

interpreter

Understanding Williamsburg's Houses

by Edward A. Chappell

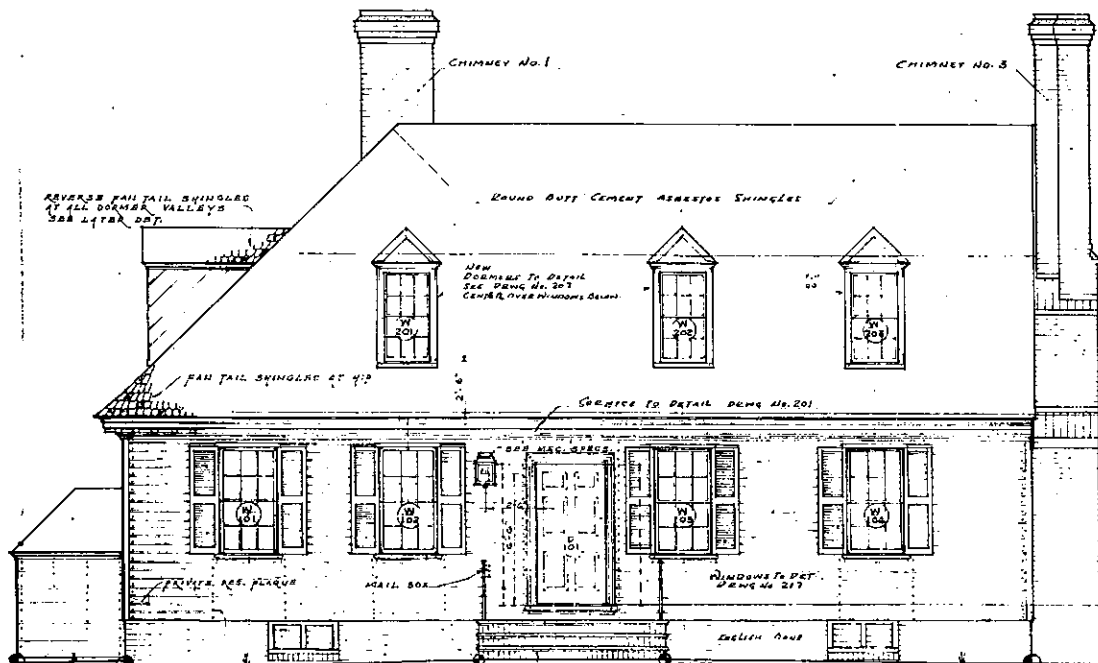
This is an overview of recent architectural investigations of several houses at Colonial Williamsburg and is the last in a series of articles on our exhibition houses. Ed is director of the department of Architectural Research. Our thanks to all the historians for their time and efforts in bringing their latest research to the front line.

Even in the rarefied world of Colonial Williamsburg, a day spent with Jack Heikkenen in the roof of the Brush-Everard House is a memorable experience. Having pulled ourselves up through a scuttle in the second-floor ceiling, we crawl slowly over the collar beams in the 2½'-high space just below the roof ridge. Jack is several decades older and perhaps seventy-five pounds heavier than I, but he gingerly drags along his lights, drills, and toolboxes, hiding any discomfort with a stream of Finnish folk songs and bad jokes. The object of our expedition is "wane edge," those small areas of framing where the eighteenth-century sawyers had cheated, leaving some of the natural surface of the log when they sawed out rafters and roof collars.

Wane edge represents the last layer of growth before the tree was felled. As such, it is essential to dendrochronologists, scientists who date pieces of wood by studying the annual rings that characterize the growth patterns of trees in regions with distinct seasonal climatic change.

Spotting a suitable specimen on an original rafter behind the 1930s insulation, Heikkenen drills out and stores a thin sample, one of dozens he will later examine in his laboratory. Using microscopes and computers, he will link the samples to key years of

(continued, page 6)



After midcentury some successful tradesmen like Benjamin Powell built dwellings that employed many of the features found in gentlemen's mansions. West elevation of the Benjamin Powell House by John Henderson, 1955.

The 1993 Book Club Reviewed

Last year the committee charged with rewriting "Teaching History"—Cary Carson, Christy Coleman, Kevin Kelly, and Bill White—selected a series of books that embraced and helped form their revisions. Their initial list included Gordon Wood's *The Radicalism of the American Revolution*, Linda Colley's *The Britons*, Richard Bushman's *The Refinement of America*, and Mechal Sobel's *The World They Made Together*. To publicize these books a book club—a series of discussions at the Hennage Auditorium—was formed to encourage us to read and explore what was shaping the committee's direction. What follows are synopses of two of those books; the first a brief overview of Bushman's book supplied by Cary and a more lengthy interview with Kevin Kelly of Colley's book, a work perhaps not as well known as Bushman's. In the next interpreter, Sobel's and Wood's books will be examined.

The Refinement of America: Persons, Houses, and Cities

by Richard Bushman (New York: Random House, 1992)

Mark Howell Why was this particular book chosen?

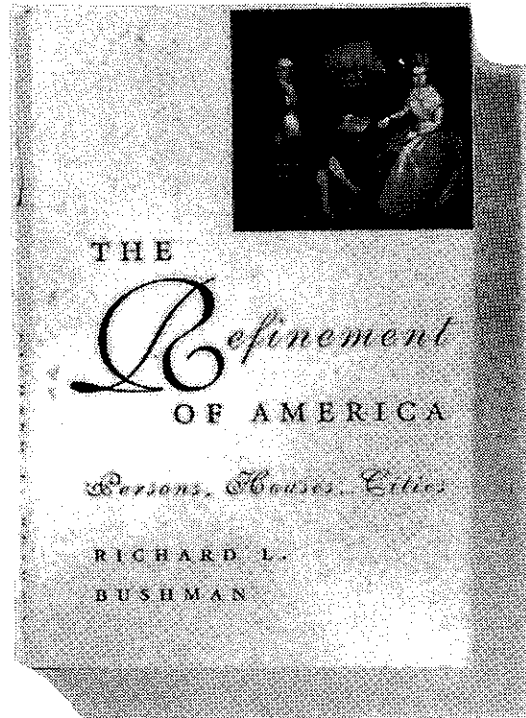
Cary Carson Because Dick Bushman has written the first major work in our period that links material life to other important aspects of American history, including republicanism, capitalism, and Christianity.

MH What is the author's main argument?

CC Many important arguments run through this wide-ranging book. They start with Bushman's observation that the practice of etiquette-book manners, which traced its origins to the royal courts of Europe, spread throughout the middle classes in eighteenth-century America as aristocratic culture was democratized after the Revolution.

MH Is this a new argument or a summation of recent scholarship?

CC This thesis has appeared in a number of recent works on the growth of the consumer society, not only in North America, but in England and Europe as well. Indeed, Dick Bushman's essay in Greene and Pole's *British North America* was one of the first and best statements of the theme that



he develops and elaborates much more fully in this book. While *The Refinement of America* pulls together earlier scholarship, its scope, its astonishing array of sources, and its connections with other major themes in early American history make a very original contribution to cultural studies.

MH What are the book's weaknesses?

CC Its explanations are shallow and unconvincing. It begs the question to say that "gentility spread in America because people longed to be associated with the 'best society' that they imagined to exist in the metropolitan centers" (page 409). What explains the "magnetic attraction of refined living" (page 408)? Bushman doesn't really tell us. But help is on the way! Stay tuned for *Of Consuming Interests*, due out from the University Press of Virginia later this summer.

MH What is the relevance of the book's argument for colonial Virginia society?

CC Seventeenth- and eighteenth-century Virginia was subject to the spread of civility no less than any other corner of the British Empire. Indeed, Bushman's book goes far to explain why Williamsburg looks like Williamsburg and not like seventeenth-century Jamestown.

MH Is there anything else you consider important for readers of this book to know?

CC Richard Bushman is one of the country's leading early American histori-

ans. He wrote books on political, religious, and social history before turning to the subject of material life. On this topic, too, he commands respect. For many years he served as coordinator of the Winterthur Museum Program at the University of Delaware. His book demonstrates that he is no stranger to the study of material culture and the use of artifacts as historical evidence.

The Britons: Forging a Nation

by Linda Colley, (New Haven: Yale University Press, 1992)

Mark Howell Obviously, these four books were chosen with a singular purpose in mind, but why particularly *The Britons*?

Kevin Kelly I think there were two reasons. The first reason was the obvious one and that's the topic. Of all the four books, this is the one that is most clearly a discussion of nation building and of how a people of different backgrounds forged a single national identity that could overlay individual cultural backgrounds: you could still be Scottish, Welsh, or English, but you also had a British identity as well. This is one of those things the "Becoming Americans" story is about: the beginning process of creating a nation, creating a national identity, linking in various ways people of different backgrounds and interests. There is more to creating a nationality than a government just drawing a boundary line around a group of people and declaring that those living inside this boundary line are British or American.

I think the second purpose for selecting this book was to remind ourselves—and this is more indirect—that the process Colley describes was an essential part of early American history up through 1776. In other words, much of what was happening to English settlers in the New World was the development of this sense of their national identity first as Britons. What is interesting is not that colonial Americans lacked a sense of history of who they were prior to 1776, but that they were part of this larger process. Things began to be viewed differently in the New World setting, however, that ultimately caused them to reassess their national identity: "Are we continuing to be Britons or not?" Never-

theless Colley correctly points out that up through the Revolutionary period—1776—Americans who had come from Scotland or Wales or England and settled in various colonies shared this experience of being part of this larger British world.

MH Does the fact that British settlers of Virginia were colonists in an overseas empire have any effect on their standing as Britons?

KK I think for our purposes what you're seeing happening is that while Americans were beginning to identify themselves as Britons, Britons at home began building a separate cultural wall around themselves and began to define themselves in terms of others that they saw outside that wall. As a result, even though the British-Americans were unaware of it, they were beginning to be cast in this other role as "colonists," as "colonials." One of the things that happened in the late 1750s and 1760s was that as the transplanted English begin to identify themselves increasingly as British Americans, they confronted the fact that they're not embraced as true Britons by the British living in Britain. This unwillingness to recognize the "Britishness" of Americans became a point of contention and it forced both Old World and New World Britons to reassess who they were. The fact that the colonists chose to seek a separate destiny was an unnerving experience to Great Britain and caused the British to rethink overseas settlements. Colley's point is that by 1830, Britain had a very different sense of who the colonists are when they were sent out to various colonial stations. With the exception of Australia, colonists living abroad remained Britons who just happened to live in India, for example. So even though there was a large native settlement—people are born, grow up, and die in India—they never developed that sense of becoming indigenous Indian people, partly because of the American Revolution and the shock that caused it.

MH Is this a new argument, a new way of looking at old research, or a summation of old arguments?

KK It's a bit of both. It's quite clear that in the last decade, the issue of nationalism and national identity has become again a legitimate topic to study. This interest is heightened, I suspect, by the problems nation-states seem to be having in the late 1980s to the 1990s. For example, Yugosla-

via has fallen apart into its component ethnic enclaves. Czechoslovakia could not maintain a "Czechoslovakian" national identity and separated into the Czech Republic and Slovakia. So, the issue of what holds people together and gives them a national identity, as opposed to an ethnic or regional one, has become of interest to sociologists, political scientists, and historians. Looking for roots, if you will. But the idea of studying nations and the rise of the nation-state is an old one, too. A lot of work in the early twentieth century focused on the rise of nation-states, especially the rise of England and France.

MH And at the same time they were coalescing, you still had the German and Italian principalities that were slower to emerge as nation-states.

KK Yes. Early work on this question was institutional history. What were the institutions that in various countries like France and England successfully created a single nation, and how did those institutions fail to achieve early unity in Germany or Italy? Today the focus is less institutional. Colley, for example, looks at nationality as a cultural phenomenon. Another example: she's very interested in religion but not church structure. She feels that one of the things that comes across clearly in the eighteenth century—in the context of an almost continuous war with France until 1815—was a heightening sense of the importance of Britain's Protestantism. There is a militancy about Britain's Protestant identity vis-à-vis France's "Catholic" identity. And Colley points out that the Catholic threat was real; France through 1745 was consciously behind the effort to put a Catholic monarch back on the throne of England. Even though there are contests between the various religious sects in Great Britain, there was a shared sense that "we're all Protestant," and in this way religion worked as a unifying force. War, religion: these were the things that enabled the English, the Scots, and the Welsh to see themselves sharing a similar identity as Britons.

MH Speaking of institutions, does industrialization play a role in this also?

KK Colley does not study industrialization in and of itself; rather she examines the consequences of the emergence of a strong commercial sector in the eighteenth century. She argues that not only the commercial class, whose wealth increasingly is drawn off of trade, but the working class, who are caught up in the textile mills,

were also part of the rise of commerce and the resulting wealth, self-interest, and the pride and comfort that gave to these people—a large part of the population—a sense of identity. "We too are part of this prosperous, well-to-do, industrious country." Being a Briton was not just open to the landed gentry. The middling sort and workers all began to see that they were a part of what was going on around them.

MH Are there any shortcomings in her argument, or limitations to the angle she's taking?

KK I think one difficulty with the book is that she tends to ignore dissidence in the underclass—what E. P. Thompson wrote about in *The Making of the English Working Class*, for example—a new proletariat who increasingly were alienated from the successes enjoyed by the middle and upper classes. This is very much consensus history and Colley acknowledges it. She's interested in the majority who came to recognize themselves as Britons. But I think she underplays the fact that this was done with a great deal of coercion and imposition on a whole segment of English society that was powerless to shape a definition of what it meant to be a Briton. But she's done a good job of showing that there was a broader-based movement toward a national identity that involved more

BRITONS

Forging the Nation 1707-1837

LINDA COLLEY



than just a handful of aristocratic elite who dictated that everybody else would be who they said they should be. Also Colley doesn't make enough of the inherent racism that also colors this process. She alludes to it by talking about the importance to Britons of contrasting their Britishness against the "otherness" of Indians, the otherness of all these strange ethnic types that the English came to dominate in their widespread empire, but she never really gets into how much the British nationality was a racial thing as well as a cultural one.

MH It sounds like this book for us as students of colonial American history is more of a contextual one, one of putting us into a perspective, rather than having a lot of immediate relevance.

KK Yes, but I think it also points us forward in time. We also need to keep in mind that, as of 1775, the process of nation building and the process of creating an American identity had just begun. If you follow her argument, white Virginians, after taking great pride in being part of the British empire, needed to replace that sense of self with a new one based on an American history. You find, for example, Columbus emerging as an important New World figure that Americans embrace as their own after the 1770s. I think some of the things she's talking about explain why someone like Washington was very quickly put in a position of being a national idol. He is one of those symbols of national identity that somehow, for whatever reason, give anybody who's looking at them reason to say, "Yeah, he's my guy."

MH This may be an unfair question, but as Great Britain's national identity coalesced, it seems that the American colonials became outsiders. Would Colley argue that a separation was inevitable as each developed separate identities?

KK That is hard to say, because she rarely deals with the colonial development. She does imply, however, that as long as the colonies were small and as long as the colonial empire remained, for the most part, marginal to the principal interests of Great Britain, the colonies and colonists were simply not central to anyone's thought in the mother country. However, that inattention became increasingly difficult and problematic with Great Britain's victory in the French and Indian War. Prior to 1763, Britons could delude themselves by assuming the interests of British Americans were

similar to Britons everywhere. But all of a sudden after 1763, Great Britain was abruptly made aware of its holdings in the West Indies, the East Indies, and especially Canada, and the country was forced to manage this vast empire in a new way. British Americans got caught up in this process and were treated in ways they resented, because Great Britain began to put them in the same alien role as other non-British members of the Empire. So, I don't know if Colley would say the War for Independence was inevitable, but she does say that a shift in English attitudes about the empire after '63 was a pivotable one, and that had to have had an effect on who British Americans thought they were vis-à-vis the home country English.

MH Is there anything we haven't covered that strikes you as important to know about this book?

KK One of the things that's really interesting about this book is that Colley really does seriously examine the pictorial record and reads it in a way that is illuminating. She uses art, imagery, and icons in a way that most colonial American scholars do not. I think her work should make us re-examine the pictorial and visual construction of early America and read from that construction evidence of early Americans' ideas. I think that's one area that seems particularly useful for a museum interpreter. We deal with so much that is visual: the arrangement of furnishings, the pictures on the wall, the placement of buildings on a lot. All these things, she implies, carry with them real, definite meaning. They're not simply pretty or decorative. For example, Colley correctly notes the fact that England is depicted as a certain kind of fair-haired white woman by Britons while America is depicted as a native American is more than mere convention. Graphic and spatial imagery are all important because they reinforce and reflect cultural sensibilities, and that's a point of view I think we could use in our own interpretive areas: more sensibility to the visual environment colonial Virginians created.

MH That seems like a good point to end on: using objects. Thanks, Kevin.

Copies of these books are still available (at a discount, even!) from the department of Historical Research. Call Wendy Sumerlin at extension 7446 for more information.

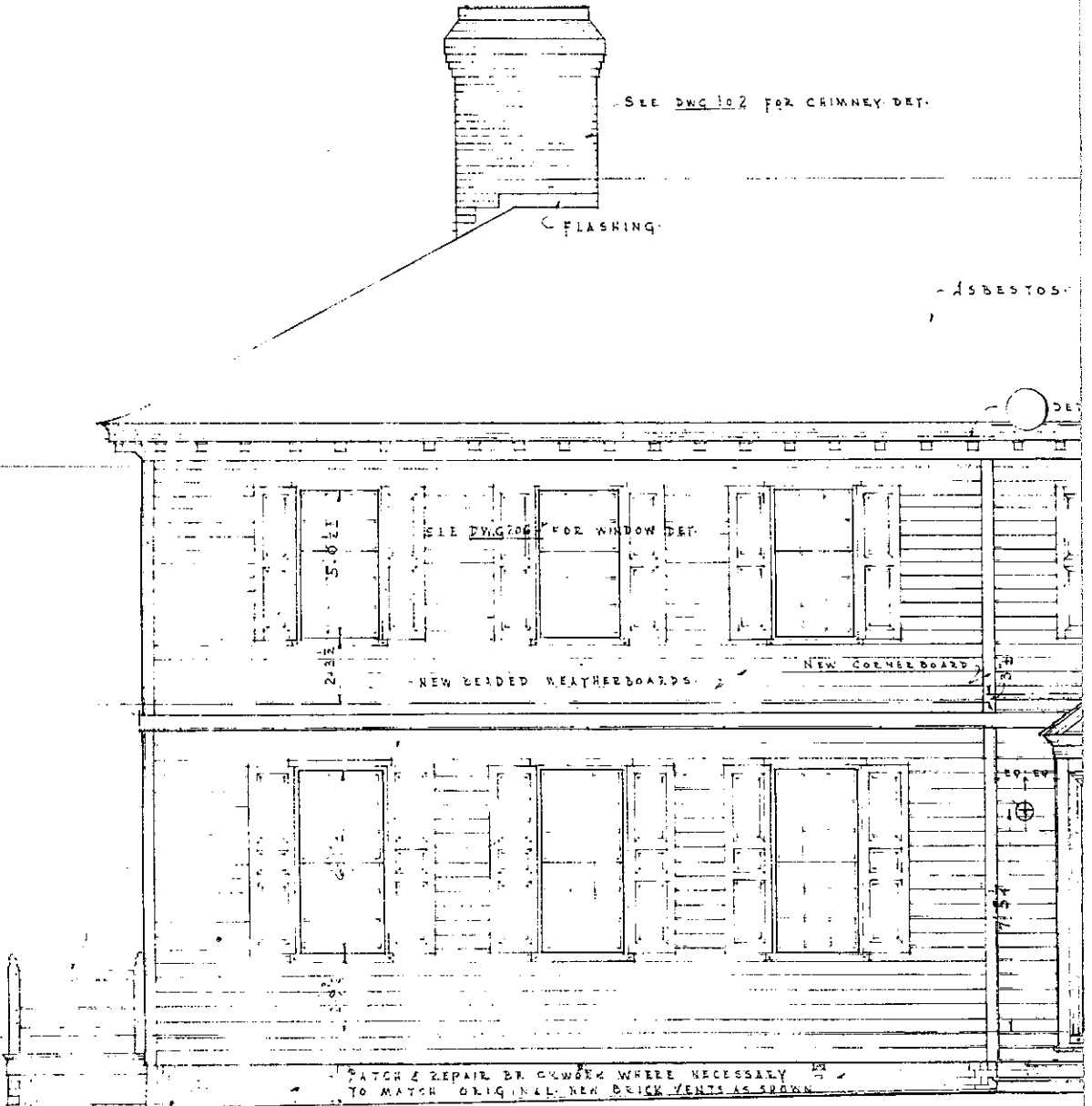
Houses, continued

unusually generous or slim growth. By establishing when the framing members were cut, Heikkenen can help us learn when a building like the Brush-Everard House was built and when it was expanded or altered. Given the relative dearth of direct documentary evidence for when most eighteenth-century buildings were constructed, new data like Heikkenen's is invaluable to Colonial Williamsburg.

Working with historic paint analyst Frank Welsh is a more sedate activity. Frank's eye travels methodically over the woodwork in the Peyton Randolph House, searching for corners where earlier restorers may not have scraped away all the old

layers of paint. Finding a likely corner, he cuts out a small plug of the paint strata and stores it away as carefully as Heikkenen does his wood samples. He too will use high-tech equipment back in his lab to study dozens of fragments. His analysis will link the various paint layers, identifying their pigments and the media in which they are suspended.

Welsh's revelations can be immediately spectacular, as when he finds the insides of early Williamsburg cupboards painted bright orange to emphasize their ceramic contents, or the outsides of buildings as seemingly sedate as the Ludwell-Paradise and Peyton Randolph houses being origi-



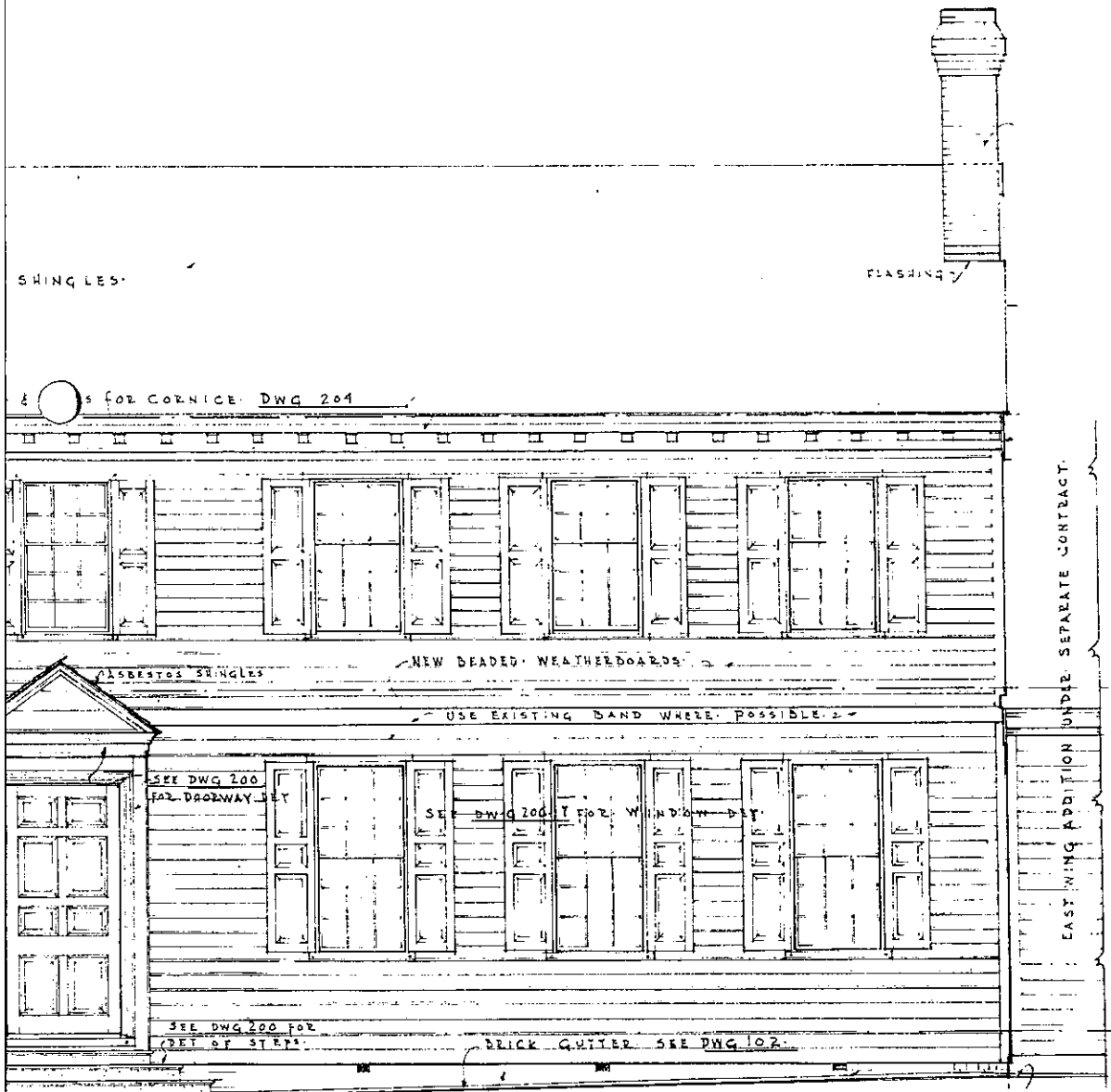
Peyton Randolph's house grew substantially to fulfill the expanded expectations of

nally painted dark red. Heikkenen's dates can be equally remarkable—establishing that the James Geddy House was in fact constructed about 1762, two years after the presumed builder passed on the property, or suggesting that perhaps the shell of the Nelson-Galt House predates the founding of Williamsburg in 1699. Yet the purpose of employing both dendrochronology and new paint analysis is less to dazzle observers with the surprising results of scientific wizardry than it is to help architectural historians and interpreters understand how buildings in Williamsburg evolved and were used.

Just as forensic science provides crucial

but isolated clues in crime detection, dendrochronology and microscopic paint analysis contributes to broader architectural investigation that relies equally on low-tech observation and thinking. At the Brush-Everard and Peyton Randolph houses we lack essential evidence about construction dates and the sequence of interior finish. But someone has to make sense of the disparate pieces of information. That's what we have been attempting to do in this series of essays.

While anyone might be excused for assuming that Williamsburg's exhibition sites are already sufficiently studied, the last decade has seen remarkable progress in



gentle householders at midcentury. South elevation by Thomas G. Little, 1939.

understanding and presenting these buildings. Essays recently carried in the *interpreter* discuss five prominent examples: the George Wythe, Benjamin Powell, James Geddy, Peyton Randolph, and Brush-Everard houses. The current National Endowment for the Humanities-funded conservation project is providing an opportunity to look closely at the Wythe and Brush-Everard, and preliminary investigation at the Randolph House has preceded the long-awaited plan to fully restore the house and re-create its late-colonial setting.

The immediate objectives of investigations at these and other sites are to discover when the structures were built, what their original appearance was like, when and how they were changed, and—most important—why? How were they intended to be used, practically and socially? The value of the various findings lies in the patterns that emerge as more buildings are studied. Thus we begin to understand that parts of the Randolph and Brush-Everard houses really are as early as has long been believed—about 1716 and 1718 respectively—but that both were dramatically transformed into more or less their present state in the middle of the century, about the same time many houses of comparable scale and elaboration were being built from scratch.

Partly because relatively early eighteenth-century houses were often thought to date from the previous century and changes like those at Brush-Everard went unrecognized, earlier historians and restorers have seen colonial Williamsburg as a relatively unchanging place. They surmised that the town might have had more buildings late in the century than it did in 1715, but that the buildings of both eras looked much the same. Increasingly, we are finding evidence suggesting that most buildings were far less finished and life less refined through much of the capital's first half-century. Ordinary people occupied and often shared small houses. The rich had more generous accommodation, of course, but even the superior houses had only two or three rooms on a floor. These rooms were plainly finished, with parts of their structural frames exposed, and relatively little genteel woodwork or painting. In Williamsburg as well as elsewhere in Virginia, generous and well-resolved mansions like the Wythe, Ludwell-Paradise, and William Byrd III houses are distinct creations of the third

quarter of the century.

The general outlines of this story are not surprising, given research on the material circumstances of life in the early Chesapeake. In fact, readers of Rhys Isaac's *The Transformation of Virginia, 1740–1790*, and Dell Upton's *Holy Things and Profane* may find most remarkable the extent to which successful tradesmen like Benjamin Powell and James Geddy, Jr., built refined and permanent Williamsburg houses in the same quarter-century. The impression recently offered by Isaac, Upton, and other students of early Chesapeake life is that most people lived rather poorly, and that there was a great disparity between the accommodations of the rich and the ordinary. Camille Wells, in a new *Winterthur Portfolio* article using *Virginia Gazette* advertisements, argues that most eighteenth-century Virginians lived in small one- and two-room houses, often without masonry chimneys or foundations. Upton has made similar arguments since the 1970s.

Our own fieldwork and documentary research reinforces the grim portrait of most rural housing in Virginia. The majority of the small, well-finished traditional houses in the countryside date from after the Revolution, probably indicating that most subgentry housing was too poor either to survive physically or to meet the expectations of later residents. When we investigate the post-Revolutionary owners of the modest houses that do survive—one-room dwellings without finished lofts and sometimes without glazed windows—we find that even they were relatively successful property owners. Most fall within the top half of landowners in their respective counties, and these houses along with their farm buildings were generally worth two to three hundred dollars, at or above the median of assessed building value.

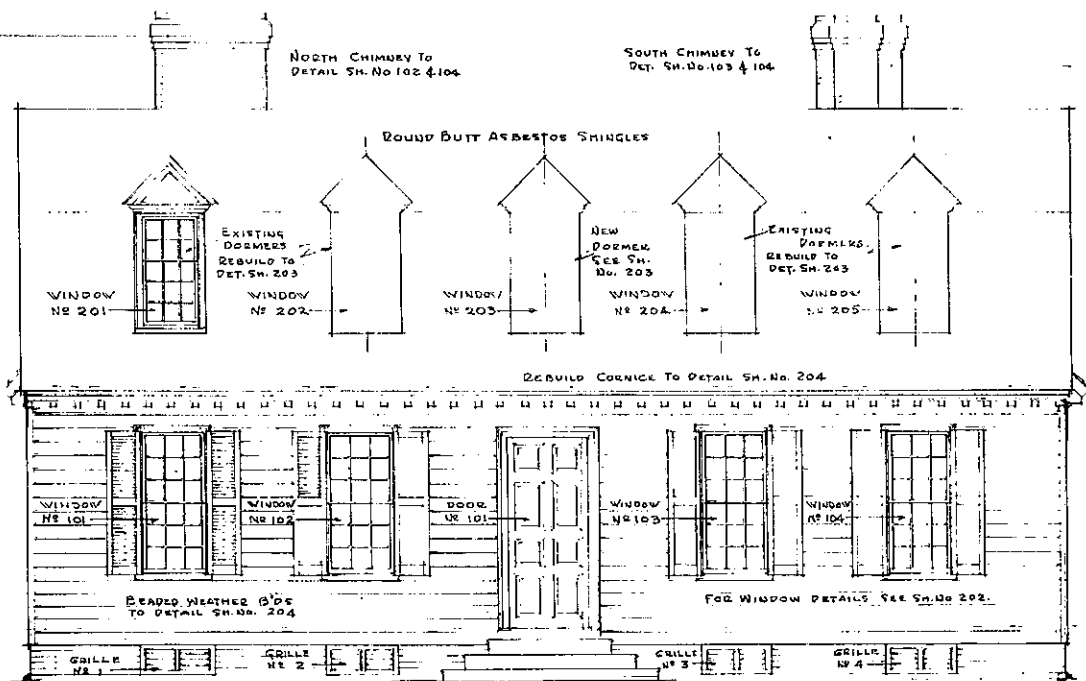
What is emerging, then, is a recognition that Williamsburg became less representative of the Chesapeake in general in the third quarter of the eighteenth century, when increasing numbers of tradesmen built or rented expensive houses. Such home builders and tenants were always a successful minority, but their homes now begin to dominate the scene here. These prim new houses shared essential features with rich people's mansions: well-lighted rooms and passages with fully plastered walls and ceilings punctuated with classi-

cal trim, all in a seemingly dress of beaded weatherboards and good brickwork. One room was generally set aside for entertainment, and some craftsmen's and retailers' houses contained the three first-floor spaces that characterized a gentleman's residence: a parlor, dining room, and bedchamber as well as a series of plastered and heated second-floor chambers. Finally, variation in size and degree of elaboration created quantitative and qualitative distinctions among the rooms. Town life often varied from that in the countryside beyond, and some of the architectural character of late-colonial Williamsburg may have been shared by Yorktown and Norfolk. We know that Jamestown had certain private edifices remarkably different from even the best rural houses in seventeenth-century Virginia. Remarkably, the scattered Jamestown terrace houses had a much stronger urban personality than what was built a hundred years later in Williamsburg. We should not lose sight of the point that Williamsburg housing may not have been so different from its rural counterparts, but that the distribution of such houses in Williamsburg changed dramatically after mid-century.

Whether life in the Chesapeake or New

England was most like that across the Atlantic is a subject of debate. Just how representative the quality of Chesapeake housing was remains to be considered when post-medieval housing standards are better studied in both England and New England. There appear to be many more surviving houses of what we might perceive as middling quality in New England, and seventeenth- and eighteenth-century almshouses may suggest that more people in parts of England had an expectation of occupying one or two plastered and well-lighted rooms, heated by masonry fireplaces. On the other hand, seventeenth- and eighteenth-century English property surveys make it clear that large segments of the urban population huddled in tiny and sometimes unheated shelters.

The extent to which we must rely on such indirect evidence reveals the still formative nature of research on housing conditions in the broader European world. Because it has been studied intensively for more than sixty years, Williamsburg can make a significant contribution to this enterprise. If we consider changes in living standards here as part of an important international story, the lessons we teach in the buildings can be greatly enriched.



Like the Peyton Randolph House, the Brush-Everard House is also the product of different construction phases, woven together in a manner that requires close scrutiny to understand. West elevation by John Henderson, 1949.

II. "MEASURES, cubical, or MEASURES of capacity for liquids

English liquid measures were originally raised from troy weight; it being enacted by several statutes, that eight pounds troy of wheat . . . should weigh a gallon of wine *measure*; the divisions and multiples whereof were to form the other *measures*: at the same time it was also ordered, that there should be but one *liquid measure* in the kingdom; yet custom prevailed; and there having been introduced a new weight, viz. the *avoirdupois*, we have now a second standard gallon adjusted thereto. . . . From this latter standard are raised two several *measures*, the one for ale, the other for beer. . . .

The sealed gallon at Guildhall, which is the standard for wines, spirits, oils, &c. is supposed to contain 231 cubic inches (the ale quart contains 70½ cubic inches, on which principle the ale and beer gallon will be 282 cubic inches); and, on this supposition, the other *measures* raised therefrom will contain as in the following tables:

English MEASURES of capacity of liquids.

Wine-MEASURE.

Solid Inches:

28⅞ :	Pint:						
231 :	8:	Gallon:					
4158 :	144:	18 :	Rundlet:				
7276½:	252:	31½:	1¾:	Barrel: . . .			
14553 :	504:	63 :	3½:	2:	Hogshead: . . .		
29106 :	1008:	126 :	7 :	4:	2:	Butt or Pipe . . .	

Ale MEASURE.

Pints:

8:	Gallon:						
64:	8:	Firkin: . . .					
256:	32:	4:	Barrel:				
384:	48:	6:	1½:	Hogshead:			
				864:	108:	12:	3 :
							2: Butt:

Beer MEASURE.

Pints:

8:	Gallon:						
72:	9:	Firkin: . . .					
228:	36:	4:	Barrel:				
432:	54:	6:	1½:	Hogshead:			
				864:	108:	12:	3 :
							2: Butt:

III. "MEASURES, cubical, of capacity for things dry.

English dry or corn MEASURES are raised from the Winchester gallon, which contains 272 ¼ solid inches, and is to hold of pure running or rain water, nine pounds thirteen ounces. . . . The divisions and multiples are in the table following:

Solid Inches:

34½:	Pint:						
272¼ :	8:	Gallon:					
544½ :	16:	2 :	Peck:				
2178 :	64:	8 :	4:	Bushel:			
	128:	16:	8:	2:	Strike: . . .		

IV. "Weights

By the twenty-seventh chapter of *Magna Carta*, the *weights* are to be the same all over England; but for different commodities there are two different sorts, viz. *troy weight*, and *avoirdupois weight*.

The origin from which they are both raised, is the grain of wheat, gathered in the middle of the ear: 32 of these well dried made one penny-weight, 20 penny-weights 1 ounce and 12 ounce 1 pound troy. . . .

The first statute that directs the use of avoirdupois *weight* is that of Henry VIII. which plainly implies that it was no legal *weight*, till that statute gave it legal sanction; and the particular use to which the said *weight* is thus directed, is simply for weighing butchers meat in the market. How or when it came into private use is not clearly known. . . .

Table of Troy Weight, as used by the

Goldsmiths, &c.			Apothecaries.			
Grains:			Grains:			
24:	Penny-weight.		20:	Scruple.		
480:	20:	Ounce.	60:	3:	Dram.	
5760:	240:	12: Pound:	480:	24:	8:	Ounce.
			5760:	288:	96:	12: Pound.

By troy *weight* are weighed jewels, gold, silver, silk, and all liquors.

Table of Avoirdupois Weight

Drams.					
16:	An ounce.				
256:	16:	A pound.			
7168:	448:	28:	A quarter:		
28672:	1792:	112:	4:	A hundred:	
573440:	35840:	2240:	80:	20:	A ton:

By this *weight* are weighed all coarse and heavy goods as pitch, tar, rosin, tallow, &c. copper, tin, &c. flesh, butter, &c. and also bread . . . and all grocery wares. . . .”

V. Miscellaneous Measurements

1. Nautical measurements:

- fathom:** six feet
- league:** three English miles
- nautical mile:** one minute of longitude (6,000 feet)

2. Surveyor’s measurements

- chain:** 66 feet. This measurement is laid out by means of a iron chain made up of 100 links and was one of the first measuring systems to use a decimalized base.
- pole:** 16½ feet
- rod:** 16½ feet

3. Textile production

- ell:** 45 inches (37 inches in Scotland)
- naïl:** ¼ yard
- quarter:** 9 inches

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