

AASLH

# TECHNICAL LEAFLET BUNDLE

A PUBLICATION OF THE AMERICAN ASSOCIATION FOR STATE AND LOCAL HISTORY

## Historic House Restoration: Getting Started

BNDL002

Are you thinking about restoring a historic building? Or, do people from your community ask you about the restoration of historic buildings? This technical leaflet bundle offers tips and techniques for learning more about historic buildings, setting the stage for a successful restoration, and avoiding common pitfalls. Whether you are beginning your own project or would like to provide information for others, this bundle provides useful and effective guidance for beginning a restoration project.

TL 048 – Nail Chronology as an Aid to Dating Old Buildings (1968)

TL 067 – Before Restoration Begins: Keeping Your Historic House Intact (1973)

TL 089 – The History of a House: How to Trace It (1976)

TL 118 – The Eight Most Common Mistakes in Restoring Houses (1979)

TL 173 – Historical Archaeology as a Tool (1990)

This bundle may help institutions achieve the standards as set forth under Stewardship of Collections and the Stewardship of Historic Structure and Landscape sections of the AASLH StEPS Program.

VISIT THE AASLH BOOK STORE AT **[WWW.AASLH.ORG](http://www.aaslh.org)** FOR MORE RESOURCES JUST LIKE THIS!

PDF Created with deskPDF PDF Writer - Trial :: <http://www.docudesk.com>



# THE HISTORY OF A HOUSE

## *how to trace it*

By Linda Ellsworth, Historian  
and Chief, Bureau of Research  
and Publications, Historic  
Pensacola Preservation Board

One often hears the expression "if walls could talk, imagine what they could tell us." In some ways walls do talk and give hints about the history of a house. Restorationists and archaeologists can discover where additions were made, where one room was divided into two, or where a porch was enclosed to add more living space. The basic architectural style can help give an approximate date of construction.

But what about all of the history a house cannot "tell"? How does one go about discovering the background of a house through deeds, maps, photographs, newspapers—the two-dimensional world of restoration? The purpose of this technical leaflet is to explain how to find information about property and buildings.

Although several citations to reference materials are specifically for Pensacola, Florida, the same types of information are readily available in most communities.

### Property Abstract

To simplify the task of finding some kinds of historical information, the first place to look is the property abstract. Most properties have a chain of title that has been prepared by a professional abstractor. Either the property owner or the mortgage holder possesses this document. The abstract is just what its name implies, a brief outline of the essential information about a piece of property. Included are all references to deeds, mortgages, wills, probate records, court litigation, and tax sales—the essential legal proceedings that affect property ownership. This listing reveals who owned the lot of a house, how long an individual owned it, and how much the property costs. Occasionally an abstract will include a description of buildings on the property or on an adjoining property. If it does, you are fortunate because this information is not always included.

The following is a sample entry on an abstract:

DEED	
Walter Gregory and Amanda C., his wife	Deed Book F, p. 17 Dated August 1, 1837 2 witnesses. Seal. Consideration \$1600.00
to	
Benjamin D. Hassell	
<p>All that certain lot and a half lot of land in Pensacola adjoining the Tivoli house commonly called and bounded on Easterly side by a lot known on plan as Hospital Lot, on North by Tivoli Street and West by lot commonly called Tivoli lot and on South by the Street on Pensacola Bay containing one lot and a half agreeable to plan of City which said lot and a half is the eastern part of the lot known on plan as Lot H containing 120 feet front on Tivoli Street and 136 6/12 feet in depth.<sup>1</sup></p>	

According to this entry, Walter and Amanda C. Gregory sold a lot and one-half to Benjamin D. Hassell on August 1, 1837. The sale price (consideration) was \$1600.00. If the consideration were listed as \$1.00 and OGVC (other good and valuable considerations), the transaction would indicate that the purchaser mortgaged the property. This deed is filed in the county court house in Deed Book F on page 17. The accompanying paragraph briefly states the important information included in the deed but deletes common legal terminology.

Each financial transaction shown on an abstract can provide information. A sizeable increase in price from two consecutive sales, for example, from \$500 in 1860 to \$5000 in 1865 indicates some capital improvement on the land. Perhaps the owner constructed a home, a rental unit, or business building. Mortgages provide similar information. A

mortgage on a particular piece of property may correlate with the construction of a new wing on the house or with new outbuildings, such as a carriage house or barn. Variations in tax assessments from year to year indicate changes on a lot also. An assessment that increased from \$50 to \$150 means an improvement. When using property values, either from sales or assessments, there is one precaution. Periods of inflation affect property values. Be aware of the history of your area and its economic ups and downs.

Basically, the abstract gives the broad outline of all legal transactions that affect the property. What does the researcher do, however, if an abstract is not available? In that case, one can find most of this information in various departments of the county court house: register of deeds, probate office, tax assessor's office. The basic information needed in order to trace the chain of title is the legal description or where the property is located in the city or county. Make sure your researcher has

1. Abstract for the West 85 feet of the South 65 feet of lot "H", Old City of Pensacola, County of Escambia, Florida.

the correct township, subdivision, block, and lot number, plus the location within a specific lot, i.e. north or south, east or west half.

### Other Legal Records

Even though an abstract saves time, a researcher should recheck some sources thoroughly. Estate records should be consulted. Wills often indicate which family member inherited a lot, a house, or an item of personal property. If a house or lot was not willed, the records of the administrator of the estate would show if the property was sold to pay expenses. Many times the administrator includes correspondence and affidavits as supporting evidence which afford valuable insights into the activities of the deceased. Another useful portion of these files is inventories of personal property which are drawn up when settling or dividing an estate. These often provide complete lists of home furnishings—from sofas, beds, and mosquito bars, to clocks, carpets, and coffee mills. Researchers with this assistance are able to reconstruct the life style of the property owner and his family.

Court cases should also be checked more carefully. The abstractor does not extract all information from a particular document. A case file may include clues that are useful to a restoration or research project but which have little significance for a property abstractor.

Many communities required building permits for new construction or for renovation work during the late nineteenth century. These official forms describe the kind of work to be done. Even if the building being researched is significantly earlier than the late nineteenth century, these documents would help identify the kinds of alternations made at one period in its evolution.

### Maps

Checking the abstract and other coun-

ty and city records is only the first step in learning about a house or property. A second valuable source of information is maps. Many cities—from Pittsburgh to Phoenix—have insurance maps drawn either by a national company or by a local insurance board. One such firm is the Sanborn Map Company (later known as the Sanborn-Perris Map Company). This firm drew at least six maps of Pensacola between 1885 and 1907. These show the location and street address of a building, indicate the construction materials used, the roofing material, as well as the existence of porches, how many stories the building was, and the location of outbuildings and wells. Even the use of the buildings is listed—dwelling, grocery, saloon, etc. The researcher's job of dating a house is made easier when he is able to compare the information included in the abstract with dated maps that illustrate the building.



Detail of insurance map of Pensacola for 1885.



Detail of bird's-eye view map of Pensacola done in 1885.

There are other maps that can provide additional information about buildings. Surveyor's maps and associated notes can locate exactly where certain structures were and identify any nearby landmarks or houses. County plats or township maps should be checked for information.

Another type of map is the "bird's-eye view" of a city. Artists drew these popular panoramic views including individual houses, businesses, and government buildings. While these maps can help locate buildings and date them, use them cautiously. These map makers, on occasion, took artistic license. The house with a two-story porch on the bird's-eye view map actually may have been a two-story house that only had a one-story porch.

### Lithographs and Prints

Paintings, watercolors, prints, and sketches offer clues to the interior and exterior appearance of buildings. Spe-

cially made note cards and business stationery that include an illustration of the building are other sources to locate. Furnishings, fixtures, and decorative details are often shown through these media. A good artist may have given an authentic rendering of the garden and landscaping as well. However, once again beware of the artist. He or she may have liked white houses with green trim no matter what the actual color scheme of the subject was. And, as shown in the illustrations, two artists may depict details of the same building in different ways.

The most detailed drawings of a house are, of course, the architect's renderings. These show the size of the rooms, the use of the rooms, and many other essentials about construction. Check these carefully to be sure they are the working drawings and that any modifications to the plan are noted; the plans might show the dream house rather than the house that finally was constructed.





Drawings of Tivoli High house in Pensacola by J. C. Halstead (left) and Manuel G. Runyan (right). These two sketches of the same house at approximately the same time by two Pensacola artists show the problems of relying on this kind of evidence for restoration.

### Photographs

Photographs and stereopticon views provide the same kinds of insight into a building that sketches do, but they are more accurate. Again, these show interiors as well as exteriors; they illustrate the furnishings, placement of pictures and prints, rugs, and window treatment; and they might show family activities, such as special holiday celebrations or reunions. Photographs showing streetscapes give an impression of the full neighborhood.

Photographs often contain hidden clues. Look at a snapshot carefully. The view of the house at 206 East Main Street may also contain a glimpse of the house at 208 East Main Street. What shows up in the background? Houses? Outbuildings? Activities? What is written on signs?

While researching a Pensacola theatre building, the investigation produced a photo of the largest steel beam shipped into the state of Florida up to that time. The name of the company that manufactured the beam was shown on a placard, and a call to that office uncovered a full set of structural blue prints of the building. Photographs can yield unexpected information.

Where do researchers find these

photographs? Check your local historical society, public library, or university library. All of these maintain files of old photographs. Previous owners or descendants of the family who built the house might have old scrapbooks or photo albums tucked away in the attic. Neighbors might be able to assist also. If efforts do not turn up photographs of the house you are tracing, look for views of similar houses from the same time period owned by families of equivalent social status.

### Newspapers

The local newspaper is another excellent source. Advertisements for businesses often give the location of a building and some indication of the activities that took place there. Notices of tax sales, sheriff's sales, or auctions can be helpful. Of special interest for frontier areas are lists of merchandise. What goods are available? From where was much of it imported? Also, pay close attention to articles about fires. Was the house damaged? What was the insurance coverage and by what company? The newspaper also reports social events such as teas, weddings, funerals, or open houses.

Little information was known about the construction of the meeting hall of



Although Miss Valades and her class met at 311 South Adams Street, this photograph also includes the only available view of the house next door at 309 South Adams Street.

a Pensacola fraternal organization, St. Michael's Creole Benevolent Association, until the description of their anniversary open house was found in an old newspaper. The group ordinarily kept their activities closed, open to their membership only, but on this special occasion—the dedication of their new meeting hall—the Creoles had invited the local press to help them celebrate.

Special business editions of old newspapers often illustrated prosperous local business concerns and the homes of their owners.

#### City Directories

Do not overlook city directories when completing research on a property. These are *not* telephone directories, but a listing of who lives or works at a particular address in the city. Most directories are arranged two ways: alphabetically by name and by street address. Although Pensacola's city directories only began in 1885, many cities have directories from an earlier period. These entries can answer a variety of questions: who lives at a specific address? is this the owner or a renter? what is his occupation? is this a residence, a business, or are both located in the same

place? Pensacola city directories also list the race of each person, Negro and white, and, at the turn-of-the-century, Creoles were listed separately.

Again the researcher must be cautious in using these directories. On occasion the canvasser missed residents or tenants; they do not list every resident of the community. Also, street addresses may have been renumbered between 1885 and the present. Be sure to check the correct address.

#### Manuscript Collections

Before the investigation is completed, the researcher should check all relevant manuscript collections. Letters, diaries, and personal financial accounts may include descriptions of the house or its furnishings. The manuscript collection of Alexander Ramsey, the first territorial governor of Minnesota, contains receipts for furniture purchases, and his daughter's letters describe other pieces that still can be found in the house. Check the business papers of the home owner; some information about his personal life might be included. Insurance files might contain policies, damage or loss claims, or inventories of property and furnishings.



This photograph of the Tivoli High house was dated by checking city directories to determine when the Ferriss-Lee Lumber Company opened.

Business papers also offer insight. For example, if the architect or contractor is known, check their business records. The people who designed or built the structure may still have plans, correspondence, or bills.

Even printed ephemera and memorabilia can yield information. A theatre program may have an illustration of the building on its cover. In New Orleans, the cover of sheet music from a popular song, "The Tivoli Waltz," provided an illustration of an eight-sided dance hall from the early nineteenth century.

Dozens of travelers crisscrossed the country during its frontier days and published their impressions of the newly settled areas. European visitors and urban critics printed their views of the cities. A literate visitor may have published his impression of your community or your building. George A. McCall, a young Philadelphian who was graduated from West Point in 1822, gave this description of modest cottages in early nineteenth-century Pensacola:

*The dwelling, then, you must know, of the unlucky Ambrosio, was a light frame one of two stories, having used in the double capacity of sitting room and kitchen, and the second as bedroom and dressingroom. And although the former communicated with the latter by a kind of stair-ladder, the ostensible and by far preferable means of access to the upper room was, as is common in the town of Pensacola, by a single flight of uncovered stairs, the first step of which sprang from the pavement immediately on the right of the house, while the last gave elevation to a little platform upon which the chamber or bedroom opened. The whole fabric was raised and supported by four blocks of live-oak at the corners, and allowing a free circulation of air beneath; cellars in these sandy regions being of rare occurrence and less use.<sup>2</sup>*

2. George A. McCall, *Letters from the Frontiers* (Philadelphia: J. B. Lippincott & Co., 1868), pp. 115—116.



## Builders' Catalogs

A final place to check is in builders' catalogs, manuals, architectural journals, and popular magazines. These will illustrate popular architectural and furnishing styles, construction materials, and colors for the interior and exterior. Old company sample books of paints, varnishes, and wallpapers also can show styles that were "in vogue" during a particular period. By 1900 many architectural details including colored-glass windows and porch brackets were available through catalogs. Even Sears-Roebuck and Montgomery Ward catalogs illustrate common styles.

Whether dating a structure, determining its exterior appearance, or furnishing it, the researcher has available a variety of information sources. The options include property abstracts, probate records, building permits, court cases, photographs, sketches or paintings, newspapers, maps, city directories, manuscript collections, and catalogs. If information is not available about a specific house, remember to look to other houses in your town or region that are similar in period, style, and economic level. These houses can give you general ideas about your project.

## BIBLIOGRAPHY

- Cumming, John: *A Guide for the Writing of Local History*. Michigan American Revolution Bicentennial Commission. Lansing, 1974.
- Hale, Richard W., Jr.: *Methods of Research for the Amateur Historian*. Technical Leaflet #21. Revised. AASLH. Nashville, 1969.
- Miller, Carolynne L.: *Genealogical Research*. Technical Leaflet: #14. AASLH. Nashville, 1969.
- Parker, Donald Dean: *Local History: How to Gather It, Write It, and Publish It*. Revised and edited by Bertha E. Josephson. Social Science Research Council, New York, 1944.
- Warner, Sam Bass, Jr.: *Writing Local History: The Use of Social Statistics*. Technical Leaflet #7, AASLH. Nashville, 1970.

Linda Ellsworth is historian and chief of the Bureau of Research and Publications of the Historic Pensacola Preservation Board. She holds a master's degree from the University of Delaware, an archival certificate from the University of Denver, and a bachelor's degree from Macalester College. She has held a grant from the National Endowment for the Humanities and a fellowship for museum professionals from the National Endowment for the Arts.



### TECHNICAL LEAFLET 89

Technical leaflets are published by the American Association for State and Local History for the purpose of bringing useful information to persons working in the state and local history movement. The series does not follow the same categories month after month,

since the selection of subject matter is based upon varied inquiries received by the Association's home office. The leaflets, which are detachable from the magazine, are copyrighted © and should be cataloged as part of HISTORY NEWS.

American Association for State and Local History Technical Leaflet 89, HISTORY NEWS, Vol. 31, No. 9, Sept., 1976. *The History of a House: how to trace it.*

Reprints are available for \$.50 each. For information on bulk rates, write to the Association at 1400 Eighth Avenue, South, Nashville, Tennessee 37203.

# Technical Leaflet

Technical Information Service

American Association for State and Local History

## Historical Archaeology as a Tool for Researching and Interpreting Historic Sites

by Lu Ann De Cunzo

*This technical leaflet is intended as a guide for governing boards and staffs of historic sites that contain or potentially may contain archaeological resources. Its purpose is to introduce historical archaeology and its relationship to historic site management and to provide a general model for implementing a historical archaeological research and preservation program. Keep in mind the general nature of the recommendations presented here; in one short technical brief, it is impossible to address all of the issues relevant to the diverse corpus of historic sites across the country. This brief overview can not do justice to all that historical archaeology offers to the historic site. Nevertheless, it is hoped that this sampling will prompt you to think more creatively and broadly about historical archaeology's potential at your site.*

### What is Historical Archaeology?

James Deetz's virtually all-encompassing definition of historical archaeology as the "study of American material culture in historical perspective"<sup>1</sup> offers a perfect opportunity to explore the discipline's potential to contribute to historic site research and interpretation. In doing so, it is helpful to conceptualize

historical archaeology as consisting of two principal activities or as operating on two different levels.

The first, or historical archaeology as technique, comprises the discovery and documentation of the material remains of an individual's or group's use of a particular place at a particular time. These remains, now preserved below the ground surface, typically include soil levels, features, artifacts, and archaeobotanical and other ecological materials. This is archaeology as it is conceived traditionally.

The second component might be termed historical archaeology as interpretation. Here the historical archaeologist is analyzing and attempting to understand the material remains. The key, however, is that this interpretive activity does not take place in a vacuum. Historical archaeology as interpretation considers the archaeological materials in their historical and cultural context in order to understand better the site, its people, and the historic period and culture in which they lived. During interpretation, the archaeologist looks beyond the "below ground" remains to all the relevant evidence—documents and graphics, oral history, landscape, architecture, and other "above ground" material culture—and hence, interacts with scholars utilizing these other sources as their primary evidence. Historical archaeologists are, therefore, members of the historic site research team, also comprised of historians, architectural and landscape historians, folklorists, curators, and often many others, all of whom are concerned ultimately with broader, synthetic interpretations.

---

*Lu Ann De Cunzo is with the department of anthropology at the University of Delaware and the office of advanced studies Winterthur Museum, Gardens, and Library, Winterthur, Delaware.*



## **Why Historical Archaeology at the Historic Site?**

Archaeological resources potentially may be associated with all historic sites. They may predate the occupation deemed significant and interpreted at the historic site; they may relate to it; and/or they may postdate it. Nevertheless, these archaeological resources potentially contain significant information not obtainable from any other source. In addition, these archaeological resources are extremely fragile, easily destroyed or disturbed by activities such as gardening, installing underground utilities, constructing parking lots, or demolishing or building structures. Once destroyed, the information contained in archaeological sites never can be retrieved. Archaeological remains are, therefore, an important and non-renewable resource of the historic site, and they require preservation just as do the historic structures, trees and plantings, documents, furnishings, and collections.

## **The Potential of Historical Archaeology in Historic Site Research and Interpretation**

Archaeological remains have been employed in the interpretation of American historic sites for decades. Traditionally, archaeological evidence has supported building restoration and reconstruction and provided information on appropriate furnishings. For example, archaeological sites can yield information regarding a structure's location, size, function, construction materials and techniques, location of principal features such as openings and fireplaces, and any changes that may have occurred over time.<sup>2</sup> Fragments of ceramics, glassware, and tools utilized in the structure often are preserved in the archaeological record as well, supplementing the information on material culture provided in documents such as estate inventories.

Today, the scope of historical archaeology encompasses much more than this. Of greatest applicability to historic site research and interpretation are two developments—the extension of the archaeologist's interests to include the entire physical environment or landscape of the site and the interpretation of all this evidence in a historic, social, and cultural context, as suggested above.

Historical archaeologists, for example, are interested in reconstructing the physical landscape and the use of space at a site, both at a single period and across time. Archaeological evidence often survives of the location, size, construction, and use of features

such as paths, fences, gardens, drains, trash pits, animal enclosures, orchards, privies, wells, and other areas utilized for various activities. Archaeological study of historic landscapes has been encouraged recently by the application of techniques such as soil chemical, archaeobotanical, pollen, and phytolith analysis. In concert with traditional archaeological excavation methods, these techniques are allowing archaeologists to begin to address questions such as the location, arrangement, and species of plantings that comprised a historic landscape.<sup>3</sup>

In interpreting a site's archaeological remains, historical archaeologists employ cultural and historical contextual themes that intersect at many points the interpretive themes guiding historic site interpretation today. Four especially appropriate examples will be outlined briefly:

- Settlement Pattern, Domestic Economy, and Daily Life
- Production, Distribution, and People at Work
- Social Interaction.

## **Settlement Pattern, Domestic Economy, and Daily Life**

Historical archaeologists' interests in the landscape today extend to the context beyond the individual site as well. In settlement pattern studies, the spatial patterns and implications of the frontier, the plantation, the town, and the urban center are being investigated. Thus placing the site physically in the local and regional settlement system, the historic site interpreter can move on to examine less tangible networks with the visitor, such as the economic and social systems.<sup>4</sup>

One avenue being explored advantageously by archaeologists studying domestic life emphasizes the family or household occupying a historic site as an economic unit. As such, the household both produces and consumes and participates in ever larger networks of production and consumption, extending from a local to an international scale. The "foodways system" is a good example of a complex component of a household's domestic economy; historical archaeology contributes to its value as a central interpretive theme at many historic sites.<sup>5</sup>

## **Production, Distribution, and People at Work**

The focus of the third group of themes is people at work. Here, historical archaeologists are contributing much to our understanding of technology and technological change in agriculture and manufacturing. Thus, some archaeologists are studying produc-



tion processes and the work patterns associated with them; others are more interested in the distribution of products and the broader economic networks in which manufacturers, producers, and distributors participated. Historical archaeology, at what might be defined broadly as industrial sites, therefore, can assist in understanding and interpreting both process and context.<sup>6</sup>

## Social Interaction

Overlapping and intersecting all these themes is the final one, social interaction. Social and economic status have been central issues in historical archaeological research in recent years. Of special relevance to historic site interpretation is archaeologists' explorations of the relationship of status and class to material culture, consumption, display, and other aspects of daily life. Interaction occurs in contexts beyond those already introduced above—the home and the workplace. Archaeological investigation of the relationships between individuals and groups also has focused on the church, school, tavern, and on wider community networks.<sup>7</sup>

In addition to illuminating historical and cultural themes, historical archaeology has been employed and continues to hold interpretive potential for historic sites in another way, that is, as a tool to teach the public how researchers learn about the past. Frequently, in current historic site interpretation, the questions posed include:

- How do we know what we know?
- How do we reconstruct buildings and landscapes, and from there daily life?
- How do we write history?

By teaching people how archaeologists work—through exhibits, tours, media presentations, or participation in excavation, documentary research, or artifact processing research—it is hoped that they will have capabilities to think critically themselves about history and to ask and pursue their own questions about the past.<sup>8</sup>

## Doing Historical Archaeology at a Historic Site: The Archaeological Management Plan

The purpose of an archaeological management plan is to guide locating, identifying, evaluating, studying, interpreting, and preserving the archaeological resources surviving on the property associated with a historic site. What follows is a general model for developing and implementing such a plan.

## Development of the Plan

The initial, preparatory steps in a plan are undertaken by the site staff and/or governing board members that are responsible for it. Greater familiarity with the archaeology by the archaeologists working in the area should be attained, with special attention being given to local and regional archaeology at historic sites. The potential role of archaeology at the historic site must be considered and its relationship to the site's other goals, activities, interpretive themes, and preservation responsibilities established. Historic site archaeology and the archaeological management plan themselves must be integrated into the broader context of the site's mission, its research and interpretation plans, collections policy, and other long-range plans. Finally, in preparing for development of the plan's first component, all available information on the site's history and occupants should be assembled (the definition of "assemble" will of course vary from site to site, dependent on such factors as site size, extent of research conducted, number and training of staff, etc.).

Entire technical leaflets could be devoted to two other issues of this planning stage—selection of an archaeological consultant and funding. In many ways, selecting a consultant and securing funding for historic site archaeology do not differ from that done for any other historic site project. Each state's historic preservation office is a good source of information on archaeological consultants; funding usually will be generated from local or regional sources. Corporate donations of equipment and services and the training and use of volunteers hold great potential as contributions to a successful archaeology program at historic sites.<sup>9</sup>

## Documentation for the Plan

Preparation of the management plan proceeds with the first component, a documentary and oral history of land use and site occupation. Archaeology is labor intensive and, therefore, very expensive. The more that is known in advance about the site's history from documentary records, oral history, and other sources, the more cost effective, efficient, and productive the archaeology. The purpose of this first section of the plan is to assist in defining appropriate archaeological research questions, in identifying those areas of the site where archaeological remains may be expected, and in predicting the nature, extent, and date of the remains. Ultimately, those portions of the site are identified that potentially contain archaeological information as well as the areas where the documents and oral history indicate land moving, construction,



and erosion have destroyed the archaeological resources.

It is recommended (and assumed below) that this first step in the archaeological planning process addresses the entire property. In the cases of extremely large historic sites, there should be three primary considerations:

- (1) Immediate threats to the archaeological integrity of a portion of the site;
- (2) Restoration or interpretation plans focusing on a particular area; and
- (3) Funding limitations.

Thus, it may be necessary to prepare separate plans for discrete sites within the larger historic site property.

In organizing and reviewing the documentary and oral information, emphasis is placed on the site's physical history—when buildings and other landscape features were constructed, altered, and demolished and how the land has been used and changed—however, the social history of the site should not be neglected. The research should reach back in time to the earliest historic period occupation of the locale and into the prehistoric period if appropriate. At the other end of the time line, documentation should extend to the present, as information on all uses of and changes to the land is important in defining areas of archaeological potential. The results and documentation accompanying any previous archaeological research on the property also are evaluated. Finally, an accurately surveyed topographical map at a useable scale of the property should be prepared, showing buildings, landscape features, and other existing conditions. Information can be plotted on site layout and the landscape at different points in time, on the location of any previous archaeological excavations, and on the areas with archaeological potential by either incorporating it on the topographical map or as a series of overlays to it. The report on this research should include summaries of:

- Site description, physical setting, and environment; research methodology, sources consulted;
- Site history and land-use history, including copies of all relevant graphic sources;
- Archaeological remains expected, their distribution, nature, extent, date (identify potentially informative areas of the property, and those with a low probability of containing preserved archaeological resources);
- Archaeological research questions and priorities, and bibliography.

## Implementation of the Plan

Based on these introductory chapters, a prelimi-

nary management plan and an archaeological resource policy can be drafted. The plan should outline the next steps in the research program, as discussed below.

The policy roughly parallels a collections policy: it states the historic site's policies regarding the identification and preservation of archaeological resources on its property. *The recommended policy is that the historic site deem these archaeological resources valuable and irreplaceable sources of information on the history, and possibly prehistory of the site, and that, therefore, every effort will be made to assure their identification, evaluation, study, and preservation.* It may state further, as a result, that no subsurface excavation will be allowed in areas identified in the plan as having archaeological potential or as being archaeologically unknown without first conducting a survey to identify and evaluate the remains. Should important archaeological resources be discovered, the policy may require that they be preserved in place or that excavations be undertaken to recover and preserve the information they contain.

The preliminary plan in its next phase should contain a research design for an archaeological field survey. The survey's purpose is to identify the archaeological sites and resources that actually do survive; it may be designed to test the entire property or as a series of separately funded surveys to be completed of individual parcels or areas. The research design addresses questions, such as the number, size, and distribution of the tests to be excavated; whether they will be hand- or machine-excavated; and whether aerial photographs should be taken or geophysical prospecting techniques, such as soil resistivity or magnetometer survey employed. The research design also forms the basis for the cost estimate for the survey.

The consultant team, of course, is expected to follow standard archaeological field procedures of stratigraphic excavation, screening of soils, recovery of artifacts, and other samples by provenience, and documentation of findings through color and black-and-white photographs, drawings, and written descriptions. Upon completion of the fieldwork, the artifact collection is cleaned, labeled, and cataloged. It becomes part of the historic site collection and, hence, subject to the same considerations of storage, organization, conservation, and preservation.

A survey report then is prepared, to include summaries of the research design and testing strategy, methodology, the results of the field testing and collection analysis, and recommendations for further work. If archaeological resources have been located, more intensive documentary and oral research and archaeological testing may be proposed before a decision is reached on the site's significance and worthi-



ness of preservation or complete excavation. In addition, at the conclusion of this and any subsequent testing phase, new information should be incorporated into the archaeological base map and plan.

Substantial or complete excavation of archaeological sites on historic site properties should be considered only if unavoidable land-altering activities threaten them or if they exhibit outstanding potential to contribute information to the understanding and interpretation of the site. The destructive nature of archaeology and the goal of preservation for future generations always must be remembered. The research process for such projects essentially is that outlined above. Greater attention is paid to research themes and questions and the strategy required to address them; in addition to the archaeologists, a variety of specialists, including architectural and landscape historians, often are involved (see July/August 1990 *History News*). Large portions of the site typically are excavated; the fieldwork as well as the analysis, comparison, synthesis, and report preparation stages are labor intensive, time consuming, and expensive. If properly planned and executed as a truly interdisciplinary effort, however, the results will be well worth the investment.

In concluding, a few basic points warrant reiteration:

- **Archaeological sites are nonrenewable, frag-**

**ile resources;** the historic site is responsible for identifying, protecting, preserving, studying, and interpreting them just as the site's buildings and collections are interpreted.

- **Archaeology is by its nature destructive; once excavated, a site can only be "reconstructed" from the collections recovered and the records maintained.** Their preservation is as important as the sites' preservation.
- **The concept of the archaeological management plan and policy is proposed as the mechanism through which the historic site fulfills its stewardship responsibilities to the archaeological resources within its borders.** Like any other plan, it best can be described as a process, requiring constant updating as new information is acquired.
- **Archaeological resources have tremendous potential to contribute to the understanding and interpretation of historic sites and their occupants, as well as historical and cultural processes,** providing information and insights unavailable from any other source. An archaeologist can be a valuable member of the team of any historic site.

## End Notes

<sup>1</sup> Deetz, James. *In Small Things Forgotten. The Archaeology of Early American Life*. Garden City, New York: Anchor Books, 1977: 25.

<sup>2</sup> For an excellent example of the synthesis of archaeological, architectural, and historical data in a study of American architecture, see Cary Carson, Norman F. Barka, William M. Kelso, Garry Wheeler Stone, and Dell Upton, "Impermanent Architecture in the Southern American Colonies," *Winterthur Portfolio*, 16, no. 2/3 (1981): 135-178.

<sup>3</sup> Two very good examples of recent historical archaeological landscape studies, each addressing landscape questions at a different scale, are Henry M. Miller, "Baroque Cities in the Wilderness: Archaeology and Urban Development in the Colonial Chesapeake," *Historical Archaeology*, 22, no. 2 (1988): 57-73 and Anne E. Yentsch, Naomi F. Miller, Barbara Paca, and Dolores Piperno, "Archaeologically Defining the Earlier Garden Landscapes at Morven: Preliminary Results," *Northeast Historical Archaeology*, 16 (1987): 1-29. See also William M. Kelso, ed., *Earth Patterns: Archaeology of Early American*

*and Ancient Gardens and Landscapes*, Charlottesville: University Press of Virginia, 1990.

<sup>4</sup> Recent examples include Kenneth E. Lewis, *The American Frontier: An Archaeological Study of Settlement Pattern and Process*. Orlando: Academic Press, 1984; Pamela J. Cressey, John F. Stephens, Steven J. Shephard, and Barbara H. Magid, "The Core Periphery Relationship and the Archaeological Record in Alexandria, Virginia," in Roy S. Dickens, Jr., ed., *Archaeology of Urban America: The Search for Pattern and Process. Studies in Historical Archaeology*, New York: Academic Press, 1982: 143-174; Edward Staski, ed., *Living in Cities: Current Research in Urban Archaeology, Special Publication Series, No. 5.*, Society for Historical Archaeology, 1987.

<sup>5</sup> There is extensive literature in historical archaeology on these subjects. A few good places to start would be with Suzanne M. Spencer-Wood, ed., *Consumer Choice in Historical Archaeology*, New York: Plenum Press, 1987; Elizabeth J. Reitz and C. Margaret Scarry, eds., *Reconstructing Historic Subsist-*



ence with an Example from Sixteenth-Century Spanish Florida, *Special Publication Series*, No. 3. Society for Historical Archaeology, 1985; Theresa A. Singleton, ed., *The Archaeology of Slavery and Plantation Life. Studies in Historical Archaeology*, Orlando: Academic Press, 1985; Leslie C. Stewart-Abernathy, "Urban Farmsteads: Household Responsibilities in the City," *Historical Archaeology*, 20, no. 2 (1986): 5-15.

- <sup>6</sup> See for example Nicholas Honerkamp, "Innovation and Change in the Antebellum Southern Iron Industry: An Example from Chattanooga, Tennessee," *Industrial Archaeology*, 13, no. 1 (1987): 55-68; David R. Starbuck, "The Shaker Mills in Canterbury, New Hampshire," *Industrial Archaeology*, 12, no. 1 (1986): 11-38; John Worrell, "Ceramic Production in the Exchange Network of an Agricultural Neighborhood," in Sarah P. Turnbaugh, ed., *Domestic Pottery of the Northeastern United States, 1625-1850*. Orlando: Academic Press (1985): 153-170; Alaric Faulkner, "Maintenance and Fabrication at Fort Pentagoet 1635-1654: Products of an Acadian Armorer's Workshop," *Historical Archaeology*, 20, no. 1 (1986): 63-94.

- <sup>7</sup> Interaction between members of different social and economic groups and the dynamics of group identification and maintenance are topics explored

in much of the literature already cited; see especially Yentsch, et al., 1987; Spencer-Wood, ed., 1987; Singleton, ed., 1985; Staski, ed., 1987.

- <sup>8</sup> There are many fine examples of, if much too little literature on, this sort of application of historical archaeology in the historic site context. Among these are projects undertaken at Colonial Williamsburg; Historic St. Mary's City; Alexandria, Virginia; Baltimore, Maryland; Charleston, South Carolina; New York City, New York. See also *History News*. In addition, several archaeologists, most notably Mark Leone and his associates, have applied critical theory in their public interpretation of historical archaeology. See for example Mark P. Leone, "Archaeology's Relationship to the Present and the Past," in Michael B. Schiffer, ed., *Modern Material Culture: The Archaeology of Us*. New York: Academic Press; 1981, and "Method as Message," *History News*, 62, no. 1 (1983): 35-41; Parker B. Potter, Jr., and Mark P. Leone, "Archaeology in Public in Annapolis: Four Seasons, Six Sites, Seven Tours, and 32,000 Visitors," *American Archaeology*, 6, no. 1 (1987): 51-61.

- <sup>9</sup> Special issue on "Museum Consulting and Consultants," *The Museologist*, 52, no. 181 (Spring/Summer 1989). The articles in *History News*, 45, no. 4 (1990) offer good ideas on volunteer programs.

### Selected Bibliography

Blatti, Jo. *Past Meets Present: Essays about Historic Interpretation and Public Audiences*. Washington, D.C.: Smithsonian Institution Press, 1987.

Carson, Cary; Barka, Norman F.; Kelso, William M.; Stone, Garry Wheeler; and Upton, Dell. "Impermanent Architecture in the Southern American Colonies." *Winterthur Portfolio*, 16, no. 2/3 (1981): 135-178.

Cressey, Pamela J.; Stephens, John F.; Shephard Steven J.; and Magid, Barbara H. "The Core Periphery Relationship and the Archaeological Record in Alexandria, Virginia." In Roy S. Dickens, Jr., ed., *Archaeology of Urban America. The Search for Pattern and Process. Studies in Historical Archaeology*. New York: Academic Press (1982): 143-174.

Deetz, James. *In Small Things Forgotten. The Archaeology of Early American Life*. Garden City, NY: Anchor Books, 1977.

Faulkner, Alaric. "Maintenance and Fabrication at Fort Pentagoet 1635-1654: Products of an Acadian Armorer's Workshop." *Historical Archaeology*, 20, no. 1 (1986): 63-94.

Fowler, P. "Archaeology, the Public and the Sense of the Past." In D. Lowenthal and M. Binney, eds., *Our Past Before Us: Why Do We Save It?* Temple Smith, 1981.

Hoepfner, Christine; Leone, Mark P.; and Potter, Parker B., Jr. "The Preserved is Political: A Critical Theory Agenda for Historical Interpretations of Monuments and Sites." *Icomos Information*. July/September (1987): 10-16.

Honerkamp, Nicholas. "Innovation and Change in the Antebellum Southern Iron Industry: An Example from Chattanooga, Tennessee." *Industrial Archaeology*, 13, no. 1 (1987): 55-68.

Hosmer, Charles B. *Preservation Comes of Age*.

- Charlottesville: University Press of Virginia, 1981
- Kelso, William M., ed., *Earth Patterns: Archaeology of Early American and Ancient Gardens and Landscapes*. Charlottesville: University Press of Virginia, 1990.
- King, Thomas F.; Hickman, Patricia Parker; and Berg, Gary. *Anthropology in Historic Preservation*. New York: Academic Press, 1977.
- Leone, Mark P. "Archaeology's Relationship to the Present and the Past." In Michael B. Schiffer, ed., *Modern Material Culture: The Archaeology of Us*. New York: Academic Press, 1981.
- Lewis, Kenneth E. *The American Frontier: An Archaeological Study of Settlement Pattern and Process*. Orlando: Academic Press, 1984.
- "Method as Message." *History News*, vol. 62, no. 1 (1983): 35-41.
- Miller, Henry M. "Baroque Cities in the Wilderness: Archaeology and Urban Development in the Colonial Chesapeake." *Historical Archaeology*, 22, no. 2 (1988): 57-73.
- "Museum Consulting and Consultants." *The Museumologist*, 52, no. 181 (Spring/Summer 1989).
- Potter, Jr., Parker B., and Leone, Mark P. "Archaeology in Public in Annapolis: Four Seasons, Six Sites, Seven Tours, and 32,000 Visitors." *American Archaeology*, vol. 6, no 1 (1987): 51-61.
- "The Relationship between Artifacts and the Public in Outdoor History Museums." In Anne-Marie Cantwell, James B. Griffin, Nan A. Rothschild, eds., *The Research Potential of Anthropological Museum Collections*. Annals of the New York Academy of Sciences, vol. 376, 1981.
- Reitz, Elizabeth J., and Scarry, C. Margaret, eds. *Reconstructing Historic Subsistence with an Example from Sixteenth-Century Spanish Florida*. Special Publication Series, no. 3. Society for Historical Archaeology, 1985
- Singleton, Theresa A., ed. *The Archaeology of Slavery and Plantation Life. Studies in Historical Archaeology*. Orlando: Academic Press, 1985.
- Spencer-Wood, Suzanne M., ed. *Consumer Choice in Historical Archaeology*. New York: Plenum Press, 1987.
- Starbuck, David R. "The Shaker Mills in Canterbury, New Hampshire," *Industrial Archaeology*, 12, no. 1 (1986): 11-38.
- Staski, Edward, ed. *Living in Cities: Current Research in Urban Archaeology. Special Publication Series*, no. 5. Society for Historical Archaeology, 1987.
- Stewart-Abernathy, Leslie C. "Urban Farmsteads: Household Responsibilities in the City." *Historical Archaeology*, 20, no. 2 (1986): 5-15.
- Worrell, John. "Ceramic Production in the Exchange Network of an Agricultural Neighborhood." In Sarah P. Turnbaugh, ed. *Domestic Pottery of the Northeastern United States, 1625-1850*. Orlando: Academic Press, (1985): 153-70.
- Yentsch, Anne E.; Miller, Naomi F.; Paca, Barbara; and Piperno, Dolores. "Archaeologically Defining the Earlier Garden Landscapes at Morven: Preliminary Results." *Northeast Historical Archaeology*, 16 (1987): 1-29.



---

## NOTES

---

© 1990 by American Association for State and Local History. Technical Leaflet 173, "Historical Archaeology as a Tool for Researching and Interpreting Historic Sites," *History News*, Volume 45, Number 4, July/August 1990.

Technical leaflets are issued by the American Association for State and Local History to provide the historical agency and museum field with detailed, up-to-date technical advice. Technical leaflets and reports are available through *History News* magazine to AASLH members or through the



AASLH Press catalog to any interested buyer. Membership information or technical leaflet or report reprints may be ordered by contacting American Association for State and Local History, 172 Second Avenue North, Nashville, Tennessee 37201, (615) 255-2971, FAX (615) 255-2979.

American Association for State and Local History endorses no particular product, service, or institution.



American Association for State and Local History

## Technical LEAFLET

### The Eight Most Common Mistakes In Restoring Houses (And How to Avoid Them)

by Morgan W. Phillips

*Society for the Preservation  
of New England Antiquities*

#### Introduction

For those interested in older houses, discovering and conserving the existing materials and evidence from a building's historic past is often a major source of satisfaction. Many old-house owners want to go further—to enhance the sense of history in their old buildings by restoring them to their earlier appearance.

Both investigation and restoration, however, can involve decisions and activities that are deleterious to the special, sometimes subtle, historic qualities of a house. Thus, in attempting restoration, it is possible to destroy the very qualities that make an old house valuable in the first place. Hasty and ill-considered removal of portions of the trim or of partitions, scraping or sandblasting surfaces, installation of "off-the-shelf" reproductions, and similar endeavors can remove a building far from the authenticity the owner intends.

Some mistakes, in attitudes as well as actions, seem to be more common and more serious than others. Concern about the destructive potential inherent in restoration of older

structures led the Office of Archaeology and Historic Preservation and the Department of Housing and Urban Development to issue a lengthy set of guidelines for rehabilitation of older buildings. While these are useful, definition of the principles of good restoration through consideration of the most common mistakes made by individuals may be more meaningful to owners of old houses.

The following discussion of the eight most frequent mistakes in restoring historic houses provides basic guidelines to anyone whose concern with older, historically valuable or interesting buildings involves restoration or repair work beyond ordinary maintenance.

#### 1. Don't Destroy the Evidence: Make Tracks

Old buildings almost invariably consist of material from a number of periods. When the decision is made to remove some recent material and to reproduce what had existed at some earlier time, there arises the problem of how to find out exactly what the earlier material looked like. Very often a detailed answer can be found





*This house, pictured before and after restoration, was constructed in the seventeenth century. The windows and doorway, dating from the eighteenth and early nineteenth centuries and visible in the picture on the left, constitute valuable and picturesque additions to the building, but unfortunately they were removed during restoration.*

in evidence actually on the site. Telltale fragments of missing woodwork may have been reused as a part of later woodwork or may have fallen into some crevice during the remodeling. A ridge in the paint layers when illuminated with a light held at an angle may reveal the profile of a key piece of woodwork that had been removed.

A common mistake is to proceed with restoration work before gathering all such evidence. The evidence is then lost—removed by carpenters, obliterated by sanding, or thrown away during the overambitious cleanup.

For the same reason that architectural evidence is valuable to use in researching a restoration, we should leave a record of our current restoration work for the future. New wood should be marked and a thorough record consisting of text, photos, and drawings or sketches should be kept. Measured drawings of the building are the ideal place on which to note all the evidence discovered.

## 2. Don't Overrestore

Overrestoration usually takes two forms. First is the replacement of old material just because it shows the signs of age and, thus, looks a little

too rough to suit the tastes of a perfectionist. Old bumpy plaster is replaced with a perfect new job; old fireplace bricks showing some minor heat damage are replaced. A building restored in this manner loses the patina of age that made it appealing in the first place and loses the materials that make it genuinely old.

A second form of overrestoration is to return the building to its original appearance by stripping away later additions of historical or architectural value. Virtually every old building is a collection of material of different dates. This is true not only of American houses but also of the famous ancient buildings of Europe and the rest of the world. Sometimes, the additions are of more interest than the original parts. A typical example of a valuable later addition is a fine Federal period mantel built in front of an earlier larger fireplace. All too often such fine work is destroyed to expose what remains of the original fireplace.

Clearly, there is often a lot of material of little value to be removed, but the decision about what goes and what stays should be made very carefully on the basis of a study of the building and only after consultation with others who are familiar with American architectural history.



*Top left: the left half of this house was constructed in the seventeenth century, and the right half was added in 1709 by the original owner. At that time, the windows in the original structure were changed to match those in the new addition. Top right: The windows in the original part of the house were restored to an earlier period than those in the later addition, thus, creating a house that never existed previously. Bottom: This house was constructed in 1759, and the porches were added in the 1790s. As important additions to the structure, the owners decided not to remove them when restoring the house.*

In general, the best policy is to retain later material. As a real part of the building's past, it has more value than "fake" material substituted during restoration. If you don't have time to conduct a study of the building, then, certainly, the safest policy is to keep later features in place.

### 3. Don't Make a Building That Never Was

This is a very common mistake, and a subtle one. It most often happens in one of two ways.

First, it is quite common to see one part of a building restored to one date and another part to a different date. As an example, suppose a house built in 1810 was heavily remodeled in 1860—raised roof, new front doorway, new window sash. If today we tear out the 1860 sash and put in 1810-type sash while retaining the other 1860 features, we have created an appearance which the building never had at any time. Usually, this mistake occurs through lack of study of the building or through the owner's

selective dislike for some part of the later remodeling.

A second example of restoring to a condition that never existed is to restore a building to an appearance that is earlier in character than the building itself—and more primitive. Many old buildings were finished better than we realize. For example, the best eighteenth-century floorboards were not eighteen inches wide and knotty, but six to ten inches wide, free from knots, and cut across the growth rings so as not to splinter or warp. The use of typically wide, poor quality attic floorboards in the restoration of formal rooms is a frequent mistake.

Probably the most common example of "earlying it up" is the removal of plaster from ceilings to expose bare beams when these beams were never meant to be exposed. Only the earliest or most primitive houses had exposed beams. In most areas of the country, from the early eighteenth century on, plaster, paneling, and moldings were considered beautiful, not beams.

In order to avoid making a building look earlier than it ever possibly could have looked, it is important to determine the actual date of the building. Quite often one sees a fine formal house of the Greek Revival period, circa 1825-1860, marked with a date of perhaps 1750 and restored accordingly. This is apt to happen when the owner has searched the deeds and discovered that a house was built on the site in 1750 but has failed to consider what might have happened to that 1750 house. Did it burn in 1790? Was it taken down or moved across the street? Or was the land divided in 1839 so that the 1750 house is really the one next door? The construction of the present house may not be recorded in any documents.

The importance of researching and analyzing a building preliminary to restoration and repair cannot be overemphasized. Documents and the building itself must be studied together. If one relies on a single document, it is easy to make the kind of mistake just described. If one examines only the building, much information



*Often the original wallpaper in a building can be salvaged, as was the eighteenth-century flocked wallpaper shown in this photograph.*

contained in deeds, wills, inventories, old maps, old drawings, and many other sources will go undiscovered. Such information is invaluable in piecing together the whole story of the building and in making the decisions required during the restoration process.

#### 4. Don't Scrape

The most common procedure in reproducing old paint colors is to scrape clean a sample of the old paint and then match its color with new paint. In many cases the color thus achieved is incorrect as the old sample has discolored with time. Many unstable pigments were used in early paints and have long since faded. Because oil yellows faster in the dark, the oil in many old paints has yellowed after the original paint was covered by later layers. Thus, many old colors were brighter than they may appear.

The analysis of old paints to determine original colors is very difficult and should be done by a professional. If the owner is serious about wanting to restore the house to the original color, unnecessary stripping of old paint should be avoided as this destroys the old samples and means that the research can never be done. It's not enough to strip a whole room and leave just one area as a sample; a researcher will want to look all around the room with a microscope to find one or two well-preserved samples. These are very apt to be little, thick lumps of paint near hardware or in crevices, and there may be only a few good examples in a whole room.

Thus, paint stripping should be undertaken only when absolutely necessary, leaving on as much of the old paint as possible. Since most old woodwork was painted from the start, the bare, knotty-pine look is apt to be incorrect anyway. An exception may be certain types of Victorian houses where interior woodwork was varnished.

Old wallpapers should be preserved when possible for the same reasons as old paints: they are evidence of changing tastes in the building through the years. Many old papers date back as far as the late eighteenth century and have real value. If a paper does have to be removed, you should keep samples large enough to show a full repeat of the pattern. Some wallpapers are important enough to deserve being kept intact on the wall at all costs.

#### 5. Don't Sandblast: Avoid Destructive Repointing

The cleaning and repointing of old brickwork is seldom done properly.

Old brickwork is often sandblasted to remove paint. Unfortunately, in most cases this also

removes the hard skin of the bricks, exposing the much more porous and weaker interior, which often will not stand up to the weather. The skin was formed in the brick kiln, and it can never be reformed once it is removed. After being sandblasted, old bricks absorb much more rainwater and, with freezing temperatures, often start to spall and crumble in a few years or even months.

After removal of the bricks' natural barrier to excessive water penetration, building owners are apt to be sold a silicone treatment to help keep water out. This treatment can trap water which has gotten into the bricks in any of a variety of ways, such as through small cracks in mortar joints, from normal interior humidity, or by rising through capillary action from damp soil beneath the building. If this should occur, such trapped water can cause rapidly accelerated decay of old brickwork. Silicones are no substitute for the bricks' own skin.

Before removing old paint from the exterior of the house, first ask the question whether the paint should be removed at all. Many early brick buildings were painted originally, and the record of the original color is the old paint itself. As with interior paint, once this is removed, the story is lost.

If the owner decides to remove the paint, a variety of chemical removers are available. If the right remover is chosen to suit the individual building, this method, although slow, is usually the least damaging to the bricks.

Repointing with Portland cement mortar is perhaps the most common and most damaging error in masonry restoration. Portland cement mortars are made with Portland cement, some lime, and sand as a filler. If the proportion of cement versus lime is high, the mortar is extremely strong and well-suited to the best modern bricks, which are also very strong. Together they produce the high-strength masonry needed for modern construction, but old bricks, and many kinds of stone, are much weaker and can be damaged by very strong, hard mortar used in repointing. A basic principle is that mortar should always be weaker than the bricks or stones imbedded in it; thus, the old lime mortars—made with only lime and sand—worked well with soft bricks and stones. A soft mortar can cushion various movements that occur in masonry—thermal expansion and contraction, expansion and contraction caused by humidity changes, foundation settlements, and so on. Small cracks of no importance may form in mortar, but where the mortar is stronger than the bricks or stones, the latter give way by serious cracking or spalling before the mortar will.



The formulation of mortar for old buildings requires experience and judgment. Many old limes contained certain impurities that actually made them stronger than today's pure lime. When using modern lime, a relatively small amount of Portland cement is often needed to provide the same durability and strength that the old mortar had. The proportion of cement should be based on the strength of the bricks or stones, the severity of weathering action, and other factors.

New mortar should be color-matched to the old. This requires sand of the right color and usually some masonry pigments. A great many buildings have been defaced by dark gray Portland cement mortar when the mortar joints originally were the light, warm white of lime. Some manufacturers offer a perfectly white Portland cement which is extremely useful in mixing new mortar to match the color of lime.

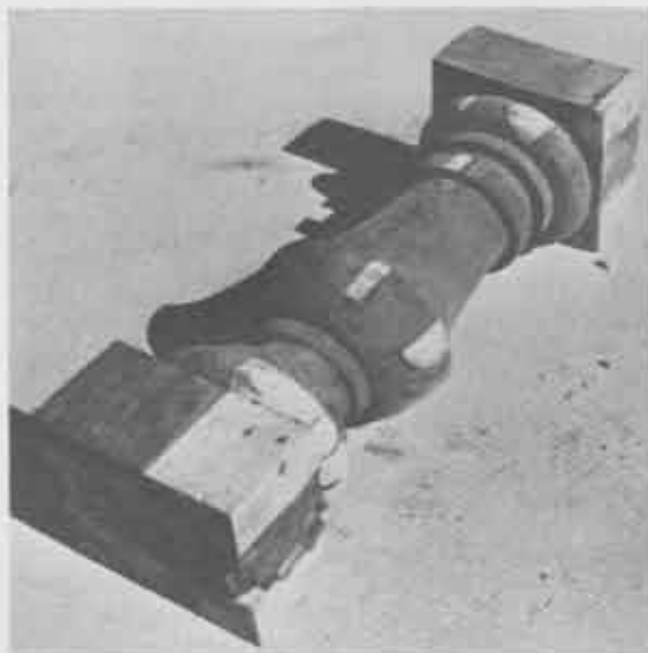
Perhaps the worst aspect of Portland cement mortar used in repairing old masonry is that its strength makes it almost impossible to remove without damaging soft bricks or stones. As for removing old mortar prior to repointing, few people realize the damage usually done in removing even a soft, deteriorated lime mortar. Electric-powered cutting wheels are often used, and they almost always damage the corners of fine, closely laid bricks, sometimes noticeably enlarging narrow mortar joints. Only hand tools should be used for removing old mortar unless a contractor can show that, in the particular situation, some type of power tool is not damaging in any way.

Old mortar in good condition should not be disturbed. It is normal for old mortar to be weathered-back a short way from the face of the bricks; this does not necessarily mean that repointing is needed but may mean the old mortar is now sheltered by the bricks from further erosion.

#### 6. Don't Assume It Can't Be Fixed

With the advent of all kinds of modern products, it has become possible to recondition partly deteriorated woodwork, plasterwork, and other architectural material which twenty years ago it would have been necessary to replace. Still, quite often today one sees old features being carted off to the dump. If they are saved, an old building retains more of its authentic material and, consequently, more of its value.

This suggestion that modern products are useful in restoration should not be seen as a contradiction of the preceding part of this leaflet where it was pointed out that lime mortar, a traditional material, is generally better than Portland cement mortar, a more modern



*The introduction of waterproof glue has made it possible to replace portions of damaged woodwork instead of replacing the entire piece.*

material, for repointing soft brickwork and stonework. Portland cement is extremely useful in restoration—for foundation work, for moderately strengthening lime mortars, and for many other purposes. The point is that both modern and traditional materials are useful but that any material can be used incorrectly.

Some of the most remarkable progress in the conservation of old buildings is being made in the area of wood preservation by means of epoxies, polyesters, and other modern synthetic resins. Such resins are the basis of modern waterproof glues and of many products sold in marine hardware stores for impregnating partially rotted wood or filling holes in wood.

The things that can be done with waterproof glue would have amazed an old-timer accustomed to animal glue, which is water-soluble. For example, an 1806 roof balustrade can have new wood fitted into each baluster wherever the wood is rotted away, and there need be no fear of the patches coming loose because of rain or dampness. Such a balustrade would have had to be replaced completely prior to the introduction of waterproof glue. Waterproof glue opens the door for the extensive repair of damaged woodwork by skillful piecing-in of new wood.

In the same way, modern resins allow permanent strength to be restored to old, partly rotted wood. In some methods, holes are drilled into the wood to expose the end grain, and the



resin is soaked into the wood through the holes. It then hardens. Not only are such wood-consolidating methods popular in the marine field, but similar methods are used in the conservation of antique wooden art objects. Resin impregnation is sometimes the only way to conserve a valuable piece of woodwork, such as the capital of a column or the bottom of an original door.

Steel is a modern architectural material which, because of its great strength, can be used to permit an old beam to be reinforced rather than replaced. Very small amounts of steel can form the backbone of an inconspicuous repair that must carry a heavy load.

Other modern materials can be used for consolidating weakened plaster, readhering peeling paint in wall paintings, and for many other purposes.

#### 7. Get the Design Right

Sometimes there is no alternative but to replace something or a portion of something that is missing or decayed beyond repair. A basic objective in such work is to avoid making the new piece a poor parody of the original. This results in much restoration work standing out like a sore thumb.

The elements of old buildings usually exhibit very specific design characteristics. Although the designs are generally similar to material on other buildings of the same date, there are important regional and individual differences which should be respected.



*A metal template is used to gauge the accuracy of a wooden cornice replacement.*

Old moldings, including large items such as cornices, were usually designed according to a geometric system which varied from one period to the next according to whether the designers were looking toward Greece or Rome or the Gothic era for their architectural details. When an old building is to be reproduced, the paint should be removed from a well-preserved section of the old piece so the design can be observed and understood. If the work of reproduction is given to a shop or mill, very specific instructions, perhaps even a precise drawing, model, or template, should be provided.

#### 8. Get Help: Don't Barge Ahead

How many times have we seen an owner, eager to "restore" a newly acquired house, rush in and tear out large portions of the interior and exterior surfaces only to discover that the original finishes are long gone and cannot be accurately reconstructed. A professional is then brought in to make sense of a confused jumble of architectural remnants, and the owner sadly discovers, too late, that he has stripped and thrown away valuable portions of the house—the perfectly sensible and aesthetically pleasing Federal remodeling, for example.

All the points discussed above should make it clear that a restoration or a repair going much beyond ordinary maintenance involves many technical and historical questions. Old buildings of any quality deserve the best study and care that their owners can give them. In the long run it pays off.

Two simple rules can be followed at little or no cost to improve the quality of repair work. The first is to seek professional advice. At the most basic level this means a visit by someone professionally qualified in the field; this may prevent a lot of money being spent on something damaging or destructive. Even architectural historians and restorationists must consult with each other constantly in regard to their various specialties, and there is certainly no way for the layman to get the proper information just by reading the available books or articles. A tremendous amount of study and experience go into the training of professional people in the field, and homeowners should take advantage of this knowledge when possible.

A second basic rule is to allow the maximum time possible to make decisions. Getting the technical or architectural history information is a slow process. Even more disconcerting can be the fact that different people qualified in the same field will give different opinions and answers to questions. What do you do when the "experts" disagree? Begin by taking enough time

to talk to several different people, and then allow enough time to sort out the people who are more "expert" from those who are less so.

#### Selected Bibliography

##### General Conservation Practices

*Building Materials Technology*, L.A. Ragsdale and E.A. Raynham. Edward Arnold, Ltd., 25 Hill St., London, W1x 8LL. (advanced reading)

*The Care of Old Buildings Today: A Practical Guide*, Donald Insall. (very good, British-oriented guide to general care of historic buildings)

*Preservation and Conservation: Principles and Practices*. Proceedings of the North American International Regional Conference, Williamsburg, Va., and Philadelphia, Pa., 1972. National Trust for Historic Preservation in the United States, 1976. (technically oriented, comprehensive series of contributions concerning all aspects of the title—administration, masonry, wood, metals, paints, etc.)

*Recreating the Historic House Interior*, William Seale. AASLH, 1979.

##### Specific Conservation and Technical Topics

##### AASLH Technical Leaflet Series

*Introduction to Early American Masonry: Stone, Brick, Mortar, and Plaster*, Harley J. McKee, FAIA.

##### History

*American Architecture Since 1780: A Guide to the Styles*, Marcus Whiffen.

*American Builders and Their Architects: The Colonial and Neo-Classical Styles*, William H. Pierson, Jr. (good comparative study of "high style" American architecture)

*The American Builder's Companion*, Asher Benjamin. Dover Publication, 1969. (reprint of Benjamin's sixth edition, 1824—good Federal, Greek Revival details)

*Identifying American Architecture, A Pictorial Guide to Styles and Terms, 1600-1945*, John J.-G. Blumenson. AASLH, 1977.

##### Technology

*American Building: Materials and Techniques from the First Colonial Settlement to the Present*, Carl W. Condit. University of Chicago Press, 1969.

*Restoration Manual: An Illustrated Guide to the Preservation and Restoration of Old Buildings*, Orin M. Bullock, Jr., FAIA. Silvermine Publishers, 1966.

Morgan Phillips holds an MA from Columbia University in restoration and preservation of historic architecture and works as architectural conservator with the consulting services group of the Society for the Preservation of New England Antiquities in Boston. In addition to his work with SPNEA, Phillips serves on several committees of the National Conservation Advisory Council. His publications include articles on restoration and reproduction of eighteenth-century paints, methods of matching early mortars, planning execution of extensive restoration work on a mid-nineteenth-century mansion, and uses of new epoxy compounds in historic building conservation.

## American Association for State and Local History

1400 Eighth Avenue, South  
Nashville, Tennessee 37203

### TECHNICAL LEAFLET 118

Technical Leaflets are published by the American Association for State and Local History for the purpose of bringing useful information to persons working in the state and local history movement. The selection of subject matter is based upon varied inquiries received by the Association's home office. The leaflets, which are detachable from the magazine, are copyrighted © 1979 by AASLH and should be catalogued as part of HISTORY NEWS.

American Association for State and Local History Technical Leaflet 118, HISTORY NEWS, Volume 34, Number 8, August, 1979, *The Eight Most Common Mistakes in Restoring Houses (and How to Avoid Them)*. Reprinted with permission from the December, 1975, issue of Yankee magazine published by Yankee, Inc., Dublin, N.H.

Reprints are available. For information on prices, write to the Association at 1400 Eighth Avenue, South, Nashville, Tennessee 37203.



## BEFORE RESTORATION BEGINS:

### *keeping your historic house intact*

By Henry A. Judd  
National Park Service

Upon acquiring an old building they wish to restore, historical societies—like individuals—generally start out with great enthusiasm. The urge to make a quick show of progress is hard to resist. But applying the good housekeeping measures suitable to a modern structure may make restoration virtually impossible. Great damage, usually in the removal or destruction of critical evidence, often results.

Accurate restoration of a historic building is, at best, difficult and specialized work, requiring some knowledge of architecture, history, building technology, and craftsmanship. The restorationist must be able to recognize and evaluate the various parts of the building fabric and put together numerous small and seemingly insignificant bits of evidence, like a giant jigsaw puzzle.

#### HESITATE

First step, then, before the profes-

sional restorationist arrives, is to hesitate. Be sure that in the preliminary clean-up, evidence is not destroyed. When removing underbrush and weeds and the ever-present bottles and beer cans, be alert to identify and save derelict materials which may have been a part of the original building fabric. Watch for—and preserve—original walks, foundation remains, garden plots, and even plant material. A concentration of broken glass near an old foundation may indicate the location of a former window. Do not discard broken hardware, old shutters, window sash, or other abandoned materials until what they are and whether they are significant to the restoration is clearly established.

Small pieces that seem insignificant at first sight may prove to be of great value. For instance, discovered in the restoration of Independence Hall in Philadelphia was a dentil from the original cornice that was removed in 1815.



The Assembly Room in Independence Hall, Philadelphia, as restored by the National Park Service. Reused materials found under later alterations proved vital in the restoration of this room where the Declaration of Independence was signed.

This tiny piece, about half the size of a pack of cigarettes, indicated, by proportion, the size of the complete cornice and all paint layers from original construction until 1815.

Old shingles which fell off during original construction or during a reroofing in the past may turn up in the attic. Unweathered original shingles may also be found that have been used as shims, tapered materials that are wedged in to increase the height of a material over its support. These keys to early roofing can be important.

#### MAKE IT WATERTIGHT

A building must be kept watertight if it is to survive. All too often when

the building is acquired, the roof leaks, window sash are missing, and doors and shutters are flapping in the breeze. After attaching proper identification to the doors and shutters you may remove them. Better yet, repair them and leave them in place. There will be less chance of loss or damage. While doors and shutters from a house in Cleveland, Ohio, were stored in the barn for safekeeping, the barn burned, and nothing could be salvaged.

Make only those repairs that must be made to keep further damage from occurring. If the roof leaks, paper over it, leaving all below intact. If it is so far gone that the roofing must be replaced, replace it as it will be in the final

restoration. Here problems can arise. The old roof sheathing may give a nail pattern revealing the original shingle exposure. But, remember, there may be a half-dozen nail patterns from the successive roofs that covered the building over the years. Identifying the correct one to duplicate requires some knowledge of the history and technology of nail manufacture as well as of roofing.

The technology of flashing, or weatherproofing the joints and angles of a roof, has changed over the years. While reproducing an eighteenth-century flashing mechanically may not prove practical, it is wise to create the same visual effect when restoring a structure of that period. Consider also the cornice, dormers, and missing or

surplus chimneys. The ridge, hips, and valleys were probably installed differently originally from what is common practice today.

The shingle itself should also be correct for the period of restoration. Remember that the "split and resawn" shingle so commonly used in restoring houses today is a product of the twentieth century and is not appropriate for most restoration.

Disintegrating mortar joints may cause a brick or stone building to leak. These joints should be repointed, or properly filled with mortar. Using Portland cement mortars or improper pointing techniques can cause permanent damage. Portland cement is so strong that it is nearly impossible to remove

Between a wall and a joist in Independence Hall, the author found this dentil from the original cornice in the Assembly Room. The 2" x 1 15/16" x 1 1/4" wooden fragment yielded clues to the size of the cornice as well as to the colors of the paint applied to the woodwork. The moral? Discard nothing during clean-ups.





without harm to the original fabric. If it has been incorrectly applied against brick, leave it. Portland cement mortar, even if well matched in color and correctly installed, is apt to shrink, leaving hairline cracks and continued leaks. Pointing small sections with cement mortar will result in separation caused by differing rates of expansion and contraction between old and new; the walls will look like patchwork quilts!

Lime mortars or hydraulic cements are preferable for repointing. Match the original in color and texture. If possible, obtain the color from the natural color of the sand. Do not try to match the color of a weathered and dirty surface—the new pointing will get dirty soon enough. When applying water-

proof materials, such as silicons, be sure the walls are dry and no water can get into them either from leaks in the roof and cornice above or from osmosis or rising damp from below. If water remains, freezing weather can cause major surface areas to spall or crumble. Such waterproofing materials should be used only as a last resort.

Remember when waterproofing to remove groundwater from around foundations. Proper grading should be considered first, but avoid destroying the original grade or evidence of it. Roof or ground gutters can be put in, if only temporarily. Installing permanent gutters requires a knowledge of the materials and designs of earlier periods. Early stone foundations were often laid

The photo below offers proof of the value of careful pre-restoration inspections. The author discovered this end framework of an eighteenth-century barn being used—its parts reassembled with no regard for original position—as a framework for a tenant house.





Off Key West, Florida, stands Fort Jefferson, built around 1846. The section of masonry shown above is the only remaining original brick work on the structure's exterior. The correct restoration of the original mortar tooling was made possible by the evidence shown in the structural brick arch to the left of the vertical joint and the decorative brick facing to the right.

with a rough exterior face below grade. Water seepage through this face leaches out the mortar, leaving the equivalent of a dry wall. Such a wall can be grouted, or filled with mortar, but only by disturbing the adjacent soil. If excavating and grouting the walls seems necessary remember that the filled-in builder's trench is usually rich in artifacts.

Damage from insect infestation and rot may be discovered during the waterproofing examination. While this damage is unpleasantly familiar, repairing it is easier and safer than eliminating the insects. If it is absolutely necessary to fumigate to get rid of insects, remember that some of the gases used can damage the building's furniture, draperies, books, or wallpaper. An expert on fumigation should be consulted.

#### IDENTIFY ANY CLUES

A deteriorated part of the construction such as a plate, sill, or stud, may be a clue to the location of a former

window or door or a vanished porch or wall. If a deteriorated part must be replaced before the restoration, record it in position by photographs and measured drawings. If possible, remove the piece intact, label it, and store it for reference by the restorationist. Proper identification is imperative, since a piece is useless if it cannot be identified in future years.

In the restoration of a late eighteenth-century building in upper New York State, windows were discovered which had been added soon after the period of historical significance. Tool marks, nails, and hardware made them recognizable even though the design faithfully followed earlier ones. One window was a recent replacement of an earlier window that had rotted out. Because the rotted window was not saved, there was no way of knowing if the recent window replaced an original window or one added later.

Alterations almost always contain reused materials. It is important to



When the National Park Service prepared to restore the Tavern Kitchen in Appomattox Court House, Virginia, the building was found to be almost in ruins. The "mothballing" operation shown below protected the structure with removable materials, and prevented further deterioration until the highly accurate restoration could be completed.



recognize them and save them. At Travellers' Rest in Nashville, Tennessee, an eighteenth-century stair had been removed many years before restoration. Evidence at both floors showed the confines of the stair but little else. When removing a door installed at the time the stair was removed, the workmen tossed aside a reused piece that was serving as a stud, or upright post in the wall. It proved to be a post which reached from floor to ceiling, where the original stair turned in a series of winders. Close study of this one piece indicated the following: the stair riser; nosing detail of the stair tread; number of winders; cross section and height of the stair rail; the design of the boxed stringer; location, size, and swing of the door to a closet under the stair; and the original two-color paint scheme, buff and Prussian blue, of the entrance hall. Because of the evidence contained in this one piece, the stairway was restored with a minimum of conjecture.

Reused materials from alterations

made after the period of historic importance can prove useful, too. For instance, the room in which the Declaration of Independence was signed in Independence Hall was gutted of its original woodwork in 1815 when the building ceased to be the Pennsylvania State House. A new interior was installed at that time in keeping with the style then in vogue. Because of public indignation about the destruction of this historic room, in 1831 the 1816 woodwork was removed and the room converted back to the style of the historic period.

The new room was of correct period design but far from the original. The craftsmen who worked on the 1831 room had, fortunately, reused pieces of wood from the 1816 rooms as backup





material, and the materials thus saved gave the design of the 1816 room. From the multiplicity of detailed evidence still on the walls—vestiges of the 1816 trim and the 1831 trim—later changes could be differentiated from the evidence of the original room.

Secondary buildings on a site should be examined even if they postdate the building to be restored for they too may contain data. At the summer home of General Philip John Schuyler in Saratoga County, New York, there was a tenant house built after the period of historic interest. The house was framed with materials from an earlier structure reused with no regard for the original positions. The reused pieces were set aside when the building was dismantled. When the cuts and original Roman-

numeral code incised on them were matched together, a large part of the framing for General Schuyler's eighteenth-century barn was discovered.

#### RECORD OLD PAINT LAYERS

Old buildings often stand in bad need of paint. Many times the finish is so far gone that what remains must be removed before repainting. There may be some areas that have never been painted or were not painted until recent years. Before adding paint, record all layers of colors and match them against a standard such as the Munsell Color System that can be referred to in future years. Better still, save some pieces of wood with all paint colors remaining on them for the restorationist to study.

During a repainting of General Robert E. Lee's house at Arlington, the shutters were being painted a dark green which conflicted with evidence clearly seen in Civil War photographs. When questioned upon their use of green paint, the maintenance people stated it had always been that way. All old paint had been removed from the shutters, giving little hope of correcting the error until a shutter that required replacement was discovered tossed aside. A flick with a penknife removed a section of paint from the shutter, revealing its early layers—a light gray-brown.

Paint can also be a dating tool. The number of layers on pieces installed at different periods varies. Comparing surfaces of known date can help date questionable areas. For example, the stairway at President Andrew Johnson's house in Greeneville, Tennessee, was known not to be original. But was it erected during the remodeling done in 1869 just before Johnson's return from Washington, or did it date from the major alteration made by Johnson's daughter ten years after his death? Comparing paint from pieces that could be securely assigned to both dates led to the conclusion that the stair was installed in 1869—and it was kept in place.

## CONCLUSION

Restoring an old building is exciting! There is a sense of rediscovery and a

pride of historical accuracy. Both of these can be enhanced, when preparing for the restorationist, by sitting back and considering these questions: How can you protect the structure pending the restoration? How can you be sure that evidence so necessary for an accurate restoration will not be destroyed? Has the structure, as it is, been well recorded by both photography and measured drawings?

Only by careful recording can you remember the materials removed and how they relate to the evidence before you as the restoration proceeds. When in doubt, seek knowledgeable assistance. The fee for an experienced consultant in advance may be the best investment you can make.

For almost twenty years Henry A. Judd has worked with the National Park Service on the intricate problems of historic restoration. In addition to his post as chief of park historic architecture he has served as an independent consultant to a number of historic sites across the country, advising on reconstruction plans, authenticity, and details of proper restoration.

This leaflet draws substantially from the author's article "What to do before the restorationist comes," which appeared in the January, 1972, issue of *Antiques* magazine. We acknowledge with thanks permission from Editor Wendell Garrett to adapt the material for use by historical societies contemplating restoration work.

All photographs were provided through the courtesy of the National Park Service.



## TECHNICAL LEAFLET 67

Technical Leaflets are published by the American Association for State and Local History for the purpose of bringing useful information to persons working in the state and local history movement. The series does not follow the same categories month after month, since the selection of subject matter is based upon varied inquiries received by the As-

sociation's home office. The leaflets, which are detachable from the magazine, are copyrighted © and should be catalogued as part of *HISTORY NEWS*.

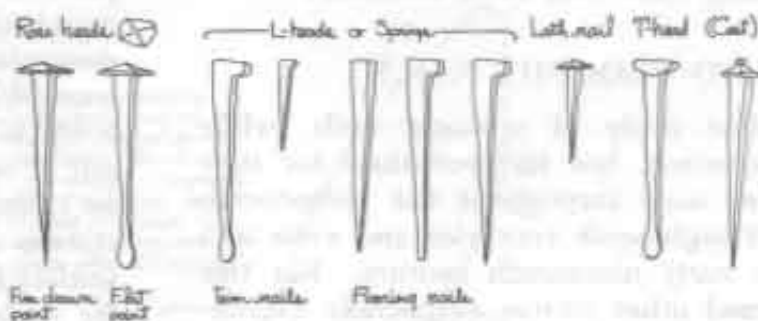
American Association for State and Local History Technical Leaflet 67, *HISTORY NEWS*, Vol. 28, No. 10, October, 1973, *Before Restoration Begins: Keeping Your Historic House Intact*.

AASLH is grateful to the National Endowment for the Arts for financial assistance in the preparation of this leaflet.

Reprints are available for \$.50 each. For information on bulk rates, write to the Association at 1315 Eighth Avenue, South, Nashville, Tennessee 37203.

**technical leaflet**

**HAND WROUGHT NAILS 17<sup>th</sup>, 18<sup>th</sup> and early 19<sup>th</sup> centuries**



# **NAIL CHRONOLOGY** *as an aid to dating old buildings*

By Lee H. Nelson  
National Park Service

The National Park Service in its historic structures restoration program has developed some research techniques in the general field of nail chronology as an aid to dating old buildings. This paper was prepared for a National Park Service Historic Structures Training Conference held in July, 1962. The paper was published, along with a paper on "Paint Color Research and Restoration" by Penelope Hartshorne Batcheler, as Technical Leaflet 15 in the December, 1963, issue of HISTORY NEWS. The Nail Chronology paper has been revised, and put in the new format, and published here in the hope that it will continue to be of use to other restoration projects and that it will stimulate further contributions to these studies. The Paint Color Research paper was revised and reprinted by itself as Technical Leaflet 15.

Dating old buildings from their nails is not a precise technique, but when used with discretion, it has proved generally reliable and useful, for example, in Independence Hall which has been subjected to a complex series of alterations from 1750 to the present time. If a sufficient number of samples are taken from all parts of the building they can be a good indication that (1) the building was built entirely at a given time, or (2) the building has been subjected to additions, alterations, or simple maintenance measures. Nails can help to define the extent of these changes. For this reason we believe it worthwhile to discuss briefly the various nail types that are generally found in American buildings. They are (1) hand-wrought nails, (2) cut nails, and (3) wire nails. Within these major groups there is a surprising variety with subtle differences



in type which enable us to use nails as dating tools with some certainty.<sup>1</sup>

#### HAND-WROUGHT NAILS

The study of wrought nails, while interesting, has its limitations for they were used throughout the seventeenth and eighteenth centuries and even into the early nineteenth century. For this period other factors (especially decorative details, hardware, etc.) are better indicators of "period." However, it is useful to become familiar with wrought nails for purposes of identification and comparison with other nail types.

In medieval England nails were made into a great variety of special shapes and sizes and sold by the hundred, e.g., 8d (pence) per 100 nails. From this practice developed the classification of nail sizes according to their price per hundred, a system which seems to have been established by the fifteenth century. After that time nails slowly became standardized by size rather than price. In 1471 for example, "fippenynayl" were only 4d per 100. In 1477 "xpenynayll" were only 8d per 100; and in 1494 "sixpenynayle" were 5d per 100.<sup>2</sup>

During the entire Colonial period nails were an important commodity for importation. In 1684 for example, James

Claypoole (recently arrived in Philadelphia from London) wrote to a London merchant as follows: "... send no window glass nor lead, but Iron is much wanted, and nayls very much vizt 6d 8d & 10d a Tunn of each sort would quickly sell, I conclude."<sup>3</sup> The scarcity of nails in colonial Virginia was reflected in a statute enacted in 1645 to prohibit settlers from burning down old buildings for their nails.<sup>4</sup> Some nails were made in the colonies in the seventeenth and eighteenth centuries, but despite this local production very large quantities of nails were imported during the same period.<sup>5</sup>

During and after the Revolution, America became more dependent upon local sources for the supply of nails. Perhaps a typical nailery was that operated by John Little in Philadelphia in late 1770s (during the British occupation). His manuscript "Account of Smiths and Nailors Work..." includes a variety of things like kettles, chain, tools, etc., but primarily covers the manufacture of nails in sizes varying from 3d to 30d.<sup>6</sup> John Little had several dozen

<sup>1</sup>*The Pennsylvania Magazine of History and Biography*, Vol. X (1886), 412.

<sup>2</sup>Hening, *Statutes*, Vol. 1, 291. See "Burning Buildings for Nails," *American Notes, Journal of the Society of Architectural Historians*, Vol. IX, No. 3, 23, showing that an early Kent County, Delaware, courthouse was ordered destroyed in 1691 "to gett the nailes."

<sup>3</sup>See also J. Didsbury, "The French Method of Nail-Making," *The Chronicle of the Early American Industries Association, Inc.*, Vol. XII, No. 4 (December, 1959), 47-48. On page 48 is an illustration of a nail-heading tool. This latter subject while interesting, is outside the scope of this brief paper.

<sup>4</sup>Peale-Sellers Papers, American Philosophical Society Archives, Philadelphia. Called to the writer's attention by Willman Spawn, Philadelphia.

<sup>5</sup>This paper does not encompass tacks or screws. Although they are interesting subjects, they are not especially useful in dating old buildings except in a very general way. Machine-cut tacks were perfected at an early date and thus not helpful as a dating tool, nor can they readily be identified as an original and integral part of a building. Machine-pointed screws with constantly tapered threads seem to have been introduced in the 1830s, but they are not a reliable indication of date because of their limited use in building construction.

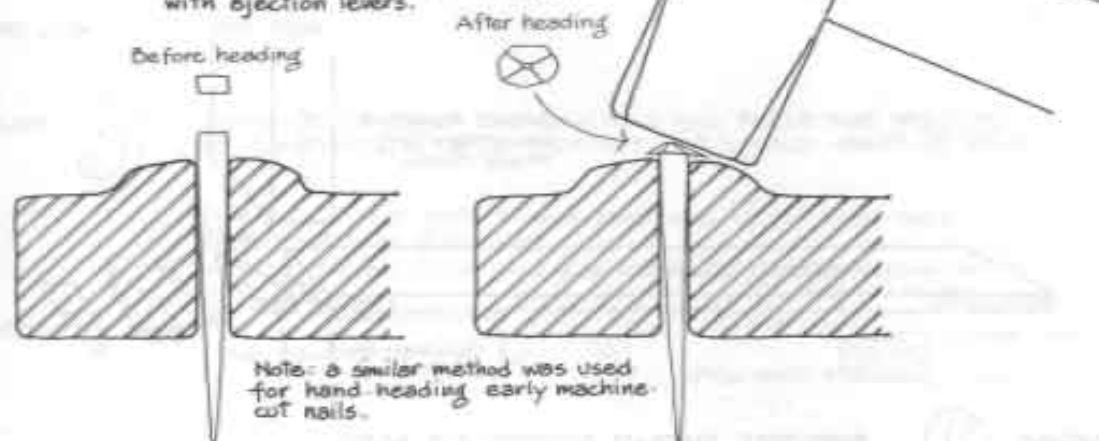
<sup>6</sup>Louis Salzman, *Building in England* (Oxford, 1952), 315.

FIGURE

1

CROSS-SECTION THROUGH  
NAIL HEADING TOOL

Tapered shank allows nail to become wedged in hole of heading tool. Size of nail and hole must be related to allow enough projection to form the head. Top of nail is heated to "work" the metal. Heading tools came in a variety of designs: some were hand-held and rested on "face of anvil" - others were mounted in the handy hole of the anvil - some were equipped with ejection levers.



smiths and nailors working at various times and a typical entry from his accounts reads:

Qty.					Co.		
to the		Weight	Total	Price of			
1778	Six Pound		Number	Making	Amount		
Jan.	10d	58	23	1334 @ 2/6/Pc	100	1	12 15
25	3d			5000 @ 1/9/D*		4	7 6
26	10d	63	14	882 @ 2/6/D*		1	2
28	20		40	1/3/Pc		2	10

It is important to emphasize that wrought nails continued to be used for several decades following the introduction of the cheaper cut nails. In the 1820s Philadelphia newspaper advertisements of "Nails, Brads and Spikes" often included both cut and wrought nails with prices for each in their respective sizes.<sup>1</sup> Wrought nails continued to

be superior for certain purposes, especially where they required clinching or for trim work. For this reason it is not uncommon to find a few hand-wrought nails used well into the nineteenth century. It is interesting that many buildings of this period utilized both wrought and cut nails in their original construction. The Old Town Hall (built 1798-1800) in Wilmington, Delaware, for example utilized hand-headed machine-cut brads for flooring and crude, machine-cut lath nails, but all the finish woodwork was held with wrought nails.

The several characteristics of wrought nails are illustrated in the drawing in the center of this Leaflet. Included is a cast nail which perhaps does not properly belong in this group but is known

<sup>1</sup>See also a nineteenth century English metal trades catalog which includes wrought joiners sprigs, floor stubs, lath

nails, etc. Catalog No. E.121-1896, *Old English Pattern Books of the Metal Trades*, Victoria and Albert Museum, Pub. No. 87 (1913), 32-33.

to have been used in the eighteenth century and well into the nineteenth.\*

### MACHINE-CUT NAILS

In 1923, Dr. Henry C. Mercer's pioneer study on cut nails was included in a published essay entitled *The Dating of Old Houses* (New Hope, Pennsylvania). Others, including the writer,

1830 encompasses a remarkable technological transition from wrought to cut nails. After the Revolution, many cut nail manufactories were established in New England, New York, New Jersey, and Pennsylvania. These were at first operated by hand power and later by water or steam power. America seems

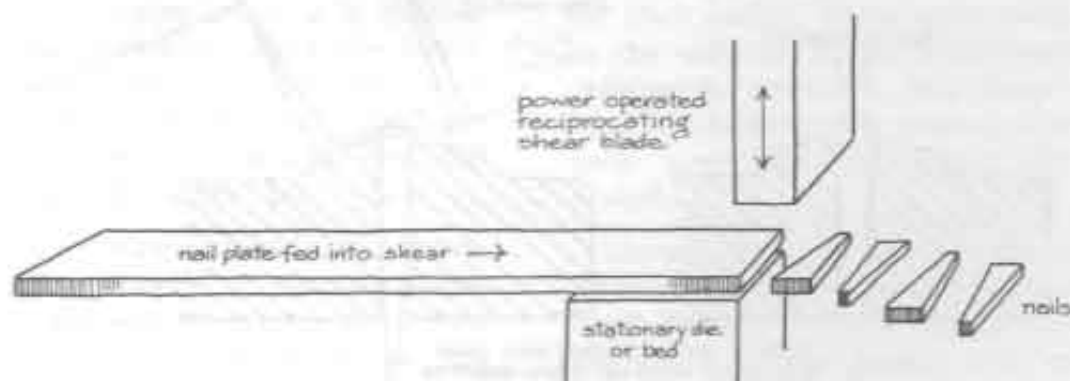


FIGURE 2 SIMPLIFIED DIAGRAM SHOWING THE BASIC PROCESS OF MAKING EARLY CUT NAILS

Nail plate was made in rolling mills, thus cut nails were of uniform thickness, depending on nail size. Thin nail plate (i.e., small nails) was usually hand-held while feeding into shear. Thicker nail plate (i.e., larger nails) offered more resistance to shearing - was usually heated and held with tongs while feeding into shear. To compensate for tapered shank, nail plate had to be alternately wiggled or flipped, see Figures 3 and 4.

After cutting, the nails were headed by: (a) hand, after heating them and using a heading tool, similar to that used for wrought nails, see Figure 1. This was the earliest method, and was used for many years, even after the introduction of (b) machine heading, which gripped the nail instantly (after cutting) and applied great pressure to end of nail, thus forming the head by the displacement of metal.

have only built upon Mercer's early work; however, much research remains to be done in this field.

The study of cut nails is especially useful where late eighteenth and early nineteenth century buildings or alterations are involved. The period 1790-

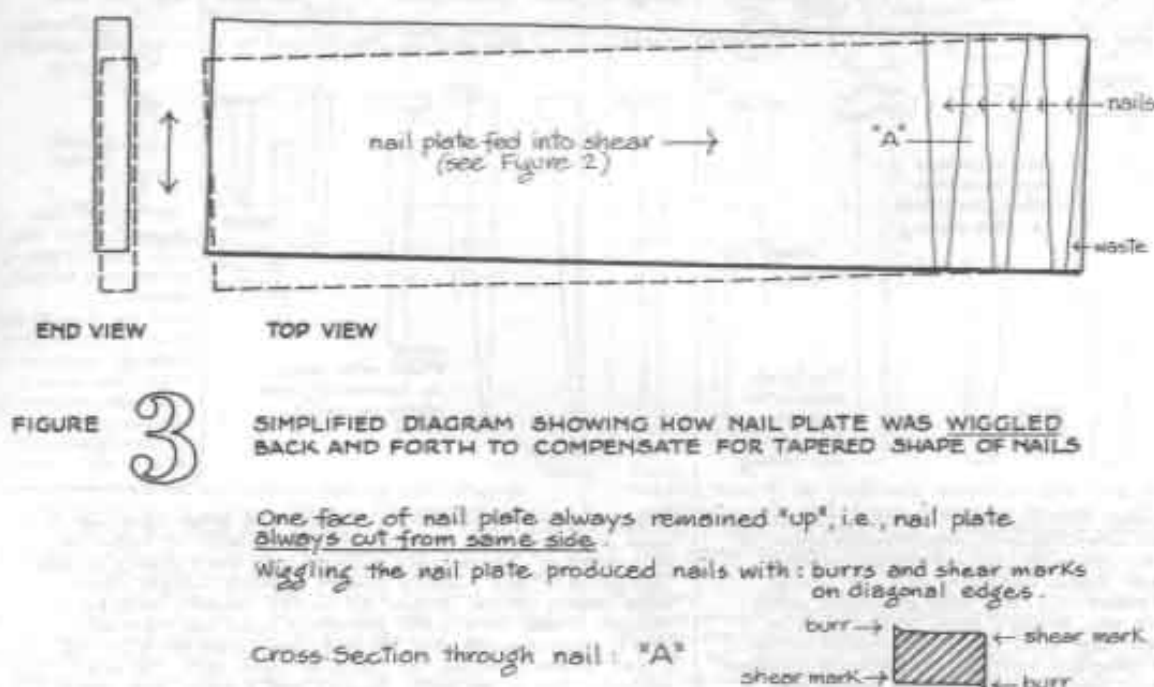
to have been leading the English in this particular field.

Authorship for the initial invention and specific improvement of cut nails remains largely anonymous. Certain individuals are known to have received patents during the 1780s-90s, but the precise nature and significance of their

\*Cast nails are illustrated in a late eighteenth century English hardware catalog, and there is an 1829 reference in Bishop, *A History of American Manufacturers* (Philadelphia, 1864), Vol. II, 341. Several excellent specimens of cast-iron nails were supplied to the writer (in 1967) by J. R.

Stevens, from a recently demolished c.1820 building in Halifax, Nova Scotia. The sketch and observations regarding cast nails, which accompany this paper, were partly based on the samples generously given by Mr. Stevens to the author.





inventions remains rather vague.\*

Unfortunately the Patent Office Record's fire of 1836 destroyed a vast amount of primary source material with respect to the invention of cut nail machines. Some of this information has been collected and appended to the scholarly biography *Jacob Perkins by Greville and Dorothy Bathe*.<sup>18</sup> This book

\*For mention of a sixteenth century "instrument for making of Nails," see Greville and Dorothy Bathe, *Jacob Perkins, His Inventions, His Times, and His Contemporaries* (Philadelphia, 1943), 172, but it seems unlikely that this was in any way related to a cut nail machine.

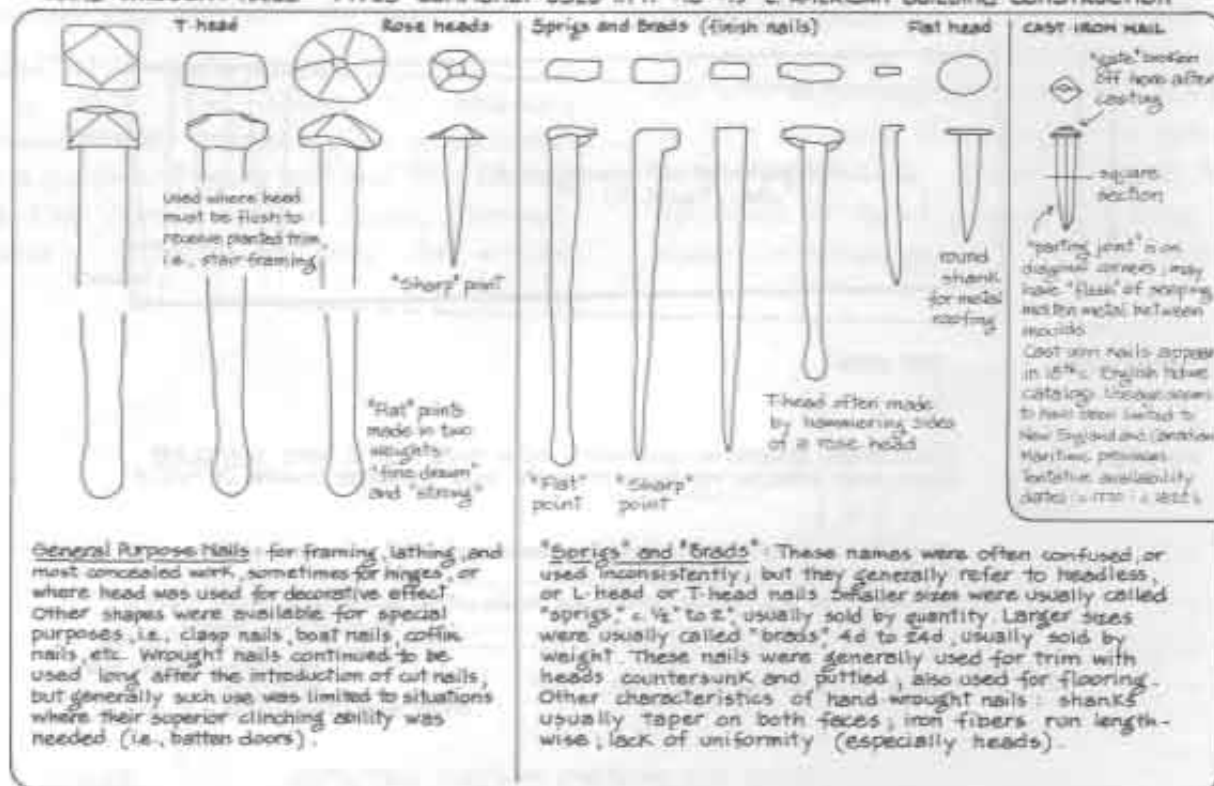
<sup>18</sup>For a more complete listing of inventions and events relating to the evolution of nail-making, see H. R. Bradley Smith, "Chronological Development of Nails," supplement to *Blacksmith's and Farriers' Tools at Shelburne Museum* (Shelburne, Vermont, 1966). See also a general history of nail-making by Arthur S. Tisch, "Modern

provides an excellent background on the development of nail machines and includes a list of 88 patentees between the years 1791-1815. It would appear that the most important contributions were made by Perkins, J. G. Pierson, Jesse Reed, Mark and Richard Reeve.

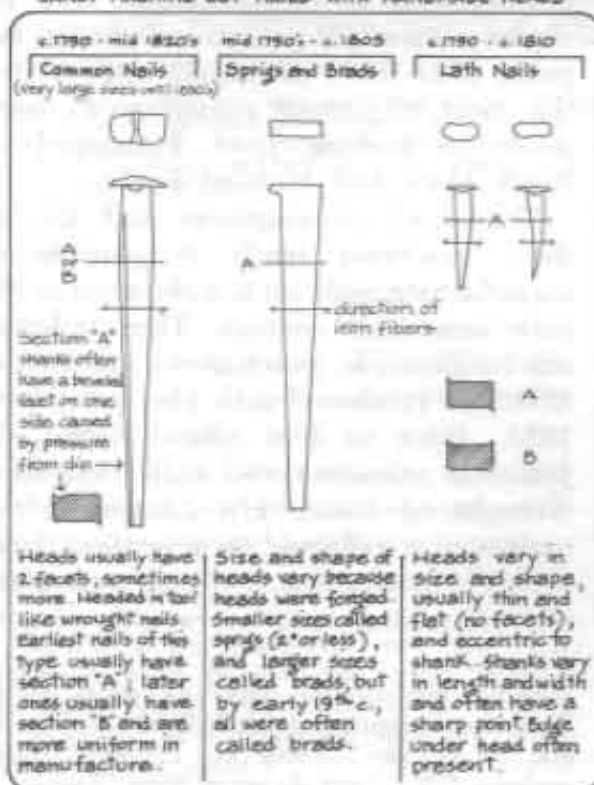
The rapid development and sale of these machines made it possible to manufacture nails on a wide scale in the early nineteenth century. Thomas Jefferson for example, purchased a machine in 1796 and produced nails (for sale) until 1823. Prior to that time (1794-1796) Jefferson manufactured nails that were wrought by hand. His interest in this endeavor is reflected in a letter: "I am myself a nail-maker. . . . my new trade of nail-making is to me in this country

Wood Construction, only as good as its fastening!" reprinted as Bulletin No. 1, by the American Society of Precision Nail-makers, 630 Third Avenue, New York.

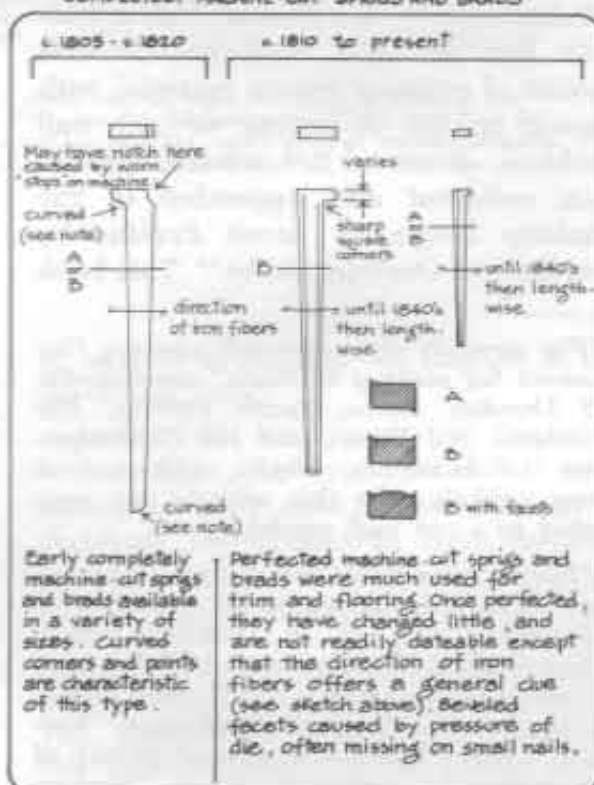
# HAND-WROUGHT NAILS - TYPES COMMONLY USED IN 17<sup>th</sup> 18<sup>th</sup> 19<sup>th</sup> c. AMERICAN BUILDING CONSTRUCTION



## EARLY MACHINE-CUT NAILS WITH HANDMADE HEADS



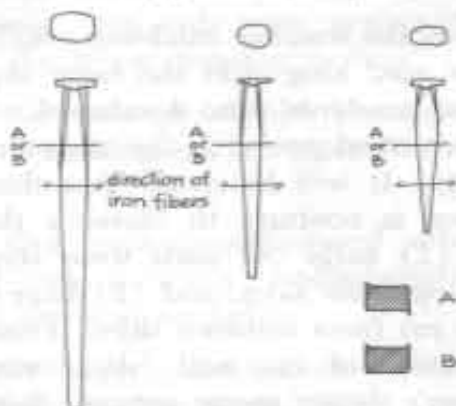
## COMPLETELY MACHINE-CUT SPRIGS AND BRADS



## EARLY MACHINE-HEADED CUT NAILS

1810's to late 1830's

Common Nails - See Strips and Brads for early cut finish nails

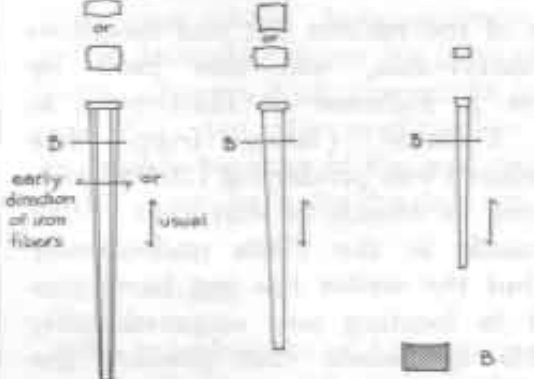


Nails of this period are distinguished by their irregular heads, which vary in size and shape, usually eccentric to shank, though they were more uniform by 1830's. Nails were irregular in length and width, but more uniform at end of period. Nails generally have a rather distinct rounded shank (under head), caused by wide heading clamp. These nails were more readily available than finishing nails, and were often locally modified by hammering the sides of the heads, thus making them into finish nails which could be countersunk. The direction of iron fibers also distinguishes nails of this period from later nails.

## "MODERN" MACHINE CUT NAILS

late 1830's to present

Box or flooring nails Common Nails Finish Nails

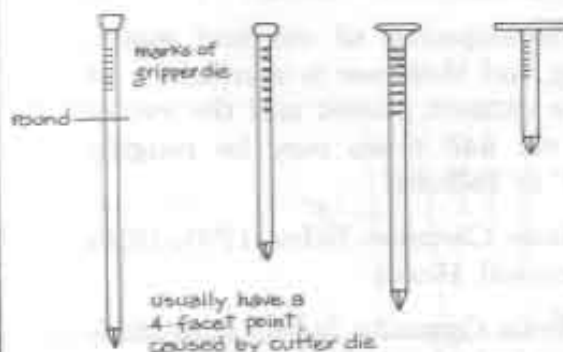


Heads tend to be uniformly convex on each side, and uniform in size and shape, depending on nail style. After c. 1840, cut nails were generally made with the iron fibers running lengthwise (and later were annealed), which made them capable of clinching without rupture, thus almost completely displacing the hand-wrought nail for building construction. There are many "modern" nail styles not illustrated here; but after the 1840's, cut nails are not readily distinguished from those made today, so that other factors, i.e., decorative details, etc., are better indicators for dating purposes.

## MODERN WIRE NAILS

c. 1850's to present

Flooring Brads Finish Nails Common Nails Roofing



These nails are usually manufactured from steel wire, which is held in gripper dies and headed (producing gripper marks on shanks); then wire is advanced and sheared to length with cutter die; and wire stock is then advanced to repeat operation. Earliest wire nails were only available in very small sizes (for picture frames, etc.). Larger sizes were not widely available or used in American building construction until the third quarter of the 19th century. By the late 1850's, they were fast superseding cut nails because of their relative cheapness. Wire nails are not readily dateable, though early examples have bulbous heads that are eccentric to shank. In more recent years, wire nails have been made in a great variety of sizes, head shapes and shank designs (e.g., threaded nails), although cut nails continue to be made for specific purposes.

The sets of nail drawings on these two pages are organized together so that the user will have a visual comparison when he is trying to identify a nail. The cast nail in the right hand corner of the upper drawing on the opposite page may not properly belong in the group but it is known to have been used in the eighteenth century and well into the nineteenth.



what an additional title of nobility or the ensigns of a new order are in Europe.<sup>11</sup>

One of the earliest cut nail machines in Pennsylvania, was one built by William J. Folsome at Harrisburg in 1789. Folsome (lately from New Hampshire) was producing 120,000 nails per week in March of that year.<sup>12</sup> Cut nails made in the 1780s undoubtedly exist, but the writer has not been successful in locating any unquestionably dateable specimens that predate the early 1790s.

In Philadelphia and Trenton, nails were manufactured using prison labor. Jacob Hiltzheimer notes in his diary for 7 March 1797, "went from the State House with John Shoemaker, of the House, and about a dozen members, to the [Walnut Street] gaol, to see the prisoners at work at different trades. We saw six men *cutting nails*, and twelve making heads to them. . . ." [italics supplied]. References to the making, sale, and use of cut nails are numerous after the late 1790s.

The development of cut nail manufacturing and their use is marked by at least five distinct phases and the evolution of cut nail types may be roughly outlined as follows:

1. Cut from Common Sides, 1790s-1820s  
Hammered Heads
2. Cut from Opposite Sides, 1810-1820s  
Hammered Heads
3. Cut from Common Sides, 1815-1830s  
Crude Machine-Made Heads
4. Cut from Opposite Sides, 1820s-1830s  
Crude Machine-Made Heads

<sup>11</sup>Edwin M. Betts, ed., *Thomas Jefferson's Farm Book* (Princeton, 1953), 426.

<sup>12</sup>This and several important related items were brought to the writer's attention by Hannah Benner Roach of Philadelphia.

5. Cut from Opposite Sides, Perfected Machine-Made Heads late 1830s to present

Even the simpler machines continued to be used long after the more sophisticated machines were developed, which creates overlapping in the above chronology. It will be noted that this sequence is contrary to Mercer's theory that (1) early cut nails were sheared from *opposite* sides, and (2) later nails were cut from *common* sides. From an inspection of cut nail "shear marks," Mercer's theory seems correct. Surprisingly enough, nails cut from a common side have "shear marks" on their opposing sides (see Figure 6).<sup>13</sup> It should also be noted that until the 1830s most cut nails are also distinguished by the fact that the iron fibers run crosswise to the shank while later cut nails have a fiber structure parallel to the shank (see drawing). For this reason early cut nails could not be satisfactorily clinched and wrought nails continued to be preferred for clinching.

To use cut nails as a dating tool, several factors must be considered:

1. Identification of the cut nail type must be precise.
2. When did that nail type become available in the area?
3. When was that nail type superseded by a "better" cut nail?
4. Are there similar cut nails in dated houses of the same locale?
5. The existence of several cut nail types in the same building might indicate a transition period of nail improvements, or alterations within the build-

<sup>13</sup>The writer is indebted to Donald Streeter, blacksmith and collector, of Iona, New Jersey, for calling attention to this fact.

ing. Note: Cut nail improvements were first applied to the smaller sizes. For example, lath nails were perfected before the larger framing nails.

6. No attempt should be made to date a building on the basis of a single nail.

7. Cut nails manufactured after c. 1830 are virtually undistinguishable from those made today.

8. Wrought nails were competing with cut nails until at least 1820.

9. Some naileries were contemporaneously offering a more advanced product than others. For example, in 1820 Pierson's nails (New York) were considered superior to those made at the Phoenix Works (Pennsylvania).

10. Urban areas responded to improved products more readily than did rural areas. The foregoing generalizations and dates are tentative and subject to correction and contributions by others interested in the subject.

In general, the study of cut nails has been quite useful in distinguishing alterations within Independence Hall. In the Assembly Room for example, extensive changes took place both in 1816 and 1831, but the evidence is easily discernible because of the vast improvement in cut nails in the interval.

## WIRE NAILS

The introduction and development of wire nails has not been adequately studied. It appears that several manufactories were established in New York during the 1850s, following an earlier development in England, France, and Germany. The first American production of wire nails was from machines either imported or adapted from existing European models.<sup>14</sup> The earliest wire

<sup>14</sup>Clark, *History of Manufactures in the United States* (New York, 1949), Vol. I, 518. See also the transcript of an unidentified magazine article (dated 23 April 1896) by John Hassall, entitled "The Early

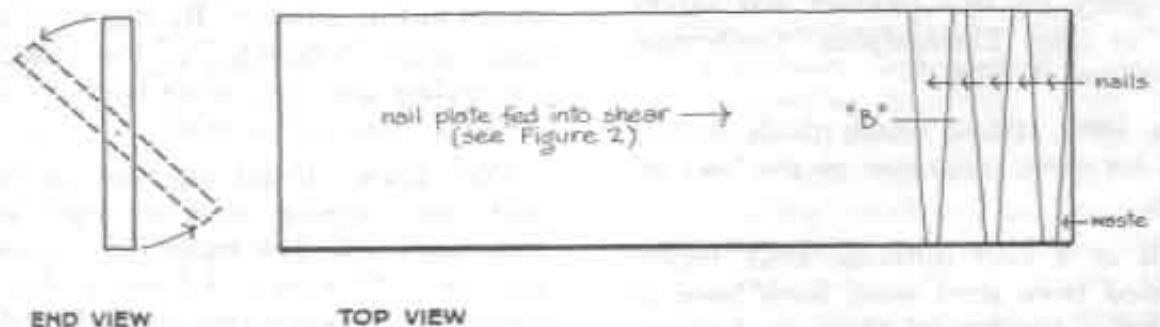


FIGURE 4 SIMPLIFIED DIAGRAM SHOWING HOW NAIL PLATE WAS FLIPPED OVER TO COMPENSATE FOR TAPERED SHAPE OF NAILS

Nail plate was alternately cut from opposite sides.

Flipping the nail plate produced nails with: burrs or shear marks on common edges.

Cross-section through nail: "B"



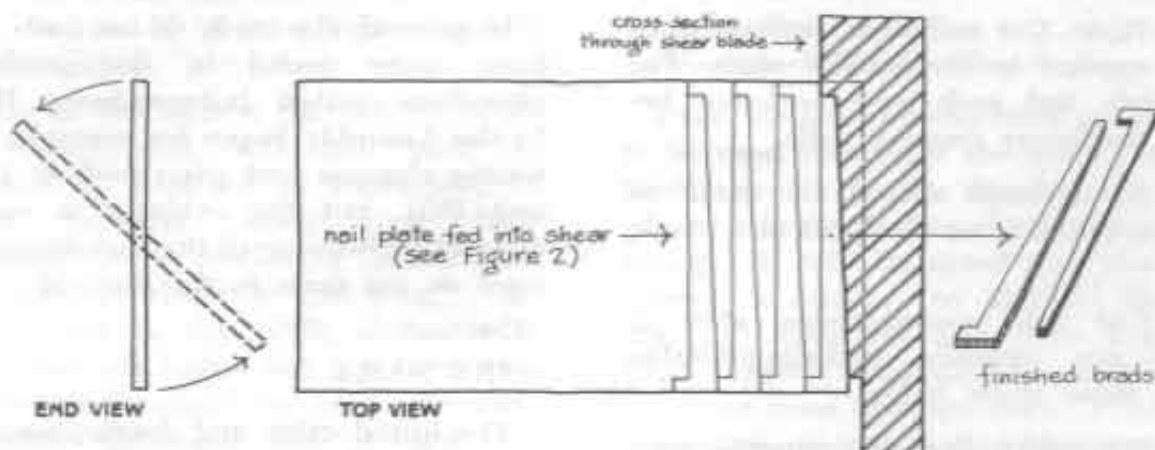


FIGURE 5  
DIAGRAM SHOWING ONE EARLY METHOD  
FOR CUTTING "SPRIGS" AND "BRADS"

Nail plate was flipped over to compensate for tapered shape and to permit nesting pattern.

Nail plate was alternately cut from opposite sides and produced nails with burrs or shear marks on common edges.

Cross-section through nail: "B"



nails were not made for building construction, but rather in the smaller sizes for pocket book frames, cigar boxes, etc. American wire nail machinery was not really perfected until the 1860s and 70s. Machinery for this product was exhibited at the Philadelphia Centennial Exposition of 1876."

An 1888 article which deals mainly with *cut nails*, comments on the "newer" type:

"Nails of a very different kind, manufactured from steel wire, have been in use for a number of years in America and for a longer period in Europe, and in both places they have been very

favorably received and are fast superseding the common cut-nails for many purposes."

Several advantages were claimed and thirteen different varieties were illustrated in this article.<sup>14</sup> By this time wire nails were definitely in the builders' vocabulary and they were made in sizes ranging from 2d to 60d.

Wire nails did not supplant cut nails with the rapidity that wrought nails were replaced. The transition was more gradual. Wire nails did not really become the dominant type until the 1890s, and many builders preferred using cut nails well into the twentieth century. The greater holding power of cut nails was certainly a factor which delayed the quick acceptance of wire nails. In the

History of Wire Nail Manufacture," courtesy the Shelburne Museum and Donald Streeter.

<sup>14</sup>"Official Catalogue of the U.S. International Exhibition (Philadelphia, 1876), "Dept. of Manufactures," 137 and *passim*.

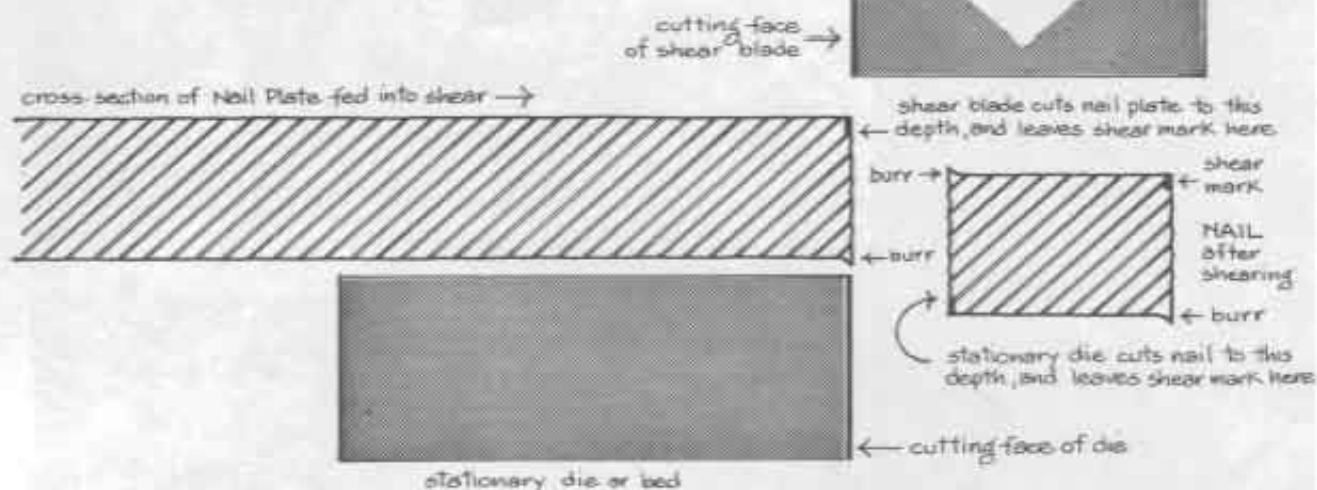
<sup>15</sup>"Builders' Hardware—III, Nails," *The American Architect and Building News*, Vol. XXIV, No. 660 (18 August 1888), 73.



FIGURE

6

## CROSS-SECTION SHOWING BEHAVIOR OF METAL DURING SHEARING OPERATION



The shear blade and die create equal and opposite forces. Simultaneously, the blade starts to cut the top of the nail plate, while the die starts to cut the bottom of the projecting portion (nail). With this action, the metal stretches beyond its elastic limits — the nail breaks off, and leaves shear marks and burrs on diagonal corners of nails.

Lee H. Nelson 15 Aug 68

1880s, a series of experiments on the adhesion of nails was carried out by the Watertown Arsenal, Massachusetts. These tests confirmed this advantage, but the relative cheapness, ease of handling and the variety of specialized wire nails gave them a gradually increasing preference.<sup>17</sup> The earliest wire

<sup>17</sup>See "Adhesion of Nails, Spikes, and Screws in Various Woods, Experiments on the resistance of cut-nails, wire nails (steel), spikes, wood-screws, lag screws," published in the *Report of the Tests of Metals and Other Materials for Industrial Purposes made with the U.S. Testing Machine at Watertown Arsenal, Mass., 1884* (Government Printing Office, Washington, 1886), 448-71. This interesting publication was brought to the writer's attention by Orville

nails can be distinguished from their modern counterparts by their "heads" being bulbous and generally eccentric with respect to the shank. There is not the clearly defined evolution of development that makes the cut nail so useful in dating buildings. As a generalization, the presence of wire nails indicates late nineteenth century repairs, alterations or maintenance, and to that extent they are useful "dating tools." Although wire nails are in common usage today in a multitude of varieties, cut nails continue to be used by some carpenters for specific functions, such as flooring nails, boat nails, and masonry nails.

W. Carroll, restoration architect, National Park Service.



Hand-wrought nails were turned out at forges such as this two-man forge operated by a blacksmith at Old Sturbridge Village, Sturbridge, Massachusetts. Latches, hinges, candlestands, foot scrapers, toasting forks, and a myriad of other objects were made by smiths at these forges of yesteryear. (Photo: Old Sturbridge Village.)

Lee H. Nelson, the author of this Leaflet, is an architect with the Office of Archaeology and Historic Preservation, branch of Restorations, of the National Park Service. He is active in the field of historic architecture and is at the Independence National

Historical Park in Philadelphia, Pennsylvania.

For this part of the revision of the original Technical Leaflet 15, Lee H. Nelson did the whole set of new drawings except the front page drawing by G. Dysert.



#### TECHNICAL LEAFLET 48

Technical Leaflets are published by the American Association for State and Local History for the purpose of bringing useful information to persons working in the state and local history movement. The series does not follow the same categories month after month, since

the selection of subject matter is based upon varied inquiries received by the Association's home office. The leaflets, which are detachable from the magazine, are copyrighted © and should be cataloged as part of HISTORY NEWS.

American Association for State and Local History Technical Leaflet 48, HISTORY NEWS, Volume 24, No. 11, November, 1968, *Nail Chronology As An Aid to Dating Old Buildings*.

Reprints are available for \$.50 each. For information on bulk rates, write to the Association at 1315 Eighth Avenue, South, Nashville, Tennessee 37203.