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# OUSE

Volume XXII, Number 4



#### Picturesque Masonry......30

BY J. RANDALL COTTON

An illustrated review of ornamental brickwork, stucco, and other exterior masonry finishes that gave many revival houses their flair in the early 20th century.



BY JOSH GARSKOF A glossary of historic brick types and masonry materials to help identify



#### and match what you have.

Mastering Brick Maintenance......38

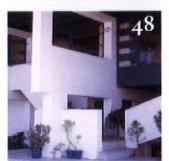
A primer of five techniques for assessing, repointing, replacing, and reworking damaged brick walls.



#### THE SHORT COURSE ON RISING DAMP ..... 43

BY GORDON BOCK

Moisture that wicks its way up the walls of an old house can be hard to stop. Here's a look at the phenomenon of rising damp and the approaches — old and new - to control it.



#### THE CASE FOR CONCRETE HOUSES......48

BY JAMES C. MASSEY AND SHIRLEY MAXWELL

Rediscovered in the 1850s, concrete construction became the building method of the future by 1900, and with it came a unique breed of houses and proponents.



#### GANGING UP ON AN OLD HOUSE ......55

BY ELIZABETH D. SMITH

Ever wonder what it's like to buy and restore an old house with your closest friends? The author and her college pals actually tried it.

ON THE COVER: During the 1920s and '30s, Tudor-style houses were built in abundance around most major cities. Willetta Stellmacher's c.1926 house in Dallas is a quintessential example with its PHOTOGRAPH BY NEAL FARRIS patterned brick nogging, half-timbering, and stucco.



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#### Editor's Page

#### CALLING ALL CONCRETE

ods popped up like mushrooms in the first years of this century and, for a fertile decade or so, ornamental concrete block construction grew the

fastest. Seems like there's one of these buildings in every town — probably the reason they fascinate OHJ readers. Letters arrive here regularly with pictures of examples or questions on their history.

I was answering the last letter with "See the article 'Concrete Block Houses,' in October 1984," when I stopped to think—1984? That's ten years ago and a deep dig even for OHJ collectors. Maybe it's time for another look at the ubiquitous block house. I called up J. Randall Cotton, long-time OHJ contributing editor and author of the then ground-breaking articles.

"Hey Randy, what would you think about updating the concrete block articles?"

"Well, I don't know . . . what more can one say?"

"There's plenty. Who built them and why? Did they make the blocks one at a time, or a big batch a year ahead of starting the house?

"Mmm . . . I have seen some great buildings since then . . ."

"Good. I'll ask the readers to help us."

After comparing our notes, here's what we're looking for:

Examples — We welcome photos of outstanding concrete block construction. Many a Foursquare, Queen Anne, and bungalow, so often built

any original block-making machines? Some were simple, reusable forms; others were contraptions with legs and levers. They appear to be scarce, the victims of WWI scrap drives. The editors would like to get their hands

on one so we can try it out for the pages of OHJ.

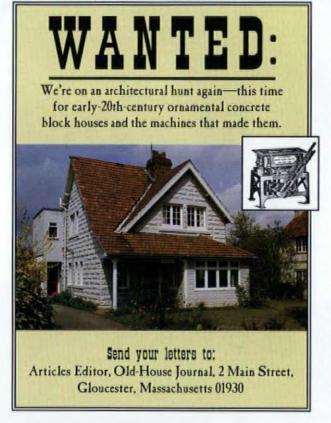
Information - Can you share any manuals or brochures on construction methods? How about oral history in the form of anecdotes or stories? You may not know anyone who actually built a concrete block house, but maybe you know their son or grandniece. How long did it take? How many people? How many blocks could be made in a day (realistically)? We'd like to learn more about block-house building in the 'teens.

Restoration — Have you restored some ornamental concrete blockwork? What kinds of deterioration are common? What fixes work? Are there any ornamental block restoration special-

ists? If we hear of some good resources, we'll include them in the article.

Our deadline is September 1, 1994. Good "blocking" and looking forward to hearing from you.

Cementitiously yours,



in wood, were rendered completely in ornamental concrete, right down to columns and ornament. The material also found its way into garages, outbuildings, or retaining walls, and even fostered its own sort-of style with features like castellated parapets. If we get enough interesting examples we'll collect them in an article.

Equipment - Do you know of

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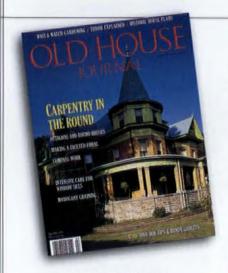
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#### Letters



**Another Octagon** 

Dear OHJ,

I JUST RECEIVED MY COPY OF YOUR March/April issue with the article on octagon and round houses. I thought you might be interested in ours. The house was built in 1914. There are eight dormers on both the second and third floors and a spiral staircase that runs from the front hall to the second floor. To light the second floor hall, every other interior door on the second floor has a glass upper panel. We want our house to be on the National Registry of Historic Places so are trying to restore it with few changes.

— CECILE ALLEN Bridgeport, Wash.



Relocating Cecile Allen's octagon bouse required removing its steeple-like roof tip in order to clear power lines.

#### Sample Stained Glass Resource

WE REALLY ENJOYED YOUR JANUary/February cover story "Caring for Stained Glass." We'd very much like to send your interested readers a free sample copy of our publication, *Professional Stained Glass*. It is the premier publication of the glass arts and crafts industry. Each issue contains photographs and information about stained and art glass from all over the world. For a copy, OHJ readers can write to *Professional Stained Glass*, 28 South State Street, Dept. OHJ, Newtown, PA 18940, or call (215) 860-9947.

— Joe Porcelli Editor and Publisher Professional Stained Glass Richboro, PA

#### More on Fixing Sills

JOHN LEEKE DID A GOOD JOB OF OUTlining window sill repair methods in "Curing Ailing Sills" (March/April 1994). Here are a couple of further thoughts that might help readers:

 On pre-1810 houses, joints may be pegged instead of nailed.

2) One good thing about exterior combination storm windows is that they can protect the original sill from further water damage — often eliminating the need to replace a

questionable sill.

3) Some of the makers of fine reproduction small-pane window units have gone from pine to other woods for their frames. Fifteen years ago when I was working in southern New England I used whitewood when I couldn't get pine in the quality, dimension, and dryness I needed. Except for its greenish cast, it proved a good substitute.

4) Don't be surprised

A new stained glass window by Little/Raidl Studios of San Francisco is detailed in a recent issue of Professional Stained Glass.



if you need something larger than 3" x 4" stock for sills. I use 3" x 4" for stiles and headers and 4" x 5" for sills.

5) It's a very useful practice to lay in (stack for drying) a supply of the types of wood you cannot get from the local lumber yard — mostly clear, large-dimension lumber.

6) Wood dries much faster — and without any sticker marks — if stacked vertically. This is particularly true of longer pieces — the weight of the water itself helps dry the board.

7) When I'm stuck with only green wood here in a New England winter, I cut the piece roughly to size and bring it inside. Since most heated houses have a relative humidity equal to the Sahara desert, green wood generally dries quickly.

8) When I'm dealing with rot problems, I'm usually very generous with wood preservative. I like preservatives that have an oil base since the lighter liquids seem to soak further into the wood.

— Leslie T. Fossel

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#### Letters

#### **Exotic Examples**

The architectural style articles by James Massey and Shirley Maxwell are always a favorite with OHJ readers, but "Exotic Revivals from the Middle East" (January/February 1994) seems to have struck a special chord. We received more than the usual amount of mail from readers, who cited Egyptian and Moorish Revivals from coast to coast. Middle Eastern exotics are not common, especially as residences, but there are scattered examples, often in places you'd least expect.

THE EDITORS

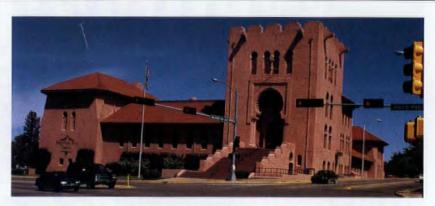
#### Egyptian in Little Rock

SHIRLEY MAXWELL AND JAMES C. Massey write that they know of "just one surviving Egyptian Revival house in the whole country"—the Dubuque, Iowa, jailhouse. Well, there is another one. It is in Little Rock, Arkansas, built in 1904 by Col. John Fordyce, whose family built the Cottonbelt Railroad. The architect was Charles Thompson, Little Rock's foremost 19th- and early-20th-century architect.

The Fordyce house is essentially American Foursquare in floorplan, but has battered outside walls, window, and door frames; cavetto



The Fordyce House in Little Rock has the battered walls and decorative details of the Egyptian Revival.



Rumor has it that an endowment mandates maintaining the pink stucco on this Exotic Spanish Revival building in Santa Fe.

moulding on door and window entablatures; and papyrus columns with lotus capitals on the front porch. An original architectural rendering shows winged orbs on the upper frames of the front porch and the second-storey windows. The early photographs show it without this ornamentation though, so the early owners were probably not bold enough to have the original plan carried out.

— PAMELA D. WALKER
Little Rock, Ark.

#### Spanish Temple

I WAS HAPPY TO SEE MASSEY AND Maxwell include a few non-residential buildings. We've got one here in Santa Fe that raises eyebrows. Designed by Hunt and Burns, the Scottish Rite Masonic Temple (1912) is reportedly based on the Spanish Alhambra. As Santa Fe served as the capitol of "New Spain," the fathers of this fraternal organization chose the Alhambra as a model for their meeting hall. The building occupies a prominent corner just a few blocks north of the city plaza, in the midst of predominantly Spanish Pueblo Revival and Territorial Revival style streetscapes.

MARY GRZESKOWIAK
 Planning Division
City of Santa Fe, New Mex.

#### Chinese Village

WE HAVE A CHINESE HOUSE HERE in Coral Gables. In the 1920s several theme villages were created — French, Dutch South African, Italian, Colonial, and Chinese. There are eight



The Werner's Chinese Exotic Revival is one of eight in a theme village in Florida.

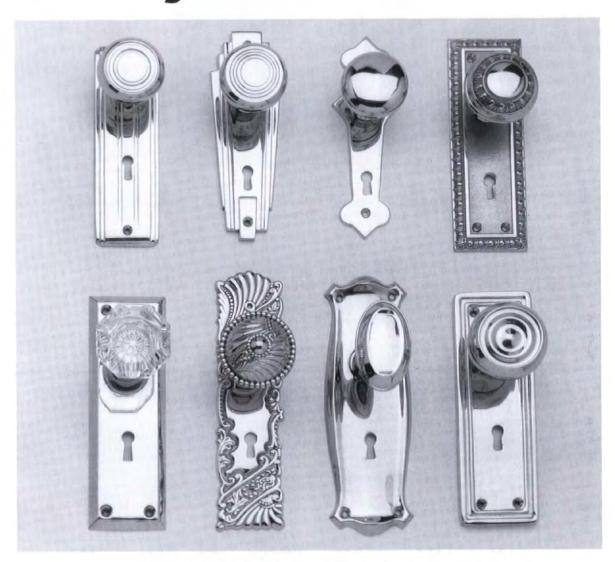
Chinese houses on our block, all fairly similar. We are curious whether other Chinese houses exist across North America and hope other readers will send information and photos of Chinese/Asian homes they know of.

— Michael & Marcy Werner Coral Gables, Fla.

#### Midwestern Mediterranean

WE ARE INVOLVED IN A RESTORATION program for the Villa Katherine. Built atop a bluff in Quincy, Illinois, by world-traveler George Metz in 1900, it was modeled after a villa in north-

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#### Letters

ern Algeria. He and his 200pound Mastiff named Bingo were its sole inhabitants. The outside of the building is highlighted by a replica of the famous Mosque of Thais at the top of the main tower. Indoor details include a courtyard surrounded by a gallery that encircles a reflecting pool.

- Nona Long Quincy, Ill.

#### More Exotic Reading

LIKE DAN AND NANCY MATtausch ("Letters," March/April 1994), I too have a fondness for Egyptianesque architecture, decorative arts, and interiors. May I mention two additional very informative exhibition catalogs which might still be available from



The Villa Katherine, in Quincy, Illinois, was designed with Algerian schemes.

the sponsoring institutions: "The Sphinx and the Lotus: The Egyptian Movement in American Decorative Arts 1865-1935" (The Hudson River Museum, Yonkers, NY, 1990) and "Egypt, The Source and the Legacy

 Ancient Egyptian and Egyptian Revival Objects" (Sarah Lawrence College Art Gallery, Bronxville, NY, 1990).

- ED POLK DOUGLAS Lyons, N.Y.

Correction: Because of an editorial error, "Wall Liners" (January/February 1994 OHJ) mistakenly mentioned a true canvas wall lining product that is no longer made. Wall-Tex is out of business ..

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THE EDITORS

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#### Outside the Old House

#### RECREATING A BRICK WALK

by Jo-Ellen Matusik

here in Saratoga Springs, New York. I was fortunate to discover the remnants of one of these herringbone-pattern paths leading to the rear porch of my 1887 Queen Anne home. Since I was busy with interior renovation work, masons Louis LaCross and Mike Suprenant helped me recreate my indigenous walk using traditional tools and techniques and a little modern masonry.

Obviously, to start such a project you need to obtain enough brick. I began by recovering the dirt- and weed-covered brick from the sagging walk, discarding anything damaged and unusable. Additional brick came from a homeowner across town who was replacing his brick sidewalk with concrete. However, if this had not been the case, I could have found old brick in salvage yards, which often have piles to sort through. Select old brick for walks carefully. To be certain your



As it is pulled along the forms, the 6"screed board levels the earth, which is now ready for a layer of stone dust.



The time-worn, old brick of the herringbone pattern walk looks as if it was laid a century ago. However, the new path is slightly wider than the original.

walk withstands the ravages of time and weather, use paving brick, which is fired in the high-temperature zone of the kiln. Brick fired in the lower zones, often called "salmon brick" due to the characteristic pinkish-orange color, is low-strength, porous brick and will chip and crumble over time. Also, paving brick is slightly smaller and heavier. Select ones with sharply defined corners and free of old mortar.

The next step is to plan the size of the walk. I decided my new walk should be the width of the back porch steps (4-½') rather than the original width (2-½'). To determine the number of bricks needed, I multiplied the planned walk's total square footage by 5 (the approximate number of brick per

sq. ft.). To this I added 110 brick for the running bond border, allowing extra for breakage. After marking the boundaries of the planned walk with stakes and mason's line, we set the pitch of the walk for good drainage (at least 1/4" per foot). The masons used a bricklayer's level to set the 2x4 side forms; a board nailed across the bottom of my porch steps served as a stop for the first row of brick.

Now the work begins. Excavate the soil 6" deep to accommodate a 4" layer of stone dust (available at masonry or landscaping supply yards) with 2" of brick laid on top. After roughly leveling the soil with a concrete rake, complete the job with a 6"-deep screed board made of two boards nailed to the top of a 2" x 6" board as wide as the walk. Rest the screed board on the framing and carefully pull it towards you to level the walk to 6". Shovel on 4" of stone dust and level the walk again with a second 2"-deep screed board. The stone dust is



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#### Outside the Old House



tamped down with the flat top of the concrete rake and wet with a fine spray of water to harden it. Continue to tamp and wet the walk un-

til it has completely hardened.

Next, set the running bond border. If the border is to sit slightly above the walk, nail a %" board on top of the 2x4 forms as a guide. I made a concession to modern masonry by setting the running bond brick in cement mortar to hold them in place. After the framing was taken away, the border was backed with more mortar. Now, covered with earth, the mortar

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1166 Spring St., Box 7001, Dept. OHJ Wyomissing, PA 19610 (215) 374-4011 Handmade paving brick Before starting the herringbone pattern, the last brick of the running bond border is tapped into place. Underneath the brick is a 4" layer of bardened stone dust.

doesn't show, and the brick won't shift or tilt over the years.

To set a gauge for the border, run a single brick along both edges of the walk, leaving a slightly lower impression for the concrete bed joint. Choose the squarest brick with the best colors for the border. Then place a bed joint of wet mortar "mud" in the groove, set the brick, and tap it into place with a rubber mallet, making sure the brick is level with the board guide. After the running bond border is completed, use the concrete rake again to level off the stone dust.

O NCE THE BORDER IS SET, START the herringbone pattern. Choose the best brick (most uniform, square, good color) and tap it into place with a rubber mallet or the handle of a mason's trowel. After the first course is in, make sure it is as square as possible and continue to tap the sides of each brick to keep the pattern tight.

Because the sizes of old brick vary so much (even from one end of a brick to the other), it's important to choose brick that fit as tightly as possible to keep the herringbone pattern. There will still be gaps between the old brick that wouldn't be there with new ones, but that adds to the charm of the walk. When nearing the end of the pattern, carefully choose the last five or so bricks so that the pattern comes out even, with a full brick at each side.

To complete the herringbone pattern, use old corner pieces (if available) or, as my masons did, cut good corners off brick that are otherwise broken. To cut the brick, first score a line with a brick hammer. Then hold the edge of the brickset (a broadbladed chisel) firmly on the line (bevel facing away from the part to be used) and strike it sharply with a hammer.

After the corners are placed, shovel fine masonry sand on top of the walk and sweep it into the cracks. Then spray the walk with a mist of water to pack the sand tighter and clean off any surplus. Repeat these steps until the sand is flush with the brick sur-



The masons have completed the herringbone pattern halfway. Note the missing corners. We used a combination of old corners from the original walk and new ones from damaged brick to finish the job.

face. Remove the wooden forms and back the running bond with mortar. The last step is to level the earth to the walk, concealing the concrete backing.

Now, the muted tones of aged brick wait to welcome visitors to my home. With this first phase of my rear landscape complete, my eyes stray to the nearby dirt patch — the perfect location for a Victorian-style flower and herb garden.



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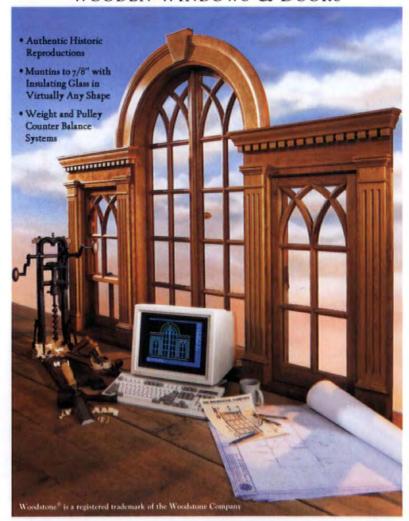
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#### Reading the Old House

#### PATENT DATES As Clues, Not Conclusions

by James C. Massey and Shirley Maxwell

TE SUSPECT OUR HOME dates from the 1860s because the door hardware is "Pat. Pend. 1863." We uncovered the decorative window cutouts two summers ago, and the side porch may have had gingerbread like the front porch because you can see ghosts. Any insights?

— FAYE WITHROW Brockport, New York

IS IT POSSIBLE OUR HOUSE WAS BUILT in 1858? All records I can find point to that year, but drawer pulls on the kitchen cupboard are labeled 1872, and the basement is not the exact shape of the house.

Parma, Mich.

THE WITHROW'S T-SHAPED HOUSE with transverse (or crosswise) gables has a modest Italianate flair that fits nicely with the assumed construction date — if the hardware is original to the house.

If careful investigation reveals no evidence of changed locations, altered size of components, or extra fastener holes, it probably is original.



The Withrow's house, with its Italianate-style moulded window lintels with cutouts, is typical of comfortable middle-class homes of the mid-19th century.

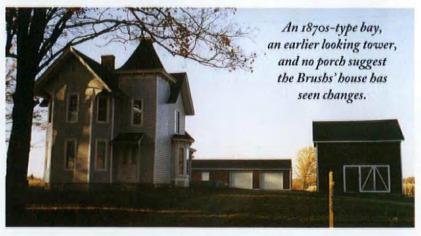
The patent date then means the house couldn't have been built before 1863. However, it's also possible that the hardware may have remained in production for an extended period of time after that date — perhaps as much as 10, 20, even 40 years. Still, most goods of this type were pushed off the market by newer designs, al-

most always within a generation.

Of course, a thrifty homebuilder could have held on to slighty declassé, but perfectly usable, goods before installing them in a new house. Or, what if the owner didn't get around to putting locks on his doors for ten years after he built the house? Scenarios of this kind can get silly, but they do remind us that physical clues such as hardware and construction techniques should be backed up by documents or other evidence.

Friendly "ghosts" — shadowy outlines of missing parts — are clues of another kind. Ghosts are sometimes obvious; other times they are found only by scraping paint or noting the patterns of nail or screw holes that once held missing features. Fortunately, here the front porch millwork survives to establish the character, if not the exact design, of that on the side porch.

[Continued on page 22]



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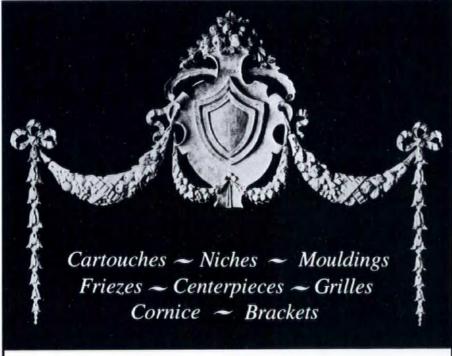
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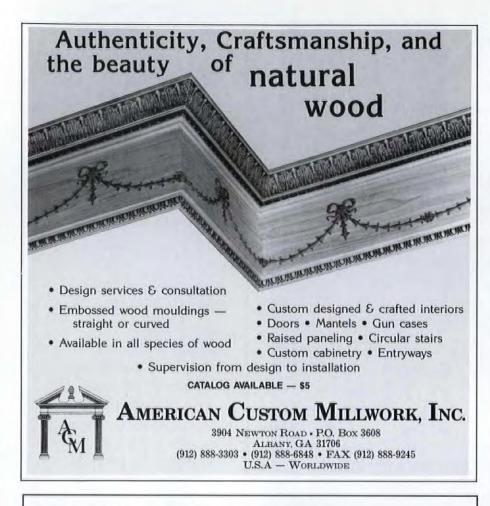
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#### Reading the Old House

[Continued from page 20]

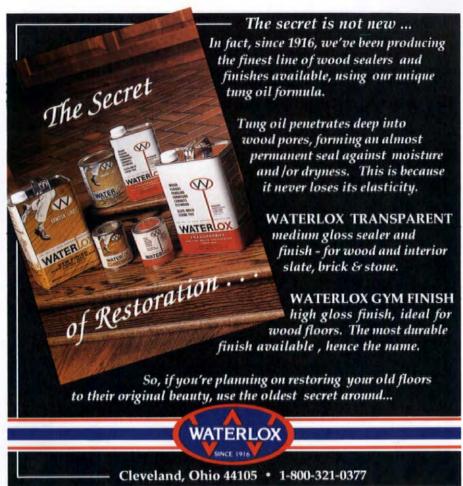
The narrow wood siding looks good. While the barn red is a bit bright, it does acknowledge the late-19th-century penchant for deep, rich house colors. However, the pale, greyblue shutters would probably have been painted a darker color, perhaps black or dark green. Scraping paint in protected areas might reveal original colors of both. White woodwork has certainly been very common over the last 100 years or so, particularly as the Colonial Revival gained ascendancy, but the 1860s-1870s color might have been quite different.

As for the Brushs' house, it seems unlikely that it would have been built in 1858, at least as it presently appears. Whereas the front bay looks more like the 1870s, the square entrance tower is very typical of the Italian villa period — say, the 1850s — yet still manages to look suspiciously like an addition because it is flush with the side wall of the house. The 1872 patent date on the pantry drawer pulls suggests at least a remodeling around that time, although the hardware could have been added later.

The deep eaves of the front bay could have held Italianate brackets, but they look more amenable to Eastlake knee braces. It also seems likely that the house once had at least an entry porch and possibly a large veranda, both normal features of this type of house. Incidentally, the pale blue body color of the house seems out of character. A light, stony gray or earthy brown might have been used in the 1850s or 1860s, and dark, rather muddy colors were prevalent after the Civil War.

So the mystery remains. Very careful physical examination by an expert to look for variations in construction techniques, trim, joints, and foundation details might be the only way to solve the various enigmas.







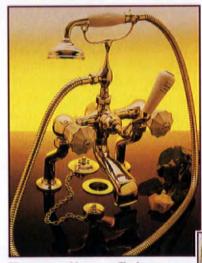


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### Restorer's

N O T E B O O K

#### Dreaming of Dropcloths

A pile of dropcloths and furniture dust covers can be quite a puzzle when you are searching for a specific size. When I buy these items



Carefully calibrated cloths simplify selection.

(often at yard and rummage sales) I measure them as soon as I get them home. Then I take a permanent marker and label the

size of each one prominently in many locations, especially both sides and one edge. When stacked, each cloth then shows the various sizes, and I can quickly pick and choose.

— RAY RONDEAU Manchester, N.H.

I masking materials in the empty corrugated boxes I bring home from the grocery. After peeling apart the glue lap or cutting one corner, they can be folded flat to catch paint drips or wallpaper paste. Of course, the machine-made edges fit close to walls and straight surfaces, but simply folding one flap will surround a porch post, or it can be cut to fit odd-shaped obstructions. They're

heavy enough to stay

put without tape or

weights, and folded with

gooey sides together,

Flatten cartons into dropcloths by parting at their seams (top); fold messy-sides-in to store (bottom). they're easy to store. Or, you can remake them into a box to cart off debris when the job is done.

— ROBIN ARTHUR PARKER

Norwood, Mass.

#### Floored by TSP

I F YOU HAVEN'T DISCOVERED THE FACT already, TSP (trisodium phosphate)

is a mild paint stripper. My favorite use is prepping old, wood floors for varnishing. Whether they were finished once long ago or were always bare wood, the ones I encounter are always loaded with years of dirt, paint drips, and overpainting at baseboards. Rather than resort to sanding (which removes wood and aging from an otherwise good floor), I give

these floors a good, stiff bath with a TSP solution.

Simply mix a strong batch of TSP and hot water, then go over the floor, foot-by-foot, flooding it with the solution and scrubbing

with medium steel wool
(bronze wool, sold
at boatyards, is
even better because it
won't rust). The TSP is
a great dirt lifter, but it
also softens the paint so
it comes up with the steel wool
little coaxing with a scraper.

In with the wool scrubbing,
so also below declare assurance.

or a little coaxing with a scraper. (Along with the wool scrubbing, the TSP also helps degloss any previous varnish.) After mopping up the slop, return to bad spots or move right on to a thorough rinse with clear water and plenty of mopping.

— BOB AURIC Gold Hill, Colo.

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M turn-of-the-century adobeand-stucco house. Unfortunately, our otherwise unique and very attractive kitchen countertop had one bad spot. What to do short of replacing the entire counter? We found a ½"-thick piece of marble big enough to be a useful work surface. Then we routed out



A marble slab will conceal a countertop blemish and can be used for pastry work.

the bad section of the laminate-andplywood counter ¼" deep to just over the dimensions of the 14" square marble. After setting the stone in place with tile caulk (grout would work too) we had a custom, marble candymaking/cutting slab in our rescued counter.

— WENLOCK FREE Provo, Utah

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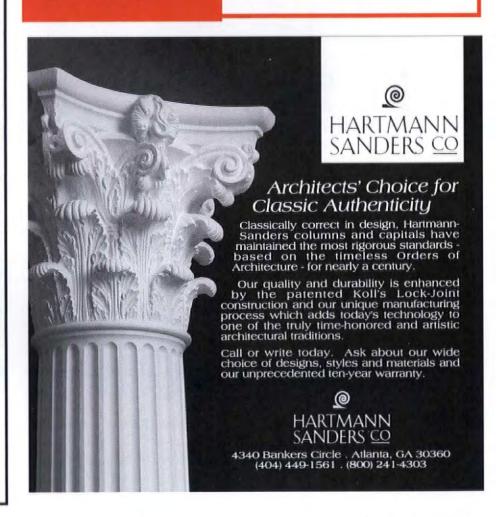
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— ROBERT SKILLINGS New Ulm, Minn.

composition cement roof tiles and shingles have been repainted with good success using latex paints. However, it is very important to first thoroughly clean the roof of dirt, scale, mildew, and other byproducts of weathering. Color consultant John Freeman (P.O. Box 430, Norristown, PA 19404) adds that using a good masonry conditioner prior to painting is another valuable step. Such a product will fill and seal any "pores" in the tile surface, creating a good substrate for the paint to bond with and de-

livering better coverage. Check the manufacturer's recommendations first, and adhere to their directions (some caution against applying thick coats). After the conditioner, use two coats of top-quality acrylic latex paint for the best color retention and surface sheen.

#### **Brushing Up on Radiators**

I have built-in hot-water radiators in my 1930s house. The visible cast iron grille gets hot, but it seems to also have fins behind it. Can you tell me how this system works? Any ideas on how to clean 60-plus years of dirt out of there?

— Annette Weidhaas-Canale St. Louis, Missouri

WE RAN YOUR PHOTOS PAST DAN Holohan, author of "Neat Ways to Heat" (Nov/Dec 1993 *OHJ*), and he

reports they look like the "Raydiant" radiators manufactured by the Weil-McLain Company in the 1920s. Actually radiant convectors, each unit is made up of a finned, horizontal, cast iron convector — the part in the wall — covered by a front panel that has steam or hot water circulating inside it. Dan notes that the front panel is permanently connected to the convector with push nipples (specialized pipe fittings used on radiators and boilers) and cannot be removed.

As for getting the dirt out, try canned compressed air, the kind used to clean computer keyboards. A stronger approach would be using a tree sprayer filled with detergent and hot water. Protect the floor well, but don't worry about the radiator — there's nothing back there that can't afford to get wet.

For working on a houseful of conventional radiators, you might want to invest in a tool made for the purpose. One brush specialist is Ace Wire Brush Company (30 Henry Street, Brooklyn, NY 11201). They carry five sizes of radiator brushes made for cleaning confined areas as well as between the columns of stan-

[Continued on page 28]



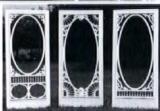
The "Raydiant" heated through the front panel as well as the convector recessed in the wall.

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[Continued from page 26] dard radiators. Call 718-624-8032 for a local distributor.

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slope of the roof. There is evidence of a window at this location, but it is long gone. What is a Lutheran window?

> — MATTHEW ELLIOTT, AIA Blue Hill, Maine

YOUR PARSON WAS PROBABLY PLANning for a luthern window, basically a dormer window set into the roof to help light the attic. In classical buildings a luthern is usually a window placed above the cornice and in line with the outside wall. The window is vertical, but beyond this can be any shape - square, arched semi-circular, bull's-eye, and so on. The term luthern was more popular in the 18th century than it is today (especially with tradespeople from England); as for the spelling on your plans we can only suppose, right pew, wrong church?



Luthern or dormer windows are a common feature of Georgian-style buildings, such as this town house.

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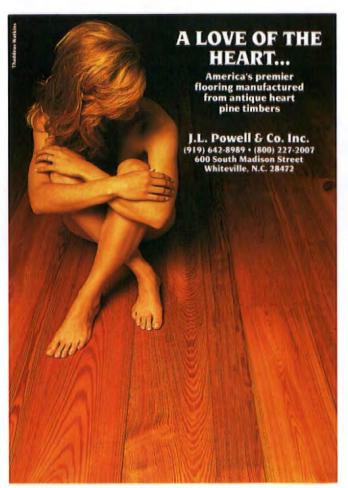
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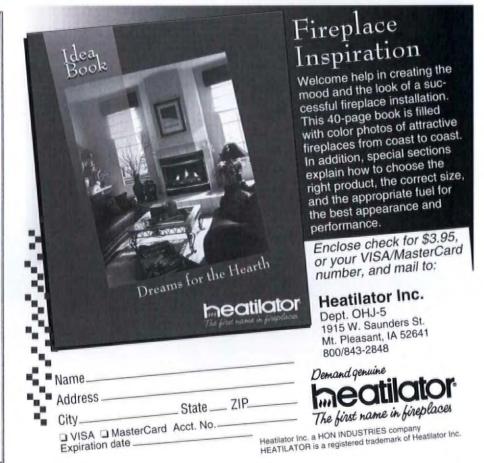


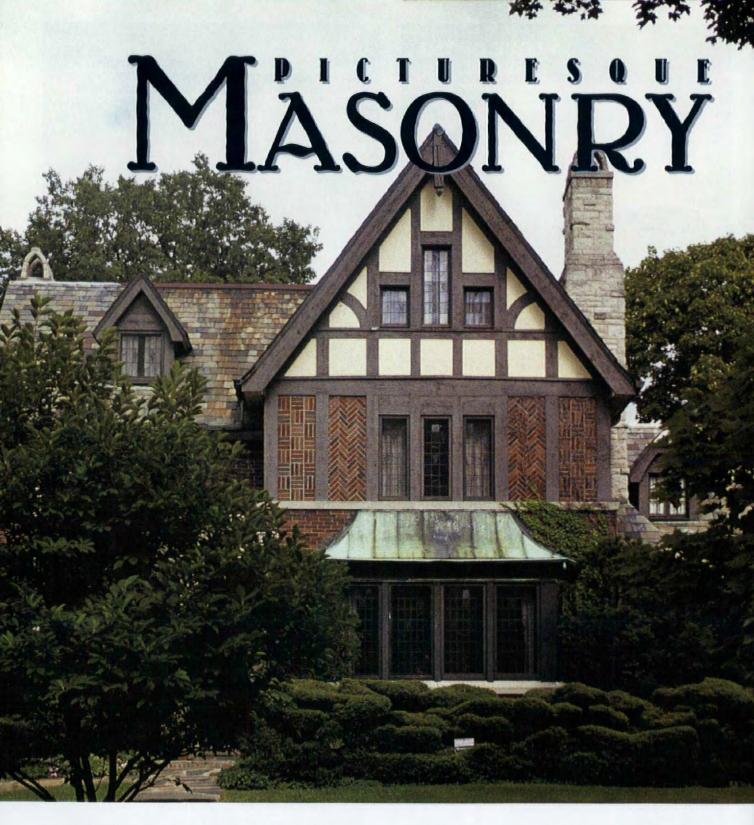




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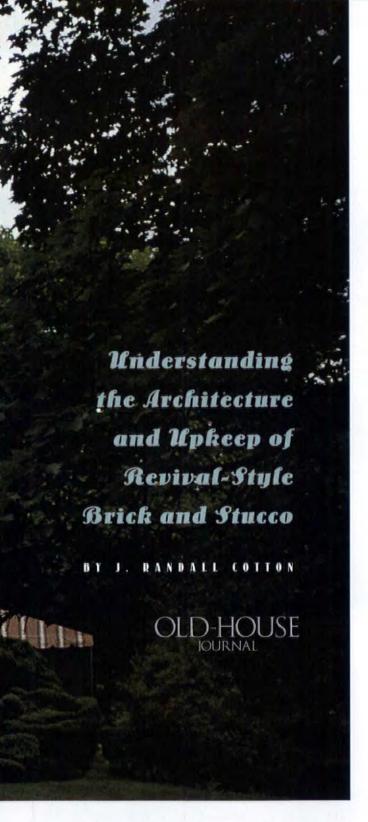




basketweave, nogging, squint quoins — all of these nearly forgotten terms refer to picturesque effects created with brick, stone, and stucco that give so many post-Victorian houses an aura of nonchalant charm. From the turn of this century to the 1930s, houses built as generalized versions of medieval originals — the French Revival, Elizabethan, Tudor, or English Cot-

tage styles — competed with the more formal Colonial Revival for the hearts and minds of North American homeowners. The public felt comfortable with the quaint informality of a house that seemed transported right out of the Cotswolds or Normandy, and block after block of them, appearing to have grown over centuries, soon graced scores of just-built suburbs.

Interestingly, the haphazard rusticity of these so-called



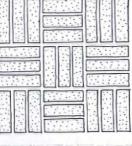
cottages and country manors is actually very deliberate and premeditated. In fact, it's trickier to create random-looking masonry than uniform work. This can pose problems for anyone caring for a revival-style old house built with picturesque masonry. Most of today's masons have little experience in producing these whimsical effects, and embarking on their repair — or even cleaning — without a grasp of the original design can lead to misguided "restoration" and obvious mis-

matches between new and old surfaces. A quick education in the techiques that make up the basic picturesque masonry bag of tricks will help avoid these mistakes, and make clearer the best options when they need major restoration work.

#### The Overall Picturesque

what defines picturesque masonry? As much as anything, it is the treatment of the exterior walls. Brick and stone combined with half-timbering and stucco create the illusion of great age. Although the materials look sturdy and ancient, most of these finishes are akin to stage sets. Much brick and stonework is just a veneer, anchored to structural backup walls of concrete block or hollow tile. Massive-looking half-timbers, complete with phony adze marks, are actually non-structural fakes. When it came to creating these picturesque masonry effects, there were no ground rules and, no doubt, some were made up at the job site by imaginative masons. Still, these effects are common throughout the country wherever French- and English-Revival houses are found. Some of these are:

Pattern Bonds. Whereas the standard brick bonds or patterns, such as common, English, and Flemish, were used primarily for building large wall sections requiring strength, decorative pattern bonds were favored as nogging (infill) between half-timbers, in blind arches above window or door openings, in gables, or in decorative panels that adorn chimney faces or blank walls. Garden wall, cross, spiral, and diagonal bond patterns were sometimes used, but by far the two most common pattern bonds were herringbone and basketweave. These two patterns are especially popular for filling the spaces between halftimbering in the manner of latemedieval European buildings. The basketweave pattern creates a checkerboard effect; each square block usually had three bricks, but sometimes two. Her-





Basketweave (top) and herringbone are the two most common pattern bonds. Both are widely seen as nogging between half-timbers (facing page).

ringbone bonds create diagonal zigzag patterns.

Several pattern bonds are often freely mixed in the

Several pattern bonds are often freely mixed in the same house — sometimes in the same wall — to create an even more lively and playful visual character that the British called a "brick cocktail." In a tradition known as tumbling, bricks are set diagonally to the main areas of masonry, but at right angles to the roof slope along the top edge of gables.

Color. Bricks were — and still are — produced in dozens of colors determined by clay and firing. To achieve a sort of casual mosaic, bricks of closely related tones — several shades of red or pink, for example — are mixed randomly. To create *diapering*, bricks of strongly contrasting colors — say, yellow and brown — are laid in patterns such as diamonds or zigzags. Bricks frequently frame window and door openings in colors that contrast with the "field" of the adjacent brick or stone walls.

During this period, brick and stone masonry joints often became part of the effect. Mortar mixes contained unusually coarse aggregates of colorful pebbles or crushed brick. Bits of tile, terra cotta or clinker bricks were even added, a tradition known as galleting (from the French galet, meaning pebble). Wide, fat joints were common and often untooled. Rough-cut joints (finishing the mortar joints flush with the brick) added to the illusion that the wall was put up by untrained workers instead of skilled masons.

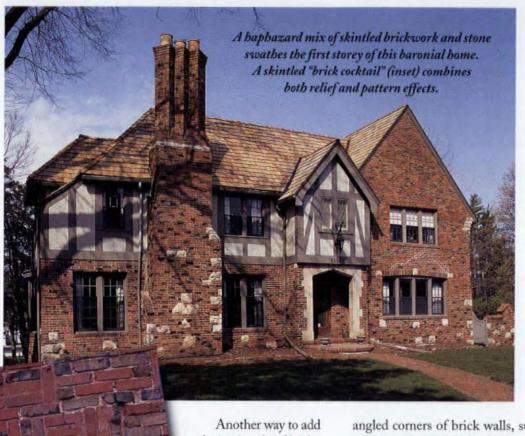
Stucco walls could be textured by running a broom or brush across the final coat before it set up. Pebbledash was also common, especially in the south. Gravel or small pebbles, often mixed in a stucco slurry the consistency of heavy cream, is dashed (thrown) onto the still-wet final coat. Stucco tints usually earthy colors produced with brick dust or mineral pigments - add an aged look. Intentionally staining stucco gives it an uneven, weathered look.

Relief effects. Sometimes, mortar is squeezed out of the brick joints on purpose and allowed to harden. Another popular picturesque effect is squint quoins where the obtuse-

angled corners of brick walls, such as at bay windows, are constructed with full-sized bricks. This results in corners with recessed "pigeonholes" or projecting sawtooth ends. More common is *skintled brickwork* where certain bricks in a wall are laid so that they project or recess slightly. Sometimes skintled brickwork has a discernible pattern, but more often the overall effect is haphazard.

Combined Materials. Really imaginative masonry creations combine all of the above effects and even mix different materials. For example, the first storey of a house might be brick or stone, and the upper storey stucco. One of the most common combinations is infilling the half-timbering of Tudor-styled houses with either brick, stone, stucco, or combinations thereof. In genuine medieval half-timbered houses, these spaces are usually filled with wattle and daub (woven sticks daubed over with a mixture of clay, dung and straw, then whitewashed). Stucco recreated this effect in 20th-century houses, usually over thoroughly modern metal lath.

Combining stucco with either brick or stone in the same wall section creates a convincing weathered look. Sometimes



Another way to add color is using glazed bricks. Their glossy finish (usually black) is baked on when a salt glaze chemically reacts with silicates in the clay during firing. Glazed bricks have been used since medieval times, and like colored bricks, they are used in

patterns, or interspersed randomly with the field.

Texture. Perhaps in no other period was masonry texture used with such variety and effect as the early 20th century. Bricks were manufactured in dozens of textures including stippled, rug (resembling the surface of a random-pile carpet), tapestry, water-struck, and sand-struck. Bricks were even intentionally overfired so that they warped and swelled with a surface texture of cracks and crazing.

just patches of the underlying masonry is allowed to peek through the stucco, giving a fatigued effect. In a similar manner, an uneven switch from stone to brick on chimneys, around windows and doors, or at corners creates the illusion that sections of the house have been rebuilt over time.

Individual decorative Arts & Crafts tiles might be set at random in stucco or masonry walls. During the 1920s and '30s, and into the post-World War II era, decorative panels became popular in the same way. Ceramic tiles create both historical and modernistic designs in these panels, especially in Mediterranean-influenced regions such as Southern California and Florida.

During the later phases of picturesque masonry, the effects became more regimented and less hodgepodge, losing that "pleasant air of general dilapidation" described by one contemporary. For instance, half-timbers looked mass-produced, machine-cut from dimensional lumber and unimaginatively spaced at regular intervals. Or, very regular brickwork delineated string courses, pilasters, and the shoulders of chimneys, or enframed window and doors. The overall effect is obviously planned and less playful.

#### Maintaining the Medieval Look

REPAIRING OR RECREATING DAMAGED OR MISSING PICturesque masonry will require not only a grasp of how an effect is supposed to work, but all-around competence with masonry construction techniques and remedies — probably in

> Veneer stone frames the wall openings and gable peaks of these Chicago-style English cottages in Berwyn, Illinois. Wide, flat, joints (inset) and coarse aggregate add a rusticity to this garden wall bond.

the hands of a professional. Choose a mason with both toplevel skills and an open mind; he or she should be willing to experiment with unfamiliar procedures until the results match the original distinctive masonry.

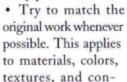
One way to insure a good match is to have the masons do a mock-up or test patch. Only when you, the homeowner, are satisfied should the work proceed. The following general guidelines may also help.

**Brick and Stone.** The same principles that apply to the proper restoration of ordinary brick and stonework also apply to picturesque masonry (see "Mastering Brick Maintenance," page 38).

 Before proceeding with any masonry repairs, correct the cause of the deterioration. Broken gutters and downspouts, clogged rainwater drains, improper foundation grading, failing roof and chimney flashing, or eroded masonry joints are some common culprits.

• Don't depend on band-aid solutions to fix fundamental problems. High-tech products like masonry sealers and consolidants can be unnecessary, short-lived, or unpre-

dictable. Put your money into tried-and-true masonry practices.





#### RESOURCES

**▼** VENEER ANCHORS:

#### Helifix

30 Milwick Dr., Dept. OHJ Weston, Ontario, M9L 1Y3 1-800-561-3026 Stainless steel retrofit wall tie system.

HILTI Fastening Systems PO Box 21148, Dept. OHJ Tulsa, OK 74121 (918) 252-6000 Variety of anchoring systems.

McFeeley's Square Drive Screws 712 12th St., PO Box 3, Dept. OHJ Lynchburg, VA 24505-0003 (800) 443-7937 Masonry anchors.

► MASONRY RESTORATION PRODUCTS:

Ahrens Masonry
Restoration Products
2000 Industrial Avenue,
Dept. OHJ
Sioux Falls, SD 57104
(605) 334-2827.
Masonry restoration training,
products, and tools.

American Stone Mix Inc. 8320 Bellona Avenue Towson, MD 21204 (410) 296-6770 Cements, mortars, and Sakrete-brand ready mixes.

Lehigh Portland Cement Company 7660 Imperial Way, Dept. OHJ Allentown, PA 18195 (215) 366-4627 Custom Color Masonry Cements.

Quikrete Companies 1790 Century Circle, Dept. OHJ Atlanta, GA 30345 (404) 634-9100 Mortars & other masonry products. · REPLACEMENT BRICK:

Continental Clay
Company
PO Box 1013,
Dept. OHJ
Kittaning, PA 16201
(412) 543-2611
Custom matching of brick size
and color for restoration
projects.

Cushwa Brick, Inc.
PO Box 160, Dept. OHJ
Williamsport, MD 21795
(301) 223-7700
Machine molded and
bandmade brick.

New London Brickworks PO Box 257, 17375 Old Beattie, Dept. OHJ Gold Hill, NC 28071 (704) 279-6901 Handmade brick and related special fired clay products.

STUCCO SUPPLIES:

Goldblatt Tool Co. 511 Osage, Dept. OHJ, Kansas City, KS 66105 (913) 621-3010 Masonry finishing tools and related equipment.

Stuc-O-Flex International 17455 NE 67th Ct., Dept. OHJ Redmond, WA 98052 (206) 885-5085 Advanced polymer alternative to traditional stucco.

REFERENCE:

The Preservation and Repair of Historic Stucco by Anne Grimmer (Preservation Brief 22) Preservation Assistance Div., National Park Service, Superintendent of Documents, U.S. Gov't Printing Office, Mail Stop: SSOP, Washington D.C. 20402-9325 (202) 783-3238 struction techniques. Replacements for original brick and stone are usually still available (see Resources).

• Since the mortar joints of picturesque masonry were often part of the overall effect, it is especially important to match the original mortar composition, color, texture, finishing, and tooling when repointing. Pay particular attention to the size, color, and type of aggregates used in the mortar mix.

• Don't use abrasive (blasting) techniques to clean masonry. In fact, except for extreme cases, such as graffiti, cleaning picturesque masonry is not necessary — remember, an aged, weathered look was the whole point.

• When trying to rebuild a section of damaged wall composed of randomly interspersed brick types, colors, or bonding patterns, try this trick. Mark off several 5' x 5' sections of the original wall. For each section, count the number of bricks of a particular color or bonding pattern, and then calculate what percentage of the whole section this represents.



A Tudor in Wallingford, Pennsylvania with classic use of brick patches peeking through the facade stucco.

For example, you might determine that, on average, the wall contains 25% red brick, 25% pink, 20% buff, 20% brown, and 20% black glazed. Or that, overall, the wall consists of 50% common bond interspersed with 25% herringbone and 25% basketweave bond. By approximating these averages, the rebuilt sections will blend in with the original.

Masonry Veneers. Many masonry walls of period-revival houses are actually non-bearing veneers. A single wythe (thickness) of brick or face stone is often "tied" to structural walls of concrete block, hollow tile, or even wooden studs with metal tie straps. Although most veneer walls will remain structurally sound, if water enters the interior wall cavity, it can rust the metal ties. Telltale signs of trouble include bulges, depressions, or cracks. Repairing veneer walls is usually a job for an experienced mason, not a homeowner. Fortunately, there is a wide array of products and techniques available for re-anchoring veneer walls (see Resources). Most of these insert some sort of anchor rod into new holes,

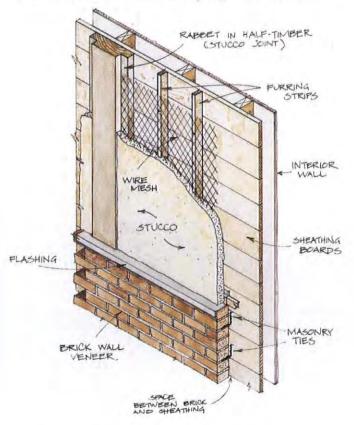
and secure them with epoxies, adhesive resins, or expansion sleeves.

**Stucco**. By the turn of this century, stucco was commonly applied over wood lath, metal lath, or wire mesh that was nailed or stapled to furring strips on the sheathing boards. It was also applied directly to concrete block, brick, or hollow tile with surfaces that were corrugated or otherwise gouged to present a rough surface.

Early-20th-century stucco mortar was made with cement, lime, and sand in varying proportions. Brick dust or mineral pigments were added to give extra color to the stucco finish. Formulas suggested at the time were not at all consistent. A typical "soft" mix was two parts hydrated lime, one part portland cement, eight parts sand; a "hard" mix

would be one part portland cement, two parts sand, plus 5% lime by volume. Soft mixes will not hold up as well over time as hard mixes, but they are easier to work and give more with expansion and contraction of surrounding materials.

Water will try to enter wherever stucco meets another building material or element such as a cornice, chimney, window, door, or porch. To prevent this, horizontal joints (for example, the top edges of half-timbers or window casings) were often flashed with metal drip edges. If this detail is not



Picturesque masonry is often a veneer. Good construction details, such as lap joints at half-timbers and flashing over all horizontal elements, keep water out of the wall.



"Normandy Village" in Berkeley, California (1924), combines randomly bonded brickwork, rough-cast stucco, and stone arches for highly theatrical — but far from unique picturesque effects.

present on the house, adding such flashing can become part of repair work. Vertical wooden members should have rabbets on their edges, into which the wet stucco is forced; otherwise joints can open if the wood shrinks. Homeowners can use modern flexible caulks to fill opened joints where stucco meets other materials. Use the best exterior-grade caulk available in a color approximating the stucco.

Half-Timbers. In the vast majority of "half-timbered" revival houses, what actually shows are flat planks imitating massive timbers. These planks are nailed to the exterior sheathing boards of framed houses; most have rabbeted edges for weathertight stucco joints.

Half-timbers are meant to have a rough, unfinished look and were almost never painted. They were often treated, however, with wood preservatives (in the past, creosote), stains, or raw linseed oil. Since these preservatives don't last forever, they should be renewed if the timbers show signs of harmful weathering, rot, or checking wood grain.

Today there are more exterior wood preservatives and stains available than 75 years ago, and the options can be confusing. Choose among the non-opaque, "natural" protective coatings that bear a resemblance to what already exists; water-repellent preservatives, semitransparent penetrating stains, and transparent coatings are all choices. Read the product information carefully, and do an inconspicuous test patch, allowing it to weather for a full year if possible. Remember, too, that these coatings will need to be renewed more often than paint to look good — and that means old.

J. Randall Cotton is a project director with the Philadelphia Historic Preservation Corporation. Thanks to Philip Scott of John Milner Associates for providing information for this article.

### BRICK BY BRICK An O

ATCHING OLD BRICK AND MORTAR WITH COMPATIBLE MAterials begins with identifying what you have. Although many old brick masonry materials are no longer used in new construction, most are still produced for restoration work.

The brick types listed were common at various times in North America. Also included are a range of mortar binders (cement and similar materials used to bond bricks), and common mortar aggregates (sands used to fuse the binder and to give it strength).

#### > BRICK TYPES

Adobe: Large, roughlymolded, sun-dried clay brick of varying sizes. Commonly used in the southwest as an easilyaccessible, on-site building material.

Clinker: Over-burned brick (often because of placement inside the kiln) with a water repellant



quality and sometimes a distorted shape. Clinker brick is often used in paving.

Common (Backup): Standard burned-clay building brick without special colorings or surface treatments. Common brick is generally used inside walls or where appearance is not a concern. Enameled (Glazed): Brick made with a ceramic glaze finish. Enameled brick is used as facing, providing protection from the elements and



an attractive surface, especially in kitchens and bathrooms.

Face (Stock): Highquality brick that is often treated to offer special surface texture and color. Face brick is a general term referring to units intended for visible sections of a wall.

Firebrick: Brick made with a clay that will withstand high temperatures. Firebrick is used in fireplaces and around boilers and furnaces. Also, brick that has been burned (fired) in a kiln. Gauged (Rubbed): Soft bricks sawn to a special shape and then rubbed smooth. Used as face brick, generally around windows and in other decorative detail work.

Molded: Specially shaped brick with rounded or angled dimensions. Molded brick is used for decorative work. Also, soft mud brick.

Paving: Very strong brick that allows only limited absorption of water, and has a very even finish to produce a smooth, flat surface. Intended to provide a hard wearing surface for driveways, sidewalks, patios, etc. (Also used for paving flat roofs.) Pressed: Mass-produced brick with regular, smooth faces, sharp edges, and square corners. The dry press process involves machines that can work with stiff clay, compressing it to create very hard and relatively non-porous bricks. Such machines began producing pressed brick in the early 1800s, but gained real popularity in the middle of the

century. With pressed brick technology, brick makers could make uniform frogs in the brick



beds and could cleanly stamp company names or dates in them.

Roman: A decorative brick shape (typically 2" x 4" x 12") reminiscent of ancient Roman units. Norman brick (typically 2-2/3" x 4" x 12") has a similar elongated shape. Salmon: Under-burned brick, often soft (because of placement inside the firing kiln). More porous and lighter colored (usually pinkish-orange)



than hard-burned brick. Salmon brick is used where strength, durability, and finish will not be tested by weathering and moisture.

Silica: Brick made with about 96% silica sand, a fine sand that resists acids and creates a slightly glossy surface. Silica brick is extremely durable and often used as firebrick where heat creates acidic

gases. However, silica brick should not be exposed to temperature variation. Also used where weather and moisture are a concern.

**Soft mud:** A porous, soft brick made (usually by hand) by placing wet clay into a mold to dry be-



fore burning. The soft mud process was used before the mechanization of brick-making and in the earliest mass-brickproducing machines. The soft mud method was the primary brick-making process until about 1800.

- Sand Struck: Soft mud brick with a gritty, textured surface created by sand sprinkled in the mold to prevent sticking.
- Water Struck: Softmud brick with a textured surface created by water put in the mold to prevent sticking.

Tapestry (Rustic): Brick with a rough (often multicolored) face. Tapestry brick is used as a *face* brick, offering a rustic look.

Terra Cotta: Burned clay bricks made of very uniform materials, and often glazed. Providing a smooth, clear surface, terra cotta is used for face work.

Wire Cut (Stiff Mud): Machine-made brick cut to form with a wire while the clay remains in a plastic state. A faster and more efficient way of mass producing brick than the soft mud process, wire cutting became the chief method for mak-





ing brick in the early 20th century. Because no mold is used, the process accommodates decorative scoring of the face before firing.

#### > MORTAR BINDERS

Hydrated Lime: Lime treated with just enough sand and water to begin chemical reaction. Depending upon the product, hydrated lime can be used almost immediately because it does not have to be slaked (hydrated) before use.

Lime (Quick, Lump): Limestone ground and burned (calcined) to drive

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off water and carbonic acid. The result is a grayish white, caustic substance that, when mixed with sand and water, undergoes a chemical hardening reaction (carbonic acid reenters). It must be slaked with water and allowed to hydrate for at least 24 hours before use. Natural Cement: Mostly outdated cement produced by heating limestone in whatever form it came out of the ground and then grinding it. Because of variety in the rock, primarily in amounts of lime and clay, natural cement varies in hardness and color. Natural cements lost popularity around 1900.

Portland Cement: Today's standard; portland is a heavy, strong, slowsetting cement, typically manufactured by mixing ground, burned limestone and clay at a ratio of 8 to 2. Although invented in England in 1824, it did not gain popular usage in North America until the turn of the century.

#### > MORTAR SAND

Mason's Sand: The standard sand used in mixing mortar; finely screened and washed.

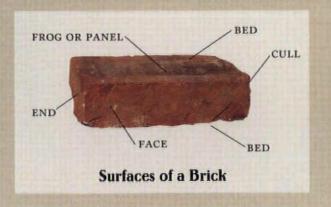
Quartz Sand: A form of silica sand which is very hard; used in concrete and brick to create strong, acid-resistant masonry.

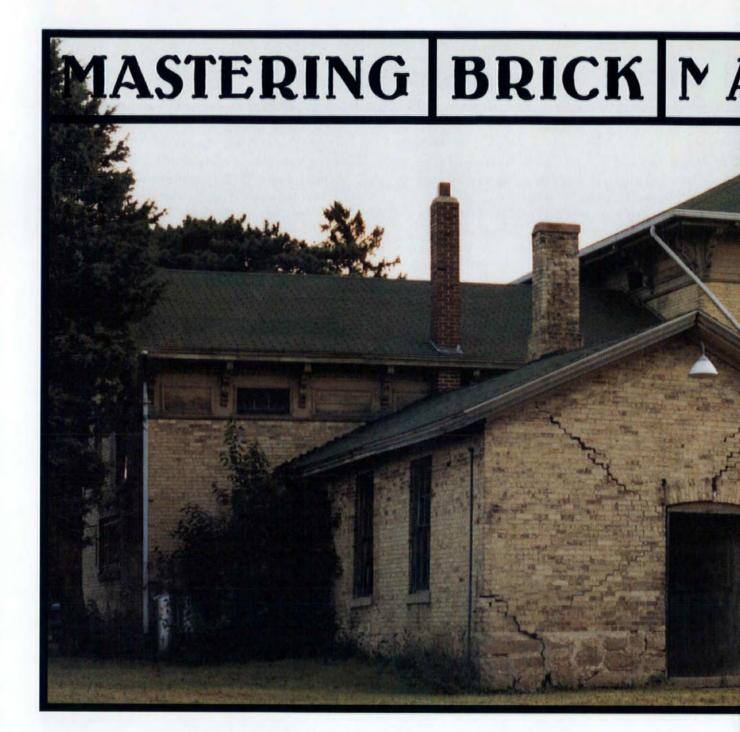
Sharp Sand: Coarse

sand whose particles are of angular shape; provides strong adhesion in narrow mortar joints.

Silica Sand: A standard sand for mortar; strong, white, extremely fine, and acid resistant.

Torpedo Sand: A rough sand with large pebbles; useful when patching spaces where mortar might tend to fall out, such as large gaps between bricks; resists sagging.





## Five Repair Procedures from a Pro

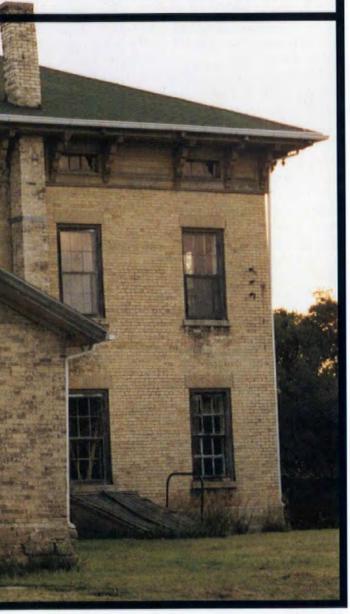
by Jacob Arndt

BRICK BUILDING CONNOTES STRENGTH AND stability. Its solid dignity is going to be there a long time. Yet, even brick is subject to the degenerative forces of nature and time. Wind, rain, and pollution erode old lime mortar. Roof runoff and building settlement can open joints or damage brick. As a rule, brick structures need major maintenance every 70 to 100 years to remain solid, safe, and

watertight. This maintenance generally involves repointing deteriorated mortar joints and replacing damaged brick.

Repairing old brickwork requires patience above all else. In our masonry business, a "fast-food" construction mentality is out of place for working with such long-lived materials. Keep in mind that brickwork has an aesthetic as well as a structural value. The same care that makes for good physical compatibility between old brick and new mortar

## INTENANCE



should be used to produce repairs that are neat and indistinguishable from the original work. Once these values are taken into account, repair work becomes a straightforward process of performing a sequence of tasks. Whether you are gearing up to perform a restoration project yourself, or overseeing one executed by others, you'll probably use at least one of the following techniques, which have worked for us to make durable repairs that respect the original masonry.

#### I. Documenting the Details

BEFORE BEGINNING ANY WORK, TAKE A CLOSE LOOK AT THE mortar and brick of your building. Note the color, texture,

and design of the masonry and how it integrates with windows and doors in the wall. Photograph details by holding a tape measure next to lintels, brick sills, pullouts, rowlock, soldier course, and archway features to scale their dimensions.

Examine cracks, dissolving mortar, and foundation sags. These problems usually occur near window and door openings, and are almost invariably associated with poor drainage or other moisture problems. Photograph these

Photograph wall defects, such as these diagonal cracks, and specific masonry details, before beginning work. problems. Thotograph these problem areas before working on them to help document what needs to be repaired or reproduced. Look for evidence of wall failure. Test the mortar by raking joints aggressively with a pointing trowel

trying to dislodge material. Then photograph the resulting voids and their average frequency in, say, ten square feet of wall area.

After you've decided who will perform the repair work, view the photos with your assistants or masonry contractor before visiting the building. Make a final list of areas to be repaired and calculate material needs. This will save you numerous trips to the job site and much explaining later about what to remove and what to leave alone. Outline damaged areas with chalk to define what will be repaired. Once the dust and noise of repair work starts it is not always evident where the damage stops and a good surface begins.

### II. Mixing Appropriate Mortar

A CRITICAL PART OF REPOINTING OLD BRICK IS USING THE right mortar. The type of sand and the proportions of cement, lime, and water allow you to match the aesthetic qualities as well as the physical characteristics of the original mortar. (See "Mortar and Brick" on page 41.) To match old mortar, you should have three ingredients on the job site: white portland cement, mason's lime, and sand that matches the grain and texture of the original.

Determine your sand needs by first breaking a handful of the building's original mortar onto a hard surface. Use the wooden handle of your trowel to gently tamp it apart. Look closely at the grains in the original mortar, using a magnifying glass to determine if the sand is sharp or round. The shape of the sand affects its color, as well as the strength of the mortar in which it is used. If the original mortar is pebbly, use torpedo sand to match its texture. If sand in the old mortar is fine-screened, use regular mason's sand.

Put the crushed mortar into a jar and shake it up to separate its elements. Roughly judge the proportions of white powder (lime) to sand grains. Use those percentages as a general guide for your new batch. I start with a mix of 1 part white portland cement, 6 to 7 parts sand, and 1 part lime. Always mix dry contents thoroughly before adding water.

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Use only enough water to make a ball of mortar that just holds together in your hand. Experiment with the recipe to match the color and texture of the old mortar. Once you decide on the proportions, strictly adhere to them. Use five-gallon pails and coffee cans to portion out each ingredient, including water. Write the proportions down and assign one

person responsible for mixing every batch of mortar.

If you are matching colored mortar, ask for a color chart from a local masonry supply yard or write to Solomon Colors (See Resources on page 42). Take a sample of the original mortar and match it as closely as possible to the color strips on the chart. Then experiment with some small test batches on the building. Begin with a coffee-can batch of 1/32 volume color to 1 volume mortar mix. Follow the mixing directions; color powder goes a long way.

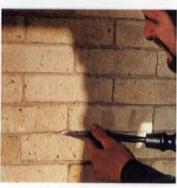
#### III. Repointing: One Step at a Time

once you've determined your mortar recipe, you're ready for repointing, the process of removing old, deteriorated mortar from masonry joints and replac-

ing it with matching new mortar. It restores the bond between the masonry units as well as the joints' resistance to weathering. Repointing is painstaking, but when executed with care and patience, it will preserve the stability and aesthetics of your brickwork for years to come.

1) Remove deteriorated mortar from the wall. Some masons hand chisel the joints and would never take a grinder to the wall. However, I have found that fine stone-fabricating grinding disks are thin enough to get into most horizontal joints without harming surrounding brick. (See Resources on page 42). Both chisels and grinders require skill and concentration to handle. It's easy to tire and slip with chisels, leaving chipped brick, and it's easy to lose control of a grinder. Whichever tool you choose, use caution. Generally, mortar





Removing old mortar for repointing can be done by hand, or
with power tools. An angle
grinder with a segmented diamond blade is thin enough to use
on most horizontal joints (above
left). When using a pneumatic
chisel be careful not to lodge the
blade into the joint
(above right).

should be removed to about a 1" depth for repointing.

2) Moisten the wall before pushing the new mortar into the joint. Use a mason's hawk (a square plate with a perpendicular handle) or a trowel to hold the mortar. Then push the mortar into the voids with a caulking trowel, trying not to slide your trowel. Push enough mortar into the joint to allow you to strike off excess later. Leave the mortar fat and protruding until the moisture has been absorbed into the surrounding material. The mortar is ready to strike when it has the consistency of workable clay: soft enough to push your thumb into, yet firm enough to hold your thumbprint.

3) Strike the joint to match the rest of the building. Most old brick buildings have a slight shadow line around each brick because of weathering action over the years. Duplicate that shadow line with the edge of your trowel, cutting along the edge of the brick when the mortar is just barely plastic. Leave it alone then until the next morning.

4) Bathe the surface in the morning. Use a soft brush and a water hose set on strong mist. If you get at it early enough, some of the lime content on the surface of the new mortar will wash away and give the new pointing a weathered look. Try for a slightly exposed aggregate effect, but don't scrub so hard as to smear the shadow line. If that happens, use

the edge of the trowel again to redefine the edge. At the same time, look for mortar on the surface of the brick and scrub it off with the soft brush. If left for even a few days, mortar requires a steel brush and lots of scrubbing to remove.

As you repoint, keep these tips in mind:

• To strike a raised joint, use a straightedge, such as a three- or four-foot level. Let the mortar protrude until the thumb press test indicates it is ready to strike, then put a straightedge gently to the top of the bed joint and cut along



Pushing mortar from the trowel into the joints must be done carefully so all voids are completely filled.

it with the trowel edge for a clean line. Do the same with the bottom of the joint, and let it stiffen up. Then smooth the face of the raised joint and re-cut any sags. Brush smooth with a fine paintbrush just before the mortar sets. Head joints can be cut without the aid of a straightedge by pushing the trowel edge to the joint, aiming for vertical, of course. Spray the joints periodically with water off the brush to keep them moist until you can mist the wall with hose water.

· If the building has a burned white or brownish mortar,

duplicate it by exposing the aggregate with water and brushing or casting sand onto the newly pointed-and-struck joints in a fan action just before it sets up. Leave until the next moming, and then wash with the soft brush.

 Experiment with procedures so that the new work blends well with the original wall. Then use the same sequence and procedure throughout the project or the mortar may end up with different shadings from day to day.

• Point only what is deteriorated and replace spalling or disintegrating brick. Follow repairs to below the founda-

tions, to the footings if necessary.

 Keep the newly pointed portions of the wall as wet as possible while you are on the job. Give the whole job a good soaking every so often with a strong mist to allow the mortar to cure slowly for strength and uniformity.

 Always work in the shade. Mortar that dries too quickly is chalky and has no strength at all. It should be ready to strike 2 to 3 hours after repointing, and will gain 50% of its strength within a week.

#### IV. Replacing Broken Brick

WHEN BRICK IS DETERIORATED, IT NEEDS to be removed and replaced with matching units. A good way to remove brick without shocking or otherwise damaging the surrounding units is to perforate the brick that is being replaced with a drill and an angle grinder. Drill holes and grind deep grooves into the brick, then chisel into the holes and grooves to remove small chunks. Be patient with the first brick. If you try to remove large chunks at a time, you will break adjacent brick and destroy the surrounding bonds. By pummeling and pounding on the brick, you may leave the area actually weaker than before you began. Once you have created a cavity in the wall, surrounding brick will follow more easily.

Replace the brick with units that match the original texture and color as closely as possible (See "Brick by Brick" on page 36). Survey brickyards and you'll come close to a match unless the brick is a very special type or design. Before placing the new brick, make sure the cavity is good and moist. Soak absorbent brick in a pail of water. Then carefully place mortar on the bed joint. Butter both head joints with a trowelfull of mortar and slide the new brick into place. Make adjustments for its final position, ensuring the joint widths are the same as the

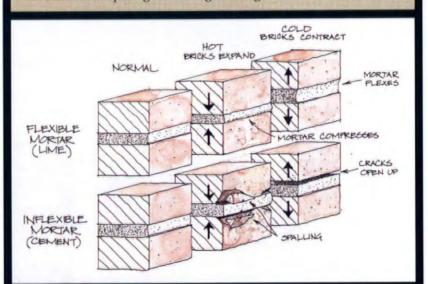
originals. Push mortar in where needed until the mortar is full beyond the face of the wall. Use the repointing techniques to strike and finish the joints, but keep the brick and surrounding area extra wet to ensure a good cure and bond.

#### V. Resurfacing Marred Walls

IN SOME CASES, OLD BRICK STRUCTURES HAVE BEEN SMEARED over with so much mortar that it is impossible to recoup a decent facade that won't look sloppy. In extreme cases, the

## MORTAR AND BRICK

THE DYNAMICS OF BRICK AND MORTAR ARE NOT A MATTER OF OPINion. They interact in predictable ways, and when their physical characteristics are not taken into account, there can be trouble. At a recent conference on historic restoration, a participant told how his structural terra-cotta smokestack was repointed with mortar too hard for these units. Spalling chunks began falling a hundred feet down onto



the parking lot just two years after job completion. Ignoring the physical principles of mortar and brick led to an expensive disappointment.

Mortar, the principle material for brickwork repairs, acts as a cushion during seasonal movement of the building. Because brick is not very resilient, the mortar must be elastic enough to absorb the expansion, contraction, and shifting of the components. If a mortar batch is harder than the brick it surrounds, shards may spall from the surface of the brick as it yields to seasonal adjustments.

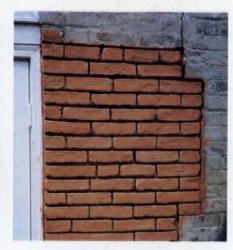
As a general rule, turn-of-the-century and earlier brick is much softer than today's brick. Today's pre-mixed masonry cement is usually too hard for use with historic brick, and its portland cement content gives it an unwanted gray color. White cement and mason's lime are just as easy to obtain at the brickyard, making it possible to custom batch your mortar with total control over strength, texture, and color.



Chipped brick, sloppy repairs, and gooey overcoats can mean repointing is not enough to resurrect the wall.



Resurfacing involves clearing mortar joints as if repointing, and then filling voids in brick.



Last comes a colored parge before re-mortaring joints to match the rest of the building.

entire brick face is disfigured from bad repairs. The only options are to remove all of the brick and re-lay the wall, or to resurface the brick with a parge coat of colored mortar that matches the original, grinding each joint for repointing.

Resurfacing requires silica sand, white cement, lime, a bonding agent, and mortar color. Experiment with the colors to match the original brick, and write down the proportions once you have a good match. Use two or three different colors to approximate the original wall because the bricks will be slightly different in color due to environmental factors. Complete uniformity will look out of place.

Experiment with the colors and test job-site curing and other conditions on the building first. Make the mix fairly strong, say 3 parts silica sand to 1 part white cement and ½ part lime content, and then add the color and water. The water should be mixed half-and-half with a bonding agent such as Acryl 60 (See Resources). Mix a batch or two that is slightly darker than the main color and a batch that is slightly lighter. With a red dye as the main color to duplicate red brick, I often add 1/32 volume to produce a deep red; adding 1/64 volume of color to the mix produces a slightly pink color.

To prepare the brick surfaces, use an angle grinder with a diamond blade to grind each joint an inch or so deep, being careful not to grind the brick. Fill in deep voids and chips with the colored mortar mix to bring them flush. Apply the main color with a brush to stain the marred surface, then go back and brush random individual bricks to give the wall a distribution of hues that approximates the original color palette. Always wet the wall to obtain a good bond and a well-cured surface. Once you have applied the color, redefine the mortar joints with a trowel to preserve a consistent line and for good brick definition. Next, repoint the mortar joints with a batch of white cement and lime consistent with the original mortar. Follow the same procedure for this repointing as described earlier, finishing the mortar to appear aged and compatible with the original look of the brick structure.

Brick repair takes on a rhythm of its own and patience is the key. Put both feet and mortar board on wide planking, and then work in the shade with a partner. After the grinding is finished, the job becomes a calm procedure of measured pace with satisfying results as you see the building transformed again into a solid, safe, and watertight structure.

Jacob Arndt specializes in historic masonry: Northwestern Masonry & Stone, 2222 Monroe Street, Madison, WI 53711.

#### RESOURCES

MASONRY PRODUCTS

Mortar Palette

Restorations

PO Box 514/MU 18 Dept. OHJ, Yelm, WA 98597

(206) 458-5645 Custom mortar analysis,

formulation, and color matching.

Solomon Colors

PO Box 8288, Dept. OHJ, Springfield, IL 62791 (217) 522-3112 Mortar color charts.

Thoro System Products 7800 NW 38th St., Dept. OHJ, Miami, FL 33166 (800) 327-1570 Acryl 60 bonding agent. VIC Industrial Corp.

PO Drawer 12610, Dept. OHJ, Knoxville, TN 37912 (800) 242-1141 Fine grinding disks.

REPLACEMENT BRICK

The Brickyard, Inc. PO Box A, Dept. OHJ, Harrisonville, MO 64701 (816) 887-3366 Authentic, old, unused clinker brick recovered from

an abandoned brickyard.

Old Carolina Brick Co. 7434 Pop Basinger Road, Dept. OHJ, Salisbury, NC 28144 (704) 636-8850 Consultants in matching brick size, color, and texture.

### What to do When Foundation Walls Become Wicks

ALLS OF BRICK AND STONE look solid and impermeable, but that is only what the naked eye sees. A closer examination shows that these materials are relatively porous with thousands of tiny pores that can hold air or

water. It is the water that concerns old-house owners because, in one form or another, it leads to most of the deterioration that afflicts buildings. Water can penetrate a masonry wall through leaks, such as cracked joints and other defects, or by saturation, as when

wind drives rainwater into the masonry. Or it can even be drawn up from sources below ground and into the wall like oil in a lamp — the mysterious phenomenon of rising damp.

What's so special about rising damp? For one, it's not always curable — frustrating for restorers, who want to fix any problem. For another, it causes some expensive damage, such as moldy wallpaper, peeling paint, or popping plaster. Left alone for years, it can lead to dete-

riorated brick and mortar, rotting floor joists, and corroding metal. Indeed, rising damp is often misdiagnosed or just covered up and ignored. Though it is mostly a problem of old houses from the mid-19th century and earlier, it's not an easy one to iden-

tify or control. With this in mind, the following pages comprise a "short course" on rising damp to explain how it differs from other water problems and what can be done if it does sneak into your old house.



Efflorescence — a sign of moisture.

## The Short Course on

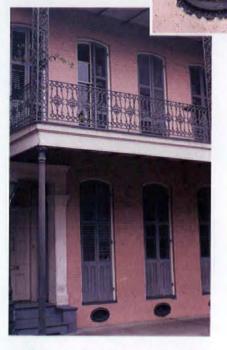
DAND

by Gordon Bock

#### What is Rising Damp?

RISING DAMP IS TYPICALLY ASSOCIated with older brick or stone masonry foundations and walls. Brick in particular was much softer and porous before 1860 than the hard-fired mate-

rial in use since the late 19th century. The soft or sedimentary building stones used often con-



Cellar vents are a common sight at sidewalk level in New Orleans, an old — and effective — response to the high watertable.

tained their own natural pores. Rising damp occurs when ground moisture enters these pores and is drawn up the wall through capillary action, the same mechanism that contibutes to water movement in plants. Hydrostatic pressure (the force of local groundwater) at the footing level helps push moisture into the pores. Evaporation above ground level helps draw moisture up the wall. Sound intensely technical? Think of the wall masonry as a wick that absorbs liquid.

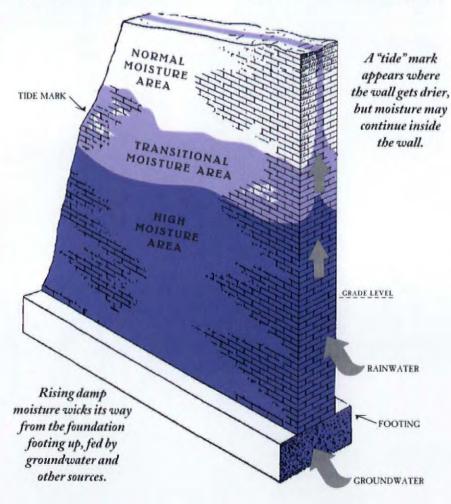
Rising damp is most common in low-lying, high-watertable coastal regions such as Charleston, South Carolina, Galveston, Texas, and New Orleans — the proverbial land of rising damp. However, it may result from locally swampy conditions, an underground spring, poor soil drainage, or even a broken waterpipe. Rising damp is also chronic and usually cyclical, coinciding with rainy seasons.

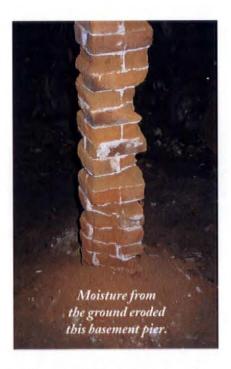
> The symptoms caused by rising damp have been recognized for centuries, and its general action has been understood for close to 150 years. Cellar vents for good natural air circula-

tion were an everpresent feature built into houses where rising damp was a fact of life. Above grade, more positive measures became common in the mid-19th century. In *The Architecture of Country Houses* (1850), A. J. Downing noted how foundation walls laid up with lime mortar absorb moisture from the soil, particulary damp soil. To block the moisture path he recommended building in a course of slate or brick laid in hydraulic lime mortar.

By the 1890s this feature had become a commonly recommended precaution and was termed a horizontal damp-proof course. One manual of the time specified a 3/8"-thick layer of hot asphalt and coal tar for the best work; two courses of slate or very hard vitrified brick laid in cement mortar for cheaper work. Another added a sand coating to the asphalt layer and a veneer of dense stone on the exterior. Damp-proof courses might also be made with sheet lead or zinc. A course of granite, one of the most impermeable stones, was also used for dampproofing.

It's helpful to know the nature of these historic damp-proof courses. First, they're evidence that builders suspected — or knew positively — that rising damp would be a problem at the site. Second, while many of these courses were once effective, rising damp has become a problem because the damp-proof course has failed due to age (cor-





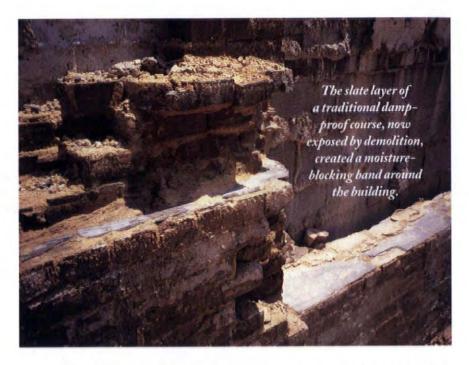
roding metal, for instance), or been compromised (see below).

## What are the Symptoms and Conditons?

damp problem can also be the result of much simpler high moisture conditions. Plumbing and drainage leaks, rain penetration through defective masonry, condensation, or surface contaminants that draw moisture may all cause damp patches, usually becoming more pronounced in rainy weather. To eliminate these as possible causes, correct their root problem and allow the wall to dry six to twelve months before drawing conclusions. Clues that a rising damp problem persists are the presence of:

r) Horizontal "tide" marks. The moisture in masonry walls is actually a solution of salts dissolved out of the masonry components or brought in with ground water (ice-melting compounds are a major source). Where this moisture evaporates, these salts form blooms of crystals known as *efflorescence*.

In a wall with rising damp, there is a zone where the lower, damp part of the wall meets the upper, drier part. Typically this zone is about a yard up



on the wall and demarcated by a shadowy line of stains or efflorescence a "tide" mark.

2) Peeling paint or plaster. Efflorescence blooms are obvious on the surface of masonry, however they also form within brick pores or underneath paint or plaster. When this subflorescence continues to grow, it can erupt through paint, forming bubbles and open blisters. If the crystals have a

chance to expand, they pop and crumble plaster off the wall and even spall brick or stone.

3) Musty odors. The moist conditions of rising damp can promote the breeding of fungal spores and mildew; these in turn can lead to the rot of adjacent wood.

Other building conditions can increase the potential for rising damp or make an exisiting case worse.

Exterior waterproofing and interior wall coatings — If these are moisture-blocking materials, they can make rising damp worse by inhibiting evaporation. Interior finishes of this kind are sometimes applied to rising damp walls in an attempt to seal out moisture, but do more damage. Moreover, these coatings can seal the wall into a kind of conduit that forces the damp even further up the wall.

**Bridging** — Existing dampproof courses may be rendered useless by conditions that create a moisture path around the barrier. New

grading outside the wall - elevated flower beds or patios are classic examples - may rise higher than the damp-proof course and completely defeat it. Exterior finishes, such as new stucco, can have a similar effect. Too high a slab floor inside the wall will bridge the barrier the same as earth, and mortar that fills the

wall creates a path right through the damp-proof course. These are likely situations in old houses because land-scaping or interior features have usually seen many changes.



Peeling paint and plaster, along with musty smells, are classic symptoms of rising damp.

Presence of salts — Older masonry walls tend to contain a significant concentration of salts, due partly to the makeup of earlier building materials, and partly to the action of normal, seasonal moisture changes that bring them into the wall. In many cases, these salts aid the movement of rising damp, which carries in more salts.

Watering systems — Undersurface automatic garden watering systems can create a ground moisture problem if they are not set properly or they spray on exterior walls.

## What are the Steps for Dealing with Rising Damp?

IN ORDER TO TREAT A CASE OF RISING damp effectively it has to be diagnosed accurately. Rising damp is a high moisture condition generally present in a wall from the footing up and through its entire thickness — not just the sur-

face or isolated sections. This means the wall's interior has to be examined in some way to confirm a case.

Visual inspection of symptoms is the first step. However, testing by a professional building inspector or preservation consultant using field equipment (and possibly laboratory work) is usually necessary to "look" at the moisture levels in the wall. Measurements are taken at a series of heights up the wall, then plotted on paper. Surface measurements are useful, but most important are those from the interior. Test equipment

varies and gets more sophisticated each year. Electrical resistance moisture meters (similar to those used for measuring moisture levels in wood) are the standard workhorse, but salts can shift their readings. Calcium-carbide meters work chemically and are more accurate. Electrical site monitors use sensors buried in the wall and give a record of moisture levels over time.

A wall starts to look like it has a case of rising damp if tests show a high moisture content starting at the base that gets gradually lower at successive points up the masonry. Most walls contain some moisture, but they seldom suffer from rising damp if the content is below 5 percent in the area under the tide mark. It is also important to note, again, that rising damp is influenced by the rise of water tables in summer and their fall in winter. Moisture readings will follow these seasonal shifts.

Once a case of rising damp has been confirmed, there are basically two courses of action open to an oldhouse owner: 1) eliminate as many of the sources of ground moisture as pos-

> sible, and 2) control the movement of moisture once it is in the building. As with so many other restoration efforts, it pays to start with the simple, low-tech approaches to treating rising damp. Not only are they relatively inexpensive, they can often be carried out by a homeowner with little change to the building itself, and should be a part of the property's general maintenance.

Correct faulty grading and rainwater systems — What goes for any foundation water problem, goes for rising damp.

First inspect the building to make sure that landscaping, gutters, and downspouts conduct water away from the foundation, not into it. Backfill should slope away from the foundation; downspouts must be ducted as far away from the building as is practical. Correct, too, the reverse situation: grading that bridges existing damp-proof courses.



Removing plaster revealed a rising damp condition; keeping it off promoted evaporation.

Add groundwater collecting systems - Footing drains - perforated pipes installed underground at the base of the foundation - may be effective for reducing water sources that contribute to rising damp. While they have limited chances of affecting moisture that rises directly up through the footing, they can catch rainwater seepage or lower the immediate groundwater level by conducting it away from the building. If footing drains are called for, waterproof the foundation wall at the same time to control lateral transmission of groundwater (see "Waterproofing Historic Foundations," May/June 1992 OHJ). Several products made for this purpose have channels or geotextile mats that have helped on rising damp projects. Sump pumps on the cellar side of the wall are another option.

Improve ventilation — Increasing the opportunities for the wall to dry out is an easy and often effective method for keeping moderate rising damp in check. Simply removing vapor impermeable coatings such as rubberized paints or plastic wall coverings will allow the wall to breathe. Cement

Photography by Sharon Park



Field test equipment can provide an initial look at moisture levels up the wall.

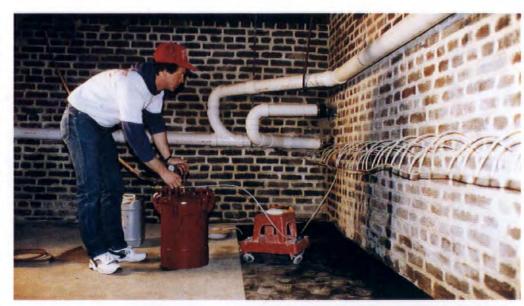
stuccos and parges are more tenacious, but may also be worth removing. Even more basic, just increasing the air circulation in basements or crawlspaces through the use of vents and fans may subdue a gentle case of rising damp. Adding heat and dehumidifiers can enhance effect, but too much may backfire in a vicious cycle where ground moisture is drawn into the basement.

Further strategies for control of serious rising damp aim at blocking the moisture path by retrofitting

a new damp-proof course. These methods involve extensive work on the building and require unique tools and specialized contractors with proven track records for this type of work. They are also more radical in nature. Their cost and impact upon the building's historic fabric have to be weighed against the impact of moisture damage. Make every effort to control rising damp by non-invasive methods before considering any of the following courses of action.

r) Chemical damp-proof course — This technique, used longer in Europe, injects chemicals into the wall to create a moisture barrier. Generally, small holes are bored in the wall first every 5" or so. Then a manifold with tubes for each hole is connected and chemical resins are injected under pressure. Chemical damp-proof coursing is less expensive and invasive than mechanical coursing, but it suffers in very wet walls or where absorption is not uniform.

2) Massari system — Akin in many respects to mechanical damp-proof coursing, the Massari system starts with 1-½" or more diameter holes bored through the wall at 10" intervals using a heavy drill. After each hole is cleaned, it is filled with a water-resistant grout composed of polyester resin or epoxy. Once one series of borings is finished, another is begun close enough to the original se-



Top: Chemical damp-proof course processes and materials vary, but all inject resins through many small holes. Right: Cutting for a mechanical damp-proof course is tricky, expensive, and limited to certain wall types.



ries so that the holes and grout connect. When the entire series of borings is complete, they form a continuous moisture barrier along the wall. While the system is not limited to courses, it does leave the wall with a disfiguring band of bore marks.

3) Mechanical damp-proof course -In this process, a new moisture barrier material is cut into an existing wall to produce something very similar to a traditional damp-proof course. First, the wall is slotted just above grade level (often along a joint) on both sides using either a diamond-blade circular saw or a tungsten-carbide tipped chainsaw. Then the barrier material - sometimes slate or lead sheeting, but more recently rubber-type membranes - is inserted and held in place with slate shims and a non-shrink mortar grout. The job progresses three feet at a time to maintain the stability of the wall and works best with regular, even courses. Thick walls and cavity walls with sides that are not evenly matched are all but impossible.

In the end, control — not cure — is the goal to shoot for with rising damp. Complete elimination of its causes may not be possible when the sources of ground moisture cannot be controlled, as in coastal areas. Radical approaches are basically a last resort, however low-tech, remedial management can be suprisingly helpful in reducing ground moisture. Rising damp has been around a long time; it will wait for a careful consideration of the treatment options on a case-by-case basis.

Special thanks to Sharon C. Park, AIA— Senior Historical Architect, Preservation Assistance Division of the National Park Service and author of the forthcoming Preservation Brief on Moisture and Historic Buildings.

# THE CASE FOR CO



## NCRETE HOUSES

Building with Poured Concrete, from Orson Squire Fowler to Frank Lloyd Wright

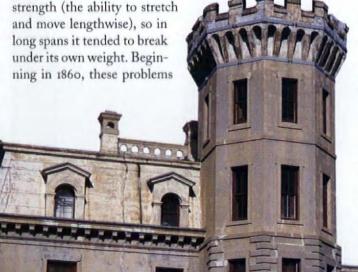
> by James C. Massey and Shirley Maxwell

rson Squire Fowler could hardly contain his excitement. Writing in A Home for All, the Gravel Wall or Octagon Mode of Building (1853), the phrenologist-social philosopher mistakenly thought that he had stumbled upon a brand new building material. He was dead right, though, in believing that the object of his enthusiasm — concrete — would one day revolutionize the housing industry. • Although modern concrete was developed in the second half of the 19th century, by Fowler's time it had been around in some form for many centuries. The Romans used a lime, water, and volcanic ash version to build their aqueducts five hundred years before the birth of Christ. The same concrete is in the walls and dome of the remarkably preserved Pantheon in Rome (rebuilt before 200 A.D.). The technology survived in Spain and Africa and was brought to North America by the Spanish early in the 16th century. In coastal areas from Florida to South Carolina, Spanish and English settlers throughout the 18th and 19th centuries built in "tabby" ("tapia"), a mixture of lime, sand, and coarse aggregate such as stones, shells, or gravel. Adding water set in motion a chemical reaction that formed a fairly strong basis for walls, floors, and even roofs. Some surviving buildings from the Spanish period in St. Augustine, Florida, are of tabby, as are

some English buildings from Georgia's sea islands.

Portland cement, invented in Britian in 1824, made a much harder and more durable concrete binder than lime or many of the naturally occuring cements. Although mass production on these shores had to wait until the 1870s, American builders were quick to try it for houses. It was the Joseph Goodrich House constructed in 1844 in Milton, Wisconsin, that inspired Fowler. Built of local stone, gravel, and sand mixed with portland cement that had been imported from England and shipped via New York, the Goodrich House was not much to look at. In fact, it was actually a large, hexagonal house-store-hotel combination, but it was big, solid and, most importantly, fireproof. Goodrich's skeptical neighbors soon saw the benefits of the new material, and Milton became noted for its many concrete structures. After Fowler's description of the Goodrich House reached his many readers, a veritable army of experimenters stepped forward. Compared to wood, concrete's economy, promise of absolute permanence (somewhat exaggerated), and ability to withstand fire seemed an attractive alternative indeed.

What Fowler called "gravel" was, in fact, mass (unreinforced) concrete: a mixture of cement, rubble stone, sand, and water. It was poured on-site in narrow bands or courses into vertical wooden forms constructed of short boards. Each course had to be tamped down and allowed to set before the next course could be added, a process that could take many days. When well-made, mass concrete had great compressive strength (the ability to withstand up-and-down pressure) but not much tensile





Only the tabby walls of the 18th-century Horton House on Georgia's Jekyll Island survive. This oyster-shell concrete was common in early coastal settlements of the United States.

were overcome by adding iron or steel to produce *ferro-con-crete* (now called reinforced concrete). After years of slow development, it led the way to enormous factories and warehouses for the new industrial economy.

Still, ferro-concrete clearly had its domestic uses as well. The 1879 William Evans Ward House, known as "Ward's Castle," was the first house in the United States built entirely of reinforced concrete. A machinist and mechanical engineer, Ward methodically tested each component and every process before moving ahead. An entire winter was spent testing the strength of the floor beams, for instance, while further construction awaited the outcome. Ward's deliberate approach no doubt also explains why his new home — with 32"-thick exterior walls and 24" loadbearing partitions, molded on-site with chases for heating flues, water pipes, and gas lines — took two years to complete. This French Second Empire-style "castle" still stands, a tribute to the builder's meticulous attention to detail.

#### Concrete Comes Into Its Own

ALTHOUGH THE POST-CIVIL WAR ERA SAW SOMETHING OF a minor building boom in concrete buildings, especially churches in the 1870s, the major thrust of the concrete housing movement came after 1880 with improvements in reinforcement technology. In the last analysis, it was the poured-

or cast-concrete house that was the real sensation of the home-building business. From about 1900 to 1920, thousands of new single-family homes were built across the country. Many were small homes, but a good number were

> Ward's Castle in Port Chester, New York, (Robert Mook, architect) is a large Second– Empire mansion of 1870 and the first house in the U.S. to use reinforced concrete. Until recently it housed the Museum of Cartoon Art.

> > Photo (left) by Ward Jandl

large suburban or country houses, some nearly mansions.

Fireproofing and permanence continued to be strong selling points. Industrialists looked for inexpensive, durable, low-maintenance, high-safety houses for their workers. In the new suburbs and on country estates, which might be far from the nearest fire station, concrete added safety. Architects the likes of Grosvenor Atterbury of New York and Charles



Close to a castle, Dr. Henry Mercer's huge concrete house and Early American collection at Doylestown, Pennsylvania, was built around 1910 and is now a noted museum.

Dana Morrill of Washington focussed on the problems of providing houses for corporate towns and new subdivisions. Albert Kahn, better known for concrete factories, designed at least one concrete country mansion for a wealthy client, as well as his own concrete home in Detroit.

Publications such as the Atlas Portland Cement Company's Concrete Construction about the Home and Farm (1905) and Radford's Cement Houses (1909) helped average homeowners select house designs suited for concrete. We ought to say right here that it is often hard to tell without deep research whether the homes pictured in these books (or, for that matter, viewed from many a street today) were built entirely of concrete. Almost always identified simply as "cement" or "concrete" houses, they could be variously cement stucco over poured concrete, stucco over wood frame with metal lath, or stucco over structural tile, another innovation.

It is certain, however, that the home of architect W. N. Wight of Westwood, New Jersey, was concrete to the core. The star of *Concrete Construction about the Home and Farm*, it was a blocky Queen Anne house complete with oriels, multiple gables, and porches — all of concrete. It had a foundation of fieldstone set in cement mortar, and first-floor walls of concrete, hand inlaid with 2" pebbles. The book even de-

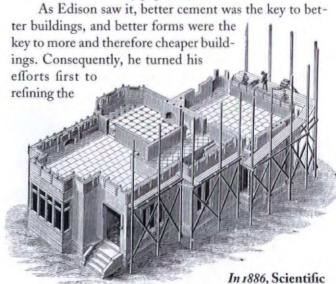
scribed the process for the concrete cladding:

The clapboard effect on the second story was produced by placing 1:1 mortar over the concrete and lining it off to represent wood. The shingles under the eaves [on the upper portion of the gabled front wall] are also of concrete . . . put on in layers before the concrete had set so as to form a bond, one layer being placed over the other.

The interior of the house was concrete throughout, right down to the concrete pantry with concrete shelves.

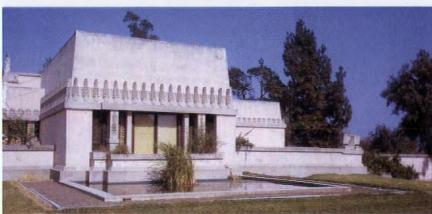
Although he was no architect, perhaps the most prestigious name associated with concrete mass-housing efforts was the famous inventor, Thomas Alva Edison. He was not the first advocate of concrete construction for public housing projects and factory towns, but Edison had an unmatchable knack for putting all the pieces together, and the reputation required to nudge the housing industry toward a more intensive use of concrete. Like many social thinkers and philanthropists of the early 20th century, he was appalled by the overcrowded tenements in which many working-class families lived. To the Wizard of Menlo Park they were "two or three small rooms with poor light, poor air, poor sanitation, accompanied with appalling fire risks and generally unattractive and demoralizing surroundings." Edison was confident that, given efficient production methods and a reliable source of good cement (such as his own highly refined and finely ground portland), a six-room concrete

house could be built for \$300. Edison was a bit too optimistic about the price tag — the final cost was about \$1,200 per unit — but he was on a very popular track.



American reported on mass concrete construction showing Ernest L. Ransome's system of slotted form boards connected by bolts.





Above: Concrete bouses at Nanticoke, Pennsylvania, are illustrated by their architect, Milton Dana Morrill in a 1919 Atlas Portland Cement advertisement. The early years of this century saw large developments of concrete worker houses built by industries, sometimes by the bundreds. Left: In the 1916-20 Hollyhock House in Hollywood, California, Frank Lloyd Wright blended his own style with Mayan architectural design in a concrete medium.

basic material, cement, and ensuring its reliability and low cost. In 1902 he opened his own super-efficient concrete factory in New Village, New Jersey, one of the five largest such enterprises in the country.

Edison's most important innovation in the housing field was the development of reusable interlocking cast-iron molds for casting concrete wall panels. The molds cost \$25,000 per set, but each set could produce 144 houses per year. If they were used often enough, as for large groups of houses in factory towns, they more than paid for themselves. As Edison admitted, it was a simple and not particularly original concept. A number of other people were experimenting with similar forms during the same period. (Grosvenor Atterbury, for one, devised a workable but very heavy system.) Edison found the challenge irresistible, nonetheless. "Someone was bound to do it," he shrugged, "and I thought I might as well be the man." No doubt, this same spirit that later led him to design phonograph cabinets of cast concrete!

Edison's first prototype house design, a two-family dwelling by Horace B. Mann and Perry R. MacNeille in the French Renaissance-Revival style, was elegant but far from an architectural pace-setter when it was unveiled in 1902. As it happened, the design proved impractical for concrete construction and was replaced in 1908 by simpler, more modern designs. However, it wasn't really architecture that the

canny inventor was selling, but rather his new construction method. (Edison's mass-produced housing career is detailed in Ward Jandl's book *Yesterday's Houses of Tomorrow*, 1991.)

Despite a public and press that saw little in the technology to get excited about, Edison's molds were much sought after by builders, who spread the Edison concept of cast-in-place houses across the country. The Lambie Concrete House Corporation, owned by one of Edison's neighbors, erected a number of poured-concrete houses in Montclair, New Jersey, using Edison's molds. They also joined forces with watch manufacturer Charles Ingersoll to build Ingersoll Terrace in Union, New Jersey, in 1917. All eleven of the Ingersoll Terrace houses still exist, but every one has been given new siding.

## Fear of Pouring

among the lay public and even caught the attention of a few architects, but most in the architectural profession were slow to take to the material. While they were willing to concede concrete's usefulness when it was well made, they continued to distrust both its questionable durability and its lack of an easy aesthetic. They found its hard gray surfaces architecturally awkward: cold, sterile, boring — in a word, ugly.

Perhaps, architects accustomed to Beaux-Arts ornamentation and the Arts & Crafts obsession with natural materials found it hard to use this very different material in a way that satisfied the senses. For one thing, compared to wood and marble, concrete just isn't inherently beautiful. In fact, early concrete blocks, still visible in many houses of the early 20th century, were often molded to look as much like rock-faced ashlar stone as possible, though the monotonous shapes of the "stones" give the game away.

For another, they couldn't get beyond thinking of concrete as, at best, a cheap, fireproof substitute for brick and stone or, at worst, a crude imitation of those traditional materials. Granted, it was good enough — by rights, indispensable — for utilitarian uses such as foundations, factories, and warehouses, but warehouses weren't Architecture, were they? Yet, soon after the turn of the 20th century, large, low industrial buildings flaunting long ribbons of concrete and glass sprang up across the nation. These were admired and emulated by European architects, but mostly denigrated by Americans.

To make matters worse, concrete was still an unreliable building material. No national standards for its production and use were developed until after World War I. Even in 1960, writing on the early history of concrete, architectural critic Ada Louise Huxtable noted wryly that it had "earned an unusually bad reputation in a comparatively short span of time." By the 'teens, concrete had become, "a synonym for streaked, cracked, shabby, decaying construction on the wrong side of the tracks and in the wrong part of town," Huxtable pointed out.

When concrete construction was used for stylish residential buildings — and the emphasis on fireproof build-



Based on Orson Fowler's model, this 1854 octagon in Boonton, New Jersey, was built with walls of slag concrete that used waste from the town's iron furnace as aggregate.



This early 20th-century thoroughly fireproof Foursquare in Washington, D.C., features an interior frame and floors of reinforced concrete; walls are load-bearing tile clad with stucco, easier to use than poured concrete.

ings made it inevitable that it would be used frequently, if reluctantly — it was likely to be concealed behind facades of more time-honored materials and designs. The Woodrow Wilson House in Washington, D.C., for instance, hides its blocklike concrete-and-steel skeleton beneath an eminently respectable Georgian-style cloak of face brick and ornamental stone. Sometimes cement stucco was scored to resemble ashlar stone.

#### Concrete in a New Mold

NONETHELESS BEFORE WORLD WAR I SOME well-known architects, including Frank Lloyd Wright, felt obliged to give concrete houses a go. In 1906, Wright had seen the construction of his design for Unity Church, a cast-slab concrete church in Oak Park, Illinois. According to Wright, the church was "the first building in America to be cast complete, ornament and all. . . and to be let alone as Architecture." One of Wright's most successful essays in concrete architecture is the Hollyhock House (1916-1921), designed for Aline Barnsdall in Hollywood, California. The integral cast-concrete frieze of stylized hollyhocks across the facade sets the theme for the house. Of course, Fallingwater (the Kaufmann House), Wright's 1937 masterpiece in Ohiopyle, Pennsylvania, could never have been built or even imagined without the use of reinforced concrete. In spite of the Hollyhock House tour-de-force, however, Wright continued to join in the general sneer at concrete, which he labeled in 1928 as an "inferior" material, a mere "conglomerate" having "neither song nor story."

There were other architects, however, who found concrete not just possible but pleasant to work with. On the West Coast, Irving Gill experimented with concrete from



Designed by J. R. Kennedy, this 1935 concrete house in Silver Spring, Maryland, features ornament precast by the Early process.

the 1910s on (see "Who They Were," Jan/Feb 1992 OHJ). Gill purchased government-surplus forms from a not-toosuccessful project aimed at producing tilt-slab concrete barracks for Spanish-American War troops. The forms were designed to be inclined at 15 degrees by supporting jacks, making it relatively easy to raise the finished wall panels. Gill used his new equipment to good effect in erecting the Banning House in Los Angeles and again on the Women's Club in La Jolla, California, one of his best-known commissions. Later he put the tilt-slab approach to use for a number of low-cost houses in Los Angeles. Unlike Wright, Gill felt that decoration was not an issue; his cubelike houses were satisfying enough without embellishment. "I like the bare honesty of these houses, the childlike frankness and chaste simplicity of them," he wrote in The Craftsman in 1916.

Rudolph M. Schindler, Wright's talented and independent-minded former assistant, also gladly embraced the potential of concrete to make the uncompromisingly flat planes and white surfaces of the International Style. In 1925–26 Schindler used a series of five concrete frames in the shape of squared-off figure-eights to support the weight of the Lovell Beach House in Newport Beach, California.

Perhaps no one addressed the issue of beauty with more wit and flair than John Joseph Earley, a Washington, D.C., stone carver whose work in the 1930s showed the direction cast-concrete housing might have taken. Earley thought of himself as an architectural sculptor, and recognized concrete's potential as a craft and an art form. His building system of small, lightweight, precast concrete panels that could be mounted on a conventional house frame of reinforced concrete threw out no gauntlets to traditional house-building practices, but it did promise to make the results

infinitely lovelier.

Earley's "mosaic concrete" system simulated expensive marble mosaics in churches and other public buildings by using fine, colored, stone aggregates. By the mid 1930s, he had become interested in affordable housing, using his glowing, permanently polychromed panels to produce colorful, offbeat, Art Decoish facades for small houses that would never need painting. In Silver Spring, Maryland, five homes put up to show off the "Earley Process" are as bright today as when they were erected in the mid-1930s. Two are officially named Polychrome House Number One and Polychrome House Number Two, clearly

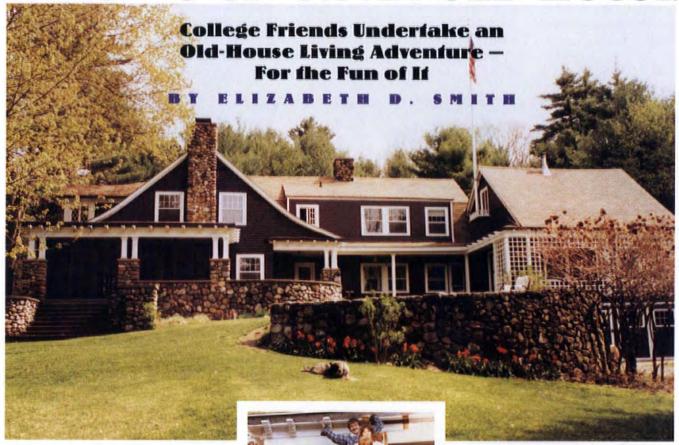
indicating their experimental nature.

Despite the sporadic interest of masters like Wright, Gill, Schindler, and Earley, and the enlightened interest of social reformers, the poured-concrete house never quite made it to the forefront of the housing industry. Perhaps it faced too much opposition from the traditional building crafts, or perhaps it required more imagination than designers, builders, and buyers together could muster. At any rate, despite two-and-a-half millennia of experimentation and high hopes, poured concrete has still hardly made it off the ground floor of residential building.



Rudolph Schindler used massive exposed concrete frames to lift the living area of the 1925-26 Lovell Beach House for privacy and an enhanced view of Newport Beach.

## GANGING UP ON AN OLD HOUSE



IN 1986, WE SEVEN SCHOOLCHUMS DID what many imagine but few try: buy a big, old house and live together, away from parents and landlords. There are, of course, reasons why most people don't choose this arrangement. Will everyone get along? How will the finances work? What if somebody has to leave? Though we discussed most of these questions beforehand, to be honest, the craziness of it all appealed to us.

Renovation work was expected —

after all, this wasn't just a place to live. It was an outlet for our creative energies, and we all felt mysteriously drawn to old houses. We figured to fix the place up and eventually sell it for big bucks. Little did we realize how the endless projects would dominate our residence there. Indeed, the work was almost the only constant The gang's all here (left, from top to bottom): Curt, Karin, Grinnell, Kristen (a visiting friend), Carl, John, Liz, and Mark. The Lyndeborough house (above) had enough room for the seven of us, plus a sweeping, dramatic lawn that led away from the fieldstone porch.

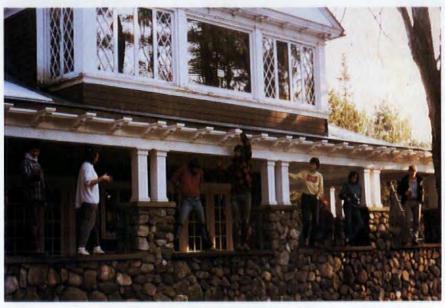
through the next seven years.

This undertaking was planned in detail for months, but the story goes way back. The original group — Mark, Curt, Carl, Grinnell, and John — were part of an informal high school club called "For the Fun of

It" (FFI) in Sudbury, Massachusetts. I became friends with Carl at college and was impressed by the projects FFI always had going as well as by the group's camaraderie, humor, and respect for each other's abilities. A year later, Karin joined the core group, and we began seriously discussing the idea of buying property in

Vermont, perceived to be the land of endless recreational opportunities. As college careers advanced, FFI newsletters flew back and forth with titles like "Vermont: Fact or Fiction?" but the consensus at the time was "too soon."

After college, Mark, Carl, and I were working in Nashua, New Hampshire. We liked the state, but not the condo building where we lived. The idea of "Hotel FFI" was revived, and the rest of the group was ready. Several core principles were agreed upon: keep detailed records of all equity investments; split up the mortgage payment according to each owner's income; vote to sell by a simple majority; and no owner receives a return on the investment until the property is sold (unless the others buy him/her out). We never signed the Charter (our attempt to avoid lawyers). However, we failed to realize that unsigned real estate agreements are not legally enforceable in New Hampshire.



Little did we know when this photo was taken that the support beams below the second-floor master bedroom were rotting.

## A Hot Prospect

IN MID-MARCH, WE TROOPED OUT TO SEE A "HOT PROSPECT" in Lyndeborough, New Hampshire, that had been on the market for two years. The house was a fixer-upper, but we immediately liked its post-Victorian style and generous size. It had five bedrooms and an attached, partially finished barn that could be divided into a bedroom and an office for Curt and Grinnell's robot business. A dramatic lawn (covered by weeds), extensive stonework, and nice woods completed the setting. We were told several towns had charming puritanical ordinances prohibiting the cohabitation of unrelated persons (our agent said not to worry), but Lyndeborough was rural and permitted home occupations. Perfect.

The property was listed for \$179,000, yet on the market a long time, so we offered \$165,000, which was accepted. Such a deal! Hotel FFI was a reality — almost. The minor matter of getting a mortgage for our very untraditional setup was the final hurdle. Surprisingly, a small local lender took the proposal in stride, and the loan was approved.

Meanwhile, we worked on the Charter. The need for a democratic way of handling future issues was obvious. Even with the best of intentions, we realized memories could become selective unless an agreement was put down on paper.

#### Settling In

I'LL NEVER FORGET OUR INVASION OF Lyndeborough, officially started on Memorial Day weekend. Moving seven people's stuff into one house requires organization. So we split into crews for cleaning and moving. Somebody chases snakes out of the yard; another attempts to mow the knee-high grass. We learn which switches operate what lights and eat our pizza dinner sitting on the floor. By the end of the weekend, the place begins to take shape, and we have a home.

After a few weeks, we fall into a routine of work and some play. Relationships within the house are good, but already evolving in ways we don't realize. Getting everybody to agree on common concerns, such as decorating schemes, is difficult. Outside the house, we grow

accustomed to being "those people" who live in "that house." In a small town news spreads quickly, but the locals seem to be rather accepting of the whole plan.

It helps that we rapidly improve the appearance of the property, starting with the landscape. Brush gets cleared, restoring the nice lawn and circular driveway. We decide the flagpole is a top priority, so it is brought down, sanded, and painted. Inside the house, people gravitate towards their particular interests. Old linoleum flooring is ripped up, revealing Arkansas pine, and a poorly installed bathroom in the barn is dismantled. Since the rest of us have full-time jobs, Curt and Grinnell do a great deal of the work as they set up their business in the office.

For an entire summer, we come home in the evenings and work on a project for a few hours. We have big meals together, quickly learning not to discuss house business at dinner because the stop and go of eating leads to misunderstandings. During one of those meals, pieces of asphalt fall past the picture window — a preview of our next problem.

Winter starts early that November with a snowstorm, and heavy snows building up on the roof. An ice dam over the front picture window forces me to go up on the roof using a rope tied to the chimney and chop off as much ice as possible. Other problems in this area include a hole in the porch

roof punched by a falling branch and deteriorating porch beams. Birds nest in a small hole in one beam, which was well on its way to the compost pile. Sitting on stone and wood columns, these beams hold up the master bedroom, so our first big project is born.

As the weather warms, we start stripping shingles off the front roof. We quickly grow blasé about heights, scampering up and down like monkeys. The first layer comes off in a few hours, but the underlying layer — crumbly and full of nails — takes several more days. (Curt's favorite removal method is prying with a flat shovel between the wood and shingles.) The roof, made of a tongue-and-groove lumber not commonly available anymore, is patched with scraps from the barn. Along with roofing, we evict the birds, replace the

rotted beams with 8x8 pressure-treated timbers, and make sure the vertical columns are in good shape. Curt draws a laugh when he carries one into the kitchen and announces, "I column as I see 'em."

In early spring, we decide to improve the parlor. The wallpaper is unattractive but, worst of all, someone had painted the beautiful wainscotting! In one big demolition session, we strip the walls, pull down the ceiling, and shovel debris out a window. We find an earlier ceiling above the latest



A coating of chocolate brown paint with white trim gives the place a "gingerbread house" appearance. The paint job was one of the many home improvement projects Karin (above) and I tackled in the summer of 1990.



Loose shingles, ice dams, and holes punched by branches kept us busy on the roof more than once over the years. Here Curt is working on the first reshingling project.

and remove that too. Live electrical wires tumble down and we begin to joke about the "house within a house."

As with so many projects that get off to a fast start, work stalls. Stripping two layers of paint from the wood proves to be difficult, even using chemicals. The outer brown layer bubbles off fairly easily, but the green paint underneath turns to something resembling guacamole and is more interested in smearing.

In the fall, we get cracking again after I finally discover the tool that pulls paint out of the cracks in the wainscotting — an ordinary screwdriver. I become a woodstripping demon and we roar to completion, hosting a New Year's party with the wallpaper still damp.

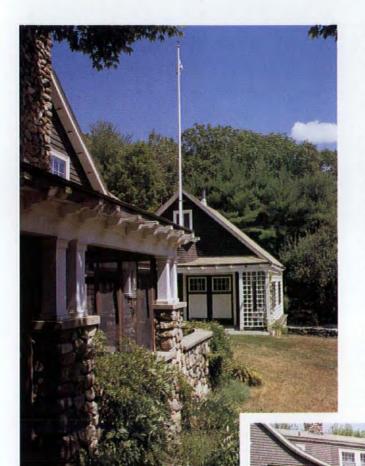
#### Complications

THE YEAR 1988 BRINGS PERSONNEL CHANGES AT HOTEL FFI. Mark and Grinnell move in with their girlfriends, and Curt leaves the robot business for an engineering job with a 140 mile commute. To further complicate things, Grinnell continues to keep the business, which never paid rent, in the house.

We discuss buying out Mark and Grinnell, who want to sell the house, but the negotiations are difficult. Impending marriages have changed their feelings toward the FFI venture, and the group is no longer of one mind. Looking back, it is clear that we considered a buyout for the wrong reason (getting them out of our hair) rather than because they needed the money or we wanted to assume their share. At the time, though, it seemed the right thing to do. We jokingly call the buyout a "home improvement" loan.

To our surprise, we are turned down for a loan. Reason: the house is not marketable, mostly due to the economy. After three years of hard work, it's unwelcome news.

57



The barn (in the background) housed Curt and Grinnell's robot business. The gleaming white flag pole was one of the first projects we tackled. One last photo (right): I relax on the lawn with Tanya, a dog we inherited. The house was sold soon after it was taken.

To resolve the issue, we allow Mark and Grinnell to stop contributing towards the mortgage, and the house residents shoulder the burden themselves. The house won't be put on the market for another year. The two absentee owners are disappointed, but agree to the master plan. However, they may have been right because, as time went on, real estate prices fell while property taxes rose.

In 1989, Curt and Karin are engaged and decide to have their wedding reception on our landscaped lawn. Predicting the impending sale of the house and wanting it to look nice for their wedding, the remaining five owners gear up for more projects. Beginning with the roof, we reshingle all the areas not done earlier. Cool days are a godsend, hot ones a curse, as we make like monkeys again and re-experience the joys of setting tarps during late-night thunderstorms. My term for it is "roofer madness."

The wedding is a memorable day, all right. Hurricane Hugo hits New England and reaches full fury in the middle of the ceremony. The beautiful lawn is turned to mush, driving the reception indoors. It's tight, but the show goes on.

## Breaking Up Is Hard To Do

HARD TO BELIEVE, BUT AS SPRING 1990 APPROACHED, WE were finishing up our fourth year in the house and still thinking about selling it. Karin (with a baby on the way) and I go crazy on home-improvements, tiling a bathroom and painting the exterior of the house. One day I find the master bedroom carpet in a heap on the stairs and Karin pulling tacks out of the wood floor. This innocent beginning grows into a major refinishing project, giving pine floors new life. Downstairs, we discover oak floors buried under wall-to-wall carpet, completely unknown to us all these years.

The property is listed with a real estate agent, and the showings commence quickly. During the first few, I had panic attacks at the thought of someone taking my home. At one point, I was on a ladder and considered dropping a bucket of paint on a potential buyer's head. On a rational level, I knew we needed to sell the house, but on an emotional level I didn't want to leave.

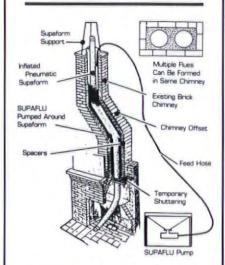
Summer progresses with the added interest of the new family member — Karin's baby, Stephanie — and more changes. The new parents want to get a place of their own, and John decides to move out. With great relief, I devise a fair mortgage system. We drop the income-proportionate idea and start with resident owners paying a flat one-seventh of the mortgage cost. In addition, unoccupied rooms and the apartment are rented. Any shortfall is split seven ways, but credit in the equity records for this

payment varies according to percentage of ownership.

The next three years go quickly, and property values continue to decline. The occasional house meetings highlight our different situations, but also the fact that working together is now second nature. Carl and I perform minor maintenance and hold the place together. A fun fraternity atmosphere prevails; everyone still calls the place "Hotel FFI." As we approach our seventh anniversary, a couple makes a purchase offer that is acceptable to everyone. A final summer bash serves as a farewell, after which we start the long process of disentangling ourselves from the property.

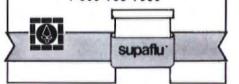
In seven years, we only needed to hire contractors three times for work we could not do ourselves. Instead of being a wreck, the house is a proud example of early-20th-century architecture. It is a point of pride that the group has met the challenge of owning a house together, and each of us carries the indelible memory of a unique time in our lives.

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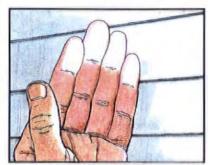


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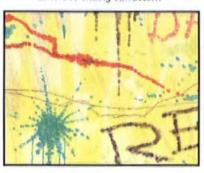
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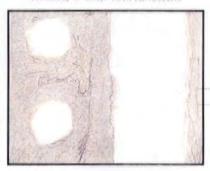
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For the houses shown in this issue, blueprints include:

- Foundation plan for basement or crawl space. (Crawl space plans can easily be adapted for full basements by your builder.)
- Detailed floor plans showing dimensions for framing.
   Some may also have detailed layouts and show the location of electrical and plumbing components.
- Interior elevations are included in some plans, showing interior views of kitchen, bath, fireplace, builtins, and cabinet designs.
- · Building cross sections:

cornice, fireplace, and cabinet sections when needed to help your builder understand major interior details.

- Framing diagrams that show layouts of framing pieces and their locations for roof, first and second floors.
- Energy-saving specs, where noteworthy, are included, such as vapor barriers, insulated sheathing, caulking and foam-sealant areas, batt insulation, and attic exhaust ventilators.

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\$15 each. (2) Mirrorreverse plans are useful when the house would fit the site better "flopped." For this you need one set of mirror-reverse plans for the contractor; but because the reverse plans have backwards lettering and dimensions, all other sets should be ordered rightreading. (3) Heating and air-conditioning layouts are not included. You need a local mechanical contractor to size and locate the proper unit for your specific conditions of climate and site.

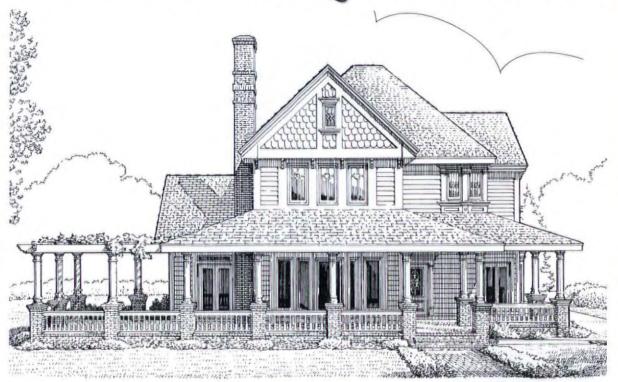
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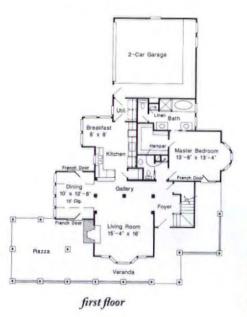
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## FREE CLASSIC QUEEN ANNE





A

SUBTYPE OF THE QUEEN ANNE STYLE, THE FREE CLASSIC QUEEN Anne became common after 1890. Its distinctive features include classical columns as porch supports, palladian windows, and

other classical details. The verandah and piazza make this house ideal for

entertaining. The dining room, with a 13' vaulted ceiling, has French doors that open to both the rear yard and the front verandah. A striking second-storey balcony overlooks the foyer and curved staircase.



second floor

Plan LG-o6-VI	
Cost	.\$230
Set of 5	\$290
Set of 8	.\$330
Bedrooms	4
Bathrooms	.2 1/2
Square Footage	2,213
First floor	1,351
Second floor	862'
Ceiling Height	
First floor	9'
Second floor	9'
Overall Dimensions	
Width	46'8"
Width (w/piazza)	.58'4"
Depth	72'4"
	70

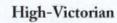
## THREE VICTORIAN GAZEBOS

#### Free Classic Queen Anne

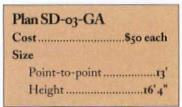




Plan SD-02-GA	
Cost	\$50 each
Size	
Point-to-point	15'
Height	19'

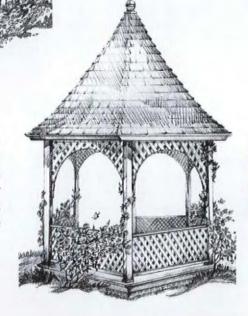


the UNIQUE DECORATIVE columns, patterned shingle roof, and piercework panels of this pretty gazebo would complement just about any Victorian-style house. Even the bench supports inside are shaped decorations.



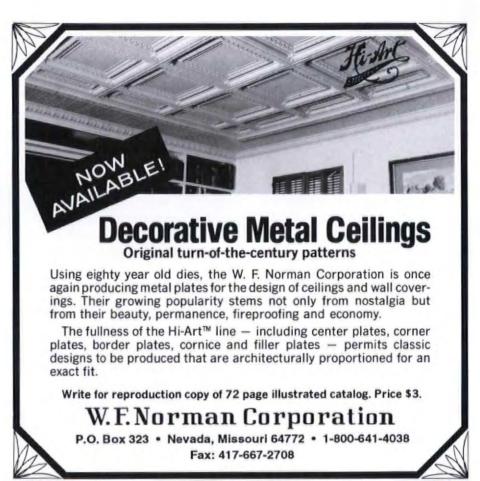
## Latticework Beauty

HIS ELEGANT STRUCTURE with square corner posts and shaped latticework is a perfect accompaniment to a less-fussy Victorian estate. Rosebushes and climbing ivy would look right at home with this classic design.



Plan SD-or-GA	
Cost	\$50 each
Size	
Point-to-point	9'2"
Height	14'9"





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## Old-House Mechanic

## RESTORING HANDSAWS

by Gordon Bock

F YOU'RE LIKE ME, YOU'RE ALways giving a home to orphaned old handsaws, especially when they're free. Though they take some tender loving care, the best pre-1940 saws, such as Disston London Spring Steel saws or Atkins Silver Steel saws, are worth the effort to re-

suscitate. These tools were made with steel that many craftsmen feel produces a keener edge than modern saws, and they resharpen better. They say some saws were so good they didn't make sawdust.

Jointing, setting, and sharpening handsaws is amply covered in carpentry texts, new and old. Information on the more mundane aspects of restoring saws, however, is much harder to track down. After asking around, here's what I've found:

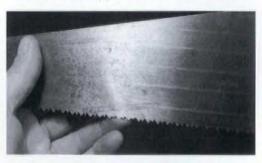
Removing Kinks — Of course, a saw that's well-cared for never gets kinks, but that's no reason to condemn an otherwise good tool that's had a hard life. Mild kinks, the kind that result when the blade pinches while sawing, are often improved by just bending the blade back gen-

tly in the opposite direction or clamping in a vice between blocks. If you believe old saw lore, you can take a small kink or wave out of a saw blade with water. Wade waist-deep into a swimming pool or still pond, then take the blade and slap it flat on the water surface. (Which side of the saw is up isn't mentioned.)

Severe buckles require retensioning the saw. This is the process of stretching and compressing the metal using a sawmaker's or filemaker's cross-peened hammer and a saw tensioning anvil — a 10" x 10" block with a very slightly convex surface. This all-but-lost art is still practiced for maintaining large circular saw blades, and shops that perform this service may also do handsaws.



Clean up handles with turps or mineral spirits (above); finish bare wood with tung oil. Mild kinks (below)may flatten in a cushioned vice.



Removing rust, scale, dirt —

Rust will make a saw drag enough to be unusable, and many old saws are rusty. To remove light rust, rub with lubricating oil and a cloth, wet-or-dry sandpaper, or a Skotchbrite pad. Avoid heavy sanding; it removes metal and scars the surface. Stay away from derusting chemicals, too, because they tend to leave an etched surface on the metal. Some restorers have had good success with glass-bead

blasting, especially where simpler methods fail; others find it mars the blade surface.

The discoloraton on handles is usually a combination of dirt and perspiration that will often improve with a cleaning of turpentine on a soft cloth. If the finish on the handle is be-

yond salvage, strip it with steel wool and chemical remover, then start over (once again, don't sand). Tung oil makes a nice new finish for an old handle that is subtle and takes well to use. Linseed oil was often recommended in the past, but it tends to get gummy with repeated handlings.

Evaluating an old saw — Overall condition means a lot when you're sizing up the prospects of a new-found saw. A little rust at the handle is OK, but be wary of a lot of scale or serious rusting around the teeth. The blade may have lost too much metal, weakening the teeth to the point that several will break if you hit a nail. According to the old-timer's test, a good saw should come back straight after you loop the blade into the handle. What

if the blade breaks? Well, then it wasn't a very good saw.

#### RESOURCES

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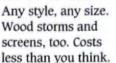
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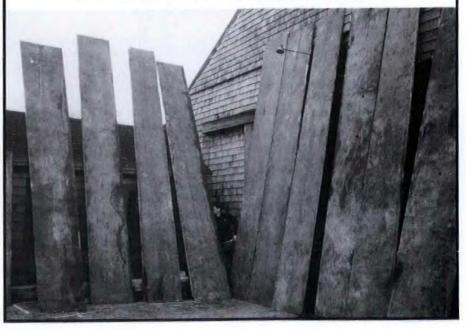


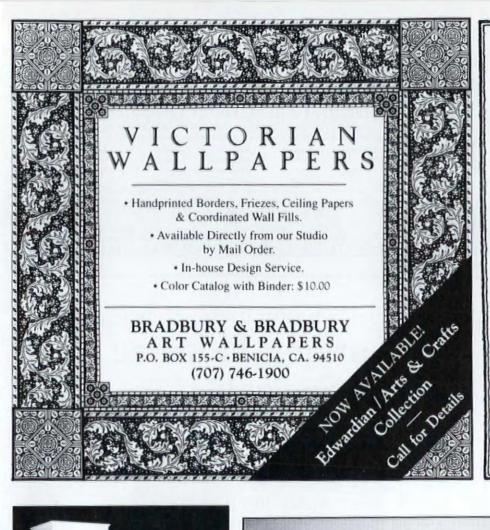
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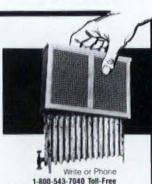
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## Restoration Products

## SETTING UP

by Josh Garskof

ware stores and home centers nationwide for about \$25. For a catalog, write Nu-Pride, a division of Marshalltown Trowel Co., P.O. Box 738, Dept.

OHJ, Marshalltown, IA 50158, or call (515) 753-0127.



The basics of concrete finishing can be found in Marshalltown's all-in-one tool kit.

## **Finishing Touches**

THETHER POURING A SLAB OR replacing an old sidewalk, oldhouse owners tackling a concrete finishing project can now get the basic tools in a single kit. The Marshalltown Trowel Company's Do-It-Yourself Finishing Kit includes a 4" x 14" steel trowel, edger, groover, 5 1/2" pointing trowel, and a 14" wood float - all the standards for creating a smooth surface on freshly poured concrete. It also comes with a handy step-by-step instruction booklet. The set is available at hard-



Finger-molded bandguards make these masonry chisels safer and smoother to use.

### Helping Hands

HISELING AWAY AT OLD BRICK mortar or concrete shouldn't leave gouges in your hands. Mayhew Steel Products' new line of masonry chisels comes with heavy-duty plastic handguards that shield knuckles from misplaced hammer swings and absorb much of the shock that jars the tool with each hammer blow. Mayhew offers 13 tools with handguards, including star drills (for boring holes in concrete), bull-point chisels (for chipping off small pieces of masonry), cold chisels (for cutting metal), floor chisels (for removing floorboards), and standard mason's chisels - which might be a good choice for old-house repointers. They cost between \$9 and \$15, and are available at most major

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## **Sweeping Changes**

THE WOOSTER BRUSH COM-L pany's new line of heavyduty masonry brushes, the "Prep Crew," includes wire and tampico models - both necessities for a repointing project. The thick wire brushes are ideal for clearing away old mortar and dirt from brick and stone before repointing. And when you're brushing away loose dirt, wetting the work-area, or applying masonry coatings, you'll need a lime-resistant tampico brush. These quality brushes are built to last with more

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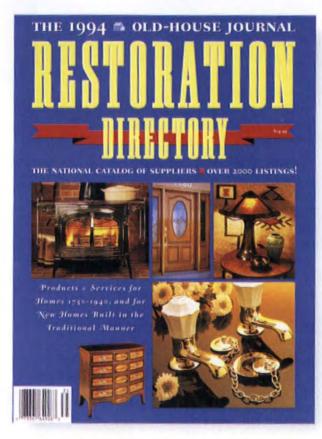
bristles than average, and hard plastic handles that feature modified pistol grips, knuckle-guards, and a wraparound design. Individual brushes retail between \$3 and \$6, and are available at most hardware and paint supply stores. For more information, write the Wooster Brush Company, P.O. Drawer B, Dept. OHJ, Wooster, OH 44691, or call (800) 392-7246.

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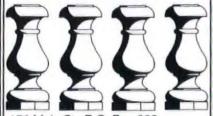
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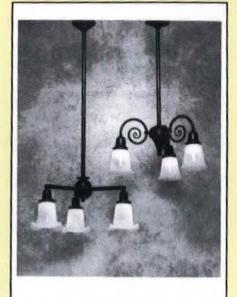


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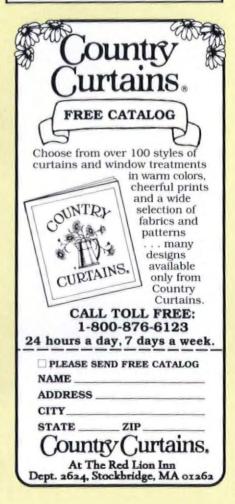


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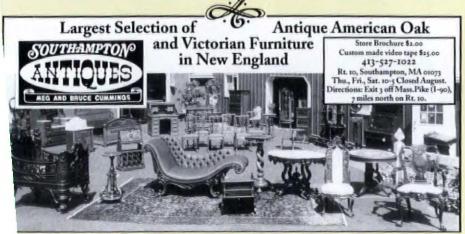
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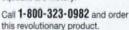


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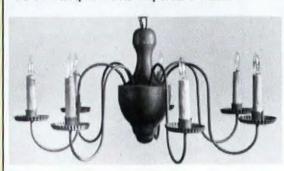
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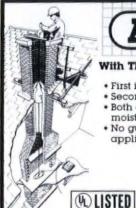
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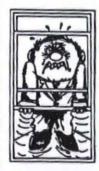
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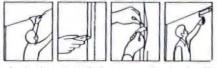




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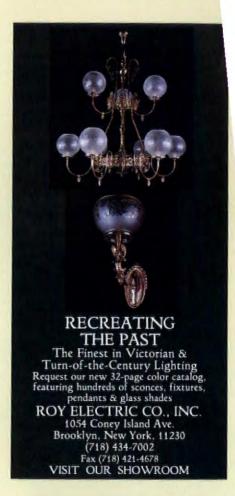
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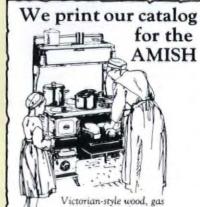
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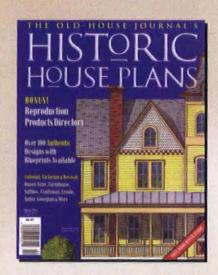
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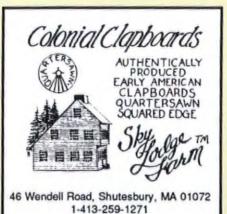
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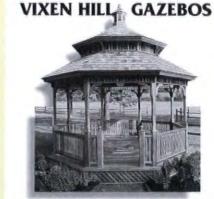




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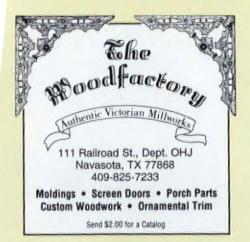


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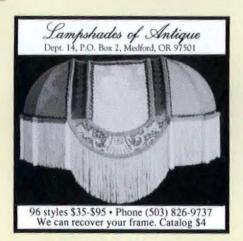
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# Remuddling



## SOUARED

ing, the alterations to this circa 1901 home (bottom) in Yreka, California, seem at right angles to its original design. The house began as a late-Victorian, pyramidal-roof cottage,

with prominent hipped dormers — a structure whose primary visual element was the polygon. A solid-but-basic folk house, it was constructed with common clapboard, and even the columns were simple.

In 1930, the home was squared (top), reportedly by its original builder. Gone now are almost all of the non-90degree angles. The old roof has been done away with (at least visually), creating a rectilinear roof line, except where parapets intersect the two original dormers. Compounding the situation, the parapet on the side of the house has a Mission-like detail — a design element



on a different stylistic plane than the rest of the structure. Stucco covers the second storey, while the downstairs remains clapboarded and essentially free from addition, right down to the columns and latticework. Plus, the windows

> — once nominally placed to set off the two angular dormers — have multiplied and now greatly outnumber those on the first storey. In sum, the protracted addition to this old house appears a bit obtuse.

The pyramidal roof line of this turn-of-the-century house (left) was erased in 1930 (top).



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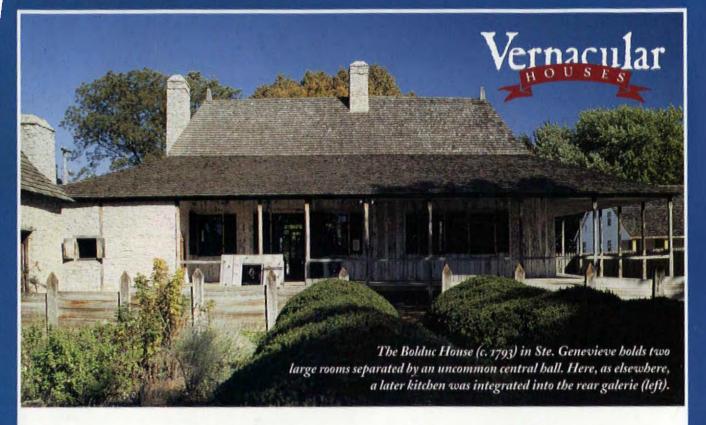
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Valley retained the cultural imprint of France well after its century of political control that followed Marquette and Joliet's 1673 exploration. Surviving evidence of this settlement are several dozen vertical-log houses. Dating from the 1770s to the early 1800s, these houses

are scattered along both sides of the Mississippi, from Saint Louis, to a concentration about sixty miles south near the town of Ste. Genevieve, Missouri.

Vertical-log houses are defined by their characteristic exterior walls made of oak or cedar logs set vertically, 2" to 6" apart. In *poteaux-sur-sole* construction (posts on foundations), the

logs are anchored to sills set on stone foundations; in poteaux-en-terre construction (posts in the ground), the logs are set directly in backfilled earth trenches. Spaces between timbers are filled with bousillage — clay nogging strengthened with straw, twig, or gravel chinking. Both wall faces were

usually whitewashed; interiors were sometimes plastered.

Following the building tradition

of Norman farmhouses and the French West Indies, vertical-log houses have full-width galerie porches both front and back — or on all four sides — with low-pitch roofs that join the steep, hipped main roof. These galeries not only protected whitewashed log walls from rain and sun, but sheltered traffic between rooms since interior hall-ways were very rare. As originally built, most houses had either one or two rooms plus an attic used for storage or sleeping. Limestone fireplaces served each principal room.

The Mississippi has threatened these buildings more than once, and the floods of 1993 severely damaged several along low-lying roads. Emergency levees saved many houses in Ste. Genevieve from the rising water — some by only a few feet.

— OSMUND OVERBY, University of Missouri—Columbia; J. RANDALL COTTON, Philadelphia



Also in Ste. Genevieve, the Guibourd-Valle House (c. 1807) is an example of poteaux-sur-solle construction. Clapboards were a typical later addition.

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