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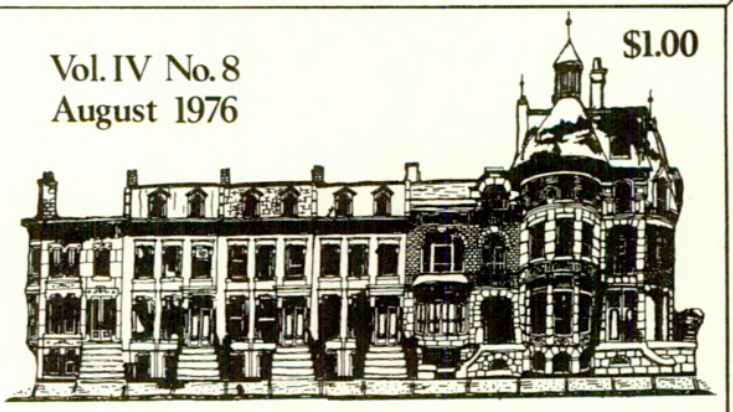


Renovation And Maintenance Ideas For The Antique House

Curing Problems In Double-Hung Windows

In This Issue

19th Century Exterior Colors.....4
Insulation.....7
Reconstructing A Log House.....2
Sawn Wood Ornament.....12
Removing Window Sash.....10

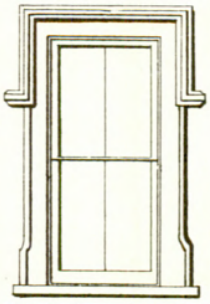
Coming Next Month

RE-CREATING INTERIOR SHUTTERS

DOUBLE-HUNG WINDOWS have been used since the middle of the 18th century. (The term "double-hung" stems from having two sashes able to move up and down independently within the window frame.) The double-hung design has proved very practical and adaptable...capable of surviving many changes in architectural fashions over the years.

EARLY VERSIONS of the double-hung window did not have counterweights to ease operation; they were held in an open position by spring plungers or pins. The addition of the counterweight in the 19th century allowed the sash to balance in any position without requiring any mechanical stops. Some modern replacement windows use spring ballasts instead of weights, but many of these have not proved as reliable and long-lasting as the old counterweight design.

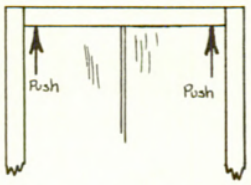
EVEN IF YOU HAVE the old reliable double-hung windows with counterweights, you are sure to encounter problems from time to time. If you have never disassembled a window, the task might seem awesome at first. But once you understand the anatomy, it's not much of a trick.



Sticking Sash

SASHES MAY STICK in their frames because they have been painted shut—or because the wood has swelled during damp weather. In most cases, sashes that stick due to swelling will correct themselves as soon as the weather turns drier. If they continue to stick, more drastic measures will be needed, as described below.

IF PAINT is the cause of sticking, try running the point of a sharp knife between the edge of the sash and the frame. This will break any bridged-over paint film. Then apply steady pressure to the sash near the side rails to work it free. (Pressure at the center may break the sash if it's really stuck.)



HINT: To prevent sash from sticking after painting, run the sash up and down for several days until the paint film has thoroughly dried.

IF FURTHER PRYING is necessary to free up the sash, use a wide-bladed chisel or stiff putty knife. Don't use a screwdriver—it will mar the woodwork. After the sash is freed, if it still is binding use a chisel to scrape excess paint from the parting strip and both stops. With coarse paper, sand edges of the stops and parting strip that have been scraped.

IF THE SASH IS BINDING against the sides of the frame, try pounding the sides of the sash channel with a hammer and block of wood. This frequently will expand the channel a fraction of an inch—sufficient to free up the

(Continued on page 10)

Old-House Living...

Reconstructing A Colorado Log House

By Peter Sanderson

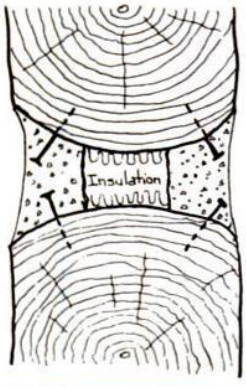
RESTORING OLD RURAL HOUSES is what I do. To take an abandoned shell and create a fine living space which is energy efficient, practical and unique is not only an economically sound concept but an opportunity to recreate something from the past. After spending four years in Santa Fe, I went looking for a house in the mountains of Colorado.

THIS TWO STORY HOUSE is located by a pond in the woods at 9,000 ft. and had been abandoned in the winter of 1932. Forty one years later, I appeared to begin restoration--it was June 6, 1974. The house had no windows or doors but the walls and foundation were solid.

AS WINTER COULD BEGIN in September, I worked 60-hour weeks to get the house enclosed before the snows came. First, I replaced the old roof completely, removing the shingles and rejoisting the framework. I added two 18 sq. ft. skylights to the south. When I began to install the new windows I found that if I plumbed them they looked out of square with the lines of the horizontal logs. So I quickly learned to compromise between the level and the appearance. This "rule" was to hold throughout the job for framing and hanging doors too.

THE WALLS are hand-adzed logs and the chinking seemed to have been of a few different types. Removing the old chinking was an incredibly messy and time consuming job. One of the formulas was so hard that the chisels just bounced off. Once the chinking was removed and the dust swept from the void between the logs, fiberglass insulation was tamped in from both the inside and outside.

AFTER SOME THOUGHT I decided the best place to run my electrical wiring (the house had never had electricity) was under the chinking. All the electrical boxes had to be routed into the logs. Whoever had chinked the house originally had used battens to hold in the chinking which I found esthetically displeasing. I ripped it off and, to anchor the chinking, I ran a series of shingle nails staggered on about 6 in. centers and driven in so that no heads would be above my finished chink line.



THE NEXT PROBLEM was to find a chinking formula that was a pleasant off-white, would

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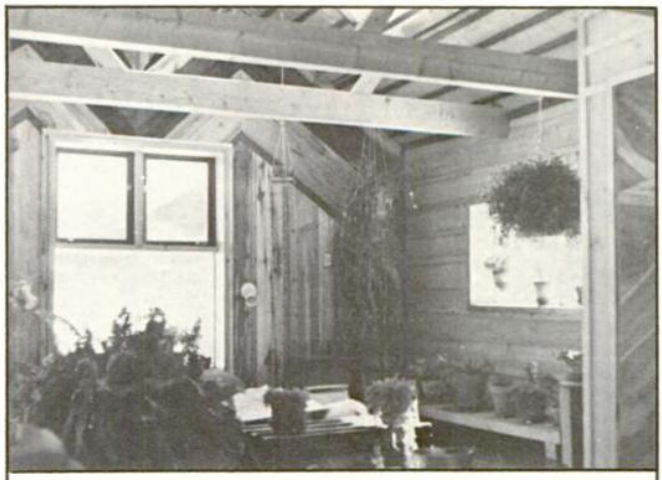
not shrink or crack, would insulate well and yet be plastic enough to allow me to trowel it to a very smooth surface. After talking to a number of "natives" I found one who had a log barn that he had chinked in 1944 and I had to use a crowbar to get a piece out. It seemed to have expanded once placed in the furrow. Quite impressed, I asked him what he'd used but he just smiled and said he wasn't sure. He thought he could remember the ingredients, but not the proportions.

I TOOK A PIECE of his chinking home to experiment with the five ingredients he remembered--sawdust (dry and coarse and tossed through a ¼ in. storm cloth screen); fibered plaster (the off-white shade of the chinking is determined by the proportion of fibered plaster used--cement alone dries a drab gray); masonry sand; masonry cement and portland cement (the cement is needed because plaster alone would be too soft and wouldn't weather well and two cements are needed because portland alone would dry too hard.) This is the formula I finally settled on, but I feel that anyone using it should do their own experiments to find the color and finish they like best. By the shovel:

1 portland cement
3 strained sawdust
4 fibered plaster
2 masonry sand
2 masonry cement

THE INGREDIENTS are dry mixed, half is taken out and water added to the remaining, and mixed to a moist but stiff consistency--stiff enough to maintain its form when forced into the void between the logs. When the chinking is leather-hard it should be retroweled very firmly to make it as smooth as possible. The smoothness makes it more weather-resistant. Inevitably, some will spill onto the log faces. Allow this to dry and then go over the wall, wearing a respirator, with a stiff wire brush. A year and a half later the chinking has not cracked or shrunk more than 1/16 in. I spent a full six weeks chinking the first floor inside and the exterior of the house--a messy but rewarding job.

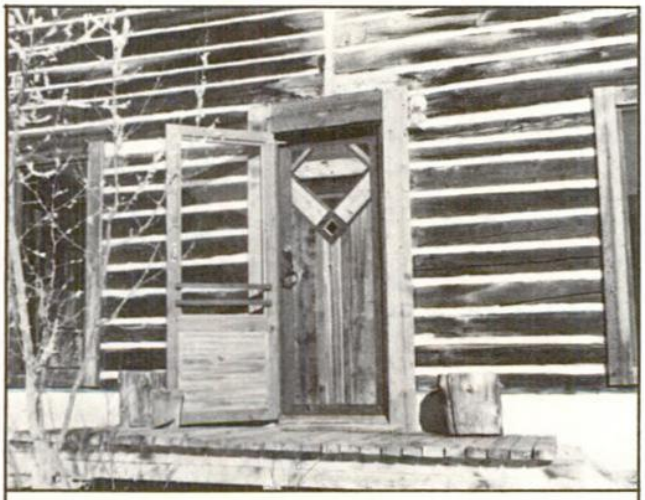


Peter created some interesting panelled effects with "colored wood"--spruce that has been killed by some wood borer, causing it to cure while standing and creating hues from blue to deep red.

THE INTERIOR SECOND FLOOR logs had been painted lime green, so I furred them out and covered them. This made wiring easy and provided me with a chance to do some interesting panellings. I was also able to insulate giving me 12 in. thick walls. The second floor is so tight that the skylights heat it on all but the stormiest winter days and coldest nights. The house is heated with thermostatically controlled wood burning stoves and electric baseboard heaters to use if the house is left empty for more than 24 hrs. Last winter I heated the house with only four cords of wood.

THERE WAS NO CRAWL SPACE under most of the first floor so I had to tear it all up to check the joisting and insulate the floor. After I removed all the animal nests, etc., I found the joisting did need additional supports. A time consuming chore has been fitting the cabinets, door facing and moulding to the log walls.

I HAVE MADE ALL my own doors, windows and cabinets and did all the electrical and plumbing work as well. Doing it alone gives you the sole responsibility for the level of quality and I enjoy not being dependent on some other tradesmen appearing before I can proceed.



The smooth chinking can be seen in this view of the front of the house. Peter made the front door pattern out of varied shades of wood. Almost all the wood used in the restoration is native spruce and pine felled nearby.

Peter Sanderson's full-time occupation is restoring rural dwellings. To discuss a project with him write to: Peter Sanderson, Box 8, Meredith, Colorado 81642.

19th Century House Colors

By Carolyn Flaherty

NEARLY AS MUCH judgment and taste is required to paint the 19th century house appropriately as is needed to design one. Also required is a bit of time and hard work and an understanding of how old houses were painted originally. The 19th century house has all those decorative features because the builder and owner thought them to be beautiful. Therefore, they were painted to call attention to the construction and decoration of the house.

PERHAPS THE MOST IMPORTANT aspect of painting the 19th century house is the selection of a basic color for the body of the house and at least two or three colors for the porch, eaves, window mouldings, etc. Picking out the details is the most neglected area of house painting today. The biggest mistake made in painting the post-Greek Revival house (the Italianate, Gothic Revival, Carpenter Gothic, Queen Anne, bracketed style, etc.) is to paint the house white. White was never used after 1850. There were no "white elephants" in the Victorian Era. Disregarding the various styles of architecture and its carefully planned decoration by making it a big white mass is a 20th century abuse of our architectural heritage.

JUST AS THERE WERE philosophical and cultural reasons why a house was designed in a style resembling an Italian villa or a small castle there were reasons why they were painted in the various shades and colors fashionable from decade to decade.

COLONIAL HOUSES were generally left unpainted until mid-18th century. Barn red (inexpensive because it used iron oxide as pigment) and pumpkin yellow were 18th century favorites, along with white and cream. Window and door mouldings were trimmed in white and doors were generally painted black, red, green or blue. The heavy bars and muntins in the windows were often painted dark to make them appear more slender. Most paint manufacturers have attractive lines of Early American colors from which to choose.

THE GREEK REVIVAL HOUSE (1820-1850) was invariably painted white with green shutters. White was thought to resemble the white marble of the ancient ruins--the inspiration for the Greek Revival style. The Greek style house continued to be popular in the South and West even after mid-century and it was always white even though other colors for other styles were fashionable.

BUT IN THE REST OF THE COUNTRY white went completely out of fashion after the middle of the 19th century. The influential romantic architects Davis and Downing changed the landscape with their designs for Gothic Revival, Italian and Bracketed houses. Their designs were quite different from the box-like Greek Revival and it was important for the effect that they not be painted white.

SO AFTER THREE DECADES of white houses, white was now completely out of fashion. Instead, the colors were light but not bright--gray, cream, fawn--colors that resembled stones found in nature. Shutters and blinds, if any, were painted the darkest green or stained in a wood color.

AS DOMESTIC ARCHITECTURE BECAME larger and more complicated in design in the last quarter of the 19th century exterior paint colors changed again. The late Victorian house (Queen Anne, Eastlake, Mansard, Stick and Shingle, etc.) was painted in darker and more somber hues. Main body colors ranged in the deep earth tones of brick red, dark terra cotta, brown, deep sage or olive green.

THE FASHIONABLE architectural embellishments--wood ornament, gable trim, finials, elaborate porch trim, carefully planned stick and shingle decoration--required that the house be painted in two, three or more colors to articulate these decorations.

THERE WERE ALWAYS REGIONAL variations. Sunny southern and western areas painted in lighter and brighter shades but with same use of two or more colors for decorative details. The South used more white for all styles of houses perhaps because the Greek Revival style remained popular for so long.

THE FOLLOWING COLOR SCHEMES are given as examples for some of the more common 19th century house styles. They all have their basis in historical fact. Some are taken from specifications in old architectural pattern and paint books, some worked out from general theories of architects like Downing.

BECAUSE IT IS QUITE DIFFICULT for two people to discuss color without an actual sample of the color to refer to--and because of the difficulty of doing an article on color in a black and white publication--actual colors are referred to by number from the Pittsburgh Paint line. Pittsburgh Paint was chosen because it is a good quality paint, has a wide variety of colors, and is distributed to a large number of paint stores around the country.

THESE COLOR SCHEMES are meant merely as a guide for the old-house owner who would like to paint a 19th century house in the manner to which it was accustomed in the last century. Substitutions can be freely made. Some of the late Victorian colors, for instance, are difficult for the modern eye and sensibility to like. For example, even though white was rarely used, a white porch is certainly pretty to the contemporary eye.

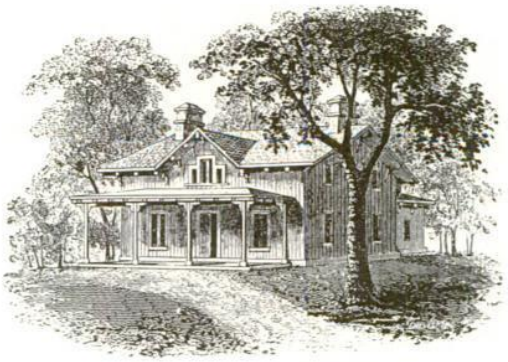
This section of a Gothic Revival cottage designed by Andrew Jackson Downing is a good example of the Victorian manner of painting houses. Architectural decoration is emphasized by the use of light and dark paint. (Photo courtesy of the Dutchess County Planning Commission)

Gothic Revival

Body: A warm gray. (PPG P2634 Gray Morn)
Eaves, porch, window trim: Dark grayish-blue. (PPG Historic Colors - Mayflower Blue)
Blinds: Dark Blue (PPG 1-346 Spanish Blue)

-or-

Body: Drab. (PPG M3609 Wheatland)
Eaves, porch, window trim: Light brown. (PPG D4488 Harvest Tan)
Blinds: Dark brown. (PPG 1-103 Bahama Brown)



Bracketed Farmhouse

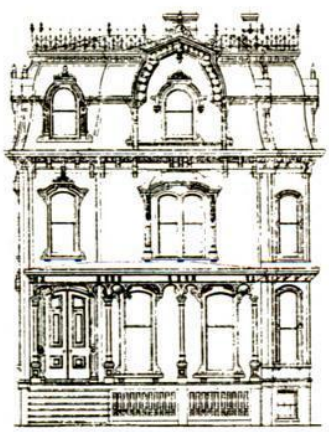
Body: Warm Sage Green. (PPG Historic Colors Soldier Green)
Porch, Brackets, Window Trim: Straw. (PPG 1-91 Salem Yellow)
Shutters and Blinds: Dark Brown. (PPG 1-103 Bahama Brown)

-or-

Body: Fawn, cream. (PPG 1-84 Jersey Cream)
Porch, brackets, window trim: Medium Brown. (PPG 1-344 Seal Brown)
Shutters, Blinds: Dark Green. (PPG 1-341 Copper Verde)

Note: The color combinations for the Gothic Revival and Bracketed farmhouse are appropriate for many styles--Carpenter Gothic, the Bracketed and the wood Italianate--built throughout the Victorian era. A plain house may have no more than a steep gable, a pointed (lancet) window or sawn wood ornament to show its Gothic influence. According to the directions given by the architects these color schemes can be reversed. That is, light trim on a dark body or dark trim on a light body. But shutters and blinds were always very dark and usually the darkest brown or green.

Late 19th Century Styles



Mansard

Body: Maroon (PPG 70-102 New England Red)
Porch, Trim, Cornice: Green. (PPG 1-338 Kentucky Green)
Blinds: Gray. (D4758 Oxford Gray)
Sash: Brown (PPG 1-344 Seal Brown)

-or-

-For Sunny Climes-

Body: Yellowish Beige. (PPG P2271 Old Parchment)
Porch, Trim, Cornice: Tan. (PPG D4487 Light Chocolate)
Blinds: Dark Brown. (PPG 1-344 Seal Brown)
Sash: Same color as body.

Stick Style

Body: Light Sage (PPG M3456 Silver Green)
Cornerboards, Bands, Porch, etc.: Orange-yellow. (PPG M3485 Oakbuff)
Cut-work and chamfered edges: Black (PPG Trim Paint Black)

Italianate

Body: Light grayish-green. (PPG M3336 Fort Pitt)
Porch, cornice, doors and window mouldings: Dark Olive Green. (PPG Historic Colors Soldier Green)
Blinds, moulding strip on cornice, door trim, etc.: Reddish-brown. (PPG 1-95 Rural Red)
Sash: Same as Porch.

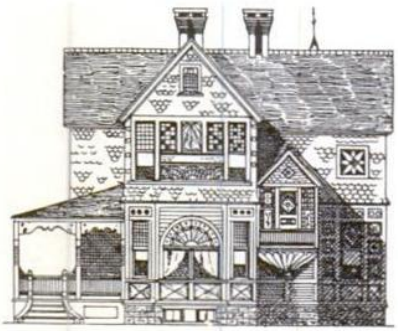
Note: The above color scheme is from the Late Victorian period. But the Italianate house had been popular since mid-century. At that time it was painted in light shades resembling stone (particularly Italian stone) and in sunny areas like San Francisco where it was especially popular, it was always painted in light colors. Here is a lighter version of the Italianate:

Body: Peachy Tan (PPG D3245 Italian Earth)
Porch, Cornice, doors and window mouldings: Cream. (PPG 1-84 Jersey Cream)
Blinds (if any), moulding strip on cornice, porch grilles: Medium Brown (PPG 1-344 Seal Brown)

Stick and Shingle

First Story Body: Maroon. (PPG 70-102 New England Red)
Shingle Work of Second Story: Terra Cotta Red (PPG D4241 Mango Spice)
Panels in Gables: Peachy Tan (D3245 Italian Earth)
Trimmings: Dark Green (PPG 1-341 Copper Verde)
Window Sash: White (PPG White Trim)
Carved Work: Chrome Yellow (PPG D3277 Gold Finch)
Blinds, if any: Green (PPG 70-101 Garden Green)

Shingles: Dark red--stained or painted. (PPG 1-95 Rural Red)
Woodwork: Dark Green (PPG 1-341 Copper Verde)
Panels, Base of Oriel Window: Old Gold (PPG M3270 Gold Leaf)
Sash: White (PPG White Trim)



Queen Anne

THE COLOR COMBINATIONS given here show the variety of shades and hues used on a single house. The scheme for the Queen Anne house is the most unusual, but not for its own time--about 1885. Today's homeowner may not like these specific combinations at all. An alternate color combination can be worked out by staying in the range of colors suggested for the period. The important factor is the use of two or more colors for picking out the details.

IT IS NOT EASY TO GENERALIZE about the delineation of details because the Victorian period encompasses so many different types of decoration. But here is a suggestion: Before you select colors, stand in front of your house and look at it with an eye to what makes your house (or row) look different. That decoration and trim, or anything that might be labeled "unnecessary" today, is what should be painted to call attention to itself. It could be said that an authentic period house painting is comprised of paint, knowledge of precedent, time and a little love.

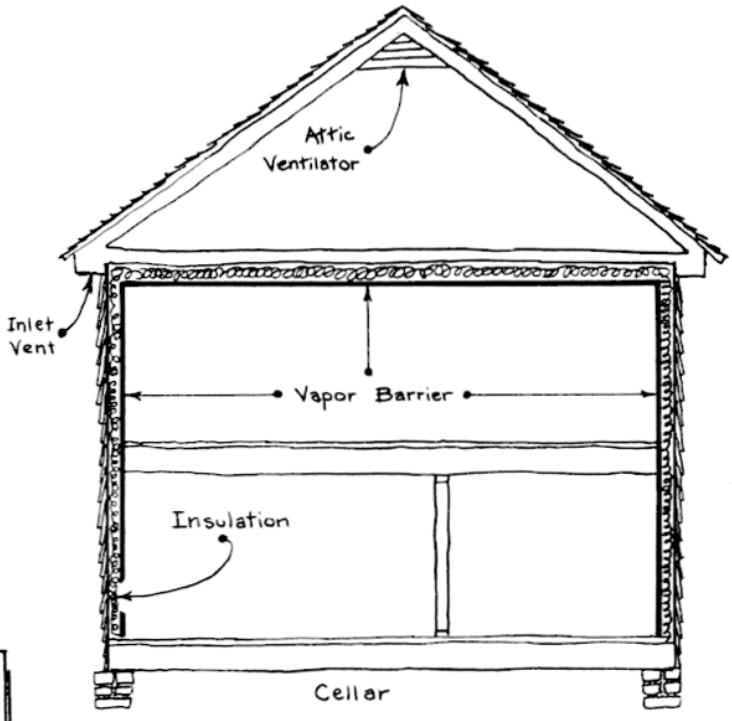
A book that proved helpful for this article is available to the reader. A large, handsome book about Victorian paint colors, "Exterior Decoration" is $35 from the American Life Foundation, Watkins Glen, N. Y. 14891.

Part I

Insulation And The Old House

By William N. Papian, P.E.
Claxton Walker & Associates

Installing insulation in an old house is not a simple task—especially in the walls. A badly done job will cause more problems than no insulation at all. In this article, the author reviews some basic principles. In Part II, he will discuss some problems peculiar to old houses.



Ideal location of vapor barriers, insulation and ventilation in a 2-storey house with full basement.

INSULATION'S JOB is to impede the flow of heat. In cold weather, you want to keep the heat inside; in hot weather you want to keep the heat out. Heat travels in three ways: By conduction, by radiation, and by convection. An effective insulation job takes account of all three.

CONDUCTION—Most heavy, dense materials are good heat conductors, e.g., metal, masonry, etc. Less dense materials, such as wood, are intermediate. Lightweight materials, such as fabrics, foamed plastics, spun fiberglass, etc., are poor conductors.

RADIATION—Heat travels through space, just as light does, by radiation. To block heat radiation, you need only insert an opaque material in the path of the rays. Most building materials—except glass—are opaque to heat radiation.

CONVECTION—Heated fluids, whether gases or liquids, rise and promote general mixing within the fluid. Thus, air convection helps to heat an entire room from a single wall "radiator" or baseboard convector. Convection is reduced by compartmenting and mechanically blocking fluid movement.

Insulation Values

EFFECTIVE HOUSE INSULATION has to do all three things: Conduct poorly, block radiation and reduce convection. For example, fiberglass batting is a good insulation, even though glass is an intermediate conductor. The reason: The air that makes up the greatest volume of the material is about the poorest heat conductor we know. In addition, the several-inch-thick mat is opaque to light and heat radiation. And the great amount of air in the mat is largely blocked and compartmented into tiny volumes so that both internal and pass-through convection is kept very low.

THE FOLLOWING TABLE gives a rough indication of the relative insulation value of some ordinary building materials. You'll see that the best insulator in the table (expanded urethane) has almost 60 times the insulating value of the poorest material in the table (concrete).

	Resistance, R, per inch of thickness
Concrete	0.1
Gypsum Plaster	0.2
Brick	0.2
Wood	1.3
Impregnated Sheathing	2.6
Fiberglass Blanket	3.4
Expanded Urethane	5.9

WITH THESE PRINCIPLES in mind, let's look at some of the commercial materials and methods.

Foamed Plastics

FOAMED PLASTICS are available primarily as boards (Styrofoam, for example). They have the highest insulation values—and are also the most expensive. Because the boards can be neither bent nor stuffed to fill a space tightly, this form is useful primarily in new construction or for fastening to basement walls. The foamed plastics are generally good vapor barriers.

PLASTICS CAN ALSO BE FOAMED in place, a technique advertised for side-wall work in old houses. Polystyrene, polyurethane and urea-formaldehyde resins are all being foamed in place by specialized contractors. Results have been mixed. At one extreme, the foams—applied through holes in the exterior siding or the interior plaster—may leave unfilled cavities. At the other extreme, the foams may burst some walls through loss of control or through swelling. Also, the odor of the urea-formaldehyde resin may persist for some time.

AN ADDITIONAL CAUTIONARY NOTE: Some foamed plastics emit toxic fumes when burning under certain conditions. Before installing any plastic foam insulation, your local fire marshal's opinion should be solicited.

Aluminum Foil

ALUMINUM FOILS function primarily by reflecting radiation. In its simplest form it consists of a single sheet of foil so placed that it drastically reduces incoming or outgoing radiation. Aluminum is, of course, a good conductor, so that if both faces of a sheet touch adjacent surfaces it is no insulator at all. And if its reflective surface gets dirty, its insulating quality is reduced.

MOST COMMON FORM of foil insulation consists of several sheets of aluminum-faced paper separated from each other by short, angled strips of paper, also aluminized. The material comes flattened and rolled. A proper pull across the width of the material causes it to snap open and hold its shape, separating the shiny inside faces. Edge flanges allow for stapling to the studs of exterior walls during construction. A two-space type may yield an insulating value up to R-5. It is also a good vapor barrier when properly installed, is relatively fireproof, and impervious to damage from moisture or vermin. It is limited pretty much to new construction, however.

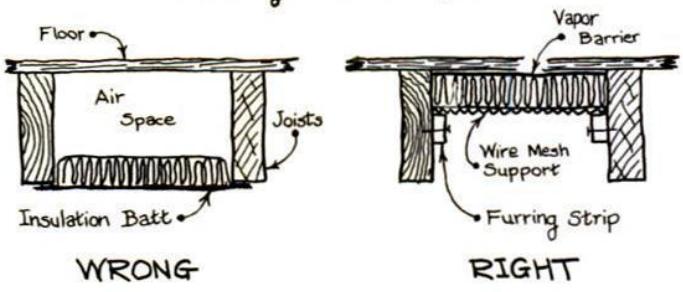
Fiberglass Blankets

FIBERGLASS BLANKETS are available in rolls or batts (4-ft. sections), in two widths (15 or 23 in.) in thicknesses up to 6½ in. There are a variety of facings: Single, double, paper, aluminum foil or unfaced. R values run approximately 3 to 3½ per inch, and the facings provide good vapor barriers. The material can be hung by its flanges between studs, laid or stuffed in place, or wrapped around objects like ducts.

FIBERGLASS rolls or batts are excellent for accessible areas: Attics, crawlspaces, half open walls, etc. Vapor-barrier problems must be kept in mind (see below). And it is wise to staple additonal support under the material if it is placed in the ceilings of crawl spaces or between rafters from below.

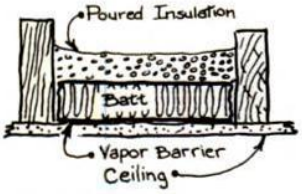
ONE SPECIAL PRECAUTION should be taken with the blanket form of insulation. It should be installed so that gross air movements resulting from infiltrating wind or natural convec-

Insulating A Crawl Space



WRONG RIGHT

tion are effectively blocked. One example occurs when batts are stapled to the bottoms of the joists over a crawl space. This makes a neat-looking installation, but the air space between the batt and the subfloor is bound to cause trouble. There are bound to be leaks around the batting. These leaks will set up convection currents in the air space that will greatly reduce the insulation value.



SIMILAR PRECAUTIONS should be observed in insulating walls and floors. Careful stuffing and fitting is the only answer. For attic floors, additional protection against leaks and convection currents can be provided by adding some poured insulation on top of the fiberglass rolls or batts.

Poured And Blown

AMONG THE INSULATIONS that pour or blow well are expanded mica, spun fiberglass (commonly called blowing wool) and cellulosic fibers. Expanded mica (Vermiculite is one trade name) is not used much for home insulation. Although it handles well, its granularity causes it to dribble out of small holes. It also packs down to a higher density than desired. It is costlier, for a given insulation value, than other types. R values run between 2.5 and 3 per inch.

FIBERGLASS WOOL (and it predecessor, rock or mineral wool) is the most frequently encountered in this class. It is not particularly suited for do-it-yourself application because it comes in a compacted form requiring a truck-mounted machine to shred and blow the stuff. It is fine for attic applications, with the following reservations: It is easily blown around by any wind or drafts in the attic, frequently being found piled back from eaves having soffit ventilation. It clings to shoes

and clothing. Finally, some people have skin and mucous-membrane sensitivities to fiberglass and its dust.

FIBERGLASS WOOL would be a good candidate for blowing into the sidewalls of an old house except for its propensity to catch on nail ends, splinters, etc., leaving serious voids. Blowing wool R values are about 2.25 per inch, a bit lower than batts (although under the right conditions wool will pack more uniformly to give better overall results).

Cellulosic Insulation

OF SPECIAL INTEREST to old-house owners is cellulosic insulation. This consists of short fibers of cellulose (often reclaimed paper) chemically treated to yield a reasonably fire-retardant material that pours or blows very well. Its R value is about 3.7 per inch, and it doesn't hang up unduly on small projections within walls. Although cost is slightly higher than its fiberglass counterpart, in my opinion this is the best material for side wall application in old houses.

CELLULOSIC INSULATION can be blown into side walls by a contractor with blowing equipment. In a typical house, holes 1 in. in dia. are made every 16 in. (to provide access to each between-stud cavity). This has to be repeated for each storey. In addition, fire-stops and between-storey framing may require additional holes. Holes can be made through the interior plaster or exterior siding. If large openings are available due to restoration activities, insulation may be poured in. Of course, it will trickle out if any holes or significant crevices exist below the pouring or blowing levels.

HOLES MADE FOR THE BLOWING NOZZLE are then closed with circular wooden plugs and finished over. It is possible for the adventurous do-it-yourselfer to rent equipment for blowing cellulosic insulation through 1 in. holes.

OF COURSE, pouring (or blowing) cellulosic insulation into between-joist spaces on attic floors is quite simple. It bothers sensitive skins and throats less than fiberglass, and is a bit more likely to stay in place.

MOST OF THE CELLULOSIC INSULATION used in the greater Washington, D.C., area is made by Cellin Manufacturing, P.O. Box 224, Lorton, Va. 22079. The root tradename for their product is "Cellin," followed by a suffix that indicates whether the product is for pouring (Cellin Craft), blowing (Cellin Pac), or spraying (Cellin Spray). Cost to have a contractor blow cellulose insulation into side walls varies from 35 to 75¢ per sq. ft. (depending on complexity of the job) including finishing over of the holes.

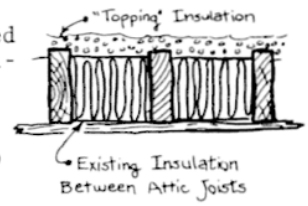
How Much?

BASED ON RECENT STUDIES—taking into account expected future prices—attics can profitably use insulation with total R values in the 20's or 30's. That corresponds to 6 to 8 in. of cellulosic fiber insulation. Side walls and crawl spaces can use half that amount. Pay-back periods (at present interest rates) are only a few years for installing that much insulation in uninsulated areas. Payout is closer to 10 years when doubling existing 1- or 2-in. amounts.

The Condensation Problem

MOST PROBLEMS caused by improperly installed insulation result from an inadequate understanding of condensation mechanics. Peeling paint and serious rot conditions inside the walls may be the consequence... even though the house was perfectly sound before the insulation was put in. A detailed analysis of condensation causes and cures will appear in Part II of this article.

FOR AN UNUSUED and unfloored portion of an attic that already has some insulation, it is usually worth it to add additional insulation if an additional inch or so will provide some modest cover over the floor joists. Wood is an intermediate conductor, and the joists usually account for about 10% of the floor area.



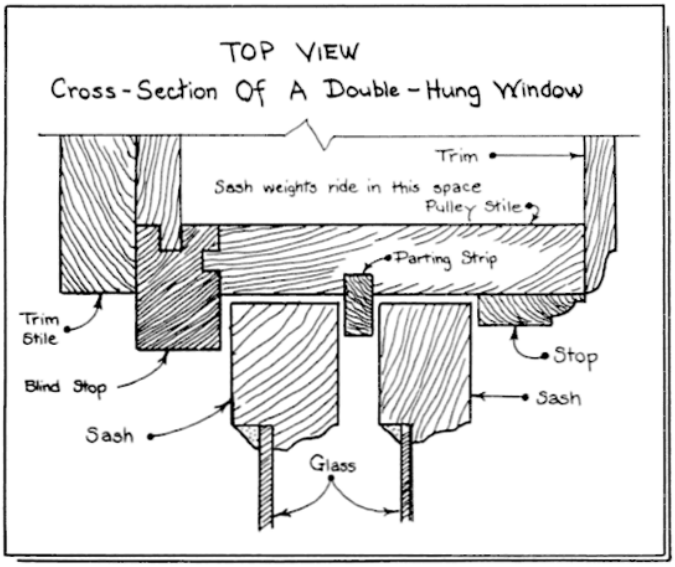
ELECTRICALLY HEATED HOMES can use half again as much inslation as the above figures indicate.

Other Factors

INSULATION may actually be a secondary consideration in an old house that has loose fitting old doors and windows. The amount of heat loss through these apertures is enormous. In these cases, caulking, weather stripping and storm windows and doors may well have the first priority. A dollar invested in these first-line measures usually has a better payout than an insulation job.

ALTHOUGH THIS ARTICLE was written primarily with winter heating in mind, the insulating measures described will also help considerably with summer cooling. ■■

William N. Papian is a registered professional engineer with the home inspection firm of Claxton Walker & Associates in the Washington, D.C., area.



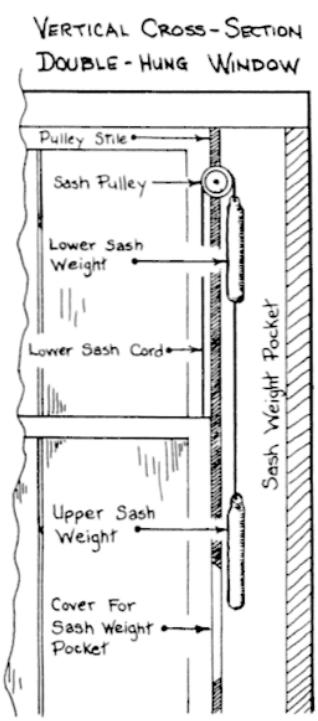
(Windows—Cont'd from p. 1)

sash. As a final touch, lubricate the channel by rubbing with a bar of hard soap. Or use a commercial silicone lubricant.

IF NONE OF THE ABOVE succeeds in freeing the sash, you'll have to remove it (see below) and plane a little off one edge. Before re-installing the sash, coat the planed edge with boiled linseed oil to retard moisture absorption (and resultant swelling).

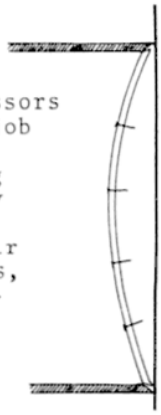
Removing The Sash

SEVERAL REPAIR OPERATIONS require removing the lower sash and, sometimes, the upper sash. First step is to remove the interior stop moulding that bears against the lower sash. Usually, it is necessary to remove only one of the stops.

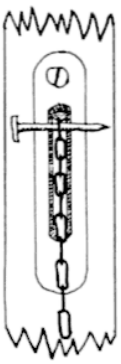


BEGIN by running a razor blade or sharp knife down the crevice between the stop and the inside frame. This breaks the paint film and helps prevent chipping. Loosen the stop by prying with a stiff putty knife or chisel. (If the stop won't budge, it may be held with screws rather than nails. You'll have to locate the screw heads under the paint.)

TO REMOVE THE STOP, you have to bow the moulding sufficiently so that it will clear the mitered corners at top and bottom. This has to be done carefully to avoid breaking the stop moulding. (You may find that the stop is already broken into two pieces because one of your predecessors wasn't sufficiently gentle.) The job is made more difficult if the stop has been nailed with long finishing nails near top and bottom. You may not be able to bend the moulding enough to clear the nails from their holes in the frame. If this occurs, you'll have to remove the nails before the stop will come loose.



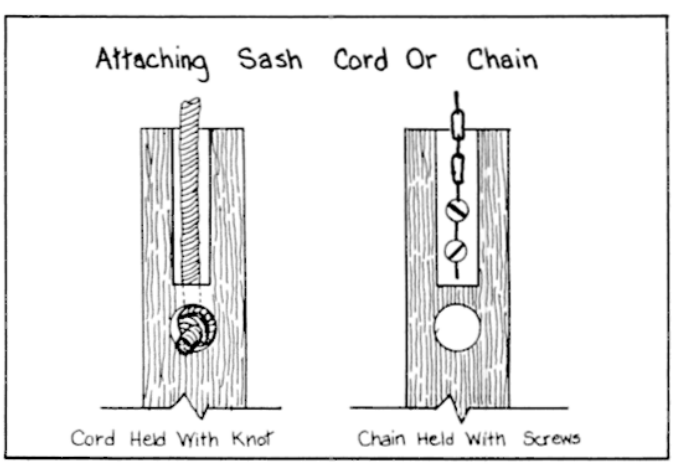
ONCE THE STOP is out, the bottom sash will swing free. If the weights are supported by a sash chain, you can make working with the lower sash easier by immobilizing the sash weight. Pull the weight to the top of the pocket by drawing down on the chain. Then slip a 2" common nail through the topmost link. This also prevents the weight from crashing to the bottom of the pocket when the chain is released from the sash.



ZINC WEATHERSTRIPPING complicates sash removal, since the metal strip will hold the sash in place. The zinc strip is held with small nails, which must be located and removed with screwdriver and pliers. Then sash will swing out as above.

THE SASHES are attached to their counterweights with either chain or sash cord. Cord is usually anchored in place by a knot in a hole bored in the top of the sash. (Sometimes cord is held with nails or wedges.) Chain may be held by nails or screws (screws are preferable) or by a spring twisted through the end of the chain and anchored in the hole in the top of the sash.

TO DETACH THE CORD from the sash, untie the knot—if you want to re-use the cord. However, if there is any sign of wear you might as well replace the cord while you have the window apart. In this instance, just cut the old cord off. (Hold onto the cord while cutting so that the sash weight doesn't smash into the bottom of the pocket.) Chain can be detached by removing the nails, screws or spring that holds it.



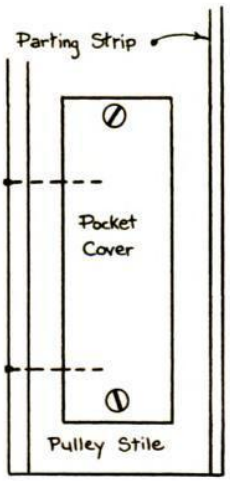
TO REMOVE THE UPPER SASH, take out the parting strip that separates upper and lower sash. Normally, this is just wedged into a groove in the pulley stile and held by friction. But odds are that it is also firmly held by several layers of paint. Cut the paint film by slicing the junction with a razor blade. Pry strip out with a putty knife. If the parting strip should accidentally break, you should be able to get a replacement at the lumber yard.

AFTER THE PARTING STRIP IS OUT, take the upper sash all the way down—and immobilize the sash weight with a nail through the sash chain. The upper sash will now swing free and can be detached as described above.

Replacing Sash Chain & Cord

WHEN A SASH CHAIN or cord is broken the sash will fall when raised because there isn't sufficient counterweight to hold it against gravity. The window has to be taken apart to replace the broken linkage. Chain lasts longer than cord, so it is worthwhile to replace with chain even if the window is currently rigged with cord.

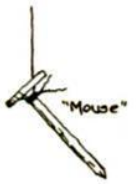
TO REPLACE A BROKEN CHAIN on the lower sash, only the lower sash need be removed. To replace a chain on the upper sash, you have to take out both the lower and upper sashes as described above.



Pocket Cover May Be Held By Nails Driven In From The Side

WITH THE REQUIRED sashes removed, you next have to recover the detached sash weight—which is lying passive and useless at the bottom of its pocket. To do this, you have to locate and open the pocket cover (see diagram on preceding page). Sounds easy, but sometimes the cover is completely hidden by layers of paint. You may have to do a little creative scratching around. In theory, the cover is held in place by one or two screws. But on some old windows, the screw holes have gotten so chewed up that the screws no longer hold. As a result, frustrated householders in years past may have secured the cover with finish nails driven in from the side. If the nails have been countersunk, it may be impossible to pull them without digging up the woodwork. Instead, cut them by inserting a hacksaw blade in the crack between the pocket cover and the pulley stile.

ONCE THE COVER IS OFF, you can fish out the weight and remove the old chain or cord. Simplest way to thread the new chain or cord into place is to use a little helper nicknamed a "mouse." Tie a small nail or screw onto the end of some nylon fishline or similarly strong line. Tie the other end of the line onto the replacement chain. Push the weight over the pulley and feed line into the pocket. When your "mouse" shows up at the pocket cover opening, you can grab the line and pull the chain or cord through.



PASS THE CHAIN THROUGH the hole in the sash weight and hook it with the metal C clip from the old chain (or buy some when you pick up your new sash chain). If you don't have any C clips, wrap the chain securely with copper wire. (Ideal wire for this job can be scavenged from some old pieces of #14 BX cable.) While the weight pocket is open, check it for accumulated debris, protruding nails, etc., that could impede free movement of the weights.

GETTING THE CHAIN the right length is critically important. If too short, the sash won't come all the way down; if too long, you won't be able to raise the sash all the way because the weight will thunk into the bottom of the pocket.

BEST WAY TO GET THE RIGHT LENGTH is to measure the old piece. If for any reason this isn't possible, do the following: Draw the weight all the way to the top of the pocket until it bumps into the pulley. Fix the weight in position with a nail through the chain. Then with the sash in the lowermost position, measure off enough chain so that it can be secured in the sash slot with screws or the old coil spring. Allow yourself about an extra inch.

BEFORE REPLACING the pocket cover and stops, test the sash by moving it up and down to make sure that everything is working smoothly.

WHEN PUTTING BACK THE STOP MOULDING, it is best to pull all the old nails and set new ones in order to give yourself maximum flexibility in getting the proper fit against the lower sash. You want the moulding to be tight enough so that the sash doesn't rattle when the wind blows—yet loose enough to permit smooth movement up and down.

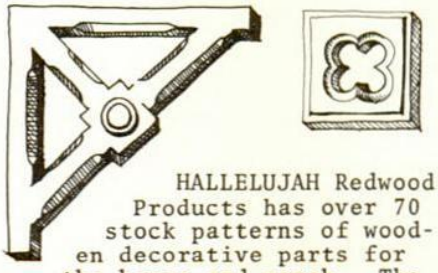
THROUGH TRIAL-AND-ERROR with the sash in both the raised and lowered positions, find the best place for the stop. Then—and only then—secure it in place with 4 or 5 1½" finish nails. It is advisable to re-check for smoothness of operation after each nail is driven. Sometimes the process of pounding the nails home moves the stop just enough to make the sash bind. And don't place nails within 12 in. of the top or bottom of the stop moulding. Or else, as described above, it will make things more difficult for you next time you have to disassemble the window. Perish the thought!! ■■

OTHER COMMON WINDOW PROBLEMS were discussed in these previous articles:

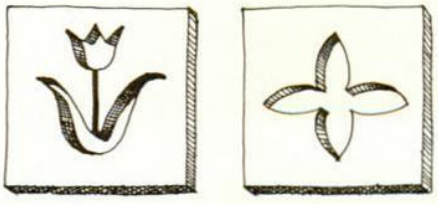
Sealing Leaky Windows	Oct. 1973
Restoring Rotted Sills	Aug. 1974
Repairing Window Sash	Jan. 1976

Products For The Old House

Sawn Wood Ornament



HALLELUJAH Redwood Products has over 70 stock patterns of wooden decorative parts for the house and porch. The patterns include: porch brackets, corbels, applique and mouldings, porch railings, belt course brackets and panels with incised decoration. The catalog is 50¢ and contains prices and shipping instructions. Write to: David Yager, 39500 Comptche Road, Mendocino, California 95460. Telephone: (707) 937-0076.



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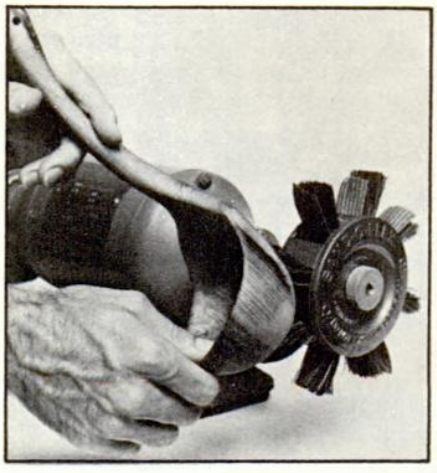
The Sand-O-Flex wheels have brushes behind each abrasive flap to force sanding fingers into the contour of the piece being sanded.



Information on finishing, polishing, grinding and sanding problems is in Merit's free "Sanding Tips" booklet. Write: Merit Abrasive Productions, Inc. Dept. OHJ, 201 W. Manville, Compton, CA 90224.

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