly for the brickmaking operations at the Structure 102 kiln, some 230 feet to the northwest. The pit (like Refuse Pit 1, which was demonstrably a borrow pit) was filled with similar refuse, i.e., brickbats, mortar, and discarded objects of many types, mostly household. Still another possibility is that this pit was originally dug to receive refuse, since the sides were gently sloping and contained no constructed masonry traces. The present writer feels that this pit was used as a refuse pit deliberately, and that its identity as a building foundation excavation is not proved.

The dimensions of this rectangular pit are 41 feet east-west, 24 feet north-south, approximately oriented on magnetic north. Structure 19B, a double house, lay 37 feet east, and Well 11, about 14 feet to the northeast. At the center the pit was 3.5 feet below the surface or 2.8 feet below the bottom of the humus zone, in undisturbed clay. The slope from the edge of the pit to the maximum depth was regular and measured 10 feet.

The pit content was described by the excavators as "dump material consisting of brick, tile, mortar, charcoal, pottery, nails, iron objects and glass." A detailed review of objects in the Jamestown collection which can be associated with this pit fill, plus further reference in the excavator's notes, indicates that the fill was characterized by a large amount of brick debris. From a single 10 foot square within this fill, 180 clean bricks and 20 bricks with mortar attached were counted. Some tile was noted, although it was not described. Probably it was all roofing tile. Although "pottery" evidence is mentioned, only one jar is identifiable at this time. This jar is described as olive colored with light-tan paste, lead-glazed, and characterized by 2 unique vertical lugs at the neck and shoulders. The lugs are placed opposite to each other and each is perforated with 2 holes for suspension. The most significant ceramic evidence is that of tobacco pipes which would appear to be associated with mid-century, judging from the apertures of white stems. Yet 4 white bowls are definitely last-quarter 17th century. Brown stems and bowls are as numerous as white, and are obviously locally made. Their dating is questionable except by reference to the white samples.

Other good dating evidence for Structure 106 comes from the wine-bottle fragments, 3 of which suggest third-quarter and 4 fourth-quarter 17th century clearly. One is early 18th century.

The most logical interpretation of the fill and use of the Structure 106 pit is that it was dug for an unknown purpose in the third quarter of the 17th century or possibly even before the first half, and was filled with the refuse of a burned brick structure. It seems reasonable to suppose that the burned structure was Structure 19A, since the artifacts are predominantly third quarter. The original destruction of Structure 19A must have taken place prior to the superimposed Structure 19B, the date of which comes close to the end of the 17th century.

STRUCTURES 107, 108A AND 108B, 109, AND WELL (UNSPECIFIED): THE GLASSHOUSE SITE

The most meticulously recorded and completely reported structures related to Jamestown Island are those of the Glasshouse site. Drawings have been finished and are exhaustive in detail and accuracy. The reader is referred to these drawings, on file at Jamestown, and to J. C. Harrington's booklet entitled *Glassmaking at Jamestown* (Harrington, 1952). For the present report, only a summary is offered.

The Glasshouse structure complex consisted of a working furnace (Structure 107); a fritting furnace (Structure 108A) joined to an annealing furnace (Structure 108B); a pot kiln (Structure 109); a cullet pile; a clay pit; and a well. Extensive test trenching to the north, south, and east failed to locate traces of dwellings or other structures, except the "greate road" (Road 1), which was found to bend around the Glasshouse cluster between the structures and the shore. The structures of the Glasshouse all were within Lot N 143, E 75.

The late Jesse Dimmick who owned the property before it was acquired by the National Park Service identified the Glasshouse site and uncovered some of the structural and artifact evidence in the 1920's. Prior to the actual re-establishment of the site through structural evidence, the location had been referred to as Glasshouse Point ever since the 17th century. Until the Revolutionary War period the causeway between Glasshouse Point and Jamestown Island had remained sufficiently intact to permit the continued use of the "greate road" which led to Green Spring Plantation and thence to Williamsburg.

Structure 107, the main working furnace, was roughly circular, 9 feet in average diameter, and built of cobbles or large river pebbles above a stone paving. Through the center of the paving lay a chamber 2 feet wide and 2 to 6 inches high. Thick deposits of slag lay on this paving, and at either side, 1 foot above, were traces of the platforms or "sieges" on which the crucibles for melting the glass were placed. The front of the furnace had a 3-foot extension also with a stone floor. Although only the furnace base remained intact, fragments of the working hole frames had stone spalls fused to them. This indicated that the entire structure had been of cobblestones obtained from an undetermined location further up the James River, towards the fall line. In a pit located immediately west of the furnace opening were found fragments of furnace refuse, including fragments of old melting pots, working hole frames, glass drippings, slag, and ashes—all probably resulting from a cleanup operation in 1621 when the second glassmaking venture began.

Structure 109, the pot kiln, was a special furnace the use of which is not definitely known; however, it was probably a kiln for firing new pots and for preheating pots before they went into the extreme heat of the working furnace. This kiln was



PLATE 53—*The Glasshouse Furnace and Artifacts*

Upper.—Two auxiliary furnaces for annealing the blown glass.

Lower.—Artifacts found at Glasshouse excavations: A small crucible, rim of a working hole, a large crucible fragment, green glass fragments, and cullet. Many of the artifacts found at Glasshouse were from the fill of a refuse pit near the mouth of the large furnace, and possibly include debris from the original operations cleaned up when the furnaces were reconstructed 10 years later.

built of large river stones, but it had the smallest fire chamber of all the structures at Glasshouse—4½ feet long and 1½ feet wide. The antechamber and opening before the potrest at the rear of the kiln were paved with fewer than a dozen bricks. The measurements of these bricks were not recorded, but they were red to orange-red and relatively soft, corresponding to the bricks of Structure 108B, the annealing furnace.

Structure 108B, the annealing furnace, was built end-to-end with Structure 108A, the fritting furnace or perhaps second annealing furnace. These furnaces were similar in the elongated forms. The annealing furnace had a small rectangular platform at the front, similar to the pot kiln, but built entirely of bricks. The fire chamber of 108B was 2 feet wide and 5 feet long and was likewise paved with bricks, affording a very important and useful observation regarding type and size, since this structure can be placed with finality as dating no later than 1621. Measurements and observations of these bricks (approximately 30) as recorded by Harrington are as follows:

> Texture and aspect, soft red (to orange-red as observed by Cotter in 1957).
>
> Size: Width—4⅛ to 4⅜ inches, average 4¼
> Length—8½ to 9¼ inches, average 8½ to 8⅝
> Thickness—2¼ to 2½ inches. (Very few measurements obtained.)

Structure 108A, the fritting furnace, or possibly a second annealing furnace, resembled its neighbor, 108B, but had a stone platform and a stone-paved fire chamber, rather than one of brick paving. The longest of the 3 small structures, 108A, had a chamber of length of 6½ feet. The walls of the joined structures were less than 1 foot thick, of comparatively small cobbles, so that the arch was probably low. A square stone platform placed at the side of Structure 108A, at the rear, provides a clue to the original use of this furnace, described by Harrington (1952, p. 26), as follows:

> The square stone platform outside and at the back of this furnace shows evidence of having been subjected to heat after being laid in place. The only reasonable conclusion is that the hot "frit" was shovelled or raked out of an opening near the back of the furnace onto this platform. If this interpretation is correct, then (Structure 108A) would have been a low, arched, tunnel-like structure, probably having a raised stone floor at the rear and an opening between this ledge and the square platform outside. There may have been one or more draft holes in the top of the arch.

The well near the furnaces yielded no diagnostic artifacts (an indication of short duration of its use). Only a nearly intact barrel 4 feet high, of oak staves, bottomless, and bound with iron hoops, lay at the usual position, in the bottom of the well. When excavated, the sides were of earth, although an original frame siding may have rotted in the ground without leaving a trace above the barrel which was preserved below the waterline.

Artifacts

Many glass fragments from the Glasshouse site were examined and analyzed by J. Paul Hudson at the Corning Glass Research Institute laboratory in 1958. Among them were fragments of the following objects, which appear to have been made at Jamestown in 1608–9: window panes, small bottles, and simple drinking vessels. Although no beads were found, presence of cobalt blue in the crucible indicates that experiments were made to produce beads. (Nearly all beads from the Jamestown collection are clearly Italian, probably from Venice.)

STRUCTURE 110

On the north side of the New Towne area at the edge of Pitch and Tar Swamp are the remains of a small building, Structure 110. This was a rectangular structure with inside measurements of 21.5 feet by an average of 20.3 feet (Simmons, 1955a). The sides face approximately the cardinal directions with the longer sides to the north and south. There is no evidence of interior partitions. At the southwest corner of the building is a sizeable fireplace projecting southward from the south wall. Structure 110 and Structure 111 are both located in Lot 102:103.

The existing ruins consist of exterior brick wall foundations on the 4 sides. Square red ceramic tiles cover most of the interior floor. The surface of the floor lies 1 to 2 feet below the surface of the ground, and the height of the remaining walls varies from 0.3 to 2 feet. The wall foundations are of locally made bricks in the size range 8½ to 8¾ inches long, by 4 to 4¼ inches wide, by 2 to 2¼ inches thick. Irregular English bond was employed for the most part in the surviving portions of the walls, although the east wall—consisting largely of fragmentary bricks—exhibits no regular bonding at all. There are intentional 1-foot-wide gaps in the brickwork at the 4 corners of the building and a similar gap about midway in both the north and south walls.

The fireplace at the southwest corner projects outward, to the south, from the building proper. On the inside it measures 7.9 feet wide by 3.3 feet deep, and has a brick floor which rises about 1 inch higher than the general floor level of the structure. The interior corners of the fireplace are rounded

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Upper.—Ruins of a possible brewhouse or workshop completely excavated. The floor was paved with square tiles except within the large south (lower left) fireplace, which was paved with brick upon which Firebox B stood. Firebox A, adjacent, in the corner, and Firebox C, at the east wall, both stood on tile. The west (left) wall also had a brick-floored fireplace of smaller dimensions which may be seen opposite the man to the left.

Lower.—Structure 110 was part of a small industrial area at the edge of Pitch and Tar Swamp dating from the first half of the 17th century, and may have been a brewhouse. Capt. John Moone is known to have owned a brewhouse in 1655 in the "James Citty" area. Research by Kocher, Hudson, Cotter, and Jelks. *Painting by Sidney E. King.* (Note that the conjectural west fireplace is represented here as a more conjectural doorway.)



PLATE 54—*Structure 110—Ruins and Conjectural Painting*





PLATE 55—*Structure 110 Fireboxes*

smoothly. On the east side there is an iron strap ¼ of an inch thick and about 1 foot long embedded in the mortar between 2 of the floor bricks. It is probably an anchor to support a crane used in swinging heavy pots over the fire.

The most striking features of Structure 110 are the 3 brick "fireboxes": Firebox A built against the east wall of the building, Firebox B inside the large fireplace, and Firebox C against the west wall about 18 inches northwest of Firebox B. These were undoubtedly used as furnaces—Fireboxes A and C still retain charcoal and ash—but for what craft or industry is uncertain.

Firebox A is trapezoidal in peripheral outline and has a circular interior fire chamber. It lies against the east wall of the building and has its own brick floor which was placed over the tile floor of the building proper. A small stoke hole (1.4 inches wide) in the west side of the firebox leads into the fire chamber.

Fireboxes B and C are both cylindrical in shape. B rests on the hearth of the large fireplace, the bricks of the hearth serving as a floor for the firebox. A small flue which leads from the interior chamber into the south wall of the large fireplace was cut out after the wall had been constructed. There is a small opening (about a foot wide) in the north side of Firebox B through which the fire could be tended. Against the northwest exterior wall of Firebox B are 4 semicircular bricks stacked vertically 1 on top of another. They appear to have been dressed down from ordinary bricks.

Firebox C was built directly on the tile floor against the west wall of Structure 110, a few inches outside of the large fireplace. There is no sign of a stoke hole as in A and B. However, only a small portion of the original brickwork remains and originally there may have been a stoke hole which has now disappeared entirely.

The fill which overlay Structure 110 was 1 to 2 feet thick. It was removed completely during the 1955 excavations, at which time 3 distinct zones were noted:

Zone A was a heavy, compact zone consisting mostly of whole and broken bricks and pieces of roofing tiles. It rested directly on the tile floor and was banked against the south wall of the building, whence it extended northward about halfway across the floor before pinching out. This stratum seems to represent debris derived largely from the fallen south wall.

Zone B was a layer of mixed soil containing building detritus (fragments of bricks, tiles, nails, etc.) which lay immediately above Zone A in the southern part of the house and directly on the tile floor in the northern part.

Zone C was a superficial stratum of topsoil which blanketed the entire area, averaging about 6 inches thick.

Firebox A had a layer of charcoal some 2 inches thick on its floor, above which was Zone B fill. Firebox C also had a basal charcoal deposit (5 to 6 inches thick) but no separate charcoal zone was present in Firebox B. Both Firebox B and the upper part of Firebox C (above the charcoal) were filled with the Zone A rubble.

Several hundred artifacts were found in the fill of Structure 110, including clay pipe stems and bowls; metal tools; gun parts; glass beads; lead shot; a fragment of a large crucible used in the manufacture of glass; tiles which had served as bases for stacking pottery during kiln burning; and sherds of earthenware, porcelain, and glass bottles. Of special interest and significance are several dozen pieces of flat roofing tiles bearing glaze drippings which prove that pottery was made locally. In the manufacture of pottery it was customary when stacking the unfired vessels in the kiln to place each one of them mouth downward on a flat surface such as that provided by roofing tiles. If glaze had been applied to the vessel, it would frequently drip down onto the tile or other base, leaving thereon an outline of the vessel's mouth traced in the glaze drippings. Several tile fragments with such glaze outlines were found in the southeast part of Structure 110 on the tile floor. A number of others came from the Zone B fill overlying Structure 110. Similar pieces of tile were unearthed in the kiln area of Structure 111, from the trash accumulation in Refuse Pit 1, and in adjacent areas.

Also related to Structure 111 and Refuse Pit 1 is a fragment of a large glass-making pot or crucible which came from the fill overlying Structure 110. A similar crucible fragment and several fragments of granitic stone coated with glass drippings were unearthed at Structure 111. Pieces of the same kind of glass-covered stone were recovered from Refuse Pit 1. Glass manufacture was one of the first industries attempted at Jamestown, the glassworks being in operation in 1608, and again in the period 1621 to 1624 at Glasshouse Point on the mainland, approximately a mile from Structure 110. One of the pieces of fractured stone from Refuse Pit 1 and another fragment found at Glasshouse Point actually fit together like 2 pieces of a jigsaw puzzle. This showed that the stones, and undoubtedly the pieces of crucibles, were brought into the Structure 110-Structure 111-Refuse Pit 1 area from the ruins of the old glassworks at Glasshouse Point.

Glass from several square Dutch gin bottles was found in Structure 110, but only a trace of wine-bottle glass was recovered from the humus zone. Bowls and stems of the ubiquitous clay pipes were present. The pipestems are remarkable in that approximately half of them have molded decorations, a trait characteristic of Dutch pipes and of uncommon occurrence at Jamestown. Ten glass beads and 10 lead shot of "goose shot" size were found in a small hole in the floor and imbedded between the floor tiles immediately around the hole. Confinement to such a small area suggests that they were spilled from

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Upper.—Firebox B, with Firebox A at the right. It is thought probable that the fireboxes of Structure 110 may indicate use as a brewhouse. The aspect of the large fireplace, however, with the fireboxes placed on the bricks of the fireplace floor and the tile of the house interior, suggests other precedent uses.

Lower.—Firebox C.

a single container. Seven of the glass beads are yellow, two are clear, and the other is blue. All are of the small "seed" variety commonly used for trade with Indians over most of North America. Archeologist Kenneth Kidd of the Royal Ontario Museum has identified these beads as Venetian, probably of the 1600 to 1625 period.

The breech end of an iron musket barrel lay on the tile floor near the center of the building. It is a 17th-century type with bore diameter of 21 mm. (.83 inches) and was apparently discarded in the process of manufacture since no touch hole had been drilled into the firing chamber.

Perhaps the most significant artifact find at Structure 110 is the large group of sherds from earthenware vessels of local manufacture. The majority of these sherds were recovered from the fill of Zones B and C over the northern half of the building. At least 28 vessels and 8 vessel lids are represented by the fragments. Many of these show evidence of warping or cracking during firing, or possess other defects which indicate they are rejects from the pottery making activities thought to have been carried on at the nearby Structure 111 kilns.

Structure 110, then, seems to have been a relatively small building which was probably erected originally as a dwelling. Gaps in the brickwork at the four corners and in the middle of the north and south wall foundations indicate that some timbering was involved in the construction despite the solid brick foundation. The large number of tile fragments found in the fill testify that tiles were one of the important structural materials, and it seems likely, therefore, that there was a tile roof. The existing wall foundations are not wide enough to support brick walls over 1 story high.

At some unknown time after the house had been completed, the three fireboxes were added. This is shown by the facts that none of the fireboxes is bonded into the house structure proper and that the flue leading from Firebox B into the south wall of the large fireplace was chiseled through the brickwork after the wall had been completed. These fireboxes must have been for some sort of industrial use, but their exact function has not yet been determined. Suggested uses include baking, brewing, or distilling.

We are indebted to The Republic Steel Corporation through the cooperation of Dr. M. J. R. Morris, Director of Research for the Central Alloy District, who supplied the following analyses and conclusions after testing four samples of earth taken from around the bricks of fireplaces and hearth features:

TABLE II—*Chemical Analysis of Earth Samples from Structure 110*

Sample	*Identity*	*Fe*	*Al*	*Si*	*Pb*	*B*	*Ca*	*Va*	*Cu*	*Ag*	*Na*	*Zn*	*Ti*	*Ni*
314	Firebox B	++	—	VH	—	tr	tr	tr	tr	tr	tr	tr	—	tr
575	Firebox C interior, floor	++	—	VH	+	—	tr	—	—	tr	tr	—	—	tr
576	Floor area	++	—	VH	—	—	tr	—	tr	tr	tr	tr	—	tr
577	Fireplace in south wall, floor between bricks	++	—	VH	+	—	—	—	—	—	tr	—	—	tr

Dr. Morris concludes:

From these analyses there is no evidence that any type of metallurgical smelting occurred in the structure. The elements and their amount listed above are not different from what might be obtained from a poor quality fireclay or a loam.

We can only make the following observations: The structure was used for a low temperature operation. This is evidenced by the lack of fusion of the mortar or conversion of the quartz to higher temperature stable forms. That the structure was for a special use is indicated by the tiled floor. Among such special uses the low temperature possibilities would be: (1) the storing and drying of glass making crucibles or ceramic ware, (2) drying and baking cores used in casting pig iron products, (3) bread making or (4) some form of distillation, curing or smoking. Distillation of tar or pitch, although a possibility, would have left a carbon deposit in the mortar and brick which was not observed in any of the samples examined.

From Dr. Morris' excellent observations we need only conclude that the best evidence points to use of Structure 110 as a bakery or brewery. Since brewing is known to have been one of the community activities at Jamestown in the 17th century, and actual remains of coarse earthenware baking ovens have been found elsewhere, in Lots 93:110, 98:100 and 96:103 to the south, it follows that baking was not done in such fireboxes as those in Structure 110. Therefore, in its ultimate use, Structure 110 was probably one of the Jamestown breweries, the first mention of which was made by Capt. John Smith (Arber, 1910, pp. 887–888), who observed that as of 1625–29 "They have two brew-houses, but they finde the *Indian* corne so much better than ours, they beginne to leave sowing it [*i.e., wheat*]."

The artifacts recovered from the fill overlying Structure 110 can be dated approximately on a basis of typology. The use of English bond and the absence of Flemish bond in the brickwork, the presence of gin bottles and the absence of wine bottles, the presence of early 17th century forms of delftware and German stoneware, the early varieties of porcelain and the locally made earthenware, the absence of artifact types considered diagnostic of the post-1650 period—all these factors

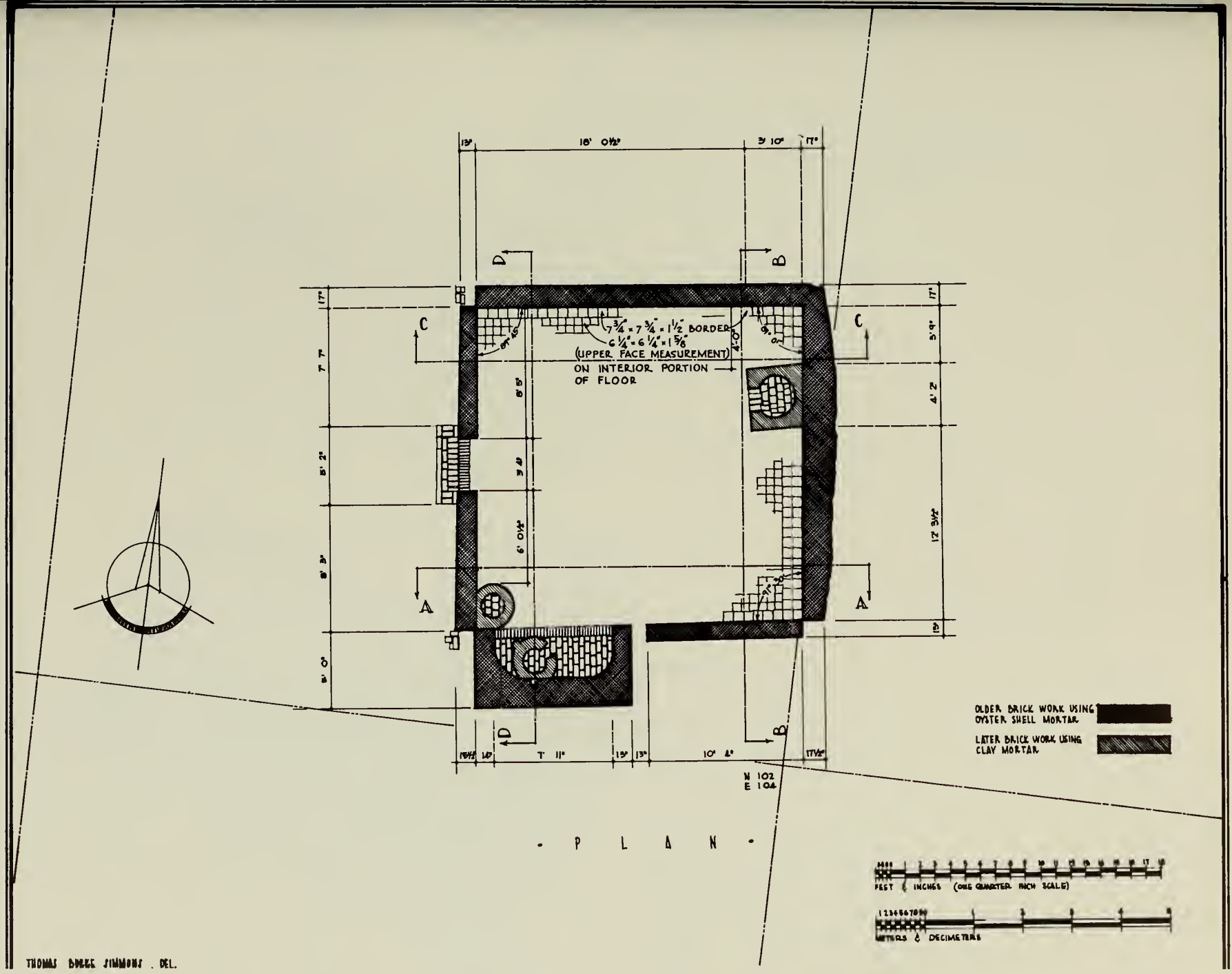
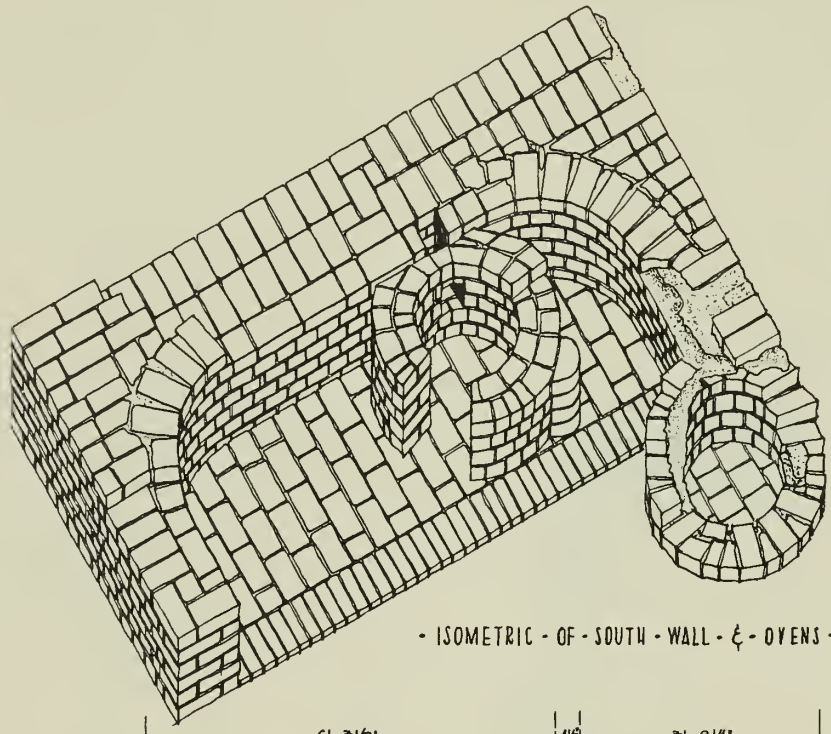
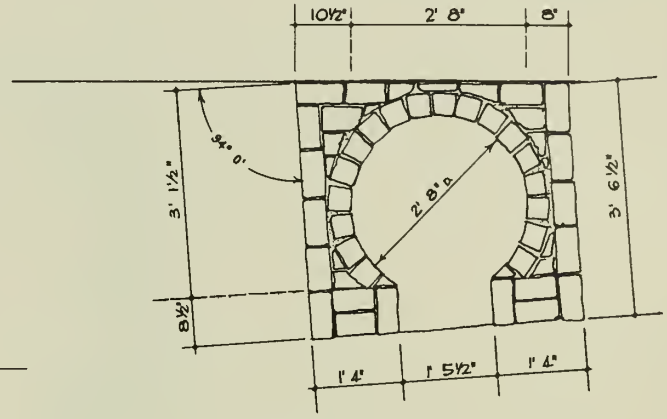
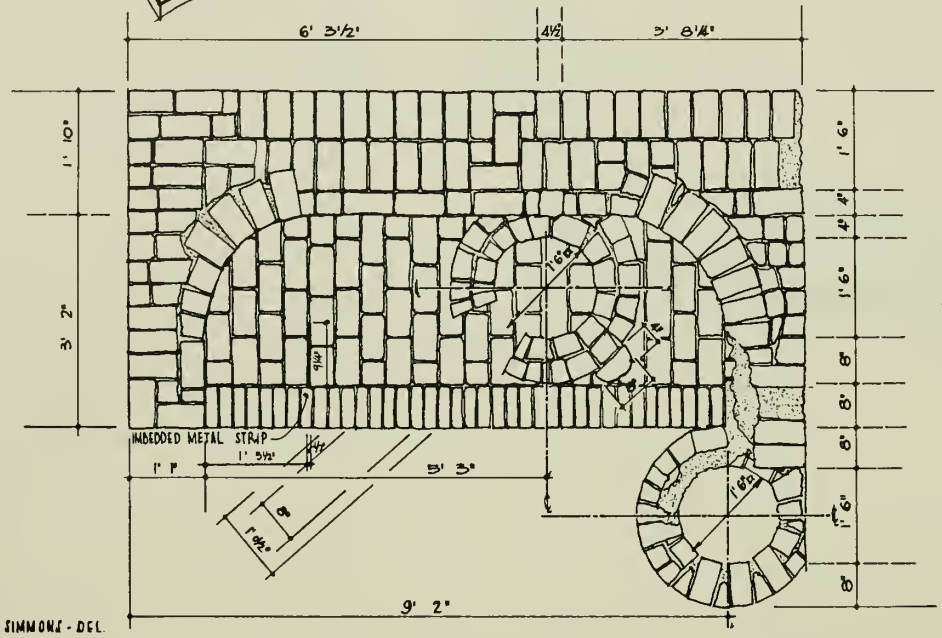


FIGURE 13—*Plan of Structure 110*

Plan of excavated foundation. *Historic American Buildings Survey drawing. Courtesy, Library of Congress.*







- PLAN - OF - SOUTH - WALL - FIREPLACE - & - OVENS -

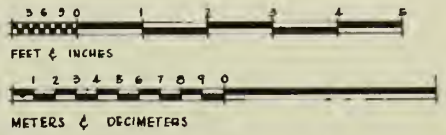


FIGURE 14—*Details of Structure 110*

Detail of fireboxes B, A, and C. *Historic American Buildings Survey drawing. Courtesy, Library of Congress.*

in combination reveal that Structure 110 most likely had been abandoned and was in ruin by 1650 or shortly thereafter. Furthermore, the glassmaking debris and the misfired pottery rejects provide evidence that the fill material overlying Structure 110 is contemporaneous with the upper fill material of the Structure 111 kilns and with the middle—and possibly the lower—zone of Refuse Pit 1.

Consequently the artifacts from those two places serve as cross-checks in corroborating the date of Structure 110. Since the artifacts from the Structure 111 kilns have been dated as belonging to the period 1620–50, and the artifacts from Refuse Pit 1 date from 1610 to 1650, it appears conclusive that Structure 110 had been abandoned and filled with earth and debris by 1650. Therefore, Structure 110 was probably in use during the period 1630–50.

There is the remote possibility that Structure 110 was originally a timber-framed house with clapboarded sides or wattled panels. In this case the bricks might have been added later to replace the clapboards or wattling. This does not appear likely, however, as the gaps in the existing brick foundations allow only for 1 upright timber at each corner plus 1 each in the north and south walls. This would leave gaps of over 20 feet across to be bridged by the plates on the east and west sides, an arrangement that is structurally unsound and not in keeping with traditional framing practices in England.

Architectural Details, Structure 110

Unit	*Description*
North wall foundation	Portions of first and second courses remain; type of bond could not be determined; foundation is 2 bricks wide (1.5′); first course consists of bricks set on edge; second course is of bricks laid flat.
East wall foundation	2 to 4 courses remain; first course is of whole bricks set on edge; second, third, and fourth courses are largely of irregular-sized bats laid erratically; interior of wall is in straight line, but exterior bulges out in the middle portion; wall width varies from 1.3′ at the ends to 2.3′ in the middle.
South wall foundation	6 to 7 courses preserved; irregular English bond; 1½ bricks wide (1.2′).
West wall foundation	1 to 6 courses, 1½ bricks wide (1.2′ to 1.4′); English bond, slightly wider at south end (1.4′) than at north end (1.2′).
Floor	The floor consists of a pavement of square ceramic tiles, 1 tile thick; 2 sizes of tiles are present; there is 1 row of the larger tiles along the outer edge of the north and south sides of the structure; there are 2 rows of the larger tiles along the outer edge of the floor at the east side of the structure; none of the larger tiles are at the west side; the rest of the flooring consists of the smaller size tiles; all tiles are beveled on 2 opposing edges so that the upper surface is larger than the lower surface; the tile flooring runs beneath Fireboxes A and C.
Subflooring	The tile flooring is laid on a general bed of sterile sand which rests directly on undisturbed clay.
Large fireplace in south wall	6 to 7 courses; south wall of chimney foundation is 2½ bricks wide (2.0′); east and west walls of chimney foundation are each 1½ bricks wide (1.2′); exterior corners are square while interior corners are rounded; brick hearth is raised 1″ above tile floor of the building.
Firebox A	Brick floor of firebox (1 brick thick) is laid on a ½″ bed of clay mortar which overlies the tile floor of the building; 1 to 3 courses remain (counting the brick floor, which appears from the exterior to be part of the firebox walls); there is no bonding to building wall or to building floor.
Firebox B	5 to 7 courses; rests directly on brick floor of large fireplace (this firebox does not have a separate floor of its own as does Firebox A); there is no bonding to either floor or wall of the large fireplace; some bricks have been dressed down into tapered forms to fit the circular pattern of the firebox; a small flue leads into the south wall of the large fireplace (this flue was cut into the wall after the wall had been erected); 4 semi-circular coping-style bricks (apparently dressed down from standard bricks) are stacked vertically against the northwest exterior wall of the firebox.
Firebox C	1 to 4 courses; rests directly on tile floor of building; no door or other opening in bottom course of bricks as in Fireboxes A and B; is not bonded to floor or wall.
Small hearth in middle of west wall	A single row of bricks set on edge faces into the building; "hearth" area is 2½ bricks or 2′ wide and 3.4′ long.
Mortar	The bricks are joined with clay containing no visible shell, lime, or sand.
Gaps in Walls	At each of the 4 corners and at the midway point of the north and south walls are square or rectangular gaps in the brickwork measuring approximately 1′ wide in each case, the other dimension being determined by the wall thickness at each particular spot.
Bricks	Locally made; hand molded. Color: dominantly red, with occasional dark-red to vermillion. Length, 8⅜″ to 8⅞″, av. 8⅝″ Width, 4″ to 4¼″, av. 4⅛″ Thickness, 2″ to 2¼″, av. 2⅛″ (Note: some of the bricks in the floor of the large fireplace measured only 1⅛″ thick, but this was very probably due to excess wear.)
Tiles	Locally made; hand molded. Color, red. Two sizes, both beveled on two opposite edges only. Large size, 7⅞″ by 7⅞″ for top surface. Av. 7⅝″ by 7¾″ for bottom side Thickness, 1⅝″ Small size, 6⅛″ to 6¼″ square on top surface. 6″ by 6⅛″ to 6¼″ on bottom side 1⅝″ thick

STRUCTURE 111

For convenience the designation, Structure 111, was given to a close cluster of three features, all of which are assumed to represent kilns of one type or another. Two of these features are rectangular, and one circular. The circular one possibly had a primary use as an iron smelting pit. Kiln A lies 3 feet to the north of the circular pit (Kiln C), and Kiln B, the edge of which is cut by Kiln C, lies at right angles to A.

Kiln A. First to be located by test trenching, this kiln appeared as a 13.5 - by 3-foot rectangular fire-marked shallow depression in the subsoil, oriented east-west. In the top of this feature, just below the humus zone, a quantity of white, lightweight material was observed which proved to be slaked lime derived from oyster shells. The trough-shaped firing chamber with clay bottom and sides showed evidence of intense heat. At the east end, the aspect suggested a rectangular flue which may originally have been of brick, although only a few broken brick fragments remained, none in pattern, at the time of excavation. At the west end of the presumed flue were two flat stones, on opposite sides of the trough. One of these stones had tool marks typical of dressed masonry. The other stone was identical in material with dressed stones from the glassmaking site at Glasshouse Point, and retained a well-preserved glaze on the top surface marked by a ring—an imprint from a round object, most likely a pot from which glaze had run down in firing. Evidence of this and other specimens of stone furnace and ceramic crucible parts in the Structure 111-Refuse Pit 1 locality show not that glass was made here, but that stones and other refuse were salvaged from the glassmaking site and reused here. Stone and refuse were useful in kiln building and operation at Jamestown.

Kiln B. This kiln, set at right angles to Kiln A, was 15 by 5 feet and was characterized by 2 narrow, parallel, trough-shaped firing chambers in place of the 1 broad chamber of Kiln A. A few scattered fragments of partially burned oyster shell here could well have been extraneously derived. It may be assumed from the limited evidence yielded by excavation that the flue was vented at the south end of the kiln. Kiln A was precedent to circular Kiln C in the latter's last stage.

Kiln C. This kiln is circular, 8 to 10 feet in diameter, and has a clay lining 9 inches thick at most. This lining has been baked to a deep-red color, grading to clean, yellow unburned clay beneath. A lump of pure gray clay, unburned and still malleable, as well as bits of limestone and bituminous coal were found in the top foot of Kiln C fill. Underlying this presumed kiln is a pit averaging 10 feet in diameter and having an entrance-like projection slightly less than 3 feet long to the east. This deeper portion of the pit has a zone of charcoal 1 to 2 inches thick along its sides and bottom. Over this zone is a layer of trash-bearing fill averaging a foot thick. At first this underlying pit was taken to be a trash deposit. However, the presence of iron ore (bog iron), some limestone and quantities of charcoal strongly suggest that the pit was used initially as an iron smelting device. Such pits were also associated with ironworking, and the presence of pieces of iron and metal objects also suggests possible proximity to a forge.

Artifacts

Only three objects of cultural significance were recovered from the shallow deposits overlying Kilns A and B. A roofing tile at Kiln B is unimportant. However, two fragments of granite stone covered with vitreous glaze were in the base of Kiln A. These were identical in type with glaze-covered granitic fragments discovered at the Glasshouse. (Note further evidence found in nearby Refuse Pit 1, including a fragment which actually fitted into a fragment from Glasshouse Point.)

The balance of artifact evidence was from Kiln C (actually the deposit overlying a circular pit) and from the deeper fill of a pit beneath the kiln layer. This may indicate metalworking and perhaps even smelting of limited amounts of bog iron ore within the pit.

In Kiln C proper (overlying stratum), 246 pieces of flat roofing tile were recovered, of which 12 were glaze-marked indicating use in a pottery kiln. A good representation of local lead-glazed earthenware was present, but no other ceramics. Significantly, no metal objects or slag traces were found here, although pieces of limestone and burned oyster shell did occur. One gin-bottle fragment, pieces of window quarrels, and three scraps of indeterminate mammal bone, completed the evidence found in the kiln stratum.

The pit beneath Kiln C proper was rich in artifacts, the majority of which were metal. Only 34 flat roofing tiles were located here, 2 of which were glaze-marked—all possibly intrusive from the kiln above. Although not numerous, earthenware pieces were present in variety, including local lead-glazed, an English marbled slipware bowl fragment, some English green, dark and light lead-glazed fragments, some delftware, and a two-handled Hispanic jug with narrow spout and partly covered with thin lead glaze. All of this earthenware represents types familiar to the first half of the 17th century. Seven fragments of blue-on-white Oriental porcelain are indeterminate except that they are within the provenience of 17th-century manufacture.

The most diagnostic artifacts, chronologically, are the clay

Upper.—This structure consisted of two pottery kilns at right angles, a problematical pit between them, shown here with the lower portion of the fill sectioned east to west. The shallow upper fill was deepest to the west (left), sloping up steeply to the west, with a well defined bottom showing heavy burning. The lower fill had several metal objects from the first half of the 17th century, and some evidence of iron smelting.

Lower.—The pit (within the angle of the two kilns) which may have been used for smelting, or certainly, ironworking. The pit is shown cleared except for a remnant of fill in the far half.





PLATE 56—*Structure 111—Pottery Kilns and Pit*

tobacco-pipe fragments, including three bowls, which clearly indicate the first half, specifically the second quarter, of the 17th century. It is important to observe the confirmation in this instance of Harrington's stem hole diameter dating estimates (Harrington, 1954). In Kiln C pit, 15 stems are 8/64 and 3 are 7/64 of an inch in hole diameter, placing the pipes specifically in the 1620–50 period. The bowls associated are clearly of this period.

The second quarter dating for Kiln C pit is borne out equally well by glass evidence (8 gin-bottle fragments, 3 partial bottles, and no wine-bottle fragments), and by metals (attachment strips for a pole arm and numerous light armor fragments).

Strong possibility that Kiln C pit was used for smelting may be seen in pieces of slag, limestone, burned lime from oyster shells, bog-iron nodules, some pieces of iron ore with bits of charcoal interspersed, and charcoal bits. The substrata may well suggest use as a forge pit as well. This is indicated by 115 handwrought nails, the armor fragments, a broadsword basket hilt (J-7081), kettle fragments, copper strips, and a curved lump of lead from the bottom of a melting pot.

Associated Features

Two closely associated features are undoubtedly related to the kiln complex designated Structure 111. These are Structure 110, 20 feet to the east, the problematical workshop indicated by a brick foundation with a tile floor and 3 brick fireboxes; and Refuse Pit 1, 10 feet to the south, the 40-foot square area presumed to have been a clay borrow pit. This pit was ultimately filled with town refuse and waste material from the nearby kilns and workshop. Although Structures 113, 112, and 117 all lie within a radius of 160 feet of the kiln complex, no definite association can be established between them.

Summary

Structure 111 is an inclusive designation for a cluster of three kilns which may or may not have been encompassed by a single structure. Most probably they were open to the weather. Of the 2 rectangular kilns lying at right angles to each other, 1 at least had a secondary use as a lime-burning device. The circular kiln may have been preceded by a smelting or metalworking pit, as indicated by iron and steel objects and raw materials required by iron smelting.

According to Malcolm Watkins of the U. S. National Museum, all three kilns are of the proper design and dimensions to have been used for firing pottery. Potsherds from the kilns and their immediate surroundings appear often to be rejected material from pottery manufacture, that is, they are apparently from vessels which warped or collapsed during firing. Roofing tiles and 1 stone bearing the impressions of pot bases or rims outlined in glaze drippings were found in Kiln A and elsewhere in the vicinity. Unquestionably these show use of such devices for supporting pottery vessels as they were being fired.

STRUCTURE 112

Structure 112 was a large building located on the northwest side of New Towne atop a low ridge, some 300 feet south of Pitch and Tar Swamp. The remaining brick foundation measures, on the inside, approximately 48 feet long by 30 to 31 feet wide (Simmons, 1955b). Near the middle of the south wall are the foundations of a porch or similar structure. The long sides of the building face approximately north and south. A small room about 6½ feet square is appended to the west side of the porch, the west porch wall and the adjoining portion of the main building's south wall serving as two of its walls. A large H-shaped chimney foundation lying 15 feet off the southwest corner of the main structure is herein considered part of Structure 112. Several subareas within Structure 112 can be recognized as probably having been individual rooms, porches, or other distinct architectural units. These have been assigned letter designations (Room A, Room B, Room E, etc.) for convenience of reference.

There are two main parts to the building—the cellar, running completely across the north side of the house, and the non-cellar portion, including the front porch. Visible structural remains consist of brick cellar walls, brick wall foundations outside the cellar area, brick flooring in the cellar, tile flooring on Room E, charred timbers in Rooms G and H, 2 H-shaped chimney foundations (1 inside the house, the other 15 feet southwest of the house proper), and 2 brick fireplaces in the cellar.

That portion of the house lying south of the cellar has been divided into 5 subareas, Rooms A, B, C, D, and F, plus Room E, the small area paved with ceramic tiles. Room A is a small enclosure, about 6½ feet square, nestled in the corner formed by the main south wall of the house and the west wall of the front porch. The west and south walls of Room A are delineated by single lines of bricks laid end to end, with a vacant interval of 2.2 feet in the south wall. The heavy house and porch walls, of course, served respectively as the north and east walls of Room A. The lines of bricks marking the south and

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Upper.—Structure 112, the largest single-unit house so far (1957) discovered at Jamestown, seen from the west. The cellar portion is to the left, at the far end of which is the pile-driving weight (Plate 58). Spaced recesses in the south wall suggest large wooden upright members. A trace of the double footing for the west wall is in the left center foreground, part of evidence of two building stages (Lots 101:101, 101:102).

Lower.—Ruins completely excavated, viewed from the east. The three header bricks and the base upon which they rest at the lower center of the picture mark the southeast corner of the house. To the left of this corner is a double line of brick rubble deposited in the top fill of Ditch 79 (nearest the camera) and Ditch 80, a serpentine ditch probably of the 18th century. Both ditches intersected the southeast corner of Structure 112.





PLATE 57—*Excavated Foundations of Structure 112*



PLATE 58—*Structure 112—Cellar Details*

west margins of this tiny room are not bonded into either the porch foundations or those of the main south wall.

Room B is the designation assigned to the front porch area. There are relatively heavy walls on the east, south, and west sides, but only a single line of bricks—placed side by side and broken by a gap of almost 6 feet—locates the north edge of Room B. The porch foundations are 19 to 20 feet wide and extend outward about 8 feet from the building proper. The east wall foundation is a double one, with an opening a foot wide and 7.2 feet long sandwiched between 2 walls of coursed bricks.

That portion of the first-story area lying west of the interior double chimney was labeled Room C. This area actually is rather large (approximately 15 by 25 feet) for a single room and may have been partitioned into two smaller ones. However, no physical evidence of any such partition was observed. The western side of the large double fireplace heated Room C, and the row of bricks connecting the north side of the chimney foundation and the basement area probably marks the east wall of the room. The architectural function of the 11-inch-by-3-foot-6-inch-brick footing (?) in the southeast corner of Room C has not been determined, but it may have supported a partition wall between Room C and Room E. No remnant of a northern wall for Room C has survived unless it is the short, single row of bricks near the south edge of the basement.

Rooms D and F are separated by a narrow row of brickbats running north and south and extending underneath the tiled pavement of Room E. The double chimney foundation, together with the partition wall foundation projecting northward therefrom, marks the east edge of Room D. The remaining section of the east main exterior wall foundation delineates the east wall of Room F. The south margins of Rooms D and F are defined by the north edge of the Room E pavement, but there is no sign of wall foundations or other structural remains to distinguish the northern boundaries of Room D and F.

Room G, at the west end of the basement, has a floor of bricks laid in north-south rows. The floor level is 3 to 4 inches higher than the floor level of Room H, adjoining on the east.



Left.—West end of the cellar of Structure 112, showing the double portion of the west wall. Had the excellent inner wall been standing after the initial destruction of this structure, it would have seemed logical to build upon it, rather than upon the poorer footing outside it. Hence, it may be more logical to assume that the original wall is the outer one, and the inner, better wall is the subsequent reconstruction. This, however, is conjecture, as the evidence was not conclusive at the time of excavation.

Above.—Octagonal cast ingot of iron with loop at the top. This object, identified as a pile-driving weight, was found lying with loop down on the cellar floor of Room J, Structure 112.

The floor of Room H also consists largely of bricks laid in north-south rows, but there are some irregularities in the brick pattern, and a flagstone about 2 feet long is incorporated in the floor on the west side of the room. Along the west edge of Room H, a charred timber lies flush against the low step resulting from the higher elevation of the Room G floor. The intact portion of the timber, which measures 6 feet 6 inches long by 5 inches wide, extends across the south half of the room, and is joined to a 3-foot-long timber. The shorter timber, also charred, projects eastward at right angles. A small segment of brick wall standing on the south side of Room H reveals the presence of a corner at that spot. This indicates that the room was L-shaped rather than rectangular. Traces of shell-lime plaster adhere to the interior faces of the wall segment.

The floor level of Room I is about 1 inch higher than that of Room H, and the checkerboard pattern of its brick floor sets it off from all the other basement rooms. Each checker in the floor is made of 2 bricks laid side by side to form a square. The squares are arranged so that the bricks in each square are perpendicular to the bricks in all adjoining squares. A fireplace with a brick hearth opens into Room I from the south side. The east end of the hearth is missing, but enough is preserved to show that the fireplace was at least 6 feet 7 inches wide by 2 feet 10½ inches deep. The level of the hearth is the same as the floor level of the room. A single row of bricks set on edge separates the floor from the hearth. On the west side of the room, 2 small flagstones, neither more than 1 foot across, are set among the bricks to form part of the floor.

The eastern 21 feet of the cellar is occupied by Room J. This area is large enough to have been divided into two separate rooms, but no indication of a partition was found. The brick floor is composed of rows running north and south except for a series of short east-west rows at the extreme east end of the room. A small fireplace is situated on the south side of Room J, and a 6-inch gap in the flooring extends across the front of the fireplace. The hearth area is depressed about 3 inches and has a clay floor.

About 10 feet from the southwest corner outside of Structure 112 is a large H-shaped chimney foundation. It is oriented approximately the same as the Structure 112 house, with the 2 opposing fireplaces facing north and south. Because its bricks are similar to those in the main building and because of its location and orientation, this double fireplace is considered to have been closely related to the large house. Therefore, it has been included as part of Structure 112. The 2 arms of the northern fireplace embrace undisturbed clay which has been burned a deep red to a depth of 3 or 4 inches. Perhaps this chimney was in a kitchen or other outbuilding of the main house.

Most of the brickwork in the ruins of Structure 112 is laid in English bond with the notable exception of the north wall of the basement which is of a very erratic Flemish bond. All wall foundations rest directly on undisturbed clay except the main house wall at the west end of the basement, which overlies a thick zone of detritus. The mortar binding the bricks together is similar throughout the entire structure, having the appearance of sandy mud with inclusion of a small amount of shell lime. The square tile pavement in Room E is set on a bed of the same kind of mortar.

The first story foundations of Structure 112, south of the cellar, were covered with a mantle of soil containing refuse and building detritus. The upper 6 inches or so of this overburden had been disturbed by plowing while the underlying material showed little or no evidence of serious disturbance. The cellar was filled with a compact mass of rubble made up mostly of bricks, mortar and plaster, with a few nails and other pieces of building hardware scattered sparsely throughout. This rubble zone, which measured from 2 to 4 feet thick, was topped by a superficial layer of soil averaging about a foot in depth. A general layer of charcoal, up to 4 or 5 inches thick in places,

lay on the basement floor beneath the zone of heavy rubble, indicating that Structure 112 must have been destroyed by fire.

After the remains of the entire building had been exposed, bricks were removed from sections of the cellar floor to ascertain what lay underneath. Here it was discovered that a clay basement floor had been used for a considerable length of time before the brick floor was laid down. Spread over the original clay floor was a thin accumulation of household trash mixed with sand and charcoal over which, in several places, layers of clay or mortar had been added later as a base for the brick flooring. Room G had a mortar base beneath the brick floor and Room J had a clay base, while in Rooms H and I there was no prepared base at all, the floor bricks being laid directly on the old clay floor and its accumulation of trash. Perhaps the primary purpose of the clay and mortar was to level the subfloor before the brick floors were installed. Beneath the tile floor of Room E also is a layer of mortar 1 to 1½ inches thick, underneath which is a 1-inch layer of sand resting on a zone of building debris and other trash 0.5 to 0.7 feet thick.

Artifacts recovered from Structure 112 include items of hardware (hinges, locks, nails, and spikes); building materials (flat pantiles, slate, plaster with lath impressions, ornamental plaster, lead window cames, and glass panes); various household objects (pottery vessels, porcelain vessels, glass drinking vessels, gin bottles, tobacco pipes, straight pins, and glass beads); such miscellaneous items as lead shot, cannon balls, and a 1,200-pound weight probably used as a pile driver. Only 9 wine-bottle fragments were found.

In the southwest corner of Room G, in the charcoal zone just above the floor, 11 small fragments of a human skull (designated Burial No. 3) were found. They are badly charred, and their inclusion in the layer of heavily burned material suggests that the person may have perished in the fire which destroyed the house. No other human bones were found in Structure 112 even though the building was completely excavated. Consequently the circumstances which caused the skull fragments to be there must remain a mystery.

The body of the 1,200-pound weight is octagonal in cross section, 1.2 feet high, with a big iron loop at the upper end to which a large line could be attached. It was found against the east wall of the basement in Room J in upsidedown position. The big loop was buried in the clay floor and the bottom was in an upright position like the top of a table. This heavy weight was undoubtedly designed as a pile driver or other weight-driven machine.

Another unusual find is a piece of ornamental plaster in the form of a lion's head, probably a sample of pargeting from the ceiling or the wall over a fireplace. It was unearthed in Room A.

Artifacts

Structure 112 artifacts provide reasonably certain dating inasmuch as provenience was recorded for all significant occurrences.

Particular pains were taken to obtain all artifact evidence beneath the brick paving of cellar rooms. Altogether four zones were discovered beneath this brick floor. Each zone represented a thin layer of fill deposited on the unpaved floor of the cellar when it served the original house. Of special importance is the evidence in Room J, where Zone 4 (the lowest and oldest floor level) yielded 11 tobacco pipestems, 9 of which were $^{9}/_{64}$ inch in diameter of aperture, 1 was $^{8}/_{64}$ and 1, $^{10}/_{64}$ inch—most significantly and definitely first quarter 17th century. One stem had a "WB" initial, and it may be relevant to note Adrian Oswald's article, "The Evolution and Chronology of English Clay Tobacco Pipes" (Oswald, 1955, p. 244) where we read under Chronology of Types:

> 1. c 1580–1630. . . . [This type] does not occur in any group after 1640. The same type was found at the bottom of the City Ditch at Cripplegate Building in deposits of the latter half of the 16th Century. The only makes which can be possibly identified are WB, incuse on pipes at the British Museum and Guildhall Museum, and IR on pipes from London, Ipswich and Worcester. The former may refer to William Bachelor or others and the latter to John Rogers living in Ratcliffe Highway 1620.

Of course, these are also the initials of William Berkeley (he became Governor in 1641), but it is not known whether he had any of his clay pipes so initialled for his use at Jamestown—initials on clay pipes are usually maker's marks—and the types antedate Berkeley's life at Jamestown.

No artifacts found beneath the brick flooring indicate dating in the second half of the century. The only glass fragments are of a gin bottle and some window quarrels. Present are earthenware vessel fragments including German stoneware, delftware, and local lead-glazed ware—the last significantly pointing to a very early beginning of pottery making at Jamestown. Handwrought iron nails and a brass tack comprise metal evidence.

Artifacts in contact with the brick floor surface of the cellar are comparable to those from Rooms G, H, I, and J. This detritus, mixed with a concentration of charcoal and other debris from the final burning of the house, includes white pipestem fragments of the 1650–80 period (5—$^{7}/_{64}$; 3—$^{8}/_{64}$), delftware and Lisbon majolica, and brown-mottled stoneware. Coarse-tempered utility earthenware from North Devon is strongly represented, and a portion of a Chinese porcelain cup was recovered. Metal objects comprised chiefly nails, all handwrought, and of various sizes. Three hinge fragments, including an 11-inch strap hinge, 2 pintles, and a 4-pound solid cannonball, 3 inches in diameter, completed the iron objects. A fragment of braided copper wire and an indeterminate brass button-like object were the only non-ferrous metals.

Some lath-marked plaster lying upon the floor bricks indicates the wall dressing of the room above. Pieces of slate were probably from the roof. Iron salts preserved a few traces of rough cording.

The lowest foot of fill proper in the cellar above the brick floor yielded a quantity of artifacts. Here white pipestem fragments suggest a dating of about 1650 and a little later, while

3 pipebowls (one "EL") fit into the 1650–75 period. Other earthenware examples show that North Devon coarse-tempered utility ware is well-represented—better, in fact, than locally made lead-glazed ware. A little delftware and stoneware were present. All evidence here points generally to a dating relevant to the final structure, although items of hardware from the house may well antedate by several generations the objects which were in daily use, as one could expect. A great quantity of handwrought nails—12½ pounds—was scattered through the fill, with four strap hinges, a pintle and a number of barrel hoop fragments. And here for the first time wine-bottle fragments are encountered in small numbers, indicating a post-1650 dating.

A large quantity of artifact material was recovered from the mixed rubble of the cellar fill proper. From surface to floor, tree and brush roots made stratigraphic observations difficult. Since there is little indication of 18th-century or later occupation here, it can be assumed safely that we have again a fair representation of artifacts belonging to the last structure at the time of its burning. In this fill most earthenware is locally made, lead-glazed, and only a single sherd of North Devon coarse-tempered pottery was found. English white delftware is present in quantity with a small amount of Lisbon majolica and Oriental porcelain.

White tobacco pipes range from $\frac{6}{64}$ to $\frac{9}{64}$ of an inch in hole diameter, with the majority $\frac{8}{64}$. The bowls indicate 1650–75, with one "EL" mark present. Thus, a definite indication of third-quarter association is again present for the last house. Metals are very numerous and hardware is indicative of interior carpentry—doors, chests, locks, and domestic gear, such as knives and scissors, kettles, and many barrel hoops. Gin-bottle fragments outnumber those of wine bottles, but evidence of both is weak. Plaster fragments are lath-marked and roofing materials are represented by pantiles, flat tiles, and slate, none noticeably predominant.

To obtain an undisturbed sampling of artifacts, the foundation area of Structure 112 south of the cellar—the major portion—was tested from 1 foot beneath the surface to the masonry or undisturbed earth, where present. In general, the objects found here indicate third quarter. Pipe fragments are from 1620 through 1680. Other earthenware—delft, Hispanic majolica, and lead-glazed jugs, local and English made—is mid-century to last quarter. Only a few roofing-tile fragments were noted, both flat and pantiles. Roofing slate was present.

Eight of the numerous handwrought nails are L-shaped, possibly used for picture hooks. Hinges and pintles were few. In the area of Room E and the wall rubble extending 15 feet to the exterior south, a large number of brass straight pins occurred. In the rubble south of Room B, the portico, many window quarrel and lead came pieces were found. There is a strong indication that the windows at least on the front (south) side of Structure 112 were fitted with diamond-shaped quarrels leaded into casements. However, no iron casement fragments were found. Gin-bottle evidence in the zone between 1 foot and the undisturbed clay was present, but no trace was found of wine bottles. Plainly, this was no tavern.

Finally, artifacts from the surface to undisturbed earth gathered in tests of the foundation area prior to the uncovering of the structure proper, show a temporal range which extends from the second quarter into the third quarter of the 17th century. Presumably these artifacts represent both the initial occupation and that of the rebuilt mansion. Among the more significant finds are over 300 white pipestem fragments with holes ranging from $\frac{6}{64}$ to $\frac{12}{64}$ of an inch in diameter (most in the $\frac{7}{64}$ to $\frac{9}{64}$ range) and 14 white pipebowls, 4 of which are second quarter. Initials on the remaining third-quarter bowls represented are "WB," "WC," "HI," and "LE." An iron stamp or brand with the letter "M" and a pargetry lion head were recovered. The lion head pargetry was found in the foundation area of Room A, beneath the humus line. A large quantity of glass quarrel and lead came fragments was found in the rubble south of Room B. Gin-bottle fragments (40) far outnumber those from wine bottles (3).

Summary

Structure 112 was a relatively large building which seems to have been used primarily as a dwelling—at least the artifacts associated with the structure are of domestic design for the most part and give little indication of industrial or commercial use. The heavy iron weight found in Room J was probably used to power some type of machine, it is true, but since it lay upside-down with the flat bottom in table-top position, its presence in the basement could be attributed to domestic use as an anvil as easily as to industrial use.

This house was certainly large enough to have been an inn or ordinary, but there is no evidence other than size to support such a contention. It is possible, too, that Structure 112 may have been the Second Statehouse, but again there is no evidence except that the Second Statehouse is thought to have been in the same general area.

The artifacts associated with Structure 112 are of types which were in common use during the period 1625–50; consequently it is thought that the house was occupied during that period. The architectural evidence reveals that the foundations were strengthened at some unknown time after the initial construction of the building. This may indicate the addition of a second or third story, which would naturally require a stronger foundation to support the added weight. The detritus-bearing occupation zones beneath the brick floor of the cellar and the tile floor of Room E contained building debris as well as a heavy concentration of charcoal; this suggests that the original building may have burned. Afterward the foundations might well have been enlarged and strengthened when the house was rebuilt. At any rate, two stages of construction are evident.

Final destruction of the house came about through the agency of fire. This is clear not only from the presence of a layer of charcoal on the basement floor but also from the survival of the fragmentary charred timbers, also in the basement. In

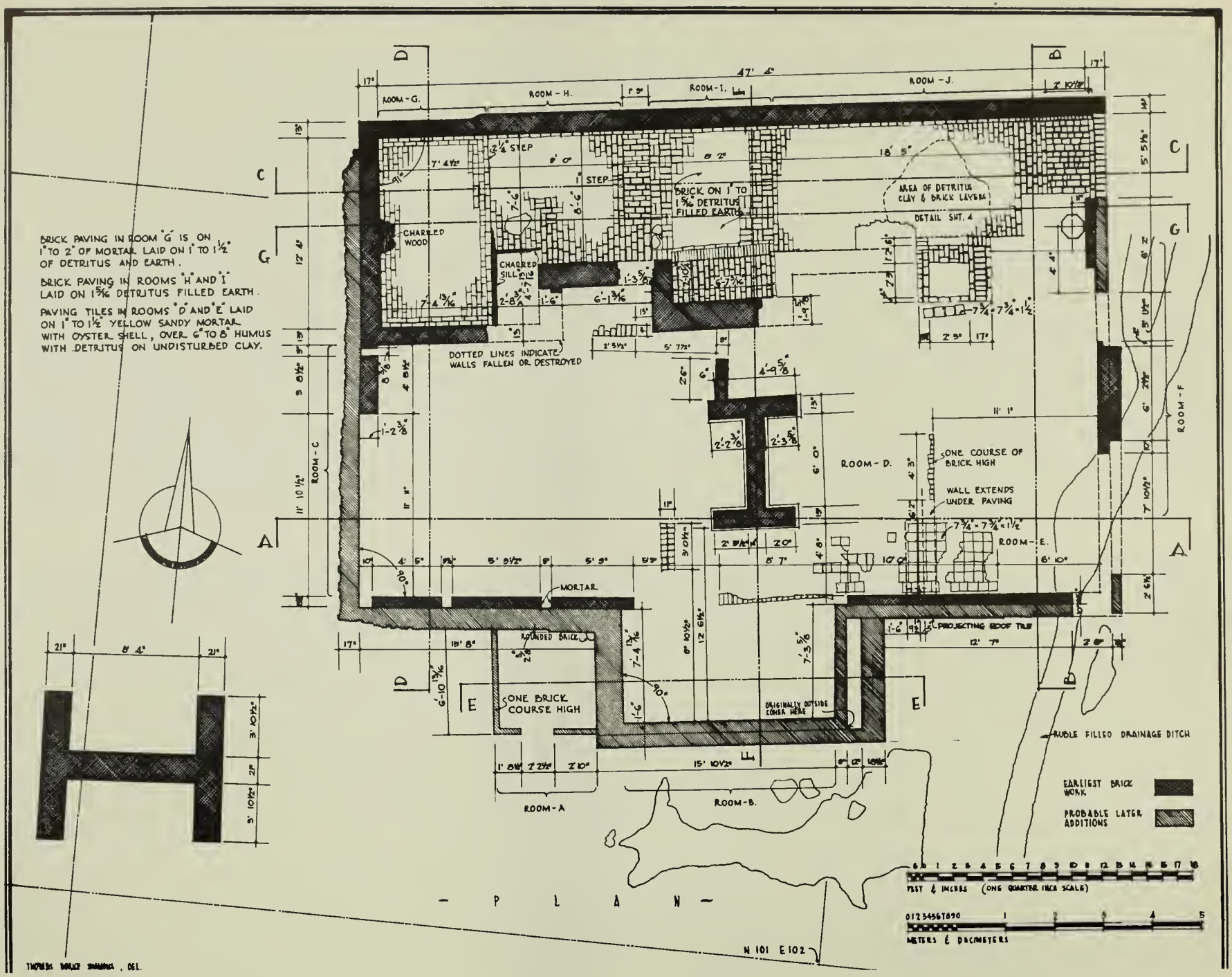


FIGURE 15—*Plan of Structure 112*

Plan of excavated foundations. *Historic American Buildings Survey drawing. Courtesy, Library of Congress.*



PLATE 59—*Structure 112—Conjectural Reconstruction*

Conjectural reconstruction with separate kitchen at left and icehouse at right. Research by Kocher, Hudson, Cotter, and Jelks. *Painting by Sidney E. King.*

addition there were several pottery vessels and wooden barrels which had obviously been resting on the basement floor when the house collapsed. They were crushed in the welter of burning debris which crashed down upon them as attested by the piles of fire-blackened sherds and barrel hoops which have survived. Evidence indicates that the building burned before 1680, perhaps in 1676 during Bacon's Rebellion.

Architectural Details, Structure 112

Units	*Description*
Room A	
West wall	1 course remains; ½ brick wide (0.35′); type of bond indeterminate.
South wall	Portions of 1 course survive; ½ brick wide (0.35′); type of bond indeterminate.
Room B	
West wall	2 to 3 courses; 2½ bricks wide (1.8′); English bond; there is 1 course of flat roofing tiles under part of the bottom-most course of bricks.
South wall	2 to 3 courses; 2 bricks wide (1.5′); English bond.
Interior east wall	3 to 4 course; 1 brick wide (0.75′); English bond; east face of this wall is neatly pointed.
Exterior east wall	3 courses; 2 bricks wide (1.5′); first course (in part) of bricks set on edge; English bond above first course; a course of flat roofing tiles lies under that portion of the first course consisting of bricks laid flat rather than on edge.
North wall	1 course; 1 brick wide (0.75′); type of bond indeterminate.
Main south wall	
West of Room B	1 to 3 courses; 2½ to 3 bricks wide (2′); English bond; 3 plaster-lined gaps* in the bricks; interior half of foundation laid on mortar bed, exterior half set on undisturbed clay.
East of Room B	4 courses; 2 bricks wide; English bond; there is a course of flat roofing tiles between the 3rd and 4th courses, the ends of the tiles projecting an average of about 0.1′ from the exterior side of

* These gaps suggest half-timbering for the south wall of the original house of the first half of the 17th century.

Units	*Description*
	the wall; in the last 4.5′ at the east end, the 4th course consists of bricks placed on edge (the course of tiles between the 3d and 4th brick courses being absent here so that the top of the 4th course is approximately level all along the wall); a 2.6′ gap in this wall, just west of the southeast corner of the structure, was evidently made when Ditch 79 and/or Ditch 80 were dug; interior half of foundation laid on mortar, exterior half set on undisturbed clay.
Main west wall	2 to 3 courses; 1′ to 1.3′ wide; made up of whole and fragmentary bricks laid in short, parallel rows; no regular type of bond; the portion of this wall at the west end of the basement is resting on fill containing bricks and other building detritus; a footing (?) 3.7′ long and 1½ bricks wide (1.2′) abuts against the interior edge of the main west wall just south of the basement. (This is alined exactly with the west wall of the basement.)
Main north wall	(This is identical with the north wall of the basement.) 4 to 9 courses; modified Flemish bond (irregular); 1½ bricks wide (1.2′).
Main east wall	Only 2 sections remain: the first is a 2- to 3-course section at the southeast corner of the building, 2.6′ long and 1 brick wide (only the exterior half of the original wall has survived); the other is a 2-course section, 7.4′ long and 2 bricks wide (1.6′), just south of the basement; part of this wall was apparently destroyed during the excavation of Ditch 79 and/or Ditch 80; English bond employed throughout.
Line of bricks separating Rooms D & F	The 1 remaining course of brick fragments seems to have been originally 1 brick wide; this line of bricks runs beneath the tiled floor of Room E.
Double fireplace between Rooms C & D	H-shaped; 3 courses; English bond; bottom course wider than overlying courses, projecting beyond them on all sides from 0.1′ to 0.3′.
Tile flooring of Room E	Floor consists of 1 layer of square, red tiles beveled on 2 opposite edges; original tiled floor area seems to have been at least 4.5′ by 13′ or larger; flooring is laid over the southern end of the single course of bricks separating Rooms D and F, and also over a small trough or ditch filled with burned detritus.
East-west line of bricks at north edge of Room C	1 course; 3′ long; 1 brick wide (0.75′).
West wall of basement	2 to 5 courses; 1½ bricks wide (1.4′); English bond; patches of shell-lime plaster on interior face.
East wall of basement	1 to 4 courses; north portion is 1½ bricks wide (1.2′); south portion is 2 bricks wide (1.5′); English bond (irregular).
South wall of Room G	1 to 5 courses; 1½ bricks wide (1.2′); irregular English bond; traces of shell lime plaster on interior face; west end missing.

Units	*Description*
Brick flooring	
Room G	1 layer of bricks in staggered rows running north-south; floor level 0.3′ higher than floor level of Room H.
Room H	1 layer of bricks in staggered rows running north-south; floor level 0.3′ lower than that of Room G and 0.1′ lower than that of Room I; flooring is not complete over entire room area.
Room I	1 layer of bricks in checkerboard pattern, with 2 bricks forming each checker; floor level 0.1′ higher than that of Room H but at same approximate elevation as that of Room J.
Room J	1 layer of bricks in staggered rows running north-south (except for the easternmost 3.3′ which is of staggered rows running east-west); floor level is approximately same as that of Room I; brick flooring is missing in the southeast portion of Room J.
Fireplace at south side of Room I	Hearth composed of a single layer of bricks in staggered rows running north-south except for a single row of bricks on edge running across the north side of the hearth; west and south walls of fireplace are 2 bricks wide (1.3′) with 1 to 2 courses remaining; interior depth of hearth is 3.7′; the maximum length of the hearth is 6.5 feet or greater, the exact measurement being indeterminate since the east end is missing; this fireplace is offset to the south from the basement proper.
Fireplace at south side of Room J	Hearth is a sunken area with clay floor containing a layer of concentrated charcoal 2″ to 3″ thick; width of the hearth is 2.7′, depth is 2.3′; 1.2′ north of the hearth is a gap in the brick floor, 0.5′ wide, running across the entire width of the hearth.
Flagstones	Flagstones 3 or 4 inches thick and 1 to 2 feet across were incorporated in the brick floor in Rooms H and I (1 stone in H and 2 in I); 3 similar stones were found in the rubble-covered area just outside the building, 2 to 6 feet south of Room B.
Timbers	Portions of poorly preserved charred timbers were found lying on the brick floor of Room G at the west end of the room, the timbers apparently having run north-south; at the extreme western edge of Room H (in the southern half of the room only) is a charred timber lying on the floor against the small step marking the floor level of Room G; another charred timber is joined to that timber at a right angle 4.7′ from the south edge of Room H and runs eastward from the juncture for 2′; plaster-lined gaps in the brickwork of the western part of the main south wall may be places where upright timbers stood.
Mortar	Has appearance of sandy mud with a small amount of shell lime added.
Bricks	Local manufacture. Color: Reddish tan to red Length: 8″ to 9¼″, av. 8½″ Width: 4″ to 4⅜″, av. 4¼″ Thickness: 1⅞″ to 2⅜″, av. 2¼″

Unit	*Description*
Floor tiles	All tiles are beveled on 2 opposite edges. Color: Red Top sides: 7⅞" to 7¾" square Bottom sides: 7⅜" square Thickness: Varies from 1⅝" to 2"

STRUCTURE 113

Structure 113 (Lot 101:102) probably served as an outbuilding for Structure 112, which is situated 50 feet to the southwest. Originally the building was about 11 feet wide (north to south), 12.4 feet long at the south wall, and 14.3 feet long at the north wall. Several possible uses for this small building are suggested: a meathouse or smokehouse, a milkhouse, or even a powderhouse.

The evidence consisted of a shallow wall foundation of brick, trapezoidal in shape, with at least 2 courses of brick. The foundation had been badly disturbed, probably by cultivation, but enough of the east and west walls remained to show they had been a maximum of 2 feet 4 inches thick. The bottom course of the west wall was made of whole bricks; the other 3 walls had bottom courses of half and even smaller brick fragments. No evidence of mortar remained. A thin layer of brick dust about ½-inch thick extended northward from Structure 113 for about 5 feet. The measurable brick showed that the range was 8½ to 9 inches long, 4 to 4¼ inches wide, and the average brick was 2½ inches thick. Most of the bricks were 8⅝ inches long and 4⅛ inches wide. The bricks were uniformly red and medium hard. The bottom course was definitely laid on clay, unprepared with sand or mortar.

No artifacts were associated specifically with Structure 113. From the plow zone above, which was in contact with the top bricks, came 14 fragments of blue-on-white Dutch delftware; 2 sherds of red, lead-glazed earthenware (both dark and light glaze); 5 brown-mottled, salt-glazed stoneware sherds; a clay-pipe fragment suggestive of 1660–80; and 3 indeterminate wine-bottle fragments. In all, the evidence of artifacts in the ground above and around Structure 113 suggests a date of use within that assigned to Structure 112, that is, 1640–76.

STRUCTURE 115

Structure 115 was a long, narrow row house situated on a low ridge in the northeast part of New Town. Its long axis is roughly parallel to the river shoreline, which is almost 500 feet to the south.

This building consists of brick foundations comprising the 4 exterior walls; 2 interior partition walls (and a small remnant of a third); 4 H-shaped double chimney foundations; a large single chimney foundation built against one of the partition walls; a large chimney foundation built onto the exterior wall at the east end of the house; and the remains of 2 basement rooms with a connecting doorway and remnants of what may have been a stairway leading down into the larger basement room. The building is 20 feet wide and slightly over 160 feet long (inside measurement). It is divided lengthwise into 4 large rooms of approximately equal length so that each room measures about 20 by 40 feet (Jones, 1958a).

To simplify the following description the 4 large rooms have been arbitrarily labelled A, B, C, and D, reading from west to east; the small basement room projecting southward from the main body of the house has been designated Cellar 1, the larger basement room Cellar 2.

In each of the rooms A, B, and C there is a double chimney foundation built against the north exterior wall with its 2 opposing fireplaces facing east and west. Room D at the east end of the house was served by 2 fireplaces—1 represented by the chimney foundation built onto the east exterior wall, the other by the east half of the double fireplace separating Room D from Room C.

The chimney foundation at the east end of Room D supported an exterior chimney. Gaps were cut in the main exterior wall of the building to receive the ends of the north and south walls of the chimney base.

Cellar 1 is the small basement room adjoining Room D on the south. Portions of the brick walls are intact on all 4 sides of the room, ranging up to 20 bricks high in places. A gap in the north wall provides a doorway opening into Cellar 2. In all 4 walls the base course extends inward about 0.2 feet beyond the overlying courses, forming a low ledge which may have been designed to support a wooden floor. However, there were no traces of flooring of any kind. Cellar 1 measures 11.7 by 10.6 feet, with the longer axis oriented east-west.

In the east wall of Cellar 1—0.7 feet from the northeast corner of the room—the fifth course of bricks (counting from the bottom) is missing over a distance of 5.8 feet. This is a gap in the brickwork which extends all the way through the wall. The floor of this gap is paved with a uniform layer of flat roofing tiles. It has been conjectured that the framework for a set of steps was anchored to a small timber set into the gap, the layer of tiles serving to chock up the timber.

Cellar 2 is a rectangular room which originally measured 16 by 20 feet on the inside. The south wall, containing the connecting doorway, serves also as the north wall of Cellar 1. The north wall is constructed of brick with as many as 20 courses remaining in spots. Near the center of the north wall is what appears to be the remains of a brick base for a stairway which probably led downward into the basement.

At both ends of the east wall there are short sections of brick walls which are joined to the north and south walls respectively at the corners. There is no brick facing along the rest of the east wall, although the bits of facing at each end hint that the entire wall was originally bricked. A semicircular depression excavated into the clay adjoins Cellar 2 to the east. This architectural feature of unknown use opens toward the

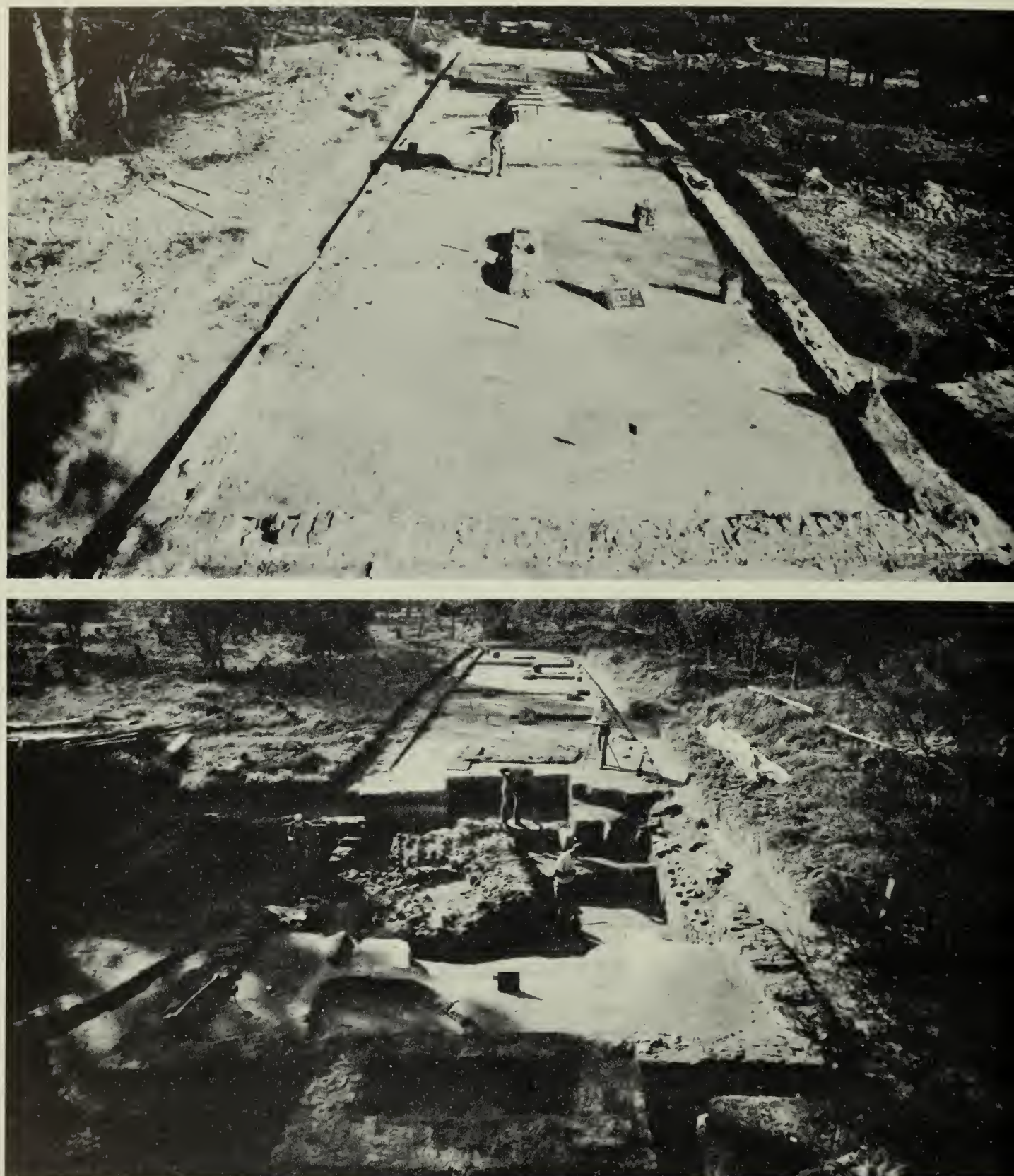


PLATE 60—*Structure 115—Excavated Foundations*

west wall of Cellar 2 near its center. Opening into the west wall of Cellar 2, directly opposite the semicircular depression, is a rectangular depression which is undoubtedly related in purpose.

Like the east wall, the west wall of Cellar 2 is devoid of brick facing along most of its length. However, there is a small section of brick facing at the north end which suggests that the wall was completely bricked in the original house. The present floor of Cellars 1 and 2 is marked by a disconformity between the detritus which filled the basement and a clean, undisturbed sand, sterile of cultural material. The cellar floor is approximately level throughout both rooms at an average depth of about 5.3 feet below the present surface of the ground.

The tops of the extant brick foundations of Structure 115 lay at an average depth of about 0.5 feet. The overburden of humus-stained soil, containing cultural debris, extended a foot or so deep over the non-cellar portion of the ruins. In the cellar area a zone of concentrated building debris extended from the bottom of the humus-stained, surface-member soil down to about 5 feet, where a stratum of mixed sand and clay was encountered. This mixture extended down to the disconformity at floor level.

Over most of the southern half of Cellar 2, at a depth of 2 to 4 feet, lay the ruins of a fallen brick wall. Its position and the alinement of its bricks indicate that it was a portion of either the north or the south exterior wall of the first story in the area above Cellar 2.

Artifacts

The artifacts recovered from the Structure 115 area came, for the most part, from 4 sources: (1) the badly disturbed, humus-stained zone extending from the surface of the ground to a maximum depth of about a foot; (2) the stratum of mixed sand and clay occupying the last few inches above the floor in Cellars 1 and 2; (3) the heavy fall of bricks, mortar, plaster, and other building debris making up the 2 or 3 feet of intermediate fill in both basement rooms; (4) an intrusive pit in the northeast corner of Cellar 2 which was dug into the cellar fill long after Structure 115 had fallen into ruin.

The humus-stained surface member has been badly disturbed by plowing through the years. This disturbance has made it difficult, if not impossible, to demonstrate any historic relationship between the artifacts from this level and the 17th-century building that the Structure 115 foundations represent. However, the artifacts from the intermediate zone of cellar fill consist largely of building material which undoubtedly derived from the original structure. Artifacts from the zone just above the cellar floor probably represent, for the most part, debris discarded by the inhabitants of the building. However, there is a possibility that some of the objects were thrown into the cellar after the house had been abandoned but before the walls and roof collapsed and sealed off the zone in question. Thus the problem of when the roof and walls fell is important in dating the occupation of the structure on a basis of artifact types found just above the cellar floor.

Foundation Area West of Cellar: Units A, B, and C. The deposit beneath the surface in the areas within the main walls of Structure 115, designated from west to east A, B, and C, was very shallow and included no cellars. Most artifacts were found in the humus zone between the surface and 0.8 feet. However, artifacts were recorded separately from 0.8 feet to the undisturbed earth (approximately 1.2 feet) in order to test key areas. A few flat tiles, 10 in all, and 13 pantiles were found from the surface to the undisturbed earth. Six flat tiles with glaze marks were found from 0.8 feet to the undisturbed earth suggesting that some of the tiles from the nearby pottery kiln, Structure 111, may have been used as leveling devices in the masonry.

The artifacts in Areas A, B, and C were very sparse. English lead-glazed earthenware occurred, represented by 42 sherds as compared to only 5 sherds of local lead-glazed earthenware. This indicated that local earthenware manufacture may have died out at Jamestown before the end of the 17th century. English or Dutch delftware occurred in moderate numbers of fragments. English polychrome was represented by 30 fragments.

Tobacco pipes in the main house area exclusive of the cellars include 7 examples of white bowls which can be dated. One of these bowls dates in the third quarter of the 17th century and the other 6 from 1675 to 1720. The stems, by aperture indications, suggest dating in the last quarter to 1700 and perhaps a little beyond.

Three pieces of Oriental porcelain occurred from the surface to the undisturbed earth.

Metal is represented in the Unit A, B, C area mainly by nails; 150 of these are handwrought, and 13 appear to be machine-cut. It is notable that a few pieces of 19th-century American ironstone pottery and 19th-century Staffordshire occurred near the surface, and it may well be that the machine-cut nails are a normal 19th-century intrusion. The remainder of the iron specimens are of little importance except a 17th-century wrought blade to fit on a wooden spade.

Some window glass (quarrels) and lead cames occurred in the interior of Units A, B, and C beneath the sod.

Artifacts of Cellar 2. Cellar 2 lay beneath the east unit of the house and was excavated in 4 zones: surface to 2 feet, 1 to 2 feet, 2 to 4 feet, and 3 to 5 feet, depending on the continuity of recognizable deposits. In this cellar area a large section of fallen wall from the south lay almost intact. This wall was left as a control and was not disturbed. In the more deeply buried portion, 2 to 4 feet, the greatest number of artifacts occurred. Here earthenware was well represented

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Upper.—Foundations being excavated; looking east.

Lower.—Foundations completely uncovered; looking west.

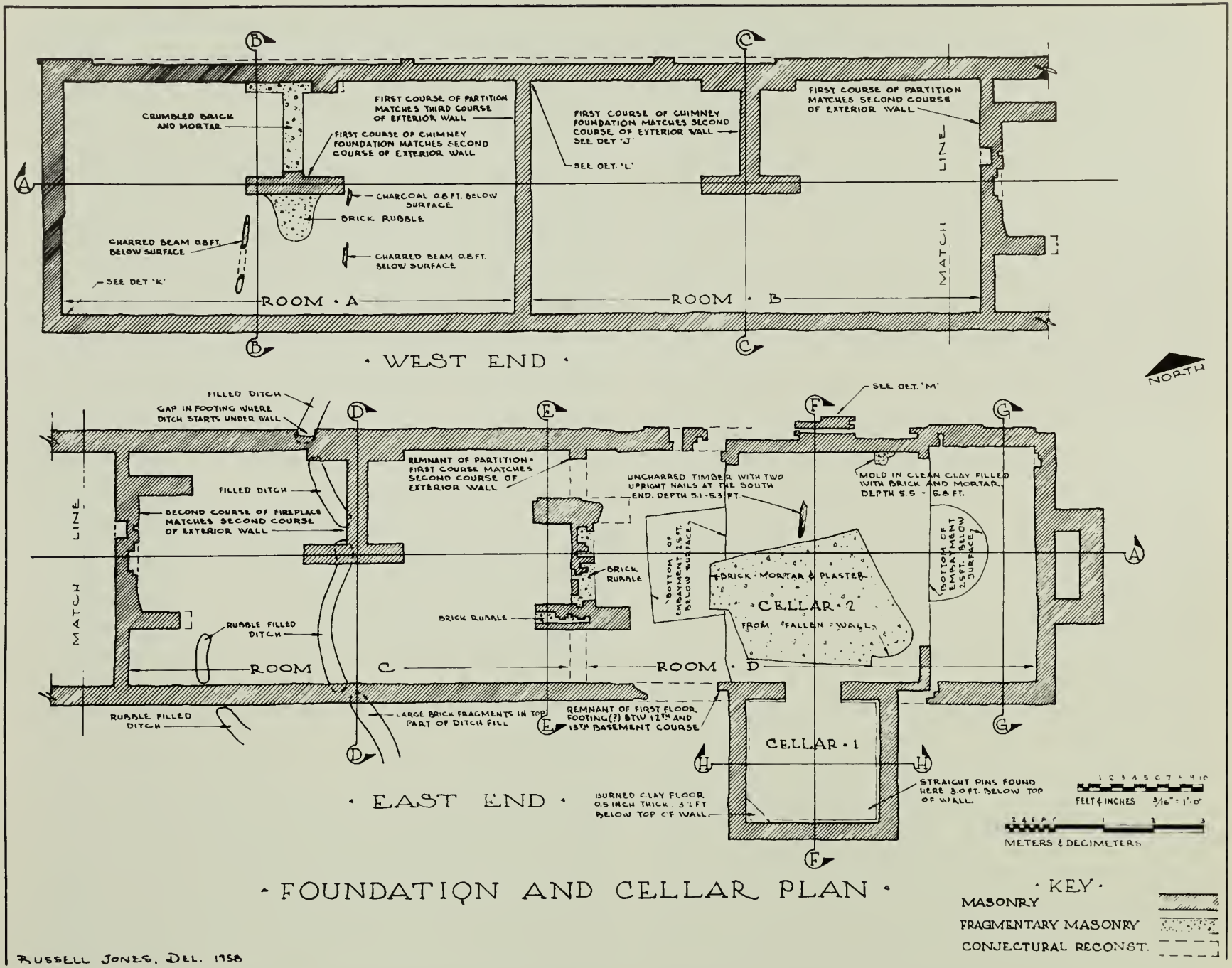


FIGURE 16—*Plan of Structure 115*

Plan of excavated foundations. *Historic American Buildings Survey drawing*

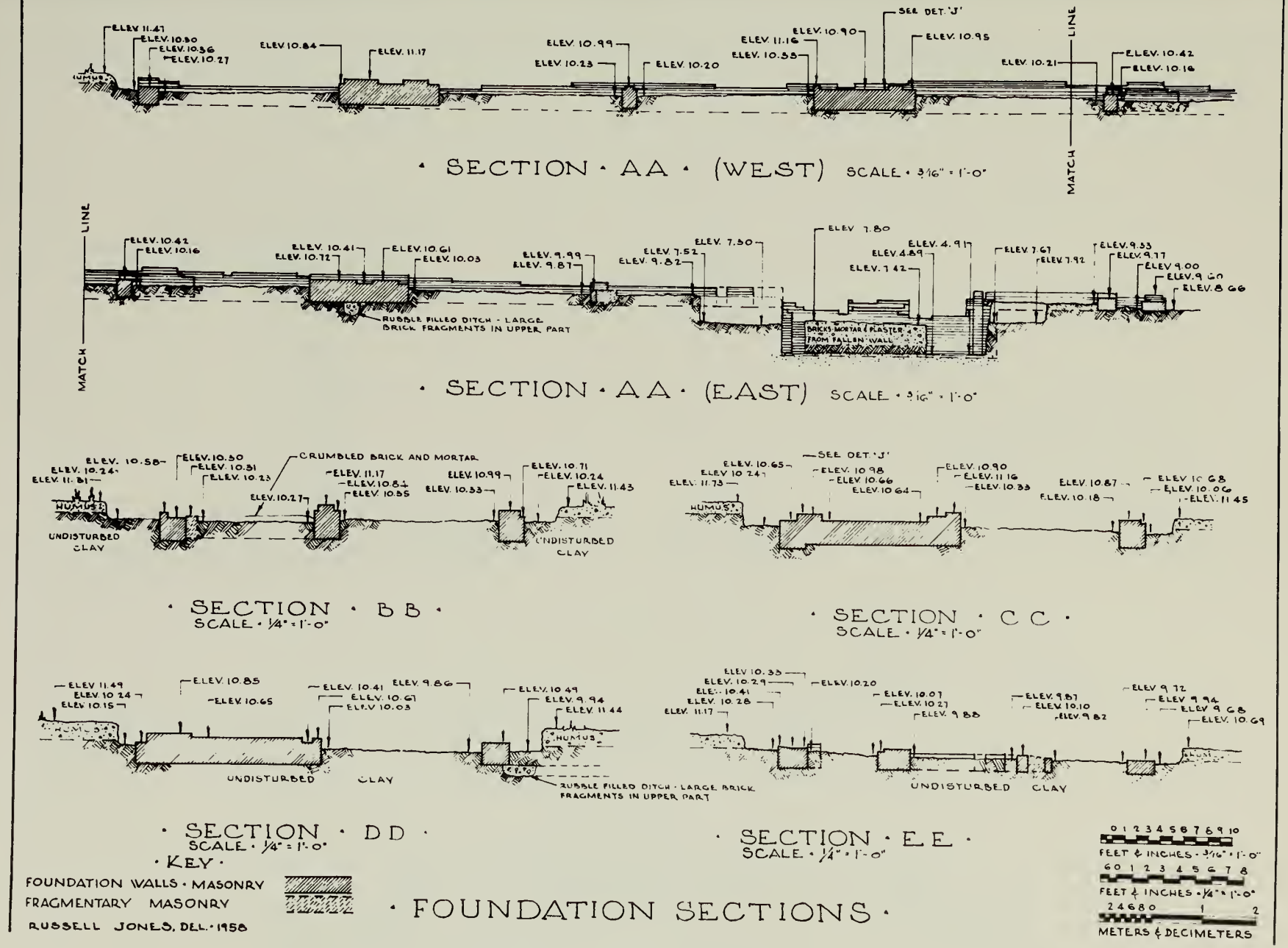


FIGURE 17—*Foundation Sections of Structure 115*

Historic American Buildings Survey drawing.

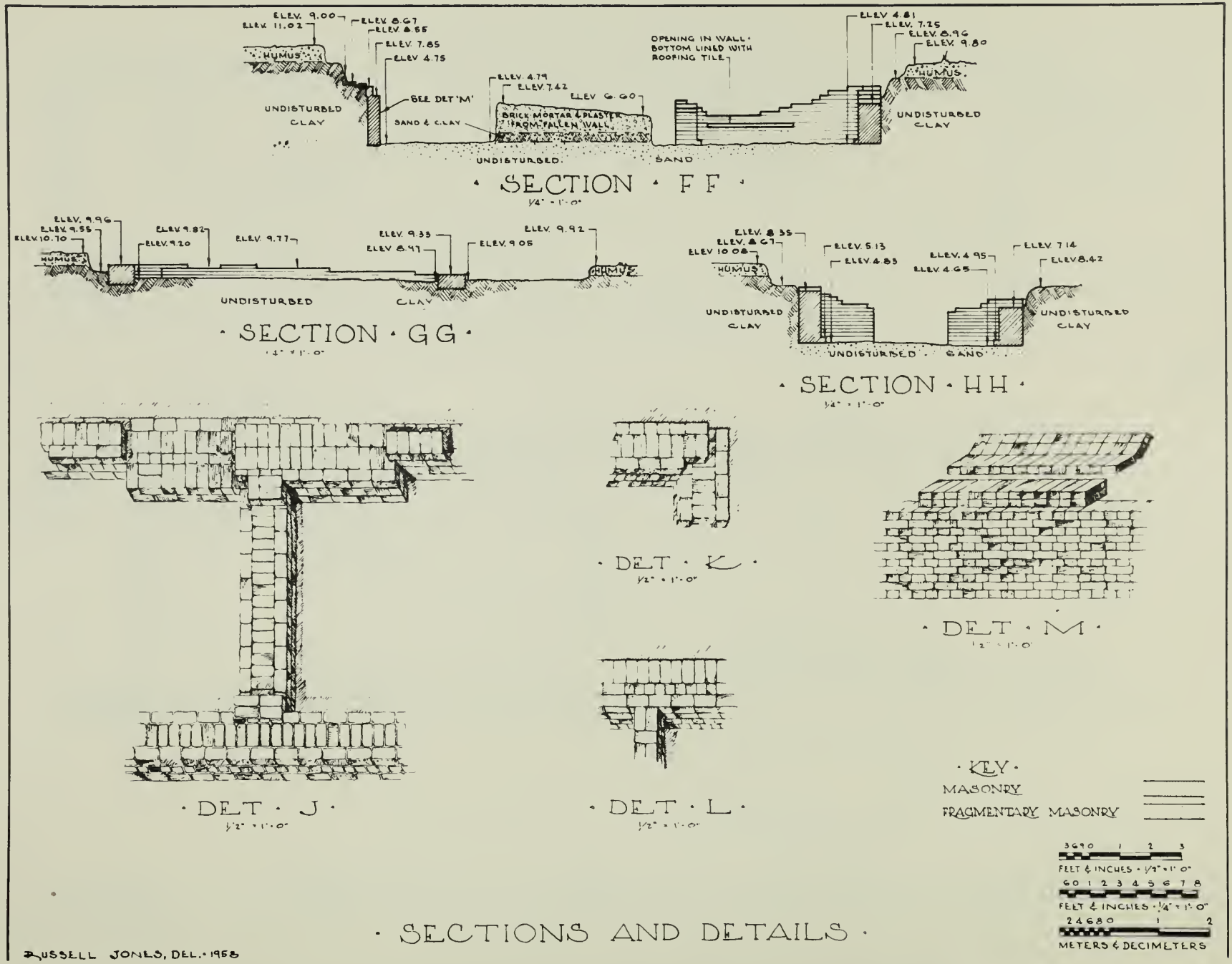


FIGURE 18—*Foundation Sections and Details of Structure 115*

Historic American Buildings Survey drawing.

by English lead-glazed with only one local lead-glazed sherd appearing. One piece of sgraffito was found and four sherds of North Devon coarse-tempered pottery of the utilitarian type. More English delft than Dutch delft was found, but both types were scarce.

Tobacco pipes are well represented by white specimens and we find 2 bowls for the 1675–1720 period and 1 for the third quarter of the 17th century. The stems show last quarter dating predominant, and "F" and "LE" initials were noted on two specimens. All of the nails are handwrought. Window quarrels and lead came fragments are well represented. Wine-bottle fragments occur in good numbers with some complete enough to indicate bottles dating from 1680–1700.

There are some pieces of lath-marked plaster (plain), 2 pieces of pargetry, and 14 fragments of cornice molding.

CELLAR 1. This cellar area, which lies outside of the main structure south of the east unit and connected with it by a doorway, was 5 feet deep and contained fill which was well interspersed with artifacts. The deepest of five zones recorded here shows the presence of a minor amount of earthenware of all descriptions. Most of this is recognizably last half of the 17th century with emphasis on the final quarter. Clay pipes, both white and brown, the latter locally made, suggest dating between 1675 and 1720.

Of the metal objects nails are most numerous, all of which are handwrought. One copper coin was found from 3 to 4 feet deep in the fill; 1 side bears the mark of William III and the date 1695, and on the other side can be read "Britannia." Brass is well represented by straight pins; 127 were found in the deepest fill. Both window cames and window quarrels are present in good numbers, the latter totaling more than 400 pieces. Wine-bottle fragments were also numerous and date in the third and fourth quarter of the 17th century. Three glass tumbler fragments were found in Cellar 1.

The main plaster found in Cellar 1 appears to have been white-washed and laid against lath. Two pieces of pargetry and an assortment of garbage bones, including game birds, cow, and deer, were also in the fill of Cellar 1.

The inference from the artifacts associated with Structure 115 is that the building was abandoned not long after the end of the 17th century at the latest. There is no suggestion of a particular use for any of the building portions except that wine was probably stored in the two cellars. Judging from the presence of brass pins in the south cellar there was usage for domestic purposes. No direct evidence of the use of a section of the building as a "goale" (jail) could be found (mentioned in the Ludwell lease of 1650).

It is particularly notable that Structure 115 in outline and interior elements is almost identical with the integral, original portion of the Ludwell-Statehouse group. (See Figure 5.)

About 15 feet north of Room C is Well 19, a brickcased well which probably was the source of water for the dwellers of the row house. Artifacts tossed into the well after it was no longer in use have been identified and dated as mostly belonging to the last half (predominantly last quarter) of the 17th century. If we assume that the well was at least partially contemporaneous with the row house (and their locations with respect to one another make this almost certain) then, by association with the well, it can be stated that the row house existed before 1700. The possibility that the well was abandoned before the house was must not be overlooked; therefore, the artifacts from the well cannot be used to define an exact terminal date for occupation of the row house. The inclusion in the well fill, less than half way down, of the left leg and the left half of a man's pelvis, challenges interpretation.

SUMMARY. Structure 115 is the third example found at Jamestown of a multi-unit dwelling in the form of a row house, the other two being Structure 17 (the so-called First Statehouse) and the Ludwell-Statehouse group (no structure number assigned). Structure 17 consists of three 20-by-40-foot units (same size as units of Structure 115), but differs from Structure 115 in having the units joined along their long sides (40 feet) instead of their short sides (20 feet). The larger Ludwell-Statehouse group exhibits a combination of the two styles in a sort of compound structure having the units joined along both their long and short sides.

Structure 115 was a long, narrow building which consisted of four separate rectangular units. Two basement rooms were situated at the east end, the smaller one jutting southward from the main body of the house. A. Lawrence Kocher has made a conjectural reconstruction of the building based on analysis of the surviving architectural features. He concludes that the house probably stood 2 stories high and that each of the separate units (Rooms A, B, C, and D) had its own private entrance from the front and back and each probably was separated from the adjoining units by party walls. There was one exterior chimney at the east end of the building and the roof was covered with either slate or clay tiles. Fragments of both types of roof coverings were found in some abundance, so it appears likely that both types may have been used. Perhaps the owners of the several units differed in their choice of roofing material, or perhaps it became necessary to re-roof all or part of the building and the kind of roofing was switched at that time.

Since most of the artifacts are of domestic forms, they support the architectural study in the conclusion that Structure 115 was probably used as a dwelling (multi-unit, presumably) rather than for commercial or industrial purposes. A typological analysis of the artifacts most closely associated with the building reveals that the life span of the structure most likely belongs to the period 1660–1700.

Historical References

We now come to historical references which substantiate these observations and refer to the use and ownership of Structure 115.

In 1680, Phillip Ludwell, Nathaniel Bacon, and George Lee petitioned the House of Burgesses for 50-year leases on 4



PLATE 61—*Conjectural Drawing of Structure 115*

Structure 115 was a continuous row of attached houses, presumably built at one time. Evidence of 4 units, three of which were separated by remaining bases of party walls, included a partial basement into the foundation of an attached cellar beneath a porch at the east end facing south. Historical references indicate that units of Structure 115 were owned at various times by Philip Ludwell, Nathaniel Bacon, Sr., and by the government for use as a jail. Research by Kocher, Hudson, Cotter, Jelks, and Powell. *Painting by Sidney E. King.*

adjoining houses in "James Citty." Phillip Ludwell was granted a lease on "the two houses . . . now lyeing in ruines, the One that house where the goale [jail] was kept And the other that next adjoyning to it, together with the lands belonging to them." Both Bacon and Lee desired "The two houses on the East End of those lately granted to Coll. Phillip Ludwell and now lyeing in ruines" (McIlwaine, 1914, p. 152), so it was decided that " . . . Its most fit Mr Auditor Bacon should have his desire in the said Houses, & Mr Lee the other House" (McIlwaine, 1918, Vol. 1, p. 10). Bacon apparently desired the "house which did belong to Mr (Richard) Auborne" (the second house from the east end), so the easternmost house, "formerly possessed by . . . Arnall Cossina," was leased to Lee (McIlwaine, 1914, pp. 142 and 152). In 1676 an order was given to rebuild the houses wherein Richard Auborne and Arnold Cassinett lately lived in "James Citty" which were burnt in the Rebellion.

That these 4 houses are Structure 115 becomes apparent from a deed recorded 5 years later (1685) by which George Lee obtains title to property enclosing his houses. The description of the three-fourths of an acre tract is as follows: "Lyeing in James Citty being formerly estate of Thomas Woodhurst deced bounding upon the land of Mr William Sherwood Easterly; And as farre as the two houses extend of the said George Lee the one being by him built and inhabited the other ruinous being Westerly; As farre as ye Common road Southerly & to the outside of the said two houses Northerly . . ." (*Virginia Historical Society Ludwell Papers, I, No. 109*). The eastern wall of Structure 115 lies approximately 200 feet west of William Sherwood's property line of 1685. A tract from the western wall of the easternmost house eastward to Sherwood's line and southward to the approximate location of the "Common road" (Back Streete?) would be the proper size.

Subsequently, the property containing Lee's houses passed to Robert and George Nicholson in 1692, to George Harvey in 1696, to Thomas Hadley in 1697, to Hadley's wife Dyonesia in the same year, and to John Tulleta in 1698 (*Virginia Historical Society Ludwell Papers, I, Nos. 92, 94, and 109*).

Architectural Details of Structure 115

Unit	*Description*
North wall foundation (ground floor)	1 to 5 courses remain; 2 bricks wide (1.6′); English bond; the bottom course is composed largely of brickbats and, on the south side of the wall, projects 0.1′ to 0.3′ beyond the overlying courses.
South wall foundation (ground floor)	1 to 4 courses; 2 bricks wide; English bond.
East exterior wall foundation	2 to 4 courses remain; bonding irregular; wall composed largely of fragmentary bricks; 2 bricks wide (1.6′); holes were cut in the wall for the ends of the large exterior chimney foundation to be fitted into.
West exterior wall foundation	2 to 4 courses remain; English bond; 2 bricks wide (1.6′).

Unit	*Description*
Partition wall between Rooms A and B	1 to 2 courses remain; bottom course is 1½ bricks wide (1.2′); 2d course is 1 brick wide (0.8′); bottom course is English bond; 2d course is Flemish bond.
Partition wall between Rooms B and C	1 to 3 courses remain; bottom course is 1½ bricks wide (1.2′) and is made of brickbats laid irregularly; 2d and 3d courses are 1 brick wide (0.8′) and are of erratic Flemish bond; a large single fireplace opening into Room C lies with its west edge flush against the east edge of the partition wall.
Partition wall at east end of Room C	A tiny fragment of what may have been a partition wall at the east end of Room C adjoins the north wall at a spot 40 feet east of the west wall of Room C; a portion of 1 course remains; 1½ bricks wide (1.2′); type of bond indeterminate.
Double fireplace in Room A	1 to 4 courses remain; the south and center fireplace walls are 2 bricks wide (1.6′); the south wall is of English bond; the bonding of the other walls is indeterminate; the north wall is 1 brick wide (0.7′ to 0.8′) and lies flush against the south side of the north exterior wall; only a layer of brick and mortar rubble marks most of the north and center walls; maximum inside measurements for east fireplace are 7.5′ by 3.4′; maximum inside measurements for west fireplace are 7.5′ by 3.3′.
Double fireplace in Room B	2 to 4 courses remain; English bond throughout; south and center walls are 2 bricks wide (1.6′); north wall is 1 brick wide (0.8′) and the 4th course is bonded into the north wall; maximum inside measurements for east fireplace are 7.5′ by 3.5′; maximum inside measurements for west fireplace are 7.6′ by 3.4′.
Large single fireplace at west end of Room C	1 to 3 courses remain; north and south walls are 2 bricks wide (1.6′); west wall is 1 brick wide (0.8′); composed largely of brickbats; bonding irregular; west wall is mortared to east edge of partition wall but is not bonded into it; maximum inside measurements are 9.8′ by 4.6′.
Double fireplace at north wall of Room C	1 to 3 courses remain; north wall is 1 brick wide (0.8′); south wall is 2 bricks wide (1.6′); center wall is 2 to 2⅓ bricks wide (1.6′ to 1.9′); English bond employed throughout; maximum inside measurements of east fireplace are 7.5′ by 3.4′; maximum measurements of west fireplace are 7.5′ by 3.5′.
Double fireplace at east end of Room C	1 to 3 courses remain; south wall is 1.6′ to 2′ wide and is composed largely of brickbats; center wall is 2 to 2¼ bricks wide (1.6′ to 1.8′) and is made up partially of brickbats; the bottom course of the north wall is 2½ bricks wide (2′) and the overlying courses are 2 bricks wide (1.6′); maximum inside measurements of the east fireplace are 7.3′ by 3′; maximum inside measurements of the west fireplace are 6.9′ by 3.5′.
Large exterior fireplace at east end of building	1 to 4 courses remain; north and south walls are 2 bricks wide (1.6′) except for the bottom course which is 2½ bricks wide (2′); English bond is employed throughout; maximum inside measurements are 6.7′ by 3.5′; the west ends of both north and south walls are inserted in gaps in the east wall of the main structure, the gaps having been cut into the wall after the house was built.
Cellar 1	7 to 20 courses remain; all walls are 2 bricks wide (1.5′ to 1.6′); English bond used throughout; the bottom course projects inward an average of 0.2′ beyond the overlying courses in all 4 walls; a doorway 4.9′ wide in the center of the north wall leads into Cellar 2; the projecting base course possibly supported a wooden floor but no traces of a wooden floor have survived; inside measurements of room are 11.7′ (east-west) by 10.6′ (north-south) by 5.2′ deep (below present surface of the ground).
Cellar 2	Inside measurements are 19.5′ to 20′ long (north-south) by approximately 15.7′ wide (east-west) by 5.4′ deep (below the present ground surface).
South wall	8 to 20 courses remain; 2 bricks wide (1.5′); English bond; a doorway 4.9′ wide in center of wall leads into Cellar 1.
North wall	11 to 17 courses remain; 1 brick wide (0.8′); English bond; a staircase foundation (?) 5.2′ wide lies near the center of the wall.
East wall	Only small remnants of the brick wall remain (at the north and south ends); bonded into north and south walls at corners; there is a flat-bottomed semicircular recess 7.8′ by 5′ by 1.4′ deep cut into the clay at the center of the wall. (See Figures 16, 17, and 18.)
West wall	Only a small remnant of the brick wall remains (at the northwest corner of the room) where it is bonded into the north wall; a rectangular flat-bottomed recess 9.0′ by 6.7′ by 2.2′ deep is cut into the clay at the center of the wall. (See Figures 16, 17, and 18.)
Room A	Inside measurements are 20.2′ wide by 40′ long.
Room B	Inside measurements are 20.2′ wide by 40′ to 40.2′ long.
Room C	Inside measurements are 20.2′ to 20.4′ wide by 39.5′ to 40′ long.
Mortar	The bottom course in the exterior walls is mortared with plain clay; the rest of the structure has light-gray to white mortar containing sand and burned oyster shell.
Bricks	Color: Red to reddish-tan Length, 8½″ to 9″; av. 8¾″. Width, 4″ to 4⅜″; av. 4⅛″. Thickness, 2¼″ to 2½″; av. 2⅜″.

STRUCTURE 116

Structure 116 (Lot 95:105) comprised the base course of a brick fireplace base measuring 10 feet wide by 5.3 feet front to back, together with traces of wooden footing for a frame house. The inside measurements of the fireplace were 6.8 feet wide by 3.8 feet deep. The bricks averaged between 8¾ and



PLATE 62—*Structure 116—Conjectural Drawing*

Evidence consisted only of a brick chimney base and a series of post molds in the undisturbed earth showing the location of sill supports for a frame house. Research by Kocher, Hudson, Cotter, and Jelks (Lot 95:105). *Conjectural painting by Sidney E. King.*

9 inches long by 4¼ to 4½ inches wide by 2⅛ inches thick. The bricks were red and fairly uniform, and they were medium hard. This fireplace had opened to the east, and lay 0.8 to 1 foot beneath the surface where the elevation was 10.65 feet above mean low tide.

A curious discovery of a bundle burial, apparently (from osteological observation and burial type) aboriginal Indian and prehistoric, lay within 0.3 foot of contact with the southern arm of the fireplace. The burial lay at a depth of 1.1 feet below the surface. (Surface elevation was 10.17 feet above mean low tide.) Although the burial itself did not appear to have been placed in a refuse pit, an area of refuse surrounded the burial and the corner of the fireplace where it lay. This refuse area was from 1 to 2 feet deep and contained cow bones, lead-glazed earthenware (locally made), an agate bead, a pin which appears to be of iron, and brickbat fragments. Two feet west and 1 foot below the surface, evidently not in the pit, a stemmed projectile of quartzite and a quartzite flake, both aboriginal, were found. The best conjecture is that the Indian burial was barely missed by the placement of the fireplace masonry, and closely encroached upon by a subsequent refuse pit.

East of the fireplace base a series of square pit postholes in 2 parallel rows extended 35 feet from the west wall of the fireplace. When fully exposed, these square pits averaged 2.4 feet on a side. The rows ran slightly south of east from the chimney foundation which was similarly biased. The westernmost pits in both rows converged slightly to lie beside the brick foundation (one on the north side, the other on the south) and measured approximately 8 feet apart. The north row consisted of 5 pits (the second from the west end appeared to be an extra intrusion), and the south row consisted of 4 pits. Two of the square pits were carefully treated with water after the tops had been planed off to make visible a mold within. In these pits the shadow of a circular postmold 0.8′ in diameter appeared and was traceable well into the fill of the pit.

Thus it may be conjectured that the house which was joined to the brick chimney and fireplace to the west was of frame construction, resting on sills which were supported above the ground by short posts sunk into the ground within square holes. (It is inconceivable to anyone who has observed frame construction on Jamestown Island that such an arrangement of wooden posts in the ground would have been satisfactory for long; however, seasoned oak posts could have remained serviceable for a quarter century or more, which would have exceeded the life expectancy of most houses of any type at Jamestown.) On both the northern and southern rows of postholes the measurement between the centers of the end holes is 29 feet. It may thus be assumed that the house sides which rose above these molds were approximately 30 feet long. The width of the house is not as easily determined, since the eastern end measures approximately 16 feet between the end molds, and the measurement between the western end molds is 15 feet. However, it is reasonable to suppose the width of the house was approximately 16 feet. No walkways were discovered in connection with Structure 116, and it might be assumed that the doorway was most logically on the east end opposite the chimney and facing a road or lane across Ditch 8, or on the southern side facing the river. However, we have cultural tradition of the late medieval builder of England to consider here, instead of modern logic. Accordingly there were probably 2 doors—1 centered in each long side of the house on the northern and southern sides.

Two round postholes in the central area of Structure 116 are of doubtful structural significance. Probably they are modern.

Artifacts

A number of artifacts were recovered above and in the vicinity of the brick fireplace foundation to a depth of 1.5 feet. Since only one fragment each was found to represent flat roofing tiles, pantiles, and floor tiles, we may assume that these were not necessarily used in the construction of this house. The only other structural evidence is a collection of 20 wrought-iron nails, from 1 inch to 3 inches long, and 4 pieces of roofing slate.

Objects of daily use were mostly from the refuse area in the vicinity of the fireplace foundation and close to the bundle burial. These artifacts include a few fragments of locally made, lead-glazed earthenware, some Dutch and English delftware, both Oriental and English porcelain (the latter 18th century), a modern steel pin, and a number of wine-bottle fragments. Only 1 gin-bottle fragment was found. Since the artifacts include some from the disturbed sod zone, the 18th- and 19th-century evidence can be accounted for. Wine-bottle evidence indicates 2 sherds possibly before 1675, 7 from the last quarter of the 17th century, and 2 from the 19th century. The best dating evidence comes from the collection of 22 white tobacco pipestem fragments which indicate a range in the last half of the 17th century, with most specimens from the last quarter.

Conclusion

The evidence at Structure 116 and vicinity shows the presence of a frame structure on wooden footings sunk into postholes. A brick chimney and fireplace stood at the east end. The structure by its design may have characterized houses constructed before the middle of the 17th century. But all associated artifacts signify usage in the last quarter of that century. Archeological evidence is that Structure 116 was a house of modest design which was built and used in the last half of the 1600's.

STRUCTURE 117

Structure 117 consists of a brick-walled basement and remnants of 3 ground floor footings. It is located on the same ridge of high ground as Structures 112 and 115, and lies between those buildings.

There are 2 connecting basement rooms in Structure 117: a large one (23½ by 15½ feet inside measurements) with brick floor, and a tiny one (6¾ feet square on the inside) with a charred wooden floor. The small room opens off the northwest corner of the main room. There is one fragmentary ground floor footing at the southeast corner of the structure, another at the southwest corner, and a third at the northwest corner of the small room.

The brick floor of the large room is at an average depth of 4½ to 6 feet below the present surface of the ground. The surviving basement walls measure from 2½ to 3½ feet high. The entire basement structure is laid in English bond (with occasional irregularities) except for the north 18½ feet of the large room's west wall which is a modified Flemish bond. In this unusual kind of bond every second course consists entirely of stretchers, the alternate courses being of the regular Flemish pattern of headers and stretchers. (See Figure 19.)

The most striking feature of the main room is a series of brick buttresses placed at intervals along the inside of the walls. There is one such buttress at each end of the room near the center of the end walls, and there are three buttresses spaced along each of the longer side walls. The buttresses at the south end of the room and the northernmost two buttresses along the west wall are bonded into the vertical brick facing of the basement. None of the other buttresses is similarly bonded to the wall, with the possible exception of the middle one of the east wall. This buttress has a plaster coating that conceals its details. The buttress at the north end of the room is unique. It has an interior space—rectangular in cross section and measuring 0.5 by 0.8 feet—extending vertically from the top of the buttress down to the floor level. The purpose of the buttresses is not known with certainty, but they were possibly designed to bolster the cellar walls or to support timber-framing. There is some variation in size and shape, but all

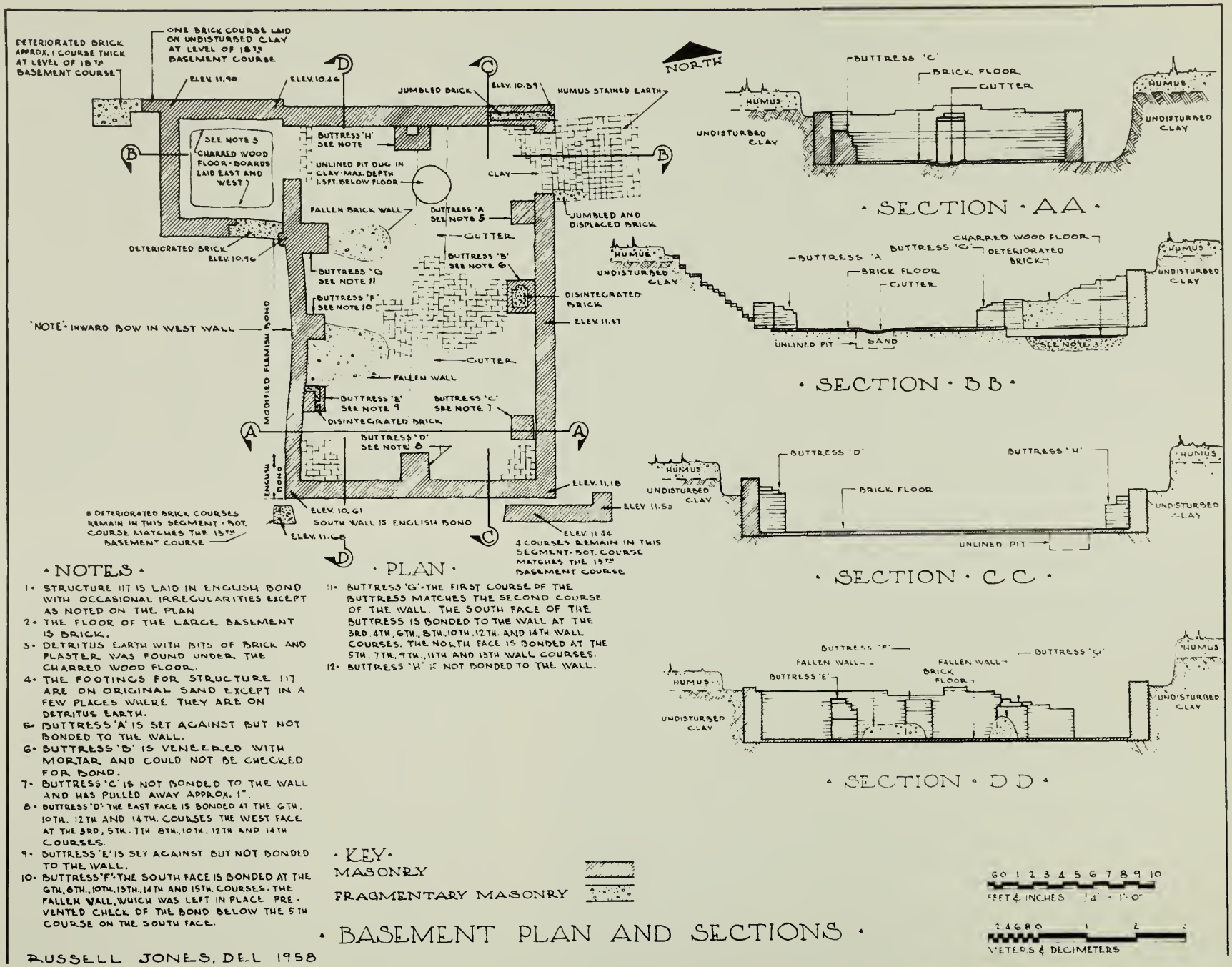


FIGURE 19—*Plan of Structure 117*

Plan of excavated foundations. *Historic American Buildings Survey drawing.*

the buttresses have rectangular cross sections with side measurements of 1½ to 2½ feet. Most of them show evidence of stepping in the brickwork on one or more sides.

A brick stairway foundation at the northeast corner of the larger room leads from the outside down to the cellar floor. The stairway was not quite 4 feet wide, and it descended a vertical distance of approximately 6 feet. The treads were probably made of wooden boards.

The brick-paved floor contains a shallow, V-shaped trough passing lengthwise through the room, beginning at the south wall and sloping gently to the north until it terminates at a small circular hole excavated into the subfloor of clay. Perhaps the trough acted as a drain to collect moisture and deposit it in the hole where it could soak into the ground.

The fill overlying Structure 117 was removed completely during the archeological excavations. This fill was made up largely of building detritus (bricks, roofing tiles, mortar) which extended from the bottom of the plow zone to the top of a distinct zone of charcoal 4 to 8 inches thick. The charcoal rested directly on the brick floor. This latter zone contained nails and a few fragments of household utensils, but it consisted mostly of charred remnants of wooden planks and beams, undoubtedly representing flooring and possibly other wooden parts of the house. Although the charcoal generally had crumbled into small pieces, it was possible to detect portions of fairly large beams (floor joists from the ground floor?) as well as planks approximately an inch thick.

A charred wooden floor, with some of the separate planks clearly discernible, lay beneath the detritus overburden in the small room at the northwest corner of the building. The level of this wooden floor was approximately 0.3 feet below the floor level of the large adjoining room. Beneath the charred planks was a detritus-filled depression extending to a maximum of 1.7 feet beneath the flooring. Several bits of roofing tiles, mortar, and broken pottery were recovered from the depression.

Artifacts

The artifacts most indicative of the use and date of Structure 117 were recovered from a deposit of charcoal and detritus which overlay the brick floor of the cellar to a depth of 2 to 6 inches. This deposit was excavated separately and the artifacts were kept distinct from the material taken from the remaining fill which extended to the surface as a mixture of brick rubble and earth. Artifacts from the floor to 6 inches above were too small for more than relative dating. Yet they were time-phased by white pipestems and by the presence of wine-bottle fragments which show post-1650 occupation. Eight of the pipestems were $\frac{8}{64}$, 2 were $\frac{9}{64}$, and one $\frac{7}{64}$ inch. Thus the pipestem evidence would appear to be pre-1650, according to Harrington's estimates. Perhaps the best conclusion is that the detritus on the floor is exactly at the 1640–50 interval. This is a 10-year period during which both wine bottles (beginning in 1640) and pipes of 1620–50 were made. Otherwise our sampling is too small to render an accurate estimate. The next best estimate is a 1650–75 dating. This third quarter dating comes from a consideration of the remainder of the ceramic evidence which includes some English lead-glazed earthenware and delftware and a complete locally made, lead-glazed earthenware pot found in 1900 during a partial excavation of Structure 117 by Louise Barney, daughter of the last owner of Jamestown Island.

Summary

Structure 117 is the ruin of a small house with 2 adjoining brick-walled cellar rooms and a brick stairway foundation leading into the larger room from the exterior. In the larger cellar room there is a series of buttresses placed at intervals around the inside of the brick wall. A shallow V-shaped trough running lengthwise down the center of the room is incorporated in the brick floor. The smaller room adjoins the other room at the northwest corner of the building and has a charred wooden floor beneath which is a detritus-filled depression. Ground level footings outside the cellar walls at three corners of the structure indicate that the upper walls of the house did not rest on the brick walls of the cellar. These upper walls could have been made either of brick or of wood. Sufficient tile fragments were recovered from the fill of the cellar to indicate that the roof was most likely plated with tiles. The debris underlying the wooden floor of the small cellar room suggests that the wooden floor was a late addition. The brick floor of the large room, however, lies on undisturbed earth showing that it was laid down during original construction of the cellar.

One puzzling note is an excavation 4 feet wide along the outside of the west cellar wall which extends down to the bottom of the wall. It is filled with clay containing a small admixture of humus-stained soil and some broken bricks and mortar fragments especially near the bottom. The purpose of this excavation is not clear. Possibly the builder excavated for the cellar, then, deciding to make the house smaller than originally planned, he might have placed the west wall 4 feet inside the edge of the excavation and filled in behind it.

The evidence, in any event, suggests that the structure was a dwelling with brick-walled cellar and framed upper construction. The weatherboard was probably of riven planks. There is a possibility that all the walls were made of brick, but the footings are so narrow that frame construction appears more likely.

Possibly associated with Structure 117 are 2 wells, the brick-cased Well 18 and the uncased (possibly unsuccessful) Well 23, both lying 40 feet west and within 20 feet of each other. Artifacts from Well 18 indicate the last half of the 17th century and very probably the last quarter. Artifacts from Well 23 are definitely earlier, the lowest fill containing a pipebowl characteristic of the first quarter, the upper fill containing nothing suggesting a date later than first half. No wine-bottle fragments came from Well 23, but one was found in Well 18, confirming its later date.

Architectural Details, Structure 117

Unit	*Description*
Main room	
North wall	8 to 14 courses remain; 1½ bricks wide (1.2′); English bond; east end is offset 0.4′ from the north wall of the small northwest room; buttress H is built against interior face; the north wall is leaning inward slightly.
East wall	8 to 16 courses remain; 1½ bricks wide (1.2′); English bond; brick stairway foundation interrupts wall near north end; buttresses A, B, and C along inside face.
South wall	10 to 16 courses remain; 1½ bricks wide (1.2′); English bond; buttress D against interior face.
West wall	4 to 17 courses remain; 1½ bricks wide (1.2′); English bond in the 1½′ section at the south end of the wall; the rest of the wall is a modified Flemish bond; buttresses E, F, and G are placed at intervals along the interior face; the west wall is interrupted 3.4′ short of the north wall by the doorway between the 2 rooms; there is a pronounced inward curving of the west wall with the point of maximum curvature near the center of the wall.
Buttress A	1 to 5 courses; sides measure 1.5′ by 1.6′; not bonded to east wall.
Buttress B	4 to 13 courses; sides measure 1.8′ by 2′; exterior is coated with shell plaster, masking the juncture with the east wall so that it could not be determined whether this buttress is bonded to the wall.
Buttress C	8 courses remain; sides measure 1.6′ by 1.6′; in the west face, the 7th and 8th courses are each indented 0.2′ to form a stepped arrangement; this buttress is not bonded to the east wall but has pulled away from the wall so that there is a crack up to an inch wide between wall and buttress.
Buttress D	12 to 15 courses remain; sides measure 1.6′ by 1.8′; in the south face, the 7th and 8th courses are each indented 0.2′ to form a stepped arrangement; this buttress is bonded into the south wall.
Buttress E	1 to 12 courses remain; sides measure 1.4′ to 1.6′; not bonded to west wall.
Buttress F	10 to 12 courses remain; sides measure 1.2′ by 1.6′; bonded to west wall.
Buttress G	9 to 14 courses; sides measure 1.9′ by 1.9′; the 9th course is indented 0.2′ on the north, south, and east sides so that there is a narrow ledge running around the 3 open sides; buttress is bonded to the west wall.
Buttress H	1 to 4 courses remain; sides measure 1.6′ by 2.3′; not bonded to north wall; a completely enclosed rectangular space (0.5′ wide by 0.8′ long) runs through the buttress vertically along the face of the north wall.
Brick floor	A single continuous layer of bricks covers the entire floor area of the main room except for a small round hole in the north part of the room. The floor bricks are laid in 2 basic patterns—(1) parallel, adjacent rows, as in the east-central area (see Figure 19), and (2) a herringbone pattern as in the northeast, southeast, and southwest corners. A narrow strip of the floor bricks forms a shallow V-shaped trough which runs nearly down the center of the room in a north-south direction. Near the north wall, in the V-shaped trough, is a roughly circular hole in the floor 1.3′ deep with an average diameter of 2.4′. The brick flooring appears to extend underneath all of the buttresses; the floor is laid directly on a thin bed of mortar approximately 0.1′ thick which, in turn, rests upon undisturbed clay.
Small northwest room	
North wall	11 to 20 courses remain; 1½ bricks wide (1.2′); English bond.
East wall	4 to 9 courses remain; 1½ bricks wide (1.2′); modified Flemish bond; interrupted 3.8′ short of north wall by doorway leading to main room; this wall is shared with the main room.
South wall	14 to 17 courses remain; 1½ bricks wide (1.2′); English bond; wall is slightly curved inward; there is a layer of shell mortar about 0.1′ thick underlying the west 1′ of the wall; a 1″-thick prepared layer of clay underlies the rest of the wall in a rather irregular fashion.
West wall	16 to 19 courses remain; 1½ bricks wide (1.2′); English bond; a prepared layer of clay underlies the south 4.5′ of the wall.
Wooden floor	The northwest room contains the remains of a charred wood floor consisting of planks approximately 0.1′ thick and 0.5′ wide running east-west. The charred remains are roughly centered in the room, leaving a continuous gap around the flooring and separating it from the 4 walls (the gap varies from 0.6′ to 1′). The flooring appears to have been at about the same level as the bottom of the brick flooring in the main room. A detritus-filled depression up to 1.7′ deep lies directly beneath the wooden floor. The perimeter of this pit follows the outline of the flooring closely, but it is a little larger, and extends beyond the flooring on all sides and averages 0.2′ to 0.3′.
Stairway at northeast corner	Top line of bricks is 5.3′ above floor level of the main room; stairway is 4.0′ wide where it passes through the east wall; maximum over-all width is 5.3′; 13 rows of bricks remain, stepped—one above the other—at irregular intervals; in some cases a row will slightly overlap the row immediately below.
Footing at southeast corner	3 to 4 courses remain; 1½ bricks wide; 7′ maximum length; bottom course of footing at same level as 13th course of basement walls.
Footing at southwest corner	Badly deteriorated; 5 courses remain; bottom course at same level as 13th course of basement walls; sides measure approximately 1.2′ by 1.2′.
Footing at northwest corner	Badly deteriorated for the most part; 1 course remains; at same level as 18th course of basement walls; 1 to 2 bricks wide; north edge alined with and contiguous to the exterior edge of the north wall of the small northwest room.

Unit	*Description*
Mortar	Under floor bricks and in walls and buttresses of main room the mortar is sandy, tan in color, and contains bits of shell and some charcoal; the tan mortar is quite friable; in the northwest room the mortar contains shell and charcoal, is white, and is relatively hard.
Bricks	Local manufacture; hand molded. Color: dark-salmon to deep-red Size No. 1 (walls of main room and buttresses B and G) Length, 8⅛" to 8¾", av. 8⅜" Width, 3⅞" to 4⅜", av. 4⅛" Thickness, 2" to 2⅝", av. 2⅜" Size No. 2 (north, south, and west walls of northwest room; also buttress F) Length, 8¼" to 8⅞", av. 8⅝" Width, 4" to 4⅜", av. 4¼" Thickness, 2¼" to 2⅝", av. 2⅜" Size No. 3 (buttresses A, C, D, E, and G) Length, 8½" to 9⅝", av. 9" Width, 4" to 4½", av. 4¼" Thickness, 2¼" to 2⅝", av. 2⅜"

STRUCTURE 118

It is difficult to say whether or not Structure 118 (Lots 94:105 and 94:106) is actually the evidence of a building. It is possible that an analogy may be offered between Structure 118 and Feature 1 of Lot 100:98, west of the Tercentenary Monument, since both appeared to be elongated burned surfaces about 10 feet wide.

Two parts to Structure 118 were noted. Lying at right angles to each other, these are: The unit designated 118A lying in a NW–SE axis, and 118B lying in a NE–SW direction. Structure 118A was approximately 15 by 11 feet and Structure 118B, 35 by 9.5 feet. The 2 units lay 11 feet apart, and each was from 1 to 2 feet below the surface, the burned top being approximately 1.5 feet deep for 118B and 1 foot for 118A.

During the excavation of Structure 118, 2 square post molds (1.5 by 1.5 feet) were observed beside the B unit, to the west. This area was further explored in search of a post-mold pattern that would establish evidence of a frame house related to the burned floor. An area 40 feet to the east and 25 feet to the west was cleared with a bulldozer to an average depth of 1 foot below the surface. Although a new rectangular burned "floor" area (A unit) was found to the west, no trace of any mold pattern was noted east of the first test. However, additional post molds, also rectangular, were found in the original line, extending at least 50 feet and averaging 9 feet apart, center to center. As Structure 118A was developed, a second line of comparable post molds was found to extend parallel to the first line and to Ditch 8 which lay between. Thus, it may be concluded that 2 lines of molds probably represent fence lines on either side of Ditch 8. Structures 118A and 118B are both undoubtedly precedent to these fence lines, and may represent the burned clay floors of frame structures which lacked any remaining foundation evidence.

In the shallow old humus line beneath the modern plow zone a small number of artifacts was retrieved above the respective burned areas. A white pipebowl dated from 1660 to 1680, a piece of Italian sgraffito, a Dutch brick, a bit of wrought-iron hardware (probably from a wallbracket), and 5 indeterminate wine-bottle fragments indicated the last half of the 17th century. And in the superficial earth, 18th- and 19th-century stoneware traces and a 19th-century wine bottle were found.

STRUCTURE 119

One of the most baffling structural fragments at Jamestown was uncovered by an exploratory trench 40 feet west of Structure 17, 60 feet from the 1935 river bank, and 2 feet west of Ditch 8 (see Lot 94:105). Remnants of a single course of flat-laid brick, 2.6 feet wide maximum, form a small, rectangular structural outline. Its southeast and northwest sides are 14 feet apart. A trace of a single course of masonry remains to the northeast. The southwest wall, if it existed, has disappeared. It is possible that these single courses represent either the basal member of the walls of a rectangular small shop building or traces of a paved walkway around a pit.

The central feature of this problematical structure was a long, narrow pit excavated well into undisturbed clay. It was rectangular in shape, 19.2 feet long and had an average maximum width of 7.5 feet. The outline of the pit became visible 2 feet below the surface, and from that level to the bottom of the pit averaged 1.8 feet. Orientation of the long axis of the pit was approximately NNE–SSW. A narrow bench of undisturbed clay ran completely around this pit about 0.5 feet below the surface of the rim or 2.5 feet below the surface of the ground. The bench was 1.5 to 2 feet wide and had a vertical wall at its inside edge running down to the bottom of the pit, making the deep portion of the excavation encompassed by the bench slightly over 4 feet wide and approximately 16 feet long. The surface of this inner pit was very hard and well defined. In certain areas the floor appeared to have been subjected to moderate heat, but there was no evidence of intensive firing, and it cannot be inferred that fire was ever made on the actual floor.

At the south and north ends of the inner pit (equidistant from the east and west walls) brick traces were recorded, 2 courses of 3 bricks each, at the south end laid flat to form a tiny paved area. One course of two bricks at the north end formed a paved area 0.7 foot square. At the south end of the pit the bricks are laid at floor level. Immediately behind the bricks a roughly square (average 0.6 foot to a side) post mold or flue extended upward through the clay wall to the surface of the pit. At the north end the bricks are set on earth fill 0.8 foot above the floor of the inner pit.

Opening into the southeast side of the long pit is an apparent fireplace (B) consisting of a more or less rectangular pit dug well into the undisturbed clay, with a floor continuous with that of the long pit and at the same level. Portions of the northeast and southwest walls are lined with brick. The masonry consists of 13 courses, 0.7 foot (2-brick-widths) wide, except for the 2 top courses which are 3-brick-widths wide. The length of the 2 wall remnants is 1.8 feet, respectively. The unbricked clay walls of the sides and rear of the fireplace are heavily fired to a brick red. The fireplace is 4.3 feet wide at the opening and 3.6 feet at the back. The depth, opening to back, is 3.9 feet.

A small pit (A), rectangular in outline, interior walls heavily fired, was located 3.5 feet west of the midway point of the northwest side of the rectangular pit of Structure 119. This small pit was dug into the undisturbed clay to a depth of 2.6 feet below the surface. The top became visible at 1.4 feet below the surface. The bottom 2 to 3 inches of the small pit contained charcoal and ash, indicating use as a firepit or that a timber had almost entirely burned within the mold. The pit was 1 foot wide and 1.3 feet long, and the long axis is parallel to that of the large adjacent pit.

At the northeast end of the large pit, 2 feet beyond the rim, a rectangular post mold 1.4 feet square lay with a trace of brick footing or walk between it and the pit. Two other square post molds lay close to each other at the southern end of the southeast side of the large pit. The fill of a pit, 5 by 3 feet, lay 3 feet below the single course of brick at the southeast side of Structure 119. No diagnostic artifacts were found in this pit.

Artifacts

Unfortunately, the artifacts found associated with Structure 119 do not seem to indicate any particular use, manufacturing or otherwise. They may as well have been found in a simple dwelling. The pantile sherds in the upper deposit most probably were derived from nearby Structure 17, where many were found. Even the evidence contained in the fill of the pit in front of the firebox or furnace does not appear especially meaningful; indeed, it may represent an accumulation of trash and debris from the surrounding area after the complete destruction of the feature. In any event, this fill contained wine-bottle fragments, bits of roofing slate, a bale seal of lead stamped with the number 104, a musket ball 20½ mm. in diameter, an indeterminate copper coin of half-penny size, some handwrought nails, and 3 white pipestems which could indicate mid-17th century and later.

The balance of artifacts suggests, chiefly by tobacco-pipe and wine-bottle fragment evidence, a dating from 1650 to the end of the century.

Associated Features

A meaningful association for Structure 119 is still in doubt, pending its identification. It can only be surmised that this structure may have some relationship with Structure 17, located 40 feet to the west. The depth and magnitude of the fireplace, or pit, and the extreme heat generated in it, would seem to preclude the location here of a smokehouse. The artifacts are apparently not diagnostic of any particular use. Since they belong to the latter 17th century, it appears that the structure may be contemporaneous with the majority of artifacts found in Structure 17.

Ditch 8 lies within 2 feet of the southeast footing or walk of flat-laid brick. The proximity of this ditch may be significant if it can be determined whether or not the ditch represents a property line related to Structure 119 or other buildings in the vicinity. However, a ditch dug that close to an existing structure is improbable, and it is evident that the ditch was built either after the structure was abandoned or before it was built.

The very dubious Structure 118—55 feet from the north—may represent the floor of a burnt frame barn, or shed, which could have some relationship to Structure 119 if it were a workshop.

Summary

It seems probable that Structure 119 was a workshop of some kind which required a fireplace capable of producing a hot fire. The nature of associated artifacts does not suggest a forge, since metal refuse is lacking, nor does it suggest a kiln. More probably the structure could have served as a brewhouse or distillery. Related artifact evidence indicates dating in the second half of the 17th century.

STRUCTURE 121

Problematical evidence of brick rubble in a horseshoe curve, covering an area 40 feet north-south and 30 feet east-west at a depth of 0.8 to 1.2 feet from the surface, constitutes Structure 121. If a brick rubble path is represented, it could have been associated with Structure 16 (30 feet to the west), or with several indefinite structure traces (Structures 120, 40, 42, 45, and 51) located a short distance away to the south, toward the river. Refuse Pit 2 extends from a distance of only 10 feet to the east, also within Lot 95:104.

Artifacts from 1 foot to the undisturbed earth within this area included a fragment of gin bottle, 2 bits of wine bottle, indeterminate as to type, a piece of window glass that could be 17th century, a sherd of blue-on-gray stoneware, a sherd of 19th-century earthenware, 3 handwrought nails, and 2 machine-cut spikes. From the surface to the top of the brick rubble were found 50 pieces of wine bottles, mostly 18th century, with a few possibly 17th century, 12 fragments of 18th-century white clay pipestems, a piece of 18th-century stoneware, and several bits of 18th- and 19th-century porcelain.

Little can be surmised with confidence here except that some

type of walkway may be represented which could date from either the 17th or 18th century.

STRUCTURE 122

Structure 122 is the designation given to a problematical basal course of bricks, 80 feet long and 1.5 to 4 feet wide. It is located in the bottom fill of a somewhat widened section of Ditch 66 in Lots 98:102, 98:103, and 97:103. The bricks of this basal course were laid on edge as headers end to end across the width of the structure. The longitudinal line of this structure was irregular. The bricks were a uniform red, evidently well-fired and medium hard. Dimensions are within the range of 8¼ to 8⅜ inches long by 4 to 4⅛ wide by 2⅛ to 2⅜ thick. One well casing brick, wedge-shaped, measured 7 3/16 inches long by 4⅝ inches wide at one end, 3¼ inches at the other, and 2¼ inches thick. Ditch 66 was 4 to 5 feet wide at the top of the undisturbed clay as it met the old humus zone, and was traceable from 1.5 to 2.5 feet below the 1955 surface. The bricks were laid on clay, with the bottom of the ditch dropping slightly on either side.

Two possible interpretations of the purpose of this structure have been considered. One, offered by J. C. Harrington in March 1957, is that this is the basal course of a brick drain, the top of which has disappeared. The second, pondered but not regarded as conclusive, is the writer's who wrote the following field note:

> 3/14/57. In extending Ditch 66 westward for exhibit in the 1957 celebrations, the landscapers opened 39 feet of Structure 122 west of the E 103 line (bringing the total length, plus the 1955 findings, to 80 feet). The brick pattern (bats laid on edge—almost none complete) was again recognized and a section was made at E 10285 to examine the profile. It was demonstrated clearly that the brick course was not a drain or a drain covering, as in Structure 33 and Structure 56. The line of bricks still appeared to be a base course, although it is so irregular both in level and in outline possibly due to settling, that no structure could be erected on it today. It could be assumed that in its original form, with proper levelling, it served as a footing for a brick wall. (The large quantity of small brick fragments on either side of the present line to the north and south indicates a wall above may have been destroyed.)

If Structure 122 was indeed a wall, it would have been a ha-ha wall, comparable to that to be seen at Stratford Hall (Robert E. Lee's birthplace in Westmoreland County, Va., on the Potomac River). A ha-ha wall is a low brick wall set within a ditch so as to be out of sight and yet remain effective in keeping livestock from crossing the ditch.

Neither of the two possible explanations is unreasonable, and it is the present opinion (1957) of the writer that neither can be proved.

No artifacts of definitive character were recovered from association with Structure 122. The total of finds consisted of 3 flat roofing tiles of local manufacture; 2 sherds of red, lead-glazed (inside) utility earthenware, probably made locally; and 3 handwrought iron nails. From evidence found in the fill of the east end of Ditch 66, near the juncture with Ditch 9, it appears that this ditch was open, probably, from 1675 to 1700.

STRUCTURE 123

This structure was a small foundation (92:109) located north of Structure 125. It is a simple rectangle measuring 20.4 by 30.4 feet overall (18 by 28 feet inside measurement) with a stairway access to the cellar from the outside through the southwest wall (Jones, 1958c). The cellar is the full extent of the rectangle, with a brick-paved floor an average of 4 feet below the present surface. The paving is constructed to slope slightly from the sides to the middle and toward a small bricked square recess in the southwest end of the cellar floor.

The masonry of Structure 123 is English bond of good quality, well laid. The mortar is white, made with burned oyster shells and sand, and is still strong. The bricks are relatively uniform in size and quality, well-fired, medium hard, and in good preservation.

When sectioned across the middle, the fill above the foundation showed that the house, after being abandoned, evidently was dismantled for brick salvage as far down as the brick could be obtained conveniently, leaving the foundation walls standing with 2 to 5 courses above base. Directly above the brick floor of the cellar lay a deposit of refuse and brick fragments to a depth of 0.5 foot. This was labeled Zone B. Above this zone lay a deposit of clean clay earth piled up against and over the remaining foundation walls and sloping to the center of the cellar, as if the foundation had been partly filled from the sides soon after demolition. Zone B did not contain a high enough concentration of carbonaceous detritus to show definitely that the building had burned. No charred timbers were found on the floor and the few nails recovered from this zone were well-rusted and heavily encrusted. They did not have the clean, hard surface of iron which is usually found in a burned structure. In Zone B only 1 flat tile fragment and 2 pieces of roofing slate occurred. In the general fill were 5 fragments of window glass.

Above Zone B and the clay fill over it, lay a lens of charcoal-stained earth, Zone A, with evidence of heavy burning at the base where the clay was fired a deep red. Thus, it is to be inferred that a hot fire was kindled in the partly filled pit of the Structure 123 foundation. Then this pit, with the fire evidence, was ultimately filled with relatively sterile earth and leveled, after which the modern humus was established. In removing fill from the southeast quarter of the cellar, workmen recovered a French copper coin dated 1772 from Zone A, lower portion, about 2 feet from the east wall and 1.5 feet above the floor. This coin could have been dropped by a soldier in the troops under St. Simon's command when they landed and bivouacked there en route to Yorktown in 1781. The assumption would be that Structure 123 was at that time

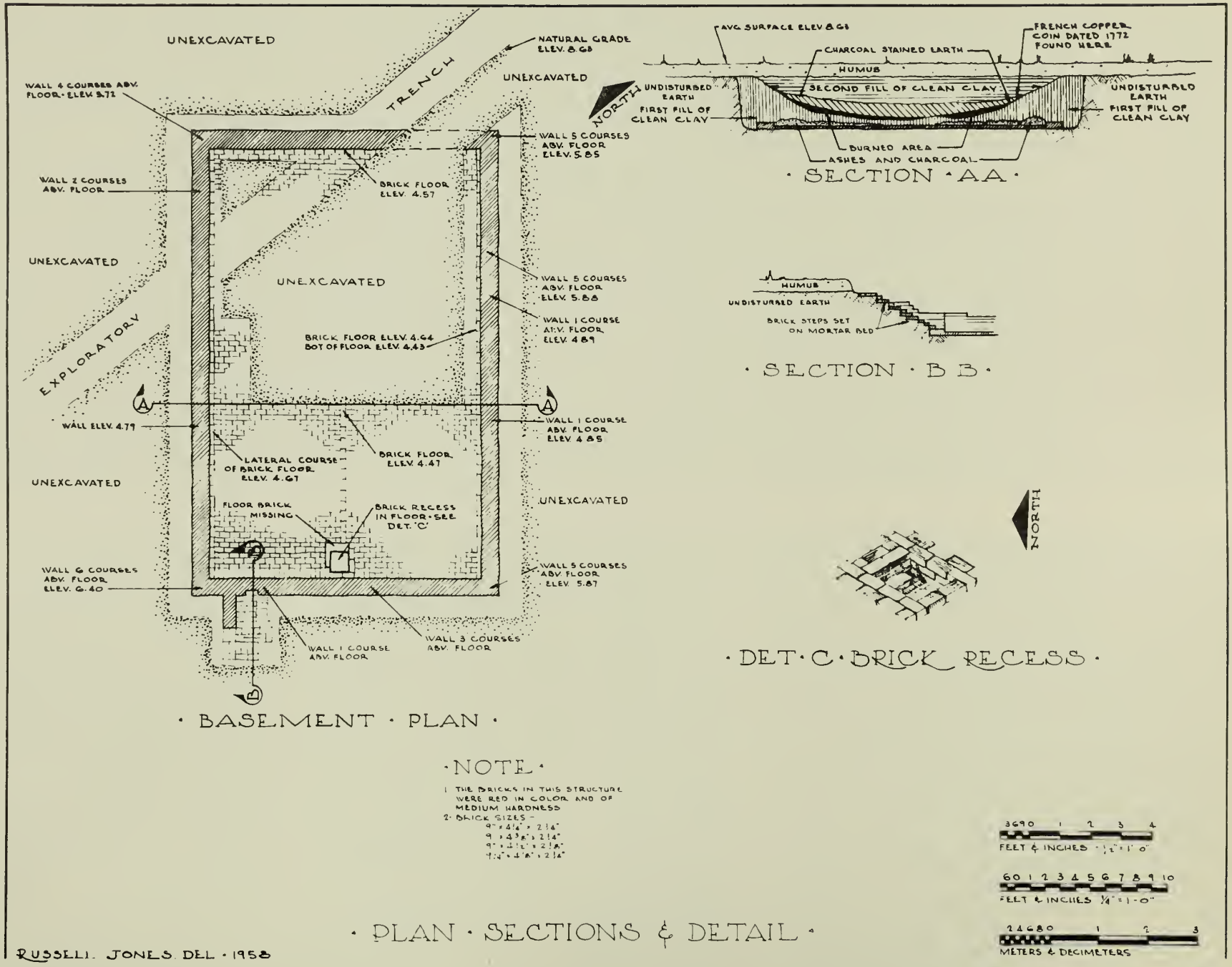


FIGURE 20—*Plan of Structure 123*

Plan of excavated foundations. *Historic American Buildings Survey drawing*



PLATE 63—*Structure 123*

This small frame building with cellar walls of brick was probably in use beyond the turn of the 18th century. In this reconstruction, the chimney is entirely conjectural. Research by Kocher and Cotter. *Painting by Sidney E. King.*

in ruin, with only the foundation hole showing. The bottom of Zone A shows evidence of firing as if a large fire had been built in the hollow. The bivouacking soldiers may well have made such a fire, and the coin could have been dropped at the edge of the foundation.

Artifacts

The evidence of objects at Structure 123 indicates that considerable quantities of wine were stored and used on these premises in the latter part of the 17th century. Within the house area itself, no less than 287 pieces of wine bottles occurred, with enough complete bottle shapes to define types common from third-quarter 17th century to first-quarter 18th. The most significant find of bottle evidence, in the box-like recess beneath the floor level, produced two bottles having the straight sides of first-quarter 18th century. It may be worth noting that, since Jamestown was a far outpost of civilization and manufactured goods were at a premium, wine bottles were expected to serve many fillings from the cask and, with good fortune, last a good many years. Furthermore, the fill of a ruined cellar could be expected to include debris of broken bottles which accumulated both before the house was abandoned and afterwards when the depression accumulated trash, thus producing a wide latitude in dated objects.

Tobacco-pipe evidence again is perhaps the best evidence for dating. According to Harrington's estimate of stem diameters, the prevalence of small stems (25—$\frac{6}{64}$, 6—$\frac{5}{64}$, 11—$\frac{7}{64}$) in the Zone B debris directly above the brick cellar floor, indicates a dating of 1680–1710.

Associated Features

Structure 123 cannot be said to be situated in significant association with any other feature. The nearest feature, Structure 125, is 120 feet south. Structure 86 is 125 feet north. Structure 123 lies within a rough quadrangle formed by Ditches 6 and 7 to the west, Ditch 4 to the north, Ditches 42 and 41

(and farther on, Ditch 13) to the east, and several indefinite ditch traces to the south. No wells or outbuilding traces appear in association.

Summary

It cannot be determined from archeological evidence at this time whether or not Structure 123 walls were frame, brick, or a combination of both. It may be assumed that it was a small residence with a full cellar. During the progress of excavation it was expedient to bulldoze the top 2 feet, after it was determined that little could be gained from excavating this disturbed area by hand. Beyond the margins of the original house excavation, the bulldozer excavated an average of 15 feet, east and west, but no post hole or other evidence was observed above the undisturbed earth to indicate that footings for frame annexes existed.

In general, the artifact material indicated last-quarter 17th and first-quarter 18th century.

Architectural Details, Structure 123

Unit	*Description*
Northeast wall foundation	4 to 5 courses of English bond remain 1.1′ to 1.2′ wide (1½ bricks); wall is solid, so far as excavated (5 feet unexcavated); well-laid, with bricks uniform red, well-fired and medium hard; mortar is good, shell-filled and white; wall is uniform, and without openings; mortar and bricks uniform for all 4 walls of the building; bricks range from 9″ to 9¼″ long, av. 9″; 4⅛″ to 4⅜″ wide, av. 4⅜″; 2¼″ to 2⅜″ thick, av. 2⅜″.
Northwest wall foundation	Most of the brick from this wall had been salvaged, apparently, so that most of wall had only 1 course remaining above the floor level. Near the junction with the southwest wall, however, 6 courses remained; bricks and mortar uniform, similar to those of northeast wall; no evident openings. English bond.
Southeast wall foundation	The middle portion of wall is stripped to 2 courses above floor level; ends rise to 5 courses above the floor; bricks and mortar correspond to the walls described above.
Southwest wall foundation	3 to 6 courses above floor; wall is comparable to the others in masonry except that it has a stairway giving access to the brick-paved cellar from the outside; stairway is located at the western end of the wall and appears to have been about 3′ wide, although it is too fragmentary to afford a true measurement.
Cellar floor	The entire rectangle of the structure foundation enclosed a single cellar without partitions; floor of cellar was paved with flat-laid bricks oriented so that the length of the bricks corresponded with the width of the cellar, except at the sides, where marginal bricks generally were parallel with the walls. In the center of the floor a single row of bricks was laid with long axis parallel to length of building, so that drainage ran toward the box-like recess in the floor at the mid-section of the southwest wall. This box-like recess in the floor is lined with brick and had original measurement of approximately 1.1′ on each side, forming a square 0.8′ deep. The bottom was also bricked, making the drainage purpose questionable.

STRUCTURES 124A AND 124B

Structure 124A (Lots 91:117 and 90:117) is a brick walk running approximately north-south immediately west of Structure 124B, the residence erected by E. E. Barney following the burning of the Ambler House in 1898. The house was destroyed in 1934 and the walk was covered with a few inches of topsoil to obliterate it. Pictures exist in the files of Colonial National Historical Park of the substantial bungalow which was the second Barney home. This information is included here for future reference.

STRUCTURE 125

Structure 125 (Lot 90:110) was a substantial house indicated by a main portion, a three-quarter cellar with outside entrance, a recess lined with brick in the floor of the cellar, an annex attached to the river side of the main wall, and a large fireplace in the southeast wall of the main structure. Facing the river, the house had been situated on a slight prominence 10 to 11 feet above mean low tide, just halfway between Structure 17 ("First Statehouse") and Orchard Run. The main foundation measured 43.5 feet outside length and 40 feet inside. (Jones, 1958d.) A fragmentary brick footing was discovered 7 feet from the northeast wall (opposite the annex on the river side). This footing possibly represented another annexed structure or porch. The annex on the southwest (river) side joined the southwest main wall, extended 12 feet, and had a double wall on the northwest side. The front (river) wall of the annex is incomplete and there is no trace of the southeast wall. The walls lay from 0.8 to 4.3 feet below the surface.

For reference purposes, well defined portions of the foundations have been labeled Areas A, B, C, and D. Area A is the originally unexcavated quarter, 20 by 8.3 feet, enclosed by the northwest main wall of Structure 125, the northwest cellar wall, and the southwest main wall. Area A is almost entirely lacking a northeast wall. However, the soil indicates that a wall footing on undisturbed clay existed here but was entirely salvaged for brick when the structure was demolished.

Area B is the main portion of the cellar, floored with brick, 20 by 14.8 feet, the long axis across the width of the house. This pavement slopes gently to the midportion where a rectangular well, 3.3 by 3.3 feet, has been sunk to 2.7 feet beneath the floor. Sides and bottom are lined with brick. The fill of this well indicates its possible use for cooling wine (wine-bottle fragments were numerous in the bottom ½ foot). The ab-

sence of mortar beneath the flooring bricks suggests drainage was desired. Area B fill was characterized by brick rubble concentrated in the first to third foot above the floor, and the absence of evidence of burning. Rather, evidence suggested deliberate demolition of the house. The remnant of a brick partition separated Areas B and C.

Although unexcavated, Area C has been tested sufficiently at its edges to show that the southeast portion of the cellar, beyond the partition separating it from Area B, was almost the same size as Area B (20 by 14.3 to 14.7 feet), but had no pavement of brick. At the southeast end, the foundations of the fireplace show an opening 7.7 feet broad and 4 feet deep, with a burned clay floor. It can be deduced that Area B was entered from Area C through the central opening in the brick partition, and there may also have been access from the ground floor, above. Area C had access through this partition, but also had an outside opening by way of a stairway in the east end of the southwest wall. The fireplace was used in the cellar, and also in the upper floor, or floors. This is evident from the burned clay at the interior of its base. It would be logical to assume that Area C had a board floor, inasmuch as there was no great amount of detritus above the basal sand, or a packed clay floor above natural sand. However, there was no evidence of boarding.

Area D, a fragmentary foundation remnant of an annex or portico, shows that a wall parallel with the long axis of the main structure lay 10.3 feet toward the river and was connected to the main structure at the northwest end by 2 parallel walls, 1 foot apart. The outermost of these walls was indicated by only a base course of brickbats, and, since it was tied more definitely into the longitudinal wall of the annex, it may be assumed that this was the original wall. The annex may have been rebuilt later and the interior wall laid down. The interior wall was tied into neither the main wall of the house nor the longitudinal wall of the annex. Because of its fragmentary nature, the size of the annex is not known.

Artifacts

The artifact evidence of Structure 125 is abundant and meaningful, but it must be used with caution and discrimination. The most puzzling factor is the goodly number of nails which appear to be machine-cut. From the cellar area fill, 1 to 4 feet below the surface, 18 of these precisely made nails were taken. No less than 120 of them were taken from the area above the structure proper, from the surface to 2.3 feet. In these proveniences, true handwrought nails appear to be missing. However, eight handwrought nails did occur in the fill of the floor well below the cellar, and no machine-cut nails. Since machine-cut nails are supposed to have been an innovation at the beginning of the 19th century, some further examination of the character of the evidence may be in order.

The balance of artifacts, notably tobacco-pipe fragments and wine-bottle fragments, definitely extend in type past the close of the 17th century into the first quarter of the 18th. The most reliable piece of evidence is the single white pipebowl found on the floor of the cellar well box. This pipe could have been made either in the last quarter of the 17th century or the first quarter of the 18th. Since the wine bottles have globular bodies and short necks, rather than straight sides, they indicate manufacture not later than the first quarter of the 18th century. But none is earlier than the last quarter of the 17th. The large number of wine-bottle fragments suggests strongly that much wine was consumed on the premises of this structure, and the "AA" and "FN" seals—indicators of the turn of the 17th century—may suggest identity with at least one historical figure, Francis Nicholson. The tobacco pipestem apertures from samples in the cellar fill range from $^{9}/_{64}$ to $^{5}/_{64}$ inch—a range which could indicate manufacture from the first to the last quarter of the 17th century and into the 18th. However, the majority of stems belong in the $^{7}/_{64}$ and $^{6}/_{64}$ category, which is consistent with the wine-bottle datings. One pipebowl is definitely of a type made from 1700 to 1725.

Of the earthenware vessels, the majority are white English or Dutch delft. The only other numerically important type is English lead-glazed, dark, earthenware of utility design which occurred in quantity in the fill of the well box in the cellar floor.

The most significant metal object was possibly a pickax of 17th-century type. It was found in the lower portion of the cellar fill, about half a foot above the brick floor. This pickax may well have been misplaced during the demolition of the house—in fact, its presence otherwise in this location is difficult to explain. Other metal objects, while numerous, are not especially noteworthy. They include, from the cellar fill proper, a brass spoon handle of trifid design and a casting counter fragment, and several iron objects—a hoe, a pothook, and a lead came.

It is probable that evidences of brickwork at the front and back of Structure 125 indicate annexes or porticos, but the nature of these structures cannot be determined definitely.

The cellar walls were plastered with a mortar, or rough plaster coat, full of oyster shells. Other evidence of plaster shows that the house walls were covered with a fine layer of thin plaster of a white color. Lath marks are not evident in plaster samples.

Only 13 fragments of flat roofing tiles were found, 2 of which had mortar on them, suggesting use in wall construction. Four were from the upper portion of the cellar fill and nine from the lower part of the fill. No examples of pantiles, and only two fragments of roofing slate were located in the cellar fill. In all, the inference may be made that Structure 125 was more probably roofed with wood shingles or with flat tiles, the scarcity of the latter being attributed to salvage for building materials.

The salvage explanation could also account for the recovery of but a single diamond-shaped quarrel from the cellar fill. To the scarcity-of-glass-window evidence must be added a total absence of leaden cames.

The fact that all 138 nails found in the cellar fill of Area B appear to have been machine-cut is an important indication of the late 18th- to early 19th-century date for the structure. Eight handwrought nails from the fill of the floor well—no machine-cut nails here—provide puzzling evidence, perhaps indicating two periods of building and use.

Wine-bottle evidence from the floor well and the cellar fill alike indicates the globular, short-necked form characteristic of the 1660–1710 period, with emphasis on the latter part of the period. However, the apparently machine-cut nails indicate early 19th-century dating—unless Virginia ingenuity anticipated the Yankee variety.

Associated Features

The closest structure is 126, located the same distance from the shore as Structure 125, and about 70 feet southeast. This brick ruin fragment gives no positive identifying characteristic and it can only be postulated that it represents a small building possibly related to the larger house, Structure 125.

A pit, irregular in outline, covers an area 6 by 16 feet and partly underlies the northwest wall of Structure 125. (See northwest wall description below). The use of this pit is not known.

Summary

Structure 125 was a substantial house located on a slight prominence facing the James River, the shore of which lay an unknown distance to the southeast—in 1956 some 40 feet away. Artifact evidence shows that it was occupied toward the close of the 17th century, and very probably the first quarter of the 18th, although the identity of the house is unknown. The date of building is harder to conjecture—the last half of the 17th century, at least. The two "FN" bottle seals from the bottom of the bricked well recess in the cellar, Area B, can be associated with Sir Francis Nicholson, last resident Governor at Jamestown, but this does not establish the house as his own. It seems probable that the house walls were constructed of brick, but this cannot be positively stated from the aspect of the foundations.

Architectural Details, Structure 125

Unit	*Description*
Northeast wall foundation, Areas A, B, and C	7 courses remain, 2 bricks wide (1.6′); courses facing interior (cellar) are English bond; outer courses are composed variously of whole and half bricks. The interior wall, facing the central cellar, is plastered with a rough coating of a plasterlike material applied in swirls which are still evident, due to the plowing effect of the shell bits in the plaster. This contrasts with the yellowish, sandy mortar between the bricks. Wall is 30′ long, interior measurement. This does not include a gap at the NW end which would, if filled, make the total wall length 40′, interior.
Southwest main wall foundation, Areas A, B, and C	4 to 5 courses remain, 2 bricks wide (1.6′); English bond fairly consistent throughout. Plaster applied to interior (cellar) wall is white and filled with shell fragments, contrasting strongly with mortar between brick which is yellowish and sandy. Wall is 30′ long. At the east end of the wall a break appears, indicating a stairway 5′ wide to the exterior. No joints appear at juncture of walls of porch or portico to the southwest.
Northwest main wall foundation, Area A	A maximum of 7 courses remain of this wall, the north half of which has a first course of brickbats set on edge, irregularly. Width: 1.9′. The south half appears more regular. English bond, 1.5′ wide, is used for the top 6 courses, where they are preserved. Inside measurement: 19.8′ long. This wall partly overlies a trough-like pit extending under the north corner of Structure 125. One and a half feet of brick rubble was deposited in the pit fill to make a footing for the wall.
Southeast wall foundation, Area C	First course only intact. English bond. Total wall length, including fireplace, 20.3′. Large fireplace in middle of wall 8′ wide (interior measurement); has walls continuous with structure wall. The clay floor of the fireplace is burned red. Fireplace is 4′ deep, interior measurement. Fireplace and main structure walls are a uniform 1.5′ wide.
Northwest interior wall foundation	The total cellar width (Areas B and C together) appears a uniform 20′, interior measurement; but the length, 30′, does not correspond with the total length of the house. A wall at the northwest end encloses the bricked portion of the floor, and a remnant of a brick partition lies 14′ opposite, at the southeast end of the bricked floor. The southeast portion (Area C) of the unbricked cellar area, however, appears to have been completely dug, as indicated by fill and the cellar stairs in the south corner. The northwest wall is 7 courses high and is laid in English bond with a trace of mortar on the interior face. Width is 1.6′. Area A, on the northwest side of this wall was apparently not excavated for a cellar.
Partition remnant between Areas B and C	The southwest end of the bricked cellar floor of Area B terminates in a single-course remnant of brick which presumably was the foundation of a partition between Areas B and C. This partition base course is 1 brick wide (0.8′) and, from a trace of a second course at the southwest end, appears to have been laid in English bond. An 8-foot gap in the middle may or may not indicate access between Areas B and C.
Fireplace foundation southeast end of Area C	A large recess (7.9′ across and 4′ deep, interior measurements) in the southeast wall of Area C, the main building wall, represents a large fireplace. The walls are a uniform 1.6′ wide, and are set in English bond. The clay floor of the fireplace is burned red. Among the artifacts found near the fireplace floor was a large iron pothook.
Area B, Cellar	The paved portion of the cellar is the northwest half, Area B. In this pavement of a single layer

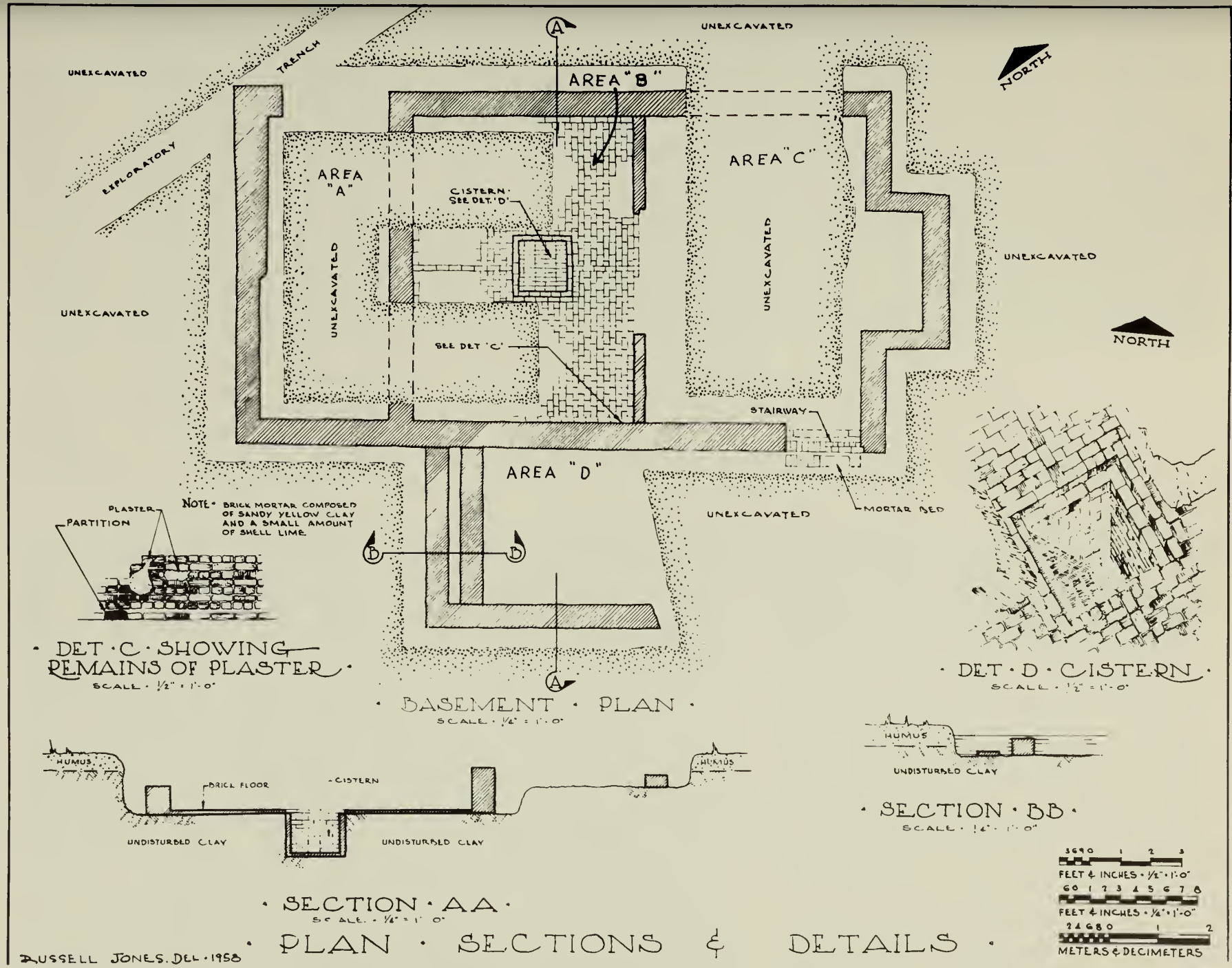


FIGURE 21—*Plan of Structure 125*

Plan of excavated foundation, sections, and detail. *Historic American Buildings Survey drawing.*

Unit	*Description*
	of flat brick, the bricks are uniformly oriented NE-SW, except for a center row and the respective margins, where the bricks run parallel to the walls. Cellar floor brick rests on a bed of mortar ½" to 1" thick which was poured on undisturbed sandy earth. There is no evidence of occupation precedent to the brick floor, that is, no evidence that the cellar of Area B was used before the brick floor was laid.
Bricked recess in floor of Cellar, Area B	In the center of the brick pavement, the lowest point in the floor, a square recess had been built, 3′ by 3′ on the sides, and 2.5′ deep. Sides and bottom had been lined with a single course of brick, the sides the width of a single brick, and the bottom the thickness of a brick. Although the sides were set with mortar, there was no mortar between the floor bricks of the recess. At the top, the bricks lining the recess began 1 course lower than the floor, so that a recess resulted suitable for framing a trap door or a simple wooden cover. Since original sand lay beneath the recess floor, drainage between the brick would have been easy.
Area C, Cellar	The unpaved portion of the cellar of Structure 125 lies between the partition remnant adjoining Area B and the southeast end of the structure, including the foundation of the large fireplace. An 8-foot gap in this partition may indicate access between Areas C and B. Access from the exterior to Area C was gained from a stairway located in the southeast end of the riverward wall. This stairway is 5′ wide. The earth floor of Area C lies 3.9′ below the present surface of the ground. Since the interior of Area C was not excavated, the foregoing observations were made from aspects of the peripheral walls and the earth profile at the partition location.
Southwest wall remnant, Area D	The southwest wall remnant of Area D is 15.5′ long, 3 courses remaining, English bond, 1.6′ wide. If this wall was part of a rectangular porch or other annex to the main structure, no trace of the southeast end of this wall or an adjoining southeast wall was found by excavating.
Northwest interior wall, Area D	This wall is not morticed into either the main wall of Structure 125 or the southwest wall of Area D. It stands 4 brick courses high from the undisturbed clay and is of English bond. Since it is more complete than the single remaining course of the exterior northwest wall of Area D, the implication is that it is later, and represents a rebuilding of the annex.
Northwest exterior wall, Area D	This wall, while not morticed into the main wall of Structure 125, forms the west corner of Area D, and may be assumed to be the original wall of the annex. Its remnant consists of a single basal course of half bricks 1.5′ to 1.6′ wide, laid on undisturbed clay.
Area A	A rectangular space 8.2′ by 19.7′ is located at the northwest end of Structure 125, bounded by the northwestern wall and the northwest wall of the brickfloored cellar area. There is evidence of an excavation for a footing at the northeast side, but all brick is missing (except at the north corner), presumably due to brick salvage. There is nothing to indicate that Area A was intended as a cellar, but rather that it is simply an unexcavated space below the floor.
Area B	This is the main brick-floored cellar area, measuring 20′ by 15′. It is separated from Area A by a footing of a full cellar wall and from Area C by the remnant of a partition marked by a remnant of a double course of brick. The fill above the northeast wall was noted to be relatively loose, as if filled after as many bricks as possible had been salvaged. Inside Area B the fill was denser and more compacted, consisting of earth, brickbats and fragments, oyster-shell mortar and fragments, and large pieces of oyster shell, and some fine, white, thin (⅛" to ¼") wall plaster without obvious lath marks. Pieces and whole bricks increase in number and size with increased depth until the last 1.5′ above the floor, where the debris is densest. The total fill depth from the surface is 4.3′. From lack of burning evidence, it must be assumed that the house was dismantled systematically after it was abandoned. As if to point this inference, a complete iron pick was found in the first foot of fill above the floor. The previously described brick-lined recess in the floor center was filled with debris from the house until the final one-half foot was reached. At this point the fill appeared to be contemporaneous house detritus, not wreckage, and contained many glass wine-bottle fragments, including 2 "FN" seals ("N" backwards) and a British halfpenny, date not discernible.
Area C	A cellar space, 20′ by 14.5′ at the southeast end of Structure 125 was unpaved. The large fireplace was inset within the southeast wall and a 5-foot-wide stairway led to the exterior at the east end of the riverward wall.
Area D	The full dimensions of this area unknown; only the width from the main wall of Structure 125 to the southwest wall of the annex can be measured (10′). The double wall at the northwest indicates that the annex was rebuilt, the second time somewhat smaller.
Mortar	The mortar of Structure 125, characteristically yellowish, is made with shell mixed with a large quantity of sand. A plaster-mortar of a whiter hue, also with much shell admixture, is noticeable on the interior surfaces of the cellar walls. The annex interior wals also had a mortar-plaster surface. Mortar underlay the cellar floor. Mortar was not noted beneath the base course of masonry walls.
Bricks	Bricks for the main walls: Length, 8¾" to 9¾", av. 9⅜" Width, 4¼" to 4⅝", av. 4½" Thickness, 2¼" to 2⅝", av. 2½"

Unit	*Description*
	Bricks for stairs, cellar partition, and floor are slightly smaller: Length, 8⅛" to 9", av. 8½" Width, 4" to 4⅜", av. 4¼" Thickness, 2¼" to 2¾", av. 2⅜"
	Bricks for annex or portico: Length, 8⅞" to 9⅜", av. 9⅛" Width, 4¼" to 4⅝", av. 4⅜" Thickness, 2⅜" to 2½", av. 2⅜"
	Main building wall bricks are medium-red to dark-red, friable in frost.
	Annex bricks are similar, trending more to medium-red.
	There are no evident color differences or texture differences in the smaller-sized brick of the floor, partition, and stairway.

STRUCTURE 126

This brick structural remnant (Lots 89:111 and 90:111) was in the deeply buried old humus, based 0.4 foot above undisturbed earth at an elevation of 9.41 feet above mean low tide. The location was within 25 feet of the 1934 shore scarp.

Structure 126 was too incomplete and the evidence of artifacts (one handwrought iron spike) too inadequate to tell the orientation, character, or purpose. Evidence of burning is not conclusive. There was no evidence of mortar between the bricks. Brick dimensions, in inches, were: Length: 8⅞ maximum, 8 minimum; width, 4½ maximum, 4 minimum; thickness 2⅜ maximum, 2 minimum. The average brick was about 8¾ by 4¼ by 2¼ inches. Brick color was red and hardness, medium.

STRUCTURE 127

This small brick kiln is of a type which, by implication, is the earliest so far found on Jamestown Island. It is one of the first kilns constructed by the settlers. The kiln was built within a rectangular pit measuring 10.9 by 8.7 feet, with a maximum depth of 5.5 feet from the present surface. Within the enclosure of this pit was a remnant of the three basal courses of what had been, in effect, a "clamp," that is, a kiln constructed of the bricks to be fired. The bricks were arranged in the pit between and beside two parallel firing chambers extending the length of the pit. Access to the firing chambers was through two parallel tunnels between the kiln pit and a second pit to the south. These tunnels had been dug apparently to the same depth in order to provide access for draft and fueling. (See Plate 64.)

The two brick courses preserved within the "clamp" were evidently a permanent base upon which the bricks were fired. The exterior bricks, lying next to the earth wall, were not completely fired, due to poor access to heat. The headers at the bottom of the kiln are glazed and the walls of the kiln above the basal courses are burned brick-red, indicating that ample heat to fire the bricks of the "clamp" was generated.

The 2 arched access holes at the south end of the kiln pit measured as follows: East arch, 1.8 feet wide, 2.8 feet high; west arch, 1.5 feet wide, 2.8 feet high; both arches 4.5 feet long, north to south, at floor level. The arches slope slightly northward toward the kiln pit. At the south openings of the 2 access holes are 2 curbings of brick 2 courses high and 1 brick wide (0.8 feet). The east curbing is 2.4 feet and the west curbing 2.7 feet long across the openings. This curbing feature before the kiln openings appears characteristic of brick kilns at Jamestown.

The patterns of the bricks within the kiln are shown in the illustration, Plate 64. In inches, the bricks range in size as follows: Length, 8½ to 9; width, 4 to 4¼; thickness, 2⅛ to 2½, with the majority of bricks slightly in excess of the median of these measurements. Brick color is characterized by a "fire red," and the texture is rather soft except for glazed portions. Bricks near the hot part of the kiln are purplish color and fired hard.

Artifacts

The significance of artifacts found in the fill of the brick kiln, Structure 127, is that they not only serve to date the kiln as a probable first-quarter 17th-century enterprise, but also strongly suggest the identity and location of a small but determined tobacco pipemaking effort at Jamestown. The artifacts also point confirmingly to the hypothesis that the first permanent construction in "New Towne" following the spread of settlement beyond the First Fort location began northwestward from Orchard Run.

Disregarding surface and plow-zone finds and referring directly to the 3 feet of fill between the first foot and the bottom of the kiln, we find, significantly, not one wine-bottle sherd, but a large quantity of gin-bottle refuse, totaling 185 fragments, including many necks and the major portion of an entire bottle. Evidence of white tobacco pipestems, confirmed by white bowl shapes is strongly of the first quarter, certainly prior to 1650. These stems have apertures (in inches) as follows: 7—$^{7}/_{64}$, 24—$^{8}/_{64}$, 9—$^{9}/_{64}$. Apertures of the locally made brown stem fragments range from $^{7}/_{64}$ to $^{14}/_{64}$, but are predominantly $^{9}/_{64}$ (25); $^{10}/_{64}$ (20); $^{8}/_{64}$ (12); $^{12}/_{64}$ (11); and $^{11}/_{64}$ (7).

Several things are striking about the collection of brown pipe fragments. Not only are the numbers startlingly large (80 stems, 7 bowls) for such a small deposit, but the pipes show clear evidence of local manufacture very possibly at the kiln itself. Anyone of modest means who worked with clay and wanted to smoke would have fashioned clay pipes by hand and devised a simple way of utilizing the heat of the kiln to fire them—anticipating the blossoming of American ingenuity. Doubtless such a workman would have few scruples about neglecting to contribute to the Crown the duty imposed upon



PLATE 64—*Small Brick Kiln—Structure 127*

This small brick kiln, located in Lot 89:112, yielded a wealth of cultural objects definitive of the first quarter of the 17th century. Thus, Structure 127 is demonstrably the earliest, as well as the smallest, of the three brick kilns found thus far at Jamestown. The other brick kilns are Structures 65 and 102.

imported pipes—nor would his companions, to whom he may have sold pipes in excess of his own needs.

The brown clay pipes have very characteristic construction details, while showing a wide latitude in ingenuity of design. Three of the bowls are 8-sided, giving them a unique design which rarely appears elsewhere in the Jamestown collection—they are undoubtedly from the hand of a single workman. The other bowls are decorated, one with elaborate stippling which has been filled with a white paste. The rounded bowls are subconical and of a shape often described as "Indian." Whether or not these subconical bowl pipes and their type were made by Indians is not known. It is quite possible that the workman in question was indeed an Indian. However, it is likely that any white settler's handmade pipe would have come closer to the Indian prototype than would the delicately rounded bowl of the molded import types. The heels of the Structure 127 brown stems also have several examples of a Maltese cross crudely modeled in relief. One heel has had the initials "BR" incised by hand in the wet clay.

Other artifacts in the fill of this small brick kiln include, by coincidence no doubt, a quartzite projectile point or knife, and a large, plain fragment of a dish. Both are Indian manufacture, the ceramic specimen having shell tempering and hand-modeling to distinguish it positively from domestic white manufacture. (Could our Indian "workman" have possibly slipped in a pot or two of his wife's manufacture for firing?) More to the point, however, are 150 sherds of local, lead-glazed earthenware, representing utility pots and jugs. Despite this relatively large amount of locally made pottery, the absence of pottery kiln equipment such as the glaze-marked tiles found in Structure 111 kiln area, leaves us with no proof that the brick kiln ever was actually the scene of pottery firing.

The balance of evidence—parts of an English lead-glazed, dark earthenware mug with deliberate roughing of the glaze below the neck, English marbled slipware, possible local slipware, delftware, and Italian majolica—is characteristic of the first half of the 17th century.

Associated Features

Structure 127 kiln lies within 150 feet of both the shore of the James River and the old channel of Orchard Run. However, in the 17th century the shore of the river may have been somewhat farther away. The closest building is Structure 18, 50 feet northeast. This is a brick foundation encountered in 1934 during some of the initial explorations. Unfortunately this structure was not completely excavated, archeologically recorded, or adequately drawn. The only significant notation is that the depth was from 2 to 3 feet and that the fill contained broken brick, mortar, and charcoal. Ten feet north of Structure 18 is Well 3, recorded as having a brick casing but yielding no significant artifacts. Ditch 15, running approximately north and south, was partially traced from a point 20 to 180 feet respectively from Structure 127 kiln, but it is certain that it did not extend to the kiln itself or overlie it. The nearest large structure so far discovered is Structure 125—235 feet upriver to the northwest. Some of the kiln bricks from Structure 127 could have been used for Structure 125, but there is no sure way of determining this. In all probability, however, the house was last-quarter 17th century, and the kiln, first half—thus, the bricks are very probably not related.

Summary

Overall evidence indicates that this small "clamp" type kiln, located in the "New Towne" section of Jamestown settlement near Orchard Run is the oldest brick kiln yet found on the island, and quite possibly one of the first actually constructed there. There is also a strong possibility that handmodeled, locally fashioned tobacco pipes of red-brown clay were fired at this kiln. This feature, with Well 21, is positive evidence of occupation immediately northwest (upriver) from Orchard Run early in the 17th century, following the spread of settlement beyond the confines of the First Fort.

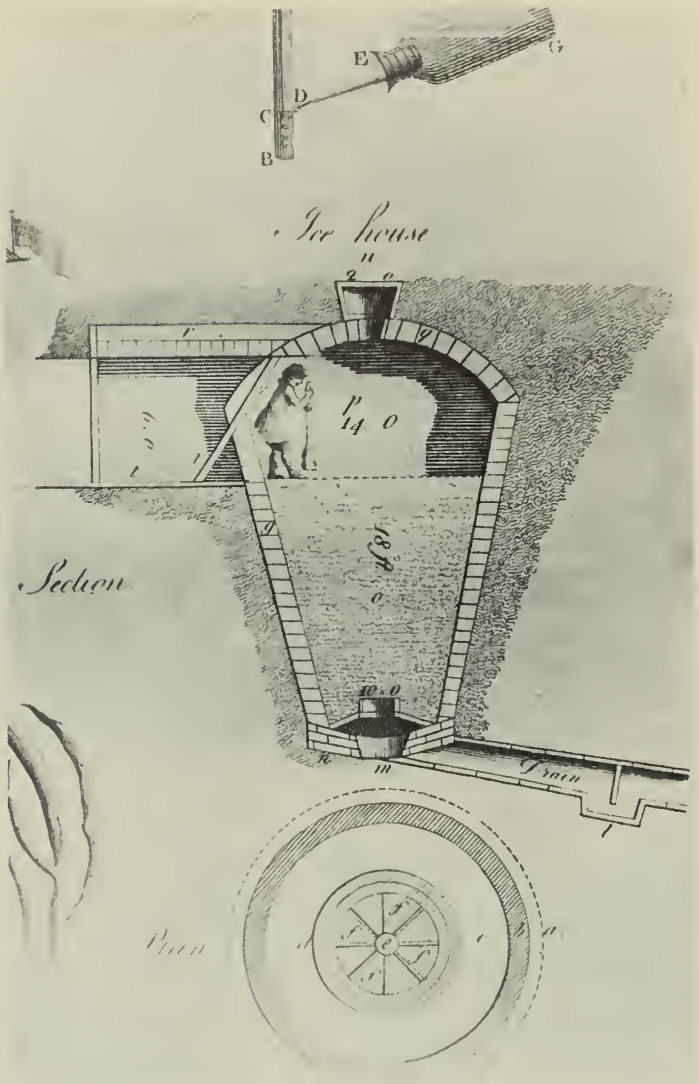


FIGURE 22—*Plan of an 18th-Century Icehouse*

This drawing shows the basic concept utilized for the icehouse (Structure 128) at Jamestown, except for the drain. Structure 128 is definitely 17th century, but the icehouse concept in Europe goes back probably to the dawn of history, if not into pre-history.

STRUCTURE 128: ICE PIT

Structure 128, the problematical ice pit, was encountered during the 1955 operations in Lot 101:102, at a distance of 55 feet east of the large house, Structure 112. The evidence consisted of a circular pit, top diameter 14 feet, walls sloping to a bench variously 1½ to 2 feet wide and 1½ feet from the floor. Inside of this bench the bottom diameter of the pit was 6 feet. The pit was obviously shaped for a definite purpose, and did not represent a well (the bottom was above the waterline) or a borrow pit (it extended into sand). The hole had been used for depositing refuse, and the fill contained six zones, designated A through F. Maximum depth was 6.5 feet.

It was first suggested that this pit could have been associated with a powder magazine. This is not impossible, although two pieces of evidence are against it, namely, the depth and dampness of the hole. More significant was the circular bench at the bottom, which most logically served a purpose, probably to support a wagon wheel.

Specifically, this feature suggests the ice storage pits which were in use in 17th- and 18th-century Britain and Italy, and which were familiar in Virginia up to the 20th century. (Some of these ice pits still exist in Gloucester County today, according to Edgar Dunstan, labor supervisor at Colonial National

Historical Park.) A circular pit beneath a roofed housing similar to Structure 128 is described in *Encyclopaedia or a Dictionary of the Arts, Sciences, and Miscellaneous Literature,* published by T. Dobson, Philadelphia, Pa., 1798. At the bottom is a well for drainage. Over this circular well a large wagon wheel is placed, and on the wheel alternate layers of insulating material (straw, sawdust, shavings) and ice are laid until the pit is filled. The Structure 128 pit has a sandy bottom, eliminating the need for a drain passage.

The six zones which could be observed in the fill were irregular and not always complete. However, these zones did indicate that the pit stood open for some time and collected debris, including a number of building bricks, locally made. These bricks could have belonged to a structure housing the pit, but left no foundation trace. The zones and the associated artifacts may be summarized as follows:

Zone A—0 to 1 foot—included the humus and plow zone and showed inevitable disturbance. Nevertheless, this zone was notable for the uniformity of its 17th-century artifact content. Roofing tiles, glazed and unglazed earthenware of the locally made types, and what may be a local slipware are all well represented. There were a few examples of Dutch and English deltfware. Of 34 white pipebowls, 4 are second-quarter 17th century, and the remainder third-quarter. In the 30 specimens from the later series are these stamped imprints: "EL" (7), "WC" (4), "IH" (2), "RC" (2) "BC" (1), "HF" (1), and 1 with a figure of a rose. As in all other zones, brown pipe fragments are relatively few. Most of the white pipe specimens were stem fragments, 4 of which were decorated, and the majority have a hole diameter of $\frac{8}{64}$ inch. Iron is represented mainly by a large quantity of handwrought nails, some handwrought spikes, and 3 strap hinges. Glass is represented solely by 125 gin bottle fragments. It is remarkable that such a superficial zone should be so free of post-17th-century detritus—an indication that no later occupation occurred in this area.

Zone B, beneath Zone A, had a maximum thickness of 1.8 feet, lensing out at the periphery of the pit. This zone contained a wealth of artifact refuse. Most significant was the mass of window glass, or quarrel fragments—1,418 pieces in all. The only other glass fragments were of gin bottles and a single wineglass, Venetian style, with mask or face in relief (J–7052). Significantly, many lead came fragments were found with the window glass—96 in all. Additional building material—including 661 handwrought nails of all sizes, spikes, picture hooks, pintles, and a lock bar—was present. The ceramic artifacts include bricks and flat roofing tiles, a quantity of locally made lead-glazed earthenware, and a representation of delftware and majolica. Especially notable was a large, complete, locally made, orange-red pot, with a horizontal bond of thumb prints added as a filler below the rim. Also present were several pieces of what may have been Spanish ollas and wine jugs, the latter with two handles. Among four pieces of blue-on-gray stoneware were the initials LM and the fragment of a name: ". . . liaum." Consistent with the evidence of Zone A, most of the 34 white tobacco pipebowls indicate the 1650–75 period. Six had the initials "EL," 4 "WC," and 1 "RC." Seven additional white bowls (one "BC" initial) are from the 1625–50 period. Many cow bones (102), deer bones (10), and a few turkey, sheep, pig, and horse bones were included in Zone B.

Zone C was up to 0.9 foot thick, lensing out at the east, west, and south edges of the pit and disappearing 4.5 feet from the northern rim. This zone, in contrast with Zones A and B, was clayey rather than dark and greasy. It contained fewer artifacts, most of which were nails (many L-shaped), pipe fragments, and gin-bottle fragments. With remarkable consistency, the white pipebowl evidence showed 33 from the 1650–75 period, and 6 from 1625–50. Initials represented were "WC" (4), "BC," and "IH." Lambeth delft fragments (26) were unusually numerous.

Zone D was a thin layer, maximum thickness 1 foot. This layer was confined to the southern half of the pit and contained a high percentage of charcoal. For a limited deposit, it was fairly rich in artifacts. Present, as in the higher zones, was the high proportion of clay-pipe fragments, handwrought nails, and gin-bottle fragments. The clay pipebowls, perhaps significantly, show a larger proportion of earlier (second-quarter 17th century) types, some of which may even be first quarter.

Zone E (3 feet thick at the center of the pit) was almost sterile of cultural refuse, except for a limited quantity of handwrought nails; an almost complete cross-cut saw, 2-handled type; 3 pipebowls of 1650–75 period, 1 with the initials "BC" stamped on it. Glass specimens, as usual, were gin-bottle fragments, but in addition there were 3 fragments of Venetian tazza goblets.

Zone F, the lowest, was similar to Zone E, but contained few artifacts. The most notable of these were a muzzle from a light cannon or robinet (J–7045), a hoe, and a key.

The ice pit with its content of artifacts is significant because here was deposited debris from a wrecked house, specifically a burned house, and almost positively, Structure 112.

Upper.—Structure 128, an ice pit, as seen after the excavation. Irregular outlines are due to test trenching and development. The pit was originally circular, sloping from 14 feet in diameter at the top to 6 feet inside a narrow bench near the bottom. Total depth was 7 feet from the present surface, probably near the original depth. A number of bricks found in the fill compared with the exterior walls of the second or rebuilt portion of Structure 112, nearby. Artifacts indicated third quarter of the 17th century, predominantly.

Lower.—Harvesting ice at Jamestown, about 1650—a conjectural scene based on the Structure 128 pit identified as that of an icehouse. The housing above the pit is conjectural inasmuch as no evidence of a masonry structure was found, although brick fragments were found in the fill. *Painting by Sidney E. King.*

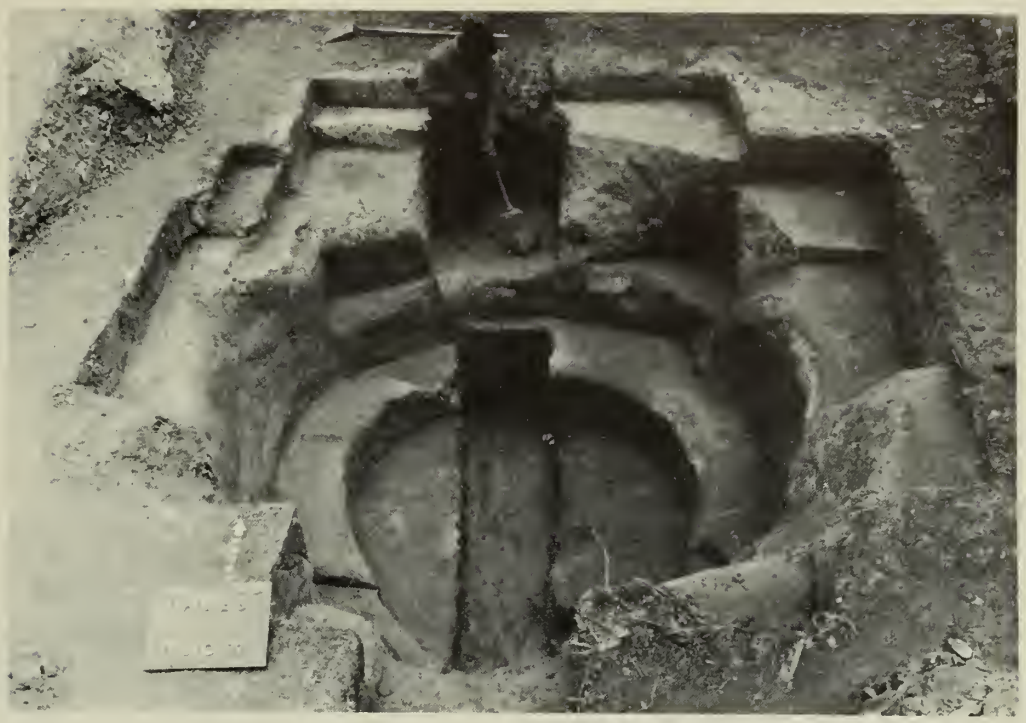




PLATE 65—*Structure 128*

The artifacts are predominantly third-quarter 17th century, with a definite, but smaller proportion representing the second quarter. If Structure 112 was burned during Bacon's Rebellion in 1676, it would seem logical to assume that the icehouse also had been destroyed by that time, or possibly during the same fire. Then during the period that the debris of the burned house was being cleared, the pit was completely filled. The large amount of fragments of diamond-shaped window quarrels would seem to offer concrete evidence of association with Structure 112, the south wall of which demonstrably contained such window material. Only 6 wine-bottle fragments of indeterminate type and date were found in Structure 112. This curious preference of the users of Structure 112 for gin matches the complete absence of wine-bottle evidence in the ice pit, and the great number of gin-bottle fragments in the fill at all levels.

It would appear, then, that the ice pit was forgotten, once it had been filled in after Bacon's Rebellion, or after the fire that destroyed Structure 112. The 4 bricks found in Zone B and the 8 bricks of Zone F have the following range in inches: Length: 8¼ to 8½; width: 4 to 4⅜; thickness: 2 to 2⅛. Although this sampling is inadequate to represent a structure, the range is comparable to that of Structure 112 bricks.

STRUCTURE 134

Structure 134 was a single course of headers, laid flat, to form a row 0.8 foot wide and 15.5 feet long within the fill of Trough Area 2, an indefinite depression 23 feet wide. Structure 134 lay at a depth of 4.8 feet from the surface at an elevation of 8.86 feet above mean low tide. It may be related to comparable Structure 29, recorded in 1934, which lay 55 feet to the southeast approximately in line with Structure 134. Structure 134 lay in Lot 92:107 within 50 feet of the James River shore.

Apparently this structure was not intended as a drain base, since it is too narrow. Nor does it seem adequate to base a wall. Its use is unknown, but may be related to the problematical series of trough areas east of Structure 17 which in turn, may be related to borrow or moat excavations for the "Turf Fort" of the latter half of the 17th century.

STRUCTURE 141

For many years historians and other students interested in the Jamestown story have voiced guesses, opinions, and convictions regarding the "brick bridge" referred to as "Mr. Knowles his bridge" (Forman, 1938, p. 130). All are unanimous as to the importance of this bridge in estimating the location of property boundaries.

In November 1956, this bridge was located with confidence in Lot 101:112,* precisely where the topographic map shows an old fill extending northward from the south side and southward from the north side of Pitch and Tar Swamp. This evidence, consisting only of the old fill and a collection of brick rubble evidence from the intervening swamp, or marsh, was designated Structure 141. The dimensions of the "bridge" could not be determined with accuracy by probing across the swamp. It is believed, however, that the direction of the fill was accurately and definitely determined.

In all probability, the "bridge" was never a masonry construction, but was rather a fill of brick rubble, which would have been just as satisfactory and far less difficult and costly to build. No artifacts other than small brick pieces were found to aid in dating.

The causeway is in the presumed location of the John Knowles tract of 1665, consisting of 133 acres (*Ambler Papers* No. 15).

REFUSE PIT 1

Refuse Pit 1 (Lot 101:103) in all probability was a borrow pit for clay—quite possibly for the kilns of Structure 111. It was subsequently filled with trash. That this pit was filled after the kilns ceased operating is evidenced by the fact that the trash includes only two sherds of wasters, both in Zone B. It is, indeed, a strange fact that no definite waster piles have been observed anywhere at Jamestown, although waster pot and tobacco-pipe fragments have been found near the small pottery kiln, Structure 27 (Lot 96:99). The shape of Refuse Pit 1 was nearly square, 41 feet east-west and 36 feet north-south. The depth from a surface elevation of 8.97 to 9.76 feet above mean low tide was 4.2 feet, maximum. The kilns of Structure 111 lie directly north, Structure 110 is 23 feet to the northeast, and Structure 112 is 115 feet to the west. Ditch 76 is 10 feet to the south and parallel with the south wall of the pit.

Refuse Pit 1 was divided stratigraphically into 3 zones, termed A, B, and C. Zone A was designated from the surface to an average depth of 1.2 feet. Zone B was characterized by brick rubble, averaged 0.9 foot in thickness, and contained many artifacts. Zone C was a clay-soil mixture overlying the undisturbed clay, with a thickness averaging 1 foot, which yielded a number of interesting artifacts.

Zone A artifacts included a small brass weight, square in shape, stamped "CARLOS REX / X.S." (J–7041). This weight is of the type used for a set of measuring scales. A silver thimble (J–8776) also came from Zone A. The few other artifacts here were comparable in type and date to those of Zone B, except for a higher proportion of wine-bottle fragments. However, artifacts later than 17th century are lacking.

* See Fig. 2, The Site of Jamestown. The location of the bridge is approximately coincident with the position of the "a" in the word "Swamp."

Zone B, the brick rubble-filled deposit, was unmistakably derived from building wreckage dating in the second and third quarters of the 17th century. Most likely 1650–60 was the interval of deposition. Flat roofing tiles are present, and 5 times as many handwrought nails—259—were found here than in either Zone A or Zone C. In Zone B, 205 pieces of window glass, mostly representing diamond shapes, were found, while only 7 window-glass fragments were found in the other 2 zones. Thirteen lead came fragments also occurred in Zone B. Possibly the most significant inclusion is 1,141 sherds of locally made, lead-glazed earthenware (including the 2 wasters mentioned above). Such debris is not comparable to that of a waster pile. Structural wreckage, possibly from Structure 110 and/or 112 could be present here together with wreckage from the clearing of the ground on which the Structure 111 kiln stood (Note Zone C).

Zone B tobacco-pipe evidence includes 21 bowls of the 1625–50 period, including the stamps "WC," "RG," "SV," and a rose. Twenty-three bowls of 1650–75 include stamps of a gauntlet, a star, "WC," "RG," "SV," "P," "HI," "EL," and "SH." From the stem diameter evidence in Zone B, it appears that a dating of 1620–50 is implied, according to Harrington's chart (Harrington, 1954). However, other evidence, including the pipebowls, is contrary, and it appears in this instance that a majority of stems with $\frac{8}{64}$-inch diameter holes indicates the 1640–60 period, in the aggregate.

Zone C. Most of the notable artifacts were found in Zone C. These include a swept hilt sword (J–7010) dating from 1600–1610, the work of Johannes Wundes of Solingen, Germany; a breastplate and a backplate belonging to a pikeman's suit of armor (J–7042, J–7043) of early 17th-century type; the guard of a basket-hilt sword (J–7044) dating 1600–1625; a cutlass (J–9721) of 1600–1625; and a musket barrel (J–9458) 2 feet long dating from 1625 to 1650. The balance of Zone C evidence which is of a diagnostic character indicated that this deposit had been made in the pit very definitely before 1650. Tobacco-pipe evidence is not great, but what there is is relatively early. It includes 8 whole pipebowls of which 3 are from 1600–1625, and the rest from the second quarter of the century. Of 56 bottle fragments, 55 are from gin bottles and only 1 is from a wine bottle. The artifacts in general are utilitarian, rather than structural, and include 7 felling axes, a saw, and 267 pieces of locally made earthenware.

It is interesting to note that refuse from the furnace structures at Glasshouse Point was transported to the Structure 111 kiln site and used in kiln construction—probably because any kind of stone building material was a premium on the island. Ultimately, these stones came to be discarded in Refuse Pit 1, Zone C. A piece of shaped granite weighing about 35 pounds was found to be covered on the original surface with molten glass. It was recognized immediately that this glazed rock was the same type as that at the main furnace at Glasshouse Point. With the discovery of 2 additional smaller fragments, it was noted that Specimen D–74 at Glasshouse was actually a fragment of Field Specimen 669 at Refuse Pit 1, Zone C, the parts matching exactly. A fragment of a glass-making crucible was also found in Zone C. Thus it can be said confidently that rocks, including several river pebbles, and crucible and furnace fragments from Glasshouse Point furnaces were removed, probably between 1622 and 1650. They were transported to Jamestown Island where they probably were used in the kilns of Structure 111, and later scattered and disposed of in Refuse Pit 1, after the kilns were destroyed.

In summary, Refuse Pit 1 appears to have been filled with refuse from habitations representing the period 1640–60, and specifically, refuse from the kiln area of Structure 111 to the north, and possibly Structures 110 and 112, or both.

REFUSE PIT 2

Refuse Pit 2, located in Lot 95:104, is the only clearly 18th-century refuse deposit so far (1957) recognized on the Jamestown site. Its location is in the nucleus of the 20 houses shown on Desandroüins' French Military Map of 1781, and nearly contiguous to the curious horseshoe-shaped, brick-rubble remnant to the west, designated Structure 121. The area to the north, while tested by 50-foot interval trenches in 1955 without revealing any structure south of the long multiple-unit house, Structure 115, has not yet been adequately explored. By the test trench evidence this area had little cultural debris in it. However, if this area should prove to have been without structures, the possibility can be entertained that here was a "village green," purposely left open, only to be traversed by Ditches 66, 24, and 10 (with Road 5—just possibly a trace of the "back streete"—between).

The 18th-century Refuse Pit 2 does not, by its content, indicate anything other than the proximity of contemporaneous dwellings. It is certainly a most unlikely spot for depositing Ambler House trash. The pit itself was in 2 parts, the west pit approximately 15 by 13 feet and the east pit, an irregular oblong shape, 25 by 17 feet. The maximum depth of both pits was 4.5 feet below the present surface. The top foot yielded numerous potsherds, glass fragments (wine bottles), pipestems, and other artifacts, mostly 18th-, but including some 19th-century material. The 1-to-2-foot level was very rich and contained largely 18th-century material. Bones of food animals, mostly beef, were especially common. The lower 2 feet of Refuse Pit 2 was filled with whole and fragmentary bricks in a jumbled pile. Other artifacts were extremely scarce. Two cross trenches at right angles to each other were cut across the west portion. No evidence of any kind of structure was encountered, and artifacts other than bricks were extremely rare in the lowest level. Therefore these two trenches were considered to have yielded adequate and representative data and no further excavation was attempted.

Artifacts in the middle and upper portions of Refuse Pit 2 included a large representation of salt-glazed Staffordshireware

of good quality; some mid-18th-century wine bottles (perhaps some of later date); green-edged ware; some combed slipware; and both blue-on-gray and brown mottled English stoneware. The clay pipe representation was mostly 1700–1750, although some may have been later in the 18th century.

REFUSE PITS 3 AND 4

Two minor refuse deposits bordered Pitch and Tar Swamp. Refuse Pit 3, in Lots 102:103 and 102:104, was a small, shallow, oval basin 20 feet long and 2.5 feet deep filled with sparse refuse associated with Structure 110, 25 feet south. Refuse Pit 4, in Lots 101:102 and 102:102 was an enlargement and terminus of Ditch 79, 50 feet north of Structure 112. Contents of Refuse Pit 4 were mostly earthenware associated in type and period with Structure 112.

REFUSE PIT 5

Refuse Pit 5 (Lot 93:107) was a small (approximately 8 by 5 feet), shallow deposit filled with cultural debris characteristic of first-quarter 17th century and perhaps extending to 1650. The significant factor here is that Refuse Pit 5 is within 15 feet east of Structure 24 and 60 feet southeast of Well 20. Virtually nothing is known of Structure 24 except that a gin bottle was found there which is datable by analogy in the first quarter of the 17th century. Likewise, at Well 20 a gin bottle of the same mold and quantities of other early 17th-century artifacts were found. Clearly, these three features are mutually related in time and culture horizons. Trough Area 1 nearly encroaches on Refuse Pit 5 on the east. Apparently this trough area is a later intrusion and quite possibly it is a borrow or moat area for the turf fort located in this approximate position in the second half of the 17th century.

Artifacts of Refuse Pit 5 include 40 white clay pipebowls, all but 2 or 3 of which are clearly first-quarter 17th century. The remainder possibly reach 1650 as indicated by slightly increased bowl size. One bowl has a hand emblem stamped in the heel. It is a single brown clay pipebowl, no larger and with the same shape as the white specimens of the first quarter. Interestingly, this bowl presumably was molded locally of Jamestown clay by the earliest Jamestown pipemaker from whom we have a trace of handiwork. In addition, approximately 200 white pipestem fragments were recovered from the fill. Most of these are characterized by large hole diameters. Some 15 brown pipestems further attest local manufacture.

Other artifacts in Refuse Pit 5 included approximately 200 nails, spikes, and small pieces of iron. It is apparent that these specimens are handwrought, and mostly of good size, probably of "mushroom" heads. Several gin bottle fragments and a few wine bottle fragments were recovered from the deposit. However, the wine bottle bits are too small to allow age determination. By association, they should be no earlier than 1640, and certainly not much later. Some 100 local and English lead-glazed earthenware pieces include both dark and light glazing, as well as very hard and relatively soft paste. Seventy-five Dutch delft and majolica fragments included drug jars, porringer handles and bowl fragments, and a piece of purple mottled delftware. Several fragments of a single, large Italian sgraffito plate and a fragment of a rather thick copper pin comprise the balance of significant artifacts.

DITCHES 66 AND 9

Ditch 66 and Ditch 9 intersect in Lot 97:106. At this junction, in both ditches, large quantities of wine-bottle fragments (virtually nothing else) were found during the 1955 explorations connected with the reopening of these ditches for display. The dating of the wine bottles was consistently last-quarter 17th century. Therefore, it may be assumed that these 2 ditches were open from 1675 to 1700. The absence of any notable inclusion of later artifacts suggests that the ditches were closed in the 18th century. The fact that there were no early 17th-century artifacts noted in the lower fill also suggests that the ditches were not constructed before the third quarter of the 17th century.

The conjecture may be offered that the ditches were used to mark boundaries after the rebuilding of Jamestown following Bacon's Rebellion and were abandoned and refilled when the land became useful as plantation acreage in the 18th century. Another conjecture is that the ditches may have been used as drains, since Ditch 9 is a functional drainage ditch extending from North 97 to beyond North 102.

At the junction of Ditch 66 with Ditch 9 at a depth of 1.7 feet a bronze thimble was found. A pellet of paper on which dim letters can be traced had been inserted and preserved in the thimble. (Perhaps a little girl tried to keep it on her finger with a packing of lesson paper, or a bit of an old letter!)

Too numerous to list in a series, the other 94 ditches at the site are mentioned *passim* in the text when they pertain to other features.

WELLS

Twenty-four wells were located on Jamestown Island during the 2 periods of archeological explorations by the National Park Service. In addition, 2 were found in the APVA grounds earlier in the century. Wells were a necessity at Jamestown, since there were no springs, and the river water was too brackish to drink. Because they were shallow and easily contaminated, the wells undoubtedly were a leading factor contributing to the assorted ills—agues, fevers, and fluxes—which in large measure brought about the decimation and disheartenment of the settlers in the difficult first years.

Probably the first wells, located near the shore, were dug too deep, allowing salt water to mingle with the ground water. No natural elevation on the island reaches 20 feet above mean low tide on Jamestown Island today, and probably did not in the 17th century. Therefore, it is necessary to sink a shallow well only to a point slightly above mean low tide level in order to collect the fresh ground water which gathers in a sandy substratum beneath the shallow clay topsoil and remains in a thin lens above the salt. Thus, it is possible to understand the complaint of William Strachey when he entered Jamestown from Bermuda with Sir Thomas Gates in May 1610:

> True it is, I may not excuse this our Fort or James Towne, as yet seated in some what an unwholesome and sickly ayre, by reason it is in a marish ground, low, flat to the River, and hath no fresh water Springs serving the Towne, but what wee drew from a Well six or seven fathom deepe, fed by the brackish River owzing into it, from whence I verily beleeve, the chiefe causes have proceeded of many diseases and sicknesses which have happened to our people, who are indeede strangely afflicted with Fluxes and Agues. (Purchas, XIX, 58)

Strachey can be suspected of exaggerating when he refers to a well as at least 30 feet depth—to dig one that deep would have taken modern pumps and casing—but that the well was too deep is manifest by its brackish water. Yonge (1903, p. 37) assumes "6 or 7 fathoms" should have read "6 or 7 feet."

Wells excavated at Jamestown are of two main categories: those with no casing remaining except a wooden barrel at the bottom, and those with brick casing. The uncased wells may have had wooden shoring which has disappeared without a trace. But they now appear as wide (7 to 10 feet) circular holes at the bottom of which a bottomless barrel was placed on sand, so that the top was somewhat above the waterline. In at least one well a rectangular wooden casing was observed. The usual casing, however, is of brick laid in a circular pattern 4 to 4½ feet in exterior diameter, with either ordinary bricks or wedge-shaped "well bricks" inside a circular excavation 10 to 12 feet in diameter. A barrel was not necessary at the bottom of the masonry casing, which rests either on sand or on wooden sill.

By proximity, most wells are logically associated with certain buildings. By their artifacts, they are datable within reasonable limitations; therefore, they are useful in determining the age of the associated structure. Just as important are the artifacts themselves, often remarkably preserved—especially leather and wood—due to their immersion in mud and water at the lower limits of the well.

Wells 1 and 2

These brick-lined wells are located in the Unit A area north of Pitch and Tar Swamp. It should be noted that Well 1 is 112 feet west-northwest of Structure 1, and that Well 17 (unlined, no barrel found) is 103 feet north. Well 1 is described briefly by John T. Zaharov as having the bricks laid dry in header bond. The bricks are said to have been whole, not wedge-shaped, averaging 8⅛ by 4¼ by 2½ inches, orange-red in color. The fill included brick debris, oyster shells, garbage bones, and some rough earthenware sherds.

Well 2 was located on the vaguely defined "building site" some 520 feet northwest of Structure 1, which was designated, not by actual masonry remains, but from brick fragments and occupational evidence, notably the well. Well 2 was observed superficially but not completely excavated.

Well 3

Located on Lot 90:113, 10 feet north of the small brick foundation of Structure 18, this brick-cased well was excavated in 1935. The only records are a rough sketch, plus a few notes. A round brick casing of header bricks of full size (9 by 4½ by 2½ inches) extended 6 courses down, below which the bricks were tapered. The inside-well diameter was 2 feet 9 inches. The circular hole in which the brick casing was set was 5 feet 3 inches in diameter—much smaller than the other wells found at Jamestown. The casing extended 8 feet 8 inches from the existing top to the bottom, which rested on a circular wooden curbing 8 inches thick and 2 feet 9 inches in diameter. The excavators of 1935 recorded that at a depth of 5 feet, modern debris was encountered consisting of tin cans, bottles, etc. Presumably, then, the top of the well had been opened previously. Eleven clay-pipe fragments (Cat. Nos. 10,248 and 10,249) were found 8 feet deep at the well bottom. A dozen fragments of a gravel-tempered earthenware pot of English manufacture were also found. The pot was definitely 17th century, but its exact date is not evident. The pipe fragments could not be found in the collection.

Well 4

This brick-cased well on Lot 99:101 was excavated in 1935. It is reported to have been 2.8 to 3 feet in diameter and 11.5 feet deep from batter board to the bottom of the masonry, which rested on sand. When excavated, the water level stood at 1.8 feet above mean low tide and the masonry extended 12.5 inches below mean low tide. The casing was laid in header bond, using mainly whole bricks averaging 8⅞ by 4⅜ by 2⅝ inches, with very few quarter and three-quarter bricks interspersed. No artifacts were recorded.

Well 4 lies north of Structures 19A and 45, and is 15 feet from each. If Structure 45 was a kitchen serving Structures 19A and/or 19B, the well location is logical.

Well 5

Well 5 (Lot 94:104) was brick-lined. It was within 10 feet of a small brick foundation, Structure 51, and within 25 feet of Structure 43, a second small brick foundation. The casing top was 3.55 feet above mean low tide, the surface being 9.7 feet above this mark. The bottom of the casing was 1.37 below mean low tide. The length of the casing was 4 feet 11 inches. The casing was 1 header thick (9 inches average), oval in plan outline, with a maximum inside diameter of 3 feet 2 inches to 3 feet 6 inches at the top, and an average diameter









PLATE 66—*Water Wells*

Brick-lined well in Lot 99:101 (Well 4), immediately north of Structures 19 and 45.

Well 19 (Lot 99:105) was cased with brick, and contained cultural evidence which would associate it with the occupation of Structure 115, in the latter half of the 17th century. Many garbage bones were found in the fill of this brick-lined well. Among them, 4 feet below the surface, was the left half of a human, male pelvis, left leg and foot, complete except for some missing tarsals and phalanges.

Well 18, located in Lot 100:102, was 40 feet west of Structure 117, a house with a paved cellar. This well was cased with brick, including some wedge-shaped well brick. It had a remnant of a brick-floored well housing at the top. The housing was built inside a circular pit 10.5 feet in diameter.

Wooden barrel with iron hoops found at the bottom of Well 15 (Structure 96) in the Travis graveyard.

at the bottom of 2 feet 6 inches. The hole above the casing was 5 feet 9 inches in diameter, according to the record, but from our present knowledge of wells at Jamestown, the masonry originally must have been set in a larger hole. The notes specify the average brick size as 9 by 4½ by 2¼ inches, color, dark orange-red to purple. The mortar of clay, sand, and oyster shell is described as poor of quality and yellowish-white in color. The joints were ¼ to ¾ inches. The top of the well hole was found 18 inches below the surface.

Artifacts from above Well 5 are of considerable interest and significance, although they are not necessarily associated with the fill of the well. A nearly complete large earthenware pot with lead-glazed interior (J–7598) was found from 1 foot 6 inches to 2 feet 6 inches below the surface, above the well fill. This pot is a typical waster, as the warped and broken rim portion indicates. The pot could not have been used, as restored. From the many pipe fragments cataloged as having been found in the Well 5 area and vicinity, 1 brown bowl and 12 white bowls were observed in the collection. All white pipebowls are characteristically early 18th century (1700–1740). The brown pipebowl is large, but indeterminate for dating. While the artifact evidence here cited is not directly indicative of the dating of the well, it does show that, as elsewhere in this lot, no early 17th-century artifacts are represented. This suggests that, in the absence of earlier debris, the well and structures most likely are related to early 18th century and possibly later.

Well 6

A brick-lined structure in Lot 96:101 located near Structures 62 and 63 was identified as a well but it was not excavated.

Well 7

This brick-lined well was located in Lot 96:100, 90 feet north of the nearest major structure, Structure 26, on the shoreline of the James River. Therefore, the well was not associated with any clearly defined structure, the nearest fragment of brick masonry being Structure 60, located 40 feet to the east. Another well, No. 8, uncased, with a wooden barrel at the bottom lay 14 feet north. The dimensions of Well 7 were: casing, 2.8 feet inside diameter, 0.8 foot thick, 4.3 feet average outside diameter. The depth at the time of excavation (1936) was 13.4 feet below the surface. The bottom of the well was 2.6 feet below mean low tide, with the water level 0.4 foot above mean low tide or 10.4 feet below the surface.

The masonry of Well 7 casing was a rough and variable English bond, using many fractional bricks. The base was set on a wooden footing, apparently octagonal in plan, which in turn rested in sand.

The fill of Well 7 showed some stratification, as follows: 3.5 feet of topsoil containing brickbats, whole bricks, clay pipes, earthenware pottery sherds, clay tile, porcelain (?), bottle and window glass, nails, bronze pins, and garbage bones. Below this was 2.2 feet of oyster shells with some brick fragments and artifacts. This alternate soil and oyster shell fill pattern repeated itself once before the water level was reached. No record on depths below the water level was left by the excavators, and no artifacts have been identified. Fortunately, 27 white pipestems and 8 pipebowls recovered from the fill were located in the collection. The analysis is: 4—$\frac{5}{64}$, 12—$\frac{6}{64}$, 4—$\frac{8}{64}$. Thus the dating is confined to the 1650–1720 period, with emphasis on the last of the 17th and first of the 18th centuries.

Well 8

This well, located in Lot 97:100, 14 feet north of Well 7, was excavated in 1936. Data available show that the well had no casing preserved, but that the barrel at the bottom was at least partly intact with the remaining top portion appearing at a depth of 9.3 feet from the 1936 surface. Whether or not the original barrel top was preserved is not stated. Judging from other similar instances at Jamestown, it is likely that the top third or more of the barrel had rotted away, especially since mean low tide level in 1936 came to 8.77 feet below the surface, or 0.2 foot below the top of the extant barrel staves. The average diameter of the circular well opening appears to have been 4.5 feet.

The fill of Well 8 is reported to have consisted of sand and topsoil interspersed with brick, brick fragments, oyster shell, charcoal fragments, nails, and garbage bones. At 44 inches below the surface was "a ring," the field specimen number of which is not recorded. Since no finger rings are known in the collection from this part of Jamestown, the ring was probably a bronze grommet or iron ring. (For structural associations, see Well 7 above.)

Well 9

Located 5 feet north of Well 10 and 35 feet north of Well 21 in Lot 91:111, Well 9 was described when excavated in the thirties, but was not drawn. The nearest building structure is a fireplace of a partly explored house, Structure 35, located 15 feet north.

The circular well hole, which became better defined as digging progressed, was 2.1 feet in diameter. At 5.5 feet the fill within this hole was a dark, dense mud filled with brickbats, bits of charcoal, garbage bones, and nails Specimens of pottery, wood, charcoal, and whole and fragmentary bricks were found to a depth of 8.8 feet where a wooden barrel was encountered. Found in the barrel were pieces of wood (not described as manufactured) and glass, including fragments of bottles. Pieces of wood, glass, leather, and garbage bones were found in the fill of the original well excavation outside the barrel. The barrel was removed after a quantity of blue clay was removed from the inside. Well 9 was probably contemporaneous with the definitely early Well 21, nearby to the south. This is attested by its many sherds of early 17th-century delftware, bottle evidence (1 wine-bottle sherd to 10

gin-bottle sherds), and tobacco pipes, which date in the second quarter of the 17th century.

Well 10

This well is in Lot 91:111, 5 feet south of Well 9, 27 feet north of Well 21 and 23 feet south of Structure 35, a brick fireplace. There was no preserved casing, but 8.1 feet below the surface a 10-stave barrel, smaller than that in Well 9, was located and removed. Artifacts in the well fill are mentioned simply as a few garbage bones, pieces of bottle glass, bits of wood, and a stone.

Well 11

Excavated and recorded in 1936, Well 11 was described as a "dirt well" with a wooden barrel at the bottom in Lot 99:101. The over-all depth was approximately 12 feet, depending upon the exact elevation of the original surface. The top of the barrel was 0.57 feet above, and the bottom 2.31 feet below mean low tide. Barrel diameter was 33 inches. The only metal artifact recorded was an adz found in the fill at the top of the barrel. The well fill above the barrel contained many whole and broken bricks, the measurements of which have not been recorded. In addition, roofing tiles were found as well as slate and a few pottery fragments. From ½ foot to 3 feet, 6 white pipestem fragments and 1 white pipebowl were located in the collection. These stems measured 2—5/64, 2—6/64, 2—7/64, placing them between 1650 and 1710, allowing for the small sample. The bowl is definitely 1700–1720 and is stamped "WW" on the body.

Well 11 lies 22 feet from the northwest corner of Structure 19B, and presumably served that building, adjacent Structure 19A, or both. The well could also have served Structure 106, 15 feet southwest, if the shadowed trace in the ground designated by that number was a house.

Well 12

One of the 1936 excavations, Well 12 (97:102, Sq. 61), is unique at Jamestown inasmuch as it had preserved at the bottom the remains of a rectangular framed casing 4.7 by 3.7 feet. This casing perhaps is best described as a box of vertical shakes framed on the inside by horizontal squared sills. Whether or not this framed casing extended farther toward the top is not certain, since no wood was preserved higher than 3.5 feet above the mean low tide datum level—in other words, above the protective saturated clay. The distance from the bottom of the deepest of these vertical wood shakes to the surface of the ground in 1936 was 11 feet. These boards could have been any length up to this figure. (The heavier corner timbers reach a depth of 12.2 feet.) In any case, it appears certain that Well 12 was either wholly or partially framed with wood. The presence of fragments of long shakes in the well fill itself appears to substantiate this probability.

Although meticulous drawings exist for the lower framing of this well, data on artifacts is disappointing. In the upper fill the remains of a delft candleholder and a number of pieces of iron (unspecified) were found. The notes also record bone (presumably garbage) from the lower fill which, as it approached the waterline, became the characteristic moist, bluish clay.

Well 13

Well 13 (93:110, Sq. 67, 74) was completely excavated in 1938, and drawings and architectural records were made. The well was simply a round hole about 5 feet in diameter and 10 feet below the 1938 surface. The nature of the fill indicated that it had accumulated at one time instead of being slowly deposited, and that almost no cultural materials had been included with this fill to within 2 feet of the surface. The bottom was apparently 3.5 to 4 feet below the present average ground water level.

From 0 to 2.5 feet above the apparent bottom of Well 13 was a layer of dark soil which contained many cultural objects below the water level and consequently well preserved. This material included 28 whole and fragmentary bricks averaging 8½ by 4⅛ by 1 13/16 inches, all highly uniform and unusually thin—unlike other Jamestown bricks.

Besides the bricks, there were the following artifacts in the well: a large wooden tray or trencher of a type possibly used by the baker in handling flour; an earthenware jug with handle missing; an iron brush knife; an iron bar (possibly an auger); a bone painted or stained blue; and several scraps of wood. The well is possibly mid-17th century.

(See Structure 34–37 for correlation and analysis of this evidence with an associated structure.)

Wells 14 and 15

These wells in Lot 81:182 were both uncased with wooden barrels at the bottom. They were located in the Travis Plantation graveyard area in the eastern part of the island. These are not directly related to the Jamestown area; therefore they will not be discussed further, except to note that the barrel in Well 15 had a top diameter of 2.2 feet, iron hoops and contained pieces of shoe soles among a few other artifacts. This coincides with evidence of preserved leather in earlier 17th-century wells (Wells 20 and 21).

Well 16

Well 16 (Lot 90:111) was a brick-lined structure located in 1935 during excavation of a sewer-pipe trench from the temporary archeology laboratory to the river. Although no excavation record was made of this well, card catalog records at Jamestown for Lot 90:111 indicate that the following were found: 2 iron axes; 11 miscellaneous iron objects (not specified); miscellaneous wine-bottle fragments; a small fragment of a delftware dish; a small earthenware fragment, unspecified; 2 tobacco pipestem fragments; and 1 pipebowl fragment with the initials "LE" impressed on it. These were intermingled with fragments of animal bones. The presence of the "LE"

pipebowl and the wine-bottle fragments place this well in the second half of the 17th century, considerably later than Well 21, which is 31 feet to the north. Excavations up to the present (1957) show that Structure 125, located 80 feet west of Well 16, is the nearest house to the well. This house evidently belongs to the end of the 17th century in its final occupation.

Well 17

This was a dirt well; no barrel; partially excavated in 1934, located 103 feet north of Structure 1 in Unit A.

Well 18

Located in Lot 100:102, Sq. 19 and 29, Well 18 was cased with specially shaped well bricks averaging 8½ inches long and tapered from 4⅛ inches wide to 2½ inches at the opposite end. Thickness was usually 2¼ inches. The casing extended downward from the bottom of the plowline (where traces of a brick well housing remained) more than 13 feet. At this lower depth the excavation had to be terminated because of danger to the workman. The casing had an average outside diameter of 4 feet and an inside average diameter of 2.4 feet. The type of well housing cannot be wholly ascertained from the footing, except that it was rectangular, presumably frame on a brick base approximately 5 by 6 feet.

Well 19

Well 19 (Lot 99:105, Sq. 60) lies 14 feet north of the north central wall of Structure 115. Although Well 19 is bricklined, it is markedly different from Well 18 in almost every other respect. The masonry does not include special wedge-shaped "well bricks," but is built with whole bricks and brickbats laid with oyster-shell mortar. Artifacts and other evidence found in the fill indicate that the well was filled with late 17th-century refuse, chiefly garbage bones, continuously to within about 4 feet of the top. At the 4-foot level a nearly complete human left leg and left half of the pelvis were found. No other human bones were discovered either in the well fill or in the surrounding area.

From the surface to 4 feet, a mixture of artifacts from the 17th century and later was collected. Among these were cut nails presumably not dating earlier than 1800. However, included in this mixture were these items presumably from the second half of the 17th century: 2 white clay pipestem fragments with the initials "LE" and 59 white pipestems. Also found at this level were 8 brown pipestems, probably of local manufacture and contemporaneous with the white clay pipes; 2 white pipebowls from the last quarter of the 17th century; 1 glass, tubular, blue-and-red bead; and 20 fragments of locally made lead-glazed pottery.

From 4 to 6 feet, handwrought nails appeared, plus 5 white pipestems representing the second half of the 17th century. From 6 to 8 feet were taken a fine agate knife handle or pendant fragment; many wine-bottle fragments; a gunlock plate and wrought-iron holder (possibly for fireplace tongs); and a large quantity of garbage bones, mainly cow, deer, turkey, and some small mammals. Dog bones were also recognized.

From the artifact evidence, it seems clear that the well was filled with late 17th-century refuse. This is evident from the bottom to within a few feet of the top, where 18th- and 19h-century objects were presumably mixed with the debris thrown in the last remaining depression where the well was located. Thus the well, manifestly contemporaneous with Structure 115, aids in dating that multiple dwelling in the closing years of the 17th century.

Well 19 could not be excavated completely because of the danger of the casing settling and collapsing as the waterline was approached. It was ascertained that the water level was approximately 10.09 feet below the surface or 0.85 feet above mean low tide. The surface here is 11.75 feet above mean low tide.

The serpentine ditch, Ditch 74, disturbed the west sector and was dug subsequent to the well casing.

Well 20

One of the few wells for which no trace of barrel or casing was found proved to be the most productive of artifacts. Well 20 (Lot 93:107, Sq. 56 and 57) is located 30 feet north of Structure 24, a problematical small brick foundation never completely excavated but thought to belong to a frame structure. The closest major building is Structure 17, "The First Statehouse," located 100 feet to the west. Both well and Structure 24 may lie within the confines of the Turf Fort erected in the 1660's.

The first 7 feet of fill in Well 20 occupied a broad, circular excavation tapering from almost 11 feet to 7.5 feet in diameter. This fill, beginning at 1.5 feet, was composed of alternating layers of clay fill, small brick fragments, charcoal, yellow sand turning gray in lower reaches, and scattered miscellaneous artifacts.

Next came mixed sand and clays with some water-washed lines indicating various periods of standing open, a layer of brick fragments, and some whole bricks. Finally came the basal bluish clay at the presumed well bottom. Here the level of mean low tide is approximately 1 foot below the level of ground water.

Artifacts appeared in all parts of the fill, indicating that the well had served as a refuse disposal facility as long as it stood open. However, the interval from 4 to 7 feet from the surface was the most productive of notable artifacts. These included many utility earthenware fragments; clay pipes from first-quarter to first-half 17th century; a complete Dutch gin bottle; a complete Hispanic two-handled jug; and many large fragments of lead-glazed earthenware, mostly local, some English. From 7 to 8.5 feet in blue, wet clay were found most of the recognizable fragments of leather, all presumably from shoes. These ranged from small fragments to the major portions of soles and liners, and at least one large upper part of a shoe. Many pieces of wood were found in the blue mud but none

seemed to be parts of utensils. It is possible that they may have come from parts of wooden well framing which disintegrated and found its way below water level in the mud. Artifacts indicate a dating from 1620 to 1650.

Extensive probing failed to locate traces of a barrel or other structure in the lower portion of the blue mud below the waterline. The rapid influx of water, in addition to the difficulty in excavating the sticky clay mud, resulted in abandoning the effort to clear this portion of the well to undisturbed sand. Very little artifact material was found in the last half foot excavated.

Well 21

This earth well with barrel in Lot 91:111 was discovered in 1956. It was beneath Feature 108, a shallow refuse area roughly circular in outline, 14 feet in diameter and 2.5 feet deep at its maximum. We can assume that Well 21 beneath Feature 108 was relatively early, because the dark midden fill of Feature 108 pit contained a wealth of artifacts characteristically first-half 17th century. These include a halberd (J–10,647) and swept hilt of a sword. Artifacts from the well fill were consistent with this assumption.

The original excavation for Well 21 was a circular hole 7 feet in diameter which tapered to 6 feet as it extended through 3.4 feet of undisturbed clay into sandy subsoil 10 feet below the surface.

No trace of casing or a ground shadow of a well opening within this excavation could be discovered until the first iron hoop of a barrel was located at 7 feet below the surface. No trace of wood staves was noted until a depth of 8 feet had been reached. Judging from the hoop fragments and the ring of partial wooden staves (18 inches long), the original barrel diameter was between 2.2 and 2.3 feet.

The fill of the well pit was a mixed earth, dark but not as dark as the fill of Feature 108 above. There was no evident stratigraphy and it is assumed that the pit was filled in a relatively short time. Undoubtedly the top of the barrel had stood out of the water and rotted away, while the lower portion, filled with gray mud and sand below the waterline, was preserved. The contents of the barrel yielded most of a small delft jar, many shoe fragments, including the major part of one shoe, and a clay pipe from the first half of the 17th century.

The bottom of the barrel was approximately 1.1 feet below mean low tide. The water level in August 1956 was 0.52 foot above mean low tide.

In his inspection of the lead-glazed earthenware from Well 21, Malcolm Watkins noted evidence of a relatively large amount of locally made pottery. He was also impressed with the early 17th-century aspect of the ceramics.

Well 22

A circular pit in Lot 98:105, Sq. 53 and 52, Well 22 averaged 10 feet in diameter and was filled with a mixture of earth and brick rubble, which was barren of other artifacts. The fill showed no signs of having remained open at any stage, and was probably filled at one time. At a depth of 7 feet the fill became muddy as the waterline was approached. However, it is not recorded that the typical blue mud of a well bottom was observed.

Well 23

Well 23 (Lot 100:102, Sq. 39) was simply a circular, earth-filled hole which had evidence of being originally 7 to 8 feet in diameter at the top and over 10 feet deep. The fill was mainly clay earth and some sparse brick rubble. Artifacts were few but significant: from the plowline to 4 feet were found 3 pipestems (2 white and 1 brown colored and hand-molded) all with large diameter holes suggesting first-half 17th century; and 2 pipebowls of white clay from the first half, probably second quarter, of the century. From 4.5 feet below the surface came a fine wrought-iron pickax dating from 1625 to 1650. From 4 to 9 feet came a pipe definitely suggesting first-quarter 17th century, a sword-blade fragment, a polearm fragment, and an assortment of handwrought nails and spikes.

Well 23 was excavated to 9 feet when mud and water, absence of further artifact material, and typical well-bottom blue mud and sand indicated that further excavation was not advisable. We may surmise that this pit was dug at an early period, presumably as a well, and, if it was used at all, was open only a relatively short time. Possibly it was not completed, since no trace of casing or barrel was observable. The fill indicated that the opening had been filled without delay and over a short time.

The nature of the fill indicated definitely that no significant stratification occurred and that the well was filled continuously with trash and earth debris. No noticeable difference in the period of artifacts was evident from the plowline to the lowest point reached. However, at the last foot below the waterline (12 to 13 feet below surface) 2 lead fittings which evidently went around a pipe were found. This suggested that a pipe and pump may have been devised and installed in the well. The remainder of the fill was characterized by the presence of earth, whole and partial brick fragments (whole bricks averaged 8¾ by 4¼ by 2¼, tan to red, moderately well-fired), and artifacts as follows: many brown-mottled and blue-on-white stoneware fragments; some blue-on-white delft; a number of pantile fragments; and a good representation of locally made lead-glazed earthenware. Clay pipes were represented by eight white stem fragments and a brown, locally made stem, all indicative of first-half 17th century. One white pipebowl is probably first quarter and two are second quarter. Several gin-bottle fragments were represented, but only one wine bottle sherd. Metal objects were mainly represented by wrought-iron nails and spikes, but one fragment each was found of a shovel blade, a sword blade (saber), and a strap hinge. A number of garbage bones were found, among which were represented pigeon (or quail), turkey, and cow, with

some scraps of indeterminate smaller mammal bones.

From the evidence of the fill it would seem reasonable to assume that this well was filled some time around the middle of the 17th century.

Since Wells 23 and 18 are both 40 feet west of Structure 117, either could belong to this house. This appears especially true regarding Well 18. Artifacts from the fill of the cellar of Structure 117 are clearly representative of the last half of the 17th century—at least one pipebowl suggests last quarter. Well 23 belongs to the first half of the century and, therefore, could represent the earliest period of habitation at Structure 117.

Well 24

Well 24 (Lot 100:93, Sq. 26 and 36) was located within the area of the Confederate Fort, 340 feet northwest of the church tower. It was tested in 1955 and found to be an authentic 17th-century brick-cased well. The top 6 feet of casing was pointed in modern times, and the casing was extended aboveground and trimmed about the rim with large half-bricks, a restoration presumably carried out by U. S. Army engineers about 1902. The 1955 excavation under the direction of Dr. Joel L. Shiner disclosed that the top part of the original casing had fallen in, but that the brick casing was found intact at 7 feet from the surface. Water was first encountered at a depth of 7 feet. The excavation proceeded to uncover parts of a barrel between 8 and 9 feet. A total depth of 12 feet was excavated. The surface of the ground at the present day above mean low tide is 10.5 feet. It may be assumed that the original ground surface was 1 to 3 feet higher.

Only the fill from 6 to 12 feet from the surface was representative of the 17th century. There was no indication reported of stratification of the fill, so it may be assumed that the well was filled progressively and without marked interruption after abandonment. Seventeenth-century artifacts included a goose wing ax of a type dating around 1600; part of an iron kettle; a large iron key; a large piece of sheet lead which may have had a cylindrical shape that represented part of a well mechanism; and some fragments of German stoneware. The latest recognizable 17th-century evidence is a pair of wine-bottle fragments, indicating that the well was in use from possibly the first quarter, at least through the first half, of the 17th century.

Other Wells

Two wells, in addition to the 24 excavated by the National Park Service, were found by Colonel Yonge during the excavating of the Ludwell-Statehouse group. One had been revealed during preparation of the seawall approximately 3 feet from the west wall of the west room of Unit D of the Ludwell-Statehouse group. The other was located about 20 feet from the southeast corner of the Third-Fourth Statehouse, and is marked today by a restored brick top. No data were recorded.

Summary

ARCHEOLOGY SETS THE STAGE

In commenting upon the value of artifacts and data unearthed at Williamsburg, Va., Dr. Thomas J. Wertenbaker has remarked

> Hitherto they [historians] have depended too much upon manuscript evidence . . . 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.

Generous words, these, and archeology has come of age in deserving them. As archival material—for that is essentially what archeological data are, in the most succinct analysis—the evidence of habitation and day-to-day usages, arts, and crafts is unique. It is, of itself, incontrovertible. It is free from adulteration or distortion in its creation and deposition. Like archival material in libraries, it can be misinterpreted by those who use it, but it is likewise possible for any new interpreter to evaluate it more accurately as long as the field data and evidence are passed along intact. Even though the historical data concerning an event may need no substantiation, the archeologist, with confidence in the inviolability of his evidence, can utilize what he finds to put flesh on the bare bones of the historical narrative.

So it has been at Jamestown, where a reasonably rounded description of events has been preserved to provide a simple outline of what happened and when. What history has not provided at Jamestown is a description of the town. Not so much as an uncontested picture has been discovered, discounting the oft-quoted 17th-century Dutch ship's log containing a vague sketch which may or may not have been intended to represent Jamestown. Archeological evidence has provided a definite plan of structures, implied their character, their equipment and their content of cultural objects. This is a considerable body of evidence in itself. It represents the major part of the life and surroundings of Jamestown folk for over a century, 24 hours a day, day in and day out. The indications of change in style, fashion, and even custom are here—pipes, glassware, ceramic vessels, house hardware, clothing accessories and articles, weapons, architectural preferences, village pattern. Here is the evidence of a way of life in the making, of culture traits familiar to the Old World subtly recast in a new environment. By knowledge of these objects and their cultural inferences, the student of Jamestown history can enter into a far more intimate state of awareness of the life and times of the first settlement.

Already the data and artifacts revealed at Jamestown by archeological techniques have been effectively employed to picture their relationship to the living culture of the community. J. Paul Hudson's "Daily Life at Jamestown 300 Years Ago as revealed by Recovered Objects" which constitutes Part II of *New Discoveries at Jamestown* (Cotter and Hudson, 1957d) basically fills the requirement for objective interpretation of these finds. A further interpretive employment of data from the earth at Jamestown is to be found in the museum exhibits installed in 1957 at the Jamestown Visitor Center for the 350th anniversary celebration. Here objects illustrate imports, local arts, crafts, industries, and usages—even events, such as the conflagrations of Bacon's Rebellion and the numerous accidental fires before and after that historical landmark, represented in fused window and bottle glass, charred wood, and heat-preserved wrought-iron nails.

A broken clay mold for lead soldiers and a little bronze thimble stuffed with paper to make it fit a smaller finger may remind us of children whose lot, we know from historical narratives, was often cruel and difficult at Jamestown. Few can remain unmoved by the plight of several hundred waifs picked up from the London streets by agents of the Virginia Company and transferred to Jamestown as indentured servants. We cannot point to physical remains of these wretched youngsters, who perished in such great numbers on the voyage over or in the first months of servitude, but the scanty trinkets of childhood juxtaposed with the scenes of happy children at play shown on 17th-century Dutch tiles of an opulent Jamestown house give us a poignant reminder. In short, archeological evidence, to the imaginative, can embody historical facts in a way that the written word cannot.

ARCHEOLOGY AND CULTURE

Here at Jamestown was the beginnning of a single money crop system, the forerunner of the plantation economy of the South. But, unlike the Caribbean where good land was at a premium and only one crop—sugar—produced great profits and where the small freeholders were not able to keep a foothold, Virginia had land enough to give the indentured servants hope to become small freeholders, and eventually to attain

status and substance in society. Tobacco was the money crop to begin with, but its harvesting was not as demanding as that of sugar cane, and the same soil could produce many other crops as well. True, the plantation owners did squeeze out the small farmers generally in the 18th-century, and the burgeoning era of Negro slave labor even resulted in legislation to protect white smallholders and servants from technical competition by slaves. (Georgia stopped slave sales once in the 18th century in deference to poor white laborers who found Negro competition too strong.)

Here was a situation unique in the experience of the British Empire. New skills, special crafts, and a way of life developed in Virginia, beginning at Jamestown.

This, of course, we knew without archeological evidence. But at Jamestown we have the fascinating picture of the confusion that such culture change and reorientation creates. We have it in tangible evidence. Here are the tools of the farmer —the hoe for corn, the ax and wedge for splitting timber, the hardware that made and fitted the special racks, barns, and casks for tobacco. At Jamestown the best selection of utilitarian tools appeared in a refuse pit of the 1640–60 period. Thereafter these tools were important only on the plantations away from the capital. The story of life at Jamestown after mid-17th century is oriented about the Statehouse and its visitors, and planters who came to transact business connected with export and import. Again, archeological evidence illustrates this trend toward the rise of taverns by showing the associated multitude of bottle fragments and pieces of clay pipes. Only the Governor and a few persons of importance could enjoy a substantial brick house, and this fact is highlighted by the finding of less than a dozen such dwellings.

The graves of hundreds of settlers at Jamestown, and many more on the mainland, are forceful reminders of the peril of the dark and fatal earth of the marshlands. Had Jamestown been from the first an integrated community, and if by 1650 there had been durable houses in good numbers for a reasonably healthy population, there is little doubt that persistence of tradition and favorable water communication could have achieved permanence for the first settlement. But fires, including one general holocaust in 1676, and a central and healthy location available at Williamsburg, turned the decision toward abandonment of Jamestown.

ARCHEOLOGY AND HISTORY

It is our feeling, as well as our hope, that the data contained in this report will supplement, correct, and enrich history. We may even show how we reconstruct things in fact as well as by conjecture. More significantly, we may have the means for reconstructing that which is more important than things, namely, ideas. Let us, then consider some of these results of our work.

At Jamestown the archeological evidence implies and sometimes confirms what is either stated or suggested by historical and sociological evidence. While it is not necessary to find an armorer's forge with the literal evidence of the improvement of firearms in the early days of the 17th-century occupation to be assured that changes in weapons and changes in military tactics really occurred, the fact remains that such evidence is not only conclusive but highly illustrative. The finding of a house which was burned during Bacon's Rebellion is not needed to confirm the historic fact, but Structure 112 evidence taken as a whole does give us a picture of how a well-appointed house of that time appeared and how it was furnished. Therefore, Jamestown archeological discoveries complete an *in situ* exhibit of 17th-century English colonial life as reflected in its arts, crafts, artifacts, and by inference, its customs, and economic character.

ACCULTURATION: AN INTERCHANGE

Archeological observation on the island also pertains to the life of the aboriginal peoples before and near the time of contact with the Europeans. But it is not essential to build up a picture of Algonquian culture on the York Peninsula and in Virginia tidewater regions by reference to the slight data at hand. What we really understand about this culture we must obtain from the remarkable observations of the 17th-century settlers and from subsequent ethnological observations by trained investigators. Indeed, probably little essential difference existed between the manner of living of the aborigines at the time of discovery and the precontact period over a span of several centuries. These Algonquians of Powhatan's day were agricultural and hunting village dwellers, employing slash-and-burn cultivation, and indulging in organized hunting. They also showed a certain amount of political integration in the instance of recent confederacy under a paramount chief. The impact of Europeans on the Algonquian Indians has been the subject of much analytical comment from anthropologists and need not be repeated here.

What is more important is to observe the Indian traits which positively and strongly influenced the English settlers. This has not been done by historians. Unfortunately, few anthropologists have considered the importance of acculturation as it affected the life and times of the invading Europeans. A. Irving Hallowell (Hallowell, 1957) states:

> Traditionally the anthropologist has not considered it his business to deal with historical facts and events in the same manner as the professional historian. Systematic inquiries by trained students, instituted early in this century, were mainly concerned with securing information from Indians on reservations which would permit the reconstruction of aboriginal cultures as they had existed in the past. The use of historical documents was a secondary consideration; information obtainable from living informants was given primary emphasis. It was only in the thirties that the study of culture contact, or acculturation, was defined as a special subject for investigation. Once begun, such studies have been focused upon the various ways in which the cultures of the Indians have been affected by their contacts with white men. Despite the fact that

in the well-known memorandum of Redfield, Linton and Herskovits (Am. Anth. Vol. 38, 1936, pp. 149–52), acculturation was conceived as potentially a two-way process, in practice, American anthropologists have investigated it as a one-way process.

Hallowell, noting how the white colonists adopted the whole material complex of maize culture (except for ceremonial traits) from the Indians, continues:

> . . . In the case of corn, however, we do have some facts which are well known to historians and easily accessible. In the spring of 1609, for example, 40 acres of maize were planted at Jamestown under direct Indian supervision and instruction. It was (Bruce, 1896:199) "the first maize produced in any quantity in the boundaries of the United States by people of English blood of which we have any authentic record." Up until this time maize had been traded from the Indians, but in precarious quantities. Captain John Smith induced two Indian captives to supervise the planting, which was done in complete accord with Indian practice. We do not know the names of these Indians, but we do know their linguistic and tribal affiliation.

Thus, corn raising was the prime, life-saving, adopted trait at the Jamestown settlement, as it was 13 years later at Plymouth when Squanto, another Algonquian, was teaching the Pilgrims to plant this vital crop. But it was tobacco, equally an Indian cultivated plant, and its use—a trait directly taken from the Indians—which gave the Virginia settlers their sole money crop and laid the foundation of the Southern plantation economy with its countless cultural ramifications in the Southern States.

A summary of cultural borrowings from the Indians by the white settlers at Jamestown follows:

1. Warfare

   Weapons: Portability of light bow in contrast with heavy arms in woods and difficult terrain.
   Armor: Heavy armor abandoned to achieve Indian mobility.
   Tactics: Mobility and surprise, use of concealment in forest, swamp, etc., ambush practice.

2. Housing

   Light frame covered with portable roll matting found best for summer and adopted sometimes in preference to tight English wood and daub cottages.

3. Clothing

   Skins and loose clothing of tailored skins sometimes used in preference to woolen and other cloth garments. Moccasins: More satisfactory footgear in the bush.

4. Agriculture

   Corn (the husking peg was an actual tool borrowing), beans, pumpkins, squash (often planted in cornfields in the Indian manner), tobacco (cultivated with native techniques), berries, nuts, etc.

5. Drugs

   Tobacco, sassafras, etc.

ESSENTIAL ARCHEOLOGICAL DATA

The most important archeological evidence as interpreted by this writer at Jamestown may be summarized as follows:

1. Jamestown Island is a river shoal formation created by tide and current action on the shelf between the channel and the shore, and as such is continually building up at the lower end and eroding at the upper, or western, end. Fingerlike projections of these shoals between the river and the low scarplike main body of the island tend to become filled-in marshes. The southern shore eroded less, but perceptibly, especially between Orchard Run and Church Point, where the major portion of the settlement occupied favorable ground.

2. Because of this erosion, the site of the First Fort of 1607 has been completely covered by the James River at a point between the present channel and the seawall opposite the Confederate Fort of 1861. Although underwater offshore tests failed to reveal evidence of the First Fort, the absence of 17th-century traces of any kind at the alternative location east of Orchard Run (Forman's hypothesis) places the 1607 fort most probably offshore from the Confederate Fort and the church.

3. Farther downstream below the Confederate Fort, the cemetery of the church of 1639–47 has been partly eroded, and in the gently crescentic beach area between here and Orchard Run the land has eroded not less than 150 feet, since 1607, probably destroying the First Statehouse.

4. The Confederate Fort of 1861 (covering an early 17th-century soil zone) could not be tested extensively enough to furnish habitation structure evidence. An early armorer's forge pit intruding into the 17th-century zone yielded evidence of the changing from obsolete gun parts in the first quarter of the century. This forge location implies strongly the proximity of the original fort location, now offshore, since it undoubtedly was located in the central part of the community at the time of its use.

5. Beneath the 17th-century soil zone and the fill of the Confederate Fort near the 1639–47 church, a well-defined zone of Indian occupation lay in direct contact with the historical debris. This Indian occupation was characterized by flaked stone points and sherds either plain, cord marked, fabric impressed, or incised. Each type was divided between sand and shell tempering. The shell tempering predominated. These artifacts, stone and pottery alike, could be anything in the archeological lexicon of 1958 from "Early Woodland" to "Late Woodland," or anything from the time of Christ to 1607. From the stratigraphy, the Indian site was abandoned shortly before Jamestown was settled. Hence, we may regard the site as late prehistoric and safely assume that the culture here represented was not materially different from the historic Algonquians of the time of contact.

6. *The Community.* In his *Architecture and Town Planning in Connecticut* Anthony Garvan has stated, "The cultural origin of its people forms the highly imperfect framework

upon which any description of seventeenth-century Connecticut architecture and town planning must hang." (Garvan, 1951, p. 1.)

The same could, of course, be said of Jamestown. In fact, Garvan likens the plan of Jamestown, as it was known to him in 1951, to that of a company town in Ireland, with the fort resembling an Ulster bawn erected at a short distance from the town (Garvan, 1951, p. 39–40). Archeological evidence, although yet incomplete due to the bulk of the Confederate Fort of 1861, strongly suggests that, indeed, "the homes of the settlers huddled closely around the church and its lands" (noting, of course, that at Jamestown the church lands were restricted to the churchyard). However, once the community had extended from the bounds of the First Fort, it rapidly progressed eastward past the church and, in the first quarter of the 17th century, occupied the whole shore from churchyard to Orchard Run.

But it must be kept in mind that Jamestown was never a successful, integrated community. Despite the confident and ambitious directives from the Virginia Company of London and the government to the settlers to build lodgings for the new immigrants, hospital facilities, and brick houses, the fact was that far fewer brick houses were built than the records imply. The evidence from the ground at Jamestown shows that, while bricks were made from the ready raw clay materials at an early date, the earliest brick buildings were either removed and the bricks reused or were situated mainly along the shore which was subsequently eroded. Our strong suspicion is that the First Statehouse was in the latter category. Most of the brick houses that have been excavated are demonstrably in the second half of the 17th century, and probably lasted well into the 18th century. In fact, the French military map of Jamestown Island of 1781 shows some 20 houses. The fact that the British were said to have left these houses in ruinous condition indicates that most of them were probably brick, otherwise they might have been totally destroyed. The earliest surviving brick-house evidence does not antedate 1640, if the associated artifact evidence is considered.

If a marketplace or common area was left open in the Jamestown community as it took form, its presence cannot be demonstrated from archeological evidence, except for the relatively vacant aspect of the area between Ditch 29 and the river, east of the churchyard. Also the major portion of the grounds west of the church tower may have accommodated a market place at an early stage of development at Jamestown. However, taking into consideration the elongated, restricted character of the available ground for housing on the island, and the sporadic growth of the settlement which was unwilling to become a community due to the preference of the planters to live away from it, it is not surprising that Jamestown did not develop into the basic pattern of the nucleated village with its church, green, and cottages. Furthermore, the orientation of the Jamestown house pattern was almost surely governed in large part by the branching of the "greate road" into "front" and "back streete," all paralleling the river. The location of "back streete" at least can be surmised by the placement of the major east-west ditches (24 and 66), although the "front streete" location may well have been lost in the river, and Road 2 evidence shown on the archeological base map (in pocket) is the location of a road extant to the 20th century and of origin unknown.

The development of community life and village planning in Virginia as it stemmed from Jamestown was markedly at variance with that of the New England communities in several important respects. The dire times of high mortality and economic failure came first. This was capped by the disaster of the Indian massacre of 1622, even after the economy had begun to prosper. Then came the rapid rise of population and the increasing wealth of plantations and small communities beyond Jamestown. All this spelled the end of any real development of the first settlement site as a town. The tendency was a virtual explosion of population into the land secure from immediate Indian attack, forming a basis for the scattered plantation system of the 18th century and the quick and widespread exploitation of great areas of land. Nevertheless, the constant communication and occasional personal visits to England by the men of responsibility and means meant the swift introduction of ideas of house building and furnishing as they developed in England. Particularly noticeable is the importation, especially after the Great Fire of London, in 1666, of the brick town house concept with its utilization of joined dwellings. Two laterally-extended row houses such as the Ludwell-Statehouse and Structure 112 rows were one way of building connected houses. More characteristic of the crowded urban brick house row, however, was Structure 17, considered by others to include the First Statehouse, in which the long axes of the house units are parallel to each other (another suggestion of the lateness of this structure).

It is useless to look for evidence of the first frame structures at Jamestown—those of the chaotic struggle to establish a settlement. They have not been found, and they probably have left no trace. The houses of the First Fort disappeared into the river. Those of the area immediately north of the First Fort were either masked by the earthwork of the Confederate Fort and have not been located by the limited testing there, or were obliterated by the scraping up of earth for the fill inside and around the 1861 fort.

Between the church and Orchard Run are traces of frame houses with brick chimneys. Here we probably have the earliest structural use of brick represented, whether or not the particular houses which we have found are themselves the oldest yet uncovered. Lack of permanence and continuity at Jamestown from the beginning was marked by the frightful mortality. The impermanence is further understood when we consider the youth of the early settlers as well as the quick disintegration of timbering made of inadequately cured wood in a damp climate, to say nothing of frequent fires and the reluctance of the more substantial planters (later) to build

permanent houses on the island as they were importuned to do by the government. Such factors explain the paucity of substantial material possessions left in evidence. Thus natural, cultural, and historical factors at Jamestown all combine to leave to posterity only the most durable (not necessarily the most common or typical) houses, mainly brick. And nearly all of these are from the second half of the 17th century.

The Churches. Since the church is a feature of foremost importance during and at the close of the medieval English period, the church structures and their remaining evidence at Jamestown are of particular interest. The first structural frame churches at Jamestown are lost. The church of 1617, a frame building, is believed on good deductive evidence to have stood on a light brick and cobble footing which is traceable partly within the area of the last church foundation, that of the 1639–47 brick structure which was rebuilt after 1676. Significantly, these church foundations were situated closest to the indicated oldest part of the settlement which lay within the ramparts of the First Fort on the original extension of Church Point. It seems unquestionable that the community grew in this logical fashion, with the church of 1617 placed just outside the decaying and obsolete fort. The Vale, a marsh between the third and fourth ridges, prevented extension to the north and west of the church, and the third ridge itself scarcely contained room for more than the original cemetery and later the superimposed Ludwell-Statehouse row. Therefore, the community had to grow eastward, downriver between Pitch and Tar Swamp and the James River to Orchard Run.

That Jamestown was perennially unpopular and offered little inducement to expand is further testified by the fact that archeological investigations have produced no indication of 17th-century occupation east of Orchard Run in the Elay-Swann tract. Likewise, the habitable land north of Pitch and Tar Swamp was carefully tested and found to have left evidence only of a single brick house, Structure 1.

Cemeteries. If all other proof of the location of the First Fort off Church Point were lacking, the finding of the additional, and possibly the original, cemetery on the third ridge beneath the Ludwell-Statehouse foundations would clearly establish that the fort was never below Orchard Run. The newly-discovered cemetery is a logical indication that the settlers found the ridge beyond the Vale the first accessible ground in which to bury the incredible numbers who perished during the Starving Time (1609–10) and the first decade of the settlement. The area immediately outside the fort in the location of the present churchyard would have been too close and too conspicuous. Furthermore, later use of this ground would have disturbed earlier graves, and such evidence has not been indicated here.

For those not buried in cemeteries there remained, with doubtful legality, the ditches. Most outside burials were manifestly Indian.

Evidence of the Character of Jamestown. Archeological evidence of industry at Jamestown does not go beyond the presence of a few crafts and domestic manufacture. At Glasshouse Point, just off the island beyond the isthmus, glassmaking was twice attempted, failed both times, and was not carried on beyond 1622. Although the evidence of the furnaces, the furnace pots and traces of melted glass is well-preserved, there is a curious lack of finished glass artifact evidence, further testifying to the utter failure of the enterprise. Ceramic manufacture endured longer since traces are more extensive. Much locally made pottery is encountered, and one kiln for earthenware, lead-glazed pottery is known. Oyster shell was fired in kilns for slaked lime. Brick- and tile-making was carried on, with evidence of work from the first to the last quarter of the 17th century represented in the remains of 3 kilns. A probable brewhouse is represented by a brick foundation with a tile floor, large fireplace, and 3 fire boxes for heating large receptacles. Ironmaking and ironworking was done locally, and is attested by 2 pits—1 a forge and 1 for general ironworking and smelting. In all, 2 foci of industry are suggested at Jamestown, one near Pitch and Tar Swamp and the other along the James River shore.

One of the main occupations at Jamestown especially in the latter half of the 17th century, was tavern keeping. This is attested by historical record and well supported by archeological evidence of wine-storage cellars, much broken wine-bottle debris and many clay pipes and potsherds. Houses built for residences were often used for other purposes, such as taverns, and on occasion, for office buildings, as the first two statehouses. The Second Statehouse may possibly be represented by a large structure (112) near Pitch and Tar Swamp. This mansionlike house had a separate kitchen, an icehouse, and a smokehouse or milkhouse a short distance away. The possible brewhouse may also have been part of this large establishment during one period of its use.

While a large amount of lead-glazed utility earthenware was made locally, much domestic pottery was imported from England, Germany, and the Netherlands. The presence of Dutch gin bottles and Dutch and German ceramics throughout the occupation, from the first quarter of the 17th century, gives solid testimony to the independent character of the early Virginians, who are said to have welcomed Dutch and other foreign trade in defiance of the obligation to deal with the mother country. (A large proportion of Jamestown glass was made in Holland, Germany, and Italy.)

One of the principal contributors to ubiquitous disease at Jamestown can be demonstrated archeologically (as well as historically) in the wells, all of which were shallow and easily contaminated by ground water. If they had been any deeper (as the well in the First Fort perhaps was) they would have tapped brackish water, and would have been useless, in any case. Most of the wells were uncased except for the barrel at the bottom, and possibly a rough board siding. A few were brick lined.

Tracts and Ditches. The exact location of the few tracts

which have come down to us in the historical records of the Ambler Papers and the Land Office at Richmond, Va., is not easily tied to archeological evidence. Most of the tracts are located only with reference to other tracts, rather than to enduring landmarks. However, the multitude of ditches and ditch traces which have been disclosed by test excavations, plus the church, Ludwell-Statehouse row, and the "brick bridge" across Pitch and Tar Swamp all have aided in defining the tracts. What is missing is the original shoreline of the James River to the south. For this reason and because of the uncertain location of "front streete," historians in the future are warned that the southern tracts may be pulled considerably farther south into the present location of the river without doing violence to the remainder of the tract picture. (The "back streete" may, indeed, have been quite wide.)

Identification of Houses at Jamestown. Certain houses have been associated with tracts, and thus with certain owners of the tracts; also, speculation has prompted some observers to associate certain house remains with the First Statehouse, the Country House, or Governor's house in the "Sherwood" tract. Despite these and other speculations, the fact remains that ownership of only two structures is finally and definitely identified. These identified structures are the Ludwell-Statehouse row and the foundations of the two churches. Tract and artifact associations lead us to suspect certain houses quite reasonably to have belonged to Ralph Wormley and Henry Hartwell, but the final proof is, and probably will always be, lacking. The precise location of the tracts of land themselves, and even their shape, may never be known accurately. Generalizations, however, are significant. First, the use of brick for houses, as we have seen, was either in chimneys or footings of frame houses, or for houses entirely walled with brick. Such houses were definitely built in the 17th century, most of them, especially the all-brick types, in the second half. Many houses were standing well into the 18th century, and at least 20 houses were standing on the island in 1781. Thus the historical assumption occasionally heard, that Jamestown was abandoned after the removal of the capital to Williamsburg in 1698, is unwarranted. The Ambler House, owned by the family which was to make the island their plantation, was, of course, standing by 1720.

Conclusion. The purpose of archeological investigation at Jamestown is largely to illuminate, supplement, and correct or verify historical data and sociological evidence. Here was a community doomed as soon as the plantation pattern was stamped upon Virginia by the development of tobacco after the first quarter of the 17th century. There were other reasons, to be sure, beginning with the wretched health conditions and seasonal flooding of land access routes. But the plantation owner, following the inexorable demands of a single, fast-profit crop requiring cultivation by many hands, had to seek a dependable source of labor. Indentured servants were transitory, expensive and intractable as a rule. The Indians were, by their culture pattern, unsatisfactory plantation labor, with their refusal to be subjugated by European masters. There was no changing the Indians by any method the settlers could manage.

With Negroes introduced by Dutch traders in 1619 it was different. By tradition familiar with capture and slavery by their own race in West Africa, the Negro was better adapted to labor as a slave in Virginia plantations, just as he had proved better than the Indian slaves of the Caribbean Islands in the 16th and 17th centuries. And, as in plantation economy everywhere, the owners depended upon profits to purchase manufactured goods. Following the initial failure of such specialized and skill-demanding industries as glassmaking and ironmaking by reasons of incompetence and misfortune, the planters were content to look abroad for supplies and equipment. Only the essential home industries most suited to materials at hand were fostered: brick, ceramic tile, and vessel making. And these industries were also abetted by the difficulty of importing quantities of such materials from overseas.

Thus, the story of social and historical trends at Jamestown, evident in the records, is given fuller meaning by data derived from the earth at the site. Here, then, history tells about dates, events, and people; sociology, anthropology, and ethnology combine to throw light upon the acculturation of settlers and Indians alike in the filter of the frontier; archeology checks, tests, and illustrates them all.

Future Archeological Exploration. In 1957 systematic trench testing at Jamestown ended, it is hoped, forever. New field techniques employing such devices as the proton magnetometer (Aitken, 1958) which employs nuclear resonance to detect underground features without excavating should be employed at sites like Jamestown—even if we must wait until the celebrations of 2007 to use the new techniques.

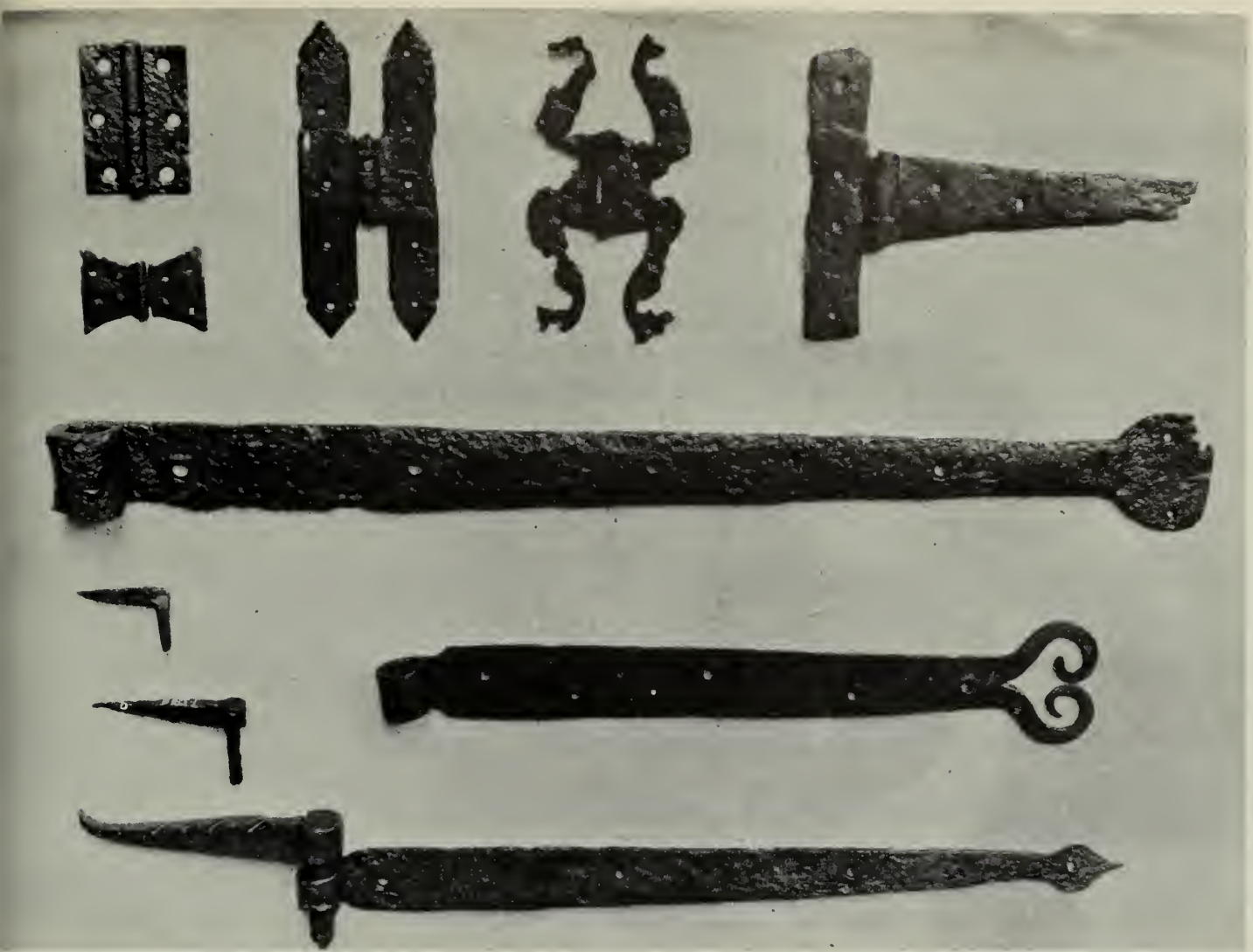
Artifact Illustrations

Plates 67-91

PLATE 67—*Building Hardware*

Upper.—Various types of hinges.

Lower.—A general assortment of 17th-century nails, spikes, staples, and general hardware.



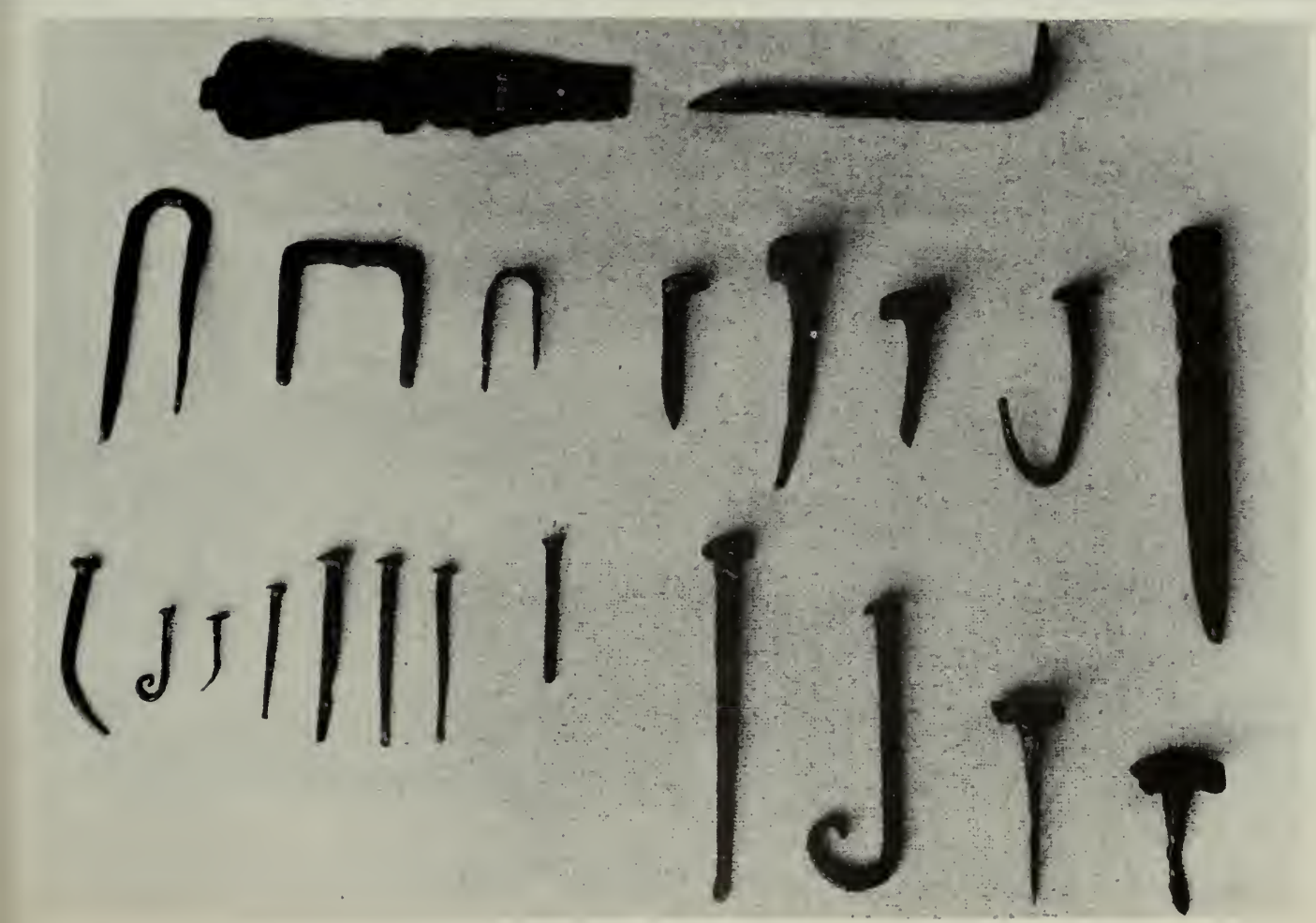




PLATE 68—*Door and Window Hardware*

Upper.—Types of padlocks, keys, door locks, and escutcheon plates.

Right.—Wrought-iron window casement and equipment from Structure 1 in Unit A, north of Pitch and Tar Swamp.

Lower.—Fragment of glass in lead cames from a casement window found at the floor level of Structure 19A in front of the vault door.



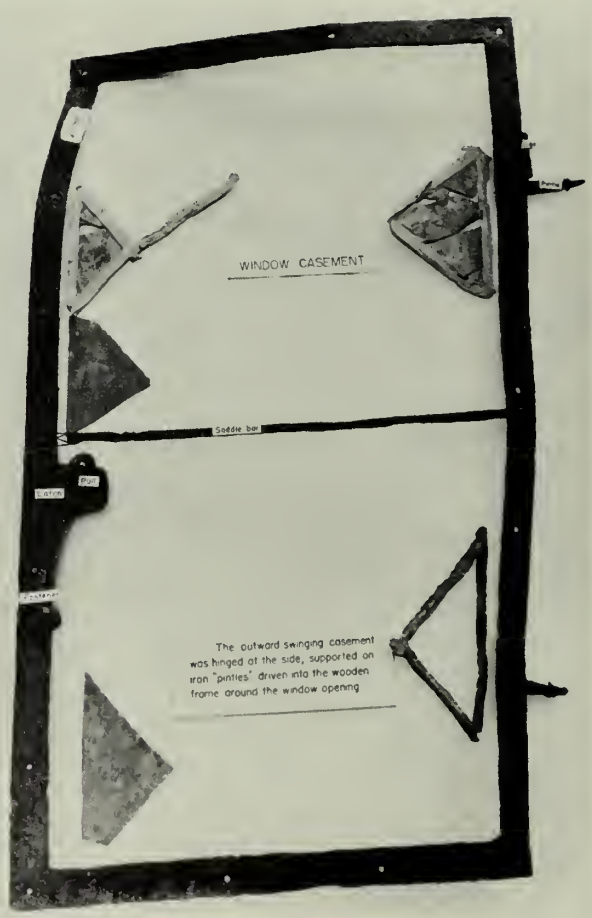




PLATE 69—*Brick and Roofing Materials*

Upper.—Some brick types found at Jamestown. Except for 2 "Dutch bricks," lower left, these bricks were probably made locally.

Lower.—Representative 17-century roofing materials.

Upper left.—Wooden shingle fragment found in the early 17th-century Well 20.

Upper right.—Curved pantiles.

Lower left.—Flat clay tiles, examples of which were found ready for firing at the brick kiln, Structure 102.

Lower right.—Slate fragments.

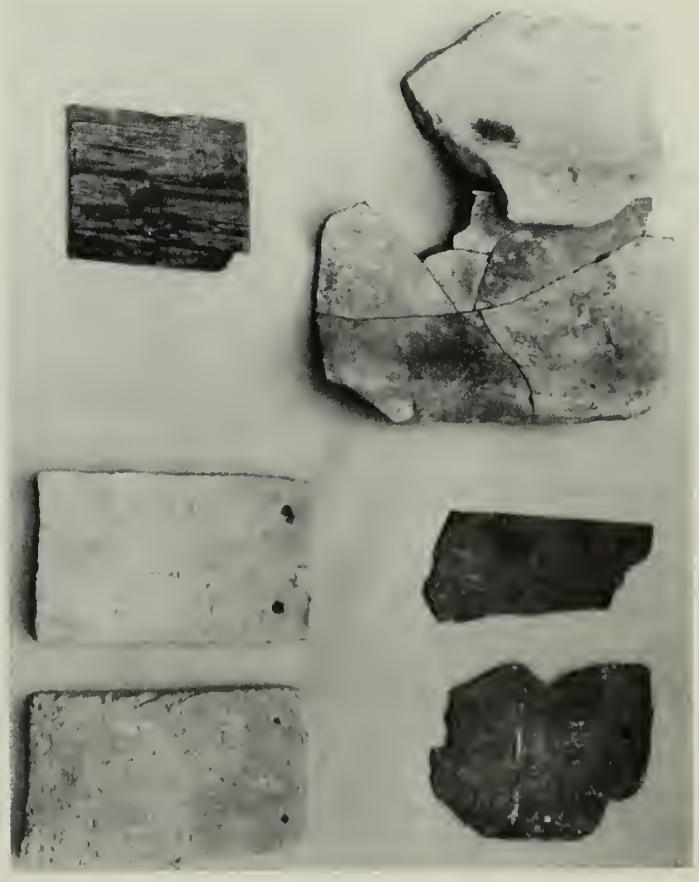


PLATE 70—*Tiles and Ornamental Plaster*

Ornamental plaster (pargetry) fragments. All pieces shown were excavated from the fill of Structure 31 except the lion's head, upper right, which came from the fill of Room A, Structure 112.

Delft tiles. Two at right (J-7623) are from Structure 1; two at left (J-7718) are from Ditch 5 associated with Structure 34-37. The playing children motif is characteristic of the many delft tiles from Ditch 5 and vicinity.









PLATE 71—*Fireplace Tools and Accessories*

Upper left.—The iron tongs (Old cat. 792) at the top was found in a fireplace of Structure 17, probably the west unit. The shovel handle (J-1908), also of iron, came from Structure 15. The iron shovel (J-206), which doesn't fit the handle, but matches in type, was found near Structure 18. The brass tongs at the bottom left (J-8678) were found in the vicinity of Structure 34-37.

Upper right.—Iron trammel, handwrought, of a 17th-century type. This specimen was found on the grounds of the Association for the Preservation of Virginia Antiquities at Jamestown, probably in the Ludwell-Statehouse excavation of 1903.

Left.—Seventeenth-century andiron with cherub's head (J-2978) excavated near Structure 31, the possible site of William Sherwood's house.



PLATE 72—*Tools Used in Building and Timbering*

Upper.—Selection of iron tools used in building—hammers, scribers, chisels, race knife, hewing ax, adz, bits, gouges, gimlets.

Lower.—Tools used in timbering—axes, hatchet, adz, saw fragment, wedge.





PLATE 73—*Farming Tools*

Iron hoes representative of 17th-century types. Lower left from Green Spring.

Fragment of pitchfork, shovel, and felling ax.





PLATE 74—*Horse Gear*

Upper.—Examples of bits and brass ornaments (or bosses).

Middle left.—Typical stirrups and spurs.

Middle right.—Branding iron with initials TR (Cat. J-561) found in or near Ditch 2 at a depth of 12 inches.

Lower.—Currycombs and horseshoes.

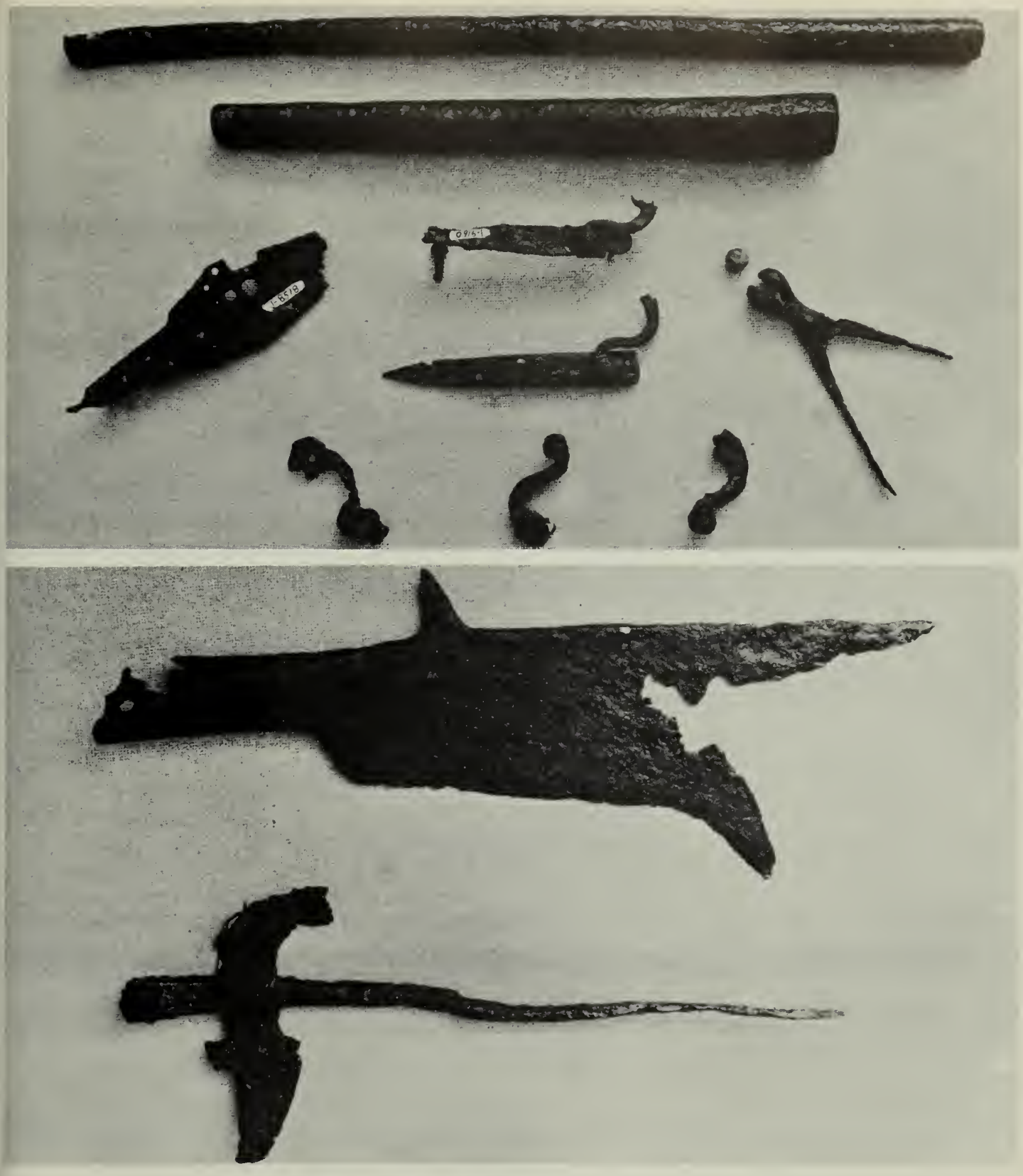


PLATE 75—*Military Weapons—Gun Parts and Polearms*

Upper.—Early 17th-century gun parts, including early gunlocks, 2 musket barrels, and a bullet mold. Three guncocks are at the bottom. The gunlock plate at the left (J-8518) is from the Forge, Structure 139, within the APVA Confederate Fort; the gunlock at the top, center (J-9160), is from another forge pit or ironworking pit, Structure 111, "Kiln C." The shorter gun barrel is from Structure 110.

Lower.—Polearms from early Jamestown: The bill (top) is from the APVA collection and is of no known provenience. However, the probability is that it was found either at the church by Tyler in 1901 or at the site of the Fourth Statehouse-Ludwell House excavation by Yonge in 1903. The halberd at bottom (Cat. J-10647) was found in refuse deposited above Well 21 in association with other artifacts characteristic of the first quarter of the 17th century.

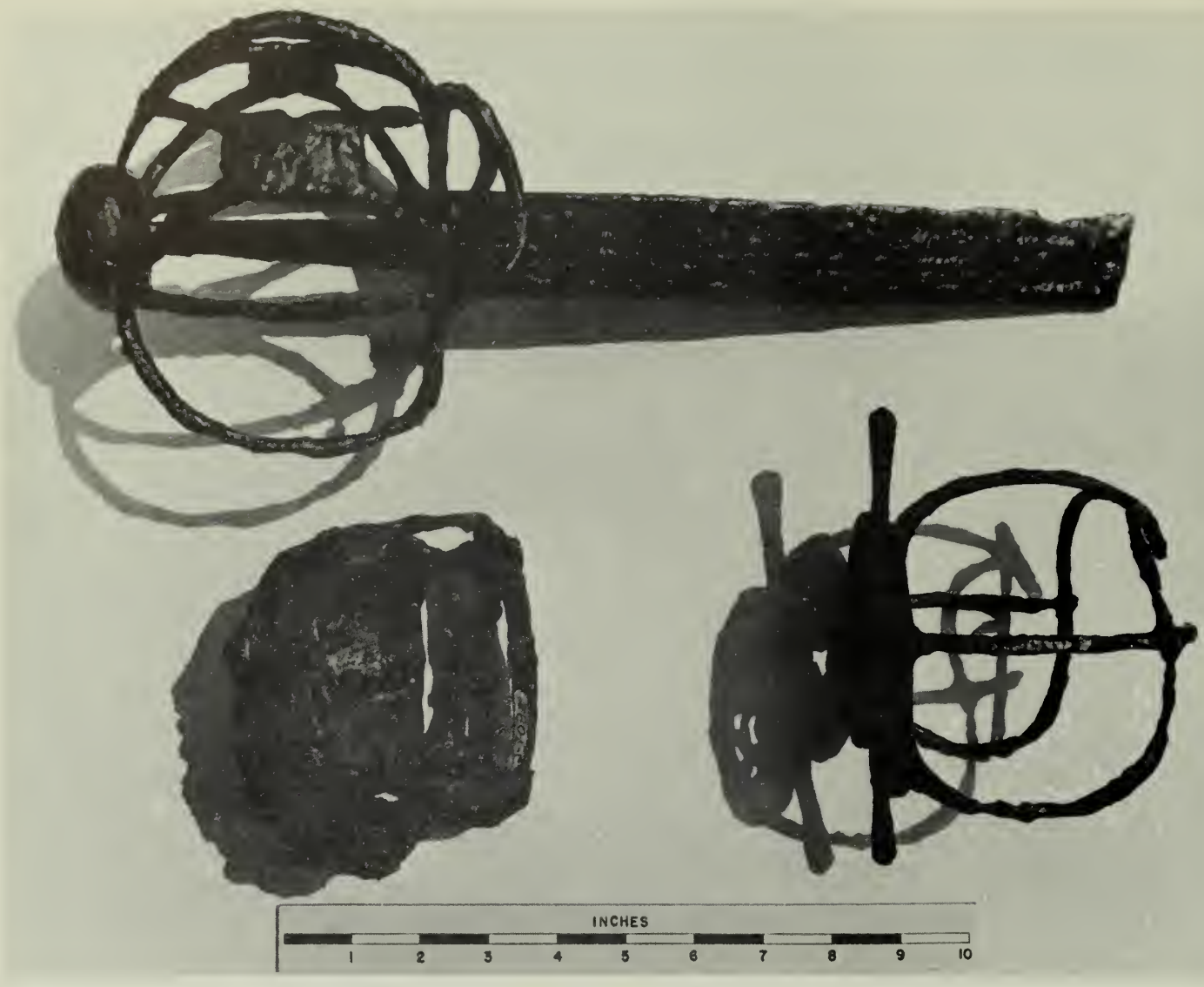




PLATE 76—*Military Weapons—Broadsword and Cutlass*

Upper.—Early broadsword and sword guards, including a basket hilt, all from Refuse Pit 1.

Lower.—Cutlass from Zone C of Refuse Pit 1 (J-9721).



PLATE 77—*Lead-Glazed Earthenware*

Types of lead-glazed earthenware made at Jamestown. The whole pot, upper left (J-7008), with finger-marked fillet around the rim was found in Lot 94:103 in the vicinity of Structure 21. The smaller pot next to it was found in Structure 111, Kiln A. The pot with the single vertical loop handle, top right (J-7085) was found in Structure 110. The fragmentary bowl at the center (J-7087) came from Structure 111. The sub-conical cup (J-7550) at the lower right originally had a vertical loop handle, and was found in the vicinity of Structure 19.

English lead-glazed earthenware, including sand-tempered (or coarse-tempered) ware. Mostly made in North Devon. The handled chafing dish (J-7473) at the left was found in the fill of Well 11. The 3-legged pot with stem handle at the bottom of the group (J-7308) was found near Structure 51.





PLATE 78—*Lead-Glazed Earthenware*

Sampling of 17th-century, lead-glazed earthenware "slipware" at Jamestown. The vertical loop-handled pot at the left with the stylized bird motif (J-7542) was found deep in Ditch 5, behind Structure 34-37, in the Henry Hartwell tract, as was the tall jug at the right (J-7584) with the fragmentary handle. Most of this ware was made in England, but a small amount may have been manufactured in Virginia in the 17th century.

Pottery cooking utensils from 17th-century Jamestown, including a baking dish, 3-legged pot, and vessel with cover. The pot lid (J-7485) was found singly above Structure 33 drain, and the matching pot (J-7484) was also found in the Hartwell tract, close by. The squared baking dish (Old cat. 285) was found in Ditch 5, behind Structure 34-37. Vessels of the same type as the pictured 3-legged pot with stem handle have been found in the Hartwell tract and the vicinity of the Country House (probably Structure 38).







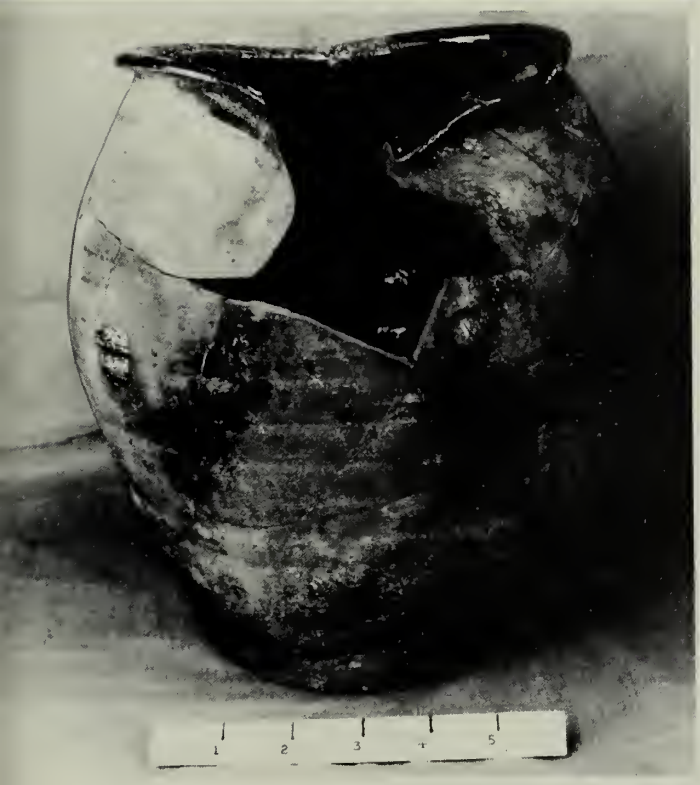




PLATE 79—*Locally made Lead-Glazed Earthenware*

Upper left.—Lead-glazed earthenware jar, glazing on inside only, 8½ inches high, found at Structure 111, Kiln A, and undoubtedly made there (Cat. J-7089).

Lower left.—Hard-fired earthenware pot, lead-glazed (green) on interior. This warped and fractured pot, an obvious waster, was found at a depth of 1½ to 2½ feet in Well 5. (Cat. J-7598.)

Upper right.—Jar fragments unearthed at and very near pottery Kiln A, Structure 111 (Lot 102:103), in 1955, restored to show whole pot form. The vessel was about 7½ inches high and had a rim diameter of 3 inches. An estimated date, based on association and other type specimens is 1640-50.

Lower right.—This vessel may have been made in Kiln A of Structure 111, 1650 or earlier. It was found near Structure 110, the presumed brewhouse. (Cat. J-7085.)





PLATE 80—*English Sgraffito-ware*

Upper.—Examples of English sgraffito-ware from the Barnstaple district. These and nearly all other whole or restorable English sgraffito specimens came from Ditch 5, directly east of Structure 34-37, a presumed kitchen on the Henry Hartwell tract. (Left is J-7341; right, J-7345.)

Lower.—Sgraffito-ware made in North Devonshire, about 1640-80. Shown are plates, pitchers, cup, and candelholder, all from Ditch 5, immediately east of Structure 34-37.



PLATE 81—*Salt-Glazed Stoneware*

Upper.—Large salt-glazed stoneware jug dated 1661, known variously as "Graybeard," "Bartmann," and "Bellarmine," with grayish-white body, brown mottled surface (made at Frechen?). This specimen was found in the 1934 excavations of Structure 17. The earliest reliable date of reference for Structure 17 artifacts is thus post 1661. Most of these fall in the last quarter of the 17h century and into the 18th century. (Old cat. 46.)

Lower.—Assortment of German salt-glazed stoneware representative of 17th-century Jamestown. The restored jug, second from left (J-7553), was found in the fill of the late 17th-century brick kiln, Structure 102. The larger jug, third from left (J-7517), was found in Structure 19. The mottled brown bellarmine (J-7147) was found in the fill of the early 17th-century feature, Well 21, and the slightly larger bellarmine (J-7776) on the right, which is incomplete, came from the fill of Feature 108, a refuse deposit above Well 21.







PLATE 82—*Tin-Enameled Earthenware*

Upper.—Examples of English tin-enameled earthenware, referred to commonly as "delftware."

Left.—Lisbon majolica bowl fragment (J-7778) found in the Structure 21 area (Lot 94:103).

Lower.—Hispanic ware: Collection of tin-enameled earthenware unearthed at Jamestown. (Excepted are the 2-handled jugs which are lead-glazed. These were found in the fill of Structure 112.) The large Lisbon Majolica plate (J-7328) to the left was found near Structures 21 and 46, near the shore. The plate to the right was found in the vicinity of Structure 19 (Old cat. 2089).







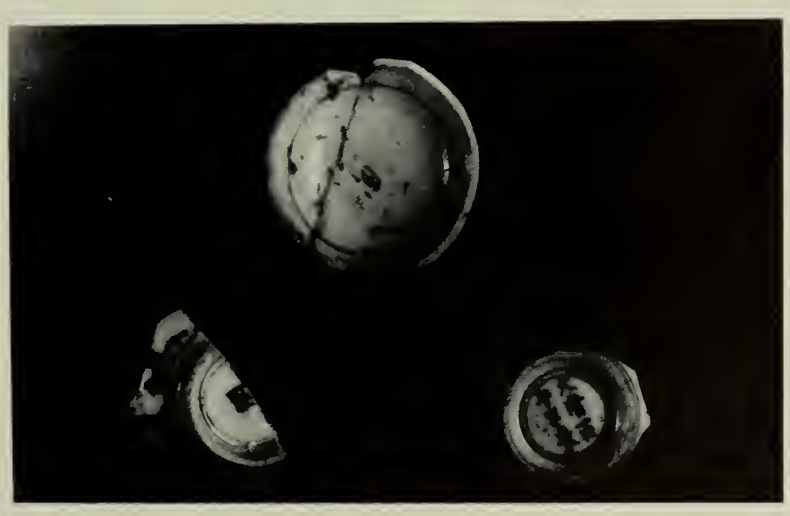


PLATE 83—*Slipware and Porcelain*

Examples of various types of slipware: Upper right and left, marbled, Structure 21 vicinity. Top center, redware, probably American. Lower center, combed and dotted, all from Lot 95:103. Lower left, combed, from Lot 95:103. Lower right, from Structure 40-72. All of these examples except the marbled English redware (ca. 1640) date from 1700-1780.

English marbled slipware fragments from the first half of the 17th century, found in the lower portion (Zone C) of Refuse Pit 1 (Lot 101:103).

Examples of Chinese porcelain from 17th-century structures at Jamestown.



PLATE 84—*Glass Vials and Bottles*

Four glass wine bottles illustrating changes in shape between 1640 and 1700. From left to right:

First—A 3-feather seal bottle, 1640 to 1660 found near Structure 18. (Old cat. 677.)
Second—Dating from 1650 to 1670, found near Structure 60. (Old cat. 7520.)
Third—Dating from 1680 to 1690, found near Structure 60. (Cat. J-7560.)
Fourth—Dating from 1670 to 1700, from near Structure 21. (Old cat. 517A.)



Three gin bottles of considerable importance as dating references: Bottle at the left (J-7312) was found on the west side of the brick drain, Structure 33, near Structure 34-37, the presumed Henry Hartwell Kitchen. Much of the English sgraffito at Jamestown was found in Ditch 5, where Structure 33 drain is located. The middle bottle (J-7145) was found in the middle fill of Well 20 and is identical with a bottle from Structure 24, nearby. The bottle on the right (Old cat. 7532) was found in the fill of Well 10, immediately north of Well 21, another 1st-quarter, 17th-century feature.



Glass vial (J-7169) found 7 to 8 feet deep in the fill of Well 7, Lot 96:100.



Wire closure attached to the neck of a late 17th-century wine bottle. The wire kept the cork tight in the opening.



PLATE 85—*Wine Bottle and Seals*

Wine bottle with 3-feathers seal found near Structure 18 in Lot 89:113, showing customary position of seal on shoulder of bottle. This is one of the earlier types of bottles, dating from 1640 to 1660. (Old cat. 677.)

A representative sampling of bottle seals from Jamestown excavations. The "HG" seals are probably those of Henry Gawler who lived late in the 17th century in the vicinity of Structure 8 to 17 in the southern shore portion of Jamestown. It was here that most of his seals were scattered. The "HH" seals indicate Henry Hartwell; most were found in Ditch 5 and in the vicinity of Structure 34-37, almost surely his property. The "FN" seal was found in Structure 125 and is thought to represent Francis Nicholson, last resident Governor at Jamestown.







PLATE 86—*Wineglasses*

Venetian glass goblet (Old cat. 1771) restored from fragments found under Structure 35, a walk of the Ambler garden, from 1 foot 7 inches to 2 feet 9 inches below the 1940 surface. This goblet dates from the 4th quarter of the 17th century.

Early 17th-century wineglass fragments from Jamestown excavations. The two goblets are restored in wax from the incorporated original stem fragments. These are, left (Old cat. 1771), from Structure 35, and right (Old cat. 773), from Ditch 5. The large stem fragment in the center (J-7052) is from Structure 128, ice pit, Zone B; next to it, to the left, is a stem fragment (Old cat. 5771) from Well 10, near Structure 35.

Lower.—Wineglass fragments with makers' marks on the stems. Two "sealed" examples here are definitely Ravenscroft wares; two others in the collection may be.

Left—From Ditch 66 (Old cat. 5618).
Middle, upper—From near Ditch 28 (Old cat. 6548).
Middle, lower—From Structure 33, drain (Old cat. 5791).
Right—From Ditch 5 (Old cat. 6309).



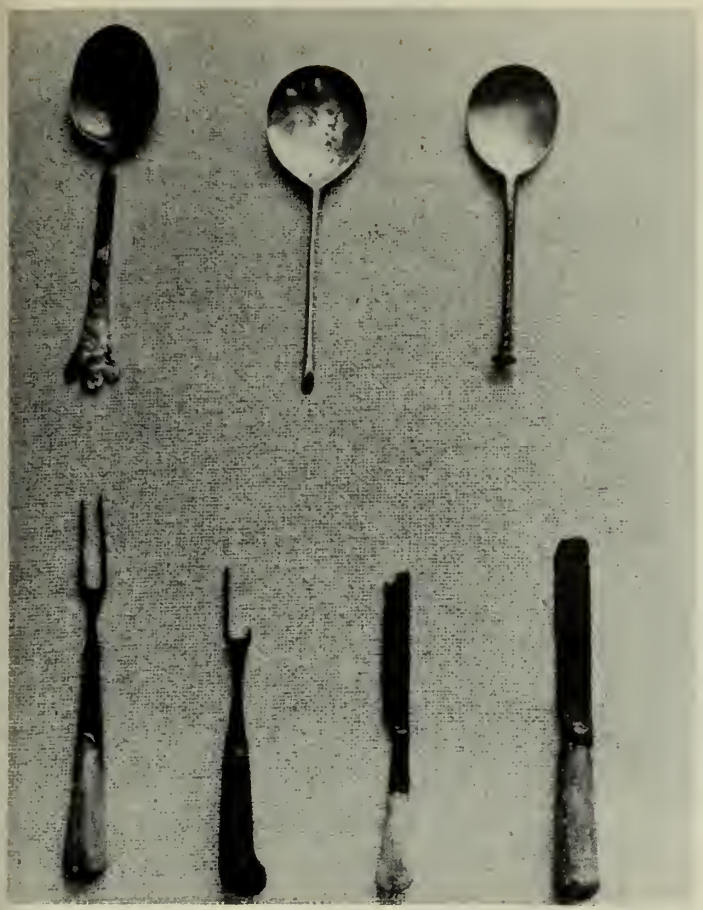
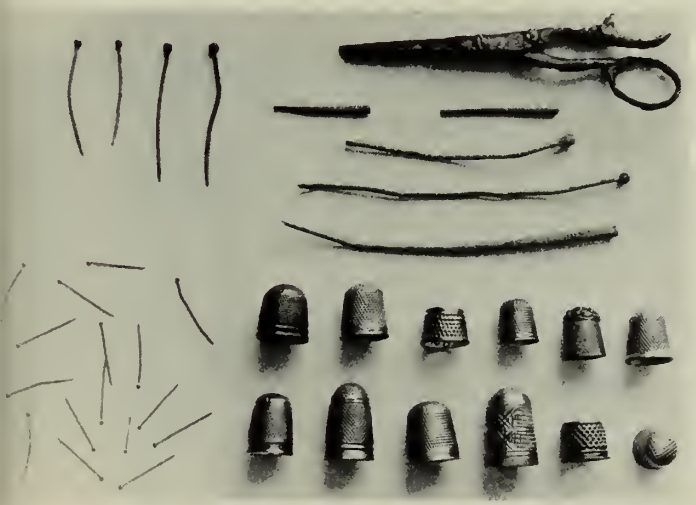
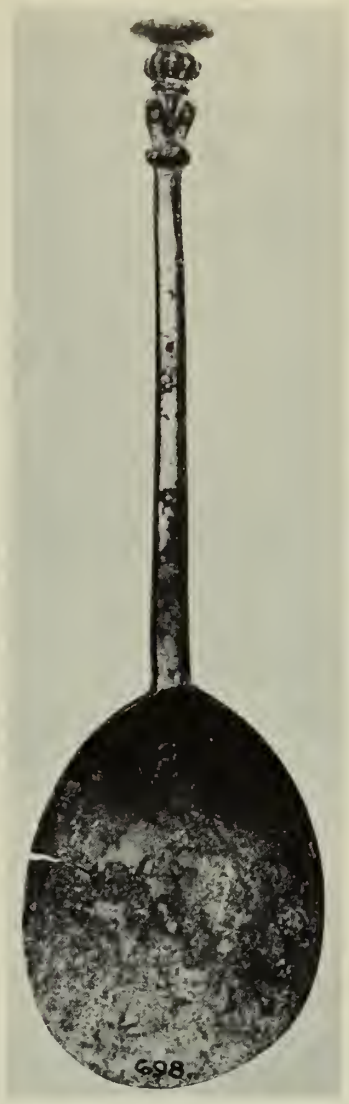


PLATE 87—*Metal Objects—Knives, Forks, and Spoons*

Seventeenth century knives, forks, and spoons from Jamestown excavations. The spoon on the left is a trifid type. The center spoon of silver (J-7053) has a slipped end on which the initials $\frac{WC}{E}$ appear; it was found near Structure 44 in the John Page tract. The spoon (J-7183) to the right, with a seal end was found near Structure 19 and Well 11. The first knife from left (J-6935) was found in the ice pit, Structure 128. The fork and knife handles are of bone.

A general sampling of pins, needles, thimbles, and a pair of scissors from the Jamestown artifact collection.





Latten spoon with seal handle (ca. 1600-1650). It was found near Structure 19 at a depth of 1 foot 1 inch, almost directly above Well 11. (Old cat. 698.)



This pewter spoon handle, unearthed at Jamestown, is the oldest dated piece of American pewter in existence. It was made by Joseph Copeland of Chuckatuck, Va., in 1675. Reconstruction at right approximate shape.

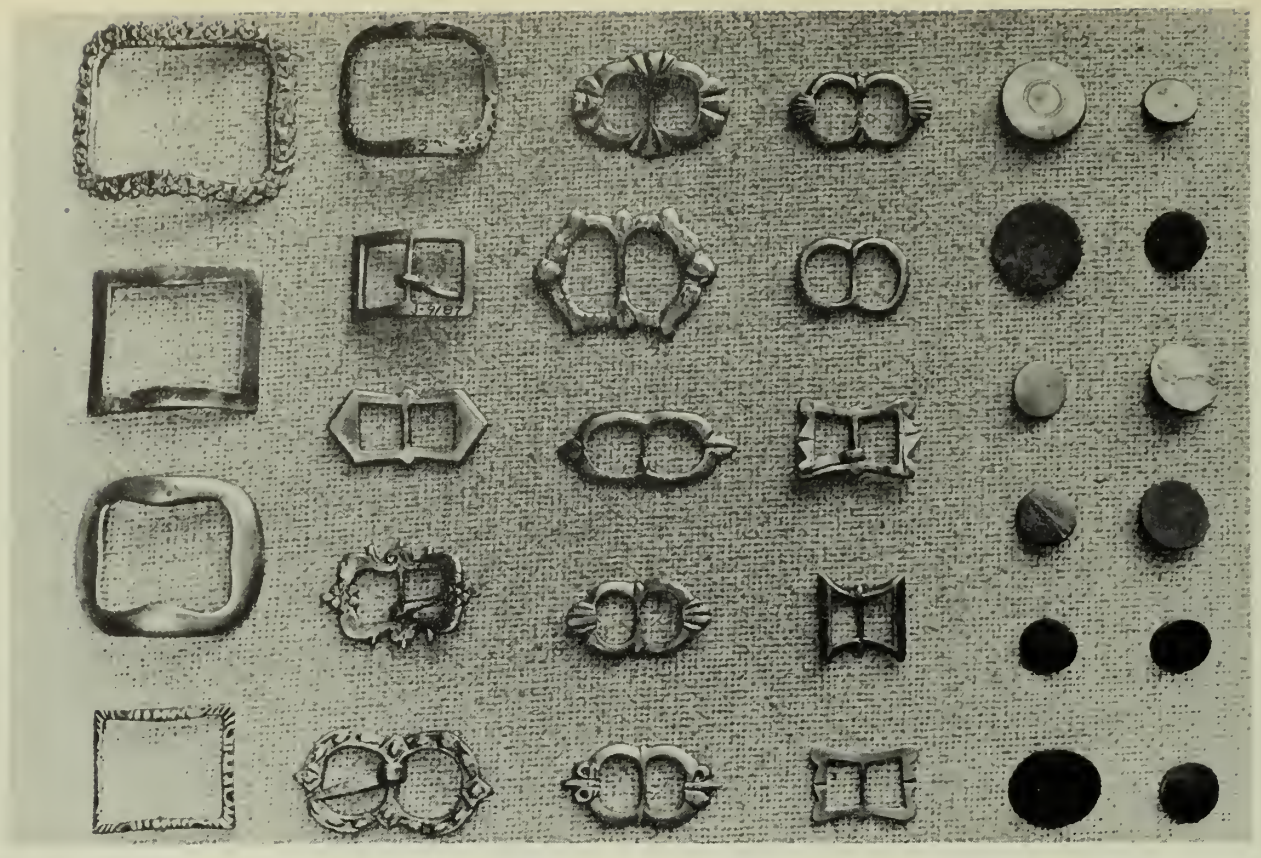


PLATE 88—*Metal Objects—Buckles and Buttons*

Upper.—A representative selection of buckles and buttons unearthed at Jamestown. Most are brass, with a few copper specimens included.

Lower.—Furniture hardware from Jamestown excavations: Drawer pulls, knobs, escutcheon plates, upholstering tacks, small locks, mostly brass.

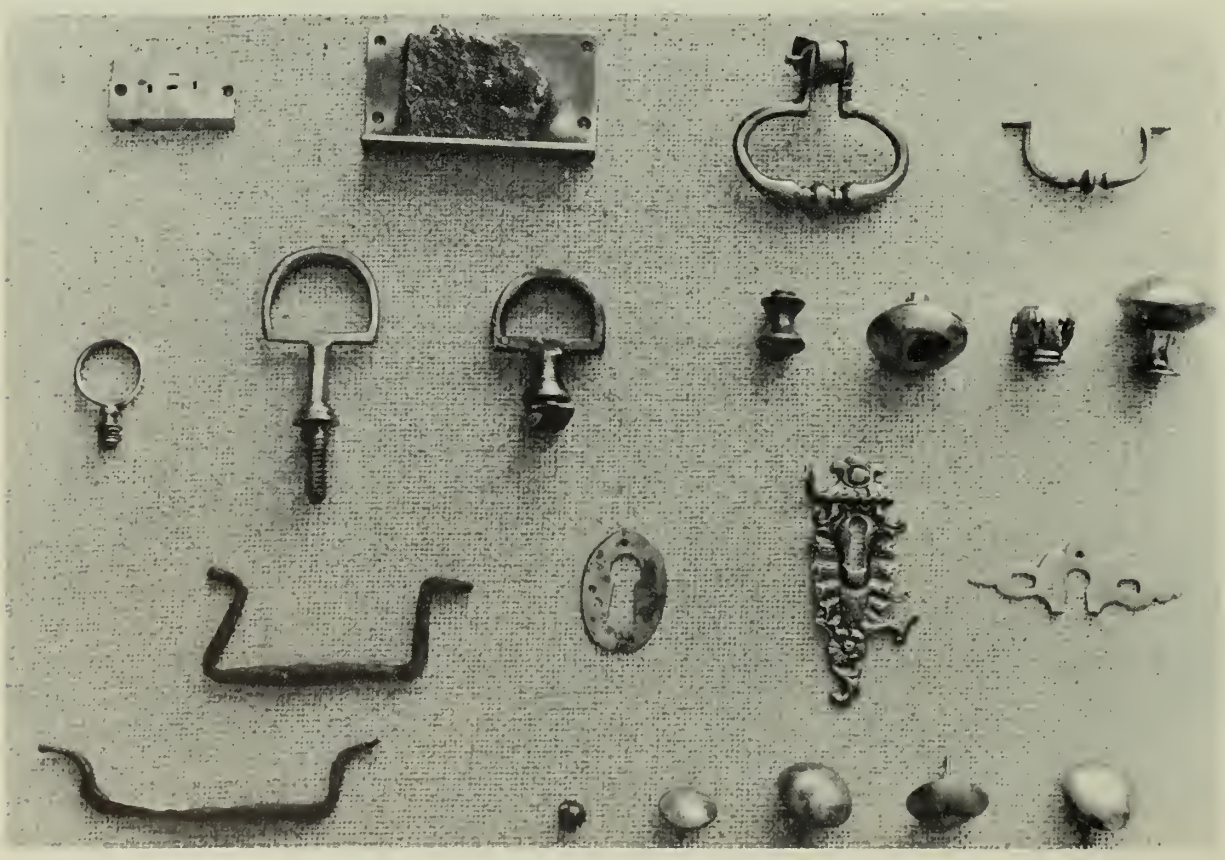
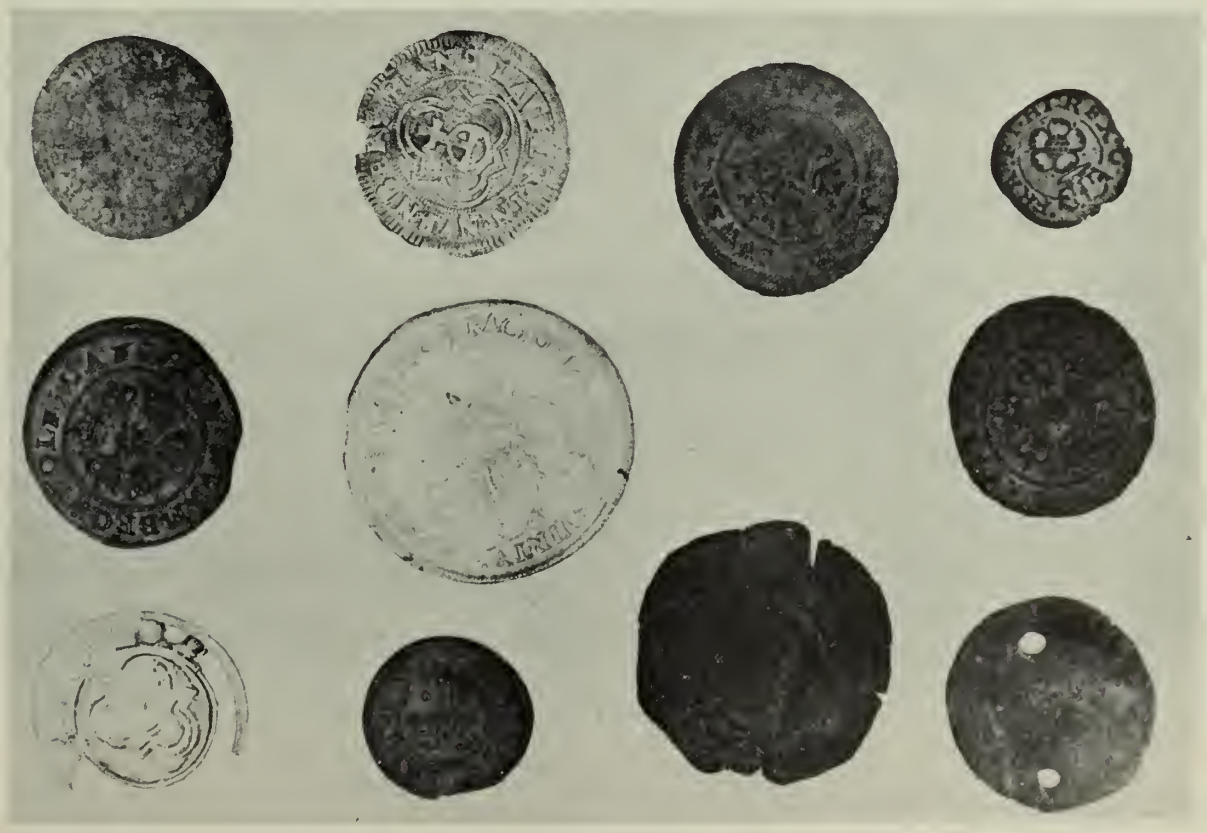




PLATE 89—*Miscellaneous Metal Objects*

Lead bale clips excavated at 17th-century sites. They were used for attaching to bales of woolen cloth. The numbers on the clips attested the quality and length of the cloth being shipped. The seal in the upper left-hand corner was found in the lime kiln, Structure 46, near Structure 21. The third seal from the left, top, was found in Structure 21.

Brass casting counters from Jamestown excavations. Used in Europe for making mathematical calculations, these counters served in America as Indian trade items.



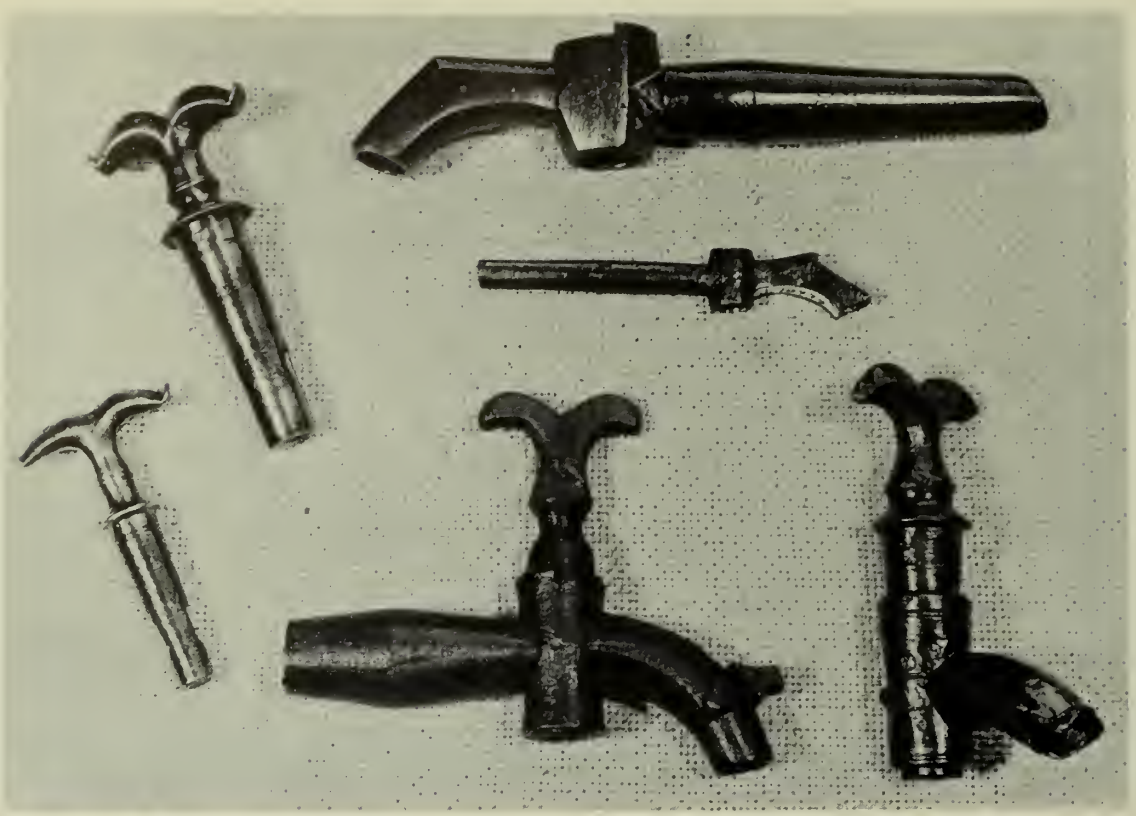






PLATE 90—*Miscellaneous Metal Objects—Brass Spigots and Cocks, A Lead Tobacco Pipe, and Pewter Flask Necks*

Brass spigots and cocks of the 17th century. Top spigot (J-10,477) from Lot A-38 in the vicinity of Structure 1; bottom spigot, left (J-7025), was found at Green Spring in the early 1920's according to the donor, Clyde E. Holmes of Williamsburg. Bottom spigot, right (J-10,483), is from the cellar of Structure 19A at a depth of 5 feet 8 inches. Cocks: Middle (J-10,479) is from Lot 95:108, near Road 3. Left top (J-10,482) is from 3 inches to 12 inches deep above Structure 34-37. Lower left (J-10,480) is from 6 inches to 7 inches deep above Structure 34-37.

> A unique lead tobacco pipe was found in the superficial fill above the foundation of Structure 19. It may be inferred that these pipes were not a success, since no others were found.

Flask necks of pewter, attached originally to pharmaceutical bottles. The threaded neck to the left was found 2 feet 3 inches to 3 feet deep near Structure 50. The cap in the middle was found in Ditch 5, 680 feet from Structure 50. The top and neck at the right were found in Structures 18 and 43, respectively, separated by 1,000 feet. The necks and caps fit interchangeably, thus indicating fixtures were of standard size.



PLATE 91—*Parts of Leather Shoe with a Wooden Heel*

Parts of a leather shoe with wooden heel (Cat. J-7187) were recovered from below the waterline of Well 21 (Lot 91:111) inside a wooden barrel at the bottom. The shoe, by association with dated artifacts in the well, represents the 1626-50 period.

Bibliography

(A large part of this bibliography was furnished by J. Paul Hudson, museum curator, Colonial National Historical Park, who is preparing a bibliography on 17th-century arts, crafts, and cultural objects for publication.)

Aitken, M. J.
1958. Archaeology Without Digging . . . The Proton Magnetometer, The Illustrated London News, October 4, pp. 560–561.

Arber, Edward
1910. Travels and Works of Captain John Smith, John Grant, Edinburgh.

Bailey, Worth
1936a. Report on the Identification of an Enamel Knife-Haft, Catalogue #874 in the Jamestown Archeological Collection.* 6 pp. ms. with illustrations.
1936b. A Report on Beads and Other Glass Fragments Reputed to Have Been Made at Jamestown: Based on the Collection of the Pennsylvania Museum of Art, 7 pp. ms. report* with illustrations.
1936c. A Report on Ceramic Fragments Excavated at Jamestown (Lots B–74, 75, 76 and 86), 65 pp. ms. with illustrations.*
1936d. A Report on Ceramic Fragments Excavated at Jamestown, 38 pp. ms. with illustrations.*
1936e. Report on the Identification of Certain Jamestown Material Made by Thomas Sutton, Esq., 9 pp. ms. report.*
1937a. A Jamestown Baking Oven of the Seventeenth Century, William & Mary College Quarterly, Vol. 17, Series 2, No. 4, pp. 496–500.
1937b. Concerning Jamestown Pottery—Past and Present, Ceramic Age, October, pp. 101–104.
1938a. Lime Preparation at Jamestown in the Seventeenth Century, William and Mary College Quarterly, Series 2, Vol. 18, No. 1, pp. 1–12.
1938b. Joseph Copeland, 17th-Century Pewterer, The Magazine Antiques, April, pp. 188–190.
1938c. Notes on the Use of Pewter in Virginia During the Seventeenth Century, William and Mary College Quarterly, Series 2, Vol. 18, No. 2, pp. 227–241.

Barber, Edwin Atlee
1907. Salt Glazed Stoneware, Germany, Flanders, England and the United States, Doubleday, New York.

Barnes, Frank
1955. Tobacco Cultivation in Seventeenth Century Jamestown and Virginia (with particular reference to the years before 1650), ms. report.*

Bentzen, Conrad B.
1941. Progress Report on Archeological Field Work, Jamestown Island, 1940, a 14–page ms. report*, dated February 3, 1941, illustrated with maps and photographs.
1942. An Inexpensive Method of Recovering Skeletal Material for Museum Display, American Antiquity, VIII, No. 2, pp. 176–178.

Blanton, Wyndham B.
1930. Medicine in Virginia in the Seventeenth Century, The William Byrd Press, Richmond.

Bolitho, Hector
1957 The Glasshouse, Jamestown, Virginia, Privately printed by Jamestown Glasshouse Foundation, Virginia.

Brown, Alexander
1898. The First Republic in America, Houghton, Mifflin and Co., Boston and New York.

Bruce, Philip A.
1895. Economic History of Virginia in the Seventeenth Century. 2 Vols., Macmillan & Co., New York.

Brydon, George MacLaren
1957. Religious Life of Virginia in the Seventeenth Century, Virginia 350th Anniversary Celebration Corporation, Garrett and Massie, Inc., Richmond, Va.

Caywood, Louis R.
1955. Green Spring Plantation Archeological Report: Excavations at Green Spring Plantation, a 29-page multilithed report with 6 maps and 17 plates showing excavated artifacts, U. S. Department of the Interior, National Park Service, Yorktown, Va.
1957. Green Spring Plantation, The Virginia Magazine of History and Biography, Virginia Historical Society, Richmond, Vol. 65, No. 1, January, pp. 67–83.

Chandler, Joseph E.
1916. The Colonial House, Robert M. McBride & Co., New York.

Cope, E. D.
1897. Physical Characters of the Skeletons Found in the Indian Ossuary on the Choptank Estuary, Maryland. In: H. C. Mercer, Researches upon the antiquity of Man, University of Pennsylvania Series in Philology, Literature, and Archaeology, Philadelphia, Pa., Vol. VI, pp. 98–105.

Cotter, John L.
1957a. Jamestown: Treasure in the Earth, The Magazine Antiques, Vol. LXXI, No. 1, pp. 44–46.
1957b. Excavations at Jamestown, Virginia, Site of the First Permanent English Settlement in America, Antiquity, March, No. 121, pp. 19–24.

Cotter, John L. and Edward B. Jelks
1957c. Historic Site Archaeology at Jamestown, American Antiquity, Vol. XXII, No. 4, part 1, pp. 387–389.

Cotter, John L.
1957d. Rediscovering Jamestown, Archaeology, Vol. 10, No. 1, pp. 25–30.

* In the National Park Service files at Colonial National Historical Park, Virginia.

Cotter, John L. and J. Paul Hudson
1957e. New Discoveries at Jamestown, National Park Service, U. S. Department of the Interior, Government Printing Office, Washington, D. C.

Day, H. Summerfield
1935. Preliminary Archaeological Report on Excavations at Jamestown, Virginia, a 29-page ms. report*, with 27 photographs, and 14 plates.

Eberlein, Harold Donaldson and Roger Wearne Ramsdell
1925. The Practical Book of Chinaware, J. B. Lippincott Company, Philadelphia and London.

Evans, Clifford
1955. A Ceramic Study of Virginia Archaeology, Smithsonian Institution, Bureau of American Ethnology, Bulletin No. 160, U. S. Government Printing Office, Washington, D. C., 195 pp.

Force, Peter, Editor
1836–46. Tracts and Other Papers Relating to the Origin, Settlement, and Progress of the Colonies of North America, 4 Vols., Printed by P. Force, Washington.

Forman, Henry Chandlee
1935a. Structure 17, Report with Photographs and Drawings on the Architectural Remains, Unit B, Sub-Units 89 & 97, Jamestown Island, James City County, Virginia, a 26-page report*, illustrated with maps and 60 photographs, dated May 4, 1935.
1935b. The Narrative and Descriptive Report, Illustrated, Architectural Remains, Unit B, Sub-Units 59 & 73 (Structure 26), Jamestown Island, Virginia, a 26-page ms. report* with maps and photographs, dated June 29, 1935.
1935c. The Narrative and Descriptive Report, Illustrated, Architectural Remains Unit B, Sub-Unit 62 (Structure 6), Jamestown Island, Colonial National Monument, Virginia, a 31-page ms. report*, illustrated with map and photographs.
1938. Jamestown and St. Mary's, Buried Cities of Romance, Johns Hopkins Press, Baltimore, Md.
1940. The Bygone "Subberbs of James Cittie," The William & Mary College Quarterly, Vol. 20, Series 2, No. 4, pp. 475–486.
1941. The Old Hardware of James Town, The Magazine Antiques, Vol. XXXIX, No. 1, January, pp. 30–32.
1948. Architecture of the Old South, Harvard University Press, Cambridge, Mass.
1957. Virginia Architecture in the Seventeenth Century, Virginia 350th Anniversary Celebration Corporation, Garrett and Massie, Richmond, Va.

Garvan, Anthony N. B.
1951. Architecture and Town Planning in Colonial Connecticut, Yale University Press, New Haven, Conn.

Glenn, Keith
1944. Captain John Smith and the Indians, Virginia Magazine of History and Biography, Vol. 52, No. 4, pp. 228–248.

Gregory, George C.
1935. Jamestown First Brick State House, Virginia Magazine of History and Biography, Vol. XLIII, No. 3, pp. 193–199.

Gustkey, Carl
1953. Sir Francis Wyatt's Horse, the National Horseman, Imperial Glass Company, Bellaire, Ohio.

Hack, John T.
1957. Origin of Jamestown Island, a 3-page ms. report* furnished by courtesy of the U. S. Geological Survey.

Hallowell, A. Irving
1957. The Impact of the American Indian on American Culture, American Anthropologist, April, Vol. 59, No. 2, pp. 201–216.

Hamor, Raphe
1615. A True Discourse of the Present Estate of Virginia, 200 copies privately printed for William Welby, London.

Hariot, Thomas
1951. A Brief and True Report of the New Found Land of Virginia, A Facsimile Edition of the 1588 Edition, The History Book Club, Inc., New York.

Harrington, J. C.
1938a. Summary of Documentary Data on the William May-Henry Hartwell Property Preparatory to its Excavation, a 21 pp. ms. report*, with plans and illustrations.
1938b. Progress Report, Archaeological Field Work, 1938 Season, a 5-page ms. report*, dated December 1, 1938, with maps and photographs.
1940a. Archeological Report: May-Hartwell Site, Jamestown, a 141 pp. ms. report*, with maps and illustrations.
1940b. Field and Laboratory Guide for Recording Archeological Data, Lithoprinted. National Park Service, Colonial National Historical Park, Va.
1940c. Partnership at Jamestown: Archeology and History Work Hand in Hand, The Regional Review, National Park Service, Vol. V, Nos. 2 & 3, pp. 2–6.
1941a. Archeological Report, Exploratory Excavations in Unit A, Jamestown Island, Virginia, a 48-page ms. report*, dated March 20, 1941, with maps and photographs.
1941b. The Elay-Swann Tract, Jamestown Island, Virginia, a ms. report*, dated May 15, 1941, illustrated with maps and photographs.
1942a. Progress Report on the 1941 Excavations in the A. P. V. A. Grounds, Jamestown Island, Virginia, a ms. report*.
1942b. Progress Report on the 1941 Excavations in the Grounds of The Association for the Preservation of Virginia Antiquities, Jamestown Island, a 15-page ms. report*, with maps and photographs.
1943. Historic Site Archaeology in the United States, Eastern United States Archaeology. University of Chicago Press, Chicago, Ill.
1946. Interpreting Jamestown to the Visitor, The Museum News, Vol. 24, No. 11, pp. 7 and 8.
1950. Seventeenth Century Brickmaking and Tilemaking at Jamestown, Virginia, The Virginia Magazine of History and Biography, Vol. 58, No. 1, pp. 16–39.
1951a. Some Delft Tiles Found at Jamestown, The Magazine Antiques, Vol. LIX, No. 1, pp. 36–37.
1951b. Tobacco Pipes from Jamestown, Quarterly Bulletin, Archeological Society of Virginia, Vol. 5, No. 4; p. 2–8, illustrated.
1952. Glassmaking at Jamestown, The Dietz Press, Richmond, Va., 48 pp.
1954. Dating Stem Fragments of Seventeenth and Eighteenth Century Clay Tobacco Pipes, Quarterly Bulletin, Archeological Society of Virginia, September, Vol. 9, No. 1, pp. 10–14.
1957. The Tools of America's First Glass Blowers, The Chronicle of the Early American Industries Association, Inc., Vol. X, No. 1, pp. 4, 5, 6, and 11.

* In the National Park Service files at Colonial National Historical Park, Virginia.

Hatch, Charles E., Jr.
1939. A Preliminary Historical Study, Unit A, Northwestern End of Jamestown Island in Colonial National Historical Park, a 98-page typewritten report*, dated September 14, 1939, with maps and photographs.
1940a. A Preliminary Historical Study of the Wyatt Tract of 1641 (Including a Grant to Richard Kemp in 1638) on Jamestown Island in Colonial National Historical Park, a 125-page ms. report*, dated June 7, 1940, with maps and photographs.
1940b. A Preliminary Historical Study of Glass House Point (With Special Emphasis on the First Attempts at Glassmaking in Virginia, a 119-page ms. report*, dated December 4, 1940, with maps and photographs.
1941a. Glassmaking in Virginia, 1607–1625, The William and Mary College Quarterly, Vol. 21, Series 2, No. 2, pp. 119–138 and No. 3, pp. 227–238.
1941b. Preliminary Historical Study of the Lawrence and Beverley Tracts, Jamestown Island, a ms. report*, dated August 15, 1941, with maps and photographs.
1942a. Jamestown and the Revolution, William and Mary College Quarterly, Vol. 22, Series 2, No. 1, pp. 30–38.
1942b. Robert Sully at Jamestown, 1854, William and Mary College Quarterly, Vol. 22, Series 2, No. 4, pp. 343–352.
1945. The "Affair Near James Island" (or, "The Battle of Green Spring"), Virginia Magazine of History and Biography, Vol. 53, Series 2, No. 3, pp. 172–196.
1949a. The Great Road: Earliest Highway Used and Developed by the English at Jamestown, Virginia Magazine of History and Biography, Vol. 57, Series 2, No. 1, pp. 14–21.
1949b. A Suggested Interpretive Development Plan for Jamestown, a 65 pp. ms.*
1951. Selected References to Support the "Sketch Plan of the First Fort Built by the English at Jamestown." Drawing No. NMP-COL 10,702*, a 31 pp. ms., with plan.
1953. A Summary of Documentary Information About James Fort (1607–1610), A 12 pp. ms. Report* with illustration.
1954. Summary of Data Relating to "Neck-of-Land Neare James City," a ms. report*, dated October 28, 1954.

Hatch, Charles E., Jr.
1956. America's Oldest Legislative Assembly and its Jamestown Statehouses, National Park Service Interpretive Series History No. 2, Revised, 1956, Government Printing Office, Washington, D. C.
1957a. Mulberry Trees and Silkworms, Virginia Magazine of History and Biography, Virginia Historical Society, Richmond, Va., January, Vol. 65, No. 1, pp. 3–61.
1957b. Jamestown, Virginia: The Townsite and Its Story, National Park Service Historical Handbook Series No. 2, Government Printing Office, Washington, D. C.
1957c. First Seventeen Years: Virginia, 1607–1624, Virginia 350th Anniversary Celebration Corporation, Garrett and Massie, Inc., Richmond, Va.

Hening, William Waller
1823. Statutes at Large, R. & W. and G. Bartow, New York.

Hrdlicka, A.
1916. Physical Anthropology of the Lenape or Delawares, and of the Eastern Indians in General, Bureau of American Ethnology, Bulletin 62, Washington, D. C.
1927. Catalogue of Human Crania in the United States, National Museum Collections, Proceedings United States National Museum, Vol. 69, pp. 24–27.

Hudson, J. Paul
1955a. Exhibit Plan for Pottery-Making Demonstration Area at Jamestown, Virginia, a ms. report*, dated August 11, 1955.
1955b. Proposed Field Exhibit on Lumbering at Jamestown During the Seventeenth Century, a ms. report*, dated August 19, 1955.
1955c. Preliminary Plan for Field Exhibit on Boatbuilding at Jamestown During the Seventeenth Century, a ms. report*, dated August 31, 1955.
1955d. Proposed Field Exhibit on a Jamestown Ice House, A ms. report*, dated September 26, 1955.
1955e. Proposed Field Exhibit for Jamestown Island Relating to a Vineyard and the Making of Wine, a ms. report*, dated October, 1955.
1955f. Making Casks at Jamestown During the Seventeenth Century, a ms. report*, dated October 27, 1955.
1955g. Field Exhibit for Jamestown Relating to an Early Seventeenth Century Tobacco Field and Tobacco Barn, a ms. report*, dated November, 1955.
1955h. Field Exhibit Relating to the Interior Furnishings of an Early Jamestown Home, a ms. report*, dated December, 1955.
1956a. Potash and Soap Ashes—Early Jamestown Commodities, a ms. report*, dated July, 1956.
1956b. The Use of Herbs and Medicinal Plants at Jamestown, Virginia During the Seventeenth Century, a ms. report*, dated November, 1956.
1956c. The Story of Iron at Jamestown, Virginia—Where Iron Objects Were Wrought by Englishmen Almost 350 Years Ago, The Iron Worker, Vol. XX, No. 3, Summer Issue, pp. 2–14.

Hudson, J. Paul and C. Malcolm Watkins
1957a. The Earliest Known English Colonial Pottery in America, Antiques, Vol. LXXI, No. 1, pp. 51–54.

Hudson, J. Paul
1957b. Jamestown Artisans and Craftsmen, Antiques, Vol. LXXI, No. 1, pp. 47–50.
1957c. A Pictorial Booklet on Early Jamestown Commodities and Industries, Virginia 350th Anniversary Celebration Corporation, Garrett and Massie, Inc., Richmond, Va.
1957d. Recent Discoveries at Jamestown, Virginia, The Connoisseur, National Magazine Company, Ltd., London, pp. 133–138.

Hughes, Thomas P.
1957. Medicine in Virginia, 1607–1699, Virginia 350th Anniversary Celebration Corporation, Garrett and Massie, Inc., Richmond, Va.

Hume, Ivor Noel
1957. A Seventeenth Century Virginian's Seal: Detective Story in Glass, Antiques, Vol. LXXII, No. 3, pp. 244–245.

Jones, T. Russell (HABS drawing)**
1958a. VA 470, Architectural Remains, Project 194, (Structure 115), 3 sheets, Library of Congress, Washington, D. C.
1958b. VA 471, Architectural Remains, Project 194, (Structure 117), 1 sheet, Library of Congress, Washington, D. C.
1958c. VA 472, Architectural Remains, Project 103, (Structure 123), 1 sheet, Library of Congress, Washington, D. C.
1958d. VA 473, Architectural Remains, Project 103, (Structure 125), 1 sheet, Library of Congress, Washington, D. C.

* In the National Park Service files at Colonial National Historical Park, Virginia.
** Historic American Buildings Survey drawings illustrated in this book, as well as those cited but not shown, are available for purchase from the Library of Congress, Washington, D. C.

Land, Robert H.
1939. Notes from Surry County Records Which Relate to Seventeenth Century Houses, William & Mary Quarterly, Vol. 19, Series 2, No. 2, pp. 227–229.

Mason, George C.
1945. Colonial Churches of Tidewater, Virginia, Whittet and Shepperson, Richmond, Va.

Mayer, Joseph R.
1939. Early Virginia Gunlocks, Rochester Museum of Arts and Sciences, Occasional Papers and Reprints, Reprinted from American Collector, June, 1939.

McCary, Ben Clyde
1957. Indians in Seventeenth-Century Virginia, Virginia 350th Anniversary Historical Booklet No. 18, 93 pp. with Bibliography, Garrett and Massie, Inc., Richmond, Va.

McIlwaine, H. R., Editor
1914. Journals of the House of Burgesses of Virginia, 1659/60–1693, Library Board, Virginia State Library, Richmond, Va.
1918. Legislative Journals of the Council of Colonial Virginia, Library Board, Virginia State Library, Richmond, Va.

Meade, William
1857. Old Churches, Ministers, and Families in Virginia, 2 Vols., J. B. Lippincott and Company, Philadelphia, Pa.

Mook, Maurice A.
1943a. The Anthropological Position of the Indian Tribes of Tidewater Virginia, William and Mary College Quarterly, Vol. 23, Series 2, No. 1, pp. 27–40.
1943b. Virginia Ethnology from an Early Relation, William and Mary College Quarterly, Vol. 23, Series 2, No. 2, pp. 101–129.
1943c. The Ethnological Significance of Tindall's Map of Virginia, 1608, William and Mary College Quarterly, Vol. 23, Series 2, No. 4, pp. 371–408.
1944a. Algonkian Ethnohistory of the Carolina Sound, Journal of the Washington Academy of Sciences, Vol. 34, pp. 181–197 and 213–228.
1944b. The Aboriginal Population of Tidewater Virginia, American Anthropologist, Vol. 46, No. 2, Part 1, pp. 193–208.

Morey, George W.
1954. The Properties of Glass, American Chemical Society Monograph Series, Reinhold Publishing Corporation, New York.

Morris, M. J. R.
1954. Examination of Three Brass Pins of 17th Century Manufacture from Jamestown, Virginia, Republic Steel Corporation metallurgical examination No. 7435, a ms. report*, dated February, 1954.

Moxon, Joseph
1703. Mechanick Exercises, or the Doctrine of Handy-Works, Printed for D. Midwinter and T. Leigh, London.

Munger, Martha Perrine
1929. James Towne, 1607–1698, Matrix of the United States, Americana Illustrated, The American Historical Society, Inc., Vol. XXIII, No. 3, pp. 265–275.

Neumann, Georg K.
1942. American Indian Crania with Low Vaults, Human Biology, Vol. 14, No. 2, pp. 178–191.

Oswald, Adrian
1955. The Evolution and Chronology of English Clay Tobacco Pipes, The Archaeological News Letter, London, Vol. 5, No. 12, pp. 243–250.

Parris, Fred P. and John T. Zaharov (HABS drawing)**
1934. VA 26, Foundations, Unit A, Subunit 39, (Structure 1), 10 sheets, Library of Congress, Washington, D. C.

Parris, Fred P. (HABS drawing)**
1935a. VA 25, Architectural Remains, Unit B, Subunits 89 and 97, (Structure 17), 12 sheets, Library of Congress, Washington, D. C.

Parris, Fred P. and Paul S. Dulaney (HABS drawing)**
1935b. VA 27, Architectural Remains, Unit B, Subunits 59 and 73, (Structure 26), 3 sheets, Library of Congress, Washington, D. C.

Parris, Fred P. (HABS drawing)**
1935c. VA 28, Architectural Remains, Unit B, Subunit 62, (Structure 6), 4 sheets, Library of Congress, Washington, D. C.
1936. VA 30, Architectural Remains, Unit B, Subunit 76, (Structure 16), 7 sheets, Library of Congress, Washington, D. C.

Peterson, Charles E.
1936. Some Recent Discoveries at Jamestown, The Magazine Antiques, Vol. XXIX, No. 5, pp. 192–194.

Peterson, Harold L.
1949. New Evidence on Colonial Firearms from Jamestown Excavations, The Gun Collector, No. 28, June, pp. 313–316.
1951. Firearms of the Early American Colonists, The American Rifleman, January, pp. 22–26.
1956. Arms and Armor in Colonial America, 1526–1783, Stackpole, Harrisburg, Pennsylvania.

Rackham, Bernard
1948. Medieval English Pottery, Faber, London.

Riley, Edward M. and Charles E. Hatch, Jr., Editors
1955. James Towne: In the Words of Contemporaries, National Park Service Source Book No. 5, Government Printing Office, Washington, D. C.

Rolfe, John
1951. A True Relation of the State of Virginia Left by Sir Thomas Dale Knight in May Last 1616, Yale University Press, New Haven, Conn.

Ruggles-Brise, Sheelah
1949. Sealed Bottles, Country Life Ltd., London, Charles Scribner's Sons, New York, pp. 161–171.

Scribner, Robert L.
1957. Digging into Jamestown's Past, Virginia Cavalcade, Vol. VII, Summer issue, No. 1, pp. 40–47.

Shiner, Joel L.
1955. Final Report, Archeological Explorations in the Confederate Fort Area in the APVA Grounds (Jamestown National Historic Site), Park Research Project No. 100, a ms. report*, dated June 1955, with maps and photographs.
1957. Early Cemetery on "Third Ridge" at Jamestown, The Virginia Magazine of History and Biography, Virginia Historical Society, Richmond, Va., April, Vol. 65, No. 2, pp. 150–153.

Simmons, Thomas Burke (HABS drawing)**
1955a. VA 444, Architectural Remains, Project 194, (Structure 110), 3 sheets, Library of Congress, Washington, D. C.
1955b. VA 445, Architectural Remains, Project 194, (Structure 112), 3 sheets, Library of Congress, Washington, D. C.

Smith, John
1884. Works. Edited by Edward Arber, 2 Vols., Birmingham, Ala.

* In the National Park Service files at Colonial National Historical Park, Virginia.

** Historic American Buildings Survey drawings illustrated in this book, as well as those cited but not shown, are available for purchase from the Library of Congress, Washington, D. C.

Speck, Frank G.
1924. The Ethnic Position of the Southeastern Algonkian, American Anthropologist, Vol. 26, pp. 184–200.
1925. The Rappahannock Indians of Virginia, Indian Notes and Monographs, Museum of the American Indian, Heye Foundation, New York, pp. 25–83.
1928. Chapters on the Ethnology of the Powhatan Tribes of Virginia, Indian Notes and Monographs, Vol. I, No. 5, Museum of the American Indian, Heye Foundation, New York.
1938. Siouan Tribes of the Carolinas as Known from Catawba, Tutelo, and Documentary Sources, American Anthropologist, Vol. 37, pp. 201–225.

Stern, Theodore
1952. Chickahominy: The Changing Culture of a Virginia Indian Community, Proceedings, American Philosophical Society, Vol. 96, pp. 157–225.

Stewart, T. D., and W. R. Wedel
1937. The findings of two ossuaries on the site of the Indian village of Nacotchtanke (Anacostia), Journal Washington Academy of Science, Vol. 27, No. 5, pp. 213–219.

Stewart, T. D.
1940a. The Finding of an Indian Ossuary on the York River in Virginia, Journal Washington Academy of Science, Vol. 30, No. 8, pp. 356–364.
1940b. A report on the Skeletal remains. In: A. L. L. Ferguson, An Ossuary near Piscataway Creek, American Antiquity, Vol. 6, No. 1, pp. 13–18.
1954. A Method for Analyzing and Reproducing Pipe Decorations, Quarterly Bulletin, Archeological Society of Virginia, Vol. 9, No. 1, September, pp. 2–9.

Strachey, William
1953. The Historie of Travaile into Virginia Britania (1612), Edited by Louise B. Wright and Virginia Freund, Hakluyt Society, London.

Tyler, Lyon G.
1906. The Cradle of the Republic, Jamestown and James River, The Hermitage Press, Richmond, Va.

Waterman, Thomas Tileston and John A. Barrows
1932. Domestic Colonial Architecture of Tidewater Virginia, Scribner, New York.

Woo, T. L. and G. M. Morant
1934. A Biometric Study of the "Flatness" of the Facial Skeleton in Man, Biometrika, Vol. 26, parts I and II, pp. 196–250.

Yonge, Samuel H.
1903. The Site of Old Jamestown, Copyright 1930 by Association for the Preservation of Virginia Antiquities, Richmond, Va.

Zaharov, John T.
1935. Report, the Foundation in Unit A, Sub-Unit 29, Jamestown Island, James City County, Virginia, a 16-page ms. report*, dated February 27, 1935, illustrated with 23 photographs.

No Author
1956. Colonial America's Beginnings Revealed in Jamestown Excavations, The Illustrated London News, August 25, p. 307.

No Author
1957. Symposium on Colonial Medicine in commemoration of the 350th anniversary of the settlement of Virginia, The Medical College of Virginia Foundation and The American Association of the History of Medicine, The Jamestown-Williamsburg-Yorktown Celebration Commission and The Virginia 350th Anniversary Commission, Williamsburg, Reprinted from the Bulletin of the History of Medicine, Vol. XXXI, No. 5, September-October.

* In the National Park Service files at Colonial National Historical Park, Virginia.

APPENDIX A

Ceramics from Jamestown

BY EDWARD B. JELKS

Recently a specialist in prehistoric American archeology wrote to Colonial National Historical Park at Jamestown to ask for identification of some "post-aboriginal chinaware" from an east-coast site. We knew what he meant, but the request (perhaps consciously) was amusing since it is comparable to a person's sending a collection of gun parts—from matchlocks, flintlocks, wheel locks, and other varieties—to an arms specialist with the request that he identify these "post-aboriginal Winchesters." It is common for American archeologists who are concerned primarily with Indian cultures to use such terms as chinaware and crockery more or less indiscriminately in referring to ceramics of European origin. The fact is that archeologists who encounter an historic horizon are urgently in need of a basic terminology and elementary definition of types to describe colonial-period ceramics.

Since 1934 archeological explorations at Jamestown, Virginia, site of the first permanent English colony in America, have produced a wealth of 17th-century ceramics. Nearby Green Spring Plantation, home of Governor Berkeley and a prototype of the southern plantations, has bridged the gap between the 17th and 18th centuries, and Colonial Williamsburg has amassed a good collection of 18th-century ceramics. The National Park Service and Colonial Williamsburg are, therefore, in a position to identify most British colonial ceramic specimens, insofar as they are locally represented.

In view of the need for a printed checklist of essential wares and types for reference by archeologists in the field, the following data are offered. We are indebted to C. Malcolm Watkins, associate curator of Cultural History, Smithsonian Institution, for checking definitions and supplying, in advance of publication of his detailed descriptions of 17th-century colonial pottery types, certain information from that work. The constant consultation and aid furnished by J. Paul Hudson, curator of the Jamestown collection for the National Park Service, during all stages of excavations and laboratory study, together with his detailed knowledge of 17th-century arts and crafts, were also invaluable.

GENERAL INTRODUCTION

All clays are composed of alumina (Al_2O_3), silica (SiO_2), and water (H_2O), and all unrefined clays also contain various other substances which can be classified as impurities. When clays are mixed with water they become plastic and can be manipulated into any desired shape. If an object made of wet clay is dried and heated to the proper temperature, the clay loses its plasticity and becomes rigid. It will then remain in a rigid state unless sufficient force is directed against it to cause it to fracture. The art of shaping, decorating, and firing clay objects is called ceramics, a term which applies also to the objects themselves.

Here, in very simple terms, is what happens in the manufacture of a ceramic object:

1. Clay is mixed with water and thoroughly blended to form a plastic mass.

2. The plastic mixture is shaped to the desired form.

3. Most of the added water is allowed to evaporate at more or less normal temperatures.

4. The dried clay object is heated in a kiln where the following sequence of processes takes place:

a. Any remaining free water in the clay is driven off.

b. The water which was in combination with the silica and alumina in the clay is driven off by the heat.

c. Some of the substances in the clay melt and fuse together, while other substances remain unchanged. (The silica is the essential ingredient here, for it is the silica which melts and combines with any of several substances which can act as fluxes. The fluxes—soda, potash, lime, and magnesia are common ones—combine with the silica in the same chemical reaction by which glass is made).

d. When the object is cooled, the melted portion solidifies into a glassy matrix which binds together the unmelted particles so that the rigid form of the ceramic object is retained.

In effect, then, a ceramic object is composed of solid particles suspended in, or bonded together by, a matrix of glass (Morey, 1954, pp. 23–24). The distinctive physical characteristics which differentiate the pastes of various kinds of ceramics are functions of: (1) the physical properties of the unfused particles, (2) the physical properties of the fused matrix, and (3) the ratio of fused to unfused materials in each particular variety. (This ratio is determined not only by the composition of the clay but also by the intensity and duration of firing.) For example, the paste of a common flowerpot differs from a porcelain cup because: (1) the unfused particles in the pot are reddish and relatively large while those in the porcelain are minute and white, (2) the glassy matrix of the flowerpot is not as translucent as that of the porcelain, and (3) there is a much greater proportion of glassy matrix in the cup than in the pot.

Actually the physical and chemical reactions and changes that take place during the manufacture of ceramics are extremely complex. Some of the details are not yet completely understood, even by specialists. Since consideration of these technical details is not necessary for purposes of the present paper, they can be happily ignored here.

Various schemes for classifying European ceramics have been devised on such bases as paste characteristics, decoration, kinds of glazes or enamels, or, in some cases, a wide variety of ceramic objects may be grouped into one class because they were made by a particular manufacturer (e. g. Wedgwood) or because they were made in a particular locale (e. g. Staffordshire ware). None of the standard classifications known to the writer conforms to the concept of typology as commonly applied in American archeology.

The majority of the existing classifications recognize a difference between permeable and impermeable pastes. Ceramics of permeable paste are generally known collectively as *earthenware,* while the impermeable pastes are divided into two large groups, *stoneware* and *porcelain.*

Under the heading of earthenware are usually included "terra cotta;" "common redware" (the faience-delft-majolica group); "creamware;" "Whieldon ware;" various slipwares; "ironstone;" several kinds of "sgraffito" wares; edged wares; some of the varieties which are included in such broad classifications as Staffordshire or Wedgwood; and many other groupings.

Stoneware, one of the two large groups of impermeable pastes, generally has a harder paste than the earthenwares and is usually gray or light-brown in body color. It is exemplified by the modern German-style beer mugs and by the churns, crocks, and "little brown jugs" which were in common usage in American homes in the 18th, 19th, and early 20th centuries. Stoneware feels slick to the tongue in contrast to earthenware, which absorbs moisture and will usually stick to the tongue.

Porcelain, the other large division of the impermeable pastes, refers to that kind of white ceramics which originated in China, has kaolin as its chief unfused component, and is distinguished by a unique translucence which is easily discernible when a piece is held to the light. Porcelain is frequently called china or chinaware.

In addition to the paste, most European ceramics found in American sites have another important component, the glaze. As the name implies, a glaze is simply a coating of glass applied to the surface of the ceramic object. In the case of permeable vessels the glaze provides an impermeable veneer so that the vessel is better adapted as a container for liquids. When glaze is applied to stoneware or porcelain, on the other hand, it does not make the vessel watertight since both of these wares are impermeable already. But it does serve to enhance its appearance and to make for cleanliness.

Glazes are applied to ceramic objects by three basic methods: (1) by coating the object with ground glass before firing, (2) by coating the object with the unfused ingredients of glass prior to firing (for example, red oxide of lead, ground to a powder and mixed in water with sand or other silicious material, was frequently employed in England for this kind of glaze), or (3) by coating the object with a flux which combines with silica from the body of the clay object itself to form the glaze under the heat of firing. The most common fluxes used in the latter process (with special reference to the ceramics found at Jamestown) were sulfide of lead (PbS)—usually in the form of powdered galena—and sodium chloride (NaCl), or common table salt. The powdered lead sulfide was dusted on the clay body before it was put into the kiln, sometimes with the addition of copper salts which imparted a greenish cast to the otherwise amber lead glaze, or occasionally with manganese salts which rendered it black or brown-black and sometimes almost completely opaque.

The customary way of applying sodium chloride glaze is to bring the molded clay objects to a white heat, then to cast a quantity of salt through the kiln door directly onto the fire. The heat vaporizes the salt and the vapor sticks to the hot clay in a thin film which acts as a flux and combines with silica from the clay to form the transparent glaze. Salt glazes are clear and thin, but have an uneven pitted surface resembling the surface of an orange peel.

In ceramic terminology, a glaze containing additives or impurities which render it opaque is termed an *enamel.* Enamels occur in many colors as well as in black and white. Most of the painted decorations of European and Asiatic ceramics are enamels. The white background of delft and majolica pottery, for example, was made by adding tin oxide to the traditional transparent lead glaze, thereby converting it into a white, opaque enamel. Then designs were painted over the white background with colored enamels.

The physical characteristics by which the Jamestown ceramics are classified can be grouped under the headings of paste characteristics, glaze characteristics, decoration, and form. Paste and glaze characteristics have been discussed above. Before beginning a discussion of form and decoration, it might be advantageous to the reader to examine the following table

summarizing the preceding remarks about paste and glaze as they apply to Jamestown ceramics:

TABLE III.—*Paste and Glaze of Jamestown Ceramics*

Earthenware	(permeable, opaque, porous paste with small proportion of fused materials) A. Terra cotta[1] (unglazed earthenware) B. Glazed earthenware
Stoneware	(impermeable, opaque, "slick" paste with medium to large proportion of fused materials)
Porcelain	(impermeable, translucent, "slick" paste with large proportion of fused materials)

[1] According to many authorities terra cotta is classified as a separate division, distinct from earthenware—the criterion for differentiation being that earthenware is glazed while terra cotta is not. In colonial sites of Virginia, however, many of the terra cotta specimens are identical in paste, form, and decoration to glazed pieces from the same sites. From a typological point of view, therefore, it is believed that terra cotta should be classified as an unglazed earthenware and it is so designated here.

Form and Decoration. Forms of the 17th- and 18th-century ceramics found at Jamestown can be divided into three basic classifications: (1) those derived from medieval and other traditional European forms; (2) those originating in the Orient; and (3) miscellaneous forms representing a florescence with influences from Europe, Asia, and even classical Greece, or combinations of these. The latter group includes many of the elaborate and complex specimens prized by collectors.

Decoration can be classified in three groups corresponding exactly to the basic form classification, i.e., the European traditional, Asiatic, and florescent groups.

In broad historical perspective, the development of European ceramics up to early 18th century followed this pattern:

1. Terra cotta
2. Glazed earthenware
3. Stoneware
4. Porcelain (Introduction to Europe through trade with the Orient)
5. Porcelain (Western European attempts to duplicate Oriental porcelain)
6. New pastes, glazes, enamels, forms, and decorations (Creation of these came largely as an outgrowth of experimentation in the search for the porcelain formula)

The historical development of European ceramics is reflected in the basic typology of material found in American colonial sites. The range of form and decoration exhibited by each of the basic "wares" (earthenware, stoneware, and porcelain) is an expression of the paste characteristics. Or, put another way, the paste of any one particular ware has characteristics which make certain forms and decorative techniques especially adaptable, while the paste characteristics of another ware lend themselves naturally to other forms and decorative styles.

A typological evaluation of Jamestown ceramics in historic perspective, then, can be viewed advantageously in reference to the three basic ceramic "wares" which influenced 17th- and 18th-century European ceramic art. The three basic "wares" are: (1) the traditional utility earthenware which developed out of medieval European pottery; (2) stoneware, which originated in Europe by the beginning of the 16th century or earlier; (3) porcelain which originated in China during the early centuries of the Christian era—it was introduced into Europe in considerable quantity by the middle of the 17th century (Eberlein, 1925, pp. 38–39). It is interesting to note that these three wares not only provided direction and impetus to modern European and American ceramic art, but all three have themselves remained popular through the centuries and are still being manufactured in the traditional styles.

The utility earthenware of Jamestown is obviously a continuation of the medieval English utility earthenware (Rackham, 1948). It is usually glazed on one side with an amber lead glaze which frequently has a pale-greenish or yellowish cast, or sometimes a black or black-brown color which is almost opaque. The glaze was not applied evenly, as a rule, and there are usually glaze drip marks down the sides of the vessels. There are occasional terra cotta pieces which are entirely without glaze. Most vessels are thick-walled, and the common forms are large, shallow bowls and large, deep jars. Less frequent are small jars, cups, small bowls, pitchers, chafing dishes, candlesticks, funnels, and other utilitarian forms. Lids with a central knob are fairly common and were evidently made to fit the small and medium jars for the most part. There are loop handles on many of the jars, pitchers, and cups; pouring lips occur frequently on the pitchers and some of the jars. The paste color of the utility earthenware is generally a reddish hue in the salmon, pink, and brick-red range. It is the natural color of fired local clays without any added substances. No tempering agent is visible except in one variety which contains small to medium quartz gravels in considerable quantity.

Decoration of the utility earthenware was achieved by appliqueing, punctating, incising, and using colored slips. Most of the Jamestown utility earthenware vessels have a band consisting of 2, 3, or 4 shallow incised lines encircling the body at or just above the point of maximum diameter. Applique strips bearing thumb-tip punctates were applied to the rims of many of the large jars. The slip decorations may be just a few thin, wavy lines (usually green or white) around the rim of a shallow bowl, or the entire vessel may be covered with a slip of one color with designs traced thereon in slip material of a second color. Brown and white slips are most common in the latter technique, with the white slip serving as the background in most cases. Other slipped earthenware are: 1 with a marbled effect produced by making a swirled mixture of 2 or more colors (1 invariably white, the others, red, green, or brown), and *sgraffito* (Italian for scratched) decoration made by incising through an overall white slip so that a design of reddish body paste shows through the slip. All slipped varieties are glazed, and when amber lead glaze is used on utility

earthenware, the white slip material appears to be amber colored.

European stoneware is thought to have originated in Germany. In any event it had become a popular European ware by the early 16th century (Barber, 1907, p. 5). Because of its impermeability, stoneware is especially adapted to vessels intended for holding liquids. The traditional style of stoneware at Jamestown occurs in three basic forms: (1) a cylindrical mug with loop handle (the common German beer or ale mug); (2) jugs in varying sizes with small round base, bulging globular body, narrow cylindrical neck, loop handle (almost invariably), and a raised, molded effigy of a bearded man on the neck and shoulder; and (3) a small-to-medium-size jug with a wide, cylindrical neck, a small, round base, and a loop handle.

Decorations on the cylindrical mugs and wide-necked jugs include horizontal ridges and incised lines made on the wheel; various molded and incised floral and geometric designs; rarely scenic panels with human and animal figures, trees, etc. Design elements are usually painted with enamel (i. e. opaque glaze, colored by the addition of certain metal salts), blue, purple, and brown being the common colors. The "Bartmann" jugs with the bearded man sometimes have a raised, molded medallion on the body below the bearded face, or occasionally there are two such medallions on opposite sides of a jug. The surface usually has a mottled-brown appearance due to combining iron from the body paste with the salt glaze. The stoneware forms at Jamestown are invariably salt glazed, generally over the enamel.

Porcelain of the 17th and 18th centuries found at Jamestown came from the Orient except for a few late pieces which may possibly have been made in England or on the Continent. The common forms are teacups without handles, saucers, and small, deep bowls. They may either be solid white or painted with blue geometric or floral designs.

In the early years of the 17th century, an overwhelming demand for porcelain swept over Europe. Ever since explorers began to bring the first pieces from the East, Europe had been fascinated by the delicate, graceful chinaware, and the 17th century saw the development of intensive trading activities whereby tremendous quantities of porcelain were imported from China, Korea and Japan. European potters, anxious to tap the expanded market, began experimenting in hopes of learning the secret of porcelain manufacture. It was not until 1709 that the secret was discovered by a German, but the experiments which had been going on in the meantime gave rise to an efflorescence of European ceramic art. It found expression in many innovations in paste formulas and in the Oriental flavor of the new forms and decorations.

The first popular imitation of porcelain was the majolica-delft-faience pottery distinguished by Oriental designs painted on an opaque white enamel applied over a porous earthenware body. The use of enameled earthenware, particularly for building tiles, had been introduced into Europe by the Moors,

TABLE IV.—*Summary of 17th- and 18th-Century Ceramics by Cultural Traditions*

Cultural Tradition	Basic Wares	Varieties Present at Jamestown
Traditional European	Earthenware	Olla, unglazed (Italian) a. lead glazed gravel tempered b. unglazed Slipped, red paste a. marbled b. appliqued c. combed d. sgraffito
	Stoneware	Bartmann jug (German) Cylindrical mug (German) Globular jug with wide neck (German and English)
Oriental	Porcelain	Cups Saucers Small bowls
Combination of traits from European, Oriental, and Near Eastern traditions plus innovations (European florescence)	Earthenware	(French faience?) Delft (English & Dutch) Majolica (Hispanic & Portuguese) Whieldon Creamware Staffordshire Agate ware
	Stoneware	Salt glaze (English, white) Basalt (English, black)
	Porcelain	Soft paste porcelain (English and/or continental)

and the tin enameled majolica,[1] with Oriental form and decorative motif, resulted from a blend of the European and Asiatic traditions. Majolica pottery appeared in its incipient form during the late Middle Ages in the Western Mediterranean area. The same general kind of pottery was later produced in other European countries and some of the varieties became known as delft and faience rather than majolica.

While the tin-enameled pottery was an acceptable substitute, it was not true porcelain and, consequently, experiments aimed toward producing true porcelain continued. As a result of these activities it was learned that refinement of the clays and the addition of certain substances to the clay (calcined flint, bone, and feldspar are examples of such additives) improved the quality of the finished product. So a number of new varieties of ceramics were created and gained popularity. Most of the new varieties have paste of very light color and were fashioned into thin-walled vessels in imitation of porcelain. Many were made whiter by the use of a white slip under the

[1] The name Majolica is a corruption of Majorca, a Spanish Mediterranean island whose ships transported the Valencian manufactured "Majolica" to Italy.

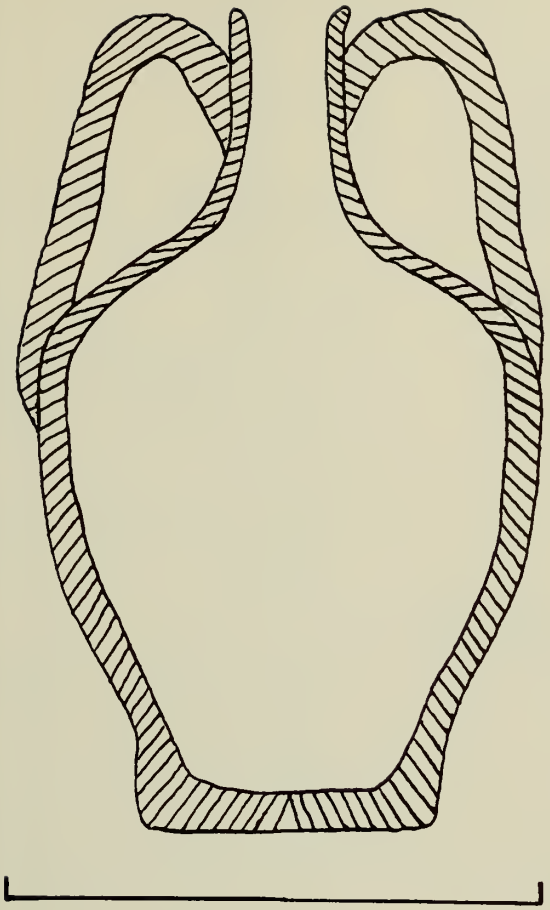


FIGURE 23—*Section of Two-handled Hispanic Jug*

Chemical analysis of the glaze from this variety showed a total absence of tin; therefore, it is doubtful that it should be classified technically as majolica.

glaze. The glaze, too, was improved and made perfectly transparent so that the white slip had more the appearance of porcelain that would have been the case if the old amber lead glaze had been used. These new ceramic varieties which were created in Europe and in general use by the third quarter of the 18th century are represented at Jamestown by such English products as Whieldon ware, creamware, Staffordshire earthenware, and salt glaze ware (a stoneware). These all represent various combinations of improved pastes containing various additives, improved glazes, and traditional European, Oriental, Near Eastern, and even classical Greek forms and decorative motifs. It was also during this period that a consciousness arose among Europeans that ceramics is an excellent medium for artistic expression, and ceramic pieces executed entirely as works of art appeared in significant quantities.

Table IV summarizes the present classification of 17th- and 18th-century ceramics found at Jamestown by the underlying cultural traditions, by the physical characteristics of the basic wares, and by the varieties of each which occur.

CHEMICAL ANALYSIS OF GLAZES ON A TYPE OF CERAMIC AMPHORA FOUND AT JAMESTOWN

A two-handled ceramic vessel, an amphora type, with a thin coating of cream-colored glaze is found consistently in 17th-century structures and other features at Jamestown. The form is Western Mediterranean in general aspect and is characterized by the 2 opposing handles running from just below the lip down to the shoulder; by a flattening of the trunk on 2 opposite sides; and by a painted star design in light-red which appears on the shoulder of some specimens. The star design consists of 8 arms of equal length radiating from a common center.

It was thought that this vessel type might belong to the general group of tin-glazed earthenware commonly designated majolica. However, the glaze is much thinner than in typical majolica and has a yellowish cast which is not characteristic of majolica. Since majolica, by definition, has a glaze containing tin oxide, it was decided to have a sample of the glaze analyzed chemically for tin content. Dr. Alfred Armstrong, professor of chemistry at the College of William and Mary, very kindly offered to make the desired chemical tests.

A sample of the questionable glaze was removed from sherds found at Jamestown and another sample of glaze from Jamestown delft (known to contain tin) was also collected as a control. Dr. Armstrong completed tests on both samples with the following results:

Sample 1 (suspected majolica)	*Sample 2* (delft)
Strong positive chemical indication of lead	Strong positive chemical indication of lead
No trace whatsoever of tin	Strong positive chemical indication of tin

Dr. Armstrong noted that the volume of Sample 1 appeared to be about two-thirds that of Sample 2. The reaction indicated the presence of lead, Sample 1 being approximately two-thirds as strong as Sample 2. This suggested that both samples were of similar lead glazes. The presence of tin in significant quantity in Sample 2 (the delft) indicates that sufficient oxide of tin was added to the lead glaze to render it a deep, opaque white. The absence of tin in the glaze of Sample 1 indicates that tin oxide was *not* added to the lead glaze of the bottles in question, unless the quantity added was so slight that the chemical test for tin showed no visible positive reaction.

Further chemical tests would be necessary to provide enough statistical weight to allow a more conclusive statement.

SEVENTEENTH-CENTURY POTTERY TYPES FOUND AT JAMESTOWN

I. EARTHENWARE:

1. Plain earthenware with no glaze and little or no decoration:

a. Indian
   (1) Smooth
   (2) Fabric impressed
   (3) Cord marked
   (4) Incised
b. English—red body or salmon body ware
c. Virginia—red body ware—probably made at Jamestown or Green Spring

2. Lead-glazed earthenware (some vessels only partially glazed):
   a. Jamestown
      (1) Type I
      (2) Type II
      (3) Red body slipware
   b. Green Spring
   c. Virginia redware
   d. English
      (1) Type I, hard-fired
      (2) Type II, hard-fired
      (3) Glazed with dark-colored manganese glaze
      (4) Glazed with clear glaze or light-colored glaze; body red, brown, or buff.
      (5) North Devon gravelware or grit-tempered ware
      (6) North Devon "sgraffito" ware
      (7) Slipware:
         (a) Redware with marbled slip decoration
         (b) Applied slip decoration
         (c) Combed slipware

3. Tin-glazed earthenware:
   a. English delftware
      (1) Southwark (painted in blue and purple)
      (2) London
      (3) Lambeth
      (4) Bristol
      (5) Wincanton
      (6) Liverpool
   b. Dutch delftware
   c. Flanders delftware
   d. French faience
   e. Hispanic majolica
   f. Lisbon majolica
   g. Italian majolica (a "sgraffito" type ware)
   h. Mexican majolica, Puebla (?)
   i. West Indies majolica (?)

II. SALT-GLAZED STONEWARE
   1. German and Flanders
   2. English

III. PORCELAIN
   1. Chinese
   2. Japanese
   3. Korean

DELFT AND MAJOLICA WITH ORIENTAL INFLUENCE

WARE:	Earthenware.
PASTE:	
Method of manufacture	Bodies of vessels are wheel made; appendages hand modeled or molded; tiles formed in molds.
Temper	None evident.
Texture	Homogeneous, fine-grained; powders when rubbed with finger.
Hardness	Mostly in neighborhood of 2.0; softest examples approach 1.0, while hardest are near 3.0.
Color	Ranges from creams and ivory into pinks and very light reds; color is consistently uniform throughout an entire vessel.
SURFACE FINISH:	Opaque enamel usually covers entire vessel except for base; enamel grades from white into bluish white, with some specimens showing a very pale pinkish tinge; thickness of enamel averages between 0.2 and 0.4 mm.; enamel is a mixture of tin oxide in a lead glaze. The lip extremity and the basal ridge upon which the vessel rests are frequently unglazed, possibly as a result of wear in many cases, as those two areas are especially exposed. A superficial veneer of transparent glaze appears to be present in most specimens.
DECORATION:	Most specimens have imitation Oriental designs featuring floral and geometric patterns, with an occasional scenic landscape painted in shades of blue. Pictures of animals occur rarely. Some specimens have scenes reminiscent of "blue plate china." Delft tiles frequently depict childhood games (top spinning, wrestling, leapfrog, etc.) involving two or more human figures, invariably done in blue. Other tiles have hunting scenes with dogs and horses, while some depict men in contemporary dress. Some smaller vessels are painted over the entire exterior (except for the basal area) with a mottled purple, through which the white background shows in speckles.

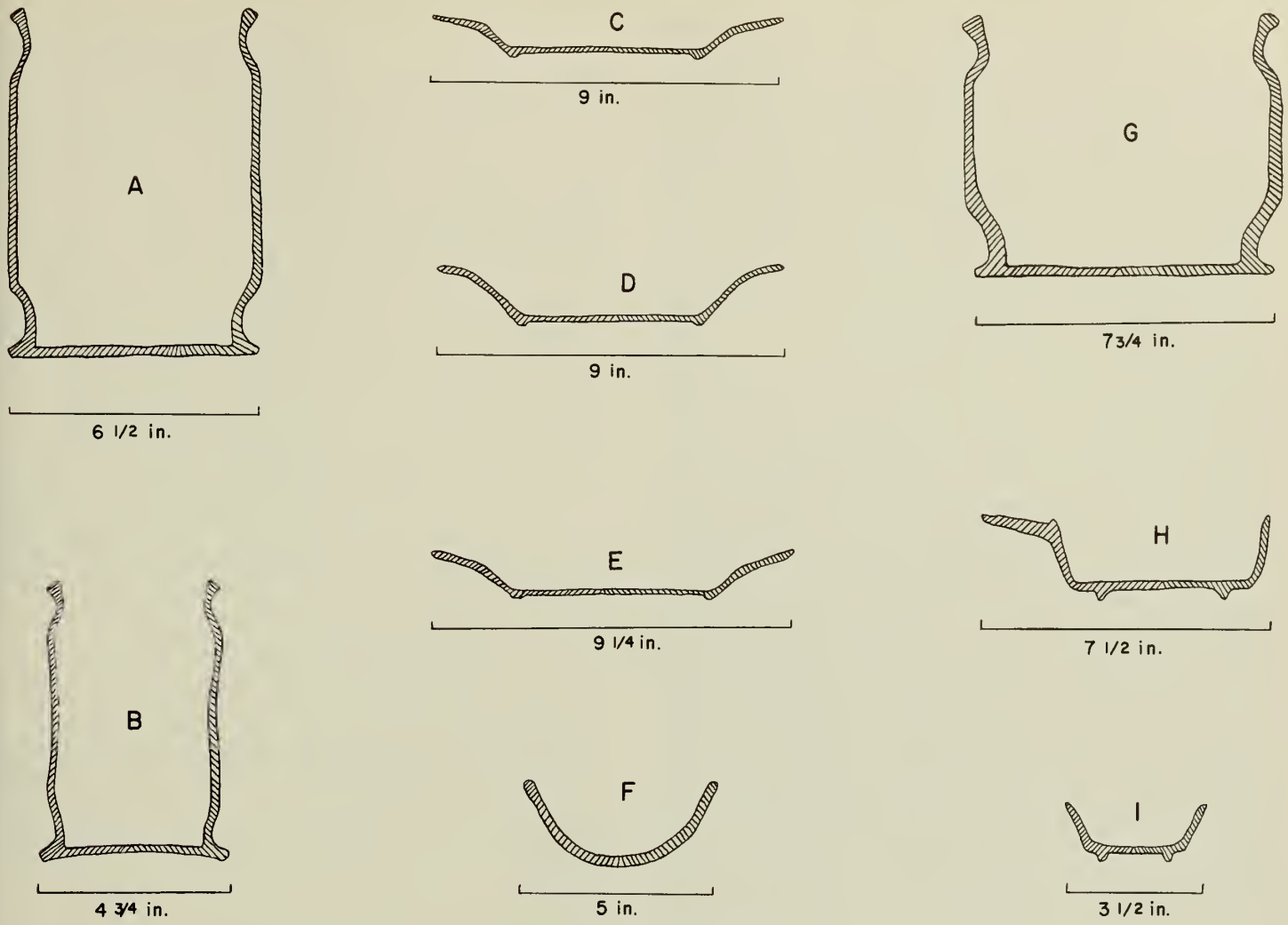


FIGURE 24—*Delft Types*

Delft types found in Structure 128 (ice pit) and other Area B Structures:

A and B— Cylindrical jars (albarello)
C—Plate with everted rim
D—Shallow bowl
E—Delft plate
F—Teacup without handle
G—Delft "apothecary jar"
H—Delft porringer
I—Delft cup

Occasionally there are combinations of blue and purple designs on a single vessel; and, rarely, there are green and yellow decorations, either singly or in combination with any or all of the other colors.

FORM:

Rim — Frequently unmodified; sometimes everted or rolled outward. In some of the jar forms the rim is thickened on the exterior, in which case the lip is flattened.

Lip — Usually rounded. Occasionally flattened, especially in jar forms with exterior thickening of the rim. The flattened lip of this form is frequently slanted outward.

Body — Occurs in many different shapes, the most frequent of which, at Jamestown, are:

Cylindrical jars (albarellos). Sides may be vertical or slightly concave. There is a narrow constriction just below the rim and a similar constriction just above the base. The rim is thickened on the exterior in this form and the lip is flattened, usually with an outward slant. Glaze

is absent at the lip and the base exterior, as a rule, perhaps due to excessive wear in some cases. Decorations consist entirely of small geometric elements of oriental motif.

Plates with everted rims. This type usually has a narrow, circular ridge or basal foot (upon which the vessel rests) at periphery of base. Decorations are almost entirely in blue and consist largely of Oriental floral and scenic designs.

Bowls with vertical or evenly curved, bulging sides, a few with rims rolled outward. Usually a narrow ridge is at the periphery of the base, and the lip is rounded. Some of these have 1 or 2 flat, horizontal tabs (usually containing holes in a decorative pattern) by which the bowls can be picked up. Deep bowls with one such tab are called "bleeding bowls"; bowls with two opposing tabs are known as "porringers." The delft bowls commonly are either plain or decorated with geometric and/or floral designs, usually in blue.

Cups or beakers with one handle. Such forms may have either vertical or bulging sides. Vessel walls are relatively thin and decoration commonly consists of purple mottling over the entire exterior of the cup except for the base.

A solid purple band, perhaps one-fourth inch wide, generally encircles the cup at the lip and there is usually a similar purple band just above the base.

(Various other forms of delft are known from European collections, ranging from tiny, plain ointment jars to large teapots, square covered boxes, and other elaborate and complex forms. While some of these are present at Jamestown in small quantity, time and space limitations do not allow their further consideration here. The major forms described above account for the large majority of Jamestown delft.)

Base — Circular, with flat exterior. Interior is flat except in bowls and cups with very small bases, in which cases the interior of the base may be concave. There is a narrow ridge or basal foot around the perimeter of the base on several forms, especially plates, cups, and small bowls. Rarely, small bowls may have convex bases continuous with the side walls.

OTHER FORMS: *Teacups without handles.* Several teacups in the Chinese tradition have been found, with walls tapering inward from the rim to the basal foot. Most are plain white, but at least one specimen is decorated with blue floral and geometric designs.

Fireplace and wall building tiles. These measure 5⅛ inches square on the top face and ⅜ of an inch thick. They are slightly beveled at the edges so that the bottom face measures about 4⅞ inches square.

TRADITIONAL MAJOLICA

The traditional majolica (without direct oriental influence) occurs at Jamestown in only one common variety, a bottle with the following characteristics:

WARE: Earthenware.

PASTE:

- Method of manufacture: Evidently thrown on wheel, then flattened slightly by compression on opposite sides.
- Temper: None evident.
- Texture: Homogeneous, fine-grained; powders when rubbed with finger.
- Hardness: Mostly between 2.0 and 3.0, with maximum range from about 1.5 to 3.0 (appears to run a little harder than the imitation porcelain delft and majolica).
- Color: Varies from creams to pinks.

SURFACE FINISH: The exterior surface of the clay is smoothed and usually shows minute, closely spaced, horizontal striations left by the potter's fingers in throwing. Frequently there are spots on the exterior of the vessel where the paste is slightly peaked or swirled as though the vessel was handled considerably while it was still plastic. (Perhaps this resulted from handling

during the process of flattening the sides.)

The bottom of the base characteristically has a series of swirled, lightly incised lines centered near one edge.

This pattern resulted from cutting the vessel from the wheel with a wire or cord. The upper one-third of the vessel's trunk is usually covered in a haphazard manner with a thin, cream-colored lead glaze. Frequently there are drip marks down the sides. The lower portion of the vessel—generally from about the point of maximum width downward—is unglazed. The interior walls show prominent, closely spaced, parallel ridges running horizontally.

DECORATION: Approximately one-half of the specimens have a star-shaped design painted on the shoulder in red or reddish brown, just above the two opposing flattened sides of the trunk, and sometimes overlapping onto the flattened areas. The star has eight arms of approximately equal length radiating from a common center.

FORM:

Rim — The rim consists of a narrow bottle neck 5/8 to 1 inch wide and between 2 and 3 inches high.

Lip — Flattened and inclined outward slightly. (Only one specimen available for examination.)

Trunk — Expands upward from base to a point about four-fifths of the distance between base and bottom of neck, at which point it constricts abruptly to form a rounded shoulder. After having been thrown to shape on the wheel and cut free, two opposing sides of the trunk were flattened, probably by pressing against a flat surface. Two handles were then applied, the lower ends attached at the shoulder on the unflattened sides of the trunk and the upper ends fastened to the neck a short distance below the lip. The handles extend upward from their attachment at the neck to form a tight loop about level with the lip.

Base — Round and flat.

TIN-ENAMELED EARTHENWARE

Tin-enameled earthenware of the varieties commonly known as delft, majolica, or faience is one of the most numerous classes of ceramics found at Jamestown. The technique of tin enameling (mixing tin oxide with a lead glaze to make it white and opaque) was introduced into the Western Mediterranean countries of Europe from the Near East. By the end of the 15th century, tin-enameled products made in Spain were being called majolica ware. Majolica reached a high stage of development in Italy and Spain during the 16th century. The forms and decorations at that period were reflecting a combination of Western European and Near Eastern traditions.

When the European demand for porcelain reached a high level in the 16th and 17th centuries, the technique of tin enameling which had given majolica its opaque, white glaze was adapted to imitations of Oriental porcelain. That is, majolica-type paste and glaze were combined with Oriental forms and decorations to create an imitation of porcelain, known as *faience* when made in France, *majolica* when made in Italy, and *delft* when made in the Netherlands or England. Similiar imitations of porcelain were also made in Spain and even in the Spanish colonies of America, but these continued to be called majolica.

For purposes of classification it would appear desirable to divide the varieties of European tin-enameled earthenware into two main groups: (1) the traditional majolica group combining the Western European and Near Eastern traditions, and (2) the delft-faience-majolica group which adapted the majolica paste and glaze to Oriental porcelain forms and decorations. This basic division of the tin-enameled earthenwares is sound, but is complicated by the loose manner in which the terminology has been used in ceramic classification.

Majolica, for example, commonly refers not only to the tin-enameled earthenwares of Italy and Spain in the 15th and 16th centuries (and to the continuation of the same styles into modern times), but also to Spanish varieties of the 16th, 17th, and 18th centuries. These Spanish varieties represented a conscious effort to duplicate porcelain. They were made in Chinese, Korean, and Japanese forms and decorated with designs borrowed directly from Oriental porcelains. Similar imitations of porcelain made in Italy, France, Holland, and England are known as faience or delft depending on where they were made. Typologically, however, they are more closely related to many of the majolica varieties than those same majolica varieties are to the original majolica of Western European-Near Eastern origin. Furthermore, some ceramists apply the term faience to all European glazed earthenwares, and occasionally a ceramist may speak of all European tin-enameled earthenware as either majolica or faience.

Despite confused terminology, however, it appears to the writer that the two classifications are typologically valid—the traditional majolica earthenware of Near Eastern-Western European affinity on the one hand, and the various tin-

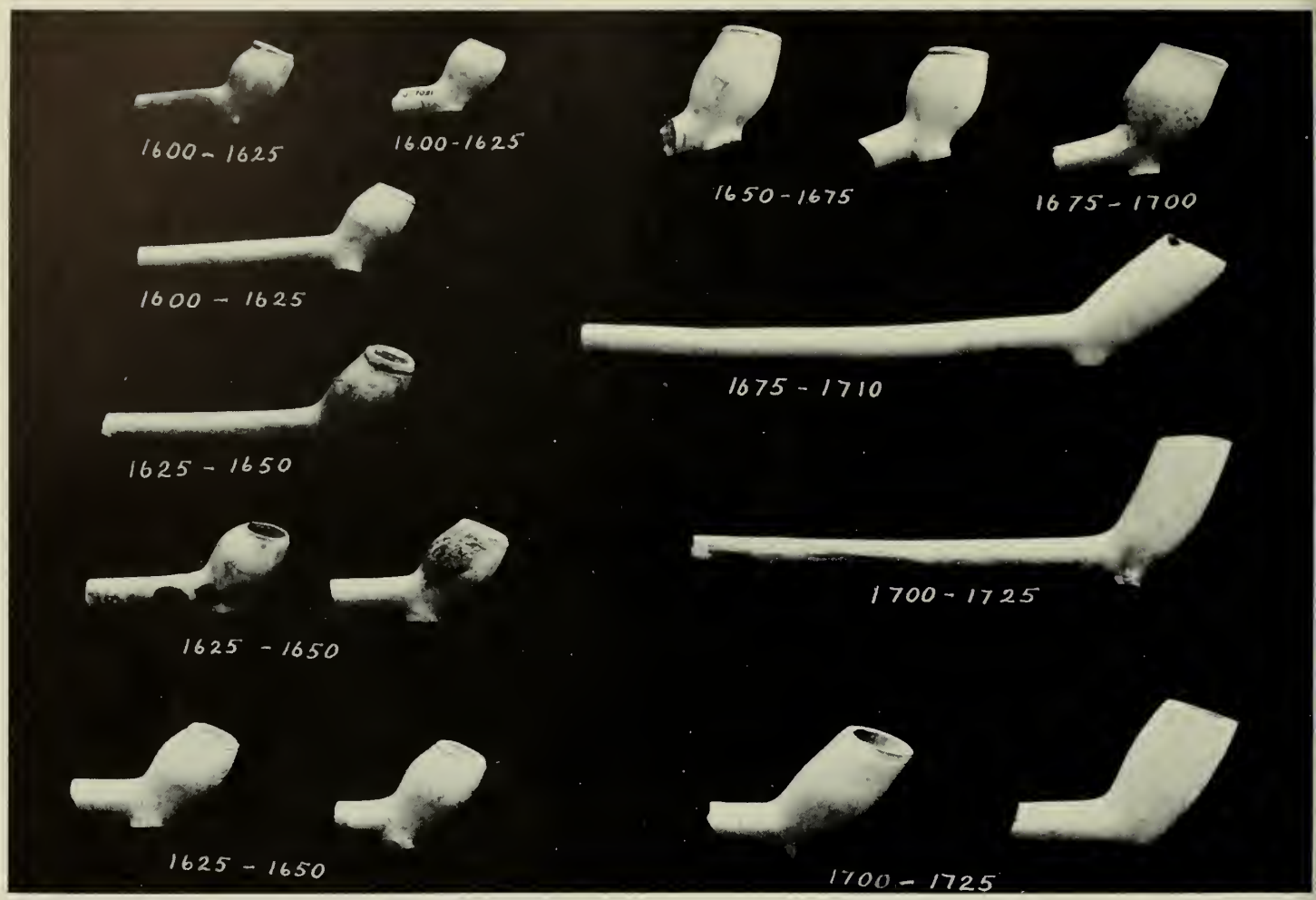


PLATE 92—*Representative White Clay Pipes from Jamestown*

These types are not, of course, always consistent, and the ranges shown are the best presently available estimates, borne out at Jamestown by other artifact associations.

enameled earthenwares made in direct imitation of Oriental porcelain on the other.

CLAY PIPES: TYPES AS TIME MARKERS

In the review of structures and other features at Jamestown, dating has been attempted on the basis of all artifacts which could be dated with reasonable certainty. To test the efficacy of types of white-clay tobacco pipes as time markers, it was decided to make a series of measurements and record the results on tables and a graph. Following are a listing of estimated dates and a number of charts relevant to Harrington's proposed association of stem hole diameters and dates (Harrington, 1954) and to Oswald's series of dated bowl shapes (Oswald, 1955).

Estimated Dates For Selected Features

(Based on Provenience and All Artifacts Recovered)

Refuse Pit 5: 1610–40

Refuse Pit 1:

- Zone A: 1650–70
- Zone B: 1620–50
- Zone C: 1620–50

Ice Pit, Structure 128:

- Zone A: 1650–75
- Zone B: 1640–75
- Zone C: 1640–75
- Zone D: 1625–60
- Zone E: 1625–60
- Zone F: 1625–60

Well 21: 1625–40

Well 20: 1630–50

Refuse Pit 2: 1700–50 (some evidence 1750–1800)

Yorktown: 18th Century

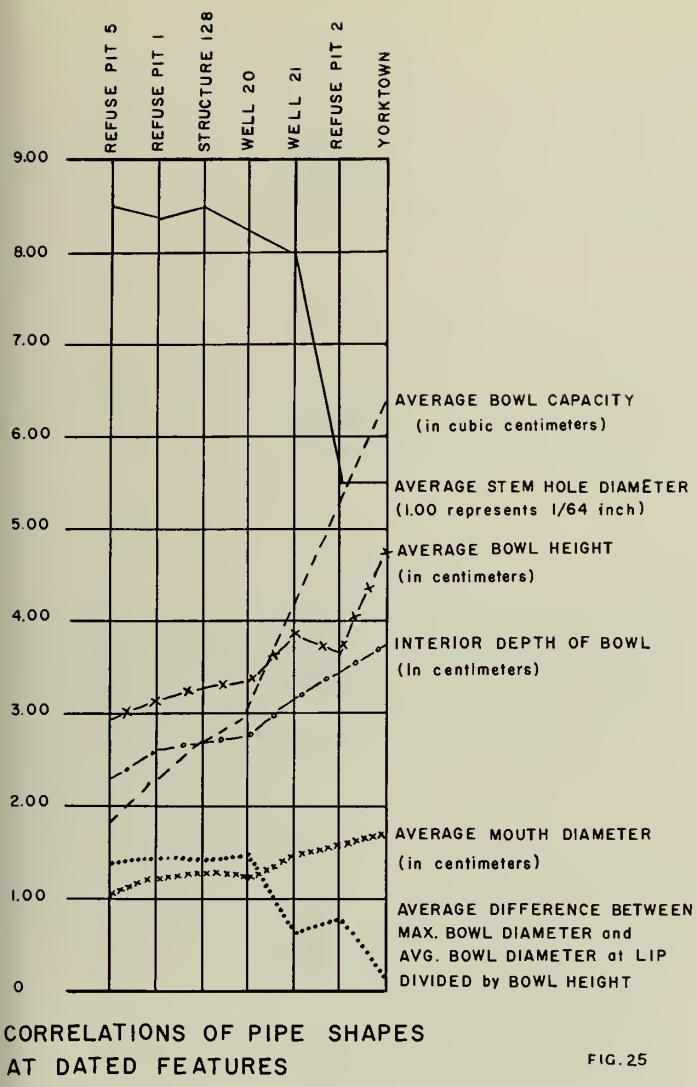


FIGURE 25—*Correlations of Pipe Shapes at Dated Features*

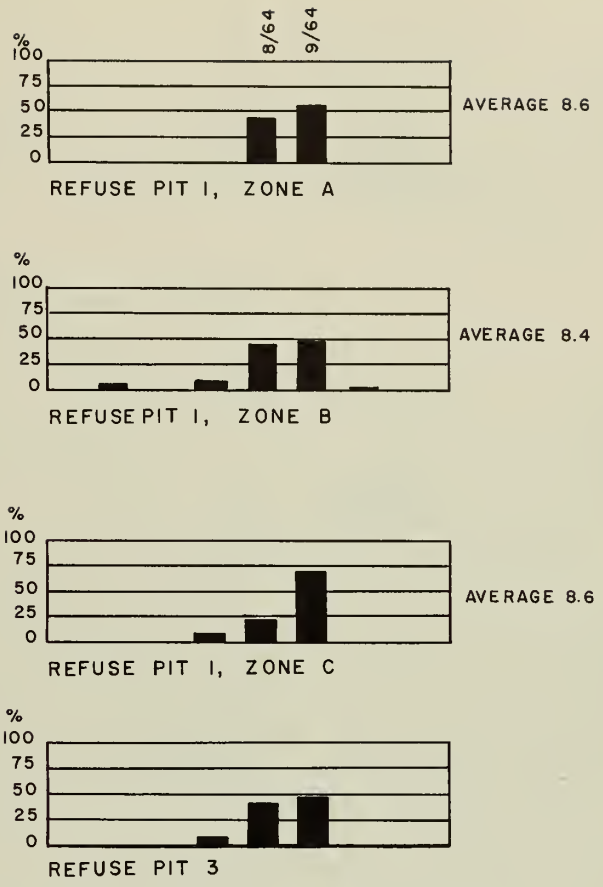
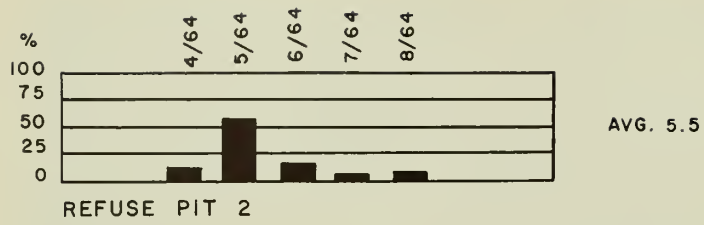
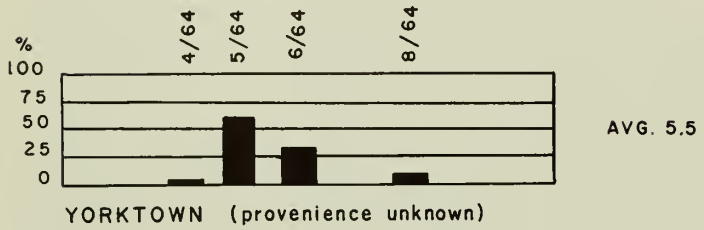
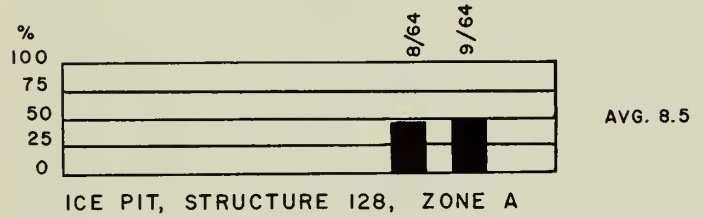
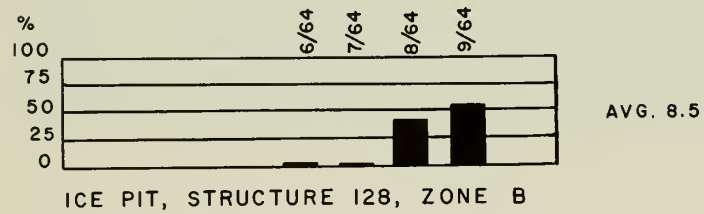


FIGURE 26—*White Pipestem Hole Diameters*



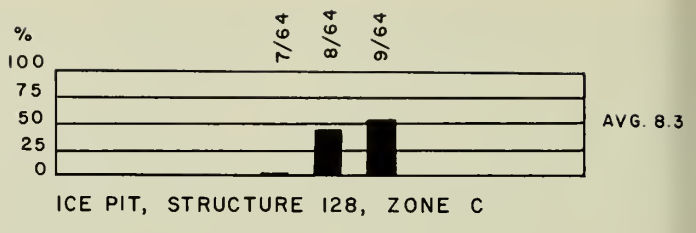


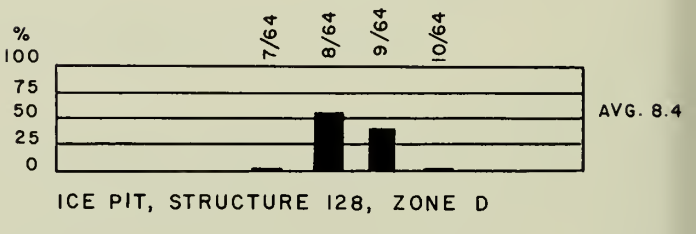


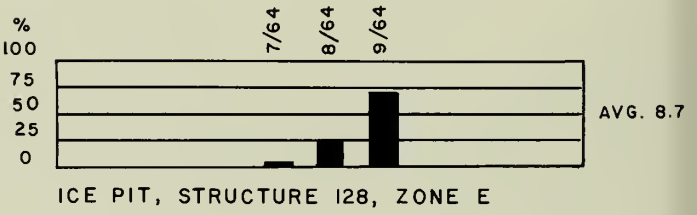


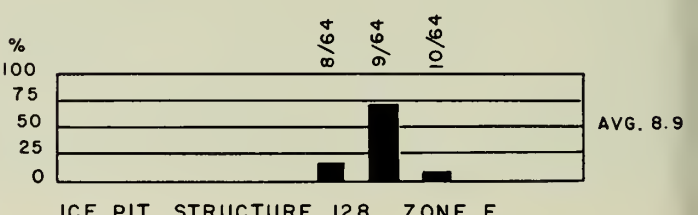
WHITE PIPE STEM HOLE DIAMETERS

FIGURE 27—*White Pipestem Hole Diameters*









WHITE PIPE STEM HOLE DIAMETERS

FIGURE 28—*White Pipestem Hole Diameters*

APPENDIX B

Notes on an Indian Cranium From Jamestown, Virginia

BY GEORG K. NEUMANN

The cranium of the Indian skeleton discovered in the excavation of the historic site at Jamestown, Virginia, merits a detailed morphological and metrical description. This description is needed because there is a relative scarcity of skeletal material that can be attributed to the Algonquian tribes of Tidewater Virginia. These notes, therefore, are written so that the gradual accretion of information may shed light on the racial relationships of the little known tribes of the Atlantic seaboard.

DESCRIPTION OF THE CRANIUM

The skull is in a good state of preservation, buff in color, and undeformed except for a slight posthumous downward displacement of the right condylar region of the occipital bone. This slight change affects only the height measurement of the vault, and can easily be corrected. The pathological changes of the frontal bone, possibly of syphilitic origin, are not extensive enough to affect any of the observations or measurements.

The cranium apparently represents a male somewhere between 26 and 29 years of age. Medium development of muscular insertions, such as supramastoid crests, pterygoid attachments, and mylohyoid ridge, blunt upper orbital margins, medium-size supraorbital ridges and mastoid processes, slightly more than average weight, and general size indicate the sex. Advanced endocranial occlusion of the sagittal suture, and corresponding dental attrition indicate the age.

The brain-case

In general size the brain-case is above average for American Indians. This is reflected by a cranial module of 156.3, an horizontal circumference of 534 mm. (530 over ophryon), a nasionopisthion arc of 377 mm., and a transverse arc (over apex) of 316 mm. (313 over bregma). The thickness of the bones of the vault is average—5 mm. for mean thickness of the left parietal. The serration of the sutures is submedium throughout, unless that of the coronal be regarded as simple. Traces of a transverse suture of the occipital and metopism are lacking; there are eight Wormian bones in the lambdoid suture.

When viewed from above the brain-case is ellipsoid in form although not quite as full in the frontal region as in some Europeans. The ellipse is rather long in accordance with a glabello-occipital length of 193 and a maximum width of 133 mm., and a cranial index of 68.91 (hyperdolichocrany). As may be expected in a vault of this form the postorbital constriction, the sphenoid depression, and the lateral bulge of the temporal squama are small, and the development of the parietal eminences is medium at the most. The maximum frontal diameter is 95 mm. and the fronto-parietal index 71.43, indicating medium absolute and high relative breadth of the frontal bone. There is no indication of cresting of the frontal and the bosses are small; the occipital is medium wide with pronounced curvature. Both the supraorbital ridges, which are of the divided type, and the glabellar region are medium in development.

From the side the vault is seen to be relatively high. The basion-bregma height is 143 mm., auricular height 118 mm., the breadth-height index 107.52, and the mean height index 87.73. A good part of this height is made up by that portion of the vault which is below porion on the ear-eye plane. This is indicated by the length-height index which is only 74.09, a length-auricular height index of 61.14, both orthocranial, a basion-projected porion height of 24 mm., and an index of flatness of the cranial base of 16.78 (Neumann, 1942). The frontal bone is high and exhibits only a slight slope; a postcoronal depression and sagittal cresting of the parietals are lacking; lambdoid flattening is small; the occipital bone is set about medium high, the external occipital protuberance is small, and an occipital torus is lacking. The pteryon region is in "H" on both sides.

It was pointed out above that the base of the skull is not flat or depressed. The foramen magnum with a length of 39 mm., a breadth of 28 mm., and an index of 71.79 is elliptical in form, and without an anomalous emargination of its posterior border. The cranial base line (nasion-basion) with a length of 114 mm., is long; the styloid processes are small, the glenoid fossae moderate in depth with a moderately long postglenoid process; the tympanic plate is thin, without dehiscense, and forms an elliptical-shaped external auditory meatus; condyle elevation is medium, and the position of the basion region about level with the occipital surfaces laterally to the condyles; a median occipital fossa and a pharyngeal fossa are lacking, and the pharyngeal tubercle, the lacerate foramina, and the petrous depression are all about medium.

TABLE V.—*Measurements of the Brain Case*

Notation	Measurement	mm.
	Vault	
CM	Cranial module (L+B+H/3)	156.3
TP	Mean thickness of left parietal	5
L	Glabello-occipital length	193
B	Maximum cranial breadth	133
MF	Minimum frontal breadth	95
H	Basion-bregma height	143
PAH	Porion-apex height (po-a)	118
BPH	Basion-projected porion height	24
LB	Length of cranial base (n-ba)	114
	Arcs	
HCG	Horizontal circumference (g)	534
HCO	Horizontal circumference (on)	530
SA	Sagittal arc	377
TAA	Transverse arc over apex	316
TAB	Transverse arch over bregma	313

The face

In general dimensions the face appears moderately large for the American Indian. The total facial height (nasion-gnathion) of 134 mm., the upper facial height (nasion-alveolar point) of about 77 mm., as well as the height of the mandibular symphysis of 45 mm. are, however, extreme. These dimensions in relation to a rather moderate bizygomatic diameter of 133 mm., a midfacial breadth of 103 mm., and a bigonial diameter of 97 mm., yield indices which reflect the pronounced height and narrowness of the face. The total facial index is 100.75 (hyperleptoprosopic), the superior facial index 57.89 (leptene), the midfacial index 74.76, the zygo-frontal index 71.43, the zygo-gonial index 72.93, and the fronto-gonial 102.11. The harmonious relation between the facial and the vault breadth is indicated by the cranio-facial index of 100.00.

The orbital and nasal proportions, on the other hand, are rather moderate. In shape the two orbits differ in that the right is square with a slight declination and the left rhomboid with a large declination of its horizontal axis. The left orbital height is 34.2 mm., the left orbital breadth from maxillo-frontale 43.8 mm. (38 mm. from dacryon); yielding an orbital index of 78.08 (mesoconch; or 90.00, hypsiconch if the dacryal breadth is employed). The lacrymo-ethmoid articulation is medium high, the suborbital fossae are medium deep, and the infraorbital sutures are lacking on both sides. The small zygomatic bones exhibit both small lateral as well as anterior projection, a combination that produces anything but a flat face. This lack of flatness finds expression in the index of facial

TABLE VI.—*Measurements of the Face*

Notation	Measurement	mm.
	Face	
TFB	Total facial breadth (zy-zy)	133.0
MFB	Mid-facial breadth (zm-zm)	103.0
TFH	Total facial height (n-gn)	134.0
UFH	Upper facial height (n-alv. pt.)	(77)
IOB	Interior orbital breadth (fmo-fmo)	103.0
SIOB	Subtense interior orbital breadth (over n)	21.0
BOB	Biorbital breadth (ec-ec)	103.0
AIB	Anterior interorbital breadth (mf-mf)	26.0
	Nose	
NH	Nasal height (n-ns)	51.8
NB	Nasal breadth (na-na)	25.4
DC	Dacryal chord (d-d)	30.7
DS	Dacryal subtense	16.0
MN	Minimum breadth of nasals (SC)	7.1
SMN	Subtense min. breadth of nasals (SS)	4.1
BNB	Breadth of nasal bridge (MOW)	66.0
HNB	Height of nasal bridge (SMOW)	—
	Orbit	
LOBM	Left orbital breadth from maxillofrontale	43.8
LOH	Left orbital height	34.2
LOBD	Left orbital breadth from dacryon	38.0
	Alveolar arch	
ML	Maxillo-alveolar length	65.0
MB	Maxillo-alveolar breadth	77.0
FL	Facial length (ba-pr)	(114)
FLA	Facial length (ba-alva. pt.)	(113)
	Mandible	
LM	Length of mandible	122.0
BC	Bicondylar breadth	121.0
SH	Height of mandibular symphysis	45.0
BA	Biangular breadth	97.0
RL	Minimum ramus length	38.0

Notation	Measurement	Degrees
	Angles	
FPL	Facial profile angle	81.0°
MPL	Midfacial profile angle	88.0°
APL	Alveolar profile angle	66.0°
NL	Nasion angle	69.0°
AL	Alveolar point angle	71.5°
BL	Basion angle	39.5°
GL	Gonial angle	131.0°

flatness, which in this case amounts to 20.39 (computed from the interior orbital breadth of 103 mm., and a subtense to this line from an arc over nasion of 21 mm.), a high value (Woo and Morant, 1934). Two additional morphological observations that should be mentioned here are the absence of the marginal process of the zygomatic bone, and the moderate height of the zygomatic process of the temporal bone. If the anterior inter-orbital breadth (26.0 mm.) is expressed in terms of the biorbital breadth (103 mm.), we get a high inter-orbital index (25.24) for this skull.

The nasal skeleton is moderate in saliency; a slight nasion depression is accompanied by a high but at the same time relatively broad nasal root, medium bridge height and breadth. The nasal bones proper are of medium size, and slight concavo-convex in profile. Metrically the conformation of the nasal root region is expressed by the length of the dacryal chord of 30.7 mm., the dacryal subtense of 16 mm., the subtense being 52.12 percent of the chord (nasal root index). Similarly the minimum breadth of the nasals is 4.1 mm., and the subtense to an arc in this region 7.1 mm., values that give a Simotic index of 57.75. The absolute dimensions of the nasal structure are

TABLE VII.—*Indices*

Notation	Index	Units
	Vault	
100 B/L	Cranial index	68.91
100 H/L	Length-height index	74.09
100 H/B	Breadth-height index	107.52
100 H/(L+B/2)	Mean height index	87.73
100 PAH/L	Length-auricular height index	61.14
100 BPH/H	Index of flatness of cranial base	16.78
100 MF/B	Transverse fronto-parietal index	71.43
	Face	
100 TFH/TFB	Total facial index	100.75
100 UFH/TFB	Upper facial index	57.89
100 UFH/MFB	Mid-facial index	74.76
100 TFB/B	Transverse cranio-facial index	100.00
100 MF/TFB	Zygomatico-frontal index	71.43
100 SIOB/IOB	Index of facial flatness	20.39
100 AIB/BOB	Anterior interorbital index	25.24
	Nose	
100 NB/NH	Nasal index	50.97
100 DS/DC	Nasal root index	52.12
100 SMN/MN	Nasal bone height index	57.75
100 HNB/BNB	Nasal bridge height index	——
	Orbit	
100 LOH/LOBM	Orbital index (maxillofrontale)	78.08
100 LOH/LOBD	Orbital index (dacryon)	90.00
	Alveolar arch	
100 MB/ML	Maxillo-alveolar index	118.46
	Mandible	
100 BA/MF	Fronto-mandibular index	102.11
100 BA/TFB	Zygomatico-mandibular index	72.93
100 LM/BC	Mandibular index	100.83

of moderate proportions with a height of 51.8 mm., a breadth of 26.4 mm., and a nasal index of 50.97 (mesorrhine). The anterior nasal spine is small and the lower margins of the piriform aperture are medium in sharpness.

In general the facial profile can be characterized as mesognathous with a facial profile angle of 81°. Its components, however, represent the extremes of orthognathy (midfacial angle of 88°) and prognathy (alveolar angle of 66°). Facial length (basion-prosthion) amounts to about 114 mm. The three linear measurements of the nasion-basion-alveolar point triangle, and its three angles express the amount of total facial prognathism in a different way. Individual values are given in Table VI.

The high palate is elliptical in form, 65 mm. long and 77 mm. wide, that is, short in relation to its breadth (maxillo-alveolar index of 118.46, brachyuranic). The transverse palatine suture is directed straight across the midline, and though there is a slight thickening on each side of the intermaxillary suture, a palatine torus proper is lacking. The external pterygoid plates are medium long and the internal ones small; pterygobasal foramina are absent; the posterior nasal spine is large.

The mandible is relatively large and high, the chin form intermediate between median and bilateral, and strongly negative in development when the skull is oriented in the ear-eye plan. With pronounced maxillary prognathism a corresponding condition is to be found in the mandible. Muscle markings, as was mentioned above, are medium, the genial tubercles and gonial eversion small. The mandibular index is 100.83, the minimum breadth of the ascending ramus 38 mm. (wide), and the left gonial angle 131° (large).

Teeth eruption is complete, attrition slight, crowding absent. One tooth was lost before death and four show caries; there are three medium-sized abcesses, and indications of alveolar destruction. The cusp pattern is 4–4–3 in the upper and 5–?–4 in the lower molars. There is a slight over-bite, and the incisors are shovel-shaped (medium development).

TAXONOMIC RELATIONSHIPS

The introductory statement pointed out that there is a paucity of published craniological data dealing with series attributable to people of the Powhatan Confederacy and neighboring tribes. In fact, the only material on the former group is Stewart's preliminary data from ossuaries on the sites of Nacotchtanke (Anacostia) and Piscataway Fort, located on tributaries of the Potomac, and from an ossuary near Belleview on the York River. These three series comprise 75 crania of adults, but only cranial indices are presented for a statement dealing with the range of the mean height index of the 8 crania from the York River site. In the report on the series from Piscataway Fort these indices are given only by frequency in 6 index classes; from the other 2 sites the individual indices appear, but the sexes have not been separated.

The mean cranial index of the skulls from Nacotchtanke, male and female combined, is 76.24 (11), the range is 72.6 to 86.0; and from the York River ossuary 74.86 (8), and 70.7 to 81.8. If the individual indices of the two series are pooled the mean is 75.76 (19). For the series of 56 crania (32 male, and 24 female) from Piscataway Fort only the range (65.8–90.9, for the combined sexes) and the class distribution are given. The latter is presented in Table VIII, in which the first column gives the frequencies for males, the second for females, the third for the combined sexes of this series, and the fourth the same for the pooled Nacotchtanke-York River series.

TABLE VIII.—*Class Frequencies of Cranial Indices—Piscataway Fort and Nacotchtanke-York River*

	Male	Female	Both	Nac-York Both
Hyperdolichocrany 65.0–69.9	6	2	8	1
Dolichocrany 70.0–74.9	10	7	17	8
Mesocrany 75.0–79.9	9	7	16	7
Brachycrany 80.0–84.9	7	7	14	2
Hyperbrachycrany 85.0–89.9	—	—	—	1
Ultrabrachycrany 90.0–94.9	—	1	1	—

From the above data it appears that we are dealing in these 3 sites with one physical type whose mean cranial index is around 75. Stewart states, on the basis of a large number of traits, that "the affiliation of this group seems to be with the northeastern dolichocephals." My inspection of some of this material bears out his conclusion. Although the hyperdolichocrany of the Jamestown skull places its cranial index six units below the mean for this type, it still falls within the range of a series such as that from Piscataway Fort, and probably has to be considered as an individual extreme in this respect.

The mean height index of 87.73 of the Jamestown skull places it among the highest means for American Indian skulls, and within the range of 83.9–88.5 which Stewart gives for the York River series of eight skulls.

Going a little further afield and comparing the skull with the Nanticoke series described by Cope it appears that its measurements will fall within the range of this series of which only a few indices are given. Unfortunately the indices of only two crania are represented for most of these, making close comparisons almost impossible. It must therefore suffice to state that the mean cranial index of 75.12 (9), the mean length-height index of 74.59 (3), and the mean index of 52.2 (2) for male Nanticoke crania compare favorably with the corresponding indices of the Jamestown skull.

This same physical type—Hrdlicka's "Algonkin" type, or my Lenid type—has a wide distribution in the East and includes groups of at least three linguistic stocks: Algonquian, Iroquoian, and Siouan. Crania from the historic Siouan towns of Tutelo (ca. 1670) and Keyauwee (ca. 1700) yield exactly the same physical type as the crania from the Hayes' Creek Mound in Rockbridge County, Virginia. Since this site is in addition located in the piedmont region which was occupied by tribes of the Monacan Confederacy, and the pottery is identical with that found on sites known to have been Siouan, it is reasonably safe to use the measurements of the crania of this series (Hrdlicka, 1927) as representative of the Siouan-speaking tribes of Virginia. In Table IX some of the measurements and indices of the Jamestown skull are compared with this putative Siouan and a prehistoric Seneca series.

From this table it may be seen that, except for the somewhat extreme individual cranial and facial length and breadth of the Jamestown skull, most of the measurements and indices correspond fairly closely to the means of the Hayes' Creek Mound and a prehistoric Seneca series.

Finally, it may be pointed out that many of the photographs of living Indians of the Powhatan tribes given by Speck (Speck, 1928) represent individuals with cranial and facial proportions which approximate those of the Jamestown cranium. The best example is perhaps that of the Mattaponi type given in Figure 16a of Speck's study. It is interesting to note in this respect that this applies especially to those individuals that seem to have the least amount of white admixture.

TABLE IX.—*Comparison with Monacan and Seneca Crania*

	Jamestown	Hayes' Creek Mound Male Means	Hayes' Creek Mound Male Range	Prehistoric Seneca Wray Collection
CM	156.30	154.05 (12)	146.6 –160.3	155.37 (11)
L	193.00	182.10 (15)	173 –190	186.91 (11)
B	133.00	137.60 (15)	128 –146	137.45 (11)
H	143.00	143.10 (12)	138 –150	141.73 (11)
TFB	133.00	138.20 (5)	126 –151	136.78 (9)
TFH	134.00	125.00 (1)	.....	125.00 (6)
UFH	(77)	73.00 (4)	72 – 74	76.10 (10)
NH	51.80	52.70 (8)	51 – 56	54.89 (10)
NB	26.40	27.20 (7)	25 – 29	27.87 (10)
LOH	34.20	[1] 33.40 (10)	31 – 36	33.88 (10)
LOBD	38.00	[1] 38.00 (10)	36 – 40.5	[2] 38.88 (10)
100 B/L	68.91	75.57 (15)	71.2 – 80.7	73.56 (11)
100 H/L	74.09	79.01 (12)	75.13– 81.32	75.83 (11)
100 H/B	107.52	103.80 (12)	97.89–109.38	103.20 (11)
100 H/(L+B/2)	87.73	89.39 (12)	84.8 – 92.1	87.39 (11)
100 UFH/TFB	57.89	55.95 (2)	54.9 – 57.0	55.60 (9)
100 TFB/B	100.00	100.34 (5)	96.67–104.14	100.04 (9)
100 NB/NH	50.97	51.41 (7)	49.0 – 53.8	50.87 (10)
100 LOH/LOBD	90.00	88.01 (10)	84.2 – 92.3	[3] 87.18 (10)

[1] Mean.
[2] Computed by making a correction from the measurement from maxillofrontale.
[3] Computed from the means of height and breadth.

APPENDIX C

Extracts From the APVA Yearbook 1900-1901

NOTE: *The following extracts from APVA records relevant to excavations on the site of the brick church foundations and cemetery east of the brick tower are offered to provide the original data from which Colonel Yonge and the present writer drew conclusions. The exact number and location of graves disturbed in quest of genealogical information were not recorded. All historical references are subject to scrutiny before modern acceptance. The writer is indebted to the Jamestown Committee of the APVA and to Mr. William H. Smith for permission to reproduce these extracts and the photograph of the church excavation.*

I. Letter to Chairman, Jamestown Committee APVA

RICHMOND, VA., *June 8, 1901.*

MRS. PARKE C. BAGBY, *Chairman,*
Jamestown Committee APVA

DEAR MADAM: I beg leave to make the following report of recent work at Jamestown:

In 1893, when visiting Jamestown Island, I was impressed with the peculiar topography of the land back of the old tower. Feeling sure that there was something buried there, I was very anxious to excavate upon that site, in order to unearth anything that lay hidden. Not, however, until the 25th of May, 1901, was I able to do anything towards discovering what remained of the church, which was there buried in its own debris.

Upon the day named, at the kind invitation of the Jamestown Committee of the APVA, I started excavating, and with the indefatigable aid of the local committee—the Misses Galt and Garrett of Williamsburg, Va.—I have found that there remains of the original church all four walls, to a height of from 6 inches to 3 feet above their foundations. Starting with excavations at the southwest corner, I carried the work along the south wall, keeping down to the top of the foundation, or beginning of the neat work. At 3 feet 4 inches west of the southwest corner, I struck the east side of a buttress, extending 3 feet 1 inch north and south, by 2 feet 8 inches east and west. At 8.45 feet from this was discovered the east side of a tile pavement in front of the minister's door, which entered through the south wall, into an aisle crossing the church in front of the chancel. Immediately upon entering this door was found a tomb, lying north and south along the aisle. This tomb had been robbed of the brass tablets with which it had been inlaid. The stone, however, bears the channels in which the brass was, as well as the brass bolts, leaded in the stone. These bolts held the tablets, consisting of a rectangular border 2 inches wide, enclosing in the northeast corner of the stone a shield, and in the northwest a scroll, and down the middle of the tomb a knight in armor standing upon a rectangular plate which evidently bore the inscription.

At right angles to the first tomb, and lying against its north side, was found another, bearing the following inscription: "Here lyeth interred the body of John Clough, minister, who departed this life the 11th day of January, 16—."

To the right as one enters the minister's door, and about a foot from the east side of the door, is a step down into the chancel. The chancel is paved with 9 inch square tiles, while both the middle and cross aisles are paved with brick.

In the northeast corner of the church and in the chancel was found a tomb covered with raised tiles; and when entered, it was found to contain the remains of a young man of great size, his skeleton as he lay being 5.6 feet long and 1.5 across the shoulders.

Lying near the north wall, and across the cross aisle, was found another tomb containing the remains of a man whose feet were about one foot from the head of the man in the northeast corner. While excavating at the second grave, along the north wall, was found part of the remains of a brass tablet, which evidently was attached to the north wall and was destroyed when the church burned and the wall fell. Letters were found upon the fragments of brass.

In the southwest corner of the church the sexton's tools—spades, picks, etc.,—were found and were evidently burned

when the church was destroyed as the charred remains of the helve were still in the pick.

The walls of the chancel were all 2 feet thick with 4 inch offsets inside and out at the foundation. There are eight buttresses, four on the north and four on the south side of the church. These buttresses are 3 feet, 1 inch north and south, by 2 feet, 8 inches east and west and are situated from the southeast corner, along the south wall, as the distance to the east side of buttress being given in each case: Southeast corner to first buttress, 3 feet 4 inches; to second, 21 feet; to third, 39 feet, and to fourth, 52 feet. The west wall of the church is 11 inches east of the old tower, which is connected with the church by two transverse walls running 5 feet 2 inches apart and on either side of the eastern arch of the tower. The connecting walls between tower and church are 3 feet thick and run from the church under the tower, evidently showing the tower to have been built after the completion of the church.

The old graveyard wall, 18 inches thick, which was built through the old church, crosses 16.8 feet from southeast corner and 13.1 from northeast corner.

Six inches from and parallel to the south wall of the church was found a 9 inch wall, evidently the foundation of some wooden structure, upon the site of which the old brick church was built. I found evidence along the middle aisle of graves and think both aisles were entirely undermined by them.

Respectfully.

JOHN TYLER, JR.

II. Report on 1901–1902 Excavations

REPORT OF THE EXCAVATIONS MADE AT JAMESTOWN IN 1901 AND 1902

(Prepared at the request of Mrs. John B. Lightfoot for the Jamestown Book.)

As Acting Chairman of the Committee, Mrs. Lightfoot requests me to give further account of the work committed to our care, and my deductions as to its importance—1901.

Subcommittee Chairman,
Miss Mary J. Galt
Miss Mary W. Garrett

When the Committee began their excavations at Jamestown there was no one present except Miss Galt, myself and one laborer. We uncovered the top of two buttresses, and a portion of the top of the foundation of what turned out to be the brick Church of 1638. We realized that the work was too important to be carried forward without skilled workmen. I suggested that we ask Mr. John Tyler, Jr., then employed by the United States government, on the breakwater, at Jamestown, to come and help us with this great work of excavation. We also called in the skilled aid of Mr. William Leal, the present custodian at Jamestown. Mr. Tyler was to leave Jamestown the next morning, but we telegraphed Mrs. Parke C. Bagby, Chairman of the Jamestown Committee, who secured his valuable services, free to the association.

Mr. Tyler has given the association a report of the discoveries we then made which will be found on the 34th page of the 1900 Year Book of the association. He reports the excavation of the foundation of the brick church of 1638 with its buttresses. He also mentions a cobblestone foundation.

1902

Subcommittee
Acting Chairman, Miss Mary W. Garrett
Miss Annie Galt

Miss Mary J. Galt having changed her place of residence, Mrs. Parke C. Bagby appointed me acting chairman of the subcommittee consisting of Miss Annie Galt and myself as acting chairman of the Committee. I submit the following report: With Mr. William Leal to carry on the work of excavating at Jamestown, we began the work June, 1902 to try to establish the further history of the old church. We commenced work in the chancel, discovered in 1901, removing the 9 inch square tiles and digging below the chancel we discovered what we believed to be another chancel—the center portion was all that had not been destroyed. We found a bed of mortar stretching from the east wall of the Church of 1638 and extending into the body of the Church westward 4 feet beyond the limits of the chancel of the Church of 1638. This chancel was paved with 7 inch square tiles, 2 inches thick. There were some of these tiles remaining, and impressions all across the mortar showing that others had been removed. In the upper chancel belonging to the Church of 1638 (we found ten bodies buried in the lower chancel) we also found ten bodies, but the lower chancel was narrower than the upper chancel—the dimensions of the upper chancel being 22 feet, 6 inches—and that of the lower 21 feet—the bodies in the lower chancel being interred closer together than those in the chancel of the Church of 1638. (Our measurements do not exactly agree with those made by Mr. S. H. Yonge with accurate instruments.)

The inside measurements of the cobblestone foundation, discovered in 1901, were 21 feet. We found the bodies, interred in the lower chancel, occupied a corresponding space of 21 feet, so we believed this to be the chancel of the Church of the cobblestone foundation. As a further proof of this, the cobblestone foundation does not lie due east and west, varying a little from the northwest to the southeast; we found that the bodies interred under the chancel did not lie due east and west but followed the inclination of the cobblestone foundation,

varying in the same degree from the points of the compass. The first body discovered in this lower chancel was about a foot and a half beyond the limits of the chancel of the Church of 1638, and a part of the body was lying under the foundation of that church, proving the church of this lower chancel to have been built prior to the Church of 1638—this must have been an extensive chancel because it extended 4 feet, 5 inches beyond the limits of the upper chancel.

Which of the Jamestown churches could answer to the dimensions of this cobblestone foundation? In width it measures (inside measurements) 21 feet, following this cobblestone foundation in length beginning at the west end of the foundation that joins the tower; we can trace it by its cobblestones and its chancel upward and prove its length for certainly 54 feet. This brings us to the east foundation wall of the Church of 1638; a body interred in this chancel extended 1½ feet beyond the eastern limits of the Church of 1638, proving that the church was certainly 55½ feet long. This could not have been the measurements of the church of 1617, as that church was 20 by 50.

Strachey writes a description of the Church found by Lord Delaware, 1610, *First Republic in America,* Alexander Brown, page 129, stating that when Lord De La Ware arrived in 1610, he found a "Pretty Chapel" 60 by 24, which he had put in good repair. He describes a triangular fort 420 feet, facing the river, and the other two sides 300 feet, and states that in the center of this fort were chapel, market place, and the "Corps du Garde"—. If this cobblestone foundation with its extensive chancel was not the Church described by Strachey, then it has never been described by any historian, for there is no description answering to its dimensions if it is not the Church built by Newport's sailors in 1608. We cannot prove that the church of the cobblestone foundation extended 60 feet, for after the building of the church of 1638 on the site, the eastern foundation which would have extended beyond was thrown in the church yard and may have been lost by interments; but there is strong proof that this foundation did extend further eastward, from the fact that one of the bodies interred in the chancel of the Church of the cobblestone foundation extended beyond the limits of the chancel of the Church of 1638 eastward. In digging to the southeast corner, we found a small heap of cobblestones with the old shell lime still adhering to them corresponding with those in the cobblestone foundation and seeming to prove that some of the stones had been removed.

In 1901 Mr. Leal excavated in the northeast corner of the chancel and found one grave; he dug down to the clay and found no grave beneath it; in 1902 he dug down in the southeast corner of the chancel and found one grave with no grave beneath it. The bodies in the last chancel discovered were all in the space of 21 feet from north to south. We think that ten bodies were in the upper chancel and ten in the lower chancel because the interments covered the space of 22 feet and were all found lying due east and west, while those ten that were buried deeper were not due east and west but followed the inclination of the cobblestone foundation and were confined to a space of 21 feet. In our report of 1902 I find that we did not make this fact plain concerning the grave in the southeast corner of the chancel.

There is abundant proof that this church of the cobblestone foundation was destroyed by fire—this is proved by excavations in the chancel and under the brick pavement in the body of the church, where we found heaps of blackened coals, bits of charred wood, and other evidences of fire.

The Cradle of the Republic by Doctor Lyon G. Tyler has a picture of Jamestown in 1620 showing a brick tower with port holes with building attached, extending east, which could have been no other building than the church of 1617. This church must have appeared in this picture, and there is no other building here represented with brick tower and without a chimney; and we know that the churches of those days were without chimneys. It is also in the center of the town, and the old church was represented as being in the center of the town. This seems to establish that the tower was in existence as early as 1617. This tower may have been built in 1608 as Strachey mentioned Brown's *First Republic in America,* page 129, that there were two bells in the steeple at the west end, in speaking of the chapel. The tower may have been added by Lord De La Ware or by Dale when he repaired the church and other buildings in 1611, for he brought over with him skilled artificers, carpenters, and brick layers.

Dale arrived at Jamestown Sunday, May 29, 1611; on the 30th he called a council and decided to repair the church and other buildings, and to make bricks in the colony. It is not unreasonable to suppose that the people of the colony who made bricks at such an early date, that they who so honored the Lord and paid such attention to His house of worship as was the custom in those days, that our forefathers should have erected a handsome tower of brick, making an impressive entrance to their church, which would be used as a belfry and also serve as a tower of defense for their congregation from the dangers that surrounded them when they assembled to worship.

In summing up the work of our committee for the year 1902, we continued the excavations in the chancel and body of the church as stated. We also excavated in the churchyard and found a number of graves there, unidentified, to which the association placed markers, then continued the excavations to try to establish the extent of the churchyard. Through these excavations conducted by Mr. William Leal we found remains that proved that the churchyard on the south extended to the river; on the north and the east we found nothing to justify us in supposing that it extended further than the enclosure; to the west, I am informed on good authority, that when the Confederate Fort was thrown up numbers of skeletons were found showing that the churchyard must have extended as far as the fort to the west.

The restoration of all tombs in the churchyard was under

the direction of Miss Mary Galt as she requested that this work should be discontinued until her return. Nothing has been done in regard to the tombstone, except that I suggested to Mrs. John B. Lightfoot that the inscriptions on the tombs of commissary Blair and his wife, which I could furnish, should be preserved; she has had this work beautifully done—it is the skilled labor of Mr. William Leal.

From the excavations that we made, I think that I can claim that we have discovered the Harrison section in the churchyard. Mrs. Edwards, who was a Miss Harrison, was buried there; Hannah Harrison, who married Philip Ludwell, is buried there; and Sarah Harrison, who married Commissary Blair. In the center of the section we found an unidentified grave containing three bodies, and we found brass-headed tacks in this grave, some of which were distintegrated, but a few were held in place by the remains of the wood of the coffin. I placed these letters together and made out the names of B. and A. Harrison. I found afterwards by reference to Bishop Meade's book that B. Harrison was buried there, and we think he was the immigrant and progenitor of the Harrison family in Virginia.

Respectfully submitted.

MARY WINDER GARRETT,
Acting Chairman, Subcommittee of Jamestown Committee, APVA
December 15, 1905.

November 5, 1906.

Since writing the above report, Miss Loulie L. Taylor, Directress of the Norfolk Branch of the APVA and myself were appointed to select the site for the monument to the first House of Burgesses to be placed at Jamestown by the Norfolk Branch of the Association. We chose a spot which has been marked and approved by the Association; and the Association has granted permission for the monument to be erected on this site.

In view of the coming tercentenary, I feel that grateful eyes will be turned to Mrs. Parke C. Bagby, the official Chairman of the Jamestown Committee, and Miss Mary J. Galt, Chairman of the Subcommittee. These two ladies have labored faithfully at Jamestown since the Association was organized; and to Mrs. John B. Lightfoot, whose untiring zeal and energy came in at a moment when most needed to carry the work forward in preparation for the tercentenary.

MARY WINDER GARRETT,
Acting Chairman of Subcommittee.

III. Mary Jeffery Galt Report

Report of Miss Mary Jeffery Galt
Originator of the APVA

This report is made by request of Mrs. John B. Lightfoot, Acting Chairman of the Jamestown Committee.

A record of my work in beginning and carrying on the first excavation of the ruins of the old Jamestown churches.

On the 15th of April, 1894 Mrs. Parke C. Bagby, Chairman of the Jamestown Committee, and myself went to Jamestown; and I was officially put in charge of the APVA property there. It was as she said—"A picture of desolation." It seemed a wilderness of poor deserted farm land.

Many, many things had to be done and done for the least expense. The first thing was to have the property enclosed. A fence was put up and then a hedge was planted.

In 1895 the first engineers came. They encamped within our enclosure, and their 27 mules and heavy machinery undid much that we had done to improve the place. After they left we remade the road, planted more trees, sowed grass, planted flowers and had some filling in and evening up of the ground done. As time went on we renewed the posts supporting the wire net around the ruins, put on a heavier wire net with barbed wire above it.

Of course, this required constant visits to Jamestown to see about it all, and many trips to Richmond to report to and to confer with the Chairman of the Jamestown Committee. Another cause of frequent visits to Jamestown was the necessity of being present during the stay of large excursions and picnics in order to protect our antiquities from relic hunters among them.

It is hard to give an idea of work done at Jamestown. Besides the almost endless task of bringing the grounds to some degree of order, such work for the first few years had also to be largely of a preservative character. Persons who were authorities in such matters had to be found and consulted. Small places in the graveyard wall and in the tower had to be mended little by little, in the best way; and as often as I could I had a bricklayer. All the time we had to consider the expense. Some of the mending of the tower I did with my own hands.

In May, 1896 we secured the services of a distinguished architect of New York. He had the tower strengthened with iron rods. He also had the little bushes and vines growing among the top bricks taken out and the top of the tower cemented so as to shed rain. He also attended to draining some of the land. Sometimes later we were so fortunate as to have a visit of a day from Mr. Charles Couper of Norfolk, at which time he had the Mrs. Mary Knight tombstone and the black marble Ludwell tombstone set. The latter was cracked in a thousand places and had to be moved in the most skillful manner.

I began from the first to study the covered ruins of the church and gradually outlined them slightly. It is well known that this foundation is that of the church built in 1639 and rebuilt after Bacon's Rebellion. In the year 1897 I dug with my own hands quite deep inside of the south wall of the church and discovered the little inner wall composed of large

bricks and cobblestones. This must have been the foundation of the Argall Church built 1617 or of the earlier one repaired by Lord de la Ware in which our beloved Pocahontas was married. The deep graves under the chancel and eastern wall may have been graves in the Argall Church. They may have been graves in the de la Ware Church. This earlier wall which now extends only to the front line of the chancel of the present ruins may have extended 4 feet further east than the present eastern wall and so have had the length of the de la Ware Church.

In the summer of 1900, finding that I should for several years be obliged to be absent from Williamsburg a great deal, I asked that Miss Mary Garrett should be appointed to serve on the local Jamestown Committee whenever I should be away. Later Miss Annie Galt was appointed to serve with her.

In May, 1901 we did some excavating among the graves east of the church, and I should explain here that these gravestones were 2 or 3 feet below the grass grown surface. They and the church ruins were under heaps of debris and vegetation, the growth and accumulation of many years. I had from time to time dug among this and found many pieces of tombstones, broken fragments left by vandals. These I had reburied for safe-keeping.

After consulting with the Chairman of the Jamestown Committee, Mrs. Parke C. Bagby, I undertook the thorough uncovering of the ruins of the church. About the 12th of May, 1901 we began with a few laborers who came from Williamsburg every day. Later when we had to have more men and board them at Jamestown, we were so fortunate as to secure the services for a week or more of Mr. John Tyler, an engineer employed by the Government on the Sea Wall for a period and living at Jamestown. He began to work with us on the 25th of May. On the 29th of May we discovered the knight's tombstone and the next day that of the minister.

It must be borne in mind that in 1793 Mr. Ambler of Jamestown Island and Mr. Lee of Green Spring had that part of the graveyard containing their family graves and part of the church foundation enclosed by a wall using the bricks of the church wall for that purpose. After discovering these memorials to the minister and knight, we understood that the wall had been made across the foundation just where it was for their protection.

In June and July we turned our attention again to the graveyard, digging down to the graves and opening many of them. We found many pieces of tombstones among the debris. Some of the fragments had lettering which we tried to piece together matching the stone. We found that these graves like those under the brick floor of the church often contained more than one skeleton. We sometimes found coffin plates and letters that had been on the tops of coffins, but so corroded and crumbling as to make it almost impossible to understand their meaning. The letters were composed of brass tacks nailed to the coffin lids on strips of wood or leather, these strips dropping to pieces.

To show how disappointing this method of marking the coffins was, I will describe one or two:

One grave that we opened contained the skeleton of a woman—on her breast the scant remains of a tiny little skeleton —the little head by her cheek—and two little skeletons, evidently a previous interment, just under her feet. The tacks that had been on the outside of the coffin partly fastened together had fallen among these bones. Some seemed to be Roman numerals; others formed the letters E. J. Another grave contained the skeletons of two grown persons and of at least one child. Broken lettering had dropped down among the ribs. As usual, I got down into the grave and traced over the letters. Parts were the Christian symbol—the Greek letters. Among the disconnected tacks were some connected together to make us pretty sure of the name B. Harrison.

I should state here that almost from the time that I took charge of the property, I found small bits of glass outside of the east end of the church. In 1897 I found a great deal when digging where the Mrs. Mary Knight tombstone is.

In the latter part of May, 1901, a good deal of this glass was found between two of the newly exposed graves which lie east of the chancel towards the south—thus showing two windows back of the chancel. To the east broken glass, then large masses of brick and mortar, and then still east but towards the south much more of the broken small panes of glass was found. We found some of the diamond-shaped lead frame work that had held the little diamond-shaped panes of these chancel windows.

Inside of the church very near the chancel to the north side on the 2nd of June, 1901, we found much charcoal and many nails showing woodwork burned. We thought this was the pulpit. On the floor near the chancel we found some bronze letters. They and other pieces of metal so melted that we could only make out one letter. This was evidently from a mural table on the north wall. Quantities of broken glass and masses of bricks and mortar were found inside of the church foundation and outside of the north wall, showing that after standing some time that in some strong wind they had fallen toward the north.

The floor of the church was of brick and underneath filled with graves, many of them containing remains of four skeletons, showing four different interments. The lowest, deep in the virgin soil almost crumbling to dust, was the best preserved. There was no evidence of any coffin decoration in these very early graves.

June 25, inside of the church, we opened a grave (No. 6) containing two skeletons. In the first or lower one we found an Indian arrowhead. In the upper one, evidently of much later date, we found about the knees a brass coin much corroded; on one side could be seen, however, the letters HERSET. I sent this to a professional coin expert to examine. He said it was a "lucky pocket piece" such as worn in old times by grave diggers or any one and had accidentally been dropped. This sort of coin is called by coin collectors "Mireaux."

In many of the graves we found pieces of broken crockery, large oyster shells, etc. These, of course, were only put there to raise the coffins a little so that the lowering ropes could be drawn out; and the many broken pieces of pipes in the later graves were carelessly dropped by the grave diggers who in those days used tobacco to keep off contagious diseases.

Early in the excavating I found that it would be absolutely necessary to cut down some of the large trees. One was a very large sycamore, growing partly in the northeast corner of the chancel, one root of which extended across the chancel and the minister's and Knight's tombstones. To cut this down and get the root free from the wall took several hard days work for 14 men. Another was the large mulberry on the north side of the church near the tower. These two trees together with the top of the sycamore at the Blair tomb furnished the wood from which our Jamestown souvenirs have been made.

On the 20th of July our attention was called to a cornice brick used as a paving brick, the molding side down in the middle aisle near the tower on a grave*. This was the last day of my work at Jamestown at this time. After this the work was continued by Miss Mary Garrett and Miss Annie Galt, excavating the chancel, etc.

In a report like this, where a general idea must be given and brevity regarded, it is hard to tell all that was done at Jamestown; much has to be condensed and much left out.

On the 7th of June we discovered in the southwest corner of the church floor the 6 x 6 compartment in a frail foundation, the two spades and grubbing hoe of the sexton; the handles, of course, had been burned up. In the northwest corner opposite we found indications of a similar compartment of the same dimensions.

The floor of the church south of the middle aisle has not been excavated.

Respectfully.

MARY JEFFERY GALT,
Jamestown Committee.

IV. Subcommittee Report

Report of Subcommittee of Jamestown
Association for the Preservation of Virginia Antiquities
June 30, 1906

The undersigned of the Subcommittee of the Jamestown Committee of the APVA, with the assistance of Mr. Leal, began excavating in the southeast corner of the chancel.

Three and one half feet below the level of the offset of the foundation we found the bones of a child. One foot below these bones we found the skeleton of a man. The cranium was perfectly preserved, of classic shape, with low, broad brow. This skeleton was of medium height; the feet and half the leg bones extended beyond the east wall of the foundation of the church of 1638, seeming to prove that the interment was made prior to the laying of the foundation of the church of that date. A few nails were found in the earth excavated, and in the earth just above the man's skeleton was found some silver tinsel, perfectly bright and in good condition, which must have been ornaments of the coffin or pall to the coffin or decorations on the clothing of the person interred. It was found immediately above the shoulder bones of the skeleton.

July 1. The work was continued in the chancel. Three feet below the offset, to the north side of graves discovered June 30th, we found 2 skeletons side by side, both of men. They were not buried the same distance from east wall of foundation. The head of one skeleton was projecting beyond the chancel, west, into the body of the church. Nothing was found in these graves except several pieces of clay pipe stems, a few coffin nails, pieces of broken bricks and tiles, etc.

July 2. The same work was continued in the chancel. Excavating north from the last found grave we discovered a fourth grave. The skeleton was not lying on the back as was usually found but was resting on the side. This interment was made 2 feet from the east wall, and from the elbows up the bones lay beyond the west limit of the chancel into the body of the church. In this grave were found the usual number of nails, one of which was very large, a piece of frail corroded metal, probably a piece of coin, a small lead or pewter candlestick or sconce. Five feet below the offset to the east foundation, we found the pieces of brick indicating where the coffin had rested. Such bricks and lying in such position were found in each grave, some not so well preserved as others. One of the skeletons was that of a woman.

July 8. Continued our work of discovery in the chancel. We found another grave. In this was the skeleton of a large man, measuring 16 inches from knee to ankle bone. He was interred 2 feet, 6 inches from east wall. In this grave were found the usual number of nails, pieces of pipe stem and some fragments of pottery.

July 9. We continued the work in the chancel. We found some nails, one big key, small pieces of coffin wood, one piece of coffin handle, pieces of brick, tiles and oyster shells, that have been found in all the graves, pieces of pipe stem and two bowls of small clay pipe, and also lead from some windows. All of these were found 5 feet below the offset to east foundation or floor to chancel. The foundation of the church wall in center of the east wall is 6½ feet in height. We found that the wall varied in depth, the southeast corner being a little more than 3 feet in height. We found 6½ feet deep and 1 foot from the east wall another grave, making the seventh, containing a skeleton. Then on top of this another grave at less depth, 2½ feet from the east wall was found; at the head of this were found the feet of another skeleton extending into the body of the church. This third skeleton was one foot nearer the surface than the second.

* Thus showing that in the 1639 church or some previous church there had been some ornamental bricks used.

July 10. We continued our work and discovered the eighth grave in the chancel; found the usual pieces of bones, nails, pipestems, and one small pipebowl. Five feet below the offset or level to the chancel under the brick division separating the chancel from the body of the church, we found a large iron coffin plate in corroded and crumbling condition; beneath this plate we found bones one foot above this coffin plate, and 18 inches north of it was a skeleton extending into the body of the church 7 feet from the north wall of the foundation.

July 11. We continued our work in the chancel and reached the ninth grave and found two skeletons; one was 3 feet below the level of the chancel; the second one was 5 feet, 4 inches below. We found a number of nails, pieces of pipestems, one whole pipebowl with short length of stem, several broken pipebowls and spur with rowel in it, this, of course, much rusted.* This grave is the last one we opened. There is one more in the chancel next to the north wall which was opened and investigated and reported last year when the work was done there. This makes ten graves in the chancel, side by side.

July 16. We made a last visit to Jamestown and saw the earth carefully replaced in the chancel and thoroughly rammed, packed and left to settle; the tiles replaced in safe position to be permanently relaid when the weather in the fall will permit work to be resumed.

In summing up results we would say that while to the careless or casual observer it might appear as little in comparison to the time, labor, and efforts expended, yet we have gained several important facts. In moving the tiles for the purpose of investigation, we found them resting in a bed of mortar. This mortar rested on a foundation of 18 inches of such trash as collects over the ruins of any burned building, broken bricks and tiles, pieces of plaster discolored by fire and smoke, bits of glass, small fragments of charred wood, dirt, etc. We then reached another layer of mortar in which were still a few tiles the same width as the tiles above, but ½ inch thinner; this mortar was still in position, and in many places larger stretches of it still showed the imprint of the tiles. This flooring of tiles extended the width of one tile or 9 inches into the body of the church, under and beyond the present brick division now separating the chancel from the body of the church, showing that the first chancel was much longer in that direction than the dimensions of the present or 1638 chancel.

We found that the skeletons in the graves under the chancel do not lie directly east and west but a little northwest to southeast. Following the line of the little inner wall rather than the wall of the 1638 church, which the engineer last year pronounced to be most accurately placed according to the points of the compass.

Out in the churchyard we think we identified the grave of Lady Frances Berkeley, and over it we placed the fragments of her tombstone.

Respectfully submitted.

Mary Winder Garrett
Annie A. Galt
Acting Chairman.

Subcommittee of the Jamestown Committee, Association for the Preservation of Virginia Antiquities. This report was submitted by Mrs. Parke C. Bagby at the autumn meeting of the Association and published in the *Times,* Richmond, Va., November 5, 1902.

* No artifacts found by the A.P.V.A. in church or churchyard excavations were preserved with their provenience; hence it can only be assumed that most of the cultural debris was precedent habitation deposit, with a scattering of items included with the burials. J.L.C

APPENDIX D

Pictorial Record of Excavations and Artifacts

Photographs for excavations prior to 1954, except for a few surviving kodachromes from the 1940's, are limited to black and white negatives. Many of these are excellent, but they do not always represent a complete field record.

During the 1954–57 archeological investigations, pictorial records were kept to the best of the abilities of the field men and within the limitations of equipment, which was not adequate in the first year of operations. A total of 531 kodachrome 35 mm. slides were made of field operations and significant objects. More than 500 black and white pictures were taken of field operations, and more than 200 pictures of objects, paintings, and research subjects. Seven 100-foot reels of 16 mm. kodachrome motion picture film were taken of field work.

APPENDIX E

Flora and Fauna of Early Jamestown

The following notations on flora and fauna are taken from the scanty records of the 17th century. To the following specialists at the Smithsonian Institution goes credit for verification and comment: Dr. D. H. Johnson (mammals), Dr. H. Friedmann (birds), Dr. Velva Rudd (plants), and Dr. Ernest A. Lachner (fishes).

FLORA

These are the trees, shrubs, and herbs most commonly observed by the first settlers on Jamestown Island and adjacent lands of Tidewater Virginia:

Pine	*Pinus virginiana* Mill. Virginia pine.
Walnut	*Carya* spp. Sometimes called hickory. Bruce cites Force (Vol. III, p. 15) and Spelman's *Relation of Virginia* for the observation that a quarter of the forest trees were of this species. *Juglans nigra* L. Black walnut was most valuable.
Oak	*Quercus* spp. Red, black, white, chestnut, and Spanish.
Liveoak	*Quercus virginiana* Mill.
Cypress	*Taxodium distichum* (L.) Rich.
Red Mulberry	*Morus rubra* L. Adapted for silkworm raising. *Morus alba* L. This species, a native of China, was introduced by settlers.
Ash	*Fraxinus* spp. Useful for soap ashes and potash.
Cedars	*Juniperus virginiana* L. Red juniper.
Sassafras	*Sassafras albidum* (Nutt.) Nees. Common on Jamestown Island now as in 1607.
Elm	*Ulmus* spp. Minor importance.
Laurel	*Kalmia latifolia* L. Mountain laurel.
Locust	(?) Possibly the following: *Robinia pseudoacacia* L. Black locust. *Gleditsia triacanthos* L. Honey locust. *Gleditsia aquatica* Marsh. Water locust.
Dogwood	*Cornus* spp. *Cornus florida* L. Flowering dogwood.
Tulip Poplar	*Liriodendron tulipifera* L.
Balsam	Probably *Abies* spp. Balsam fir.
Sugar Maple	*Acer saccharum Marsh.* West of the Potomac River.
Chestnut	*Castanea dentata* (Marsh) Borkh.
Chinquapin	*Castanea pumila* Mill. Dwarf chestnut.
Hazel	*Corylus* spp.
Crab Apple	*Crataegus* spp.
Cherry	*Prunus serotina* Ehrh. Black cherry. *Prunus virginiana* L. Chokecherry. *Prunus pennsylvanica* L. f. Pin cherry.
Persimmon	*Diospyros virginiana* L.
Myrtle	*Myrica* spp. Bayberry.
Holly	*Ilex opaca* Ait.
Black Raspberry	*Rubus occidentalis* L.
Whortleberry	*Gaylussacia baccata* (Wang.) K. Koch. More properly, huckleberry.
Cranberry	*Vaccinium* spp.
Gooseberry	*Ribes* spp.
Blackberry	*Rubus* spp.
Dewberry	*Rubus trivialis* Michx.
Wild Grape	*Vitis* spp. Sloe, fox grape, and other varieties.
Strawberry	*Fragaria* spp.
Muskmelons	(?) Native?
Squashes, Gourds, and Pumpkins	*Cucurbita* spp.
Maracocks or Mayapples	*Podophyllum peltatum* L.
Beans	*Phaseolus* spp.
Maize	*Zea mays* L. Corn.
Tobacco	*Nicotiana rustica* L.
Wild Oats (Mattoum, in Algonquin)	*Avena fatua* L. The wild oat. More likely the reference is to *Uniola paniculata* L., commonly known as sea oats.
Water Flag	Cattail? Boiled and stripped for cordage and fibre.
Sumac	*Rhus* spp.
Puccoon	*Lithospermum* spp.
Snakeroot	*Eupatorium rugosum* Houtt. Also other genera.
Jimson Weed	*Datura stramonium* L. Jamestown weed, early noted as a narcotic. Introduced from Asia.
Briar	*Smilax* and *Rubus*. Various.
Honeysuckle	*Lonicera* spp.
Alder	*Alnus* spp.

FAUNA

"It is difficult to ascertain the reliability of some of the scientific names given to several of the common names [of fishes]. Without factual data in the form of descriptions, illustrations, or specimens, we cannot do anything but suggest probable names.

"The fauna has certainly changed since early American times, as well as the 'abundance' of certain 'food fishes.' These conditions make it even more difficult to 'tie down' certain common names used in the early days."

(*Note by Dr. Ernest A. Lachner, Associate Curator of Fishes, United States National Museum.*)

Fish and other seafoods, mollusks, and crustacea were of the greatest importance to the settlers. Civilization has greatly changed the pattern of aquatic life in Tidewater Virginia, chiefly in depleting certain species. The settlers were familiar with the following:

Alewife	*Pomolobus pseudoharengus.* Of the herring family.
Sheepshead	*Archosargus probatocephalus.*
Shad	*Alosa sapidissima.*
Sturgeon	*Acipencer sturio.* Large and numerous—as long as 12 feet!
Herring, more likely Menhaden	*Brevoortia tyrannus.*
Rock	*Roccus saxatilis.* Several of the family *Scorpaenidae*—possibly a killifish, *Fundulus majalis.*
Sole	*Achirus fasciatus.*
Butt	(?) A flounder or flatfish? *Pseudopleuronectes americanus.*
Mullet	*Mugil cephalus.*
White Salmon	The "true salmon or trout" were probably never abundant enough to be of any food value to the early American settlers. This name may have referred to one of several common marine fishes that were "salmon shaped" and "silvery." A guess is hazardous.
Roach, probably Spot	*Leiostomus xanthurus.*
Plaice, probably Southern Flounder	*Paralichthys dentatus.*
Eels	*Anguilla rostrata.*
Lampreys	*Petromyzon marinus.*
Cat	*Galeichthys felis.*
Perch	*Perca flavescens.*
Tailor, the Bluefish	*Pomatomus saltatrix.*
Sun or Sunny	Probably *Eupomotis gibbosus.* A small sunfish.
Bass	*Micropterus salmoides.*
Chub	Any of several common cyprinoid fish of the Atlantic coast, such as the horned dace, *Semotilus atromaculatus,* or the fallfish, *Semotilus corporalis.*
Flounder (other than Plaice)	*Pseudopleuronectes.*
Whiting	*Menticirrhus.*
Flatback	We can find no reliable reference to this name. Dr. L. P. Schultz, Curator of Fishes, United States National Museum, and Mr. Isaac Ginsburg, United States Fish and Wildlife Service, could offer no help. Mr. Ginsburg has spent his life studying western Atlantic fishes and is the best living authority.
Jack	(?) *Poronotus,* the *Pompano* or *Caranx,* a jack. Probably refers to a species of *Caranx,* commonly called jacks.
Carp	This may have been one of our suckers. The "carp," *Cyprinus carpio,* so widely known in the United States today was not known to the settlers, for it was not introduced into America until the late 1860's.
Pike	Probably a gar pike, of the family *Lepisosteidae.*
Breme or Bream	Probably the golden shiner, *Notemigonus crysoleucas,* depending on local terminology; or sunfish, *Lepomis.*
Stingray	*Dasyatis.*
Drum	*Pogonias cromis.* The common drumfish, known to attain a weight of more than 100 pounds and described by 17th century settlers as 6 feet in length.
Toadfish	*Opsanus tau.*
Smelt	Probably a silverside, *Menidia.*

To these fresh and tidewater dwellers can be added mollusks (especially large and numerous oysters which were much fancied by the settlers and were always an important item of diet for prehistoric and historic inhabitants) and crustaceans—the crabs (one species having great size and much meat), fiddler crabs, etc.

The bounty of fish in the tidewaters was impressive in the early days of settlement, especially in spawning season. Shad and sturgeon threatened nets and the latter were even killed with axes near Jamestown (Rolfe's Relation, *Virginia Historical Register,* Vol. I, No. III, p. 106). John Smith was impressed with the pneumatic toadfish and fancied himself lost when stung by a stingray.

Archeological evidence at Jamestown is abundant for the use of oysters as food—shells are usually present in fills of all types. They were used in the very mortar and plaster and pargetry of the houses. Oyster shells were the common source for lime and an important item from the founding days of the settlement to the abandonment of Jamestown.

Conversely, traces of fish are rare because of the acid soil and perishability of the bones.

Among the reptiles and amphibians, those of economic importance were turtles, then common in the Tidewater, and land tortoises, the carapaces of which are frequently encountered at Jamestown and in prehistoric aboriginal sites. Strachey (p. 127) mentioned the latter as eaten daily by the settlers. Oddy, bull and tree frogs are not recorded as an item of diet—but if they were not used it was by cultural, not gustatory, determination. At least, they were appreciated during "Starving Time" (1609-10).

On the debit side, Jamestown did have some poisonous snakes, notably the copperhead and possibly the water moccasin (his-

torically, not observed north of the James River). Most of the snakes were harmless and beneficial, such as puff adder, corn, black, water, and horn snakes. However, neither they nor any other natural enemy could cope with the European brown rat. This hardy creature quickly established itself in Virginia wherever civilization brought its blessings. It did grievous damage and still does.

Of all the fauna, the birds probably most impressed the settlers. Wild fowl, like the fish, were present in Tidewater in truly fabulous numbers, especially in migratory seasons when they were drawn to the rivers, marshes, and sounds by lush aquatic vegetation such as wild celery and oats, and by the abundant crustacea. Some may be listed as follows:

Ducks	*Aythya valisineria.* Canvas-back. *Aythya americana.* Red-head. *Anas platyrhynchos platyrhynchos.* Mallard. *Mareca americana.* Wigeon.
Dottrell	*Arenaria interpres.* A shorebird, the turnstone.
Oxeye	A name used for small sandpipers of several species.
Wild Goose	*Branta* sp. (?)
Swan	Probably the whistling swan, *Olor columbianus.*
Plover	*Charadrius* sp. There are several possibilities.
Snipe	*Capella gallinago delicata.*
Woodcock	*Philohela minor.*
Curlew	*Numenius* spp. Several possible species.
Blackbird	*Agelaius phoeniceus.* Redwing blackbird.
Turkey	*Meleagris gallopavo.* Very numerous in early Virginia, still extant in small numbers.
Heron	*Ardea herodias.* Blue heron.
Egret	*Casmerodius albus egretta.*
Sora	*Porzana carolina.* A short-billed North American rail.
Eagle	*Haliaeetus leucocephalus.* Bald eagle.
Crow	*Corvus brachyrhynchos.*
Owls	*Tyto alba.* Barn owl. *Otus asio.* Screech owl.
Turkey Buzzard	*Cathartes aura septentrionalis.*
Whip-poor-will	*Caprimulgus vociferus.*
Jay	*Cyanocitta cristata.*
Snow Bird	*Junco hyemalis.* Slate-colored junco. Possibly also the snow bunting, *Plectrophenax nivalis.*
Cardinal	*Richmondena cardinalis.*
Lark	*Eremophila alpestris.* Horned lark.
Kingfisher	*Megaceryle alcyon.* Belted kingfisher.
Dove	*Zenaidura macroura.* Mourning dove.
Martin	*Progne subis.*
Hummingbird	*Archilochus colubris.*
Bluebird	*Sialia sialis.*
Goldfinch	*Spinus tristis.*
Partridge	*Colinus virginianus.* Bobwhite or quail.
Pheasant	*Bonasa umbellus.* Ruffed grouse.
Pigeon	*Ectopistes migratorius.* The passenger or wild pigeon. These birds were irregularly migratory and almost incredibly numerous when in passage flights. Easily killed, they were later to be slaughtered by the hundreds of thousands for market purposes and are now extinct.
Parakeet	Common in Tidewater in the days of settlement, but now extinct there. Parakeets extended south through Florida. Hariot, in *A Brief and True Report of the New Found Land of Virginia,* mentions "parets" on the Capes of Hatteras in 1585.
Woodpecker	Several possibilities.
Mockingbird	*Mimus polyglottos.*

Virginia had one ubiquitous and preeminent land mammal which was a prime source of meat to the Indians and to the first settlers: The Virginia or white-tailed deer, *Odocoileus virginianus.* Force (Vol. III, p. 13) states that in 1610 "hard by the fort, two hundred in one herd have been usually observed." Despite the depredations of civilization, this incredibly persistent animal still abounds on the York Peninsula. In 1957 many of them braved the presence of an astronomical number of ticks and swarms of visitors to the 350th anniversary celebration to enjoy the thickets of Jamestown Island. Some of the other land mammals mentioned in early 17th century references follow:

Elk	*Cervus canadensis.* Presence inferred from descriptions of Hamor, Strachey, and Force.
Eastern Bison	*Bison bison.* In 1613 Samuel Argall wrote to Nicholas Hawes that he saw many "cattle" big as kine, easy to kill and slow and heavy. Purchas *Pilgrimes* speaks of the "shaggy" coats of these "cattle." There is little doubt that bison of the eastern variety ranged sufficiently east of the Appalachians to be seen in the upper tributaries of the Chesapeake Bay waters.
Wolves	Present and an annoyance to the early planters. They were said to be relatively small, but vicious. Presumably they were a variant of *Canis lupus,* or possibly of *Canis niger,* the red wolf of the Mississippi Valley.
Black Bear	*Ursus americanus.*
Dog	Known to the Indians. Described as appearing like a cross between a wolf and *Canis familiaris,* a scavenger and carrion eater.
Gray Fox	*Urocyon cinereoargenteus.* Red foxes were introduced into this area from England by colonists. There is no evidence that they occurred here before sometime in the 18th century.
Beaver	*Castor canadensis.*
Raccoon	*Procyon lotor.*
Otter	*Lutra canadensis.*
Mink	*Mustela vison.*
Wildcat	*Lynx rufus.*
Skunk	*Mephitis mephitis.*
Marten	(?) The only marten-like animal in this region was the fisher, *Martes pennanti,* and it was restricted to the highest parts of the Appalachians.

Squirrels	*Sciurus carolinensis.* Gray squirrel. *Sciurus niger.* Fox squirrel. *Tamiasciurus hudsonicus.* Red squirrel. *Glaucomys volans.* Flying squirrel. No ground squirrels in this area except chipmunk, *Tamias striatus,* and woodchuck, *Marmota monax.*
Hare	Probably the cottontail rabbit, *Sylvilagus floridanus.*
Opossum	*Didelphis marsupialus.*
Muskrat	*Ondatra zibethicus.* Still numerous in the marshes of Jamestown Island.
Panther	*Felis concolor.* This large cat, sometimes called cougar or American lion, was extant in the upper Tidewater reaches in the days of contact with the wilderness. It was seen in Gloucester County as late as the end of the 17th century. See Bruce, *Economic History of Virginia,* Vol. I, p. 128.

Of insects we have little descriptive material. Plainly, the insect which most concerned the settlers was the indigenous mosquito which smote them early and often when the season was on, doubtless carrying the principal fever. This was more likely yellow fever than malaria, since the settlers became "seasoned" to it—if they survived.

Ticks (not insects, but arachnids) presumably are a recent import. Had they been present, the settlers would certainly have described this greatest present threat—with mayflies a close second—to human joy at Jamestown.

APPENDIX F

Note: These tabulations of artifacts by feature at Jamestown are presented, not only to substantiate observations and conclusions in the foregoing text, but also to provide comparative cultural and architectural data for students of the 17th- and 18th-century colonial sites in the New World.

TABLE X.—*Structure 17*

Artifacts	F–1 (West)	F–2 (Central)	F–3 and General
Ceramic:			
Brick: Local, from fill (see text for measurements)			
Dutch	.....	South stair	F–3 floor (part)
Tiles, roofing: Flat, most with mortar adhering	.....	.....	10
Pantiles	.....	.....	100 (est.)
Stoneware, salt-glazed:			
German: Brown-mottled	3	(F–2 presumed) Bartman large jug, date 1661 and medallions (old Cat. No. 46)	
Blue-on-gray	16	13	
English: Brown-mottled	1	9	
White	7 (1 with molded pattern)	3	
Earthenware:			
Spanish (?) Olla	1	3	
Locally made (?), unglazed	4		
Locally made, lead-glazed	32	53	
English slip-decorated (brown spots, yellow glaze)	.....	8	
English sgraffito	3	9	
Italian sgraffito	1	1	
English lead-glazed: Dark	3	12	
Light	17	20	
English coarse-tempered, Devon	18 (including rectangular baking dish)	5	
Small earthenware bowl, lead-glazed interior, probably English, 1660–1700 (J–7582)	.....	1	
Large pot, lead-glazed interior, probably American late 17th–early 18th century (J–7597)	.....	1	
Delftware:			
B/W (English-Dutch)	28 (1 English transfer printed)	89	Not counted.
English: White	.....	13	
Purple/white	.....	2	
Manganese purple-speckled	.....	7	
Polychrome	.....	1	
Orange/white	.....	1	
Creamware	1	3	

TABLE X.—*Structure 17*—Continued

Artifacts	F–1 (West)	F–2 (Central)	F–3 and General
Ceramic—Continued			
Porcelain:			
English?	1		
Oriental		1	
Tobacco pipes:			
Stems, white:	1680–1710?	1670–1700?	
5/64	5	5	
6/64	70	55	
7/64	23	33 (2 from below floor bricks)	
8/64	5	8 (one from below floor bricks)	
9/64		2	
Bowls, white:			
1680–1710		2	
1690–1740	22	51	
Stems, brown:			
5/64		3	
6/64	2	7	
7/64	9	38	
8/64	13	62	
9/64	3	19 (one from below floor bricks)	
10/64		1	
11/64		2 (one from below floor bricks)	
Bowls, brown, indeterminate	several est. 1680–1740	several (one nearly complete pipe beneath paving, est. 1650–80)	
Metal:			
Iron:			
Hinges:			
Butterfly, 3″ and 4″		2	
Cocks Head, 6½″ x 3⅜″			1
H-Hinges, 5½″ to 7¾″		3	1
Strap, some pairs, some with pintle, 12″ to 24″		27	5
Pintles, 2⅜″ to 4¾″		12	10
Lock plate:			
3¼″ x 4⅝″ with "cross" keyhole		1	
2 holes, 2⅞″ x 3¾″			1
2¾″ x 3¾″		1	
Rim lock (?), 3″ x 4″		2	
Cabinet (?) lock, 2½″ x 2¾″, heart-shaped			1
Lock fragments, lot		1	
Lock bolt, 12¼″ long			1
Keys, 4¼″ to 5½″		2	2
Latches, 5″ to 10½″ long		3	
Catch, 3⅛″		1	
Casement, 4¼″ and 8½″		2	
Hasps:			
¾″ hasp and staple		1	
4⅜″		1	
Spikes, 3″ to 9¼″, heads, ¾″ to 1¾″		6	6
Staples, 2¼″ to 5″		3	3
Hooks, 3½″ to 6½″		2	

TABLE X.—*Structure 17*—Continued

Artifacts	F–1 (West)	F–2 (Central)	F–3 and General
Metal—Continued			
Iron—Continued			
Nails: Estimate 20 lbs. Originally excavated from general structure—present number unknown. All wrought, mostly rose-headed, HABS sheets show 2″ to 4″ illustrated.			
Fire fork	.....	1	
Flintlock (J–301)	.....	1	
Ladle	.....	1	
Hammer	.....	1	
Fire tongs, long	.....	1	
Poker	.....	1	
Adz	.....	1	
Casements:			
2 fragments of a casement and 4 fragments of saddle bars	.....	1	
Fragment of casement, 7½″ x 14″	.....	.....	1
2 saddle bars (broken)	.....	.....	2
Fragment of casement, 5″	.....	.....	1
Spade blades, 7¾″ and 10¾″ long	.....	.....	2
Miscellaneous iron (unspecified)	66 (cannot at present be identified in collection)		
Brass:			
Molded, round-headed upholstery tack	.....	1	
Pan, brass, with handle	1 (J–10, 926)		
"Lead and brass objects" (unidentified)	.....	11	
Lead:			
Objects, unidentified	.....	29	
Cames, pieces	.....	.....	23 plus
Pewter, basin, 13″ diameter, 3½″ high (J–7773)	.....	1 (?)	
Glass:			
Window, diamond-shaped, green to clear	17 pieces	.....	Lot 13 4″ x 4″ x 1″2boxes
Wine-bottle fragments (early 18th century)	250	1375	
Restored wine bottles (old Cat. No. 7514, 678, 2)	2—late 18th century	1—fourth-quarter, 17th century	
Plaster, ornamental:			
Pieces from south stair	.....	5	
West wall, pieces	.....	8	
Pieces, at large	.....	26	
Fireplace, south center section	.....	22	
Slate, roofing:			
8¾″ x 5″	.....	1	
Fragments	4 (1 w/nail hole)	3	

TABLE XI.—*Structure 18*

Artifacts	Lot 89:113, old lot 184—mostly general but some from vicinity of S–18, Ditch 15, and Well 3
Ceramic:	
Bricks	Described as present only; assumed local
Tiles, roofing:	
Flat	20 fragments, no mortar adhering
Pantiles	200 fragments, est.
Stoneware, salt-glazed:	
German brown-mottled	71 (1 fragment Bartman jug w/medallion)
German blue-on-gray	128
English (?) mottled brown	12
English white Staffordshire	16 (ca. 1760)
Earthenware: Locally-made lead-glazed, English lead-glazed, light and dark, are represented; also some coarse-tempered English utility-ware.	Est. 200 sherds, all suggesting second-half 17th century—probably mostly third quarter
Delftware: English-Dutch B/W, English delft (1640–50) plates, vessels and porringers.	Est. 200 sherds
Spanish and Lisbon majolica	Est. 20 sherds
Tobacco pipes:	
Stems, white:	
6/64	25 Note: 102 out of estimated 300
7/64	51 fragments were measured as
8/64	23 sample.
9/64	3 1650–80 plus 4–"LE"; 1–"WG"; 1–"R"
Bowls, white (All last-half 17th century, majority last quarter.)	100 est.
Stems, brown (Two-thirds are 9/64 or larger, 1/3 are 7/64 and 8/64.)	100 est.
Bowls, brown (Last-half 17th century (est.).)	20

Artifacts	Lot 89:113, old lot 184—mostly general but some from vicinity of S–18, Ditch 15, and Well 3
Metal:	
Iron:	1—4 in., directly above S–18:
Spear head, wrought-iron	1
3–tine kitchen fork, without handle	1
Flint-lock pistol spring	1
Flint-lock pistol lock fragment	1
Scythe blade fragment	1
Key, 3" long	1
Handwrought nails, spikes, tacks, many with mushroom heads, fragments of strap iron and plate, knife blades and indeterminate.	2600 est.
Brass:	
Spoons	2
Tacks	2
Objects, indeterminate	4
Spoon fragment	1
Brass and lead objects, indeterminate	2
Brass and peweter handle	1
Lead:	
Bale seal	1
Came fragment	1
Shot	1
Pewter flagon fragment	1
Silver, token	1
Glass:	
Wine bottles: Fragments 1660–75 (some to end of century)	700
Whole with fleur-de-lis seal	1
Gin bottles, fragments	50
Bottle seal, fleur-de-lis	1
Ornamental plaster, fragments	195

TABLE XII.—*Structures 19A, 19B, and 45; Wells 4 and 11; Ditches 17 and 18. (Lot 23, general)*

Artifacts	S–19A fill	S–19B	S–45	Ref. pit E. of S–19B	W–4	W–11	D–17	D–18	Lot 23
Ceramic:									
Brick, local (see text) water table	8								
Tile: Paving tile	2	33	.....	1					
Roofing (9 to 10 x 5½ to 5⅜ x ½ to ⅝ inches)	.....	.....	.....	.....	.....	.....	.....	.....	20 (w/ mortar)
Pantile (13 x 9¼ to 9½ x ½ inches) fragments:	700 in vicinity of S–19A and 19B.		.....	6					
Salt-glazed stoneware:									
German brown-mottled	.....	.....	.....	.....	.....	.....	.....	.....	31 (some 18th C.)
German blue-on-gray	1 (jar)	.....	.....	.....	.....	.....	.....	.....	50 (¼ 18th C.)
White, decorated with blue and purple—17th century Westerwald	.....	1 (jug Cat. No. J–7517)							
English: Staffordshire (after 1750)	.....	.....	.....	.....	.....	.....	.....	.....	1
Earthenware:									
Locally made, lead-glazed	.....	.....	.....	.....	.....	.....	.....	.....	100
American (?) lumpy glaze	1 small jar (J–7590)								
English lead-glazed, dark	.....	.....	.....	.....	.....	.....	.....	.....	6
English lead-glazed, light	.....	.....	.....	.....	.....	.....	.....	.....	70
Coarse-tempered Devonshire	.....	.....	.....	.....	.....	.....	.....	.....	17
English slipware:									
Marbled	.....	.....	.....	.....	.....	.....	.....	.....	3
Creamware (after 1750)	.....	.....	.....	.....	.....	.....	.....	.....	1
English sgraffito	.....	.....	.....	.....	.....	.....	.....	.....	2
Italian sgraffito	.....	.....	.....	.....	.....	.....	.....	.....	1
Delftware:									
Blue/White, English-Dutch	.....	.....	.....	.....	.....	.....	.....	.....	120
English white	.....	.....	.....	.....	.....	.....	.....	.....	10
Tobacco pipes:									
White stems:									
5/64	3	4	.....	.....	1	.....	1		
6/64	23	7	8	3	1	.....	.....	1	
7/64	23	32 (1–dec.)	33 (2–dec., 1–"LE")	13 (1–dec.)	6 (1–dec.)	50 (2–dec.)	1	7	
8/64	13	14 (1–dec.)	17	16 (1–dec.)	.....	25	.....	1	
9/64	5	3	.....	2	.....	8			
White bowls:									
1600–1625	.....	.....	.....	.....	.....	.....	.....	.....	1 (Old Cat. 7051)
1650–1675	1	2	.....	1	.....	14			
1675–1700	15	4	5	7 (1–"LE")	2	25			
18th century	1 (complete) [2 frag. lead pipe]								
Brown stems:									
6/64	1	.....	1	.....	1				
7/64	5	2	1	3	1	.....	1		
8/64	9 (1–dec.)	9	4	13	.....	30	.....	3	
9/64	11 (1–dec.)	3	7	15	.....	30	.....	1	
10/64	1								
Brown bowls:									
1675–1700 (estimated)	.....	.....	1	5	1	5			
Porcelain (Oriental) teacup	1								

TABLE XII.—*Structures 19A, 19B, and 45; Wells 4 and 11; Ditches 17 and 18. (Lot 23, general)*—Continued

Artifacts	S–19A fill	S–19B	S–45	Ref. pit E. of S–19B	W–4	W–11	D–17	D–18	Lot 23
Metal:									
Iron:									
Nails	Quantities of nails and spikes in and around Structure 19.								
Spikes	.....	2 (door)							
Pintles	2	.....	.....	.....	2				
Staples	1								
Bolts	1								
Latch bar or bolt	.....	.....	.....	.....	.....	1			
Escutcheons	1								
Keys	1								
Drawer pulls	present								
Center strap hinge	1	.....	.....	.....	.....	1			
HL hinge	.....	.....	1						
Cabinet hinge	.....	1							
Lock plate	.....	1							
Strap hinge with pintle	1	.....	.....	.....	1				
Strap hinges, large	2								
Butterfly hinge	.....	.....	.....	1					
Chest or door pull	.....	.....	.....	.....	1				
Casement frame fragments	1								
Fireplace spit	1								
Sword blade fragment	1								
Rapier, hilt	1								
Cannonball	1 (floor)								
Brass:									
Piece, indeterminate	1								
Trigger guard	1 (surf.)								
Spoon bowl	1								
Thimble	1 (vault)								
Brass and silver button	1								
Copper pot lid	1								
Lead: Came fragments	several	.....	.....	2					
Tobacco-pipe fragments	2								
Pewter, spoon handle (*pied-de-biche* type)	1								
Silver, spoon bowl	1 (Old Cat. 2112)								
Glass:									
Window-quarrel fragments	60+ (J–7295)	.....	.....	55	.....	.....	.....	.....	12
Bottles: Gin	.....	.....	.....	.....	.....	.....	.....	.....	2
Wine (some melted, 19A floor)	231 last Q; 17th C.; 2—18th C.	.....	25— last Q 17th C.	.....	10— last Q 17th C.				300— last Q; 20—3rd Q 17th C.
Bottle, recon. 1675–1700	1								
Goblets, fragments	1 (Old Cat. No. 5617)	.....	.....	.....	.....	.....	.....	.....	2
Bottle seals	1 ("GL")	.....	.....	.....	.....	.....	.....	.....	1 ("HG")
Roofing slate	.....	.....	.....	.....	.....	.....	.....	.....	present
Arrowhead, Indian	1								

TABLE XIII.—*Structure 21*

Artifacts	0–12"	12"–24" 12"–clay	Brick to 12" above brick	Add'n W. of fireplace wall	Brick fill behind hearth	18" below paving	Depth unknown
Ceramic:							
Brick:							
Local Note: 9 brick fragments from Lot B 86 are fired dark-gray and 5 have glaze on them. 12"–clay		4¼ x 9 x 2⅜ 4 x 8½ x 2¼ 2 chamfered		1 (4½ x 8⅜ x 2⅛)			
Dutch							45
Tile, roofing:							
Flat (12 drawers from Lot B–86)		30	7		1		81
Pantiles			1				
Earthenware:							
Local, unglazed	1						
Local, lead-glazed	9	48				4	
N. Devon coarse-tempered		49			1	3	3
English lead-glazed, dark		7			2	3	2
English lead-glazed, light	4	22					2
Saucer, 1650–1700							1 (Old Cat. 281)
Spanish olla		1				1	
Delftware: b/w, Eng.-Dutch	2	9					1 restored ointment cup (J–7319)
Bristol delft plate "Britannia Rules the Seas"		1					
English white		12			3		
Eng. (?) Black-on-white		1					
Hispanic tin-glazed large plate		1 (J–7328)					
Lisbon majolica		2					1 large plate (Old Cat. 1467)
Tobacco pipes:							
White stems:							
6/64		1 (IF)			4		
7/64		7 (4 LE, 1 Fleur-de-lis, 1 dec.)			10		
8/64		6 (3 LE, 2 dec.)			3		
White bowls:							
Intermediate					10		
1675–1725		4 (1 TO)			4		
Brown stems, 8/64					2		
Indian pottery (undescribed)							8
Porcelain (Oriental)		2			1		
Metals:							
Iron:							
Stirrup							1
Jew's-harp							1
Scissors	1						
Buckles							5

TABLE XIII.—*Structure 21*—Continued

Artifacts	0–12"	12"–24" 12"–clay	Brick to 12" above brick	Add'n W. of fireplace wall	Brick fill behind hearth	18" below paving	Depth unknown
Metals—Continued							
Iron, knife-blade fragment	1						
Lead:							
Buttons, indeterminate							2
Bale seal							1
Brass:							
Pins							5
Snuffer							1
Buckle	1						1
Thimbles							3
Eyelet			1				
Handles, indeterminate							2
Coin (copper?) indeterminate							1
							Geo. III 1773
							1 Carolus II 1672
							1 Ca.–FRA ET. HIP. R
Trade token							Henry Jenner 1656
Pewter:							
Cylinder, indeterminate		1					
Spoon handles		2 (one is the Copeland spoon, 1675)					
Slate:							
Flagstone		5	1				
Roofing			±20				
Glass:							
Wineglass or goblet, fragment							55
Window	28						106
Bottles:							
Gin		3 or 4	several				
Wine	several	3 or 4		several			1 (Old Cat. 517)
							several frag.
							1640–1650
Seals							2 HG, FN, GL, IR
Bone:							
Die	1						
Handle							5
Indian projectile point	1						3

TABLE XIV.—*Structure 31*

Artifacts	Below fallen E. Chimney	On steps or 12" to cellar floor	Fill: General	Vicinity
Ceramic:				
Bricks:				
Local (of fallen chimney)	Av. 8¾ x 4¼ x 2½ to 2⅜			
Local, molded, many types including gauged water table, flat door and window angles, ovolo molded and squincheon			Several	
Tiles, roofing:				
Flat			20 (selection)	
Pantiles			4 (selection)	
Stoneware:				
Salt-glazed			Fragments of 1 or 2 large 18th C. stoneware crocks	
Brown-mottled		2 fragments of small jar		
Blue- and purple-on-gray		2 fragments of German small mugs		
Earthenware:				
Lead-glazed				
Probable locally-made		10		
" English		2		
Milk pan, N. Devon, coarse temp.—J–7530		1		
Pot cover—J–7476		1 (initial "X")		
Delftware:				
Dutch 17th C. (late)		4	1	
Probable English 18th C.		12		
Tobacco Pipes:				
Stems white:				
4/64	7	12	400 to 500 stem and bowl fragments, ranging from first half, 17th century to early 19th century. Most from first half of 18th century. (Both white and brown stems represented, the white in the great majority.)	
5/64	10	25		
6/64		4		
7/64	2	4		
8/64		5		
9/64	2			
Bowls, white:				
1680–1720	4			
post–1720	2	7 (2–TD)		
Stems, brown:				
7/64		1		
8/64		1		
9/64		1		
Metal:				
Iron:				
Undefined			Many pieces—to be identified from collection	
Andiron, English make, 17th-century type, probably ca. 1650, decorated with cherub head			1 (J–2978)	
Brass:				
Buttons			4	3
Buckles			6	8
Thimbles			2	3
Spigot		1		
Spur			1	
Spoon bowl		Cat. No. 2104 under crosswall—1		
Tube—pistol barrel?			1	

TABLE XIV.—*Structure 31*—Continued

Artifacts	Below fallen E. Chimney	On steps or 12" to cellar floor	Fill: General	Vicinity
Spoon: Bowl, latten				1
Handle, latten, trifid		1		
Rings			3	
Candlestick fragment		1		
Candle snuffer			1	
Tack		1	1	
Skillet fragment and chafing dish		2		
Enameled handle				1
Clock wheel		1		
Sheet			1	
Miscellaneous unidentified objects		3		15
Copper coins:				
Probably George III			1	
Georgius III Rex Virginia 1773				1
Silver, buttons		1		1
Pewter:				
Spoon handle			3 (1 round end)	
Spoon bowl			1	
Button		1		
Handle fragments		1		1
Flask top			1	
Lead:				
Cames			7	5
Fragments, indeterminate, sheet		2	1	2
Ball			1	
Ring			1	
Glass:				
Window	12		(10 in collection—65 listed in catalog)	
Wine bottles:				
4th Quarter–17th century			2 J–7567 J–7572	
Late 17th–early 18th century			5	
Late 18th century			13	
Indeterminate			70	
Plaster:				
Plain, oyster shell		25 (against both wood and brick)		
Pargetry (from 50,000 original total)		200 plus		

TABLE XV.—*Structures 23, 49, 55*: Lot 98:100 (Old 34)*

Type	Lot in General—Surface—undisturbed
Ceramic:	
Brick, local (see text)	
Tiles, roofing: Flat	10
Pantiles	50
Pipes:	
White stems:	
6/64	21
7/64	45 (1–LE)
8/64	26 (1–WE)
White bowls, 1675–1720	5
Brown stems: 7/64	6
8/64	18
Glass, wine-bottle fragments, 1675–1700 plus	150 (est.)

* No significant data pertaining to these 3 structures appears on the structure artifact cards.

TABLE XVI.—*Structure 26 and Vicinity*

Artifacts	No data	0–18″	0–2′	0–3′	15–36″	18–40″
Ceramic:						
Bricks:						
Local (see text)						
Dutch	1					
Tiles: Roofing (see text), flat	600±	.....	.....	.....	.....	217
Floor	1					
Fireplace, Dutch	.....	1				
Brown-glazed, 1⅛″ thick	3					
Stoneware, salt-glazed:						
German brown-mottled	.....	3	2	4	.....	1
German blue-on-gray	2	5	.....	4	.....	1
English gray	6	1	2	1	.....	1
Earthenware:						
Indian cord-marked pottery	4					
Locally made, lead-glazed	46	18	11	12	.....	15
Locally made, unglazed	3					
Spanish olla	2	1	.....	2	.....	2
North Devon coarse-tempered	6	2	3	.....	.....	5
English slipware:						
Combed	1					
Marbled	2	2	1			
English hard-fired red ware	9	2	8	1		
English lead-glazed:						
Dark	5	10	8	2	.....	7
Light	22	13	9	4	.....	16
English sgraffito	.....	.....	2	3		
Hispanic-Italian green-glazed ware	2					
Italian sgraffito	5					
American Rockingham (19th–20th C.)	.....	2				
Misc. American (?) 19th C. wares	5	1				
Delftware:						
Blue/White (English-Dutch)	17	21	1	14	.....	2
English White	9	4	.....	7	.....	2
English manganese Purple/White	1	2	1			
Blue and Purple/White (Lisbon majolica)	4	4	.....	3		
Porcelain (Oriental)	.....	.....	.....	1		
Pipes:						
White stems:						
6/64	9	.....	.....	.....	14	
7/64	11	.....	.....	.....	25	
8/64	18	.....	.....	.....	20	
9/64	7	.....	.....	.....	10	
White bowls:						
1625–50	2	.....	.....	.....	(1 dec.)	
1650–75	1					
1675–1700 +	5					
Brown stems:						
7/64	8	.....	.....	.....	5	
8/64	21	.....	.....	.....	29 (1 dec.)	
9/64	14	.....	.....	.....	5	
10/64	4	.....	.....	.....	3	
12/64	.....	.....	.....	.....	1	
Brown bowls, Indeterminate	1					
Glass:						
Window	6					
Bottles, gin	.....	.....	.....	.....	4	
Bottles, wine	2 drawers (4th Q.)	.....	.....	.....	11	
Modern, white	.....	.....	.....	.....	1	

TABLE XVI.—*Structure 26 and Vicinity*—Continued

Artifacts	No data	0–18″	0–2′	0–3′	15–36″	18–40″
Metal:						
Iron:						
Lock plates	3					
Spikes, wrought	6					
Staple, wrought	1					
Key	2					
Knife blade and bone handle	.....	.....	.....	.....	.....	1
Chest lock	1					
Strap hinge	1					
V-shaped padlock	1					
Drawer handle	1					
Lead, came	1					
Brass:						
Pin	.....	.....	.....	.....	.....	1
Thimble	.....	.....	.....	.....	.....	1
Spoon bowl	.....	.....	.....	.....	.....	1
Objects, unidentified fragments	85					
Ring	.....	.....	.....	.....	.....	1
Pewter:						
Tankard hinge	.....	.....	.....	.....	.....	1
Spoon handle	.....	.....	.....	.....	.....	1
Copper, tack	.....	.....	.....	.....	.....	1
Slate	30					

TABLE XVII.—*Structures 27, 28, and 67; Lots 59 and 60 (96:99 and 96:100)*

Type	S–27 and vic.	S–28 and vic.	In S–67	Lots 59 and 60
Ceramic:				
Brick, local (see text)				
Tiles: Floor (glazed, one a kiln prop)	3 (5 in cat.)			
Roofing, unspecified	52			
Earthenware:				
Local, lead-glazed	30	.....	2	43
English, lead glazed:				
Dark	3	.....	.....	2
Light	15	.....	.....	5
Coarse-tempered, N. Devon	1	.....	.....	5
Hispanic 2-handled jug, amphora	.....	.....	.....	13 (2 vessels)
English slipware, combed	1			
Italian sgraffito	1			
Delftware:				
Blue/White, E–D	39 (15 blue spatter—2 in S–27)	.....	3	54
English, white	1	.....	.....	17
Lisbon majolica	.....	.....	.....	1
Spanish majolica	2	.....	.....	2
Tobacco pipes:				
White stems:				
5/64	.....	.....	.....	2
6/64	3	5	11	49
7/64	14	24	8	54
8/64	21	19	4	40 (I–LE)
9/64	2	10	1	12
10/64	.....	1		
White bowls:				
1600–25	.....	.....	.....	18
1625–50	1	.....	.....	4
1650–75	.....	2	3	3
1675–1700 plus	3	12 (6—no heel)	3	29 (9—no heel 1–L, 1–W)
Brown Stems: (All decorations are punctate.)				
6/64	.....	.....	.....	7
7/64	1	.....	2	31 (2 dec.)
8/64	9	10	.....	67 (5 dec.)
9/64	4	8	2	47 (4 dec.)
10/64	.....	.....	.....	4 (1 dec.)
Brown bowls:				
1650–75?	9 (1 waster, 1 dec.)	.....	.....	10 (5 dec.)
1675–1700?	1 (deer dec.)			
Glass, bottles:				
Gin	.....	.....	1	4
Wine	.....	.....	15	2 drawers (1–3rd Q. rest 4th)

TABLE XVII.—*Structures 27, 28, and 67; Lots 59 and 60 (96:99 and 96:100)*—Continued

Type	S–27 and vic.	S–28 and vic.	In S–67	Lots 59 and 60
Metal:				
Brass or copper:				
Brass button	1			
Key, clock? (ornamental)	1			
Pins	3			
Copper coin, half	1			
Stone:				
Indian scraper	1			
Arrowpoint	1			
Roofing slate	11			

TABLE XVIII.—*Structure 33 and Ditch 5*

Artifacts noted in catalog	Ditch 5 fill	Structure 33 in Ditch 5
Ceramic:		
Tile fragments: Roofing, unspecified	36 (2 show glaze drippings—kiln props?)	164
Floor	1	4
Dutch brick	2	3
Salt-glazed stoneware (present but unspecified—included in "Miscellaneous Pottery")		
Earthenware:		
Unspecified "Miscellaneous Pottery" fragments	768	2,621
Sgraffito:		
Bowls, plates and dishes	23	
Porringer	1	
Pitchers	12	
Candlestick	1	
Fragment, unspecified	1	
English yellow slipware:		
Bowls, plates, or dishes	10	2
Pot	1	
Porringer	1	
Delftware:		
Blue/White, Eng.-Dutch	1 (pot)	2 pots (1 drug)
Bristol (?) 1650–1700	3 (cups)	2 cups 1 chamber pot
Lambeth (pre–1680)		1 plate
Dish	1	
Pot, vert. sides	1	
Pot or jar, 1570–1600	1	
Bleeding bowls	2	
Albarello drug pot	1	
Tile*	6	
Fragments, unspecified	161	161
English lead-glazed inside and out		1 jug with vert. handle
North Devon coarse-tempered, lead-glazed:		1 pipkin (3 legs) 1 pot lid
Baking dish, rectangular	1	
Bowls	2	
Possibly American, 1690–1725 milk pan		1
Clay-pipe fragments, white and brown (characteristically late 17th–early 18th century)	1,883	37
Metal (incomplete):		
Iron:		
Gun barrel		1
Ball	1	
Brass:		
Spoon handle	1	
Fire tongs, fragment	2	
Buttons	3	
Candle-snuffer fragment	4	
Buckles	8	
Wire and pins	22	11
Latten, object, unidentified, stamped	1	
Pewter, neck of flask—screw cap	3	

* Note: Approximately 8,000 delft tile fragments were reported found in old Lots 101 (93:110) and 102 (93:111). Only a small representation remains in the collection.

TABLE XVIII.—*Structure 33 and Ditch 5*—Continued

Artifacts noted in catalog	Ditch 5 fill	Structure 33 in Ditch 5
Metal—Continued		
Lead:		
Shot	4	
Cames	2	
Bale seals	2 (BG, MO, RWI, H)	
Copper, patch	1	
Glass:		
Gin bottle reconstruction		1
Wine bottles, 3rd–quarter 17th century	1	1
4th–quarter 17th century	5	3
Miscellaneous glass fragments (mostly wine bottles?)	224	540
Wine-goblet:		
Fragments	12	9
Restored, Venetian ca. 1675	1	
Bottle seals:		
HH	8	8
Merchant's mark	1	
E (Bell) H		1
Bone:		
Handles	3	
Comb fragments	12	
Slate, roofing	1	12
Plaster:		
Wall	2	
Ornamental	10	8

TABLE XIX.—*Structure 40–72*

Artifacts	B–1 Level	B–2	Under center of stair	Floor level	Hole in floor
Ceramic:					
Brick:					
Local (see text)					
Dutch (several from vicinity)	3				
Tiles:					
Floor	.....	1			
Roofing: flat	100				
Tobacco pipes:					
White stems, indeterminate	4				
1670–1720 plus:					
4/64	1	3			
5/64	2	11	.....	.....	2
6/64	29 (1–IF)	5	3	4	1
7/64	16	7			
8/64	4 (1–LE)	2			
White bowls:					
1680–1720	2				
1700–1720 plus	2	.....	.....	.....	1
Brown stems:					
6/64	1				
7/64	2				
8/64	5 (1 dec.)	5	1		
9/64	2				
Brown bowls, indeterminate	2				
Salt-glazed stoneware. (Note: 45 sherds recorded, probably mostly stoneware, but are not located.)	.....	1			
Earthenware: English lead-glazed, light	1				
Metal:					
Iron: Miscellaneous pieces unspecified and cannot be located	100	40	.....	1	
Buckle, fragment	.....	.....	.....	.....	1
Casement	.....	.....	1 (on bottom step)		
Glass:					
Bottles, wine, pieces	250 (late 17th–early 18th C.)	200 (late 17th–early 18th C.)	.....	.....	8 (late 17th C.)
Miscellaneous, undefined	107	122	3		
Bones, indeterminate (unspecified in collection and not preserved)	3	2	.....	.....	2
Plaster: Lath-marked with split laths	.....	12			
Pargetry	.....	76			

TABLE XIXa.—*Structure 40–72*—Continued

Artifacts noted in catalog	In Structure	Near Structure
Metal:		
Iron:		
Staple	1	1
Key		1
Knife blade	1	
Drawer pull	1	
Lock-plate fragment	1	
Copper:		
Name plate "S.B. 1779"		1 (30"–39")
Tankard fragment	1	
Brass:		
Spout of teapot		1
Pot fragment		1
Button		2
Spoon fragment		1
Buckle, plain		1
Rings	2	
Silver, buttons		1
Pewter:		
Buttons	1	1 ("104")
Spoon bowl—"rat tail"	1	
Glass, bottle seals: Tradesman's mark	2	
"HG" and Lion's Head		2
"HH"	1	

TABLE XX.—*Structures 44–53–138, 58, and 65*

Artifacts	S–44	S–53	S–138	Near S–44–53–138	S–58–59	S–65
Ceramic:						
Bricks:						
Water-table	42					
Tile, roofing, frag.	.....	8	.....	3	69	1
Vessels: 400 pieces of miscellaneous pottery are listed for Structure 44 but not located in collection. 300 additional pieces cataloged for S–53 and 138, but not observed in collection						
Delft tile	present					
Delftware (unspecified)	.....	.....	3			
Pipes (about 200 stems observed—not measured)	426 frag. in cat.	.....	72 white stems—est. 1625 to 1750			
Stems, white: Floral relief 8/64	2	.....	1			
Monogram K 8/64	1					
Stems, plain:						
6/64	.....	.....	.....	.....	2	
7/64	1					
Stems, brown	.....	.....	7–early 17th C.			
Bowls, white:						
1620–1650	.....	.....	3			
1675–1700	.....	3				
1680–1720	1	.....	.....	.....	6	6
ca. 1750	.....	1				
Bowl, brown (est. 1720–50)	.....	.....	1			
Glass:						
Wine-bottle fragments (all from 4′–5′ level):						
Late 18th, early 19th	.....	several				
Late 17th, early 18th	.....	at least 2				
Bottle seal, Leoville Medoc	.....	.....	.....	1		
Seal: RW (same as from house in London, 1666—Ralph Wormley?)	(6″–12″) 1					
Goblet fragment:						
Cutglass	1	.....	1			
Molded	.....	1				
Prunt	.....	.....	.....	.....	1	
Vial	.....	.....	1			
Window	.....	.....	.....	.....	100 + (50 near)	
Enameled	.....	.....	2			
Metals:						
Iron:						
Knife blade	.....	1				
Buttons, steel	.....	.....	.....	.....	2	
Brass:						
Buttons	1	1	.....	9 (1 "Gilt")	1	
Buckles	1	.....	.....	12		
Thimbles	.....	.....	.....	2	1	
Sheet	.....	.....	.....	.....	1	2
Candle snuffers	1	1 ("PF")				
Spoon bowl	.....	.....	.....	.....	1	
Spoon handle	1 (seal top)	.....	.....	1		
Bolt	.....	.....	.....	1		
Andiron fragment	1					
Tacks	4					

TABLE XX.—*Structures 44–53–138, 58, and 65*—Continued

Artifacts	S–44	S–53	S–138	Near S–44–53–138	S–58–59	S–65
Metal (Continued)						
Latten:						
Spoon handle	1					
Spoon bowl, rose touch					1	
Lead:						
Cames				5	1	
Seal				1		
Pewter:						
Spoon bowl				1 anthemion decoration		
Spoon handle						1 (near)
Cap	1					
Spoon handle						1 (near)
Silver:						
Buttons					3 (2 near)	
Spoon				1 (slip end)		
Ornamental plaster fragments	55	291	674	373	96 (20 near)	12

TABLE XXI.—*Structures 71–74–77 and 41*

Artifacts	surf.—1′	1′6″–2′	Near
Ceramic:			
Brick:			
Local (see text for measurements)			
Dutch	7	1	
Tiles, roofing:			
Flat		12	
Pantiles		1	
Stoneware, salt-glazed:			
German brown-mottled	1		Jug, undec. J–7521
German blue-on-gray	9	1	
Staffordshire "scratch blue," early mid–18th century		1 tankard	
English white	1		
Earthenware:			
Locally made, lead-glazed		9	
English lead-glazed, coarse-tempered		2	
English slipware, marbled	1		
English lead-glazed, dark		1	
English lead-glazed, light		5	
Delftware:			
Blue/white (English-Dutch)	8	8	
English white	2	2	
Blue & purple/white (Lisbon majolica)	1		
Porcelain, Oriental	2		
Tobacco pipes:			
White stems:			
5/64	2	2	
6/64	6	16 (1 dec.)	
7/64	30	34	
8/64	11	8 (1 dec.)	
9/64	1		
10/64	1		
White bowls:			
1625–50		1	
1650–75	1		
Brown stems:			
6/64		1 (dec.)	
7/64		1	
8/64	4	2	
Brown bowls, indeterminate		1	
Metal:			
Iron:			
Angle-iron fragment		1	
Keyhole escutcheon	1	1	
Hasp	1		
Gouge	1		
Knife blade		1	
Key		1	
Brass:			
Clasp		1	
Button		1	
Hasp & tuck		1	
Spoon fragment		1	
Object, unidentified	1	5	
Lead, bale seal	1		

TABLE XXI.—*Structures 71–74–77 and 41*—Continued

Artifacts	surf.—1′	1′6″–2′	Near
Metal (Continued)			
Pewter:			
Spoon handle *pied-de-biche*		1	
Spoon handle "RM"		1	
Spoon bowl		1	
Glass:			
Bottles:			
Gin, fragments		9	
Wine, fragments		58 (1 neck—1680–1700)	
Seal, "H.G."		1	
Slate		1	
Flint, English		1	
Plaster, ornamental		4	

TABLE XXII.—*Structure 100 Fill Area*

Artifacts	Comments
Ceramic:	
Brick:	
Dutch	Many samples, various sizes.
Local	9" x 4⅜" x 2⅛", mostly orange-red and soft, some coping or rounded.
Tile (presumed local):	
Floor tile	Incomplete, less than 7" on a side, ca. 1½ inch thick, some with green glaze on top dripping over sides.
Flat, roofing	Over 100 pieces, probably local.
Stoneware	German-English blue-on-gray—1 sherd
Earthenware:	
Utility red	Light yellow lead glaze inside—several sherds.
Delftware	Blue-on-white inside of bowl fragment, base has green glaze exterior.
Pipes, white	Many stems, a few decorated with floral motif in relief.
	Bowls: 1640–60 19
	1660–80 6
Pipes, brown, local	Half as many stems as white, both molded and modeled, former more numerous. Two examples of marbled and decorated stems.
	Bowls: Molded: 5 (1 decorated). Modeled: 3 (1 decorated with roulette and initialled "AT".)
Glass, Dutch gin bottles	Ca. 50 fragments.
Iron, handwrought nails	Ca. 50, various sizes.

TABLE XXIII.—*Structure 106*

Artifacts	Fill (general)
Ceramic:	
Bricks, presumed locally made	From one 10-foot square: 180 bricks, clean; 20 bricks, mortar attached.
Tile (roofing?)	Described as present.
Stoneware, salt-glazed	Note: "Pottery" mentioned by excavator but not identified; presumably present.
Earthenware, English, lead-glazed, light	One jar described with unique lateral vertical lugs each perforated with two superimposed holes.
	Other samples not described.
Tobacco pipes:	
White stems:	
6/64	1
7/64	8
8/64	11
White bowls:	
1675–1700+	4
Brown stems:	
6/64	1
7/64	2
8/64	8
9/64	6
10/64	2
Brown bowls, 1675–1700+ (estimate)	2
Metal:	
Iron	Many nails and miscellaneous pieces mentioned, not described.
Brass:	
Pins	2
Button	1
Buckle	1
Lead, shot	1
Pewter (?), spoon bowl	1
Glass:	
Wine-bottle fragments	3—3rd Quarter, 17th Century.
	4—4th Quarter, 17th Century.
	1—Early 18th Century.
Bottle, restored	1—4th Quarter, 17th Century (near S–106) (Cat. J–7310).
Bottle seal fragment	1 (manufacturer's mark only).

TABLE XXIV.—*Structure 110, Workshop Foundation*

Artifacts	Surface to 0.8′	0.8′ to Floor
Ceramic:		
Brick (see text for brick measurements)		
Crucible, for melting glass, fragment	1	1
Tiles:		
Roofing, flat	170	48
—showing intense heat	4	
—bats-pot rests, glazed-marked	33	50
Pantiles	8	9
Stoneware, salt-glazed:		
German brown-mottled	7 (including top of jug)	1
German blue-on-gray	1	
English blue-on-gray		1
Earthenware:		
Indeterminate	1	
Local:		
Lead-glazed	105	625
No glaze		2
English lead-glazed, dark	1	
Delftware:		
Blue-on-white (Eng.-Dutch)	64	3
Polychrome	1	1
Wall or fireplace tile	2	
Tobacco pipes:		
White stems:		
7/64	2	3 (1 dec. with fleur-de-lis)
8/64	6	12 (3 dec., 1 fleur-de-lis)
9/64	1	3
White bowls:		
1625–50	1	
1630–70		1
Brown stems:		
8/64	1	
9/64	1	2
10/64	2	
12/64	2	1
Brown bowls:		
Indeterminate		1
1625–50	1	
1650–75	1	
Porcelain	3	

Artifacts	Surface to 0.8′	0.8′ to Floor
Metal:		
Iron:		
Nails, handwrought	34	22
Spikes, handwrought	6	
Saw, rip, teeth 1″ between tips, large, probably an ice saw		1 (5″ wide)
Key	1	
Hinges, strap, fragments	2	
Scythe blade fragment	1	
Wedge	1	
Skewer	1	
Hook	1	
Spring—gun-lock fragment?	1	
Latch hook? fragment	1	
Bar iron	3	
Musket-barrel fragment, 21 mm. bore diameter (.83 inch). Touch hole not bored	1	
Copper, sheet scrap fragments		2
Brass:		
Eyelet	1	
Fire-tool handle	1	
Lead:		
Came		1
Goose shot	1	11
Glass:		
Bottles, gin, fragments	8	6
Beads (6 yellow, 1 blue, 2 white, 1 light blue)		10
Slate, roofing, fragment	1	
Flint, English, pieces	1	3
Indian arrowpoint	1	
Mortar, samples	1	2 (Tempered with glass, bone, and brick fragments)
Plaster, plain	1	
Bones:		
Deer	2	1
Mammal, indeterminate	1	

TABLE XXV.—*Structure 111—Kilns A, B, and C*

Artifacts	Kiln Area, General	Kiln A	Kiln B	Kiln C	Pit under Kiln C
Ceramic:					
Brick fragments, local, from fill, showing effects from extreme heat	32	.....	.....	7	3 (2⅛" to 2⅜" thick)
Tiles:					
Roofing, flat, fragments	579	.....	1	234	33
Roofing, glaze-marked	57	.....	.....	12	2
Crucible fragment (glass making)	2				
Stoneware:					
German graybeard jug fragments	.....	.....	.....	.....	2
German blue-on-gray	4				
English	1				
Earthenware:					
Locally-made lead-glazed	73 (incl. base of small 1⅛" diam. crucible)	.....	.....	39	8
English slipware, marbled	.....	.....	.....	.....	1 (part of bowl)
English lead-glazed, dark	1	.....	.....	.....	4
English lead-glazed, light	1	.....	.....	.....	5
English lead-glazed, green	.....	.....	.....	.....	2
Unknown (delft?)	.....	.....	.....	.....	1
Delft:					
Indeterminate	.....	.....	.....	.....	2
Blue and brown-on-white	.....	.....	.....	.....	4
2-handled lead-glazed jug	.....	.....	.....	.....	1
Indian pottery, fabric-impressed	1	.....	.....	1	1
Porcelain (Oriental), blue-on-white	1	.....	.....	.....	7
Tobacco pipes:					
White stems:					
7/64	.....	.....	.....	.....	3
8/64	1	.....	.....	.....	15
White bowls, 1625–50	.....	.....	.....	.....	3
Brown stems:					
Indeterminate	.....	.....	.....	.....	1
8/64	.....	.....	.....	.....	1
14/64	.....	.....	.....	.....	1
Metal:					
Iron:					
Nails, handwrought	12	.....	.....	.....	115
Light-armor fragment?	.....	.....	.....	.....	49
Attachment strips from a polearm	.....	.....	.....	.....	2
Kettle fragments	.....	.....	.....	.....	7
Knife-blade fragment	.....	.....	.....	.....	1
Fragments, indeterminate	1	.....	.....	.....	2
Bog iron, samples	1	.....	.....	.....	33
Brass:					
Fragment, indeterminate	.....	.....	.....	.....	1
Horse trapping ornament, fragment	1				
Copper:					
Strip fragments	.....	.....	.....	.....	10
Strainer fragments	.....	.....	.....	.....	4
Scrap copper	.....	.....	.....	.....	1

TABLE XXV.—*Structure 111—Kilns A, B, and C*—Continued

Artifacts	Kiln Area, General	Kiln A	Kiln B	Kiln C	Pit under Kiln C
Metal (Continued)					
Lead:					
Curved lump from bottom of melting pot					1 piece (1 lb. 2 oz.)
Strip of goose shots, untrimmed					1
Window cames					1
Bale seal fragments					1
Glass:					
Window quarrels, fragment				1	3
Bottles:					
Gin				1	8 (3 partial bottles)
Wine	1				
Bead, blue					1
Flint, English, nodule fragments	2			2	21
Oyster-shell burned lime, samples	10			10	1
Limestone, white, porous, pieces	25			8	2
Slag (In Kiln C, pieces of iron ore had bits of charcoal interspersed)	2				8
Coral, white					1
Stones, shaped, granitic, glaze-covered, from Glasshouse Point		2			
River pebble, with glaze					1
Clay lumps, unfired					3
Bone:					
Deer					2
Large mammal, indeterminate	3			3	1
Boar tusk					5
Large bird bone					1

TABLE XXVI.—*Structure 112*

Area and Description of Artifacts	Quantity
Zones below Cellar Floor	
Room G (Zones 2 and 4):	
Tobacco pipes, brown stems 8/64	2
Nail, iron, handwrought	1
Garbage bone fragment, indeterminate	1
Room H (Zones 2 and 4):	
Nail, iron, handwrought	1
Delftware, Dutch blue-on-white	1
Room I (Zones 2 and 4):	
Tobacco pipes:	
White stems, 8/64	1
White bowl, indeterminate	1
Glass, gin-bottle fragments	1
Nails, iron, handwrought	5
Room J (Zone 2):	
Nails, iron, handwrought	13
Lead:	
Pieces, indeterminate	1
Goose shot	1
Garbage bones, indeterminate fragments	2
Cow tooth	1
Ceramic:	
Stoneware, indeterminate, fire-damaged	3
Tobacco pipestems: White 7/64	1
8/64	2
Brown 9/64	1
11/64	1
Tobacco pipebowl, white, indeterminate	1
Room J (Zone 4):	
Earthenware:	
Lead-glazed, local	5
Delftware, Dutch blue-on-white	3
Glazed, fire damaged, indeterminate	2
Tobacco pipe:	
White stems:	
8/64	3
9/64	1
10/64	1
White bowls, indeterminate fragments	2
Brown stems, indeterminate	1
Brass tack head, ornamental	1
Nail, iron, handwrought	1
Glass, window quarrels	2
Room J (Zones 2 and 4):	
Earthenware:	
Lead-glazed, local	3
Delftware:	
Dutch blue-on-white	1
English white	1
Tobacco pipe:	
Stems, white:	
8/64	1
9/64 (1–WB)	9
10/64	1
Bowl, white: 1650–75	1
Nails, iron, handwrought	2
Spikes, iron, handwrought	2
Cellar Floor Detritus (in contact with floor)	
Ceramic:	
Tiles:	
Flat	7
Pantiles	5
Tobacco pipes:	
White stems 7/64	5
Brown stems 8/64	3
Stoneware, German brown-mottled	1
Earthenware:	
English sgraffito	1
English lead-glazed, light	7
Devon coarse-tempered	28
Delftware:	
Blue-on-white	1
Blue- and purple-on-white (3 or 4 pots)	150
Lisbon majolica	1
Porcelain (Oriental) whole cup	1
Metal:	
Iron:	
Handwrought nails	2⅜ lbs.
Hinges (1 probable)	2
Strap, 11 inches long	1
Cannonball, 4 lbs., 3 inches diameter	1
Pintles	2
Brass, button (in association with Burial 3)	1
Copper, braided copper wire 1⅛ by ½ inch	1
Glass, bottles, gin	4
Mortar: Shell-filled (samples)	
Room G below brick floor and north wall	2
Room B, west wall	1
Room B, interior wall	1
Plaster, lath-marked, pieces	2
Slate, roofing	4
Cording fragments, charred	4
Cellar fill (1 foot below surface to floor, all rooms)	
Ceramic:	
Bricks, large quantities of locally-made (see text for measurement)	
Tiles:	
Flat, roofing	31
Pantiles	7
Stoneware, salt-glazed, German brown-mottled	4
Earthenware:	
Delftware: English-Dutch blue-on-white	4
English white	2
Indeterminate unglazed	1
Lead-glazed, local	14
North Devon coarse-tempered	51
Porcelain	2 (1 cup)
Tobacco pipes:	
Stems, white:	
6/64	1
7/64	4
8/64	10
9/64	9
10/64	1

TABLE XXVI.—*Structure 112*—Continued

Area and Description of Artifacts	Quantity
Cellar fill (surface to floor of cellar)—Continued	
Metal—Continued	
Brass—Continued	
Small, cylindrical, perforated fragment	1
Lead, fragment, fire melted	1
Glass, bottles:	
Gin	10
Wine	3
Drop seal	1
Small square base	1
Mortar, oyster-shell, samples	2
Plaster:	
Lath-impressed	6
Plain	7
Slates, roofing	12
Flint, English	1
Quartz crystal (?) shaped and polished, fragment	1
Foundation area outside cellar (general surface to undisturbed)	
Ceramic:	
Brick:	
Building, local (see text for measurements)	
Well brick	1
Water table, rubbed	2
Tiles:	
Flat, roofing	56
Pantiles	8
Floor, beveled	4
Stoneware, salt-glazed:	
German brown-mottled	8
German blue-on-gray	15
German gray	3
English	1
Earthenware:	
Locally made, unglazed (?)	4
Locally made lead-glazed	55
English slipware (combed)	2
English sgraffito	1
Italian sgraffito	3
English lead-glazed:	
Dark	3
Green	1
Light	1
North Devon coarse-tempered	2
Delftware:	
English-Dutch blue-on-white	29
English purple-on-white	1
English white	15
English polychrome	3
Majolica blue-purple-on-white	2
Staffordshire, 18th-century English	1
Porcelain, Oriental (1 white cup included)	3
Melting-pot fragment, for glassmaking	1
Tobacco pipes:	
Stems, white:	
6/64	5
7/64 (1–SV) (2 decorated)	98
8/64 (6 decorated)	155
9/64 (2 decorated)	65

Area and Description of Artifacts	Quantity
Foundation area outside cellar—Continued	
Ceramics—Continued	
Tobacco pipes—Continued	
Stems, white—Continued	
10/64	4
11/64	1
12/64	1
Bowls, white:	
Indeterminate	2
1625–50	4
1650–75—1 roulette decorated; 1–WB; 1–WC; 1–HI; 1–LE	10
1675–1700	1
Stems, brown:	
7/64 (1 decorated)	13
8/64 (9 decorated)	28
9/64 (8 decorated, 2 marbled)	62
10/64	16
11/64	8
12/64	1
Bowls, brown:	
Indeterminate	1
1650–75 (2 decorated)	3
Metal:	
Iron:	
Nails, handwrought	434
Rivet in small iron plate	1
Screw, blunt point, 2¾ inches	1
Spikes, some with large heads	7
Tacks	2
Pintles	2
L-shaped picture hooks (?)	4
Ring	1
Cloven iron knob (screw head?)	1
Horseshoe fragments	2
Pike tip or bar iron	1
Casement-frame fragment, wrought iron	1
Handles (probably to chest)	2
Hinges, strap, fragments	5
Hinge and screw	1
Bar, wedge-shaped	1
Knife blade	1
Sliding bolt from lock	1
Thumb latch	1
Padlock	1
Threaded bolt, eyelet in head	1
Bolt fragment	1
Stamp or brand with letter "M"	1
Brass:	
Straight pins	7
Tacks	3
Hook	1
Ring or eyelet	1
Small plate, decorative	1
S-shaped ornament, 3¼" long	1
Copper:	
Sheet, fragment	1
Wire, fine	1
Pipe, with lead collar	1

TABLE XXVI.—*Structure 112*—Continued

Area and Description of Artifacts	Quantity
Cellar fill (1 foot below surface to floor, all rooms) —Continued	
Ceramics—Continued	
Tobacco pipes—Continued	
Bowls, white 1650–75 (1–EL)	3
Stems, brown:	
8/64 (1 decorated)	6
9/64	4
10/64 (1 decorated)	4
Metal:	
Iron:	
Nails, assorted handwrought	12½ lbs.
Hook, with eyelet	1
Pintle	1
Hinges, strap, over 1 foot long	3
Hinges, strap, less than 1 foot long	1
Barrel-hoop fragments	8
Lead:	
Came	1
Pieces, flat, indeterminate	4
Glass:	
Window-quarrel fragments	3
Wine-bottle fragments	5
Mortar, samples from masonry	17
Plaster, samples	2
Slate, roofing, fragment	1
Whetstone, fragment, 3¾ inches long	1
Bone:	
Canine	1
Cow	1
Cellar fill (surface to floor of cellar, all rooms)	
Ceramic:	
Bricks:	
Local (see text)	large quantity
Dutch	1
Tiles:	
Flat, roofing	16
Floor, square, partial paving in place (see Figure 15) beveled side 7⅜ by 7¼ inches; broad side 7¾ by 7¾ inches	
Pantiles	30
Stoneware, salt-glazed:	
German brown-mottled	2
German blue-on-gray	1
Earthenware:	
Locally (?) made, unglazed	16
Locally made, lead-glazed	132
English lead-glazed:	
Light	3
North Devon coarse tempered	1
Slipware (hand decorated)	1
(marbled)	1
Italian sgraffito	1
Delftware:	
English-Dutch blue-on-white	10
Purple on white	1
English white	22
Burned–indeterminate	10
Fireplace or wall tile	1

Area and Description of Artifacts	Quantity
Cellar fill (surface to floor of cellar)—Continued	
Ceramic—Continued	
Delftware—Continued	
Majolica, Lisbon	3
Hispanic 2-handled jug	1
Porcelain, Oriental (including half a cup)	4
Tobacco pipes:	
Stems, white:	
6/64	3
7/64 (1 decorated)	35
8/64 (1 decorated)	63
9/64 (1 decorated)	42
Bowls, white:	
Indeterminate	4
1650–75 (1–EL, 2 decorated)	2
Stems, brown:	
7/64	2
8/64 (2 decorated)	21
9/64 (3 decorated, 2 marbled)	29
10/64	6
11/64	2
12/64	2
Bowls, brown:	
Indeterminate	3
1750–75 (1 decorated)	2
Metal:	
Iron:	
Nails, handwrought	502
L-shaped (picture nails?)	4
Spikes	17
Staple, small	1
Pintle	1
Nut	1
Handles, furniture	3
Knife-blade fragment	1
Scissors	1
Strap iron:	
Over 1 foot long	2
Less than 1 foot long	4
Strap-iron fragment, less than 1 foot long	6
Strap-iron fragment, 2 inches long, 1 inch wide, indeterminate	1
Strap-iron fragment, 4 inches long, 1 inch wide	1
Hinge, garnet (T), fragment	1
Kettle fragment, cast-iron	1
Barrel-hoop fragments	20
Sheet-iron fragments	2
Drawer lock, fragment	1
Door lock, fragment	1
Ornamental iron with handle, 6 prongs and one leg (trivet?)	1
Sliding-bolt fragment from lock	1
Large hook with twisted shank	1
Brass:	
Ring or eyelet	1
Cylindrical fragment 2 inches long	1
Fragment—manufactured, indeterminate	1
Spur	1

TABLE XXVI.—*Structure 112*—Continued

Area and Description of Artifacts	Quantity
Foundation area outside cellar—Continued	
Metal—Continued	
Lead:	
Cames	19
Goose shot	6
Scrap, fragment	1
Pewter, fragment, indeterminate	1
Glass:	
Window-quarrel fragments	31
Small mass of cames, plaster, and glass	1
Bottles:	
Gin, fragments	40
Wine, fragments	3
Drinking-vessel fragments	5
Button	1
Indeterminate fragment	1
Flint:	
Fragments (English)	13
Gunflint	1
Slate, roofing, pieces	25
Plaster:	
Wall, lath marks on back, whitewash on front	2
Pargetry, lion's head	1
Slag	1
Charcoal pieces, indeterminate	2
Foundation area outside cellar (general, 1 foot beneath surface to undisturbed)	
Ceramic:	
Tiles:	
Roofing, flat	3
Pantiles	2
Stoneware, salt-glazed:	
German brown-mottled	4
German blue-on-gray	2
Earthenware:	
Locally made, lead-glazed	11
English lead-glazed, dark	5
English slipware:	
Combed	2
Marbled	1
Delftware:	
English-Dutch blue-on-white	12
English white	4
English polychrome	1
Majolica, Lisbon blue- and purple-on-white	1
Hispanic lead-glazed, two-handled jug	2
Tobacco pipes:	
Stems, white:	
Indeterminate	2
7/64	22
8/64	56
9/64	16
11/64	1

Area and Description of Artifacts	Quantity
Foundation area outside cellar—Continued	
Ceramic—Continued	
Tobacco pipes—Continued	
Bowls, white:	
Indeterminate	1
1650–75	1
Stems, brown:	
7/64	3
8/64 (4 decorated)	21
9/64 (1 decorated)	8
10/64 (2 decorated)	7
Metal:	
Iron:	
Nails, handwrought	171
Nails, handwrought, L-shaped (picture hooks?)	8
Spike (large head)	1
Pintles	2
Ring attached to bar	1
Hinge fragment, strap	1
Cannonball 8⅜ lbs., solid	1
Knife-blade fragment	1
Object, use unknown	1
Brass:	
Straight pins	29
Buckle	1
Ring or eyelet	1
Sheet fragment	1
Copper:	
Sheath, rolled, with string inside, 1 inch long	1
Wire, wrapped, to form braid?	1
Lead:	
Cames	29
Goose shot	18
Small bar, 1 inch long	1
Silver, hollow handle, rolled sheet, 1¾ inch long, indeterminate	1
Glass:	
Window quarrels	23
Bottles, gin	6
Bead, milky white	1
Slate, roofing	10
Flint, English, pieces	3
Plaster:	
Lath-impressed	2
Chunks	9
Area E (beneath tiles)	
Tiles, roofing, flat	1
Tobacco pipes, stems, white, 9/64	1
Metal, iron, nails:	
Handwrought	1
Hinge fragment	1
Brass, fragment, indeterminate	1
Glass, bead, clear glass	1

TABLE XXVII.—*Structure 115, Multiple House, Cellar 1*

Artifacts	Surf.—1′	1′–2′	2′–3′	3′–4′	4′–5′
Ceramic:					
Brick, local (all fill includes brick; see text)					
Tiles, roofing, flat	.....	.....	2	3	
Stoneware, salt-glazed:					
German brown-mottled	1	1	1	.....	1
German blue-on-gray	.....	.....	2		
English white	1	.....	2		
Earthenware:					
Local lead-glazed	6	3			
Staffordshire, lead-glazed			1		
Slipware (hand decorated)	3				
Sgraffito	.....	7	4	2	
Lead-glazed: dark	2	3	.....	4	
light	5	2	16	1	4
North Devon coarse-tempered	1				
19th-century, white, lead-glazed cup fragment	.....	.....	.....	1	
Delftware:					
Blue-on-white (English-Dutch)	6	3	2	2	3
English white	5	2	1	4	2
English dark-blue on light-blue	.....	.....	.....	2	
Porcelain (Oriental)	.....	.....	.....	1	
Tobacco pipes:					
Stems, white:					
5/64	.....	3	7	35	5
6/64	17	11	10	45	18 (1 dec.)
7/64	12	9	4	36	35
8/64	5	.....	3	7	11
9/64	.....	.....	.....	1	
Bowls, white:					
Indeterminate	6	1	11	.....	4
1650–75	.....	.....	.....	.....	1
1675–1700 plus	.....	.....	2	7 (1-RT)	7
Stems, brown:					
6/64	.....	.....	.....	3	
7/64	2	.....	.....	4	
8/64	3	.....	1	1	3
9/64	.....	.....	1	3	2
10/64	.....	.....	.....	2	
Bowls, brown:					
Indeterminate	.....	.....	.....	2 (1 dec.)	1 (1 dec.)
1675–1700	.....	.....	.....	6	
Metal:					
Iron:					
Nails, handwrought	76	60	129	75	38
Spikes, handwrought	.....	2	1	.....	2
Brush hook	1				
Hoop	1				
Hinge, strap	.....	.....	.....	1	
Strap iron	.....	.....	2	.....	1
Buckle	1				
Ring	.....	.....	.....	1	
Hoe	.....	.....	1		

TABLE XXVII.—*Structure 115, Multiple House, Cellar 1*—Continued

Artifacts	Surf.—1′	1′–2′	2′–3′	3′–4′	4′–5′
Metal—Continued					
Copper:					
Sheet, piece, indeterminate	.....	.....	1		
Copper Coin: 29mm. by 2mm.; Date 1695; obverse Wm. III; reverse; Britannia	.....	.....	.....	1	
Wire	.....	.....	5	25	6
Scrap piece	.....	.....	1		
Brass:					
Bridle ornament	.....	.....	1		
Straight pins	1	5	2	95	20 (1–2 in.)
Wire pieces	1	1	.....	4	
Tacks	.....	.....	.....	1	1
Lead:					
Window cames	11	1	58	20	13
Seal	.....	.....	.....	1	
Glass:					
Window quarrels, fragments	28	26	28	319	38
Bottles:					
Gin, fragments	.....	4			
Wine, fragments	69	40	83 (2 bottles 3rd Q.; 1–4th Q.)	25	55
Tumbler fragments	.....	.....	.....	3	
Beads, clear	.....	.....	.....	1	
Medicine vial	.....	.....	.....	1	
Wine-glass fragments	.....	.....	.....	.....	8
Slate, roofing	3	5	8	7	3
Plaster:					
Plain	.....	.....	13		
Plain, whitewashed	.....	.....	1		
Lath-marked, whitewashed	.....	.....	.....	2	
Pargetry	.....	.....	2		
Bones:					
Deer (or sheep?)	.....	.....	.....	4	
Cow	2	1	7		
Boar tusk	.....	.....	.....	.....	1
Dog	.....	.....	.....	1	
Game bird, indeterminate	.....	.....	1	3	2
Large mammal, indeterminate	1	.....	1		
Small mammal, indeterminate	.....	.....	.....	2	1

TABLE XXVIII.—*Structure 115, Multiple House, Cellar 2*

Artifacts	Surface—2′	1′–2′	2′–4′	3′–5′
Ceramic:				
Brick:				
Local (all fill includes brick; see text for measurements)				
Dutch	.....	.....	1	
Tiles, roofing, flat	16	1	11	
Crucible, fragment, with molten glass	.....	.....	1	
Stoneware, salt-glazed:				
German brown-mottled	.....	.....	2	3
German gray	.....	.....	1	
German purple-on-gray	.....	.....	1	
Earthenware:				
Local, lead-glazed	.....	.....	1	
English lead-glazed, dark	.....	1	5	
English lead-glazed, light	8	2	30	1
North Devon coarse-tempered	.....	.....	4	
Hand-decorated Staffordshire	.....	.....	1	
Sgraffito	.....	.....	1	
Delftware:				
Blue-on-white (Eng.-Dutch)	3	1	1	
English light blue	.....	.....	1	
English white	2	.....	2	
Tobacco pipes:				
White stems:				
5/64	1	2	9	
6/64	24	.....	30	5
7/64	45 (F and LE) (3 decorated)	1	23	5
8/64	20 (3 decorated)	.....	10	1
9/64	4			
White bowls:				
Indeterminate	5	.....	2	
1650–75	1	.....	1	
1675–1700 plus	3	.....	2	1
Brown stems:				
7/64	.....	1	1	
8/64	7 (1 decorated)	.....	1	
Metal:				
Iron:				
Nails, handwrought	42	6	80	3
Spikes, handwrought	1			
Buckle	.....	.....	1	
Chain	1			
Table-knife fragment	1			
Hasp	.....	.....	.....	1
Cannonball (hollow)	.....	.....	.....	1
Barrel-hoop fragment	.....	.....	1	
Brass:				
Spoon handle, trifid	2	.....	1	
Candle-snuffer fragment	1			
Book-clasp fragment	.....	.....	.....	1
Copper, sheet fragment	.....	.....	4	
Lead, came	1	.....	19	13

TABLE XXVIII.—*Structure 115, Multiple House, Cellar 2*—Continued

Artifacts	Surface—2′	1′–2′	2′–4′	3′–5′
Glass:				
Window-quarrel fragments	10	5	31	4
Wine bottle fragments	63	16	81 (1680–1700)	72 (1680–1700)
Wineglass fragments			2	
Large jar, square			1	
Base, square, from jar			1	
Slate, roofing	2	4	4	1
Plaster:				
Plain			10	
Lath-marked			4	
Pargetry			2	
Cornice molding	2	5	14	5

TABLE XXIX.—*Structure 115, Foundation area west of cellars—Units A, B, and C*

Artifacts	Surface to undisturbed	0.8 ft. to undisturbed
Ceramic:		
Tiles, roofing:		
Flat	10	1
Flat, with glaze marks	1	6
Pantiles	13	5
Stoneware, salt-glazed:		
German brown-mottled	1	
German blue-on-gray	1	1
German gray	3	
English white	.....	1
Earthenware:		
Unglazed coiled bottleneck	1	
Local, lead-glazed	4	1
English sgraffito	1	
Italian sgraffito	.....	2
English lead-glazed:		
Dark	8	7
Light	18	9
North Devon coarse tempered	2	
English Staffordshire, 19th century	1	
American ironstone, 19th century	6	5
Delftware:		
English-Dutch blue-on-white	17	5
English white	5	
English polychrome	3	
Majolica, Spanish	1	
Tobacco pipes:		
White stems:		
5/64	1	
6/64	27	9
7/64	39	4 (1-dec.)
8/64	19 (1-dec.)	15 (1-dec.)
9/64	4	
10/64	1	
White bowls:		
Indeterminate	2	1
1650–75	1	
1675–1700+	3	3
Brown stems:		
7/64	5	1
8/64	28 (1-dec.)	8 (4-dec.)
9/64	12 (2-dec.)	14 (3-dec.)
10/64	3	1
11/64	1	
12/64	2	1
Brown bowls, indeterminate	.....	1
Porcelain (Oriental)	3	

Artifacts	Surface to undisturbed	0.8 ft. to undisturbed
Metal:		
Iron:		
Nails:		
Handwrought	131	19
Machine-cut	10	3
Pintles	.....	1
Bolt, pointed, threaded, square head, 14 mm.	1	
Hook, large	1	
Spikes, handwrought	6	2
Spike, machine-cut	.....	1
Shackle	1	
Punch fragment	.....	1
Hinge fragment	1	
Sliding bolt to door lock	2	1
Spades (blade portion)	1	2
Rings	1	1
Handle	1	
Knife-blade fragments	3	
Shaped bar, small, indeterminate	1	
Objects, use unknown	1	2
Copper, sheet fragment	1	
Brass:		
Buckle	1	
Button (undecorated)	1	
Stud	1	
Lead:		
Window cames	8	
Scrap, flat pieces	2	
Glass:		
Window quarrel, fragments	27	
Bottles:		
Gin, fragment	1	
Wine, fragments	25	18
Jar base, square	1	1
Bottle, indeterminate, fire-melted fragments	4	
Milk glass, modern 19th century	1	
Slate, roofing	15	
Plaster, cornice molding	1	

TABLE XXX.—*Structure 116*

Artifacts	Surface to structure or 1.5′
Ceramic:	
Brick, local (see text)	
Tiles:	
Roofing, flat	1
Pantiles	1
Floor	1
Salt-glazed stoneware:	
German brown-mottled	1
German blue-on-gray	4
Earthenware:	
Local, lead-glazed	9
English lead-glazed, light	1
Modern (19th century?) lead-glazed	2
Italian sgraffito	1
Delftware:	
Blue-on-white, English-Dutch	2
English white	4
Lisbon majolica (early 17th century)	1
Tobacco pipes:	
White stems:	
5/64	1
6/64	5
7/64	10
8/64	4 (1–LE—bowl heel looks last quarter 17th C.)
10/64	2
Ceramic—Continued	
Earthenware—Continued	
Tobacco pipes—Continued	
Brown stems:	
7/64	1
8/64	1
Porcelain:	
Oriental	1
18th century English	1
Metal:	
Iron:	
Nails, handwrought, 1″ to 3″	20
Pin (steel? modern?)	1
Glass:	
Bottles:	
Gin	1
Wine:	
1650–75	2
1675–1700 plus	7
19th century	2
Stone:	
Bead, agate	1
Indian projectile point, quartzite stemmed	1 (2′ west of Burial 1)
Roofing slate	4

TABLE XXXI.—*Structure 117, Brick Foundation with Interior Buttresses*

Artifacts	Large Room		Northwest Annex		
	Surface to 0.5′ above floor	0.5′ above floor to floor	Surface to 2′	0.5′ above floor to floor	Beneath planking
Ceramic:					
Bricks (see text)					
Tiles, roofing:					
Flat	12 (1 has mortar on one side)	3 (2 have plaster on one side)	5	1 (mortar both sides)	4 (mortar traces)
Pantiles	9	9 (some plaster traces)	.....	1	
Stoneware, salt-glazed:					
German brown-mottled	9				
German blue-on-gray	1				
German gray	1	.....	1		
Earthenware:					
Burned beyond indentification	2	4			
Locally made (?) unglazed	12	1			
Locally made, lead-glazed	21	(?) Whole pot found ca. 1900 by Louise Barney	1		
English lead-glazed:					
Dark	8	7	2	.....	2
Light	7	.....	2		
North Devon coarse-tempered	.....	1			
English slipware, undecorated	.....	.....	1		
Italian sgraffito	.....	.....	.....	1	
Delftware:					
Blue/white, Eng.-Dutch	11	4	6	.....	1
Eng. white	3	1			
Purple/white	1				
Wall/fireplace tile	.....	.....	1		
Burnt, indeterminate	1				
Tobacco pipes:					
White stems:					
6/64	2	.....	1		
7/64	16	1	1		
8/64	24 (2-dec.)	8	3 (1-dec.)		
9/64	6	2			
White bowls:					
Indeterminate	3				
1625–1650	.....	.....	2		
1650–1675	1	.....	.....	1	
1675–1700	5				
Brown stems:					
8/64	6	1 (1-dec.)	1	2	
9/64	6 (1-dec. and modeled)	5 (1-dec.)	1		
10/64	1				
Brown bowls, indeterminate	1				
Porcelain (Oriental)	.....	.....	1		

TABLE XXXI.—*Structure 117, Brick Foundation with Interior Buttresses*—Continued

Artifacts	Large Room		Northwest Annex		
	Surface to 0.5′ above floor	0.5′ above floor to floor	Surface to 2′	0.5′ above floor to floor	Beneath planking
Metal:					
Iron:					
Nails, handwrought	34	40	2	54	
Spikes, handwrought	4	2	1	1	
Pintle	.....	.....	1	2	
Barrel-hoop fragment	1				
Gutter support (?)	2				
Buckle	1				
Hinges, strap, fragments	3				
Handle (from kettle)	.....	1			
Bar iron	.....	.....	.....	1	
Chunk of fused iron	1				
Pieces, use unknown	3	.....	1		
Copper:					
Sheet, piece, indeterminate	.....	1			
Washer	.....	1			
Brass, tack, mushroom (upholstery)	1				
Pewter, spoon bowl fragment	.....	.....	1		
Glass:					
Window quarrel fragments	3				
Bottle, wine, fragments	67	7	3	6	
Jar, square base	1				
Slate, roofing	7				
Flint, English, pieces	1	.....	1		
Plaster:					
Plain	2	6	.....	.....	4
Plain-whitewashed	3				
Mortar, sample (oystershell-sand)	1	2	.....	.....	1

TABLE XXXII.—*Structure 119*

Artifacts	Surface—1′	1′–2′	1′ to top of bricks	Pit in front of firebox
Ceramic:				
Brick:				
Local	Present in all locations, sparsely—not measured.			
Dutch	.....	1		
Tiles, pantiles	12	1		
Earthenware:				
Locally-made: Unglazed	1 chafing dish?			
Lead-glazed*	15	5	1	2
Hispanic olla (amphora)	1			
Delftware:				
Blue/white, English-Dutch	5	.....	2	
English white	1	1		
English polychrome	.....	2		
Wall/fireplace tile	.....	2		
English creamware, early 19th century	.....	1		
Tobacco pipes:				
Stems, white:				
6/64	5	11	1	
7/64	14	4	2	1
8/64	2	8	.....	2
Bowls, white:				
1675–1700	.....	1		
Indeterminate	.....	1		
Stems, brown:				
8/64	2	.....	.....	2
9/64	1	1		
Bowls, brown, est. 1650–75	1			
Porcelain (Oriental)	.....	.....	.....	1
Metals:				
Iron:				
Nails:				
Cut (?)	2			
Handwrought	14	10	2	6
Knifeblade fragment	1			
Spike	.....	1		
Chisel (?)	1			
Copper, coin, indeterminate	.....	.....	.....	1
Lead:				
Bale seal, stamped *104*	.....	.....	.....	1
Musket ball, 20½ mm.	.....	.....	.....	1
Glass:				
Window	1	.....	1	
Bottles:				
Gin	1	.....	.....	1
Wine	17	7	5	4
Drinking vessels	.....	1 ?	.....	1 (base of ves.)
Slate, roofing	6	6	.....	4

*Note: Waster pot J–7598 found in W–5, 80′ NW

TABLE XXXIII.—*Structure 123*

Artifacts	General Surface—4′	1′–3.5′	Lower fill		Floor Recess
			Zone A	Zone B (on floor)	
Ceramic:					
Brick, local (see text)					
Tiles, flat				1	
Stoneware, salt-glazed:					
German brown-mottled	1		1	2	
German blue-on-gray	1			1	
German gray				1	
German blue- and purple-on-gray		1			
Earthenware:					
Indeterminate—badly burned		1			
Locally-made lead-glazed		1			
English lead-glazed:					
Dark		4			
Light	6	2	4	4	
North Devon, coarse-tempered	3	2		2	
Staffordshire, lead-glazed			1		
English slipware				2	
English ironware, lead-glazed, 19th century	1				
Delftware:					
Blue-on-white, English-Dutch	1				
English white	1	4		1	
English blue- and purple-on-white	1				
Indeterminate	2				
Tobacco pipes:					
White stems:					
5/64	3			6	
6/64	34	15	1	25	
7/64	7	7		11	
8/64	10 (1-dec.)			1	
9/64	1		1		
White bowls:					
Indeterminate	8			2	
1625–50			1		
1675–1700 plus	2	1		1 (possibly 3rd quarter)	
Brown stems:					
8/64	1				
9/64	1				
Metal:					
Iron:					
Nails, handwrought		9		10	
Spike, handwrought				1	
Wrench with threaded shank		1			
Barrel hoops				2	
Scythe-blade fragments			1	4	
Brush hook					1
Fragments		2		1	
"H" hinge	1		1		
Pintle			1		
Pieces, use unknown		1		6	
Fireplace tool handle fragment		1			
Copper, French coin, Louis XV, 1772			1		

TABLE XXXIII.—*Structure 123*—Continued

Artifacts	General Surface—4′	1′–3.5′	Lower fill		Floor Recess
			Zone A	Zone B (on floor)	
Lead:					
Goose shots	2				
Sheet, small piece	.....	1			
Piece, indeterminate	1				
Glass:					
Window quarrels, pieces	1	4			
Bottle, wine, pieces	50 (1 neck 3rd Q., 17th cent.)	151 (2 necks 3rd Q.; 2—4th Q, 17th cent.)	48	103 (7—3rd Q.; 2—are 4th Q., 17th cent.)	35 (2—1st Q., 18th cent.)
Slate, roofing	1	1	.....	2	
Flint, English, piece	.....	.....	.....	1	
Plaster, plain	.....	.....	.....	4	

TABLE XXXIV.—*Structure 125, Brick Residence*

Artifacts	Above whole structure: Surface—2.3′	Cellar area fill 1′–4′	Upper fill of well 4.1′–6′	Well floor deposit 6′–7.1′
Ceramic:				
Bricks, locally-made (see text)				
Tiles, roofing, flat	4	9 (2 with mortar)		
Stoneware, salt-glazed:				
Indeterminate	1			
German brown-mottled	1	3		
Blue-on-gray			3	
Purple- and blue-on-gray	1			2
Earthenware:				
Indian, plain, shell-tempered		1		
Unglazed (local?)		1		
English lead-glazed:				
Dark	5	5	29	4
Light	3	5	3	
Lead-glazed, indeterminate		1		
Delftware:				
Blue-on-white, English-Dutch		2		1
Purple-on-white, English-Dutch				1
White, English or Dutch	19	10	1	
Majolica, Hispanic		1		
Tobacco pipes:				
White stems:				
5/64	3	5		
6/64	7	9		2
7/64	2	12	1	1
8/64	2	8		
9/64	1	3		
White bowls:				
1675–1700 plus				1
1700–25		1		
Brown stems:				
7/64			1	
8/64	3	4	2	
9/64	1	3	3 (1-dec.)	
Brown bowls:				
1675–1700 plus		3		
Porcelain, Oriental, blue-on-white	1			
Metal:				
Iron:				
Nails: Machine-cut	120	18		
Handwrought			8	
Spikes	4			
Pintle	1			
Pin, eyed, large	2			
Nut and bolt	1			
Bolt, L-shaped, with nut and 3 washers		1		
Bolt, complete	3			
Eye bolt	1			
Fragment	1			
Hook fragment	2			
Eye hook	1			
Pot hook		1		
Hook, hinged	1			

TABLE XXXIV.—*Structure 125, Brick Residence*—Continued

Artifacts	Above whole structure: Surface—2.3′	Cellar area fill 1′–4′	Upper fill of well 4.1′–6′	Well floor deposit 6′–7.1′
Metal—Continued				
Iron—Continued				
Staple, large	1			
Hasp	1			
Pickax		1		
Chain with hook at end	1			
Chain	1			
Hoe fragment		1		
Pitchfork fragment				1
Bridle-bit fragments	1			2
Iron buckle	2			
Tube, 6/10″ diam., fragments		3		
Bar iron	1			
Curry-comb fragment	1			
Washer		1		
Ring		1		
Object, unknown use		1		
Copper, sheet fragment		1	1	
Brass:				
Plain button		1		1
Spoon handle (trifid)				1
Casting-counter fragment				1
Lead, window came		1		
Glass:				
Window quarrel, fragments	12	4		1
Bottles:				
Gin, fragment		1		
Wine (all ca. 1660–1710)	45	63	108	85
Wine, melted	2			
Molded, 18th century	1			
Seals			1 (AA)	1 (FN)
Drinking vessel, goblet, fragments		1		3 (hobnail design in relief)
Bases to wine glasses		2		
Slate, roofing, fragments		2		1
Mortar, samples		2	1	
Plaster, smooth, ¼ to ½ inch thick:				
Whitewashed		22		3
Lath-impressed		2	7	
Bones: mammal, large, indeterminate		2	2	
Coal, lump	1			

TABLE XXXV.—*Structure 127—Brick Kiln*

Artifacts	1′ to 3′	1.5′ above to bottom of kiln
Ceramic:		
Bricks:		
Local (see text)		
Dutch	1	
Tiles, roofing:		
Flat	2	
Pantiles	1	
Pottery:		
Stoneware:		
German brown-mottled	8 (1—graybeard)	3
Blue-on-gray	2	
Earthenware:		
Local, lead-glazed	120	30
English, lead-glazed, dark	6	1
North Devon coarse-tempered	1	
Local (?) slipware	1	
English slipware, marbled	10	
Italian sgraffito		1
Delftware:		
Blue-on-white		
English-Dutch	6	1
Italian majolica	1	
Indian, plain, shell-tempered bowl fragment	1	
Tobacco pipes:		
White stems:		
7/64	7	
8/64	22 (1–PG; 1 dec.)	2
9/64	8 (1 dec.)	1
White bowls:		
1600–1625	1	1
1625–50	1	1
	(8/64)	(8/64)

Artifacts	1′ to 3′	1.5′ to bottom of kiln
Ceramic—Continued		
Tobacco pipes—Continued		
Brown stems:		
7/64	2	
8/64	11	1
9/64	21 (1 dec.)	4 (1 dec.)
10/64	16	4
All handmade, possibly fired in brick kiln.	7 (1 dec.)	
12/64	10 (1 stippled)	1
14/64		1
Brown bowls, 1600–50?	6 (4 dec.; 1–BR; 2, 8-sided)	1 (8-sided, 9/64)
Metal:		
Iron:		
Nails, handwrought	32	3
Strap fragments	2	
Strike-a-light?	1	
Copper, fragment of tubing (?)		1
Glass:		
Window	3	
Bottles, gin	160	25 (1 part bottle)
Bone:		
Cow	10	2
Small mammal, indeterminate		1
Wolf (?)	1	
Sheep (?)	4	
Plaster, lath-marked	1	
Stone:		
Button, possibly chert?	1	
Indian projectile point or knife (quartzite)	1	
Coal	1	

TABLE XXXVI.—*Structure 128, Ice Pit*

Artifacts	Zones						
	A	B	C	D	E	F	D, E, F mixed
Ceramic:							
Bricks:							
Local (see text for measurements)	.....	4 (1 glazed)	.....	.....	.....	8	
"Dutch"	1						
Water table brick, local	.....	.....	1				
Tiles:							
Roofing, flat	23	35	7	1	6		
Floor (see text)	.....	.....	.....	.....	.....	1	
Pantiles	1	.....	.....	.....	1		
Stoneware, salt-glazed:							
German brown-mottled	20	32	6	1	.....	2	
German blue-on-gray	3	4 (LM; *liaum*)					
English "Tiger Ware"	.....	2					
Earthenware:							
Locally-made, unglazed	7	7	1	.....	9		
Locally-made, lead-glazed	77	112 (1 chafing dish)	32 (1 mug; 1 bowl)	21 (1 bowl; 1 jar)	1	4	2 (1 handle)
English lead-glazed, light	1	1	2	3			
English hard-fired, dark brown	1	12	1	.....	3		
English hard-fired, gray-brown	9	.....	.....	.....	2		
Slipware, locally-made (?)	17						
Slipware, English	.....	.....	1	.....	1		
English small crucible	.....	1					
Pottery bead	.....	1					
Delftware:							
Blue/white, English-Dutch	6	7	26 (Lambeth delft)	.....	.....	.....	3
English white	5 (1 fluted bowl)	8	2	1	.....	1	
Polychrome, English	1	.....	3				
Manganese-spotted, English	1						
Spanish majolica	.....	3					
Olla or amphora, Spanish (?)	7	13	1	.....	.....	1	
Jug, 2-handled, lead-glazed, Hispanic	.....	1	2	.....	.....	1	
Indian pottery fragment, fabric imprint	.....	.....	.....	1			
Tobacco pipes:							
White stems:							
6/64	.....	3					
7/64	19 (1 dec. fl.-de-l.)	26	10	10 (fl.-de-l.)	2	1	1 (dec.)
8/64	167 (3 dec.)	254 (2 dec., WC)	115	98 (1—fl.-de-l., WC)	39 (1–R)	20 (1–RC)	29
9/64	32	70 (1–WC)	38	18	12	4	5

TABLE XXXVI.—*Structure 128, Ice Pit*—Continued

Artifacts	Zones						
	A	B	C	D	E	F	D, E, F mixed
Ceramic—Continued							
Tobacco pipes—Continued							
White bowls:							
Indeterminate	1	16	11 (1–WC)	3	1	2	1
1625–50	4	7 (1–BC)	6 (1 dec. BC)	8 (2–BC)			4
1650–75	30 (7–EL, 4–WC, 2–IH, 2–RC, BC, HF, Rose)	34 (6–EL, 4–WC, 1–RC)	33 (4–WC, 1–IH)	10 (1–FS, 1–WC, 1–RR)	3 (1–BC)	3	1 (1–IH)
1675-1700			1				
Brown stems:							
6/64		2					
7/64		1					
8/64	3	3			1		
9/64	3	2		1			
10/64	1	1		1	1		
12/64		2					
Brown bowls, indeterminate	2	2 (1 dec.)		1			
Metal:							
Iron:							
Nails, handwrought	288	661 (2—L-shaped)	246 (73—L-shaped)	52	81	59	41
Spikes, handwrought	10 (1—L-shaped)	6	2		1		
Picture hooks	1	3					
Pintle		3	1	2			
"Holdfast" clamp fragments		1					
Drawing knife		1					
Cannon muzzle						1	
Matchlock lock plate		1					
Scutcheon plates	1	1	2				
Post guard plate		1					
Sword carrier		1					
Scythe blades		3					
Sword blades		1					
Crosscut saw				1			
Saw wrest							1
Chopping blade, large		1					
Lock spring			1				
Padlock		1					
Ball-shaped lock		1					
Sliding bar from lock			1				
Staples	1	1	1				1
Draw pull (handle)	3	3					1
Hinges, strap, fragments	3	1	1				1
Hinge, "H"							1
Bolt	1						
Rings		2					
Collar			1				
Kettle fragment		2					
Pothook					1		
Gutter support			1				
Fishhook	1						

TABLE XXXVI.—*Structure 128, Ice Pit*—Continued

Artifacts	Zones						
	A	B	C	D	E	F	D, E, F mixed
Metal—Continued							
Iron—Continued							
Trowel (?)	1						
Spade blade			1				
Wedge		1					
Knife-blade fragments	6	5		1			
Spoon handle (?)		2					
Hoes		1	2	1		1	
Adz hammer	1						
Key						1	
Barrel-hoop fragments	4	3					
Bar iron	5	5	1	1	1	1	
Wire		3					
Sheet fragments	7	15	15	1			
Gouge	1						
Objects (pieces), use unknown	4	2	3			2	
Buckle		1					
Copper:							
Tack				1			
Tack heads		1	1				
Sheet fragments	1	5	1	1 (perforated)			
Brass:							
Ring or eyelet		1					
Tack		1					
Lead:							
Came fragments	5	96	2		1	13	
Sheet fragments	3	2					
Fragments, use unknown	1	4					
Lump		4					
Glass:							
Window quarrels, fragments	3	1,418 (1 scored)	1				
Bottles, gin, fragments	123	243	104	69	30	14	11
Drinking vessels		1 (wine glass)		1	1	7	
Venetian tazza, fragments					3		
Retort flask, neck			1				
Case bottle with lead neck		1					
Handle	1						
Bone:							
Worked:							
Handle							1
Bead, perforated				1			
Deer		10	2				
Cow	28	102	18	10			
Horse		1	1				
Pig	1	1	4	11			
Dog		1	1				
Sheep (?)		2	2				
Wolf (?)					1		
Large bird (turkey?)	1	4					
Large mammal, indeterminate		15		1		4	
Small mammal, indeterminate		4		7			
Bird, indeterminate		1	3				1
Slate, roofing	1	1					

TABLE XXXVI.—*Structure 128, Ice Pit*—Continued

Artifacts	Zones						
	A	B	C	D	E	F	D, E, F mixed
Flint, English, pieces	6	15	2	4	1	1	
Plaster:							
Plain		3					
Lath-marked		1					
Stone bowl, carved		1					
Limestone, rock pieces	2	2	2			1	
Charcoal		1					
Coal					1		
Coral, fossil						1	

TABLE XXXVII.—*Wells 7 and 11*

Type	Well 11	Well 7	Well 7 vicinity
Ceramic:			
Brick, local (see text)			
Tile fragment		1 (4′–6′)	
Salt-glazed stoneware:		11 (11″–12″)	
German brown-mottled			2
German blue-on-gray			4
English, 18th century			1
Earthenware:			
Local, lead-glazed			3
Coarse-tempered, North Devon			1
Teacup—imitation porcelain (Dutch—early 18th century)		1 (7′–8′)	
Delftware:			
Blue/white, English-Dutch		22	13
Bleeding bowl, Lambeth, early 17th century		1 (7″–8″)	
Bleeding bowl, Lambeth, 17th–18th century		1 (4′–6′)	
English white		31	
Wall or fireplace tile			1
Lisbon majolica, blue and purple			1
Tobacco pipes:			
White stems:			
5/64	2	4	
6/64	2	12	
7/64	2	7	
8/64		4	
White bowls:			
1675–1720	1 (WW)	8	
Porcelain: Oriental			1
Glass:			
Bottle, wine, 1675–1700		1 (J–7578)	
Vial		1 (J–7169) 7′–8′	
Goblet fragment		1 (old Cat. No. 5615)	

TABLE XXXVIII.—*Refuse Pit 1*

Artifacts	Zone A	Zone B	Zone C
Ceramic:			
Bricks, local	few fragments	many fragments	rare
Tiles:			
Roofing, flat	6	93	81
Bats with glaze	4	2	1
Floor	.....	2	
Pantiles	8	25	2
Stoneware, salt-glazed:			
German brown-mottled	16	32	20
German blue-on-gray	3	10 (1 jar with medallions)	2
English	1		
Earthenware:			
General, indeterminate	.....	.....	1
Locally-made (?), unglazed	.....	18	8
Locally-made, lead-glazed	63 (1—chafing dish fragment)	1141 (2 sherds are wasters, glazed over fracture)	267
English lead-glazed:			
Dark	3	18	4
Light	3	5 (1—chafing dish fragment)	2
English sgraffito	.....	1	
Delftware:			
Blue-on-white (E–D)	1	156	7
English white	1	14	
English polychrome	.....	2 (fragment of drug jar 7" high)	
English purple-on-white	.....	1	
Dutch wall or fireplace tile	.....	2	
Tobacco pipes:			
Stems, white:			
6/64	1	2	
7/64	4	25 (2 dec.)	2
8/64	56	160 (7 dec.)	34
9/64	15	55 (1 dec.)	15
10/64	2	2	
Bowls, white:			
Indeterminate	4	7	1
1600–1625	.....	1 (Rose)	3
1625–1650	4	21 (WC, FS, IP, Rose)	5
1650–1675	6 (EL, RG)	23 (2–WC, RG, SV, P, HI, EL, SH, 2–Gauntlet, Star)	
Stems, brown:			
7/64	1	2	
8/64	5	55	1
9/64	2	13	3
10/64	1	13	
12/64	.....	11 (1 dec.)	
14/64	.....	2	1

TABLE XXXVIII.—*Refuse Pit 1*—Continued

Artifacts	Zone A	Zone B	Zone C
Ceramic—Continued			
Tobacco pipes—Continued			
Stems, brown—Continued			
16/64		1	
Bowls, brown, indeterminate	1	5 (1 dec.)	
Porcelain (Oriental) blue-on-white	1	2	1
Metal:			
Iron:			
Nails:			
Handwrought	60	259	57
Cut	2		
Tack:			
Wrought		1	
Small—possibly modern		1	
Spikes, handwrought		3	4
Lock fragment			1
Spring or clamp, indeterminate		2	
Handle:			
Furniture		1	3
Use unknown		1	1
Saw			1
Ax, type unknown			1
Kettle leg		1	
Strap iron	2	2	1
Bar iron, use unknown			1
Barrel hoop fragment	2	1	3
Mold for shot and ball		1	
Hoe		1	
Pole arm collar fragment (?)			1
Spade blades		4	2
Large blade fragment			1
Scythe blade			1
Chain links (2)		1	
Sliding bolt to lock		1	
Spur fragment			1
Auger or gouge fragments	1	1	
Bolt strap		1	
Bar iron	1	1	1
Scribe (?)		1	
Window casement fragment	1		
Keyhole escutcheon plate		1	
Sheet fragments, unidentified		2	
Iron fragments, indeterminate		3	3
Wire, modern		1	
Sheet, indeterminate	1	2	4
Cuirass, breastplate, and backplate (J–7042 and J–7043)			1 set
Swept hilt rapier (J–7010)			1
Rapier guard			1
Basket hilt of sword			2
Cutlass (J–9721)			1
Musket barrel (J–9458)			1
Knife blade		1	
Washer	1		
Gouge			1
Bullet mold (J–8381)			1
Axes, felling, narrow	1	2	7 (1 with wedge)
Hinge, strap	2	8	4
H–Hinge			1

TABLE XXXVIII.—*Refuse Pit 1*—Continued

Artifacts	Zone A	Zone B	Zone C
Metal—Continued			
Iron—Continued			
Hinge, indeterminate			1
Silver, thimble (J–8776)	1		
Copper:			
Strap fragment			2
Sheet fragments	8	9	1
Scrap fragments		2	
Tubing, small		1	
Brass:			
Straight pins	1	5	
Collar for holding ramrod to musket	1		
Square weight, small, "Carlus Rex" (J–7041)	1		
Buckle		1	
Tacks		2	
Round plate, furniture ornament	1		
Button or tack head		1	
Picture frame wire, 6"		1	
Use unknown, fragment		1	
Pewter, fragment, indeterminate	2		
Lead, goose shot		1 (strip of shots)	1
Musket balls	1	2	
Sheet fragments	2	5	3
Cames for window casements	4	13	
Bale seals		2 (1—"12" stamped)	
Pipe, molded			1
Glass:			
Window (mostly diamond-shaped)	2	205	5
Bottle fragments:			
Gin	57	377	55
Wine	13	17	1
Drinking vessels		2	
Beaker fragments			3
Vial, small		1	
Beads, cylindrical	1 (1 in. long)	1	
Slate:			
Roofing	2	44	
Ground, use unkown		3	
English flint:			
Pieces of nodules	18	29	15
Gunflint	1		
Limestone* pieces	6	4	
Lime*, calcined and slaked (oyster shell)		1 sample	
Coral, chunk		1	1
Granite stone fragments with glass glaze, one part of a stone from Glasshouse			3
Coal, bituminous, pieces	1		2
String, braided, possible wick, impregnated with copper salts	1		
Bone:			
Horse		1	
Deer	1	6	
Cow	8	35	1
Bear		1	
Pig		1	
Large mammal, indeterminate		6	2
Small mammal, indeterminate		1	

* Harrington, J. C. (Glasshouse) concluded no local source of lime was available; hence lime for glassmaking was imported. This may be iron-making charge.

TABLE XXXIX.—*Lot 47 (97:101) Including Ditch 28, Ditch 29, Structure 22*

Type	Lot: General	Ditch 28: Surface—18″	Ditch 29: Surface—18″
Ceramic:			
Brick:			
Local (see text)			
Dutch	Present		
Tiles:			
Roofing, flat	34	.....	4
Floor	.....	.....	1
Pantiles	2		
Earthenware, bleeding bowl, Lambeth, delft, early 17th century	.....	1 (J–7504)	
Pipes:			
White stems:			
6/64	18 (1 dec.)	3	1
7/64	31	9	14 (3 dec.)
8/64	18	8	3
White bowls:			
1600–25	2	1	
1650–75	.....	.....	3 (1–KC)
1675–1700	1	.....	3 (1–LV)
Brown stems:			
7/64	2		
8/64	4	.....	3
9/64	3	.....	2
10/64	1		
Metal:			
Iron, nails, and several spikes, all handwrought	75		

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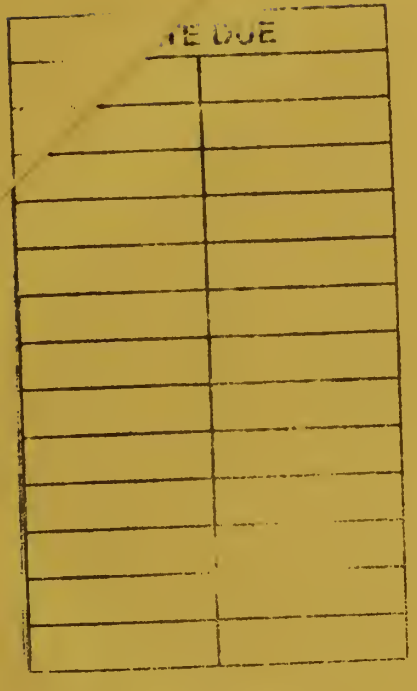
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* U.S. GOVERNMENT PRINTING OFFICE: 1959 O—470356


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