UR 50-YEAR-OLD HOUSE, virtually antiquated by Houston standards, needed repainting. As we biked through the older areas near Rice University, looking for ideas for color combinations, we decided that we would also replace our aluminum screens with ornamental wood screens appropriate to the period during which our house was built.

OUR HOUSE HAS 18 double-hung divided-light windows. We discovered that replacing our aluminum screens with simple ready-made wood screens was going to run well over $700. And these ready-made screens would lack the ornamental design characteristic of the house's historical period. So we decided to build the screens ourselves.

WE KNEW THAT at one time our house sported wood screens because their hardware was still hanging on the outer frames—albeit covered by several coats of paint. The previous owners had "modernized," replacing the wood screens with "no-maintenance" aluminum screens that were very tacky looking. Those screens also routinely lost the fasteners that held them to the sills, so one of our first tasks upon moving in was to secure the screens from the outside—in order to keep our window-sitting cats from plunging out into the bushes!

YET DESPITE OUR PROBLEMS, we were more fortunate than many of our neighbors. Some had installed all-aluminum windows in their old houses, while others simply removed the original wood screens, painted their windows shut, and ran their air conditioners constantly. (Houston reveals a penchant both for excessive energy consumption and for "updating" old houses by such steps as replacing original windows with fixed sheet glass.)

TO FIND MODELS for our ornamental screens, we had to search for houses where owners had preserved the original screens that dated from pre-air-conditioning days. We found many of these screens in conservative "old money" areas near Rice University,
All About Money & Self-Reliance

At the OHJ, we continually get phone calls that run something like this: "I just bought an old house. Now, who will give me the grant to fix it up?"

The answer, of course, is that there is very little public money available for private restoration. And what little there is is shrinking every day.

The new Reagan budget has cut out virtually all federal funding for preservation—including the funding for the state historic preservation offices. Among other things, this federal cutback—if it passes Congress in its current form—puts the entire National Register program in the deep freeze. Only a $5 million appropriation for the National Trust for Historic Preservation escaped the budget-cutter's axe.

Where's the Money Coming From?

The Reagan administration is essentially saying to the preservation community: "If what you're doing is so worthwhile, you should be able to find ways to make it pay for itself!" This is a bold challenge to the private sector.

It's easy to be against Big Government and big spending. It's a lot tougher when the cutbacks affect programs in which we have a personal interest. When citizens ask that government spending be reduced, there's an implied commitment on the part of the citizenry that they are willing to shoulder some of the burden that government formerly carried.

In the Preservation Field, much of that burden comes down to money. A lot of popular programs are disappearing. It's going to take everyone a while to adjust to the new reality.

As a small part of the required adjustment, the Old-House Journal has already begun to look for ways to provide additional funds for preservation groups. In previous issues, we announced our Revenue-Sharing Program. In this issue (page 165C) we're announcing our new Grant Program.

A Habit Of Self-Reliance

The harsh new economic reality of the 1980's won't come as a big shock to most old-house owners. We tend to be a pretty self-reliant bunch. After you discover that the plumber never comes when he promises...and the contractor is always behind schedule...and the job always costs twice as much as you budgeted, you come to realize that the more self-reliant you are, the less you are at the mercy of forces you can't control.

So the cutback on government funding will mean less "free money" in the short run. But it also means fewer restrictions, less bureaucratic red tape...and more opportunity for individual initiative and creativity.

Everywhere around us is evidence that people are beginning to realize the truth of what we've been saying for years: Preservation pays. In fact, we're in some danger of being overrun by the forces we've helped unleash. It sometimes seems that there isn't a factory or loft building left that some developer isn't recycling for co-ops.

So although the new economic realities of the 1980's are going to create new demands on all of us, we at The Old-House Journal welcome the challenge. We happen to believe that the economic and aesthetic reasons for living in old houses...and recycling old buildings...will attract sufficient private capital and imagination. One major challenge is for those of us who know what sensitive rehabilitation is all about to educate the newcomers so that they don't ruin good old buildings in their rush to make money.

Through our Grant Program—which we expect will get even bigger next year—The Old-House Journal will be helping those organizations that are spreading the word about sensitive rehabilitation.

--The OHJ Staff
By Allen Charles Hill

A basic question confronting you, the new owner of an elderly house, is how best to rehabilitate or restore it within the limits of your time and money. An analogy with furniture can be useful: Some pieces of furniture are "old," while others are "antique." These two words, "old" and "antique," denote two opposite ways of regarding and dealing with the same object, and can apply to houses as well as to furniture.

"Old" is pejorative. "Old" is outmoded, rundown, dilapidated, unfashionable, dirty, shabby, and ugly. "Old" is a disease to be cured by repair, modernization, clean-up, paint-up, fix-up, and renewal.

"Antique," on the other hand, carries more positive connotations. "Antique" objects have patina; they are heirlooms, charming, precious, rare, beautiful, unique, and full of character. They are appreciated, cherished, conserved, invested in, and, occasionally, restored.

A curious but significant result of dealing with our chest as though it were merely old is that doing so will severely compromise its chances of ever being seen as an antique: When an object receives new hardware or a new finish—to say nothing of when it is rendered into firewood—its antique value is drastically reduced, and it is frequently left useless as well.

Similar things happen to houses. Few old houses can safely lay claim to being antiques in the same exact sense as a fine old chest of drawers which has been used and cared for lovingly over generations. Most houses have all too often been subjected to the questionable values of modernization: the deliberate destruction of one character in favor of another, more recent one. Yet some buildings have survived almost unmodified or with the modifications made long ago and with great care, and so can justifiably claim to be real antiques.

It's Up To You

PRESSING THIS ANALOGY FURTHER, we can say that a few well-preserved masterpieces (be they silverware, chests of drawers, quilts, carpenters' tools, or houses) are unequivocally antiques. Most other objects of a certain age, however, become either antiques or else merely old depending on how their owners treat them. When viewed one way, a scarred and worn painted chest becomes a candidate for stripping, refinishing, receiving new hardware, and all the other indignities that can be visited upon an object, even in modern contexts, it can be the object of admiring attention at an antique show as an outstanding example of its type; when viewed from yet another perspective, it ends up being knocked into firewood to take the chill off the parlor.
help will be needed to ascertain what the house represents, how it is significant, and how best to deal with it; and all this information will be needed before beginning work. Taking time to think and probe is undoubtedly the most difficult part of working on an old house, because every instinct—to say nothing of a double-digit mortgage—urges getting the job done as fast as possible.

TREATING AN OLD HOUSE LIKE AN ANTIQUE, however, requires more than just waiting until the necessary research is complete before starting rehabilitation: If you are serious about treating it this way, then you should be prepared to consider altering your lifestyle to accommodate the house. This idea should not sound shocking: Removing the partition that separates two principal rooms of an antique house in order to fit your apparent need for larger rooms is no less destructive than cutting off the feet of a Queen Anne chest-on-chest in order to fit it under a low ceiling. In both cases the objects are being treated as though merely "old," rather than as antiques whose forms are intrinsically valuable.

What Should Change

THERE ARE OBVIOUSLY LIMITS to how little change one can make and still have a habitable house. Modern kitchens and bathrooms are essential, for instance, as are measures to reduce fuel consumption. Careful thought can usually lead to good solutions:
incorporating the "moderns" into secondary space or newly built additions, inconspicuous heat-saving means that will not damage the building now or in the future, and so on. If you intend to treat an antique house with respectful regard for its age and what it represents, then you must take care that the very qualities that give it its value are not needlessly damaged or destroyed.

JUST AS OUR ANTIQUE PAINTED CHEST showed its age and wear, so will an antique house. Floors may not be flat, doorways may sag, walls may be out of plumb, plaster may not be smooth, and woodwork may be worn. If the house is thought to be merely old, then all of these characteristics become blemishes that must be corrected. If, on the other hand, the house is treated as an antique, then they are the stuff of which its character is made--its wrinkles, if you will. Rehabilitation should then proceed with a light touch, avoiding the special grotesqueness common to wrinkle-free old ladies and "shiny new" antique houses. A practical consideration is involved as well. Levelling sagging floors and truing out-of-plumb walls may damage finishes and introduce new stresses and instabilities into the house, thereby hastening its deterioration.

What Should Stay The Same

ANTIQUES ARE NOT FOR EVERYONE, any more than antique furniture is. It is irresponsible to risk damaging an eighteenth-century chair by tipping it onto its back legs while sitting in it; if you want Chippendale chairs and insist on tipping them back, then you probably should acquire modern reproductions. They are products of our own time and will not represent as great a loss if damaged. Similarly, if you want a house with eighteenth-century trim plus flat floors, plumb walls, smooth plaster, crisp woodwork, and a floor plan perfectly suited to your way of life, then you would be wise to have a "reproduction" newly built for you.

ANTIQUS TAKE RESPECT AND CARE. They have been around long before you and I appeared on the scene, and if we aren't too hard on them, they will be around long after we've gone. And that's the way it ought to be, it seems to me, with chairs, with painted chests, and with houses.

ALLEN CHARLES HILL, AIA, a licensed architect, specializes in historic preservation. He is a member of numerous professional and preservation organizations and the founder of a firm providing comprehensive professional assistance to individuals and organizations concerned with the "care and feeding" of old buildings:

Allen Charles Hill, AIA
Historic Preservation and Architecture
25 Englewood Road
Winchester, MA 01890
(617) 729-0748
FISHER WAS PARTICULARLY INTERESTED in the way Pepper's wooden gates and palings were finished. They were all "washed with coal tar, which is dead black and makes them look as if made of iron." He considered this "far handsomer than white or any other color," and remarked that it "preserves the wood." Fisher also added that he hoped to treat his own fences in this manner in the spring.

Arthur Channing Downs, Jr. 
Newtown Square, PA

Got Any Tips?

Do you have any hints or short cuts that might help other old-house owners? We'll pay $15 for any short how-to items that are used in this "Restorer's Notebook" column. Send your hints to: Notebook Editor, The Old-House Journal, 69A Seventh Avenue, Brooklyn, N.Y. 11217.

Tarred Gates

SIDNEY GEORGE FISHER'S nineteenth-century diary was reprinted in 1967 as A Philadelphia Perspective (edited by Nicholas Wainwright). In his entry for January 29, 1839, Fisher described a trip he took along "ridge-road" (now Ridge Avenue) in what was then the suburbs of Philadelphia. He noted his admiration for one George Pepper's estate, "Fairy Hill," which was "kept up in beautiful style."

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What caused the cracks? Cracks are the visible evidence that something moved or is still moving. All buildings move, so cracking isn't always a sign of trouble. But until you uncover the culprit that caused the cracks, you don't know how serious the condition is, and you can't proceed with corrective action. Here is a lineup of major offenders:

- Settlement or Foundation Erosion
- Decay of Materials
- "Vandalism" by Renovators
- Structural Failure
- Change in Materials or Geometry
- Moisture and Temperature Changes

Ground settlement is probably most often indicted...but not as often convicted. We often say that parts of a house which have moved from their original position have "settled." However, individual parts of the house moving downward isn't the same as the whole house sinking into the ground.

If the entire house sank into the ground at the same rate after it was built, there was little stress and little or no cracking. In fact, it may be hard to tell that the house even settled. You have a clue that your house has settled if the bottom step of the front stairs has a shorter riser than the rest.

EXACTLY THE OPPOSITE MOVEMENT sometimes occurs. A heavy set of stone steps that has no foundation may settle faster than the main building, causing cracks where the steps join the wall. (These cracks would be open at the top and closed at the bottom.) A similar cracking pattern can develop when the house is added to many years after it was built. The main house will have settled a bit for a few years after its construction. A new addition is built at the same level as the original, settled house. As the addition settles, cracks will develop between the two parts of the structure. These cracks should be decelerating or stationary a year or so later.

Differential settlement happens if the house sits on two different kinds of earth. A dramatic example will illustrate this: Imagine one end of a house built directly on solid rock while the other end floats on swampy mush. The end on the rock will stay in its original position while the other end rapidly looks for the bottom of the swamp. A brick house would literally be torn in two by this kind of differential settlement. A crack in the exterior wall from bottom to top would develop above the point where earth changes from harder to softer.
IN A WOOD FRAME HOUSE, crack evidence isn't as obvious. Wood framing and clapboards tend to bend rather than crack. Nevertheless, you can trace a general pattern of cracks from the foundation to the roof in such a case. (Techniques for discovering cracking patterns were described in Part I, May 1981 OHJ.) Whether the house is brick or wood, these cracks will tend to be wider at the top of the building than at bottom.

**Underground Crimes**

THE FOUNDATIONS AND FOOTINGS (or lack of them) may also be a cause of differential settlement. Until after the first World War, there was very little standardization of materials and methods for building foundations. An older house may have a foundation of brick, wood, stone, concrete, or mud. There are two truths about any traditional foundation: It deteriorates and it can't bridge soft spots in the soil.

In SWAMPY PARTS of the country, wood piles or rafts were often used as the foundation for both wood and masonry houses. As long as the wood foundation stayed completely below water level, it didn't rot. (It is said that there are several stone buildings in New Orleans which are "floating" on cotton bales.) With modern improvements in drainage, unfortunately, the water table often drops below the top of the wood foundation. This causes rapid decay. In such a case, the entire building drops down somewhat unevenly, and is evidenced by cracks appearing almost everywhere.

A FOUNDATION is designed to spread the weight of the walls over a larger area to support the house. It was not designed to act as a beam to bridge over holes which might develop from either heavy water flow or soft spots in the soil.

A HEAVY UNDERGROUND water flow will produce a cracking pattern similar to the failure of a window lintel. Above the point where the support for the foundation has washed away, there will be a stepped pyramid cracking pattern. As the erosion of the soil continues, the pyramid will get larger and larger. Cracking from this cause should be given serious attention.

**Eroded Foundation**

WATER SHOULD BE SUSPECTED in the deterioration of other kinds of foundations too. For instance, the soft lime mortars in older houses can be washed away over the years by water seepage. If the foundation is exposed to running water from an underground spring, this could result in actual collapse of the wall above. But more often, the foundation settles gently as small particles of sand are washed away. There may be no cracking in the foundation wall...but there will be cracks in the plaster walls above.

**Settlement Cracking**

SETTLEMENT CRACKING can also be caused by the nature of the soil underfoot. During construction, a trench is often dug deeper than the bottom of the foundation. Even though the hole is filled later, that soil is not as compacted as the stuff which was undisturbed for centuries. The weight of the foundation compresses the disturbed soil after the house has been built, causing settlement cracks above. Since this type of settlement has usually stopped within five years of construction, it is usually not a problem for the old-house owner.

CLAY SOIL can also cause problems. Many clays expand in size when wet. Since the ground directly under the house is usually much dryer than the earth at the outside walls, the edge of the house will rise in damp weather and fall in dry weather. This movement will cause cyclical cracks which will open and close in different seasons.

ANOTHER SUSPECT: Foundations and footings that are too small for the loads on them. The job of the foundation is to spread the load over a large enough area to prevent localized soil compression. Sometimes the builder made a bad guess on foundation size, and sometimes he just cheated to save money.

EXPANSIVE CLAYS will also cause cracks when a permanent change is made in the water table. Improvements in drainage, or a new well, can lower the underground water level. This dries out the clay soil—causing short-term settlement of the house above.

**Footings**

CHECKING FOUNDATION SIZE may involve pick and shovel work to find out what's belowground. Typically, the bottom of walls and the footings below columns will be six to twelve inches wider than the load-bearing structure above them. However, there is tremendous variation in the footings required on different types of soil. On hard clay, walls have been built without any footings at all without any noticeable settlement in 100 years. But in general, undersized or missing footings below settlement cracks should be considered a prime suspect.
CONCENTRATED loads over inadequate footings can also cause settlement. Such loads are found at the end of a beam supporting several floor joists, and at the bottom of a column. When the beam end rests on a wall, it can cause local settlement below, which results in a pyramidal cracking pattern. Heavy loads on a column may cause it to sink relative to the rest of the house.

FOUNDATIONS CAN BE too shallow. In northern and mountainous parts of the country, the ground freezes several feet below the surface. This will cause the foundation to move unless its bottom is below frozen soil—below the frost line. The effect of frost heaving is uneven settlement of the foundation. Foundations of dry-laid (mortarless) stone may actually take on a wavy appearance over the years. This problem is most common in pre-Victorian and rural houses where the builders were not able to benefit from a local craft tradition.

Case of the Bowed Wall

IN INADEQUATE foundation is also the culprit in the case of the bowed wall. The weight of the wall causes the footing to settle unevenly, which allows the bottom of the wall to tilt outward. If the wall is tied in to the top of the building it will bow outward in the middle. At the corners, vertical tapered cracks will appear which are widest in the middle of the house and closed at top and bottom. (See the illustration on page 159.)

ON THE OTHER HAND, the wall may not be attached at the top. This is the case when the front wall of a townhouse was built after the party walls were constructed. The entire front wall can tilt outward; this results in cracks at the corner of the house which are wide at the top and closed at the bottom.

TO SUM IT UP, the crack detective suspects that settlement is the culprit when the structural parts of the house are basically sound, but the cracking pattern indicates that parts of the house have dropped from their original level.

Decay of Materials

NOTHING LASTS FOREVER, and material decay is another common suspect. Decay may cause both local cracking of finish materials and major failure of structural materials. All old houses are made of wood. Even those referred to as brick and adobe have wood to hold up the roof or floors. The decay of walls, beams, and columns causes loss of strength and/or size which results in minor and major cracking patterns.

ROT FUNGI should be suspected when cracking patterns indicate failure of the wood structure. Look for deep cracks (especially across the grain), musty smells, a dead sound when the wood is tapped, and fuzzy white fungus. Common rot fungi prefer dark areas for initial growth, so plaster or other finish materials may need to be removed to definitely identify it. Suspect wood rot wherever hidden moisture may be present. This includes the top of foundation walls, below bathrooms, in basement and crawlspaces, below built-in gutters, and below roof joints. Keep in mind that the cracking may be a long way from the rot which is causing it. Decay fungi are vicious consumers of wood and creators of cracks—kill on sight.

INSECTS WHICH EAT THE WOOD are another cause of wood decay. In most parts of the U.S., these include termites and carpenter ants; both types of insects cause cracks by eliminating poor quality materials were used in the original construction and where there are many freeze-thaw cycles during the winter. A notorious example is the brownstone of Victorian-era townhouses in the New York area. New York has numerous freeze-thaw cycles during a long win-

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ter...spaces between the blocks of brownstone veneer provide the perfect place for water to collect...and the brownstone (sandstone) was laid up with its natural grain running the wrong way.

THE APPEARANCE of masonry damaged by salt decay and freeze-thaw decay is quite similar. In tracing down the suspect, look to see how the cracks are distributed. The salt decay will be limited to those areas where there is a flow of moisture in the masonry. These areas would include the base of walls, below windows, and around leaky downspouts. Freeze-thaw cracking would be found everywhere a particular material is used.

RUST IS ALSO associated with masonry decay. As iron corrodes it expands in volume, creating pressure where it is embedded in stone or brickwork. In some cases this is easily detected, such as where an iron railing was placed in a hole in a stone step. Shear cracks will radiate from the base of the post toward the edge of the step.

A MORE DIFFICULT situation to detect is where hidden iron fasteners—called cramps—were used to hold masonry work. (I once came of the post toward the edge of the wall had caused the cramps to rust through the stone blocks along every joint. It turned out that the stone facing was attached with iron cramps to a brick bearing wall. The moisture in the wall had caused the cramps to rust and expand, thereby cracking—and spalling—the limestone at nearly every cramp.)

COMING NEXT MONTH...

...more suspects. We'll present a clear description of the structural failures that cause cracks—and two red herrings for the detective to beware. Then, Part IV will be all about what to do when corrections are needed.

Victims or Perpetrators?

SUSPECTS WHO OFTEN commit their crimes undetected are the renovators themselves. With great energy and good intentions, they vandalize the fine old houses they're trying to improve.

THE PLUMBER DID IT! If there are cracks anywhere around a bathroom, immediately suspect the plumber. The average plumber has absolutely no respect for the structure of a house. He will drill down and through...saw notches...and leave beams hanging in mid-air. Brick walls will be bashed out to make the largest possible hole for the smallest pipe. Anything in the way of his pipes will be removed, no matter what the consequences for house or owner.

THE PLUMBER often has accessories to his crimes. The electrician, the heating-duct installer, the mason, and the do-it-yourselfer are all guilty of house vandalism on occasion.

THE EASIEST VANDALISM to detect is where parts of the original structure have been removed. Even seemingly small changes can create large cracks. Notches and holes in beams can seriously weaken them. Holes which are drilled in the center third of the depth of the beam will generally not cause a problem. However, holes or notches near the top or bot-

tom of the beam, or vertical notches, will definitely weaken the structure. Notches and holes at the center of the beam length are worse than ones near the ends. A weakened beam will deflect or fail, creating cracking patterns in the house above. [See "Sagging Floors," January 1981 OHJ, for more about weak joists and beams.]

WALLS, TOO, can be seriously weakened by holes. Studs are often notched so deeply that less than a quarter of their original thickness is left in place. A house can often accommodate the notching of one stud, but when several studs have been notched in a bearing wall, cracks are bound to result.

LIKewise, masonry walls may be damaged by holes. A small hole in a solid brick or stone wall is not likely to have much impact. However, when the hole is located in a relatively thin wall or near an opening, the effect can be much greater. (In one case, a renovator had knocked out a few bricks at the end of an arch to install a four-inch dryer vent. Unfortunately, those few bricks were helping to hold the weight of the wall above, and a good part of the brickwork cracked. For the time being, the wall is still being held in place by the wood window frame, but I peer anxiously each time I walk by.)

THE MORE that's removed, of course, the more likely cracking is to occur. In an effort to "brighten things up," door and window openings are often enlarged. Sometimes these enlargements cause problems because no thought is given to what is going to hold up the wall above. For example, a new window may be placed in a wood-frame house without provision of a header over the window. In other cases, the enlargement means that the wall between openings becomes so small that it can no longer hold up the weight of the house above.

MOVING OR REMOVING WALLS can also create cracking problems. Just because the house doesn't fall down immediately when a wall is removed doesn't mean that the wall wasn't part of the support of the house. When walls that hold up floors (bearing walls) are removed, there will always be deflection of the joists. In addition, removing walls that don't appear to be supporting floor joists can cause cracking. These walls may have served two different functions: stiffening the structure and holding up other walls. The stiffening function reduces "bounce" even when it is not necessary to carry the load of the building and furnishings. Interior walls weigh a lot—a plastered wall weighs about fifteen pounds per square foot. Old houses were frequently designed so that this weight was carried by the non-bearing "partitions, rather than by the floor joists and walls they bear on directly.

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MOVING A BEARING WALL even a few inches should be regarded as a suspicious action if you see new cracking patterns. The house is still structurally sound, but it will deflect a little bit differently than before the wall was moved. Cracking will generally stop after a new breaking-in period.

DISASTROUS THINGS can result from removing apparently unimportant parts of a building. Beam ends may be supported by chimneys and walls in ways that are not immediately obvious. (A church group in Washington, D.C., was removing some "unnecessary" brick flues and didn't notice that the brick was supporting a small beam. That small beam was holding up the end of a large beam, which in turn was supporting a brick wall at the fourth floor level. The entire wing of the house collapsed. They declared that God was testing them.)

SIMILAR CHANGES in deflection can result from just making repairs to the house. Replacing plaster on lath with drywall reduces the weight of the house considerably. This may cause the floors to deflect upwards (!), causing ceiling and wall-finish cracking.

PARTICULARLY SERIOUS—and common form of renovation vandalism involves the removal of the foundation footings. There are many reasons for this move, including wanting to lower the basement floor to put in an apartment, making a basement window into a door, or running a new sewer or water line. Since the footing is only cut off on one side, the weight of the wall begins to tilt the foundation. The results are the same as can be expected with ground settlement: tilted or bowing walls, arch failure, floor and wall settlement.

AN UNEXPECTED CAUSE OF CRACKS can be the strengthening of parts of a house. A stiffer beam or wall may actually carry more weight than before it was strengthened. This may reroute the stresses in the house, resulting in a new cracking pattern.

NEW CRACKS can also appear when more weight is added to part of the house. This weight is sometimes obvious, as when another storey is added to the top. More commonly, the extra weight comes from small improvements. These include putting on a new type of roof, adding a fire escape, or tiling the kitchen floor. A common weight increase comes with the installation of a new bathroom. In addition to the weight of the plumbing fixtures, the eight hundred pounds of water in a full tub is likely to bend the floor joists below.

A MINOR and perhaps unavoidable kind of renovation "vandalism" creates cracked plaster. The vibration of pounding hammers and buzzing saws can break the bond of plaster to the lath quite a distance from the actual construction work. This eventually creates an alligator-hide cracking pattern. But enough on the unforeseen pitfalls of well-meaning renovation...next month we'll get back to the mistakes of the original builders.
Repairing Wood Stairs

Anatomy Of A Newel

By Jonathan Poore & Patricia Poore

The newel connection to the bottom step is a vulnerable joint. Because of its height, the newel acts as a lever when something bumps against the top of it. This weakens the connections of the newel to the bottom step and to the floor.

Newels come in many sizes and styles, but there are really only two main construction types: solid and hollow. The newels shown in the photographs are solid; such a newel can be made from a single piece of wood, or glued up. This type is often turned on a lathe. In most cases the wood joint at the base of the newel is housed, or cut to let in the step. The newel is fastened through its face to the string and/or riser and to the floor. Alternately, it might be bored through the bottom step, as in the stair shown on page 162.

The other major type of construction is the box newel. Built up from several to many pieces of wood, it can be anything from a simple four-sided hollow post, to a grand 19th century newel with recessed panels and moldings. Again, the newel is housed to receive the bottom step. The newel is probably toe-nailed to the step and the floor, but its stability most often comes from a threaded center rod that is tied in to the top of the newel, and then attached to the floor.

The newel may be the most decorative element in the stair; its function, however, is to support the handrail. So you'll find a newel at the bottom and top of open-string stairs, as well as wherever the handrail abruptly changes pitch or direction along the run.

IN A SOLID NEWEL with an easement in the rail just above the newel, the nut is in the rail and the wood-screw threads are in the newel. (The rail is also mortised into the newel on expert jobs.) With a straight rail, as shown in the photos, the rail is just butted and toe-
The string will always strengthen the newel connection; its disadvantage, of course, is the plugged hole left in the face of the newel.

IF A NEWEL is very loose, you might as well remove it to examine the actual connections, rather than taking pot-luck with random nails. First, disconnect the handrail. Pull the newel loose from the floor...it's probably toenailed, but if the newel was loose to begin with, removal should be easy. Take out all the old nails, and start over on the assembly. Don't use glue except on a bored connection into the rail or tread. Drive nails at an angle to the grain; nailing directly into end grain gives a weak connection.

TO TIGHTEN the connection of a box newel to the floor, take off the cap and see if there's a center rod. If there is, tighten the nut to pull the newel against the floor. If the rod is no longer connected to the floor, remove the newel and secure the rod to the floor. If there is no rod, install a threaded rod the height of the newel.
Swell Steps

LEAST SOPHISTICATED in swell-step construction is a newel which is merely bored into the bottom tread. In somewhat better construction, the bottom "pin" of the newel continues through the rib underneath the swell step. In fine custom work, the "pin" is carried through the rib, and also wedged just under the tread. (There's a photo of this connection below.)

IF YOU HAVE ACCESS from under the stairs, you can see if the connection was wedged. When it does eventually loosen up, the wedge can be driven tight again from beneath. Of course, you can always create such a connection if the bottom of the newel is long enough to be mortised out and wedged. If the newel wasn't extended down far enough to be wedged, or if you don't have access from below, you'll have to work from above. Reglue and toe-nail the newel connection into the tread.

HARRY WALDEMAR is our consultant for this series. A retired stairbuilder, he also made the models shown here. (1/2 scale: 6 inches = 1 foot) You'd have to pull your stairs out of the wall and lay them sideways to see details like these! More models will be featured in upcoming Journal articles; they were recently purchased by the New York State Museum in Albany.

A swell step is shown here. The handrail ends in a volute, which corresponds in plan to the step below. Newel is bored, glued, & nailed into volute.

Here is a construction detail of the newel at an intermediate platform of the open-string L-shaped stair above. The bottom of this newel has a "drop" – the decorative part below the string.

The wedge through the bottom of the newel provides maximum stiffness for the newel-to-step connection. Such joinery is found only on custom jobs. Note kerfing in the curved riser.
**Rescuing A Frieze**

ROUND 1916, A LOCAL ARTIST painted a vine with clusters of purple grapes below the moulding in our dining room. The room was painted white in the 1940s and papered in the '50s. Is there any way to remove the paper and paint and find the design?

--Sherry Harmond Columbus, MS

**Working With Asbestos**

WE WILL SOON BEGIN WORK on the thirty-year-old asbestos shingles that compose the most recent layer of siding on our house. Since the OHJ often expresses concern about health and safety hazards, I'd like to know if there is any risk to breaking, sawing, or handling asbestos shingles.

--Dorothy Kern Lafayette, LA

THE BIGGEST HAZARD TO YOUR HEALTH occurs when you saw asbestos. It is a fibrous material; the fibers embed themselves in lung tissue and create a condition that has been linked to lung cancer. It is advisable, therefore, to wear a filter mask when you work on these shingles.

**Repainting Basement Walls**

OUR RECOMMENDATION IS NOT TO USE a sealer at all. Repointing should limit the crumbling you've been experiencing; whatever persists should be minor, unless a more serious underlying problem exists. A clear sealer can trap moisture in your basement walls, and the results could be very bad for the foundation walls. If you must put a finish coating on the walls, then your safest bet is to go with a latex masonry paint, which will allow the passage of water vapor.

--John Q. Adams Roslyn Harbor, NY

POLYURETHANE DISPLAYS UNPREDICTABLE bonding characteristics when applied to a refinished floor, and so we really can't recommend it for use on a previously painted, outdoor surface. You'd do best to apply an exterior deck enamel to it. A compromise you might want to consider, however, is an exterior, mildew-resistant opaque stain. It's not as tough as paint and will require reapplication about once a year, but it isn't a film-forming surface like paint, and therefore will not peel.

MOISTURE FROM THE SOIL shouldn't pose any serious problem for you. If you haven't found any signs of rot so far, then the porch is probably far enough from the ground to be safe. If your porch hides the ground beneath it, then you can lay a 6 mil thick plastic vapor barrier on the ground, just to be on the safe side.

**Finishing A Porch**

CAN YOU HELP ME WITH MY SCREENED PORCH? It has a wooden floor that extends over a downhill slope; at its closest, it is one foot above the ground. I have removed the paint from the porch floor and want to sand and refinish it. I would like to use polyurethane but am worried about moisture coming up from the soil beneath the porch and ruining the job. Also, wind-driven rain may penetrate the screens and lie on the floor. What do you recommend for a finish?

--John Q. Adams Roslyn Harbor, NY

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Do You Have Questions for OHJ?

Send your questions with pictures or drawings, if possible. (We prefer black & white photographs.) We cannot promise to answer all questions personally, although we will try to answer all questions from current subscriber/members. Questions of general interest will be answered in print. Write: Questions Editor, Old-House Journal, 69A Seventh Ave., Brooklyn, NY 11217.

July 1981 163

The Old-House Journal
were framed in a less than systematic fashion. Unfortunately, we underwent the frustration of discovering that a screen that fit snugly in one window was too large for the next window, even though they appeared to be a matched pair. Accurately measuring the windows in advance, as well as labelling the screens, will pay off in the long run and save much last-minute fiddling and adjustment--such as shaving a quarter of an inch off a completed screen and then having to repaint the bare edge with primer and finish coat (for us, a two-day delay in hanging the screen, due to Houston's humid weather).

ONCE THE MEASUREMENTS WERE TAKEN, many screen pieces were cut to length in a mass-produced fashion, and the joints then put in, almost like on an assembly line. After components for several screens had been cut, it was a relatively easy matter to assemble, glue, and clamp the screens. When the clamps were removed from the screens, Olin cut the bottom rail at a slight angle that conformed to the slope of the outer sill, thus ensuring a close fit. I sanded, primed, and painted each screen--a four-day task because only one side could be painted at a time (paint dries slowly in Gulf &

Finding The Patterns

We sketched and photographed the different types of ornamental screens that we found on homes of our house's age. While I worked out the proportions for the design we chose, my husband, Olin Joynton, detailed specifications for lumber and joints. We used 1x2 fir for the screen frame and 1x1 fir for the ornamental crosspieces. From our subsequent experience in mounting the screens, I would suggest using a 1x4 board for the bottom rail of the screen frame.

The frame has lap joints at each corner, and Olin made these with successive passes on his table saw. We examined one screen whose joints were joined with dowels, but rejected that approach because of the tools then available to us. The notches in the crosspieces were also formed by making successive passes on the table saw until the correct width was obtained. (Woodworkers who own dado blades could accomplish the same effect with less effort.) The screens were assembled with Elmer's Water-Resistant Carpenter's Glue, clamped at all the joints, and left to dry overnight. Ideally, a waterproof glue would offer the best results, but we have had no problems with our water-resistant glue in Houston's tropical weather.

I cannot over-emphasize the importance of carefully measuring the window frames before cutting the lumber. Houses as old as ours often have windows that only appear to be the same--but are actually quite different because they

}
The author's husband, Olin Joynton, is shown gluing and clamping the joints in the framework for the screening.

In place, the decorative pattern in the screen latticework echoes the pattern of the muntins in the window behind.

On a set of narrow windows, the screen lattice was changed to reflect a different muntin arrangement in the windows.

Other decorative screen patterns found by the author in Houston neighborhoods were also based on the arrangement of the muntins in the window behind.

Coast weather). Like Olin, I tried to do as much of the work as possible in assembly-line fashion.

SCREENING WAS THEN ATTACHED to the painted frames. Using a staple gun I first tacked one vertical side, then the other, then the top, and last the bottom of the screen. I had primed and painted screen tack strips when I painted the frames, and these were cut to length, placed over the edge of the screen to hide the staples, and then tacked into place with brads. I butted the edges of the tack strips (a more resourceful woodworker would probably mitre the corners).

I ALSO LEARNED that the placement of the tack strips is essential if one is to correctly fit the screen in the window: They should be positioned so that they fit smoothly into the opening, lest they project and not allow the screen to lie flush. We then attached screen hardware (Stanley sells sets for less than one dollar per window) to both the exterior window frames and the screens themselves, so the screens would lift neatly on and off. Finally, we screwed hooks and eyes to the sill and bottom rail, providing a much more secure closure than our old aluminum screens offered.

Our screens are now an improvement over their aluminum predecessors in terms of both function and aesthetics. This restoration is especially pleasing to us because thoughtless, trendy renovation has so damaged the appearance of many of Houston's old homes. Admittedly, a Houston summer is not the most pleasant time for making wood screens, but the benefits of the screens are lasting and the labor is well-rewarded.
FREE ADS FOR SUBSCRIBER/MEMBERS

Classified ads are FREE for current members/subscribers. The ads are subject to editorial selection and space availability. They are limited to one-of-a-kind opportunities involving small-lot sales. Standard commercial products are NOT eligible.

Photos of items for sale are also printed free—space permitting. Just submit a clear black & white photograph along with your ad copy. If you'd like, we'll make corrections and print your ads.

Examples of types of ads eligible for free insertion: 1) Interesting old houses for sale; 2) Architectural salvage & old house parts for sale; 3) Restoration positions wanted and vacant; 4) Hard-to-find items that you are looking for; 5) Trades and swap; 6) Restoration and old house services; 7) Meetings and events.

Free ads are limited to a maximum of 50 words. The only payment is your current OHJ mailing label to verify your membership/subscriber status.

Deadline will be on the 5th, 2 months before the issue. For example, ads for the December issue are due by October 5th.

Write: Emporium Editor, Old-House Journal, 69A Seventh Ave., Brooklyn, NY 11217.

FOR SALE

ARCHITECTURAL TREASURES—from unique to standard re-usable parts. Brass doorknobs, marble mantels, sconces, glass windows, and more. Historic Albany Foundation's Parts Warehouse, 206 N. Pearl St., Albany, NY 12210. (518) 463-0622.

ANTIQUE IRON: Box locks, press lever-locks, rare padlocks, cast iron bake oven doors, peals, (do fireplaces to, small early cast iron key lock safe, etc. Historic Albany Foundation's Parts Warehouse, 206 N. Pearl St., Albany, NY 12210. (518) 463-0622.

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100 POST OFFICE BOXES, approx. 5 ft. long, 4 ft. high, 14 in. deep. Doors are solid brass with twin combination locks and U.S. eagle on faces. 60 of one size (3 1/2 ft by 3 1/2 in.) and 40 of another (5 by 7/8 in.). Minimum offer 6500. Door size 3 1/2 in. thick. J.W. Jones, 3 PO Box 367, Elberton, GA 30605. (404) 283-2526.

HARDWOODS, ANY GRADE. Oak (red or white), aspen, ash, birch, basswood, tamarack. Rough or planed. Moulding also available. Terry Schmitz, 5841 Shurber Rd., Ozro, WI 54963. (414) 685-5707.

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3-STORY 1864 STAIRCASE with walnut newel post, handrail, 148 balusters, and poplar stair paneling. $450. Pr. of large brass 4-arm chandeliers from 1903 Colonial Revival mansion, $500. Pair or $300 each. Poplar mantel with iron crane, $150. 10 gas sconces, $50 for all. Danny Cox, 2625 Wayside Dr., Richmond, VA 23225.

NEWEL POSTS-150 years old, Solid black walnut; beveled glass—about 100 pieces, 14 by 36 in., uniformly shaped. Sold all or part, $15 each. Thomas Cox, 6255 Wayide Dr., Richmond, VA 23225.

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GUIDE FOR DOWNTOWN MERCHANTS—Provides property owners with information concerning storefront design, business signs, window displays, paint selection, plantings, infill construction, and other topics concerning the general improvement of a historic downtown commercial district. Contains architectural renderings and photos that show how low-cost improvements can vastly improve appearance of various buildings. "A Guide for Downtown Improvements" is $3.00. Write to: Dept. of Community Development, 351 W. Second St., Frankfort, KY 40601.

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MEETINGS & EVENTS

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VAN VORST PARK ASSN. of Jersey City, N.J., holds monthly meetings regarding this designated historic district. On the third Tuesday of each month in the Barrow Mansion, 83 Wayne St., 4 blocks front PATH Grove St. Station. Come find out what's happening just across the river. For information: (201) 484-3535.
ARCHITECTURAL CONSERVATORS and Preservation Consultants can informally discuss your present problem or project and assist you in deciding whether to undertake your own projects or to employ a professional. We can conduct research, advise on appropriate repairs, consult with contract architects and construction contractors, or help you select a professional to carry out your work.

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(2) THE GRANT PROGRAM: The OHJ will award an unrestricted $1,000 grant to each of five groups participating in the Revenue-Sharing Plan. Winners of the five grants will be determined by a drawing to be held in December. Winning organizations will be drawn by Henry McCartney, Coordinator of the Neighborhood Conservation Program for the National Trust. Names of the five winners will be published in the February issue of The Old-House Journal.

JUST ABOUT ANY GROUP fostering restoration or preservation is eligible to participate in this Revenue-Sharing and Grant Program: Block association, neighborhood group, historical society, or city or state preservation society.

FOR THE NECESSARY FORMS to make your group eligible for a $1,000 grant and revenue-sharing, call or write:

Sally Goodman
Grant Program Coordinator
The Old-House Journal
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Plaster Resurfacing System

IF YOU HAVE plaster walls that are badly cracked, bumpy, or covered with alligatored paint, you may want to take a look at the Flexi-Wall system. The system is based on a fabric impregnated with gypsum. When applied with its special adhesive (it goes up like wallpaper) the system essentially creates a thin plaster veneer on top of the old wall. And the slight texture in the fabric helps hide irregularities in the surface below.

ONE ATTRACTION of the system is its fire resistance. Unlike vinyl wallcoverings, Flexi-Wall gives off no toxic gases in a fire. It's been approved for use on HUD projects.

FLEXI-WALL comes in rolls 48 in. wide and 90 ft. long. Installed cost for a homeowner would be about 90¢/sq. ft. On a do-it-yourself project, the material cost would be about 60¢/sq. ft. (Cost would be lower on large commercial projects.)

THE FABRIC comes in 45 colors, so it is not necessary to paint. It can be painted if desired -- although paint does change the reflectance of the fabric and may make underlying bumps more noticeable. Some renovators have also used the material as a liner under wallpaper on walls that were too rough to take paper directly.

FLEXI-WALL is sold through major paint distributors. It can also be ordered directly from the manufacturer. For free brochure and ordering information, write: Henry Levy, Flexi-Wall Systems, Dept. OHJ, P.O. Box 88, Liberty, S.C. 29657. Tel. (803) 855-0500.

Penetrating Oil Floor Finish

IN THE MAY ISSUE the editors recommended penetrating oil finishes as the best compromise finish for many old-house floors. Penetrating oil is easy to apply and easy to touch up: You just wipe on more finish in any high-traffic areas where the previous finish is wearing thin. Any wax residue on the floor won't prevent the oil from drying -- the way it will with varnish.

THE MAJOR PROBLEM with penetrating oil floor finishes: Finding them! Many stores don't stock them, preferring instead to tout polyurethane as the answer for every problem.

ONE MAIL-ORDER SOURCE for penetrating oil floor finish is Daly's Wood Finishing Products. Daly's "Floor Fin" sells for $24.95/gal. + shipping and handling. For free brochure and ordering information, write: Jim Daly, Daly's Wood Finishing Products, Dept. OHJ, 1121 N. 36th, Seattle, WA 98103. Tel. (206) 633-4204.

Brass Hardware

THIS SOLID BRASS door lever is one of the new offerings from Renovator's Supply. It's 4-3/8 in. long, with a projection of 2-3/4 in. It comes with 1-3/4-in. spooled roses and spindle. Cost is $36 ppd. for a pair of levers and accompanying roses. For catalog of door hardware, plumbing & lighting fixtures, and other old-fashioned accessories, send $2 to: Renovator's Supply, Dept. OHJ, 71A Northfield Rd., Millers Falls, MA 01349.