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Architecture of the Popham Colony, 1607-1608: An Archaeological Portrait of English Building Practice at the Moment of Settlement

Peter H. Morrison

ARCHITECTURE OF THE POPHAM COLONY, 1607-1608:

AN ARCHAEOLOGICAL PORTRAIT OF ENGLISH

BUILDING PRACTICE AT THE MOMENT

OF SETTLEMENT

By

Peter H. Morrison

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Thesis Advisor: Dr. Alaric Faulkner

An Abstract of the Thesis Presented

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From August 1607 to summer or fall 1608, the Popham Colony was established on what is now known as Hossketch Point, in Popham Beach, Maine. Rediscovered in 1994, the archaeological remains of the colony are providing insights into one of England's earliest colonial efforts in North America. Among the most exciting finds, are features relating to early seventeenth-century English building practices. Archaeologists have uncovered evidence of the colony's six meter wide by twenty meter long storehouse, the "Admiral's howse," one of two apparently connected buildings, the buttery general or the Corporal's house; and what has tentatively been identified as the "Vice Admiral's howse." The

storehouse was timber framed and earthfast posts were employed as footings. The arrangement of postholes and postmolds indicate that in building it, carpenters first assembled its wall sections on the ground, then tilted those assemblies into place. This technique is known as "normal assembly." Further, the storehouse was built with interrupted sills and had wattle and daub walls. The storehouse was destroyed by fire, possibly as the fort was abandoned in 1608.

The Admiral's house was considerably smaller than the storehouse, though its dimensions remain unknown. Like the storehouse, the Admiral's dwelling was timber framed, and its regularly arranged posts were set in holes in lieu of a foundation. Sometime during the settlement's short life, possibly during the winter, the structure burned. The colonists subsequently replaced the structure on nearly the same site. The Admiral's dwelling differed from the storehouse in having a semi-circular stone hearth and a wattle and daub chimney. The exact arrangement of this hearth and chimney with respect to its building remains unclear, as do most other details of the Admiral's house construction. Similarly, evidence from other structures within the fort remain incomplete, and firm conclusions about their appearance and construction cannot yet be made.

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(positive) influence on my work since then. All have labored valiantly to improve the present work.

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CHAPTER 1

INTRODUCTION

Tuesday, being the 18th [of August]... we all went to the shore and there made choice of a place for our plantation, which is at the very mouth or entry of the River of Sagadehock on the west side of the river....

Wednesday... there we had a sermon delivered unto us... and our patent was read with the orders and laws therein prescribed....

Saturday the 22th August Capt. Popham early in the morning departed in his shallop to go for the river of pashipskoke [Pejepscot]. There they had parle with the savages....

Thursday being the 20th of August, all our company landed and there began to fortify. Our president, Capt. Popham set the first spade of ground unto it, and after him all the rest followed and labored hard in the trenches about it.

Friday the 21st..., all hands labored hard about the fort, some in the trench, some for fagots, and our ship carpenters about the building of a small pinnace or shallop.

The 24th, all labored about the fort.

Monday, being the last of August, nothing happened, but all labored for the building of the fort and for the storehouse to receive our victuals.

The 7th [of September], our ship the Mary *and* John *began to discharge her victuals.*

The 16th, 17th, 18th, 19th, 20th, 21st, [and] 22nd, nothing happened, but all labored hard about the fort and the storehouse for to Land our victuals.

Captain Robert Davies, 1607-1608[1]

As captain of *Mary and John*, Robert Davies was intimately involved in the founding of Fort St. George. He landed with the colonists on August 18th, 1607, and remained until early October, when he departed with his ship to England. When *Mary and John* returned with supplies in the spring of the following year, Davies was again in command. During his initial stay, Captain Davies recorded the essential tasks of exploration, raising of defenses, treating with the local Wabnaki, shipbuilding, and construction of the storehouse. He failed to document the countless other tasks that must have taken place in support of those accomplishments: hunting, gathering food, felling

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trees to be hewn and sawn into frames and planks for the pinnace *Virginia* and the
storehouse, mining clay and mud for the storehouse walls, and mowing roofing thatch.
Throughout his narrative, Davies mentioned his superiors and peers by name, and in
particular, frequently discussed the activities of the colonies leader, George Popham, and
the second in command, Raleigh Gilbert. Not surprisingly, he failed to record the names
of those master craftsmen and common laborers situated beneath him. Those men remain
anonymous, but even today, evidence of their skills, efforts, and place of origin, can be
found beneath a lawn on the north side of Sabino Head, in the village of Popham Beach,
Maine (Figure 1).[2]

The English tried to establish footholds in the New World prior to 1607, but Fort
St. George and its sister colony in Jamestown were the most ambitious, the best planned,
and the best outfitted colonizing efforts yet attempted. The Roanoke Colony of 1585 to
1587 had been well manned, but the colonists failed to receive the continued logistical
support that they needed to survive. In 1602, Bartholomew Gosnold led an expedition
comprising just 32 men, who built a fort on what is now called Cuttyhunk in the Elizabeth
Islands, south of Cape Cod. Gosnold planned to leave 20 of his men behind when he
returned to England. He proposed to return to his fort within six months. Gosnold's
preparations seem half-hearted now, and must have seemed so to his men at the time. A
number of the "planters" got cold feet as the day of Gosnold's departure neared and they
"revolted." In the end, the small fort that they had spent just three weeks building was
abandoned with nobody left behind to man it.[3] Similarly, Henry Challon's expedition of
1606 departed England with instructions to leave as many men in Virginia as could be
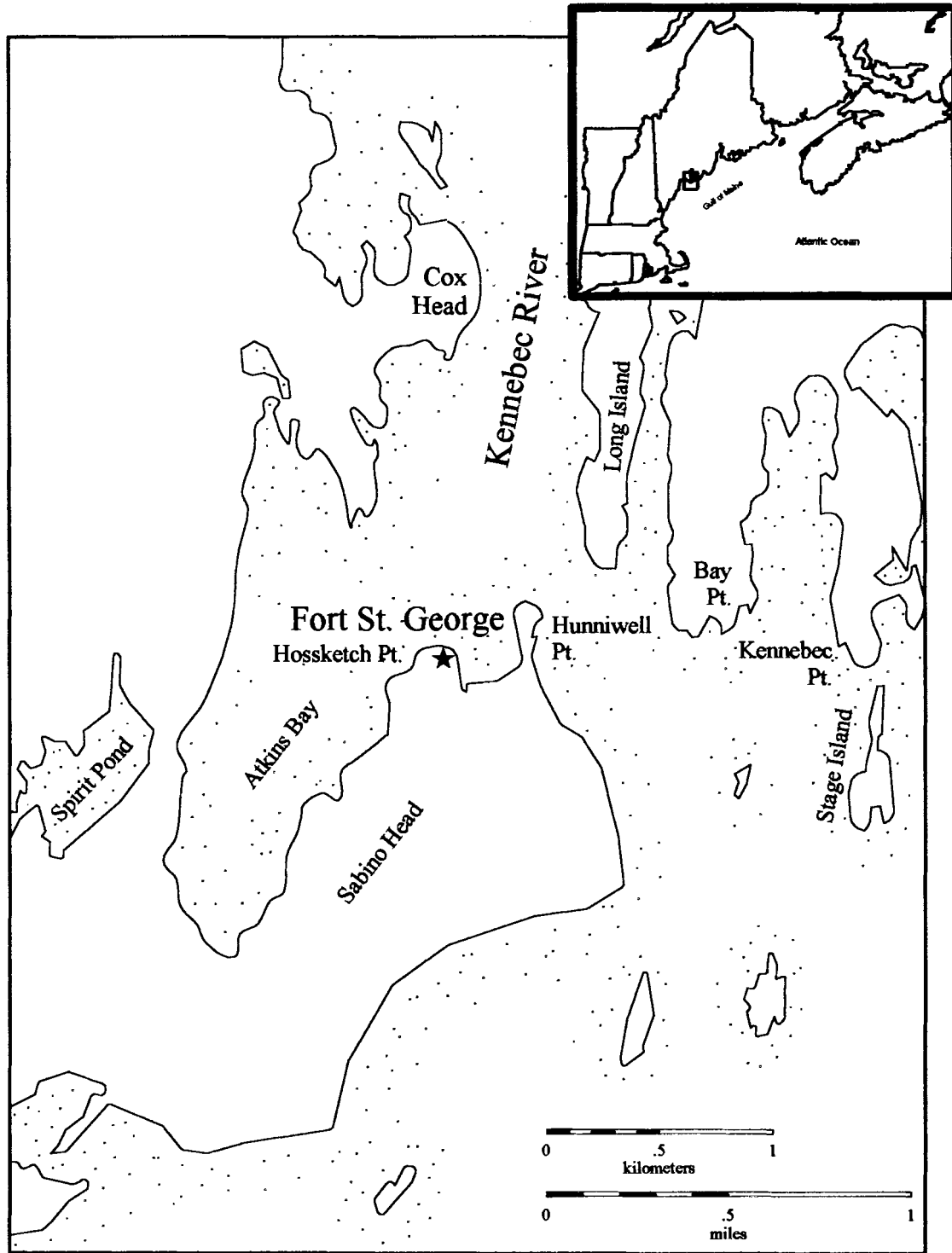
Figure 1. The mouth of the Kennebec River, formerly the Sagadahoc River, site of Fort St. George, England's first colony in New England (1607-1608). At the entrance of Maine's second largest river system, the area's strategic importance continued in later centuries, leading to construction of fortifications and batteries at Hunniwell Point (c. 1814, 1858-1865, and 1898), and on Sabino Head (1905-1918, 1942-1945).

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spared, "if any good occasion were offered."[4] Yet this too, was intended primarily as an

exploratory voyage and *Richard*'s entire compliment numbered just 31 men. There is no

knowing whether any of these men would have eventually agreed to stay; the Spanish

captured *Richard* during her crossing and imprisoned her crew.

Thus, the Gosnold and Challons expeditions each comprised about 30 men, and

their attempts at colonization were merely incidental to their primary goal of exploring the

coast. In contrast, the 1607 Plymouth Company expedition to the Sagadahoc River had

the principal goal of establishing a settlement, and to this end it was well planned. The

backers of the Popham Colony had a fairly clear idea of where their colony was to be

placed, and they certainly had access to information brought back by such explorers as

Bartholemew Gosnold, Thomas Hanham, Martin Pring, and George Waymouth. It is not

apparent that Waymouth visited the Sagadahoc River based on the primary descriptions

from his voyage, but Robert Davies specifically mentioned details of Waymouth's voyage.[5]

Furthermore, William Strachey, writing in 1618, explicitly stated that Waymouth explored

the Sagadahoc and strongly implied a connection between Waymouth's exploration and

the Popham Colony's choice of the Sagadahoc.[6]

Unlike the minimally manned English expeditions that preceded it, the Popham

Colony was outfitted with two ships and a combined complement of over one hundred

men in addition to the sailors. Furthermore, the leaders evidently took pains to recruit

men with the skills necessary to carry out their plans. Among the colonists were the

gentlemen to organize and lead, a physician, a draftsman, a master shipwright, ships

carpenters, a cooper, a blacksmith, a baker, sailors, and soldiers. To this list of men

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known to have attended the expedition, can be added by inference house carpenters, farmers, and general laborers.[7]

In spite of extensive planning, organization, and support, the Northern Virginia Colony suffered from the death of several of its principals and from a harsh winter, and it was abandoned after just one year. Because of this, Fort St. George has received little attention from historians and the public, especially when compared to Jamestown. Still, there has been a persistent local interest in Maine on the part of professional scholars and the public.

Over the years, only a few primary documents have been discovered that relate specifically to Fort St. George. Chief among these are Davies' journal,[8] a summary version of Davies' account included in William Strachey's 1618 history of Virginia,[9] a contemporary plan of the fort, a letter from George Popham,[10] a few court documents,[11] and several general comments on the Popham Colony dating from many years later attributed to Ferdinando Gorges.[12]

The Davies' Journal is the source for the quotes at the head of this chapter. It provides an almost-day-by-day account of the major activities at the fort for the two months that it covers. Unfortunately, no comparable source of information survives for the period following Davies' departure. For knowledge of what occurred during the remainder of the colony's existence, we must rely on much less detailed first-hand accounts as well as second-hand accounts.

William Strachey, who was not a participant in the colony, printed a paraphrased version of the Davies Journal.[13] This version followed Davies' in most respects, including

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the use of specific dates up to October 6th, the same date on which Davies' account ends. Still, Strachey provides a few details not contained in the Davies' journal. Either Davies originally wrote more extensively, and we now have only a shortened version, or more likely, Strachey consulted other sources that are no longer available, including participants in the Popham Colony, and quite possibly, Captain Robert Davies himself.[14] However, Strachey failed to record these other sources in as great detail as may be wished, and his account of the colony from the time of Davies' departure in October to its abandonment is very general.

Unlike the contemporary settlement at Jamestown, for which there is no detailed plan, Fort St. George is depicted in detail in a contemporary map prepared by John Hunt (Figure 2). Clearly Hunt was present at Fort St. George and presumably the colony's leaders recruited him in part for the cartographic skills attested by his map. Aside from his name on the map, however, no mention of him has been found either in the colony's records or elsewhere.[15] Still, the quality of his work shows that he was trained in much the same tradition as the more famous French explorer and navigator Samuel Champlain or English surveyor Thomas Raven, known for his careful renderings of England's Ulster plantations in the 1620s.[16] Though skilled, the level of drafting that these men demonstrated was not so demanding as to represent a distinct trade in itself. Instead, this kind of record keeping was a useful peripheral skill to any number of occupations, including: navigation, surveying, military or civil engineering, house construction, architecture, espionage, or exploration. The colony's leadership might have recruited

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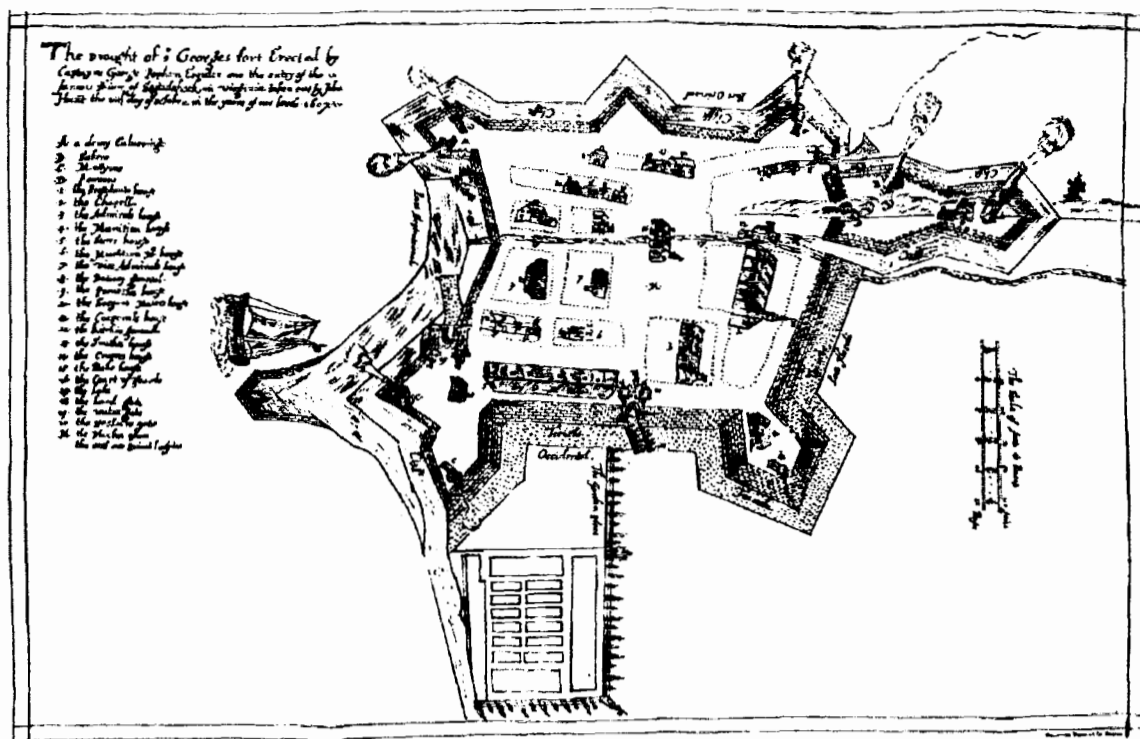
Figure 2. Brought to light at the General Archives of Simancas, Spain in 1888, this map was drawn by John Hunt in October 1607. The inscription in the upper left reads: "The Draught of St. Georges fort Erected by Captayne George Popham Esquire on the entry of the famous River of Sagadahock, in Virginia taken out by John Hunt the viiith day of october in the yeare of our lord 1607" (From Henry O. Thayer's copy, Maine Historical Society).

transcription of key:
A a demy Culvering
B Sakers
C Minyons
D Fawcons
1 the Presedente howse
2 the Chapell
3 the Admirals howse
4 the Munition howse
5 the Store howse
6 the Munition Mt. howse
7 the Vice Admirals howse
8 the Buttery general
9 the Provostes howse

10 the Sargant Maiors howse
11 the Corporals howse
12 the kitchin generall
13 the Smithes howse
14 the Coupers howse
15 the Bake howse
16 the Court of Goarde
17 the Lake
18 the Land gate
19 the water gate
20 the posterne gate
M the Market place
the rest are privat Lodgins

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Hunt to fill any one of these jobs principally, but they probably employed him in different capacities as needed.

Hunt completed his map on October 8th, 1607, in time to ship it on *Mary and John*, which sailed two days later. The ship carried the map to England, but within a year, Don Pedro Zuñiga, Spanish embassador to England, appropriated it. Zuñiga forwarded it and other documents concerning Virginia, along with a cover letter dated September 10, 1608, to King Philip III of Spain. Possibly this was the only copy of Hunt's map then in existence, as no copy of it has been found in England.[17]

With Zuñiga's sleight of hand, Hunt's map was lost to English knowledge for almost 300 years. In 1888, Alexander Brown requested help from the U.S. Ambassador to Spain, Jabez Curry, in researching the early settlement of North America. Curry then visited Spain's General Archives of Simancas (Archivo General de Simancas), or sent a researcher on his behalf, and there rediscovered the map.[18] The map was first published in Brown's *Genesis of the United States* followed one year later by its publication in Henry O. Thayer's *The Sagadahoc Colony*.[19]

John Hunt's map of Fort St. George depicts the fortress with its three gates, and inside, ordinance and 29 single-story structures of various kinds (Figure 2). These are the storehouse, munitions house, buttery general, court of guard, chapel, "smith's house" (either a residence, a smithy, or both), cooper's house, bake house, kitchen general, and houses for the President, Admiral, Vice Admiral, Provost, Munition's Master, Sergeant Major, Corporal, eleven unlabeled residences, and two structures that might be

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outbuildings associated with neighboring residences. Outside the fortress walls, Hunt recorded a windmill, gardens, and a pinnace or shallop.

Hunt clearly illustrated wall posts in eight buildings, indicating that these structures were box framed. These were the cooper's house, munition house, storehouse, Admiral's house, Munition Master's house, chapel, court of guard, Vice Admiral's house, and Provost's house. The remaining buildings were not illustrated as having wall posts, consistent with three competing possibilities: the buildings were only one bay in size and therefore had only corner posts, the buildings were not box framed, or Hunt considered them too inconsequential to warrant detailed attention. One structure, the round "bake house," was in fact an oven, and certainly not box framed.

Of the twenty one apparent residences, Hunt depicted a chimney in all but one. The exception was the cooper's house. Perhaps this building was really a cooperage and not a house in the modern sense of a residence, or perhaps it was both residence and workshop, but the cooper decided against placing a hearth among the cooperage waste. Less likely possibilities are that the cooper used an old fashioned open fire or that the absence of a chimney in the drawing was an oversight on Hunt's part.

In twelve buildings with chimneys, the stack stood centered at, and apparently interior to, the gable-end (see Figures 3a center, 3b, and 3c). In six instances, the chimney stood nearly-centered in the house (see figures 3a right, 3d, and 3e). In the remaining four instances, the location of the chimney appears ambiguous. The location of the door in relation to the chimney is not always apparent, but it can be discerned in a few instances. In the Admiral's house, a four bay long structure, the chimney is at the end of the house

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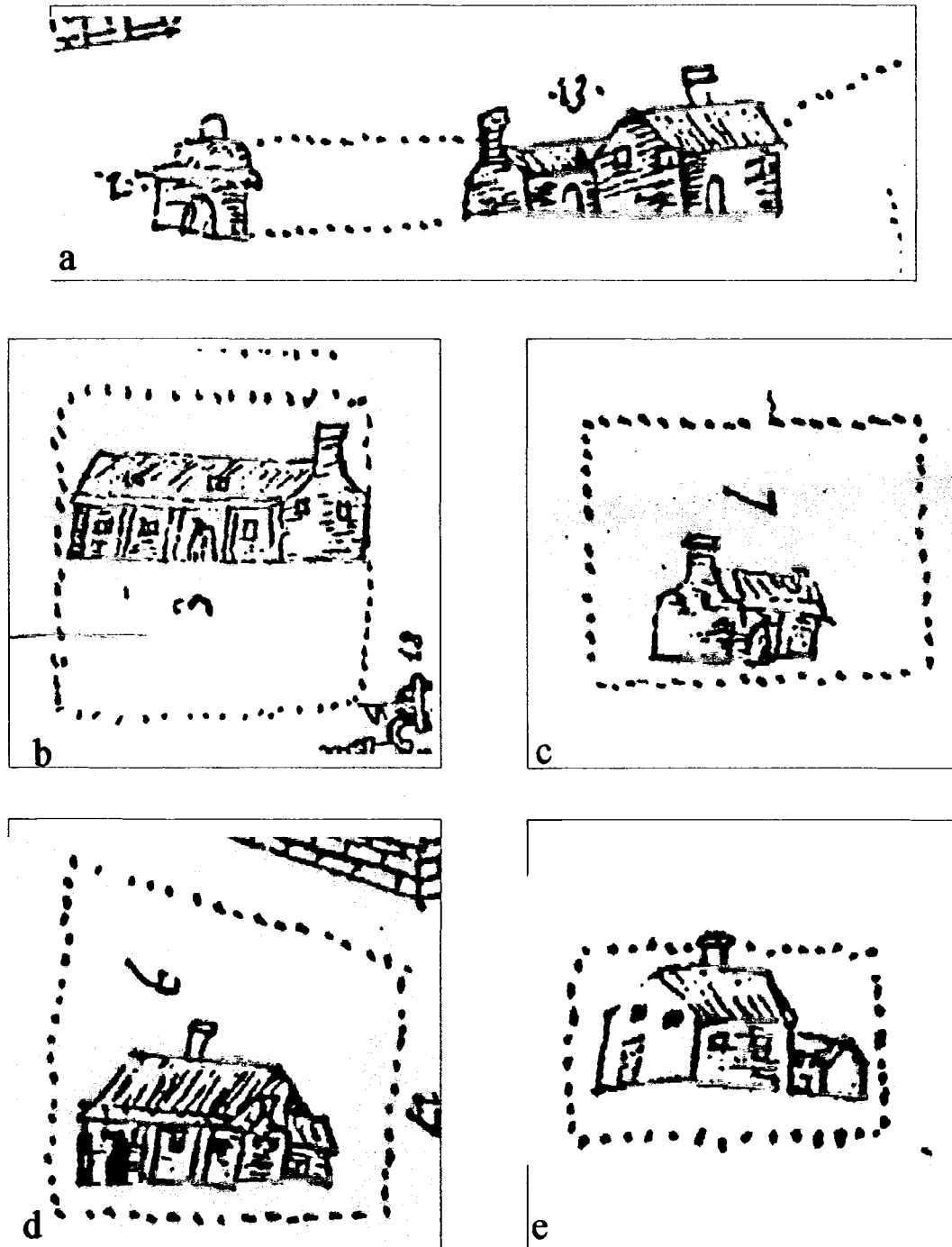
Figure 3. Details of selected dwellings at Fort St. George as illustrated by John Hunt. a. bake house and smith's house; b. Admiral's house; c. Vice Admiral's house; d. Provost's house; e. unidentified dwelling. B, c, and d were each timber framed, while construction of a and e is ambiguous. Note the variability in door and chimney placement.

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and the door in one of the middle bays (Figure 3b). The provost's house, possibly two bays in length, has a center chimney, and a door in the sidewall at one end (Figure 3d). It is not clear whether this building had an entrance lobby into the chimney space or not. The court of guards has its chimney at one end and its doorway at the opposite end (Figure 4c). This arrangement is also found in a neighboring unlabeled residence (Figure 2). The door of the smith's house appears centered in a sidewall, while its chimney is at the gable end (Figure 3a). The arrangement is nearly reversed in the building adjoining on the right, with its door offset to one end of the sidewall, but its chimney centered. Of the chimney-less buildings, the coopers house and buttery general have doors centered in their sidewalls; the munitions house has its door on the gable end but offset to one side, while the chapel (Figure 4b) and storehouse (Figure 4a) had doors on their sidewalls, offset to one side of center.

Though the Hunt map indicates the fort covered a footprint of just one-half of a hectare (one and one-quarter acres) and an interior area of one-third of a hectare (one-eighth acre), the impression it evokes is of an extensive walled village with all of the necessary accouterments. According to its date, the map illustrates the situation as of October 8th, 1607, less than two months after the colony's founding. The short time between the founding of the colony and the drafting of the map has left many researchers incredulous. It is commonly speculated that the map was partially a plan of what the colonists intended to be build, rather than a record of what was already built. It has been pointed out that the leaders would have desired to give their backers in England the most optimistic reports possible, and that the Hunt map would have played into that effort. The

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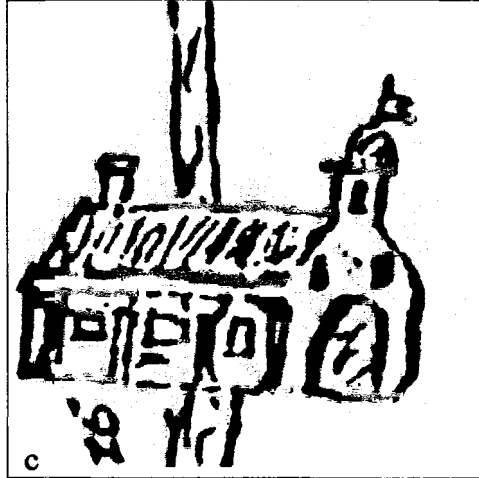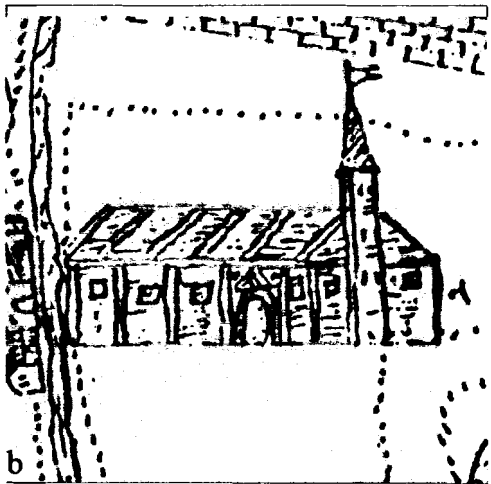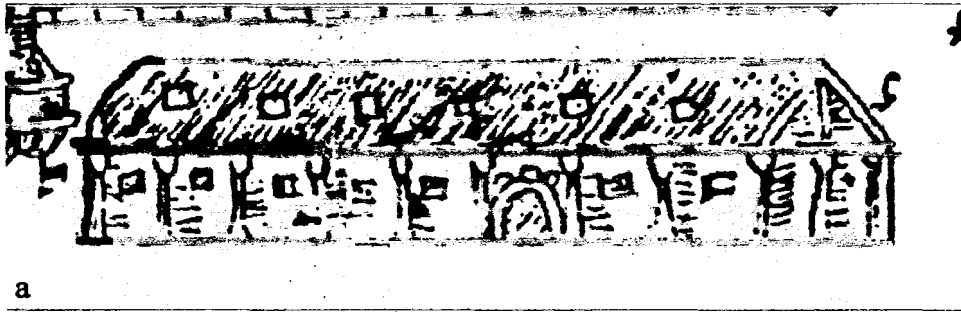
Figure 4. Details of selected public buildings at Fort St. George as illustrated by
John Hunt. a. storehouse; b. Chapel; c. Court of Guard. Each of these major
buildings was timber framed. Note the "dormers" in the storehouse roof and the
steeple and cupola on the chapel and Court of Guards, respectively. Also, note
the roofing detail shown on the chapel.

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map also can be viewed as a stylized illustration. Hunt clearly represents some aspects of the fort faithfully, for instance, its lay on the land, but in other respects, he relied on conventional representations. Assuredly the colonists did not allocate resources to raising a windmill, as they could not have had grown grain to process. For all of these reasons, researchers have been cautious in relying on Hunt's map, since they have had no independent way of recognizing which parts of the fort actually were completed, which aspects of the fort were exaggerated, and which aspects of the illustration resulted from the use of conventional drawing techniques. Recent archaeological research, however, offers is a new basis for understanding what Hunt illustrated and provides information for aspects of the colonial endeavor upon which Hunt and his contemporaries offered no information.

The Popham Colony has generally been thought to be somewhere at the mouth of the Kennebec River, but the exact location of the fort was a subject of debate through most of the nineteenth century. The mouth of the Kennebec River is bound by Kennebec Point and Bay Point on the east side and Hunniwell Point on the west (Figure 1). Inside of Hunniwell Point is a second point, known both as Popham Point and Hossketch Point. Though the high bedrock ridge called Sabino Head rises behind it, Hossketch Point sits just three meters above the high-tide line, and except for the steep ridge forming the head, is gently sloping (Figure 5). The point is surrounded by a steeply-eroded sand and gravel shoreline bluff. In two places, the bluff is interrupted by exposed ledge.

When the Hunt map was discovered, researchers quickly realized that the shape of the fort's water-front and citadel was the key to determining its location. The design of

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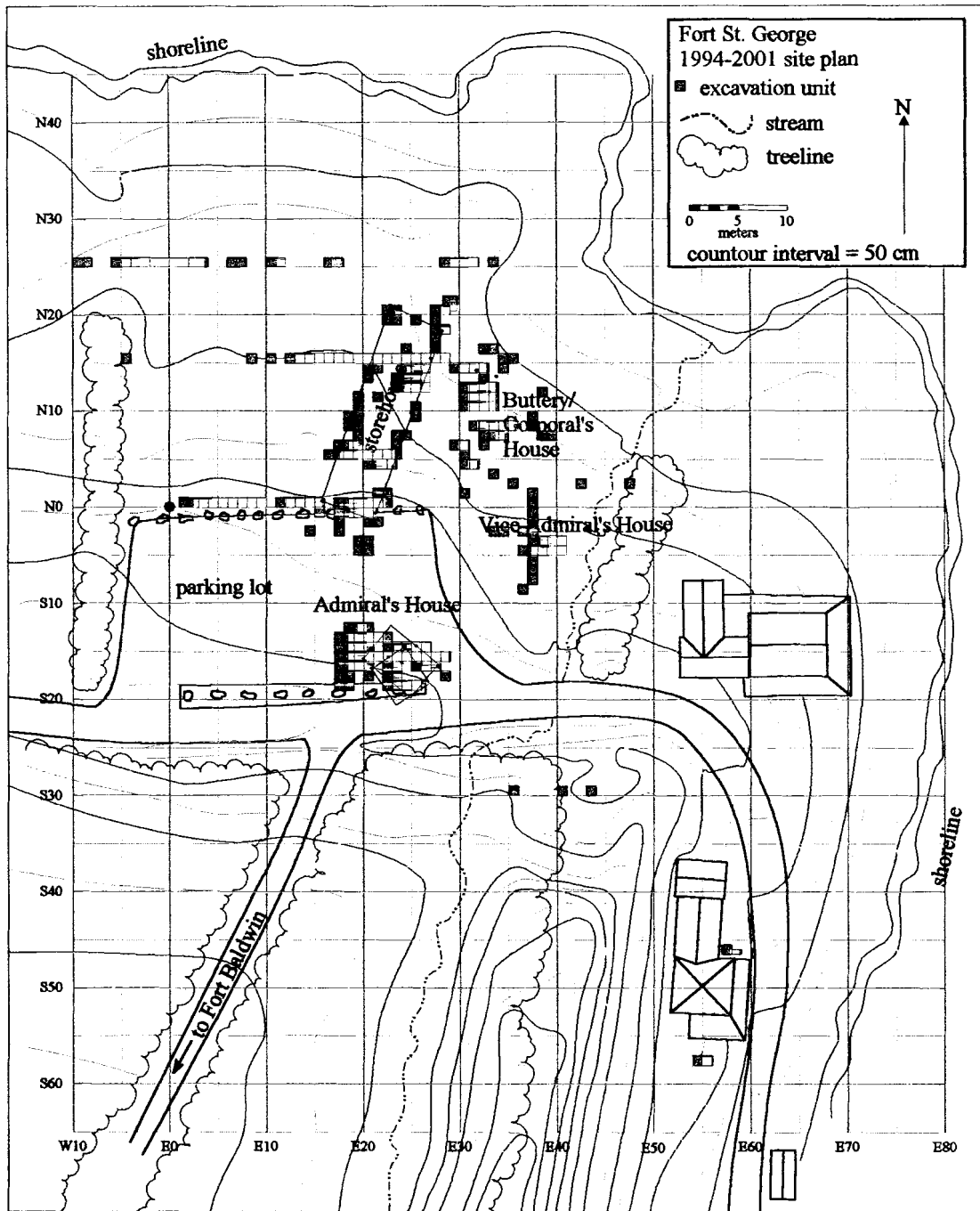
Figure 5. Hossketch Point in Popham Beach, Maine, site of the Fort St. George excavations, 1994-2001. The fort covered the parking lot, the lawn to the north, and the grounds of the two standing houses. The high bedrock ridge is the site of the fort's "citadel" as depicted by John Hunt's map of 1607. (Adapted from Jeffrey P. Brain, Fort St. George, p. 28, figure 17)

the fort fit the shoreline of Hossketch Point and Sabino Head, and nowhere else. This realization ended most serious debate concerning the colony's location.

Prior to its settlement by the Popham Colonists, Hossketch Point was occupied from time to time by local Wabanaki. After the colony was abandoned, the Wabanaki made brief stays on the point once again. Apparently, Europeans and their cultural descendants did not reoccupy the point until early in the 1800s when a Mr Hill established his homestead.[20] Through the nineteenth century, several additional houses and farmsteads were built and maintained on the point.

By 1905, the United States military purchased the land to establish gun batteries on the height of Sabino Head to defend the mouth of the Kennebec River and the industries located upriver. These defenses are named Fort Baldwin. The military built a long pier at the tip of Hossketch Point so that ships could land supplies. Rails were laid on the pier and up the slope to the gun emplacements. The rails remained in place at least until the batteries' construction was completed. Later, barracks and other support facilities for the battery were built on Hossketch Point, on the former site of some of the nineteenth-century farm buildings, and on what earlier had been the site of Fort St. George. The batteries were manned during World War I but were determined to be surplus afterwards, and were turned over to the state in 1924. The battery was once again manned during World War II when four 155 mm guns were mounted and a sighting tower built to direct 16" guns in Casco Bay. After the Second World War, the military reservation was returned to the State of Maine.

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Archaeological Research

Sabino Head, featuring the reinforced concrete bunkers and gun emplacements of Fort Baldwin, has been administered by Maine's Bureau of Parks and Lands as part of Popham Beach State Park since the 1920s, with an interruption during the 1940s. The site of Fort St. George lies partially under a state-owned parking lot and lawn, partially under a town-owned road, partially under privately owned woods, and partially under two private residences and their yards.

In the early 1960s the State Bureau of Parks and Lands sponsored archaeological investigations at several sites under its management. This work was carried out under Wendell Hadlock, Director of the Farnham Art Museum in Rockland, and Gardiner Lane, who served as field supervisor. In 1962 and again in 1964, Hadlock sent his crew to Hossketch Point to search for archaeological evidence of Fort St. George.[21] Excavations consisted of numerous narrow trenches and cross-trenches roughly dug by shovel. Excavated soils were sifted for artifacts, as archaeologists generally do today, and the team recovered a few artifacts. Hadlock and Lane predicated their use of trenches on the assumption that structural remains from the colony, including the fortress walls and building foundations, would be substantial and obvious. While they discovered several nineteenth-century foundations, their technique proved poorly suited for revealing more subtle soil features such as postholes or stains left by decayed wood. The team was discouraged by the absence of any stone foundations that they could attribute to the 1607 settlement. Though they found artifacts, they were unimpressed, and concluded that little or no surviving evidence of the fort survived in the ground.

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The discipline of historical archaeology was in its infancy in the 1960s. Over the next 30 years, archaeologists learned a great deal about seventeenth-century material culture. Eventually, Alaric and Gretchen Faulkner re-examined Hadlock's Hossketch Point material and realized that some of it indeed dated from the early 1600s. Ironically, Hadlock's fieldcrew kept notes that indicate they encountered many ephemeral architectural-related features that went unrecognized. With the benefit of hindsight, we now know that many of them were, in fact, associated with the colony.

By the late 1970s, archaeologists working in the Chesapeake region recognized that many early English building sites were not represented by obvious masonry features such as foundation walls or stone plinths. Rather, they were often marked by soil features left behind by the decay of "earthfast" buildings.[22] In the 1980s, archaeologists realized that similarly-built structures had been common in many other places settled by the English in the seventeenth-century, including Maine.

Archaeologist Jeff Brain spent much of his career studying prehistoric and historic Native cultures of Mississippi, where he gained extensive experience with earthfast architecture. In the Summer of 1990, Brain visited the village of Popham Beach in Phippsburg. During the trip, he was introduced to the fact that Jamestown had a sister colony, also established in 1607. Tantalized, he delved further into the subject. In looking over Hadlock's results, he realized, as had the Faulkners, that the results of the earlier excavations were at worst inconclusive, and that contrary to Hadlock's assessment, probably offered positive evidence that the site *did* survive. Brain reasoned that with the

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increased knowledge that archaeologists had acquired during the intervening decades, he might well be able to recognize a site that had proved elusive 30 years before.[23]

Jeff Brain began his fieldwork in 1994. Initially he planned to answer two basic questions. First and foremost, he wanted to determine once and for all whether significant evidence of the Popham Colony survived. If sufficient data survived, he then wanted to know how closely the map drawn by John Hunt depicted what the colonists actually created.

For the first several weeks of the excavations, the results were "underwhelming," and the suspicion grew that Hadlock was correct to conclude that archaeological remains of the site had been destroyed. In the final two weeks of the season, however, discoveries began to confirm that important remnants of the colony survived. This evidence consisted of a small number of early seventeenth century artifacts, including ceramics from the West of England, hand-forged nails, musket balls, pipestems, and two postholes (Figures 6 and 7). Apparently, these features marked two separate buildings.

Thus, the first season's excavations partially answered the first question; remains of the settlement indeed survived. The extent and state of preservation remained unclear, as did the degree to which Hunt's map corresponded to the features in the ground. Over the next two years, Brain continued to analyze his excavation results, to carry out further historical research, and to plan. In 1997, he returned to the site in the first of what have become brief annual field sessions. This time he brought a much larger crew made up of professional archaeologists, students enrolled in the Maine State Museum's field-school program, and volunteers.

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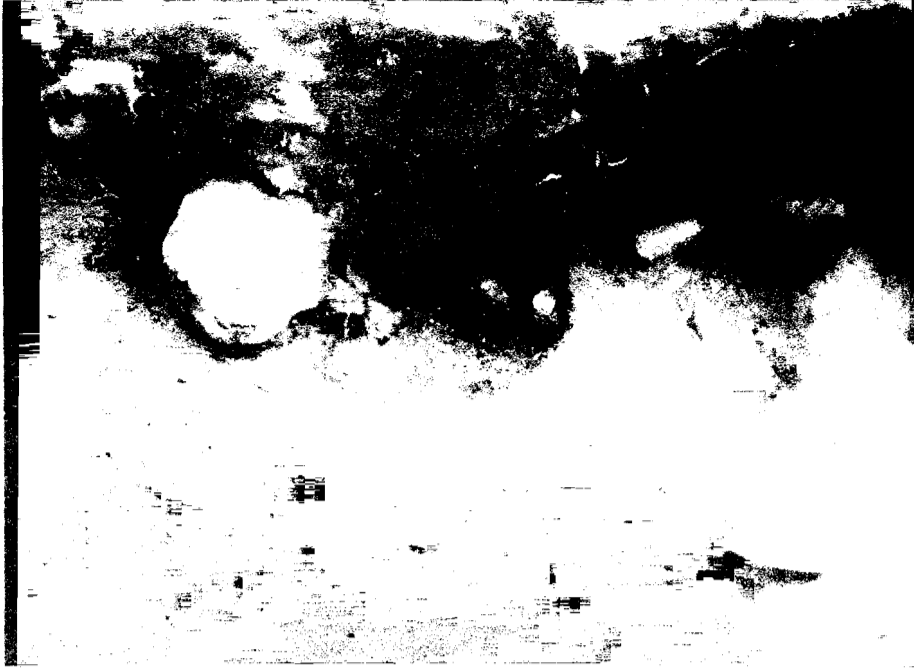
Figure 6. Posthole found in excavation unit P181-182 in 1994. Taken from above, this photograph shows the shape of the posthole and the appearance of the postmold within it.
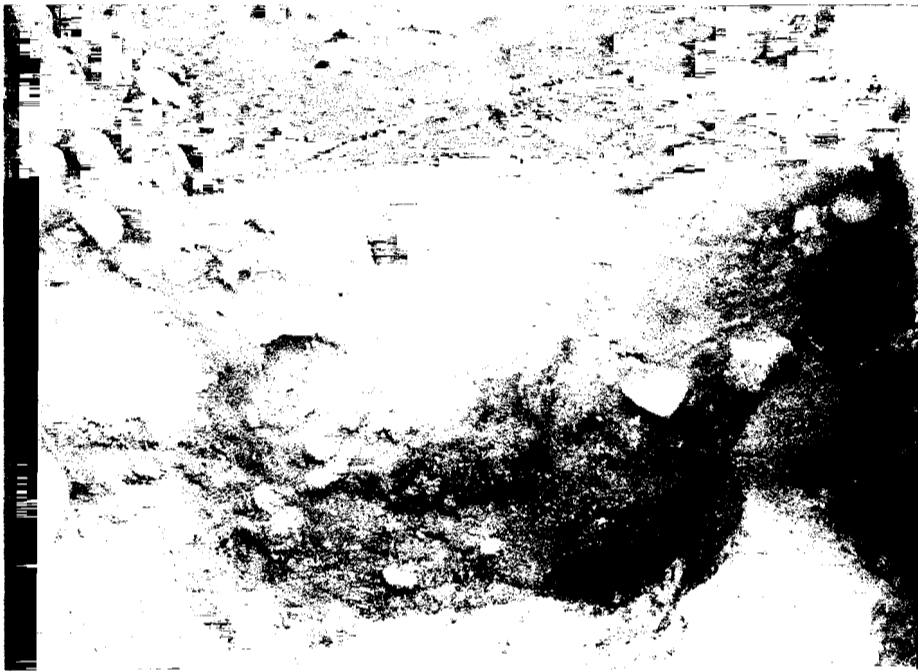
Figure 7. This is the same set of features shown in Figure 6. Now, the posthole and postmold have been half excavated to show a vertical slice through them. Note that the base of the postmold is about 20 cm above the bottom of the posthole. This indicates that the colonists packed soil under the post in order to level the wall.

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The excavations in 1997, 1998, and 1999 uncovered the footprint of the colony's storehouse. The evidence for this structure comprised postholes and postmolds, ground sills, as yet unidentified secondary timbers, daub, and perhaps thatch. In broad outline, the storehouse corresponded to what Hunt had recorded. With respect to topographical landmarks, the storehouse was located and oriented as Hunt showed it. In fact, by using the Hunt map and one of the postholes found in 1994 as a starting place, Brain successfully predicted where most of the remaining postmolds would be. The archaeological results also demonstrated that Hunt faithfully represented structural details, including the storehouse's two-bay width, the relative proportions of the building, and possibly the location of its door.

By the end of the 1999 season, however, a few small discrepancies between Hunt's map and the archaeological evidence had surfaced. Whereas Hunt illustrated the storehouse as eight framing-bays in length, the archaeology demonstrated that it actually had been only seven bays long. Also, when Brain tried to use the map to predict where the remnants of Raleigh Gilbert's house lay, he found that his estimate was off by three or four meters. Fortunately, Gilbert's house was further north than had been expected, and therefore more of it lay on accessible state-owned land.

As of the end of excavations in 2002, evidence of the fortification trench and five buildings that stood inside of the fort have been uncovered. With the mounting evidence provided by these excavations, answers to broader research questions are now becoming accessible.

Project Goals

As Davies' Journal indicates, the colony's leaders were sufficiently comfortable with their fortifications by the end of August 1607 to reassign some workers to other tasks, including erecting the storehouse. From all of the written sources as well as the archaeological evidence, we know for certain that they eventually completed at least five buildings. If Hunt's depiction is correct, the fort may actually have enclosed as many as twenty-nine structures.

The written sources provide little information concerning the kind of structures the colonists built or what motivated those choices. Davies, of course, was entirely mute on the subject, as were George Popham, Ferdinado Gorges, and William Strachey. Hunt illustrated each building in the fort, but the degree to which he depicts what was ultimately erected remains unclear. Hunt probably accurately portrayed some of the buildings as framed, as opposed to stone-, log-, or mud-built, but we can be less certain about his depiction of finer details, such as the location of chimneys, doors, and windows. He offers no information regarding such details as wall and roofing materials, kinds of foundations, joinery techniques, presence or absence of floors, arrangement and usage of interior spaces, sequence of construction operations, or whether the colonists built from scratch or from prefabricated parts brought from England. Furthermore, these records provide no direct information concerning the background of the artisans responsible for the work.

Undoubtedly, a considerable part of the construction was carried out by relatively unskilled laborers. Indeed, some of the simpler forms of earthfast structures, such as those raised on forked poles called cratchets, might have been built entirely by unskilled

laborers. Even in assembling such technologically simple buildings, however, workers presumably had models from which to draw, possibly including barns, sheds, and other temporary or even durable shelters. The techniques needed to build more sophisticated buildings required the skill and experience of a master house carpenter. In addition, the master carpenter would probably require support from competent journeymen to shape timbers and to cut and fit joints, as well as laborers to assist in these operations.

Though we do not know exactly how the leadership recruited the Popham colonists, we can safely speculate that all or most were English. Further, Fort St. George was an endeavor of the Plymouth branch of the Virginia Company and it was from Plymouth that the ships *Gift of God* and *Mary and John* set forth. One man, the ship's carpenter Digby, came from London,[24] and others might have been recruited from across England, including the Southeastern England, East Anglia, the Midlands, or Northern England, and some may have been found in Wales, Scotland, or Ireland. Nonetheless, it seems reasonable that most of the men for the expedition hailed from Plymouth or nearby areas of Devonshire.

If the colonists were recruited mainly in the west, it is tempting to speculate that the form of buildings and the construction methods used at Fort St. George would reflect those used in western England, and particularly, in Devonshire. This possibility cannot be taken as axiomatic, however, and at first blush, there is a disconnect between the presumed center of recruitment and the kinds of buildings used in the colony. Box-frame timber construction was the most widely distributed method of construction in the early English colonies regardless of what form of house is represented, and so far, it is the only

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form of construction that can be demonstrated at Fort St. George. In England, timber framing was a construction method most commonly associated with the eastern and southeastern counties. Builders in Western England were more likely to use cruck framing, when they built with frames at all, or to build mass walls of stone or cob (mud).[25]

If the one hundred-plus souls engaged in the enterprise were mostly from Devon, yet the colony's few house carpenters were from Norfolk, then the buildings could very well reflect the dominant culture of the East Anglian builders rather than that of the possible majority from Devonshire. Alternatively, the apparent homogeneity of early colonial construction methods may, in fact, represent the experiences and influence of relatively few colonial leaders who were connected to most of England's initial colonial endeavors, rather than the cultural preferences of the rank and file that made up the majority of those separate colonies. Thus, buildings found in initial settlement may not reflect the same regional variation that became apparent along the eastern seaboard of North America later in the Colonial Period.

By 1607, Englishmen had been advocating oversees colonization for many years. In several cases they had built settlements, including those at Munster in Ireland, Roanoke in Virginia, and at Cuttyhunk in Massachusetts. In these, a few notable names emerge over and over again, and connections to these names extend to Fort St. George where Raleigh Gilbert was one of the leaders.

Sir Humphrey Gilbert received letters of patent for a North American colony in 1578, and twice sent out ships to capitalize on his grant. Humphrey Gilbert was Raleigh Gilbert's father.[26] Walter Raleigh was a member of a syndicate that established a

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plantation in Munster after 1583, and at about the same time, was a prime mover behind the Roanoke settlements.[27] Walter Raleigh was Humphrey Gilbert's half-brother and Raleigh Gilbert's half-uncle.[28] Walter Raleigh was also connected to the 1602 Gosnold expedition and the 1603 Martin Pring expedition.

Fort St. George was not simply an English village, and the culture reproduced there was not simply English domestic culture. Rather, Fort St. George was one in a series of related English colonizing efforts. The connections between these efforts suggest a simple mechanism by which the experiences of each failed colony fed into a common pool of developing ideas about how colonies should be organized, equipped, and manned. The growing body of knowledge could easily have encompassed ideas about what kind of English buildings would be most suitable in establishing new settlements.

As a result, the structures found might very well reflect the experience of the inner circle of planners, rather than that of the broader pool of colonists. And though the Pophams and Gilberts were West Country families, it does not necessarily follow that they would seize on West Country forms and construction methods as the best way to build. Many, perhaps all, of these leaders had extensive military experience, and Fort St. George was quasi-military in its organization and construction. In looking for English antecedents to the building forms and methods at Fort St. George, it might prove fruitful to study the buildings used in British military encampments and cantonments as well as to look at regional styles of domestic architecture.

The architecture at Fort St. George, therefore, may be pertinent to the archaeology of contemporary English colonial sites as well as to aspects of English vernacular

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architecture in general. The original Jamestown, site of the 1607 London Company settlement on the James River, is undergoing excavations as the "Jamestown Rediscovery Project." The sister colony of Fort St. George, Jamestown was established in the same summer. Both colonies had similar missions and were organized in similar ways. Presumably, the two colonies would have needed to build more-or-less equivalent facilities, including fortifications, a storehouse, a bakery, a church, and housing. What is found out at one site can aid in the interpretation of what is found at the other.

Just as there are important similarities, there are also important contrasts between the two sites. Whereas the Plymouth Company outfitted its expedition in the West of England, the London Company outfitted its expedition in the East. These differences feed into questions of whether the craftsmen at the two sites learned their skills in different regions of England, and therefore built different forms and used different methods, or alternatively used similar methods and forms.

Artifacts have revealed different sources of supply for the two colonies. Notably, the earliest ceramics found at Jamestown include types that were commonly supplied to the London area. Among these are a ceramic type from the Hampshire-Surrey border area (i.e. "border wares"). While West of England wares are also present at Jamestown, they are rare.[29] The Fort St. George ceramic assemblage, however, is dominated by wares made in England's western counties, and the collection primarily includes ceramics made in South Somerset and Devon as well as stoneware bottles from the Rhineland. Many of the Devon wares are from the northern part of the county, but many are attributable to the village of Totnes, just a few miles east of Plymouth.[30] Border wares are absent.

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A similar contrast in building forms and methods has not been demonstrated. Box frame timber framing and post-in-ground footings certainly were used in Jamestown as well as at Fort St. George. Details may yet come to light that will reflect the source regions of the two colonies. Alternatively, it may be that in spite of different supply sources, architectural forms and methods used at the two colonies were essentially the same. If the styles of building and methods of construction prove to be similar in the two colonies, the implication is that the builders were recruited from the same regions in England, or that wherever the men were recruited, they were guided by the same policies handed down from their leaders.

Fort St. George was built and abandoned in less than 14 months. Faced with novel conditions, such as an abundance of timber, and new kinds wood, the colonists may well have made innovations in the way they approached the building. Essentially, however, the entire store of knowledge that the colonists possessed came with them on *Mary and John* and *Gift of God*. As Abbott Lowell Cummings wrote in his classic book *The Framed Houses of Massachusetts Bay, 1625-1725*:

> The immediate background of this dominant [English] majority among the earliest inhabitants is thus a matter of basic concern. The observer must be able to recognize the evolutionary changes that occurred in postmedieval vernacular buildings during the reigns of Queen Elizabeth and the early Stuarts. He must know the exact level of development and the character of these humbler English houses at the opening of the seventeenth century in terms of plan, construction technology, and regional stylistic differences if he is to understand fully the structures built by Englishmen in the New World throughout the first century of settlement.[31]

The building evidence from Fort St. George is among the most tightly dated early colonial architectural evidence available anywhere.

The lessons learned from study of Fort St. George offer other points of comparisons as well. The Plymouth Colony was established just 13 years after Fort St. George in what is now southeastern Massachusetts. Like the slightly later Massachusetts Bay Colony, documentary evidence indicates that it was largely peopled from the East of England. The building form most associated with settlers from the East of England is known as the "hall/parlor" type. However, based on archaeological evidence, a considerable proportion of the structures built in the Plymouth Colony during its first 50 years are of a kind known as a "longhouse." This type is generally thought of as peculiar to the highlands of western England, not of the east. Because of this possible tie to England's western counties, the site of Fort St. George may be relevant to students of early Plymouth Colony building practices.[32]

The men that built Fort St. George arrived from England with a particular store of skills and mental "blueprints" of what buildings should look like and how they should be built.[33] Possibly, these skills and templates simply reflected the place of origin of the colony in Western England. Based on their experiences or the advice of relatives and close associates involved in earlier colonizing efforts, the leaders of the expedition likely had their own ideas about what kinds of structures should be built to forward the interests of the colony. If so, they would have sought artisans they believed were best-suited to build those forms or to use those methods, even if that meant seeking them in distant regions in England.

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Understanding what mental templates and skills were represented at Fort St. George requires study of the archaeological remains in order to reconstruct what the colonists built and how they worked. With this information in hand, we may begin to understand the place of those buildings and builders within the framework of English vernacular traditions.

Though working from the same data, Jeff Brain and I have frequently arrived at different conclusions, demonstrating that these conclusions are equivocal. Further, it turns out that the English data are not as clear as I originally hoped. In the end, this thesis stands principally as a description and analysis of the archaeological remains that Jeff Brain's team has uncovered at Hossketch Point, and my interpretation of this evidence. Notwithstanding our reservations about the absolute correctness of my interpretations, I will also suggest how this might fit in with the data from Britain, but with the appropriate "ifs."

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Notes to Chapter 1:

1. Robert Davies, "Relation of a Voyage to Sagadahoc, 1607-1608, in Henry S. Burrage, ed., *Gorges and the Grant of the Province of Maine, 1622,* State of Maine, (Augusta, 1923), pp. 79-90. In this introduction, I have modernized the spelling and punctuation, but have left Davies' choice of words unchanged.

2. Jeffrey P. Brain, *Fort St. George Archaeological Investigations of the 1607-1608 Popham Colony on the Kennebec River in Maine,* Peabody Essex Museum, (Salem, 1995).

3. Gabriel Archer, "The Relation of Captaine Gosnolds Voyage to the North part of Virginia, begunne the sixe and twentieth of March, Anno 42. Elizabeth Reginae 1602," in Andrew J. Wahll, ed., *Sabino: Popham Colony Reader, 1602-2000,* Heritage Books, (Bowie, Maryland, 2000), pp. 22-30.

4. John Stoneman, "Relation on the voyage of the Richard and the fate of her men," in Andrew J. Wahll, ed., *Popham Colony Reader, 1602-2000,* Heritage Books, (Bowie, Maryland, 2000), p. 65.

5. Robert Davies, "Relation of a Voyage to Sagadahoc, 1607-1608," in Henry S. Burrage, ed., *Gorges and the Grant of the Province of Maine, 1622,* State of Maine, (Augusta, 1923), p. 85. James Rosier "A True Relation of the Most Prosperous Voyage Made this Present Yeere 1605, by Captaine George Waymouth," in Andrew J. Wahll, ed., *Sabino: Popham Colony Reader, 1602-2000,* Heritage Books, (Bowie, Maryland, 2000), pp. 30-60.

6. William Strachey, "Extract from 'The Second Book of the First Decade of the Histoire of Travaile Into Virginia Britannia,'" *Collections of the Maine Historical Society* (Portland, 1853), Series 1, volume 2, p. 287.

7. Jeffrey Brain, *Fort St. George,* p. 4.

8. Robert Davies, "Relation of a Voyage to Sagadahoc, 1607-1608," pp. 79-98.

9. William Strachey, "Histoire of Travaile Into Virginia Britannia,'" *Collections of the Maine Historical Society* (Portland, 1853), series 1, volume 2, pp. 283-309.

10. George Popham, "Letter to James I, December 13, 1607," in Andrew J. Wahll, ed., *Popham Colony Reader, 1602-2000,* Heritage Books, (Bowie, Maryland, 2000), p. 95-97.

11. Charles Edward Banks, "New Documents Relating to the Popham Expedition, 1607," *American Antiquarian Society Proceedings* (1929), volume 39, part 2, pp. 307-334.

12. In particular, Ferdinando Gorges, "A Brief Relation of the Discovery and Plantation of New England, 1620," in Henry S. Burrage, ed., *Gorges and the Grant of the Province of Maine, 1622,* State of Maine, (Augusta, 1923); and "A Brief Relation of the Originall Undertakings of the Advancement of Plantations into the Parts of America, especially showing the Beginning, Progress and Continuance of that of New England," in Andrew J. Wahll, ed., *Sabino: Popham Colony Reader, 1602-2000,* Heritage Books, (Bowie, Maryland, 2000).

13. William Strachey, "Histoire of Travaile Into Virginia Britannia,'" *Collections of the Maine Historical Society* (Portland, 1853), Series 1, volume 2, pp. 283-309; Ferdinando Gorges, "A Brief Relation of the Discovery and Plantation of New England, 1620," in Henry S. Burrage, *Gorges and the Grant of the Province of Maine, 1622: a Tercentenary Memorial,* State of Maine, (Augusta, 1923), pp. 39-164.

14. William Willis, "Introduction for 'Histoire of Travaile Into Virginia Britannia," *Collections of the Maine Historical Society* (Portland, 1853), Series 1, volume 2, p. 281.

15. John W. Bradford, "JOHN HUNT'S 'draught of St. Georges fort' in Context." Manuscript prepared for the Virginia Project, Inc., August 10, 1999, p 3.

16. Philip Robinson, "'English' Houses Built at Moneymore, County Londonderry, c. 1615." *Post-Medieval Archaeology,* volume 17, (1983), p 50.

17. John W. Bradford, "JOHN HUNT'S 'draught of St. Georges fort' in Context," p 3.

18. ibid.

19. The original Hunt Map is at the Archivo General de Simancas (M.P.yD. XIX-163), Simancas Spain. Published copies can be found in Alexander Brown's *The genesis of the United States* and in Henry O. Thayer's *The Sagadahoc Colony.* Thayer's own copy of the map is at the Maine Historical Society, Portland (map #FF30). For a discussion of the history of the map and the available copies see John W. Bradford, "JOHN HUNT'S 'draught of St. Georges fort' in Context." Alexander Brown, *The genesis of the United States: a narrative of the movement in England, 1605-1616,* Houghton, Mifflin (Boston, 1891). Reprinted, Russell & Russell (New York, 1964), v. 1, following p. 190; Henry O. Thayer, *The Sagadahoc Colony, Comprising The Relation of a Voyage into New Englad: (Lambeth Ms.) with an Introduction and Notes,* The Gorges Society (Portland, 1892). Reprinted, Research Reprints (New York, 1970).

20. Jeffrey Brain, *Fort St. George: Archaeological Investigation of the 1607-1608 Popham Colony on the Kennebec River in Maine.* Peabody Essex Museum, (Salem 1995), pp. 14-21.

21. Gardiner Lane, "Fort St. George Supposed Site - Popham Beach, Maine." Field Notes, May 27-June 27, 1962. On file, Maine State Museum, Augusta. "An

Archaeological Report on Excavations Carried Out at Sabino Head in Popham Beach, Maine - The Site of Fort St. George - 1607-1608 A.D." Manuscript Maine Bureau of Parks and Lands. Augusta, Maine.

22. Cary Carson, Norman F. Barka, William M. Kelso, Garry Wheeler Stone, and Dell Upton, "Impermanent Architecture in the Southern American Colonies," *Winterthur Portfolio* 16 (numbers 2 and 3, Summer and Autumn, 1981), pp. 135-196.

23. Jeffrey P. Brain, *Fort St. George*, pp. i-vi.

24. William Strachey, "Histories of Travaile into Virginia," in Andrew J. Wahll, ed., *Sabino: Popham Colony Reader 1602-2000*, Heritage Books, (Bowie, Maryland, 2000), p. 439; Jeffrey P. Brain, *Fort St. George*, p. 4.

25. Ronald W. Brunskill, *Illustrated Handbook of Vernacular Architecture*, revised edition, Faber and Faber (London, 1978).

26. Jeffrey P. Brain, *Fort St. George*, pp. 3-5.

27. Orloff Miller, "Archaeological Investigations at Salterstown, County Londonderry, Northern Ireland, Ph. D. dissertation , University of Pennsylvania, 1991, p. 30; Edwin A. Churchill, "The European Discovery of Maine," in Richard W. Judd, Edwin A. Churchill, and Joel W. Eastman, eds., *Maine: the Pine Tree State from Prehistory to the Present*, University Press of Maine, (Orono, 1995), p. 40.

28. Edwin A. Churchill, "The European Discovery of Maine," p. 40; Jeffrey P Brain, *Fort St. George*, p. 4 footnote 2.

29. Beverly Straube and Nicholas Luccketti, *1995 Interim Report*, The Association for the Preservation of Virginia Antiquities (Jamestown, Virginia, 1996), pp. 22,24. Jamestown features that can be dated to as early as 1610 show a much greater variety of ceramics, mainly from the east of England and the Midlands and from Europe, than does Fort St. George. This greater variety is probably explained by the simple fact that Jamestown received many additional supply ships than did Fort St. George.

30. Jeffrey P. Brain, *Fort St. George V*. Peabody Essex Museum, (Salem, 2000), p. 15.

31. Abbott Lowell Cummings, *The Framed Houses of Massachusetts Bay, 1625-1725*, Harvard University Press, (Cambridge, 1979), p. 3.

32. In this regard, there has already been fruitful collaboration between the carpenter-scholars at Plimoth Plantation and the archaeologists working at the site of the Fort St. George. The interpretive staff from Plimoth Plantation visited the excavations at Popham Beach on one occasion, and hosted visits by the staff of the Fort St. George excavations on several occasions.

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33. James Deetz, *In Small Things Forgotten: The Archeology of Early American Life*, Anchor Books (Garden City, New York, 1977), p. 36.

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CHAPTER 2

VERNACULAR ARCHITECTURAL TRADITIONS OF EARLY

SEVENTEENTH -CENTURY ENGLAND

English Traditions

When studying a building, students of vernacular architecture look at many different details, which together tell much of the culture(s) from which a building stems. Building forms and building methods are two phenomena lying near the core of this study. The form of a building refers to its floorplan, including overall layout. Building proportions, number of floors, number and placement of rooms, the location of hearths, chimneys, doors, and passages are all elements that can be evaluated.[34] Construction methods, by contrast, include the materials used and the specific ways that those materials were assembled to make a structure. For instance, the structure could be supported by a wooden framework, in which the weight of the roof, floors, and walls is transferred to specific load-bearing vertical members in the walls of the building. Alternatively, a structure could have mass-walls, made of stone, brick, mud, or horizontal logs. In these structures, the walls not only carried their own weight, but that of the floors and the roof. Framed buildings could be erected in several ways and its timbers fastened together using any of a great many joining methods. Many kinds of materials were also available to sheath the frames or to fill the spaces between them. Architectural historians also pay attention to the arrangement of buildings *vis-à-vis* other buildings, landscaping features like gardens and walkways, and the overall placement of all of these elements on the

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landscape. Evidence of these building elements and arrangements often survive and remain available for study by archaeologists as well.

Students of vernacular architecture can also look at surficial stylistic elements, such as paint, carvings, and moldings. Information concerning this aspect of a building can be found in written documents, photographs, drawings, paintings, and on surviving buildings, but is unlikely to be preserved in the archaeological record. All of these characteristics of a building are more-or-less independent from each other. For example, a builder could make a Cape Cod house either using timber framing or bricks, and add Georgian, Federal, or Greek Revival molding details.

With respect to form, there were two prevalent traditions of rural housing in southern and western England in the early 1600s. The first was a set of buildings classified, according to architectural historian Ronald Brunskill, as the "central-chimney family" of houses.[35] In England, these are found principally in low-lying East Anglia and Southeastern England. The second were houses belonging to the "two-unit" or "two-cell" family, and includes the "longhouse" form as a subset.[36] This form was common in the upland regions of England, including the Midlands and the West of England. Recognition of both traditions arises from study of domestic structures, and both forms were built out of a wide variety of materials.

Central Chimney Houses

The central-chimney forms are said to be a derivative of the medieval "hall." At the core of a medieval hall was the single-story hall proper, which was open to the rafters.

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The reason for the open roof-space could be found in a further defining characteristic, the absence of any kind of chimney. Thus, a medieval hall had an open hearth in the middle of its main room, and smoke simply rose up to fill the roof before escaping out smoke holes. Typically, there were two doors into the hall, one at the front side-wall and one directly opposite it at the back wall, forming a "cross passage." The doors and cross passage were usually located near one end or the other of the hall, and the cross passage was screened-off from the remainder of the hall by a partition.

In modest hall houses, there was a service wing at one end of the building, usually beyond the cross passage from the main hall. Frequently, the service wing had a second floor, forming a chamber above. More grand examples had a second wing at the opposite end of the hall. The ground-floor of that wing was used as the principal bed chamber. The chamber above was for entertaining and formal occasions. In the "typical" hall house, the two end-wings stood at right-angles to the hall.[37]

In the 1400s and especially the 1500s, southern England and East Anglia experienced an economic expansion. One manifestation of this was seen in housing, resulting in what has come to be known as the "housing revolution." Whereas only buildings belonging to the very highest economic classes used chimneys in the preceding centuries, the use of chimneys spread to all economic classes for the first time. Chimneys were added to existing houses, and new houses were designed with chimneys from the outset. As will happen whenever one element of structural system is altered, other elements of the system were adjusted as well. In hall houses, the use of the chimney made maintenance of an open roof space obsolete. Halls were frequently retro-fitted with a

second floor, or in new construction, hall-like houses were built with a second floor. This new form of house was being built in East Anglia by the early 1600s.[38]

Abbott Lowell Cummings points out a shortcoming in this story. Particularly, it does not neatly explain the transition from the hall form, with cross wings, to the two-room central-chimney form, without cross wings. He suggests that a more direct antecedent might be found in a variant of the hall evolution that occurred in Suffolk. Suffolk hall-houses, frequently referred to as Whielden houses, had two rooms but did not have cross wings. During the housing revolution, builders placed a chimney between the two rooms, which allowed back-to-back fireplaces to share a single flue. This had an important effect on house framing, which were redesigned to accommodate the chimney through the addition of a central chimney-bay. The space in front of the chimney stack was also used to accommodate an entry lobby, and frequently, a stairway to the second floor.

This kind of house, with a chimney bay and entry lobby, was recognizable as a distinct form in East Anglia by 1600 and has direct parallels in New England, where it is often referred to as a hall/parlor house.[39] The hall/parlor form is believed to be basic to the development of other types, including the "salt-box" and the Cape Cod house.

One-room versions of this form were also built in England and New England by people of more modest means. Besides having only one room, this variant differed from the larger version in the position of the chimney and fireplace, which were at one end of the building. Still, the two forms are related in having separately framed bays that housed the chimney, an entrance lobby, and the stairs to the floored upper-chamber.[40]

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Thus, the principal unifying characteristic of "central-chimney" houses is the location of the chimney with respect to the entrance lobby and stairs. In particular, the principal entrance leads into a lobby adjacent to the chimney rather than leading directly into the living-space of the house (Figure 8). Houses belonging to this family never are built with a straight-line cross-passage between the front- and rear- doors. This holds true regardless of whether the building is framed or mass-walled, and regardless of whether it is of the one-room or two-room variant. This also holds true in derivatives having still greater numbers of rooms such as the salt-box or Cape Cod house. In two-room versions, the two ground-floor rooms are separated by a central chimney that usually serves back-to-back fireplaces. In timber-framed examples, the chimney and entrance-lobby share a framing-bay that is separate from the bays for the adjacent rooms.

Two-unit Houses

The "two-unit" family of houses is subtly different in plan. The simplest form consists of a single structural unit separated into two rooms by a partition (Figure 9 a, b, c). The main room was heated by an end-fireplace. The principal entrance usually was directly into the main living-space of the house rather than into a separate lobby.[41]

In extended versions of the two-unit house, an additional room was placed beyond the main fireplace (Figure 9 d, e, f). In this case, the entrance would be situated in such a way that the continuous straight-line passage to a second door at the rear of the house was maintained, forming a cross-passage. If it was to be used as living-space, the added room could have its own fireplace (Figure 9 e). In this case, the additional fireplace also had its

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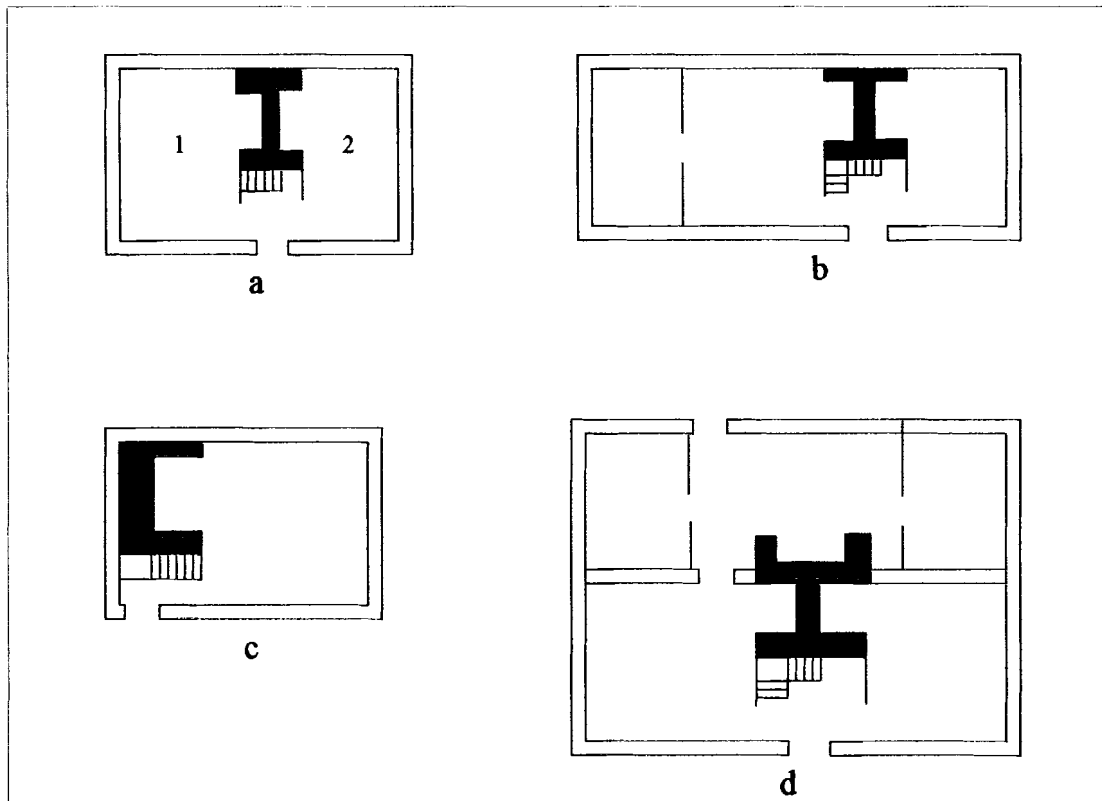
Figure 8. Typical "central fireplace" houses, common in lowland eastern England and in New England. The principal unifying characteristic of "central-chimney" houses is not the location of the chimney with respect to the floor plan, but with respect to the entrance lobby and stairs. In particular, the principal entrance is into a lobby adjacent to the chimney and not into the living-space of the house. (a) Basic plan with hall (1) and parlor (2) on ground floor. (b) Variant with additional rooms at one end. (c) One room variant. (d) Additional service rooms in rear. In New England, this floorplan is found in "salt-box" and Cape Cod houses. After R. W. Brunskill, page 107.

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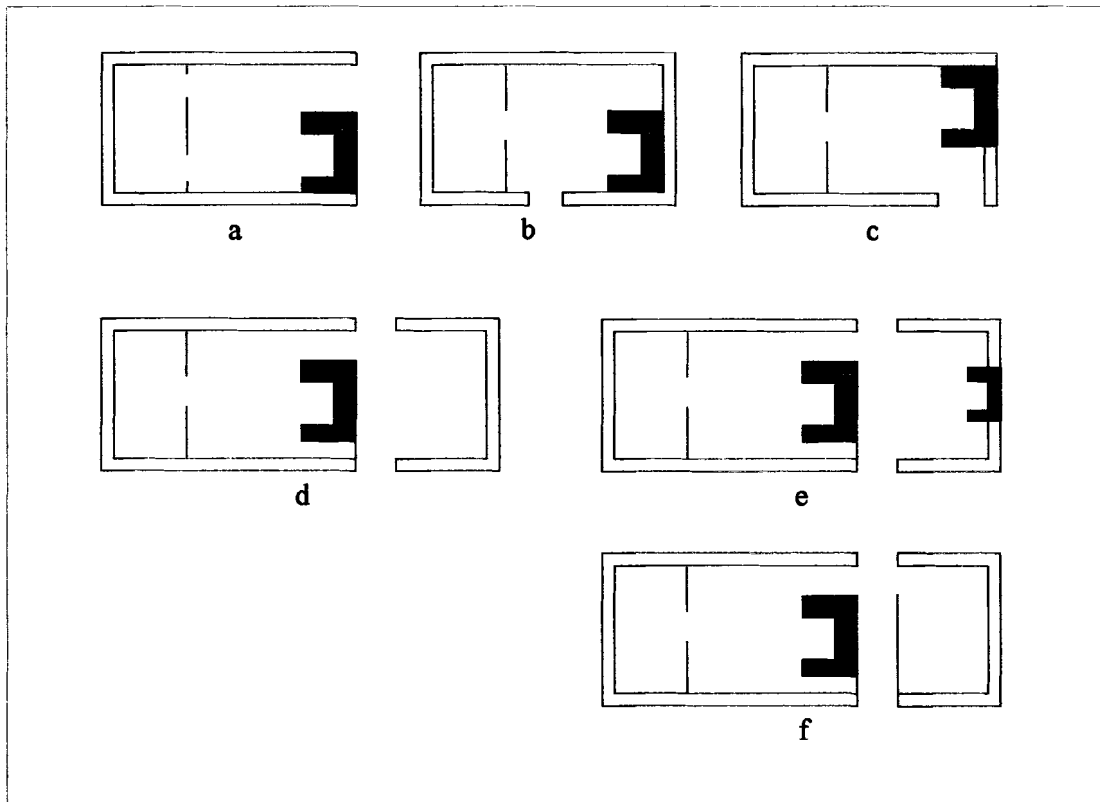
Figure 9. Typical two-cell houses, common in the western counties of England.
The simplest form consists of a single structural unit separated into two rooms by a
partition. The main room was heated by an end-fireplace. The principal entrance
usually was directly into the main living-space of the house rather than into a
separate lobby. The essential trait is a partitioned single structural cell with
(a) Basic plan. (b) Alternative door placement. (c). Alternative fireplace and door
placement. This arrangement converges in form with the central fireplace group of
houses (see Figure 8 c). (d) Variant with cross passage and service room added at
lower end. (e) Extended version with fireplace for additional living space.
(f). "Longhouse:" additional room is partitioned to separate animall space (byre)
from cross passage and living space. After R. W. Brunskill, page 105.

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own chimney.[42] If the additional space was to be used as a byre, or cow barn, a second

chimney was not needed. This form is known either as a byre house or a "longhouse"

(Figure 9 f).[43]

Two-unit houses were used in the upland regions of England including the

Midlands and Devon as well as in neighboring south Wales in the fourteenth and fifteenth

centuries and may have continued to be used in Devon into the mid-seventeenth century.[44]

The so-called Rhode Island stone-ender is a house form found in New England that is

thought to be a derivative of the two-unit house. Like the English examples, its main

entrance is directly into the living space.[45]

Framed two-unit houses, as opposed to mass-walled examples, are apparently

further differentiated from center-chimney houses by the absence of a separately-framed

chimney bay. Chimney bays are also absent in Rhode Island "stone-enders" as well as

from the further derivative of the stone-ender, the "square-plan" house.[46]

Building Methods and Materials

Buildings in England have been made using an array of materials and methods.

Builders have used cob (mud), brick, stone, and timber. Cob, brick, and stone were used

to build mass-walls, that is, walls that carried their own weight as well as that of the floors

and roof. By contrast, timbers were usually used to build a frame, that in turn, supported

the walls, floors, and roof.

In traditional English construction, frames are either classified as cruck frames or

box frames. In basic cruck construction, the roof was formed using pairs of very heavy

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timbers, called blades. These blades were joined at their upper ends to form the peak of the roof. The distinguishing trait of this kind of construction is that at their lower ends, the blades were brought well down the side of the house, so that the blades were also part of the house-frame proper. Indeed, cruck blades often extended to the ground.[47] A box frame is one in which the roof truss is supported by a framework made up minimally of vertical posts, transverse tie-beams, and longitudinal wall-plates.[48] Ideally then, a cruck frame can be distinguished readily from a box frame. In practice, there are numerous "hybrid" frames that have characteristics of both.[49]

Just as the preferred form of house varied region by region in England, so to did preferences for different building materials. Stone and clay mass-walls, for instance, were popular in the West of England, while brick was commonly used in northern, eastern, and southeastern England. The use of timber in box-framing was favored in Northern England, the Midlands, East Anglia, and Southeastern England. The use of cruck framing and its variants, on the other hand, were used across most of England except for East Anglia and the Southeast. The kind of cruck frame variant known as the jointed cruck frame was used particularly in the West of England. Interestingly, areas like Devon where the two-unit family of buildings were used were also areas where people were more likely to build mass-walled houses or to build cruck houses than they were to build box frames.[50]

Though many methods and materials were used in England, far fewer methods were used in New England. Through the seventeenth century, the vast majority of New England houses were box-framed. To date, archaeology at Fort St. George has provided evidence only of box framed structures, as do the house drawings on John Hunt's map.

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Earthfast Construction

In 1981, a group of archaeologists, architectural historians, and social-historians collaborated on a ground-breaking article on seventeenth-century colonial architecture. In "Impermanent Architecture in the Southern American Colonies," these scholars synthesized a growing body of evidence concerning a previously overlooked tradition in early building in the Chesapeake colonies.[51] Cary Carson, Norman F. Barka, William M. Kelso, Garry Wheeler Stone, and Dell Upton addressed "earthfast" construction, a term that they used to describe several ways of erecting a structure without benefit of a masonry foundation or plinth. Several broad categories of traditional buildings can be classified as earthfast, including log buildings and sod houses, but these authors particularly concerned themselves with timber-framed examples.

Carson and his collaborators pointed out that earth-fast framing was used in Medieval England, and though poorly documented, probably remained in use in contemporary England. Thus, the common usage of earthfast framing in the Chesapeake represented more of revival of an uncommon English building method than use of a new invention by the colonists. Indeed, the fact that the practice emerged full-blown throughout the Chesapeake area as early as 1618 demonstrated that the colonists were drawing from a set of established building techniques.[52] Since 1981, this hypothesis has received further support by the discovery that earthfast construction was used by English settlers as far away as Ulster between 1614 and 1619[53] and by discovery of its use at Fort St. George and Jamestown beginning as early as 1607. In all likelihood, earthfast methods were used by Gosnold's crew in 1604 and by the settlers at Roanoke in the 1580s.

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Indeed, it now appears likely that earthfast framing was more common in England in the early 1600s than was realized in 1979, and that it continued in use there at least through the seventeenth century in houses and into the nineteenth century in outbuildings.[54]

Several key assumptions and conclusions of the "Impermanent Architecture" article have been brought into question by subsequent work. Though the authors knew from documentary sources that post-in-ground construction was not invented in the Chesapeake region, they saw archaeological evidence for its seventeenth-century use restricted to that region. As a result, the authors spent considerable effort theorizing about what cultural, economic, social, and environmental conditions peculiar to the Chesapeake might help explain why colonists there adopted and perpetuated a construction method that colonists elsewhere avoided. Had they known that post-in-ground construction was far more widely distributed in the seventeenth century British colonies, they might well have framed their discussion differently and probably would have raised very different social, cultural, and economic theories about the use of post-in-ground technologies. It also was in part the presumed Chesapeake context that led them to characterize earthfast construction as "impermanent." While it is true, of course, that all timber framing is impermanent, the term probably would not have been accepted by many of the original builders or occupants, and in some instances, even post-in-ground structures appear to have survived more than a generation.[55]

Still, the article can be credited with spurring a great deal of subsequent research into this construction method and its distribution. The article introduced archaeologists outside of the Chesapeake region to the possibility that they, too, might encounter

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evidence of these kinds of heretofore unrecognized building practices. Indeed, it still provides what is the best available summary of the range of earth-fast construction methods that were available to traditional English builders.

Recent studies in Maine inform us more fully on the subject. Though the locations of numerous seventeenth-century sites were known to archaeologists based on documentary evidence, few sites had been identified in the field prior to 1981.[56] Sites related to the colonial village of Pemaquid and to the Clarke and Lake Trading Post in Arrowsic comprised notable exceptions, and both had been studied extensively. Partly, the paucity of confirmed sites is explained by the small number of archaeologists actually paying attention to historical period sites in Maine. The lack of success in finding early sites also resulted from a misconception about what the remains of such sites would look like.

Prior to the 1980s, Maine archaeologists believed stone foundation work to be the principal English building tradition. This expectation seemed to be confirmed by Helen Camp's work at Pemaquid during the 1960s and 1970s. She identified a number of seventeenth-century sites there, and each appeared to have had a stone-lined cellar or some other kind of substantial foundation. Similarly, archaeologist and historian James Leamon found masonry foundations at the Clarke and Lake Trading Post.

When archaeologists failed to find masonry foundations where they knew early sites to have been, they invoked vaguely defined processes of "erosion" to explain how seventeenth-century artifacts remained in the ground while architectural features were completely erased from the record. For instance, Wendell Hadlock did not find masonry

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footings attributable to Fort St. George. He concluded that site had been destroyed by shoreline erosion, decades of plowing, and nineteenth- and twentieth-century construction. Neither he nor his contemporaries had any expectation that architectural features might survive, albeit in a more subtle fashion.

In the decade following the appearance of the "Impermanent Architecture" article, Maine archaeologists confirmed the existence of six seventeenth-century sites on which earthfast, and particularly, post-in-ground, construction was represented.[57] During the 1990s, archaeologists discovered further examples of earthfast construction on early English sites in Maine. In fact, every Maine archaeological site with evidence of seventeenth-century English construction found in the last 20 years has been represented at least partially by earthfast-related features. It is now known that even some of the buildings at Pemaquid and Arrowsic were partially built using earthfast techniques.[58] Thus, in Maine as in the Chesapeake, earthfast timber-framing dominated English building practices through the 1600s.

Understanding Archaeological Manifestations of Earthfast Construction

A post is a vertical load-bearing member used in box framing. In many varieties of earthfast construction, the post is set directly into the ground. When the post decays or is removed, the soil feature known as a *postmold* forms, and it marks the exact location of the original post. As archaeological features, postmolds can take on different characteristics depending on how they formed.

When a post deteriorates in place, or *in situ*, then the mold appears as a dark colored humic soil that extends vertically down through the surrounding soil medium. If soil conditions are favorable and not too much time has passed, actual wood may be preserved in such a postmold. If the building in question burned, the mold may contain charcoal. To some extent this occurs because a smoldering fire can follow a timber down into the ground. If the post is sufficiently burned to leave a hole in the ground, that hole will serve to trap debris that falls into it.

When a post is physically removed from the ground it will also leave an empty pocket representing the post. In this case, however, the postmold will be preserved as a "cast," into which more recent sediments have filtered. At Fort Pentagoet in Castine, Maine, several postmolds left behind when small-diameter driven pales were removed actually survived as empty pockets in the soil.[59]

A *posthole* is the hole excavated for the purpose of placing a post, and as such, is a byproduct of construction. Archaeologically, the posthole will appear as an intrusion through the pre-existing stratigraphy. Generally it contains the same kinds of material as the surrounding medium through which it intrudes, including sands, silts, clays, stones, and artifacts. However, those materials will be mixed haphazardly within the posthole, in direct contrast to the discreet and organized horizontal layers outside of the feature.

Where many posts are to be set close to each other, as in a palisade, a trench may be used in place of individual holes. Trenches are conceptually similar to holes, and their fill will exhibit the same kind of mixing as in postholes. Such trenches are a subset of a

larger group of features known to archaeologists generically as "builder's trenches" or "construction trenches."

The complete sequence of events that creates a posthole-postmold complex, is as follows: First, the hole is dug. Second, the post is set upright into it. At this time, builders may discover that fine adjustments are needed to the height or placement of the post and they may place stones under or next to the post to force it into position. Next, the hole is refilled with soil, and the soil may be tamped down. These steps represent the construction episode. During the demolition episode, the posts either deteriorate *in situ* or are pulled out of the ground. In either case, some surrounding sediment filters into the resulting pocket.

While larger posts usually need some kind of hole or trench excavated for them, smaller posts may be driven with a sledge hammer or mallet, and very small "posts" may be pushed into the ground. If no discernable posthole can be found associated with what is believed to be a postmold, an archaeologist may reasonably conclude that the post was driven or pushed into the ground. Alternatively, a small posthole, little bigger than the post that is to go into it, can be bored with an auger, making the hole and mold indistinguishable, but use of this method dates from the late nineteenth century and later.

The principal function of a building frame is to give shape to the building and to support the weight of the walls, floors, and roof and to transfer that weight to the ground. The principal framing members are posts, plates, tie-beams, ground-sills, and girts. Secondary vertical framing members located between posts are studs. To render the building weather-proof, the spaces between these framing members must be enclosed. In

early seventeenth-century England, this was typically done using wattle and daub. According to Abbot Lowell Cummings, wattle refers to any arrangement of sticks used to bridge the space between adjacent studs that would give support to the wall filling. The wattle could be small wooden staves or it could be a woven mat of small sticks and branches. This light wooden framework was then sealed from both sides with a mixture of mud and straw, known as daub. Once the daub was made thick enough, it was trowled smooth to form the interior and exterior of the wall.[60] Some authors prefer to reserve the term wattle for a woven mat, calling mud on staves "mud and stud."[61]

Carson *et. al.* described five basic kinds of earthfast timber construction: puncheon buildings, hole-set framed buildings, framed buildings with hole-set blocks, buildings raised on "cratchets," and raftered houses. The defining characteristic of a *puncheon* building is that its vertical supporting members are driven into the ground without the benefit of first excavating a hole. Such buildings can be quite primitive, at least with regard to their footings.[62]

The palisade building, or "palisado," is included as a subcategory of puncheon building by Carson and his collaborators. It differs from other puncheon structures in that its builders would place the posts close together so that they not only form the principal supports, but also the wall itself.[63] While it may make sense for archaeologists to group this kind of construction with other puncheon buildings based on the absence of postholes, architectural historians, were they to see the buildings standing, would probably classify these two kinds of construction differently based on the different kind of frame and infilling used.

A building with a *hole-set frame* is one in which the structure's framing posts were set directly into holes in the ground, and not onto some other intermediary foundation. The method is distinguished from other earthfast box frames by the fact that posts were each a single timber that extended from the bottom of the hole to the eaves of the building. In this kind of construction, the postholes could impart a significant proportion of the frame's strength and stiffness. Most often, the posthole and postmolds are arranged in fairly regular patterns suggesting the bays commonly seen in box framed structures.[64]

If present, a ground sill is the lowest horizontally-lying timber in a structure. Some hole-set frames were built without sills. In that case, any studs would themselves be earthfast. Such studs could be either driven into the ground using a mallet, or could be placed into a trench dug for the purpose. Alternatively, if a hole-set frame had sills, those sills would have to be *interrupted sills*. In this case, each sill element was cut to fit the space between bays. Sometimes interrupted sills were laid directly on the ground or into a shallow trench. Even in cases where the sill sections were not joined directly to the posts, they would still provide an attachment point for possible studs.[65] Where evidence suggests that sills were absent it is reasonable to infer that the building did not have a floor, at least at the time of its original construction.[66]

The final way of building a hole-set frame was to use sills that were attached to the vertical posts. This is accomplished using a tenon on the ends of each sill section that fit into a mortise on the side of the posts. This had several benefits. First, the sill could be suspended several centimeters above the ground, away from moisture. Second, such a sill added strength to the house frame, strength that could be further increased through the

use of braces. Third, such a sill could readily be used to support bridging beams and sleepers for a floor.[67] The framing in this kind of building was sophisticated, and possibly, every bit as sophisticated as the framing found in surviving seventeenth-century timber-framed buildings that stand on masonry foundations.

Three different approaches have been hypothesized as to how such buildings were raised, and in modern times, each has been successfully used by carpenters employed by living-history museums. One way of erecting such a building is to stand each post individually, and then wrestle the sills and plates into position. It is also possible to assemble frame sections together on the ground and raise them in units. If the two side-walls of a building are assembled and then raised, the assembly is said to be "normal." In a one-story building, such sidewall sections include the posts and wall plate, and possibly studs, braces, and ground sill. Transverse timbers, especially the tie-beams, can only be positioned once the wall sections were up.

The alternative to assembling the building in wall-sections is to assemble it in bent-sections. Whereas wall-sections represent longitudinal framing-units, bents are transverse-, or cross-section, framing units. In a one-story building, a bent includes the posts and tie-beams, and possibly girts and braces. The assembly of a building in bent units is said to be "reversed."[68] The term "reversed" is apropos in two respects. First, and most obvious, is that bents are transverse framing units, oriented at right angles to longitudinal wall sections. Less immediately obvious, is that the relative position of the tie-beam and wall plates may also "reversed." In a normal building, the plates are installed before the tie-

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beams, and so the tie-beams must, perforce, sit on top of the plates. In reversed framing, the tie-beams are placed in position first, and as a result, the plates rest on top.

One other point should be borne in mind when considering the distinction between normal- and reverse- assembly. The logical link between bent-section construction and the alternative tie beam-plate positions only holds true if the building in question is one-story in height. This link breaks down when two-story buildings are considered. Abbott Lowell Cummings, for instance, concluded that both the Fairbanks House in Dedham, Massachusetts, and the Gedney House in Salem, Massachusetts, were raised in bent sections. Both structures, however, exhibit classic gunstock posts and have their plates under their tie-beams. His interpretation was possible because the structures are two-stories tall. When raised, the bents included the wall-posts and first-story girts but not the tie-beams. The tie-beams were only installed later, after the plates were raised into position.[69]

Tom Gerhardt is head of the artisans group at Plimoth Plantation, and Pret Woodburn is head carpenter at the same institution. They pointed out that the different placements of the tie-beams and wall-plates further implies differences in the joinery used at each post, plate, and tie-beams junction.[70] In normal construction, the vertical post is secured to the longitudinal wall plate and the transverse tie-beam using a combination mortise-and-tenon and dove-tail joint. To provide the quantity of wood needed to accommodate these joints, the top of the post is made quite wide, often in the shape of a gunstock (Figure 10). This form of junction is complicated and requires considerable skill in joinery.

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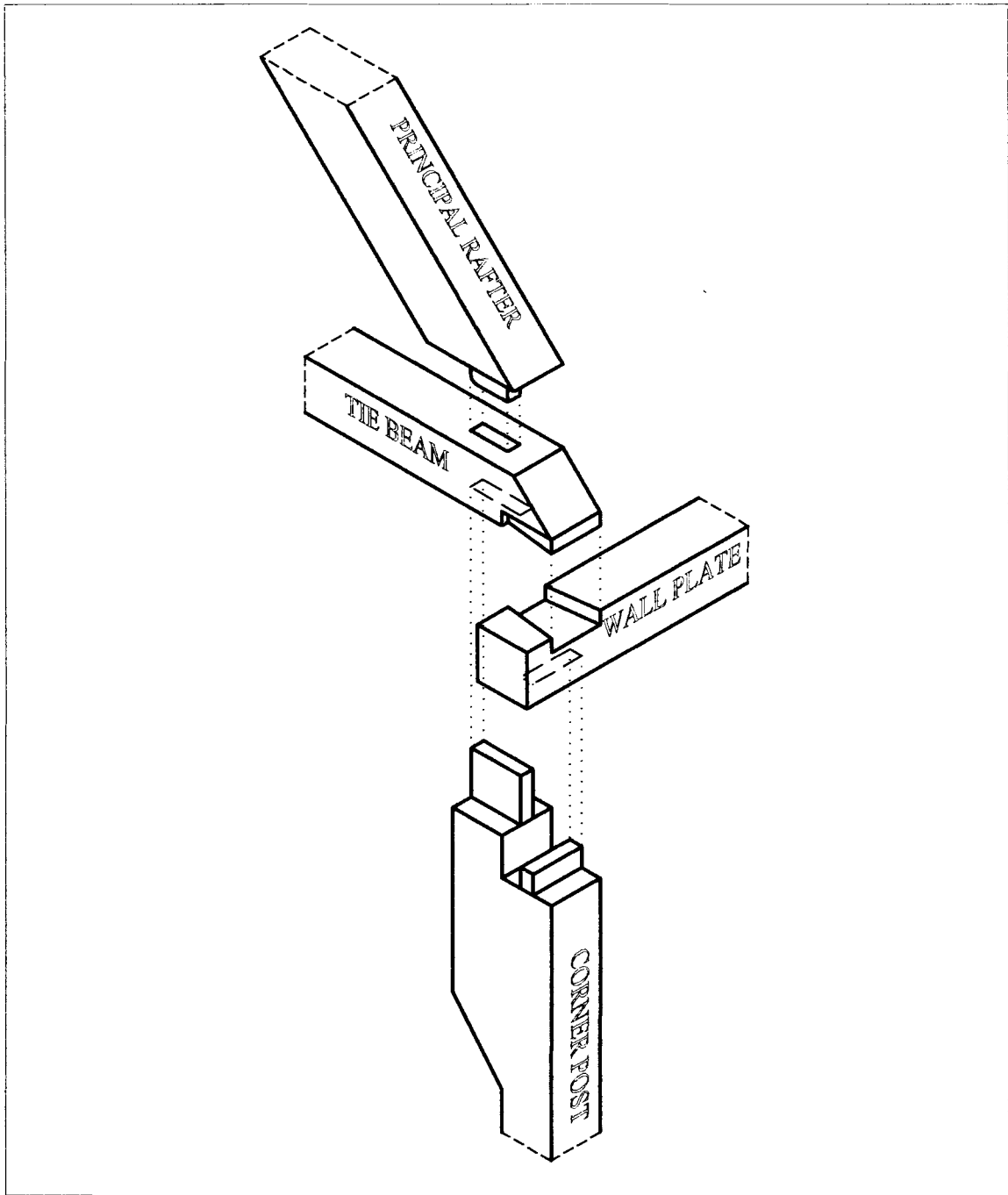
Figure 10. Typical joinery used to connect post, wall plate, tie beam, and rafter in normally assembled buildings. Compare to Figure 11.

In comparison to normal framing, the use of reverse framing offers several advantages, especially if skilled labor is scarce.[71] The joints used in reverse construction can be considerably simpler to make. This is because the joint may be comprised of two separate, but easy-to-make, mortise and tenon joints (Figure 11). A second advantage of reverse construction arises when earthfast studs are used. Because the plates sit on top of the tie-beams and not directly on top of the posts, the plate can be off-set inwards by the thickness of the studs. If this is done, a man can work from on top of the assembled frame to drive the studs into the ground. Because of the off-set, the outside of the studs end up forming a flush face with the exterior face of the posts. It is also true that frames can be reversed in other ways, some of which are as complex as normal framing. Several Connecticut houses built late in the seventeenth century and eighteenth century exhibit elements of reverse framing. In those cases, the carpenters retained jowled posts, but turned them ninety degrees, so that they expanded parallel to the house's sidewalls.[72]

The artisans at Plimoth Plantation have been experimenting with reverse construction since 1993, and since that date, they have raised most of their buildings in this way. Citing a house in England believed originally to have been earthfast and exhibiting reverse construction, Tom Gerhardt and Pret Woodburn have speculated that reverse assembly might have been at least as common in earthfast construction as was normal assembly.

The authors of the 1981 article offered several suggestions as to what might distinguish the sub-categories of hole-set-frames archaeologically. For example, if a building had unusually small posts or if its holes were irregular, then they were probably
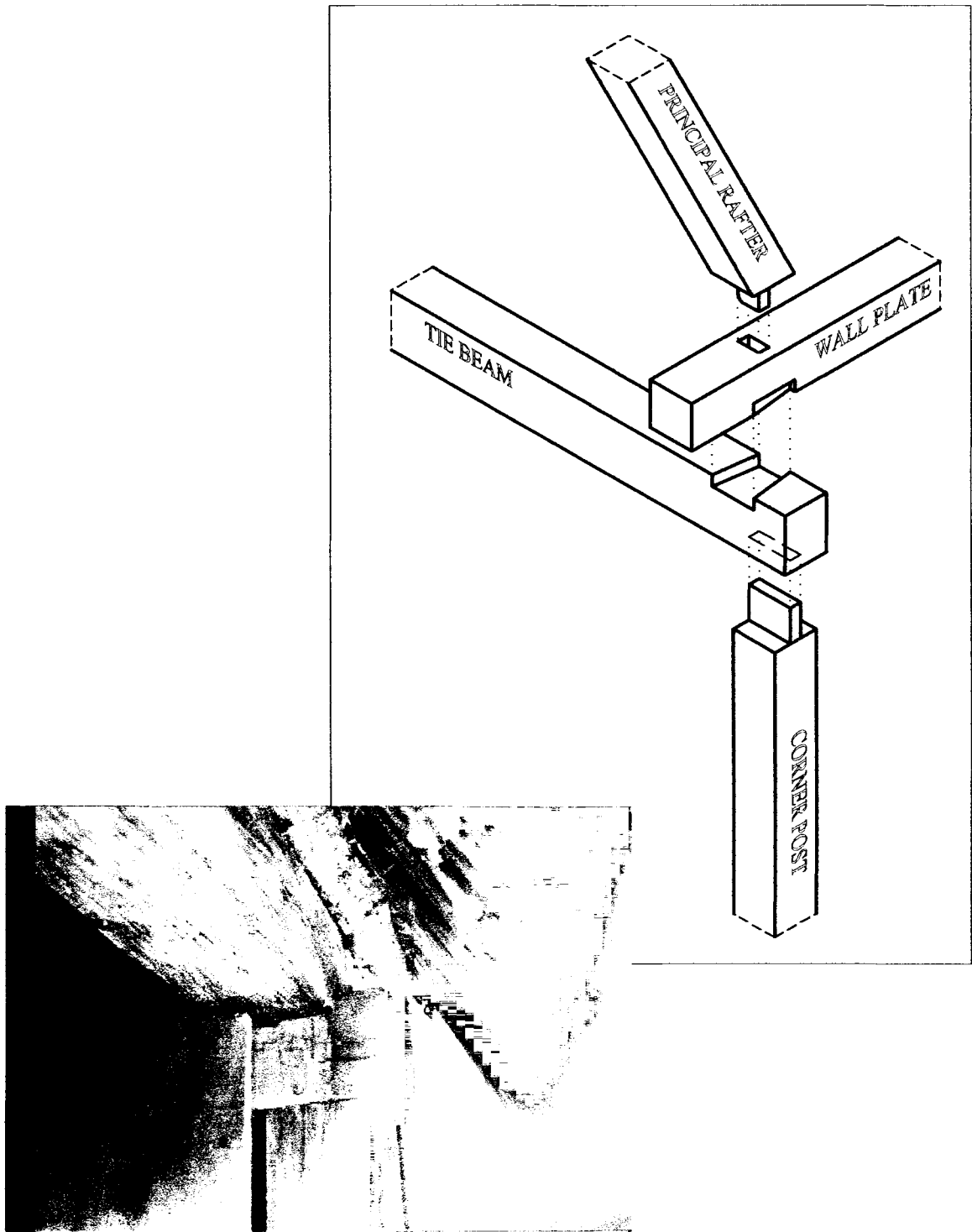
Figure 11. Conjectural joinery used to connect post, tie beam, wall plate, and rafter in single-story reverse assembled buildings. Inset: reverse frame joinery as used at Plimouth Plantantion, Plymouth, Massachusetts.

from a building that was raised post by post.[73] Though they did not clarify what they meant by "irregular," they may have meant an irregular alignments of postholes, irregular placement of postmolds within postholes, or both.

Their suggestions for distinguishing frames that were raised in either wall sections or bent sections were more concrete:

> Normal assembly of side-wall frames was usually aided by positioning the rectangular postholes with the long axes at right angles to the length of the building. Their bottoms sometimes were sloped or stepped in the direction in which the wall was raised, each post coming to rest near the middle or far side of the pit...[74]

Bent section construction, on the other hand, would be recognizable by rectangular holes that were oriented with their long axes parallel to the length of the building.

For example, archaeologists working at the main building at Littletown Plantation, in Kingsmill, James City County, Virginia, observed that the posts along each wall were in nearly straight lines. From this they deduced that the structure was raised using normal assembly.[75] A contrasting argument was made in the case of the so called Tenement II site, also in Kingsmill. In that case, the wall-postmolds were seen to form somewhat crooked lines. Additionally, the postholes were "decidedly rectangular" and oriented with their long axes parallel to the long axes of the building. The archaeologists looking at this data concluded that the structure was assembled in reverse, using pre-assembled bent sections.[76]

Another kind of earthfast structure is a *framed building with hole-set blocks.* Here, posts were set into a hole, but those posts were separate from the wall or corner posts of the building-frame proper. Because the building frame would be largely

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independent from the foundation system, it would not derive its strength from the rigidity of the blocks in the ground, and a sill would be required. Indeed, a building that can stand on hole-set-blocks is conceptually no different than one that can be placed on stone pilings or a massed foundation or plinth.

If used during original construction, the building placed on blocks would probably be raised on continuous ground sills made from timbers extending the building's entire length or width. Blocks could also be used to repair a building with a hole-set frame, if that building had interrupted sills and not hole-set studs. Hole set blocks might have been used only in repair work of hole-set-frames during the seventeenth century, at least in the Chesapeake region, but came into use in new construction during the eighteenth century.[77]

No suggestion was given by the authors as to what such a structure would look like archaeologically, but some ideas can be reasonably inferred. Because the placement of the blocks would be independent of the building's posts, the distances between blocks could be very irregular. Further, the blocks on one side of the structure would not necessarily be paired with blocks on the opposite side, and blocks on the two sides might not even occur in the same numbers. Finally, such posts would be individually raised, and the hallmarks of wall- or bent- raising would be absent.

The hole-set frame of a *cratchet* building also provides rigidity. The distinguishing feature between cratchet and hole-set-post buildings is not the presence or absence of a ground sill (though very likely, there is none) or how the ground sill is attached to the posts, but the nature of the joinery at the top of the post. In the buildings discussed so far, some kind of carpentered joint would be required to connect the vertical posts to the

horizontal plate and transverse tie-beams, and possibly to the rafters of the roof. In a cratchet building, the posts are cut from forked trees. With the fork placed upwards, horizontal poles could then be laid into them to serve as plates, or if the post was at the center-line of the building, a ridge pole. Such a building would be a simple affair and would not require great sophistication in its carpentry. It normally would have small-diameter posts, and probably correspondingly small postholes. As the buildings were not raised in pre-assembled sections, the spacing and alignment between posts would probably be irregular.

The *raftered* house is one in which the walls and roof are one and the same, somewhat like a modern A-frame.[78] This description also fits that of cruck framing, in which the cruck blades can extend all the way from the peak of the roof to the ground. However, the authors of the 1981 article appear to believe that the raftered house was a much less sophisticated structure than the cruck house.

Though Carson and his collaborators referred to the *plank-framed* house as a particular kind of earthfast structure, it probably does not qualify as a basic framing method at all. Plank-framing refers to the use of vertical planks butted together side-by-side to form a building's walls. These could be set into a trench, as in a palisado, if sills were not used. The bottom of the planks can also be fastened to a sill.[79] In so-called "plank framing," the planks are not actually substitutes for timber frames. Rather, as Abbott Lowell Cummings explains, the planks replace the use of studs and in-filling between posts.[80] Thus, the use of plank-framing may not be readily apparent in the archaeological record unless the planks were themselves earthfast.

To learn just how builders four centuries ago practiced their craft, it is necessary to make careful observations about the remains the buildings left in the ground.[81] Are there postholes and postmolds? How large are they? At what depth do the bottom of the posts sit, and how consistent is that depth from post to post? Where are the postmolds located within their holes? How regular are the intervals between posts along the side walls and across bents? Do the postmolds form perfect lines, or are they irregular? Are there any signs of sills? Are there studs set into the ground? Is there daub, and is it fired or unfired? Is there charcoal? Are there sequences of postholes, cutting into earlier postholes, indicating repairs or replacements?

The Hunt map may provide general information about the outward appearance of the buildings at Fort St. George, though the accuracy of Hunt's portrayal cannot be taken as a "given." Archaeology can fill out this picture by informing us about structural details and on the organization of interior spaces. The Hunt map suggests that all of the buildings at Fort St. George were one-story high. Assuming this was true, the link between wall-section assembly and normal framing on the one hand, and bent-section assembly and reverse framing on the other hand offers a real possibility that the kind of framing used will be reflected in building footprints. Examination of postholes and postmolds can lead to valid deductions about the joinery between posts, plate, and tie beams, even though all direct traces of it is missing. The more precisely we can characterize these construction methods, the more clearly we may be able to understand the building culture the colonists possessed.

Notes to Chapter 2:

34. The term "form family" is used by Brunskill, while Henry Glassie uses the words "form" and "type." Both writers used their terms to refer to the layout of a building, not to the materials or techniques used in erecting it. Ronald W. Brunskill, *Illustrated Handbook of Vernacular Architecture*, Faber and Faber, (London, 1978), pp. 98-99; Henry Glassie, *Pattern in the Material Folk Culture of the Eastern United States*, University of Pennsylvania Press (Philadelphia, 1968), pp. 8-11.

35. Ronald W. Brunskill, *Illustrated Handbook of Vernacular Architecture*, pp. 106-107.

36. Brunskill uses the term "unit" while N. W. Alcock, M. W. Barley, P. W. Dixon, and R. A. Meeson use the term "cell." Either way, they are referring to the division of spaces within a building and not to the number of framing bays. Ronald W. Brunskill, *Illustrated Handbook of Vernacular Architecture*, pp. 104-105; N. W. Alcock, M. W. Barley, P. W. Dixon, and R. A. Meeson, *Recording Timber-Framed Buildings: An Illustrated Glossary*. Practical Handbooks in Archaeology No. 5, revised edition, Council for British Archaeology, (York, United Kingdom, 1996), pp. F16-F19.

37. Abbott Lowell Cummings, *The Framed Houses of Massachusetts Bay*, 1625-1725, Harvard University Press, (Cambridge, 1979), p. 4.

38. *Ibid*, p. 6.

39. *Ibid*, p. 7.

40. *Ibid*, p. 7.

41. Ronald W. Brunskill, *Illustrated Handbook of Vernacular Architecture*, pp.104-105.

42. *Ibid*, pp.106-107.

43. *Ibid*, pp. 106-107; Patricia Scott Deetz and James Deetz, *Vernacular House Forms in Seventeenth Century Plymouth Colony*, University of Virginia (Richmond, 1998).

44. Patricia Scott Deetz, and James Deetz. Vernacular House Forms in Seventeenth Century Plymouth Colony: An Analysis of Evidence from the Plymouth Colony Room-by-Room Probate Inventories, 1633-1685, http://etext.lib.virginia.edu/users/deetz/ Plymouth/folkhouse.htm, p. 9 (citing Maurice Barley, *The English Farmhouse and Cottage*, Routledge and Kegan Paul [London, 1961], pp. 10, 24).

45. Robert Blair St. George, "'Set Thine House in Order': The Domestication of the Yeomanry in Seventeenth-Century New England," in Dell Upton and John Michael Vlach, eds., *Common Places: Readings in American Vernacular Architecture*, University of Georgia Press, (Athens, 1986), pp. 346-349.

46. Myron Stachiw, personal communication 1999.

47. N. W. Alcock, M. W. Barley, P. W. Dixon, and R. A. Meeson. *Recording Timber-Framed Buildings*, p. G5.

48. *Ibid*, p. G2.

49. *Ibid*, p. G5; Ronald W. Brunskill, *Illustrated Handbook of Vernacular Architecture*, p. 54.

50. Ronald W. Brunskill, *Illustrated Handbook of Vernacular Architecture*, pp. 187-193. Brunskill has broken out the distribution of different materials across England in a series of maps. Unfortunately, the maps do not provide any sense of time-scale. So, for instance, jointed cruck frames were used in Devonshire, but whether they were used specifically in the late 1500s and early 1600s, is not indicated.

51. Cary Carson, Norman F. Barka, William M. Kelso, Garry Wheeler Stone, and Dell Upton, "Impermanent Architecture in the Southern American Colonies," *Winterthur Portfolio* 16 (numbers 2 and 3, Summer and Autumn, 1981), pp. 135-196.

52. *Ibid*, p. 138.

53. Orloff Miller, "Archaeological Investigations at Salterstown, County Londonderry, Northern Ireland, Ph. D. dissertation, University of Pennsylvania, 1991, pp. 320-345.

54. Emerson W. Baker, Robert L. Bradley, Leon Cranmer, and Neill DePaoli, "Earthfast Architecture in Early Maine," unpublished manuscript, 1996, p. 17. Baker *et. al.* cite J. T. Smith, "Short-Lived and Mobile Houses in Late Seventeenth-Century England," *Vernacular Architecture* volume 16, (numbers 33-34, 1985) and R. A. Meeson and C. M. Welch,"Earthfast Posts: The Persistence of Alternative Building Techniques," *Vernacular Architecture* volume 24 (1993), pp.1-17.

55. Emerson W. Baker, Robert L. Bradley, Leon Cranmer, and Neill DePaoli. "Earthfast Architecture in Early Maine," p. 5.

56. Robert L. Bradley and Helen Camp, *Forts of Pemaquid, Maine: An Archaeological and Historical Study*, Occasional Publications in Maine Archaeology Number 10, Maine Historical Preservation Commission, (Augusta, 1994).

57. Emerson W. Baker, Robert L. Bradley, Leon Cranmer, Neill DePaoli, "Earthfast Architecture In Maine," paper presented Vernacular Architecture Forum Annual Meeting, 1992.

58. Lee Cranmer, personal communication, March 18, 2002; Emerson W. Baker, Robert L. Bradley, Leon Cranmer, and Neill DePaoli, "Earthfast Architecture in Early Maine."

59. Alaric Faulkner and Gretchen Faulkner, *The French at Pentagoet 1635-1674: An Archaeological Portrait of the Acadian Frontier*, The Maine Historic Preservation Commission, (Augusta, Maine, 1987), p. 44, figure 3.5.

60. Abbott Lowell Cummings, *The Framed Houses of Massachusetts Bay, 1625-1725*, p. 11.

61. Alcock, N. W., M. W. Barley, P. W. Dixon, and R A. Meeson, *Recording Timber-Framed Buildings: An Illustrated Glossary*, pp. G12, G20 .

62. Cary Carson, Norman F. Barka, William M. Kelso, Garry Wheeler Stone, and Dell Upton "Impermanent Architecture in the Southern American Colonies," pp. 148-149.

63. *Ibid*, p. 148.

64. *Ibid*, p. 149.

65. *Ibid*, p. 149.

66. *Ibid*, p. 149.

67. *Ibid*, pp. 149-150.

68. *Ibid*, p. 150.

69. Abbott Lowell Cummings, *The Framed Houses of Massachusetts Bay, 1625-1725*, p. 63 figure 60 and p. 82, figure 96.

70. Tom Gerhart and Pret Woodburn, personal communication, March 23, 2000.

71. Tom Gerhart and Pret Woodburn, personal communication, March 23, 2000.

72. J. Frederick Kelly, *Early Domestic Architecture of Connecticut*, Yale University Press (New Haven, 1963), reprinted Dover Publications (New York 1963). Examples include the Tyler House in Branford (page 27, Figure 28) and possibly the Stevens House, West Haven (page 29, Figure 32).

73. Cary Carson, Norman F. Barka, William M. Kelso, Garry Wheeler Stone, and Dell Upton "Impermanent Architecture in the Southern American Colonies," p. 150

74. *Ibid*, p. 150

75. *Ibid*, 180.

76. *Ibid*, p. 179.

77. *Ibid*, p. 153

78. *Ibid*, p. 154.

79. *Ibid*, p. 155.

80. Abbott Lowell Cummings, *The Framed Houses of Massachusetts Bay, 1625-1725*, p. 89.

81. Cary Carson, Norman F. Barka, William M. Kelso, Garry Wheeler Stone, and Dell Upton "Impermanent Architecture in the Southern American Colonies," p. 150.

CHAPTER 3

THE EVIDENCE

As of September 2001, specific evidence of either four or five structures have been found at the site of Fort St. George, depending how the evidence is read. Using the John Hunt map as a reference, the first was positively identified as the storehouse based on its location, orientation, and dimensions. The second location, possibly encompassing remains from two successive buildings, is very near where Hunt shows "the Admiral's howse." The third building site is tentatively identified as "the Vice Admiral's howse." The fourth is probably one of two apparently connected buildings, the buttery general or the corporal's house.

Archaeologically, the storehouse is by far the best understood. A great deal of evidence has come to the surface concerning the Admiral's house, but putting that evidence together into a clear story has proven a challenge. The remaining two structures, the Vice Admiral's house and the Corporal's house/Buttery General, have received less attention in the field and few reliable conclusions can be made about them beyond the bald fact that they were built using some form of post-in-ground construction.

The Storehouse

After the colonists began their fortifications in August 1607, they initiated construction of the storehouse.[82] As depicted by John Hunt in October 1607, the storehouse was eight bays in length and two bays wide (Figure 4 a). An arched door was located in the third bay from the north, and each of the remaining bays had a window. His

illustration hints at some kind of device at the top of each post and this detail appears on the Court of Guard as well (Figure 4 c), but just what Hunt intended to show is not at all clear. While it is possible that he was illustrating a decorative finial it is more likely that he meant to show a small brace, bracket, or other reinforcement. Jeff Brain has suggested Hunt was depicting jowled "gunstock posts." If that suggestion is right, and if Hunt accurately portrayed the posts as expanding longitudinally along the sidewalls and transversely along the endwalls, then he was not recording a normally-assembled structure. Instead, this arrangement would indicate that the storehouse and Court of Guard were reverse-framed.

More certain, is that the storehouse roof employed a vertical "king-post" between the center of its end tie-beams and the roof peak. Quite possibly, such posts were used at every rafter pair along the building's length. Hunt also depicts a series of six apparent roof openings. The builders might have intended these as smoke vents. The storehouse only would require smoke vents if it served a function additional to storage, perhaps as barracks. If this was the case, then the garret probably did not have a floor, which would have prevented smoke from rising to the vents. On the other hand, these openings might have served to admit daylight into the otherwise pitch-dark garret or loft. Since darkness in the garret would not have been a concern unless it was useful space, the presence of the openings would suggest the opposite conclusion, that the loft had its own floor. Because there are so many openings, it seems likely that illumination was their primary purpose. In addition, it seems probable that the colonists would have desired to keep fires well away from their vital stores. This is particularly the case since, prior to completion of the

separate munition house (number 4 on the Hunt map [figure 2]), the storehouse probably housed gunpowder.

Unfortunately, it is impossible to discern how the storehouse roof was clad based on Hunt's vague representation (Figure 4 a). Presumably the roof was thatched, and the lines that Hunt drew up the slope of the roof might have been a stylized representation of that material. Perhaps instead, the lines represent battens or weights that helped hold the thatch in place, or perhaps they represent shingling. However the colonists roofed the storehouse, the Hunt drawing suggests they used the same material to cover the majority of the buildings in the fort. Only the chapel, whose roof exhibits longitudinal lines overlain by more substantial vertical structures, was illustrated differently (Figure 4 b).

Three hundred and eighty seven years after it was erected, discovery of a posthole and postmold from the storehouse provided the first proof that structural remains of the colony still survived (Figures 6 and 7). Based on that alone, we knew that the colonists were using an earthfast framing technology. Over the course of three more field seasons, from 1997 to 1999, 16 additional postholes and postmolds were recorded. Based on the location of these, it was a simple matter to determine the size and shape of the storehouse. Such characteristics as the depths of the posts and postholes, the positioning of postmolds within their postholes, and the contents of the holes and molds, revealed information about more ephemeral aspects of the building, such as how the building was framed. Considering the difficulty encountered in finding the initial evidence of the fort, excavators were pleasantly surprised to find that the ground also contained other evidence of the building, including ground sills, wattle and daub, and perhaps indirectly, thatch.

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Eight posthole-postmold sets were found marking the entire east wall of the structure. Six postholes and postmolds have been uncovered on the west wall. Two additional posthole and postmold sets are presumed to survive on the west wall, but they have not been excavated. Three posthole-postmolds have been uncovered on the centerline of the building including one at the center of each end.

All of the postholes and postmolds from the storehouse are very similar to each other in most respects. The fill within the postholes was a mixture of soil material naturally occurring on the site, and as a group, the holes contained very few artifacts. This is consistent with the notion that the storehouse was built early in the settlement, as there were not yet many lost articles to be accidently incorporated into the back-fill of the holes. This also indicates that the storehouse was built in a single episode.

The wall- and corner- postholes are consistently circular to oval in plan, and range from 65 cm to 110 cm across. In a few cases, the firm subsoil, below the level of most root and animal activity, preserved the shape of individual shovel cuts. These revealed that the colonists excavated their holes using flat-bladed spades rather than rounded shovels. The postmolds varied from 20 cm to 30 cm across. Several of the postmolds were sufficiently clear to show that the posts originally had been hewn or sawn to a rectangular cross-section. Actual wood was found at the bottom of all of the postmolds that were fully excavated. R. Bruce Hoadley of the Wood Technology Department, University of Massachusetts, Amherst identified the wood as that of a native, hard-grained, resinous pine; possibly pitch pine.[83] This firmly establishes that the colonists were framing their buildings from trees cut on site, rather than assembling frames prefabricated

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in England. Charcoal has been found in the upper reaches of a number of the postmolds, indicating the building was destroyed by fire.

The dimensions given above apply specifically to the wall posts and their holes. The center-line posts were somewhat lighter and their holes correspondingly shallower and smaller. The north gable center posthole, for instance, was 50 cm across.

The postmolds along each wall are in near perfect alignment, and nowhere does a post stray from a straight line by more than about 12 cm. Further, the building's east and west walls are very nearly parallel, resulting in a building about 5.75 m (18.8 ft) wide. The variation in width averaged just 7 cm, though the widest part of the building was 19 cm (8 inches) different than the narrowest part. Along each wall, post spacing is more variable. The east wall posts averaged 2.99 meters apart, measured center to center, and this distance typically varied by just 7 cm.[84] On the west wall, the posts averaged a slightly larger 3.07, but the variability was much greater. Here, the distance typically varied by 32 cm, and the largest distance of 3.54 meters was a full 80 cm longer than the shortest distance of 2.74 meters. The additive result is that the east and west walls differ in their overall lengths. The west wall is 21.5 meters (70.5 feet) long, while the east wall is 20.91 meters (68.6 feet). As these represent measurements from the posts' centers, the overall dimensions would have been slightly greater: about 21.2 meters (69.5 feet) on the east wall; 21.75 meters (71.3 feet) on the west wall; 6.1 meters (20.0 feet) on the north wall; and 6 meters (19.7 feet) on the south wall. The difference in post spacing also led to differences in the angles formed by the sidewalls and the individual bents. Because the building is nearly rectangular overall, the angles average 90 degrees, plus or minus three

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degrees. In one case, however, the angle formed between the wall and the bent is nearly eight degrees from perpendicular.

Each postmold along the east and west walls of the building is located towards the exterior side of its posthole (Figure 12). That is, posts that formed the east wall of the structure stood against the east side of their holes, while posts that formed the west wall of the structure stood against the west side of their holes. In the four places where both the seventeenth-century ground surface and the bottom of the postholes could be identified, the holes were found to have been excavated between 69 cm and 88 cm deep. Notably, the hole for the center post at the north end of the building was 50 cm shallower than either of the neighboring corner posts.

In some instances the postmolds extended to the bottom of their holes. In many instances, one or more rocks had been placed under the post to raise it above the bottom of the hole. The correction in elevation created by the stones was usually about 10 cm or less, but one post near the middle of the west wall was raised over 30 cm from the bottom of its hole.

The near perfect alignment of postmolds marking each wall line indicates that the storehouse was raised in pre-assembled side-wall sections. In other words, the builders used "normal" assembly. Because the storehouse was built in sidewall sections, we can further conclude that the wall plates were placed on top of the posts, and the tie-beams on top of the plates. The consistent placement of the wall posts against the outside of the holes permits us to go further, as this indicates the manner in which the posts were raised. When a builder raises a post, he first lays the post on the ground, its base over-hanging the
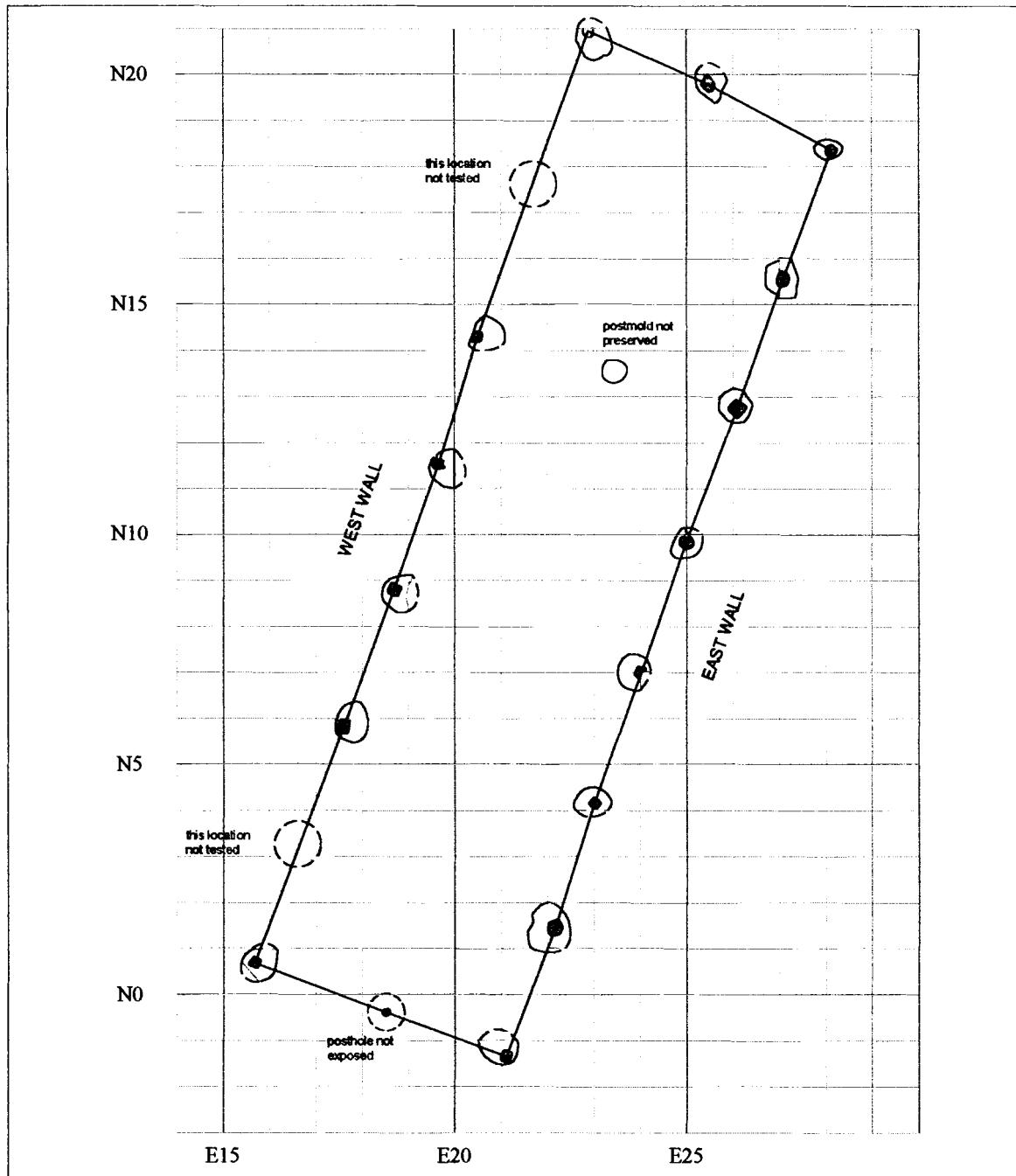
Figure 12. Spatial relationship between postmolds and postholes from the storehouse. Note that the east- and west-wall postmolds are located on the exterior or "outboard" side of the hole. Since a post base typically settles on the opposite side of a hole from where it is raised, this positioning indicates that storehouse posts were raised from the interior of the buildings footprint. The consistent pattern further suggests the posts were raised in assembled longitudinal wall sections, though the pattern could also be created by raising the posts individually from the building interior. The same relative positioning of postmolds and post molds would be unlikely in a building raised in transverse bent-sections.

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prepared hole. As the post is raised, the near edge of the hole forms the fulcrum on which

the post pivots. Typically, the butt of the post slides into place against the far-side of the

hole from where the post lay on the ground.[85] The observation that the storehouse

postmolds are situated against the exterior side of their holes, means that the carpenters

framed the wall sections inside the foot-print of the buildings and raised them outward

(Figure 13). It is not known if this has any real cultural significance; building inside the

footprint may have been done simply to conserve limited workspace within the fort. This

may have been particularly useful since the storehouse was adjacent to the western

defensive wall.

The posts were not the only timbers to leave their mark in the ground. Clear

evidence of ground sills survived along the sidewalls in the south half of the storehouse.

Most of the sills burned. In some instances, they survived as linear arrangements of small

charcoal fragments, whereas in other cases the charcoal retained substantial structure. A

few small pieces of actual wood survived along with the more typical charcoal at the south

gable end. The spatial relationship between the sills and posts did not in itself confirm that

the sills were interrupted by the posts, but the arrangement was consistent with that

hypothesis.

Also at the southern end of the storehouse, evidence of other timbers survived. In

these cases, the timbers appeared to be elements that had fallen during the demolition of

the structure, and were therefore displaced. While some could be seen to overly others, it

was not possible to determine what parts of the building's superstructure were

represented.

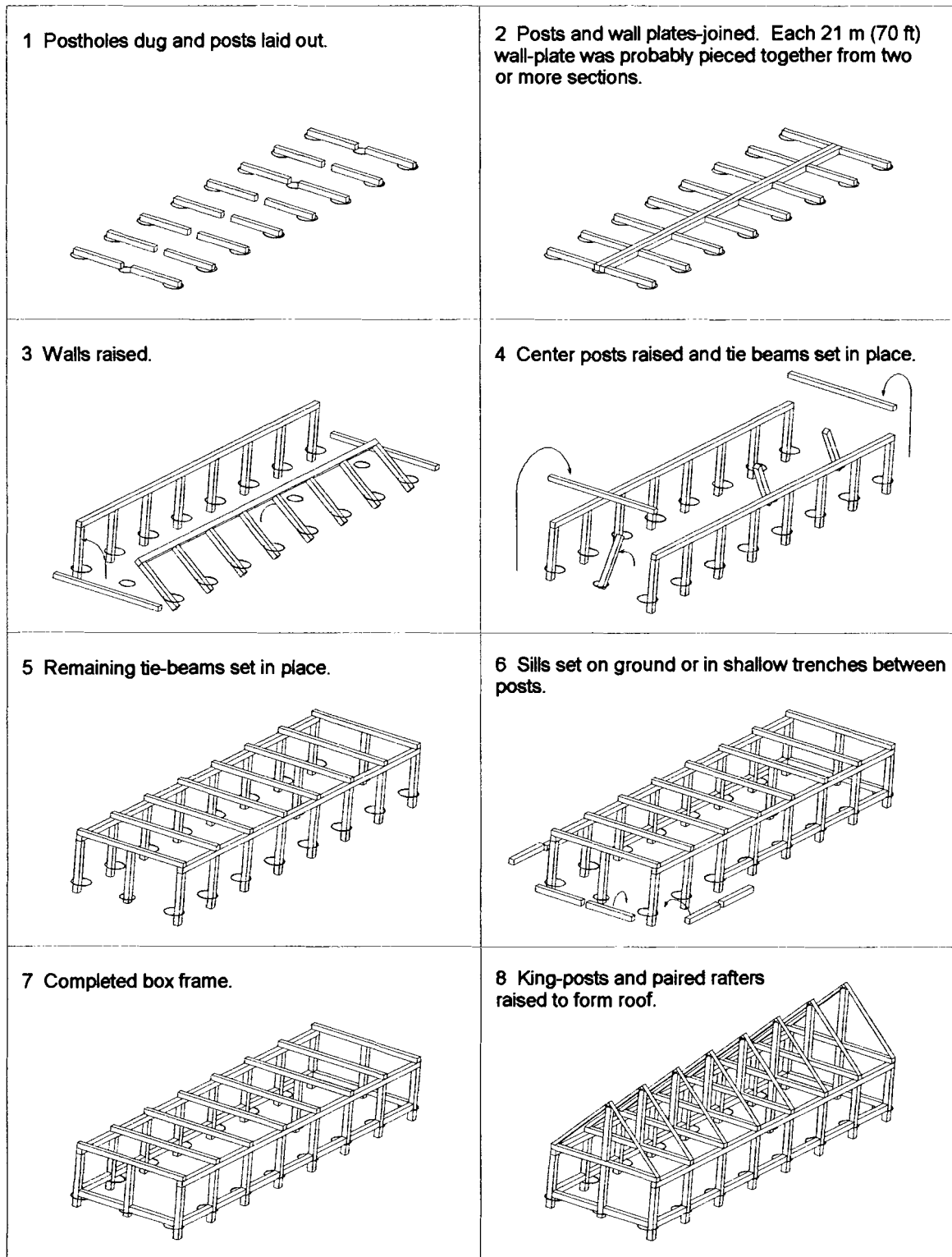| 1 Postholes dug and posts laid out. | 2 Posts and wall plates-joined. Each 21 m (70 ft) wall-plate was probably pieced together from two or more sections. |
3 Walls raised.	4 Center posts raised and tie beams set in place.
5 Remaining tie-beams set in place.	6 Sills set on ground or in shallow trenches between posts.
7 Completed box frame.	8 King-posts and paired rafters raised to form roof.

Figure 13. Assembly of major timbers in storehouse frame. Steps 1 through 7 are conjectured from archaeological data. The use of king posts with each pair of rafters in the roof, step 8, is a conjecture based on Hunt (see figure 2).

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To summarize, John Hunt shows us that the storehouse was one story tall. Though he showed the building to be eight bays in length and two bays wide, it was in fact only seven bays in length. The building was framed using hole-set-posts and interrupted ground sills. As no discernable trenches were discovered, it is likely that the sills sat at grade.

The arrangement of postmolds within their postholes suggests that the carpenters raised the building using normal assembly. That is, the east and west walls were each pre-assembled flat on the ground. These assembled units would have included the posts and wall plate, at least. Due to the length of the building, over 21 meters (70 feet), each plate was probably pieced together from two or more shorter and more manageable sections. Once the walls were raised, the east and west walls were connected together by tie beams. Thus, the tie beams sat atop the plates, and the post-plate-tie-beam junction was probably effected using a common "gunstock" joint. Drawing again from Hunt, it appears that the joints between posts and plates were further reinforced through the use of a device such as brackets, rising braces, or knees. The use of longitudinally oriented jowls, hypothesized based on Hunt's drawing, is not consistent with this analysis.

Once the walls were raised, several subsidiary posts were installed to provide additional support for the weight of the roof and floors, and against leaning. The centerline-postmolds and postholes indicate that the builders utilized additional posts at the gable ends and at the third bent (counting from the north). Possibly, the interior post suggests the site of a transverse partition, in which case the building had at least two cells. Each gable end also possessed a king post located directly above the center post and

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extending from the tie-beams to the peak of the roof. Presumably, king posts were used at every bent to help support the great weight of a thatch roof, but they may have been installed only at those bents that had a center post, or only at the ends.

Whether or not the sills were included in the preassembled section is not clear. If so, the sills would have been made with tenons that fit into mortises cut into the side of the posts. If not, the sills would have simply been laid on the ground between the posts after the walls were raised into place. Mortise and tenons were not discernable at the junction between the posts and sills, and in fact, it is unlikely that the soil would have preserved such a subtle detail of construction. None-the-less, the sills and posts were closely positioned, indicating that they might have been mortised together.

Though the excavators found clear evidence of sills, no evidence was found to indicate that the structure had a wooden floor. Possibly, the building had earthen floors, but the possibility that it had a wooden floor or a partial wooden floor cannot be ruled out. The sills were heavy timbers and as a result, they partially survived the fire that destroyed the storehouse and the weathering processes of another 400 years in the ground. In contrast, floor planks would have been fairly thin and might not have survived in any recognizable form. Any sleepers used to support the floors would have been heavier beams, though probably smaller than the sills. If the sleepers themselves did not rest directly on the ground, then girts would also have been needed to bridge the width of the bays. These would have been very heavy timbers and the fact that no sign of such timbers was found is a strong indication that they, never existed, at least at the south end of the building where preservation was best.

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Wattle and daub was probably the most common kind of infilling used in seventeenth-century English buildings, and apparently, the colonists used it in the storehouse. The wattle, which was wood, did not survive in the ground, but some of the daub did survive. Usually, the daub survived because it was burned, turning it into stable brick-like chunks. Imprints left in the daub indicate that it was pressed into wattle that was generally less than 1 cm in diameter. In a few instances, both the wattle imprint and the smoothed interior or exterior face of the wall were preserved on a single piece of daub. These indicate that the total thickness of the infilled wall was about 5 cm. Imprints of grass leaves have also been found in the daub. While the grass might have been used as a binder to strengthen the daub, it may also have been incorporated into the mixture by chance. If the grass is eventually identified, it may be possible to determine whether it is a variety native to Hossketch Point, or whether it would have grown off site.

The early completion of the storehouse was vital to the colony so that the ships could be off-loaded and returned to England for further supplies. The storehouse may also have been needed for temporary housing while other shelters were completed, particularly after the ships left. From the Davies journal, we know that intense effort was put into raising the structure in the first month of the settlement. The archaeological evidence shows that this work was directed by a master carpenter with the assistance of skilled laborers. The trees needed for the structure were not brought from England, but were cut on location. Once the timbers were hewn or sawn square, the builders laid out and partially assembled the frame on the ground. The fact that the building was assembled in wall sections shows that the builders had the skills to work with the relatively

complicated joinery needed in normal assembly. Furthermore, it demonstrates that the

presumed benefits that could accrue from using simpler reverse construction were out-

weighed in the builders' minds by the benefits of normal construction. Though we cannot

know for sure why the made the choice they did, factors that they considered might have

included perceived advantages and their familiarity with one building method over the

other.

The Admiral's House

The evidence for the storehouse construction was relatively straightforward. As

we excavated most of its footprint over the course of three seasons, the details were laid

out for us to see. Not so with the Admiral's house. Interpretation of that structure was

made difficult by a succession of buildings on the same location and because a large part

of that site was inaccessible due to the town road that crossed over it. Still, a good case

can be made for the story of the Admiral's house and how it was built.

John Hunt's drawing indicates that this structure was the third largest structure at

Fort St. George; only the storehouse and chapel were larger (Figure 2). According to the

Hunt map, the structure was four-bays long and one bay wide (Figure 3 b). It was

oriented east-west, approximately perpendicular to the storehouse, and had a chimney at

its west end. The drawing also shows that the door provided entrance into the second bay

from the end, not the end-bay where the chimney was shown. As in the storehouse, the

roof appears to have been built with covered openings, somewhat like dormers. Since this

building had a chimney, smoke holes were not necessary, lending further support to the suggestion that such openings provided light to the second floor, or garret.

The admiral in question was Raleigh Gilbert, second in command at the colony under the president, George Popham. When George Popham died in February 1608, Gilbert rose to the leadership. Though perhaps overblown, his title of Admiral denotes his position as overall-commander for the colony's two, and later three, vessels stemming from his role as the colony's head explorer. Admiral of the colony's navy, Gilbert might also have been commander-in-chief of the colony's land forces.

By comparing the Hunt map to the known location of the storehouse, Jeff Brain was able to determine the approximate location of the Admiral's House. He decided that the house site probably lay partially under the paved town road where it would remain inaccessible to us for the present, though hopefully preserved for future study. It also appeared that the site partially lay under the unpaved Fort Baldwin parking lot. The 1999 and 2000 excavations confirmed both of these expectations.

In the predicted location of the Admiral's house, Brain's team discovered nine posthole/postmolds, a half-excavated posthole in which a mold was not found, a hearth, and two separate debris fields. In addition to these, they found three posthole-like features. Each of these features lacked a postmold but contained one large stone. These, too, may have been related to the construction of the Admiral's house. The stone base of the hearth consisted of large flat-lying and closely-fitted slabs of schist at its center (Figure 14). These were surrounded by a semi-circular arrangement of smaller stones. Around the whole arrangement was a narrow trench, again semi-circular in plan.

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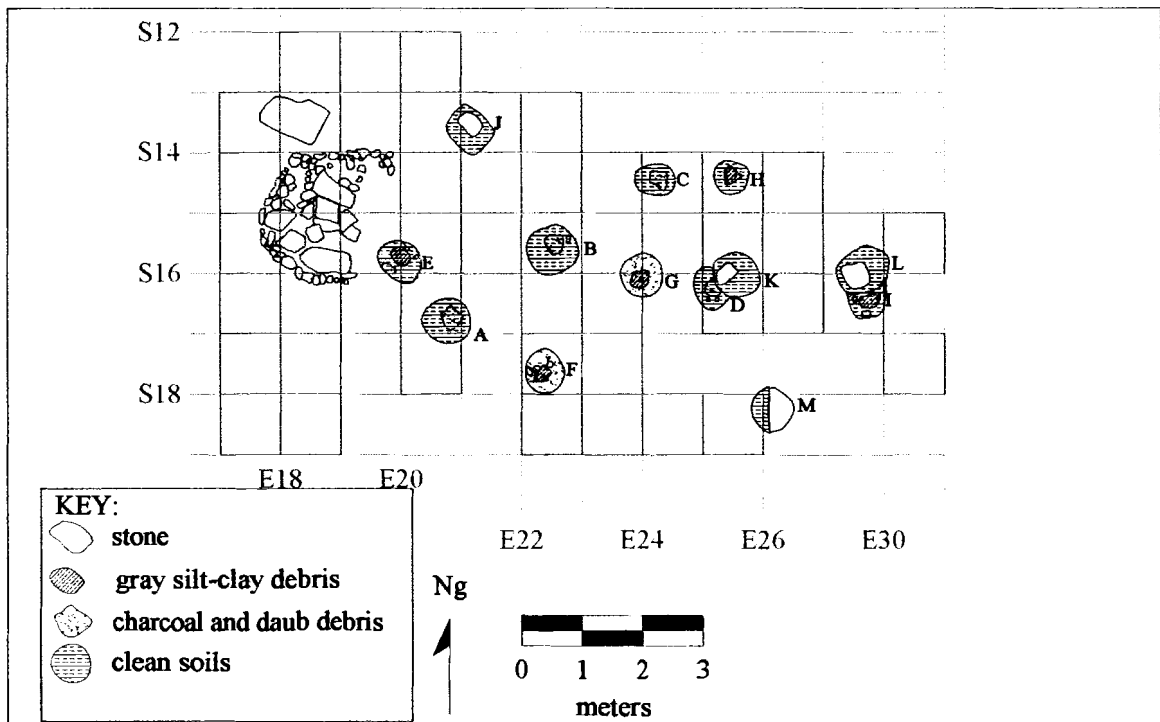Figure 14. Hearth, postholes, postmolds, and large stones on the site of the Admiral's house. (After Jeffrey Brain, Fort St. George V, p. 8, figure 9.)
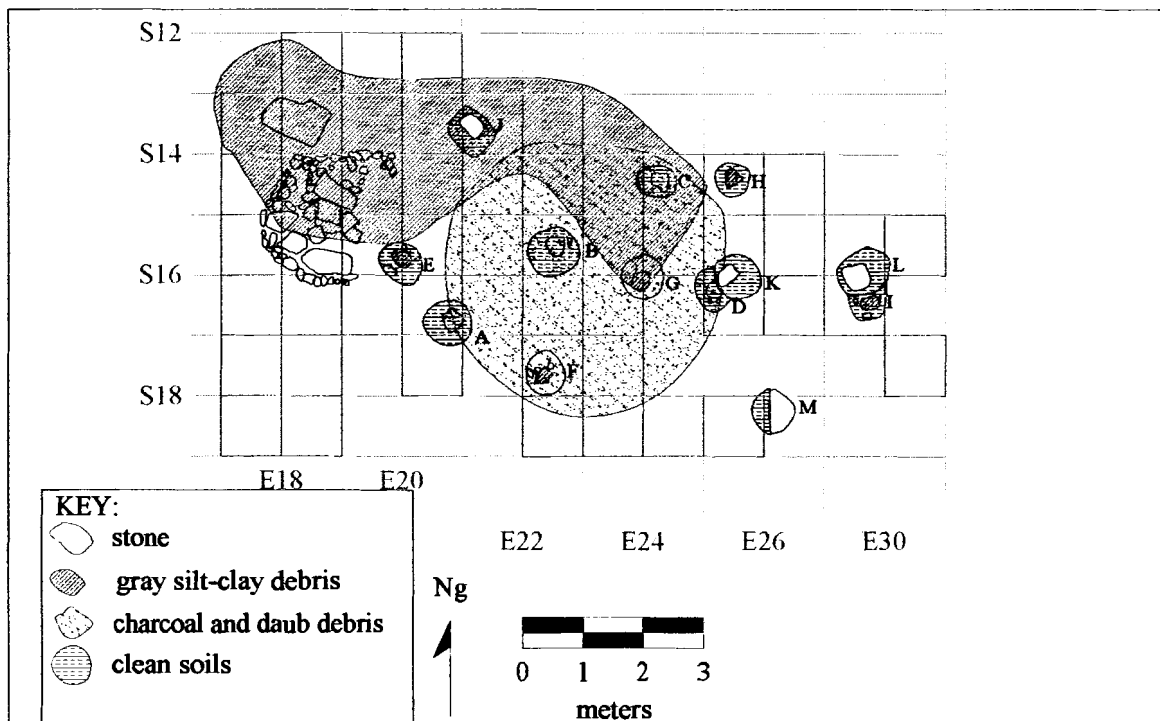

Figure 15. Extent of debris fields containing gray silty clay and fired daub and charcoal. (After Jeffrey Brain, Fort St. George V, p. 5, figure 4.)

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In his year 2000 report, Jeff Brain interpreted this constellation of features as indications that the Admiral's house was partially destroyed by fire and subsequently repaired.[86] To him, the apparently-random distribution of postholes represent a contingency building thrown up in a hurry, possibly by unskilled laborers trying to complete work before the onrush of winter.

The current analysis offers a different interpretation. I believe that the burned wood and fired daub indicate that the original Admiral's House was completely destroyed by fire. Furthermore, I feel that the pattern of postholes and the distribution of demolition debris provides evidence that the colonists built a new structure slightly offset to the north of, and at a different orientation to, the original building. Both buildings were built in regular bays. Thus, while they might have been built quickly, they were not nearly as crude as they first appeared.

As Jeff Brain pointed out, "[the postholes] do not at first glance seem to form a coherent pattern" (Figure 14).[87] He went on to say that the key to making sense of the profusion of postholes and their confusing arrangement is in the differing contents of the postholes and postmolds. Most of the *postholes* contained only mixed, nearly artifact- and debris-free soils, very much like those found in the storehouse. Two postholes were very different in that they contained dense concentrations of charcoal and fired daub within their fill. Consequently, the holes must have been excavated after the burning episode.

The nine post *molds* can be grouped according to their contents, as well. Four of the molds contained dense concentrations of charcoal and fired daub, similar to what was found in two of the postholes. The presence of this debris indicates that hollows were left

in the place of the posts at a time when a great deal of burned wood and fired daub was available to fill them, probably immediately after the building burned. The remaining five postmolds, on the otherhand, did not contain this concentration of burned demolition debris. These molds were characterized by gray clay that had filtered into the pocket left near the ground surface as the upper portion of the posts decayed. Deeper in the same molds, darkened humic soils indicated the presence of decayed wood *in situ*. These molds were the remains of posts that decayed slowly over time. The gray clay derived from *unfired* daub that washed into the resulting pockets when little or no burned debris was available to fill the mold.

The two kinds of holes and two kinds of molds combined to form three different groupings of hole-mold complexes. The first group contained natural soil in their holes, and demolition debris, burned daub and charcoal, in their molds. In these cases, the holes were dug prior to the fire, and the molds formed from the demolition of that fire. The second group contained demolition debris in their holes, but contained decayed wood and gray clay in their molds. In these instances, the holes were dug after the fire. The posts, however, did not burn, indicating that they were part of a building that decayed slowly over time after abandonment. The third set contained natural soil in their holes and decayed wood and gray clay in their molds. These features were contemporary with the second set that contained debris in their holes. To understand why the contents of the holes differ, it is necessary to understand the extent of two other important features of the site: a field of charcoal and burned daub and a second debris field, containing unfired daub. It is also necessary to look at the soil stratigraphy in this part of the site.

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At the base of excavation was the undisturbed, natural glacial till. This horizon was dark reddish brown in color and sandy loam in texture. It contained many cobbles. Above this subsoil was what was, in 1607, the ground surface. This was a horizon of very dark gray to black humic loam with fine to medium sized bits of charcoal and fired daub.

Spread across part of the Admiral's house area was a debris field containing a relative abundance of early seventeenth century artifacts, charcoal, and fired daub. This debris field was centered at S16 E23 (Figure 15), and extended more than two meters horizontally in each direction. The fired daub, charcoal, relative abundance of domestic artifacts, including burned and fire-damaged artifacts, indicate that this was demolition from a house, and in particular, a house that was occupied until the time of the fire.

Partially overlying this artifact- and debris-rich layer was a stratum consisting largely of gray silty clay. The gray silty clay was distinctly thickest on and around the hearth. The material became thinner towards the east, but excavators noted that it ultimately terminated with an abrupt edge in that direction. Furthermore, they noted that this east boundary coincided with the location of a postmold. This layer had relatively few artifacts, though those that it did contain were attributable to the 1607-1608 occupation. In the western part of the gray silty clay, the majority of artifacts were architectural in nature, particularly nails. The silty clay contained very few domestic artifacts.

This very fine-grained gray material is geologically out of place at Fort St. George and had to have been brought onto the site.[88] This gray silty clay is believed to have been used as daub. The fact that this material was not fired suggests that it came from a building that did not burn but rather disintegrated over time in the weather. Thus, there

were two distinct demolition levels, not just one. The first, stratigraphically deeper and slightly older level is from a house that burned. The second and more recent level represents a house that slowly collapsed, possibly over a period of years.

Scattered on top of the gray silty clay were many more flat-lying stones. These were most densely concentrated around the hearth, and they probably were originally part of that structure. As they did not exhibit the coherent arrangement seen in the hearth base, these overlying stones were clearly displaced, possibly through the action of plowing. Their stratigraphic position on top of the gray silty clay shows that they only collapsed once most of the daub had washed out of the surrounding walls or chimney. Possibly, they originally formed part of the fire-back

Above the stones and silty clay were 10 to 20 cm of sediments that had accumulated on site between 1608 and the 1960s These were sandy loam in texture and very dark gray in color, mottled with dark brown. This layer of sediments contained a mixture of artifacts including mainly historic-period Native American artifacts, seventeenth-century English colonial artifacts, and nineteenth- and twentieth-century American artifacts. This horizon was a "plowzone," and its contents were fairly well mixed throughout. Fifty centimeters of sand and gravel sat above this, extending to the parking lot surface. This thick layer of fill dates from 1982 when the Bureau of Parks and Lands imported it to the site to build the current parking lot.

At first glance, the postholes and postmolds do not form any clear-cut rectangular patterns of the kind made by the storehouse posts. Several lines of posts do stand out, however, and these provide the first clue as to what occurred. In particular, postmolds A,

B, and C form a perfect line (Figure 16). Furthermore, they are at equal distances apart: 2.09 meters between A and B, and 2.02 meters between B and C. Also, post D is the same distance from post C (2.03 m) and is located at a nearly 90° (actually 83°) angle from the ABC line. These four postmold/postholes are of the same type. That is, they each contain artifact-free natural soils in their holes, and demolition debris in their molds. These observations suggest a unity between the four sets of features.

Posts F, G, and H form a similar line. Here, the distances are not quite equal: from F to G is 2.14 meters while the distance from G to H 2.44 m. Two other posts are situated at nearly 90° to the FGH line. Post E lies 3.01 meters to the northwest of F (95° off the line), while post I lies 3.08 meters to the southeast of H (90° off the line). This pattern is made up of two different kinds of postholes-postmolds. Holes E, H, and I contain *nearly* artifact- and demolition-free sediments. The holes for posts F and G, on the other hand, contain large quantities of demolition debris and artifacts. All five of these features have similar molds, containing darkened soils, in some cases small amounts of decayed wood, and in each case, gray silty clay.

From these alignments, I believe that posts A, B, C, and D can be connected to show a partial outline of one structure. This was the *first* Admiral's house. Possibly, it was begun prior to October 1607 in time for John Hunt to have seen and drawn it. This building burned sometime during the course of the next year. The debris from its demolition fell primarily within the building's footprint forming the charcoal and daub-bearing debris field and filling the voids left by the building's burned-out posts. Thus, the distribution of debris consisting of the fired daub and charcoal correlates with the footprint
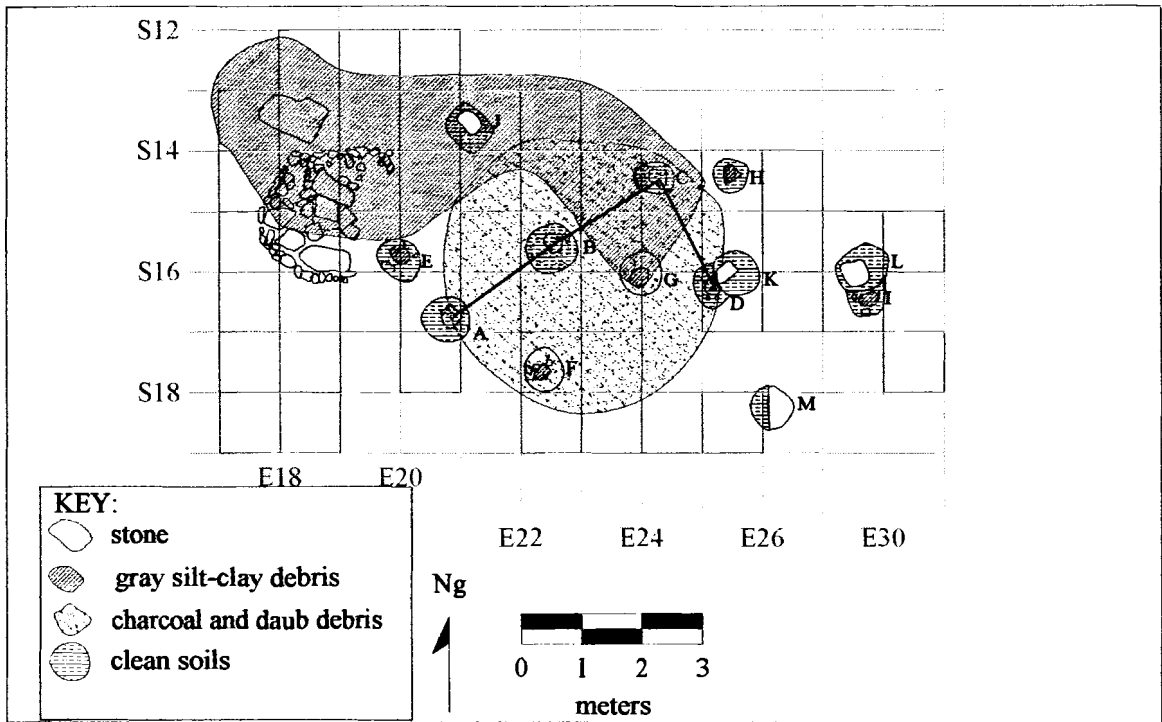
Figure 16. Features representing Raleigh Gilbert's first house. Each posthole was artifact- and debris-free; each posmold contained artifacts charcoal, and fired daub.
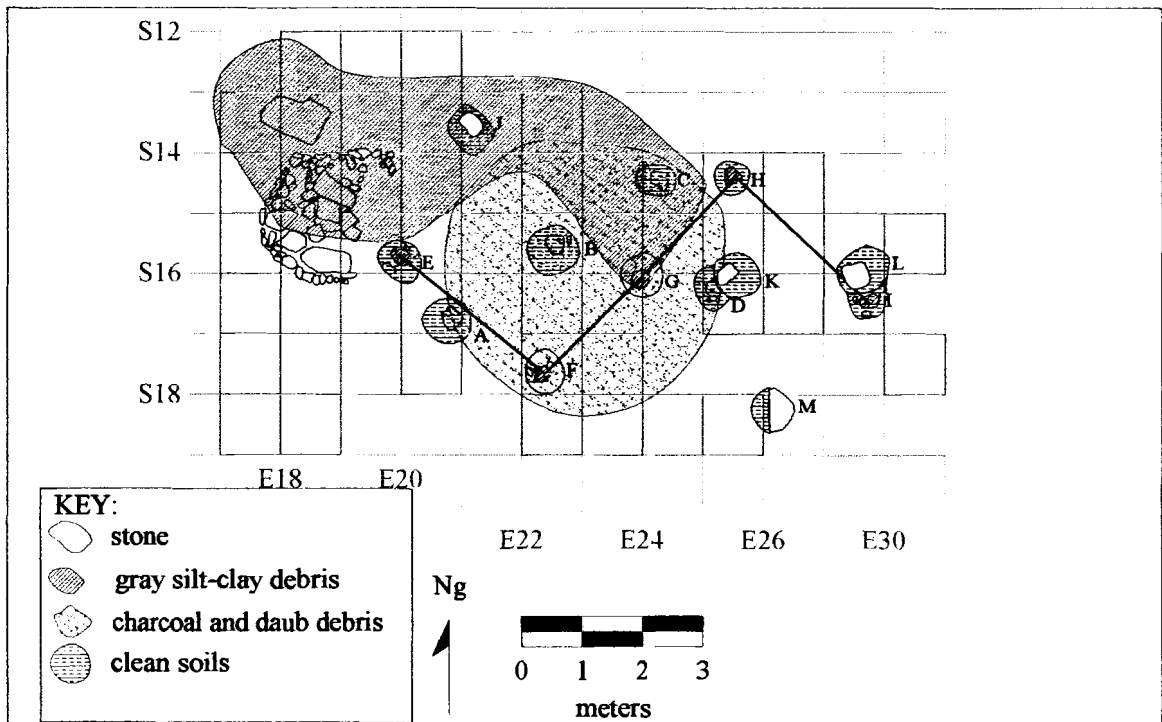

Figure 17. Raleigh Gilbert's second house. Postmolds contained humic soils and gray silty clay (unfired daub) and few artifacts. Postholes F and G contained burning debris from the first house. Postholes E, H, and I contained little burning debris and few artifacts.

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of the Admiral's first house, though as Jeff Brain points out, this debris field is not fully as extensive as the building footprint to which I say it is related.

Almost immediately after the destruction of the first building, a new building was raised. The partial footprint of the second Admiral's house is marked by posts E, F, G, H, and I (Figure 17). While all of these post holes are contemporary with each other, they contain different kinds of fill. The explanation for this is found in the position of each posthole in relation to the footprint of the original building. Those postholes dug outside of the first building's footprint contain little or no demolition debris, while the two postholes dug inside of the first building's footprint contain large quantities of debris.

A few well placed excavation units could confirm whether this scenario is correct. If it is correct, we can predict the likely location of additional postholes and postmolds (Figure 18) and it should be possible to predict what kind of material will be found in each, even before they are found. A predicted posthole at S12.5 E 23 (Figure 18 ①) should contain nearly sterile natural soils, perhaps with a little bit of daub and charcoal, and a postmold without debris. Location ② should mark the location of a posthole with natural soils, but with a mold full of debris. As a possible posthole with clean fill was already found at that location (Figure 18 M), the unexcavated portion of that hole might contain a debris-filled mold. However, this same location falls on the possible site of a posthole/postmold from the replacement structure. That being the case, there could be two postholes/postmolds, one set intrusive into the other. If that is so, the earlier mold will contain debris, as will the later intrusive hole, but the mold associated with the intrusive hole will contain humus capped by gray silty clay. Similar arguments can be
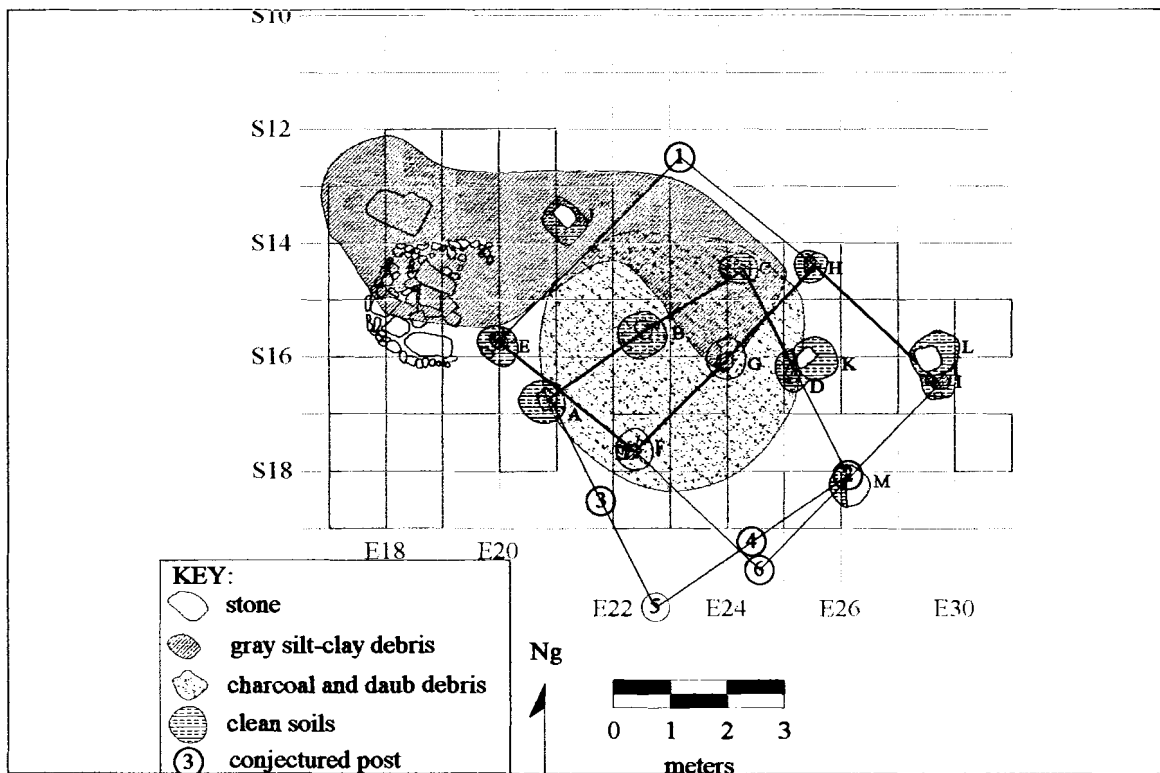
Figure 18. Possible location of additional postholes and postmolds related to Raleigh Gilbert's first and second houses.

made for the remaining conjectural posts. Posthole/postmolds ③, ④, and ⑤ should be similar to those at A, B, C, and D, while posthole/postmold ⑥ should be most like those at H and I (Figure 18).

Judging from the relationship between the hearth, the gray clay, and the clay-bearing postmolds, it appears that the known hearth was part of the second building rather than the first, but none of the building's bays appear to encompass the hearth. Possibly, evidence of additional posts exist and we simply failed to identify them. However, an alternative explanation is better supported by the evidence at hand. If post E is at the northwest end of Gilbert's second house, then the hearth and its chimney were located outside of that wall. This scenario makes use of the semi-circular trench that surrounded the hearth, which excavators referred to as a "builders' trench." Posts molds were not observed in the trench, but if small poles were used, they could have been missed. These hypothetical small posts or poles could then have formed the framework for a wattle and daub fire-place and chimney. Alternatively, the poles might have been closely set in the form of a palisado, and daubed. As the gray silty clay is thickest on and around the hearth, it very likely represents primarily a chimney-fall rather than wall-fall. The Hunt map des not show any exterior end chimneys. Brick examples of exterior gable chimneys are legion in Tidewater Maryland and Virginia, as well as in England, but those date from later years.

By the current reconstruction, Raleigh Gilbert's first house and the storehouse were skewed out of alignment by nearly 45°. The rebuilt house was skewed about 22° from the axis of the storehouse. These conclusions fit poorly with the orderly

arrangement portrayed by Hunt, with the storehouse and Admiral's house set at nearly right angles. This suggests that Hunt was indeed "tidying up" the fort, at least on paper.

Robert Davies did not mention any major fires in his description of the early months at Fort St. George. Assuming that such an event would have attracted his notice, it follows that the destruction of the first Admiral's house occurred after October 8, 1607 when he left the colony. Since the Hunt map was apparently sent back to Europe on that same voyage, it is possible that the house depicted in the map is the first Admiral's house, but it probably is not the second house.

The carpenters raised both the first and second Admiral's houses utilizing hole-set-posts. Beyond that, we do not even know such basics as the orientation of the buildings or number of bays they had. Further conclusions, such as whether the posts were raised individually or in already-framed wall or bent sections, are beyond the available information. There are hints, however, that this information is preserved in the ground and someday might be recovered. Notably, posts A, B, and C (Figure 16) are positioned in the same position relative to their postholes. This regularity shows that they were all raised from the ground in the same direction. Without knowing the orientation of the building, and where these posts were located on that building, we cannot yet decide whether normal or reverse assembly was used, or perhaps even, if the posts were raised individually.

The analysis of the Admiral's houses leaves us with equivocal conclusions and many unanswered questions. To Jeff, the evidence suggests a single building that suffered a fire and was repaired. In his view, its posts were raised individually, resulting in a

building sufficient for the exigency, but not one intended for the long-term. To me, the

evidence indicates that there were two successive buildings on the same site, and that both

the first and second were erected in bays. Furthermore, it appears to me that Raleigh

Gilbert's houses were built with as great, or nearly as great, a level of skill as was the

storehouse. In the limited data we have, it is notable that the bay-widths in the two

Admiral's houses and the precision with which the various walls were squared to each

other, is in keeping with those found in the storehouse. The colony might have had a

limited number of carpenters whose first priorities were to raising the public structures,

and particularly the storehouse. Once those were completed, however, it is reasonable

that they would have turned their attention to construction of the President's and the Vice

Admiral's houses. If any members of the colony were able to preserve some standards in

the building of their New World homes, it would be these gentlemen.

Postholes from at least two other buildings have been identified since 1994. So

far, these have been insufficient to permit reconstruction of footprints, or consequently,

more sophisticated analysis. Extensive excavations were made around one of these

houses, possibly the Vice Admiral's house, in the 2002 season. Analysis of the year's

results have not yet been undertaken in detail.[89]

Notes to Chapter 3:

82. Robert Davies, "Relation of a Voyage to Sagadahoc, 1607-1608," pp. 79-98.

83. Jeffrey P. Brain, *Fort St. George III*, Peabody Essex Museum (Salem, 1999), p. 12, citing analysis by R. Bruce Hoadley, Wood Technology Department, University of Massachusetts, Amherst 1998.

84. These distances are from post centers to post centers. As the posts averaged about 30 cm across, the space measured between posts would be correspondingly smaller, by 30 cm, than the distances given.

85. Cary Carson, Norman F. Barka, William M. Kelso, Garry Wheeler Stone, and Dell Upton "Impermanent Architecture in the Southern American Colonies." *Winterthur Portfolio* volume 16 (numbers 2 and 3, summer and autumn, 1981), p. 150; Tom Gerhart, personal communication, April, 2002.

86. Jeffrey P. Brain, *Fort St. George V*. Peabody Essex Museum, (Salem, 2000), pp. 10-12. Personal communication, 2002.

87. *Ibid*, p. 8.

88. Jeffrey P. Brain, *Fort St. George IV*. Peabody Essex Museum, (Salem, 1999), p. 18.

89. Jeff Brain is currently preparing his report for the year. I have not yet undertaken a separate analysis from his.

CHAPTER 4

CONCLUSIONS

...upon which all resolved to quit the place, and with one consent to away, by which means all our former hopes were frozen to death....

Ferdinando Gorges, 1658[90]

Conclusions

Initial reports to England were promising: work on the fort moved apace, relations with the native Wabnaki were cordial, and according to the Wabnaki, all of the treasures that the English sought were to be found within easy travel.[91] By the end of the first winter, however, the outlook became more bleak. According to Ferdinando Gorges, the storehouse burned along with much of its contents.[92] Of the promised riches, only timber, fish, and furs appeared forthcoming, and at this early date, these were not enough to maintain the enthusiasm of the colonists. George Popham died and Raleigh Gilbert replaced him as president. Reportedly, this led to a souring of relations between the colonists and the neighboring Wabnaki.[93] News from England that both John Popham, the colony's chief political backer and financier, and John Gilbert, Raleigh Gilbert's elder brother, had died completed the ill fortune. The colonists sailed away to England before a second winter could take hold, and Gorges' remark above provides a concise epitaph.

But the colonists left their mark on the ground, albeit less of one than they hoped. When a shipload of Frenchmen visited the Sagadahoc in October 1611, they easily found the abandoned fort. Impressed, they began "praising and boasting" of the English enterprise, though, alas, they did not itemize what they found.[94] Centuries of weathering

eventually covered those remains. Today, viewing the fort cannot be undertaken casually. Viewing the site archaeologically, however, is an endeavor that promises an unsurpassed glimpse of an initial New World English colony. The rewards include a detailed look at what might be the most-closely dated evidence of early seventeenth-century colonial English building practices anywhere in the world.

The archetypal house of early-seventeenth-century eastern England was the "center-chimney house." The archetypal house of western England, on the other hand, was the two-unit house. Among the two-unit family of houses was the much-discussed longhouse. The Fort St. George storehouse was undeniably a long building. Great length in relation to width, however, is not the sole defining characteristic of the longhouse form, and in fact, it is not even an important characteristic of the tradition. Like the entire family of two-cell house forms, longhouses were distinguished by the placement of their chimney or chimneys, presence of a cross-passage, and possibly, the absence of a separately-framed chimney bay. These are characteristics that were recognized from the study of domestic structures, and the storehouse certainly does not meet that criterion. This introduces a real problem. How does one relate a utilitarian structure like a storehouse to a building tradition that is defined entirely by reference to domestic forms? Comparable information specifically related to seventeenth-century English storehouses is not yet available.

Theoretically, study of the Fort St. George houses including Raleigh Gilbert's two houses should provide us with a much clearer route towards seeing these connections. As the discussion of Raleigh Gilbert's house shows, however, we do not yet have the kind of details necessary to make valid comparisons. With regard to Gilbert's first house, we

believe that it was built in regular bays and that it burned. We do not know the orientation of the structure, its dimensions or number of bays, the placement of its door or doors, the placement of its hearth, or the number or location of any internal partitions, or in what sequence the structure was assembled.

We know slightly more about Gilbert's second house. It was built in regular bays, decayed and collapsed over time, and apparently, was oriented at an angle of about 22° from perpendicular to the storehouse. But the exact arrangement of its hearth and chimney, the location of its door or doors, the location of any internal partitions, the overall dimensions and the number of bays, and the sequence in which it was assembled remain unknown.

Even if we could characterize the buildings at Fort St. George more fully, problems would still remain. The discussion of house forms in England given in the second chapter was drawn from a few sources. Abbott Lowell Cummings, Patricia Deetz and James Deetz, and Robert Blair St. George all paint a consistent picture. Their picture is satisfying in that it simplifies a vast array of English house forms into a manageable framework. However, the summary nature of their discussions frustrate any effort to place individual, idiosyncratic examples within the sequence.

To carry this analysis further, we must have first, a more thorough knowledge of the Fort St. George buildings, and second, a more detailed understanding of English building archetypes. Such an analysis could reveal a wide variety of possible alternative chimney and door arrangements in use in both Eastern and Western England, beyond those that have been suggested heretofore. Chimneys were still a relatively new element in

house construction in the early 1600s. This suggests that there would still have been considerable variability in just how they were incorporated into existing buildings or new buildings. Cummings' statement that central chimney hall/parlor houses "were firmly rooted in East Anglia by the beginning of the seventeenth century and became common... as the century progressed" contains the implication that other contemporary forms must also have been present.[95]

An alternative avenue to addressing the possible regional antecedents of the Fort St. George buildings is to look at the building methods and materials rather than forms. At Fort St. George, as at other early English settlements in North America, the Carribean, and in Ireland, the colonists used earthfast box-frame construction. According to Ronald Brunskill, box framing is primarily a building practice of Southeastern England, East Anglia, and the Midlands; it was not the primary traditional building method of Western England. To the extent that timber framing was used in the West, jointed cruck framing was preferred.

On face value, this broad statement suggests that the master builders at Fort St. George were using practices learned somewhere outside of the Plymouth area. As in the case of the building forms, however, I am not ready to commit to this conclusion based on my current knowledge. Though box framing might have been less common in the west than in the east, it probably was not unknown. Given the ample supply of timber available in the environs of Fort St. George and speed with which a framed building can be raised, box framing might have come to the fore among the choices available.

Knowing that the storehouse was raised in wall sections and probably assembled using "gunstock" posts does not as yet narrow these conclusions. As discussed earlier, the choice between using reverse framing or normal framing might be one largely determined by the skill-level of the builder. It is also possible that the choice was at least partially a cultural one, with builders in some regions preferring one method, and builders from other regions preferring another. From the available literature, it is clear that the use of normal assembly is consistent with the possibility that the Popham builders were recruited from East Anglia or Southeastern England, or that they were specifically instructed to use the building methods typical of the Eastern Counties. Whether use of this building system might also be consistent with the premise that the carpenters were recruited in Western England who then followed some aspect of their own traditions remains an open question.

While the broad issues surrounding early seventeenth-century English building practices remains fuzzy, certain details concerning archaeological interpretation of architectural remains and details about the history of Fort St. George have been brought into clearer focus. These involve the archaeological interpretation of postholes, details of how the buildings were placed within the fort, and the question of when and how the storehouse and Admiral's first house burned.

The remnants of the buildings at Fort St. George provide "textbook" examples of post-in-ground earthfast structures. Carson and his collaborators suggested that distinguishing normal from reverse assembly would partly hinge on the regularity or irregularity of post alignments. Also, they suggested that normal assembly of side-wall frames would be indicated where rectangular postholes had their long axes at right-angles

to the axis of the building. When a building was raised in bent sections, its rectangular

postholes would be oriented parallel to the long axes of the building.[96] Apparently, these

generalities are correct. Report after report dealing with sites in the Chesapeake illustrate

postholes as rectangular in shape, and depending on the building, oriented consistently

perpendicular to the long axes of the building or parallel to the long axes of the building.

In reports addressing Maine sites, however, it is not at all clear that rectangular postholes

were the norm. At Fort St. George, postholes are consistently circular or at best oval.

Even where they are oval, there is no clear consistency as to how the long axis of the hole

was oriented in relation to the axis of the building. This appears to be the case in several

other Maine sites including the Cushnoc Trading Post, Augusta, the Montouri Site,

Pemaquid, and the Foxwell House, St. George.[97]

Several explanations could account for this. Possibly, the shape of the hole simply

reflects whether rounded or flat bladed shovels were available for use at a particular sites.

At Fort St. George, however, we have recorded individual shovel cuts, and from them we

can conclude that the colonists excavated their rounded holes using square shovels. In

addition, the apparently consistent difference between posthole shapes in Maine versus the

Chesapeake seems to call for a larger-scale mechanism. The shapes may themselves be

what were culturally informed. At least as likely, is an environmentally based explanation.

The soils of coastal plain Maryland and Virginia are usually sandy and nearly stone-free;

excavating them is undeniably a pleasure. In contrast, soils in Maine are often rocky and

not infrequently, they are cemented by oxides and salts making them difficult to dig.

These factors alone may be all that is needed to explain the difference between the

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carefully dug rectangular holes of the Chesapeake colonies and the rounded holes of Maine.

The Hunt map shows that the buildings in Fort St. George were regularly arranged within the fort. Though they were not lined-up to make regular streets, Hunt illustrated most of the buildings as being square to each other. In particular, he showed the storehouse and the Admiral's house as sitting nearly perpendicular to each other. The fact that John Hunt depicted the storehouse so faithfully strongly suggests that he observed it before drawing his map. Perhaps he also witnessed the construction of the Admiral's house, but this remains unclear. Certainly Hunt did not illustrate its placement on the ground with the same fidelity that he showed the storehouse, since the current analysis indicates that the two buildings were far from perpendicular to each other. It might be that he wished to portray an orderly compound to his English audience, regardless of the reality. Alternatively, it might be that the intended site for the Admiral's house had been determined by early October when Hunt drew his map, but that construction had not yet begun. If so, Hunt might have fallen back on conventions, including regularly arranged buildings representative of what might be built in the coming months. Such would still be valuable as it would show what "mental templates" Hunt carried, but it might not be an accurate portrayal of what the builders eventually executed. As excavation of the Fort St. George compound continues, the relative accuracy of his map with regard to the placement and the construction of different buildings may reveal which of those buildings were completed by October 1607, in time for Hunt to include it in his map, and which were begun later.

Since 1994, we have had increasing evidence that the storehouse burned. Just as clearly, the structure was never rebuilt. Excavators working in and around the storehouse footprint repeatedly commented upon the scarcity of seventeenth-century artifacts. This observation provided circumstantial evidence that the building was at least partially emptied before it burned. Most of the artifacts found were small objects that could have been lost easily during the course of the building's life. Combined with the absence of signs that the structure was rebuilt, it seemed likely that the colonists set fire to the structure deliberately, probably upon abandonment of the settlement.[98] This action would have denied the use of the structure to England's competitors, as well as possible English competitors, who might otherwise have welcomed the discovery of a fully erected fort complete with buildings.

The primary problem with this scenario is that it contradicts Ferdinando Gorges' testimonies of 1622 and 1658. According to Gorges, only one colonist, George Popham, died during the winter of 1607-1608. This in spite of "the greater extremities; for that, in the depth thereof, their lodgings and stores were burnt, and they thereby wonderously distressed."[99] The 1658 statement specifies not only that the stores were burned, but the storehouse. Gorges was not present on the Sagadahoc River, but as one of the principal backers of the Plymouth Company, he had considerable access to people who were. If Gorges's information is correct, then it follows that the burned timber and daub uncovered archaeologically resulted from a calamity during the first winter and not by a planned fire set in the fall of 1608. This fire probably happened after both John Hunt and Robert Davies had quit the place in October. If the fire occurred, it could have devastated the

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morale of the colonists and might easily have been a contributing factor in their decision to abandon Fort St. George, as Gorges implies.

Reconsidered, the archaeological evidence might be seen to support the story as Gorges recorded it. The apparent scarcity of artifacts might reflect just that: an *apparent* absence of artifacts. In the year 1608, a large proportion of the materials in the storehouse would have been foodstuffs and other consumables stored in fabric and wooden containers. If the trading expeditions were at all successful, as Davies suggested, the storehouse might also have held furs. Given these kinds of materials, relatively few artifacts would be likely to survive a fire. Furthermore, there were *some* artifacts found in the storehouse, including trade beads, ceramics, lead shot, and pieces of armor. These indicate that the building was not entirely empty when it burned. Finally, whatever could have been salvaged might have been removed by the colonists themselves during the fire or once the fire was extinguished. In that case, the small artifacts that have been found in the storehouse represent items lost and left behind.

The colonists' failure to replace the structure might be explained by a shift in their immediate priorities. In fact, the very destruction of the stores would have mitigated against the immediate need for a storehouse. In the winter, however, loss of houses would have required immediate rectification. As a practical matter it might even have been necessary to dig replacement postholes immediately after any houses burned and on the site of the fire to avoid excavating in frozen ground.

Now, in addition to the evidence that the storehouse burned, we have evidence that the Admiral's house burned. In that instance, the debris contained numerous

domestic artifacts. That constitutes circumstantial evidence the colonists did not set the fire on purpose. We also have indications that the structure was immediately replaced. These facts at least partially confirm Gorges's statement that lodgings burned.

Given the close quarters within the fort and the probable use of thatch, any uncontrolled fire on the site would have been a terrifying event. The storehouse stood about fourteen meters from the Admiral's original house. If either of the structures had caught fire, it is entirely possible, that the other would also have caught. Perhaps, then, the great fire occurred just as Gorges reported it. If, for the sake of argument, we take the opposing view that the storehouse *was* burned by the colonists as they left, it seems incongruous that they did not take the trouble to fire other buildings, including the Admiral's second house. Even if they chose to burn only the storehouse, as a principal structure in the fort, the fact still remains that the neighboring Admiral's house was unscathed.

Still, the circumstances under which the storehouse burned is not settled. Though destruction of the buildings simultaneously is plausible and fits Gorges' brief mention of a fire, it is also possible that the buildings burned under different circumstances. That, at least, appears to be the most likely implication of the dearth of artifacts in the storehouse versus the wealth of burned and melted artifacts in the Admiral's house. As excavations shed light on the fate of other buildings, we will gain additional insight as to the extent and timing of the fire or fires.

In August and September 2002, excavators turned their attention to yet another structure, tentatively identified as the home of the Vice Admiral, possibly Edward

Popham. This site lies on State-owned land and remains accessible for study. Like the Admiral's house, the Vice Admiral's house was a dwelling rather than a purely utilitarian building. Therefore, it may be more directly comparable to the available models concerning English building traditions. So far, however, the building's form and the sequence of its demise remain unclear.

It is commonplace to conclude a study by declaring that it "raised more questions than it answered." The statement reflects the fact that knowledge grows incrementally, rarely in great leaps. The archaeological study of Fort St. George has begun to reveal the store of skills and "mental templates" possessed by the builders at Fort St. George. The building evidence from Fort St. George is tightly dated; we know with certainty that every architectural feature associated with the site was part of the builders' repertoire at the moment of settlement in the year 1607. Just where Fort St. George fits into English building traditions remains unclear, pending further research into the comparative literature. With that information in hand, further progress will be made in understanding how the structures at Fort St. George fit into the broader framework of English vernacular traditions or of the palate of simple exigency buildings available to them.

Notes to Chapter 4:

90. Ferdinando Gorges, "A Brief Relation of the Originall Undertakings of the Advancement of Plantations into the Parts of America, especially showing the Beginning , Progress and Continuance of that of New England," in Andrew J. Wahll, ed., *Sabino: Popham Colony Reader 1602-2000*, Heritage Books, (Bowie, Maryland, 2000), p. 115.

91. George Popham, "Letter to James I, December 13, 1607," in Andrew J. Wahll, ed., *Sabino: Popham Colony Reader 1602-2000*, Heritage Books, (Bowie, Maryland, 2000), p. 96.

92. Gorges, Ferdinando, "A Brief Relation of the Originall Undertakings of the Advancement of Plantations into the Parts of America, especially showing the Beginning , Progress and Continuance of that of New England," in Andrew J. Wahll, ed., *Sabino: Popham Colony Reader 1602-2000*, Heritage Books, (Bowie, Maryland, 2000), p. 114.

93. Father Pierre Biard "Letter to the Right Rev. Provincial at Paris," in Andrew J. Wahll, ed., *Sabino: Popham Colony Reader 1602-2000*, Heritage Books, (Bowie, Maryland, 2000), p. 110.

94. Father Pierre Biard "Letter to the Right Rev. Provincial at Paris," in Andrew J. Wahll, ed., *Sabino: Popham Colony Reader 1602-2000*, Heritage Books, (Bowie, Maryland, 2000), p. 112.

95. Cummings, Abbott Lowell. *The Framed Houses of Massachusetts Bay, 1625-1725*, Harvard University Press, (Cambridge, 1979), p. 6.

96. Cary Carson, Norman F. Barka, William M. Kelso, Garry Wheeler Stone, and Dell Upton "Impermanent Architecture in the Southern American Colonies," *Winterthur Portfolio* volumer16 (numbers 2 and 3, summer and autumn, 1981), p. 150.

97. Leon Cranmer, Personal Communication; Emerson Baker, Personal Communication; Alaric Faulkner, Personal Communication.

98. Jeffrey P. Brain. *Fort St. George IV*. Peabody Essex Museum, (Salem, 1999), p. 13.

99. Ferdinando Gorges, "A Brief Relation of the Discovery and Plantation of New England, 1620," in Henry S. Burrage, ed., *Gorges and the Grant of the Province of Maine, 1622: a Tercentenary Memorial*, State of Maine, (Augusta, 1923), p.142; Ferdinando Gorges, "A Brief Relation of the Originall Undertakings of the Advancement of Plantations into the Parts of America, especially showing the Beginning , Progress and Continuance of that of New England," in Andrew J. Wahll, ed., *Sabino: Popham Colony Reader 1602-2000*, Heritage Books, (Bowie, Maryland, 2000), p. 114.

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