



American Association for State and Local History

Technical LEAFLET

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

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*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.

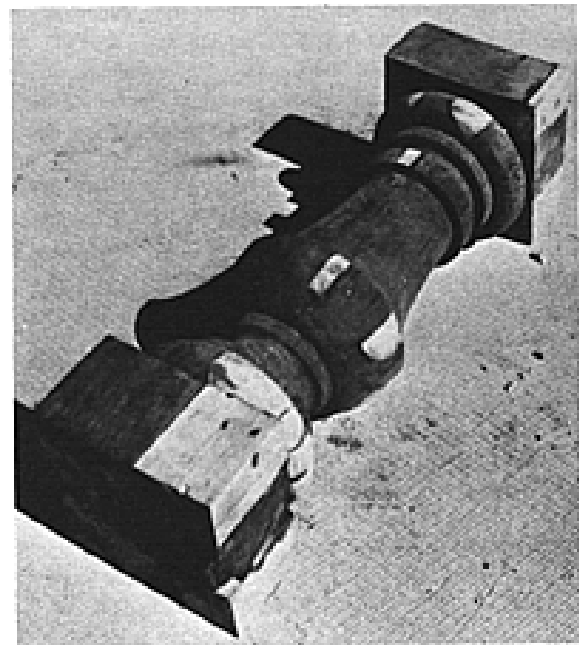
Perhaps the worst aspect of Portland cement mortar used in repairing old masonry is that its strength makes it almost impossible to remove without damaging soft bricks or stones. As for removing old mortar prior to repointing, few people realize the damage usually done in removing even a soft, deteriorated 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.

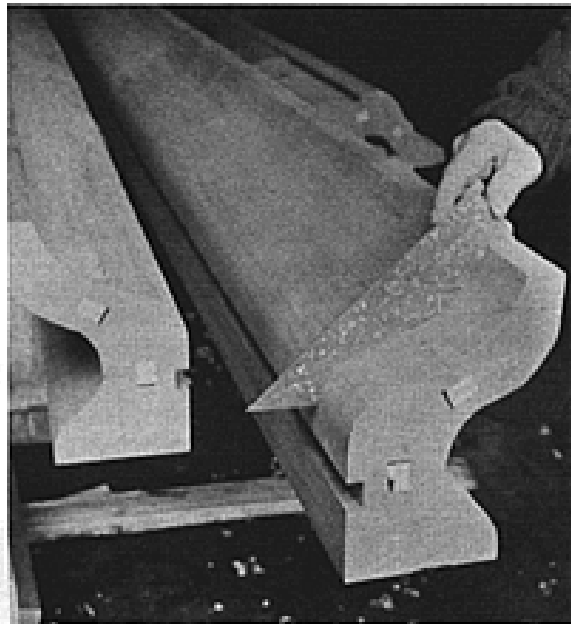
Steel is a modern architectural material which, because of its great strength, can be used to permit an old beam to be reinforced rather than replaced. Very small amounts of steel can form the backbone of an inconspicuous repair that must carry a heavy load.

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.

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