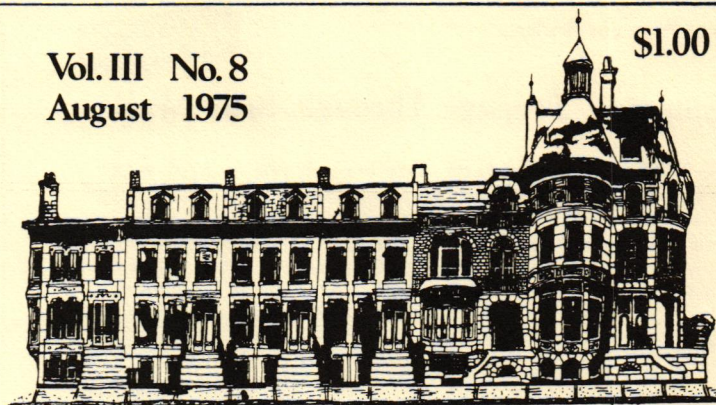


THE OLD-HOUSE JOURNAL

Vol. III No. 8
August 1975

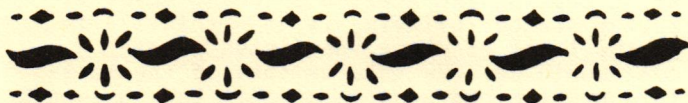
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Renovation And Maintenance Ideas For The Antique House



Paint and Color Restoration



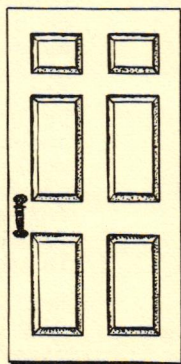
By Frank S. Welsh

WHEN RESTORING AN OLD HOUSE, whether of historical significance or not, the question most often asked by the owner is: "What colors should be used for repainting?" The answer requires some knowledge of the types and colors of paint used in 18th and 19th century architecture.

SIMPLY DEFINED, paint is a liquid consisting of vehicle and pigment, which when applied to a surface dries to become a protective and/or decorative film. White lead, an artificially prepared pigment, has been in use for over 2,000 years.

EARLY PAINTS WERE USED PRIMARILY as a protective coating to retard warp and rot on exterior wooden surfaces. During the Colonial period in North America, the use of good-quality, colorful house paints was limited to the homes of the wealthy. In the late 18th century and into the 19th century, paint raw materials became less expensive. The result was increased architectural usage of paint, with growing interest in its decorative aspects.

PAINTS OF THE 18th and 19th century were either lead-in-oil or water base. The three essential components of 18th century lead-in-oil base paints were: Linseed oil, white lead and coloring pig-



In This Issue

Stopping Brick-Wall Seepage.....	2
Recycling Renaissance in Boise.....	3
Repairing Leaded Glass.....	5
Mending Stone Steps.....	11
Refinishing Supplies.....	12
Early American Wrought Iron.....	12

Coming Next Month

RESTORING VICTORIAN LIGHTING

ments. Linseed oil is a drying oil obtained from flax seeds. After the seeds are washed, they are ground and heated to extract the oil, which is then refined. Walnut or fish oil could also have been used, but linseed was the most popular and successful of the available oils.

PIGMENTS of the 18th and 19th centuries were mainly imported from Europe. The most popular were the umbers and siennas (both burnt and raw), bone black, french ochre, red iron oxide, prussian blue, verdigris and vermilion. The ingredients were mixed by hand. Using plenty of "elbow grease," the painter first ground his dry pigment with oil, using a mortar and pestle. After he had enough white lead paste prepared, he added more oil to thin it; then the coloring pigments were mixed in. Turpentine, a balsam tree distillate, was not used extensively as a paint thinner until the late 18th century. It wasn't until the end of the 19th century that machinery was developed to produce the first "ready-mixed" paints.

MANY TYPES OF WATER BASE paints were known, the cheapest and most extensively used being whitewash. Whitewash is basically a liquid plaster composed of slaked lime and water. Other additives used were salt, glue, sugar, or rice flour, plus anything to give color such as brick dust, charcoal dust,

(Continued on page 8)



Stopping Seepage Through Brick Walls

ED. NOTE: A number of readers have asked what to do about interior plaster applied directly to brick walls when water seepage from outside is damaging the plaster. Two readers have sent in their own solutions. The first, since it involves less interior upset, seems like the one to try first. If that doesn't work, then the second—more drastic—solution would seem to be in order.

To The Editor:

When we bought our old house, there was considerable water damage in the plaster facing the outside walls. The trouble, we soon found, was that the plaster had been applied directly to the bricks of the exterior walls.

We had a few soft spots in the exterior masonry repointed, but that didn't help—especially when there was wind-driven rain beating against the side of the house. After much research in the neighborhood, we finally found a person with a similar vintage house who had finally (after much trial and error) come up with an answer.

The solution: Silicone sealer applied three times more thickly than the directions specify. Our neighbor told us that he had tried silicone sealer applied according to the label and it hadn't done any good. We have had this "three times thicker" coating on the walls for two years now and it seems to have corrected the problem—although we expect to have to re-apply more sealer in another year or two.

Anthony Hanson
Rochester, N.Y.

To The Editor:

Water seepage through one of our exterior brick walls was defying our best efforts to locate and cure the problem. One by one we ruled out water pipes, the roof, downspouts and cracks in the brickwork as sources of the moisture. We finally concluded the water was coming through the bricks themselves. Silicone sealer on the outside gave very little improvement.

Since the problem seemed especially bad on the ground floor, it raised the probability that at least part of the problem was "rising damp"—ground moisture being drawn up through the brickwork by capillary action. We had started to consider nailing furring strips to the wall and building a whole new interior surface, with an air space between the new plaster and the old brick wall. But that seemed like a lot of work—and we hated to lose that additional 6" of space in an already small room.

A workable solution was finally offered by a local mason. It was messy—but it worked. His procedure involved chipping off all the old plaster in the affected area, taking it right down to the brick. He then applied a coating of cement stucco (he used the pre-mixed mortar that comes in bags) about 3/8 in. thick. After letting the coating set for

THE OLD-HOUSE JOURNAL

Published Monthly For People Who Love Old Houses

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Published by The Old-House Journal Co., 199 Berkeley Pl., Brooklyn, N.Y. 11217. Tel. (212) 636-4514. Subscriptions \$12/yr. in U.S. and Canada; \$20/yr. elsewhere. Printed at Royal Offset Co., 34 W. 15 St., NYC 10011. Contents of The Old-House Journal are fully protected by copyright and must not be reproduced in any manner whatsoever without specific permission in writing from The Editor.

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about 30 min., he scratched the surface with an old piece of wire lath to leave the surface rough. The next day, he wet down the first coating and applied a second layer of mortar stucco, bringing it to within 1/8 in. of the level of where the finish plaster coat would be. (He told us that if the moisture problem had been especially bad, he would have used three thinner coats instead of two.)

He roughened the second coat with the wire lath again, and about 24 hours later he applied a finish coat of plaster to the stucco. Although we had to put up with all the plaster dust and mess that this procedure generated, it did eliminate the problem of moisture seepage through the interior plaster.

Patricia Santulli
Philadelphia, Pa.

National Conference on Urban Restoration

THE ST. PAUL HILTON on Sept. 26-29 will be the site of the second national "Back To The City" Conference. This year's conference will focus on conserving the physical character as well as socio-economic diversity of old neighborhoods. Also to be discussed: Effects of public policy on restoration efforts, and the experiences—successful and unsuccessful—of a number of communities throughout the country. Workshops will be offered on the repair and maintenance of historic structures, techniques for making neighborhood associations more effective, and reviving business districts in old areas.

Registration is \$75. Contact Joanna Baymiller, Old Town Restorations, 158 Farrington St., St. Paul, MN 55102. Tel. (612) 224-8134.

RECYCLING RENAISSANCE IN BOISE

By Alan Minskoff

THE LOGAN/TWILEGAR HOUSE is but one example of a recycling renaissance occurring in Boise, Idaho. Ron and Betsy Twilegar live in the large, lovely Queen Anne house painted a soft gray with charcoal gray trim and a black shingle roof.

THIS ASYMMETRICAL AND MYSTERIOUS looking house, that has had fewer than a half-dozen owners, has always been something of a curiosity. At the time it was built, the location, away from the more fashionable Warm Springs Avenue mansions in east Boise, was considered out in the country. In the first decades of the 20th century one could see herds of cattle and sheep pass by the 11th Street residence on their way to graze in the hills to the north.

THE ROOF OF THE HOUSE has three gables that are right angles and one shallow, irregular dormer projects from the roof. A red brick

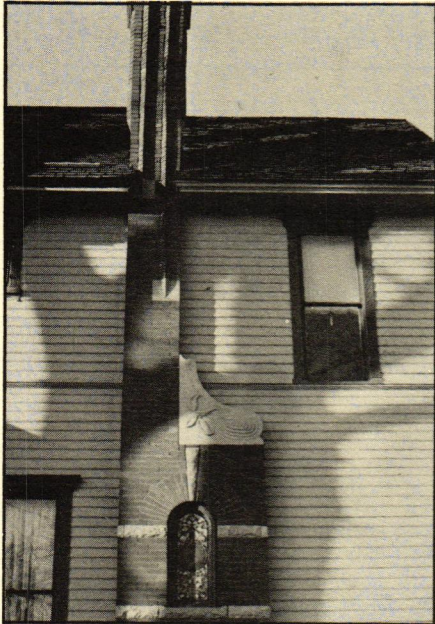


chimney with a leaded glass window inset doglegs up the south side of the house, while a beautiful, long, semi-circular and narrow glass window protrudes off the north side.

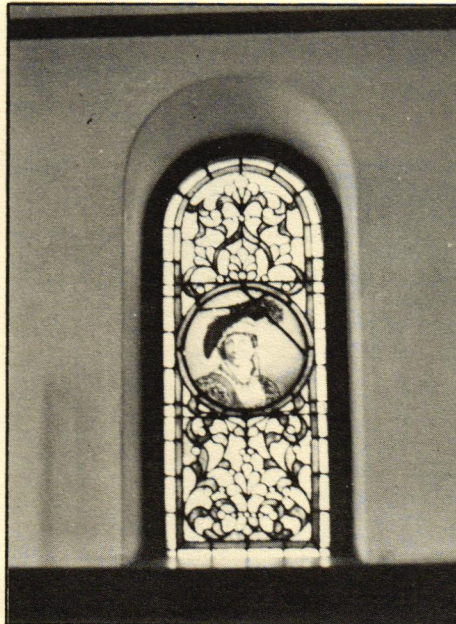
A CLASSICAL PEDIMENT is supported by the white Tuscan columns of the front porch. White fluted pilasters trim the windows and there is a topless turret (actually a round bow) on the south side of the house.

LOGAN, mayor of Boise three times, had the house built in 1892. Eighty three years later the general features of the exterior remain intact. The years have brought some changes to the interior, but thanks to an intelligent and sympathetic restoration, the house reflects its era but has no museum mustiness about it.

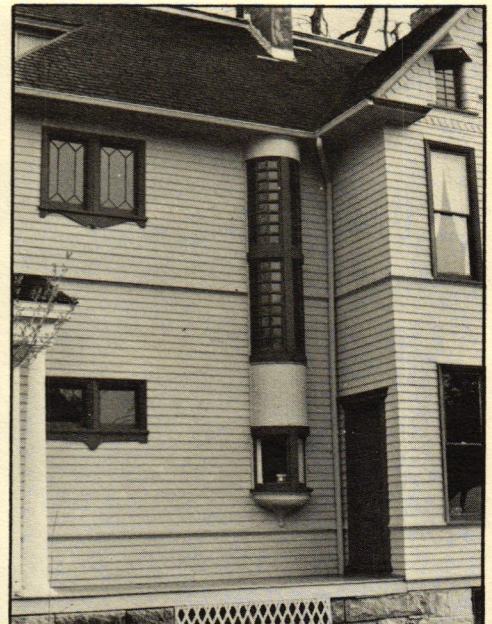
THE TWILEGARS MOVED IN in October 1972, the restoration process has been straightforward.



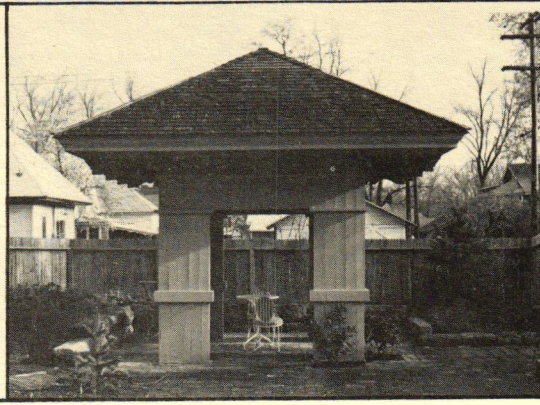
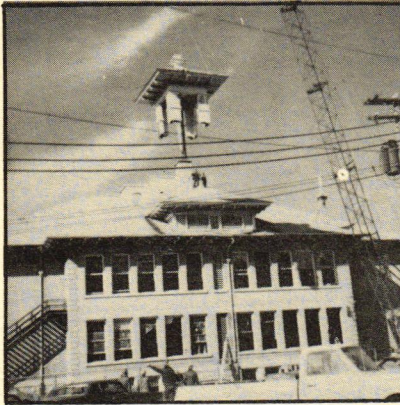
The unusual red brick dogleg chimney has a stained glass inset and a uniquely decorated bracket.



The leaded glass window with stained glass portrait inset as seen from the interior of the house.



The long, semi-circular bow window is original to the house despite its almost modern appearance.



The crane is rescuing the bell tower from the about-to-be-demolished Central School. Enjoying its new lease on life, it is a charming gazebo in the Twilegar backyard.

FOUR MORE HOURS and the bell tower was safely removed from the roof and on its way to the Twilegar's backyard.

RON TWILEGAR is a first term member of the Idaho legislature and is sponsoring the Idaho State Historic Preservation bill.

FORTUNATELY, old building enthusiasts have multiplied over the past five years and Idaho's capital city is seeing many of its finest historic buildings restored and renovated.

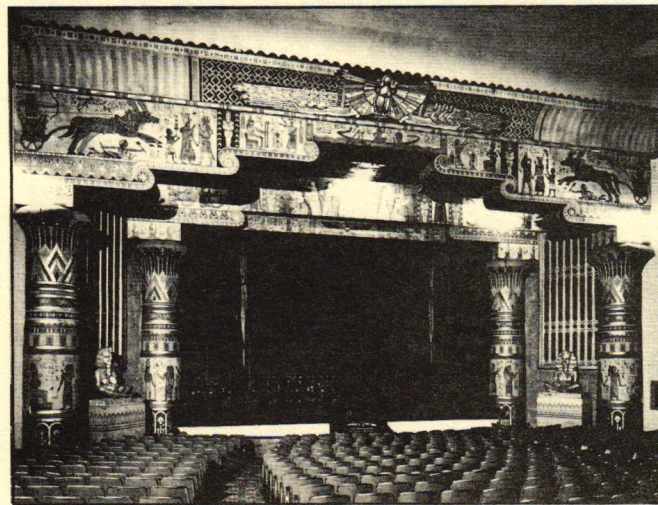
Upstairs oak woodwork and floors were stripped and refinished; walls were patched or sheetrocked. Downstairs a new kitchen was added. A handsome brick fireplace dominates the kitchen and the old chalk railings out of a classroom in the Central School are used as mouldings. The flooring of the back porch was replaced and the backyard landscaped and fenced.

A UNIQUE GAZEBO in the backyard, painted with a black shingle roof to match the house, resembles a cupola—and that is exactly what it is was.

LAST YEAR, when the old Central School was torn down, Ron Twilegar, a native Boisean, inquired if he might save the bell tower. The demolition people gave him 30 hours. The one helicopter in Idaho that he could have rented to the job was unavailable. He had to settle for a 250-foot crane that cost \$50 per hour and took three hours to assemble on site.

UNFORTUNATELY, some of Boise's most historic structures have already been razed by urban renewal. Happily, the 1927 Egyptian Revival Ada Theater, originally called the Egyptian, has been given a one-year reprieve by the Boise Redevelopment Agency. The theater, which had been scheduled for demolition, became the rallying point for local preservationists last year and seems likely to have a secure future.

Alan Minskoff is an ardent preservationist and Editor-in-Chief of a handsome new quarterly publication, "Idaho Heritage." Focusing on preservation, art and history in the Gem State, it will certainly be of interest to like-minded groups. A subscription is \$3.50 for one year and mail should be sent to Idaho Heritage, Inc., 513 N. 13th Street, Boise, Idaho 83702.



The proscenium of the Ada (formerly the Egyptian) theater. A buyer must be found within the year or the building will be destroyed for Urban Renewal.



Cleaning Wicker Furniture

FURNITURE MADE OF wicker, willow or cane add a Victorian flavor to an old house—whether old or contemporary reproductions.

TO CLEAN these kinds of furniture, wash thoroughly with soap and warm water and a small, stiff brush or soft rag. If the piece is placed in the sun to dry it will bleach to a slightly lighter shade. Another way to lighten is to add some household bleach to warm water and apply after cleaning. Let this application remain on the furniture for about a half hour before rinsing.

IF SOME PARTS have come loose or unravelled, thread them back into place and fasten with a waterproof glue. It may be necessary to bind the part in place while the glue sets for a day. You can then polish the furniture with a silicone wax. Older pieces may benefit from a coating of polyurethane varnish to prevent further splitting or breaking.

How To Repair LEADED GLASS

By H. Weber Wilson

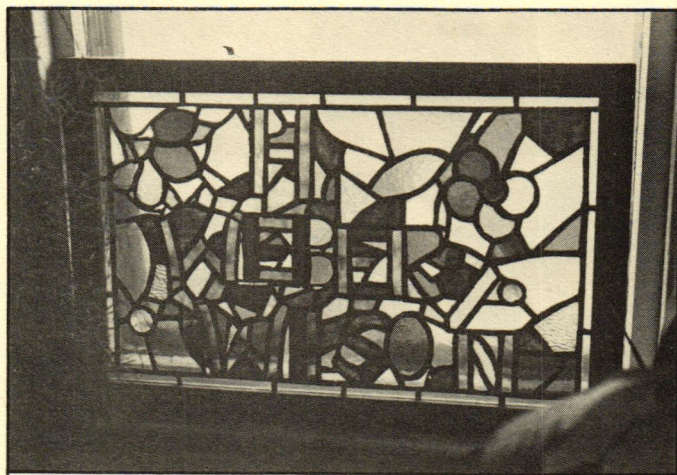
AS AN OLD-HOUSE LOVER, you've seen the difference between a staircase or bay window where there is blazing color instead of just clear plate glass. You may also know the thrill of taking on all the responsibilities of a crumbling yet majestic relic of a house if only because such irreplaceable architectural details are "free" for just the price of the mortgage—and the concomitant improvement bills.

SO IF YOU HAVE LEADED GLASS windows, or you want to acquire more, this article will help you select better quality windows and guide you in the simple repairs that can sometimes turn discards into heirlooms.

NOTE THE USE OF THE WORD "leaded" glass. This is really what antique, residential, colored glass windows are all about. The "stained-glass" most people talk about is actually painting of scenes or words onto glass and then firing the pigment onto the glass. True, the pieces of glass are hand-cut and held together with lead strips called "came," but what the eye is seeing is as much the work of a painter as a glazier.

STAINED GLASS is of course spectacular, especially in religious windows. In domestic architecture, however, stained glass is not found often; what is found is "leaded" glass. This means simply that the window is made of colored glass of different shapes and sizes that is held together by lead came to form a design based solely upon the character and color of the glass.

SPECTACULAR LEADED GLASS windows are a marvel of imagination, design, and construction no longer a natural part of home-building. Old-house owners are now the lucky ones to live with these scenes of

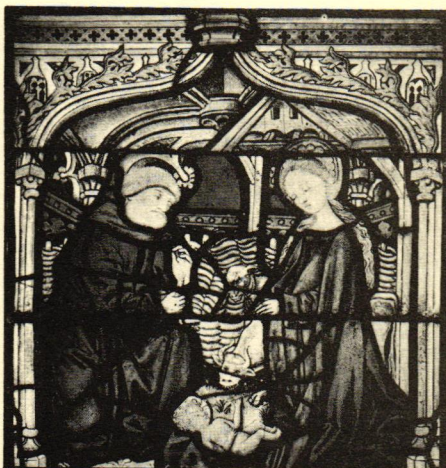


The author made this leaded glass window with his name as part of the design. All the glass was salvaged from broken windows and is held by copper foil and solder.

liquid color that change as the earth moves through the light and shadow of a day. It is an art form that will almost certainly never again be available on the public scale found when eclectic architecture was acceptable and affordable.

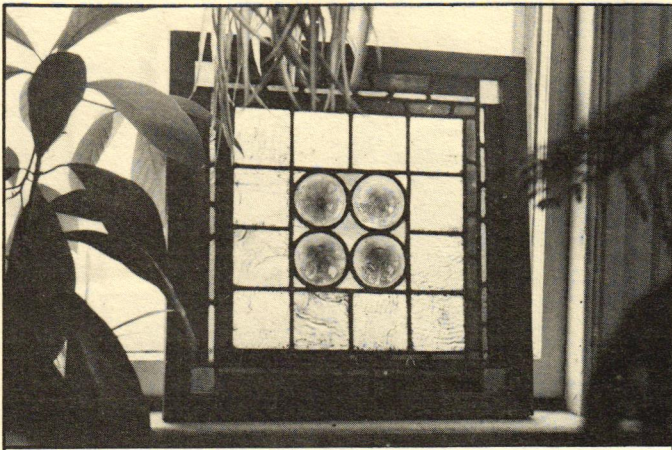
THERE ARE OTHER METHODS of window construction using copper foil or molten lead, but these are found infrequently in houses and so will not be discussed here. As with most art forms, it is helpful to know the components available to and used by the artist in order to better appreciate his work. With leaded glass windows, the keys to appraisal are basically the design employed and the glass itself. Remember that no machine has or will fabricate leaded glass windows—each is the result of a craftsman working with his hands and the skill of his trade.

THE FIRST COMPONENT of a window is the over-all design. But just more color or a busier pattern doesn't elevate it from the "nice" to the "magnificent" category. Look at the shape of the pieces—straight lines are the easiest to cut. Check the curves—the deeper the concave area and the longer and more narrow the section, the more skill that was required. Then notice how all the pieces fit and flow together, especially the tiny pieces that complete the total scene. Even in transom windows, craftsmen worked marvels in creating a work of art out of a simple house number.



THE NATIVITY, ca. 1540. A stained-glass panel assembled with over 60 pieces each having painted lines and shadows. From the Metropolitan Museum of Art.

WHEN APPRAISING LEADED GLASS windows, look also at the glass itself. Look for colors with depth, not just brightness; also notice the little bubbles and imperfections that give good quality glass texture and character.



Rondels are used as the focus of the design in this leaded glass window.

ALMOST EVERY QUALITY window also includes in its design separately formed "jewels" and "rondels" which form the focal points and highlights of the design. Jewels can be smooth or bevelled and while normally round, can be found in many shapes from teardrops to triangles. Rondels are the flat circles of glass that look like bulls-eyes. Other types of focal pieces were incorporated in windows, and it is exciting to discover a new shape or size. Of special interest is the "chunk" of glass that looks like a hewn gem squatting among the flat panes, sometimes as small as a fingernail, sometimes the size of a walnut.

THE LEAD ITSELF was sometimes formed into patterns or special decorative sections were added to give extra dimension to certain portions of the design.

IF YOU OWN LEADED GLASS WINDOWS, or are going to buy some, then you are certainly interested in the question of repairs. Listed below are the main considerations before getting involved with actual repair work.

If your windows are already installed, and they are going to remain in that spot, your last choice should be to remove them for repairs. This can be a complex job, requiring the dismantling of considerable woodwork. And if your window is a real gem, you stand the chance of doing additional damage just from the risks of moving it about.

So read below concerning simple repairs, and try to make do without taking the window out of its frame. Don't worry if there are cracks, loose lead or even large undulations in the surface. If the lead is basically sound (and if it weren't the glass would be falling out), rest easy knowing that the window has made it through 80 or 90 years with a lot less attention than you're going to give it, so it has already proven its basic sturdiness.

If the window has large sections of glass missing, it will have to be removed and should come out with its wooden frame. Study the construction of your window and dismantle as required. If you bought a window needing

repairs, it also probably came with a frame. It is recommended that the leaded glass section be removed from the frame and placed on a large flat surface for working. This greatly improves your ability to handle the window during repairs, especially when you have to put pressure on a part that needs a firm backing.

To get the leaded portion out of the wooden frame, scrape away the putty around the edge. Then locate and remove all the tacks that keep the outside edge of lead secure. Next, carefully unbend the wires holding the iron rod supports and open them up. With all the tacks out and the support rods detached, the glass section should pry easily away from the wood. Handle carefully, but note its basic rigidity, so you don't have to be overly timid in moving the section about.

Before getting into the work, think about getting your supplies together. If you don't require much in the way of glass or lead, you could likely get what you need from one of the glaziers listed in the Yellow Pages under "stained glass." These shops don't always sell to the general public, but if you're a good talker, and you find the right shop, you may get precisely the glass and lead you need plus a lot of additional, expert advice. If you have a lot to purchase, check with hobby shops and the larger glass supply houses. Glass can be found quite easily—except it isn't often you find an exact color match unless you know a friendly old glazier who's been squirrelling away shards for several decades. Insisting on a precise match is each person's decision, and is one good reason to retain as much of the original window as possible.

So get your supplies together, including some 60/40 solder (60% lead and 40% tin) which costs more than other types but is the only type that flows properly. Call around first as it's not readily available. You'll also need some flux and a soldering iron as well as a glass cutting tool—available where you buy the solder.

Lastly, practice your glass cutting on plain plate glass to get the feel of the cutting tool and of "snapping" off the glass. Do straight cuts first, then try curves and following patterns before cutting the actual pieces you will use.

WITH YOUR WINDOW ON THE WORK surface, you can do quite a few repairs easily by yourself. The easiest is to tighten up loose glass. Just force putty into the came next to the glass and it becomes both firm and airtight.

THE SECOND EASIEST REPAIR is to re-solder broken lead joints. First, clean the patina off the lead with a sharp blade or file, exposing the shiny lead for $\frac{1}{2}$ to $\frac{1}{4}$ in. Get the sides as well as the top. Then apply a little flux and a little 60/40 solder, and the joint is just like new, except that it is bright silver instead of weathered gray. Be sure to do both sides.

SOMETIMES LEAD EDGES around the border become

rotted, in which case a new piece of came is required. Using came from other broken windows is often as good as new and helps keep the window from getting that re-built look of shiny strips and blobs.

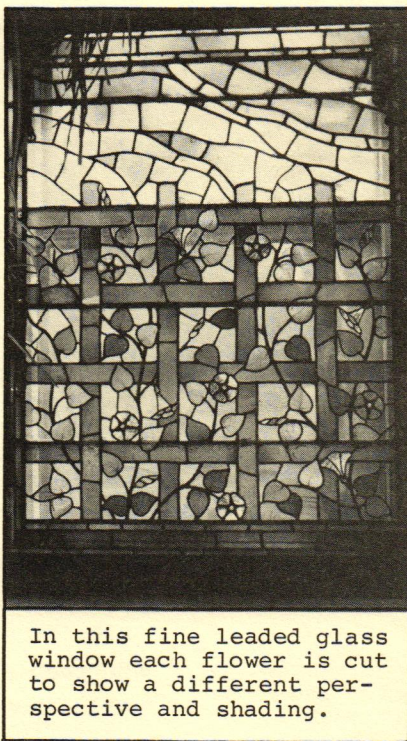
IF THE LEAD WITHIN THE DESIGN needs replacing, then most likely you're in need of a complete reconstruction job. In this case, you have to decide if the window is worth the substantial cost of professional restoring or your time in learning a new craft.

IF THE LEAD IS GOOD, but the glass needs work, then we're into a new area. Again, there are simple and complex repairs, so let's look at the easiest first.

CRACKED GLASS is the most frequently found problem with leaded windows and the best advice here is: Let it be or try one of the simple patches described further on. Think about replacing only lost or shattered pieces.

TO REPLACE A PIECE, first remove all the glass fragments from the section. If only a part of a piece is broken, then leave the portion of solid glass and put in a new lead section but don't solder the ends yet. Next, make a template, allowing for a little extra size to fit into the groove. Don't cut the glass until the lead has been opened and you can test the template in the space.

IF THE REPLACEMENT is to be made near the border of the window (and the window is out of its frame) the easiest method is to open up the came and remove all the glass at least half way around the hole. This is easier than it sounds because the soldered joints melt easily; or you can make new cuts in the lead. The idea is to get the area around the hole flexible enough so that the new piece can be slipped into the opening easily. Each window will be different depending upon the irregularity of the design and the size of the piece to be replaced.

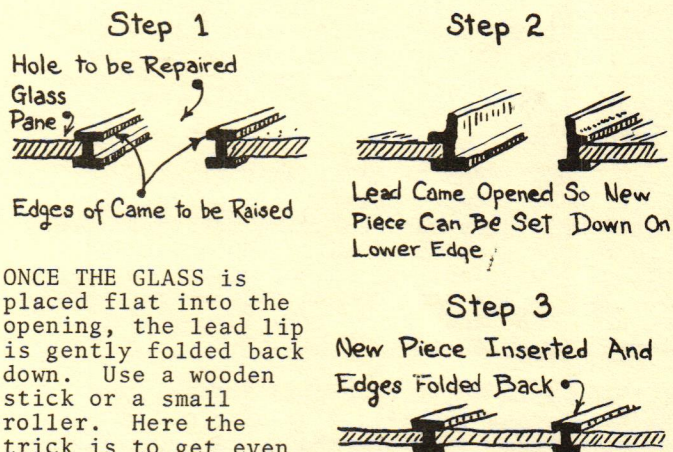


In this fine leaded glass window each flower is cut to show a different perspective and shading.

AFTER THE NEW PIECE is in, replace the other pieces, first having cleaned out the old putty from the channels. Then re-solder and re-putty the lead, remembering to re-solder both sides.

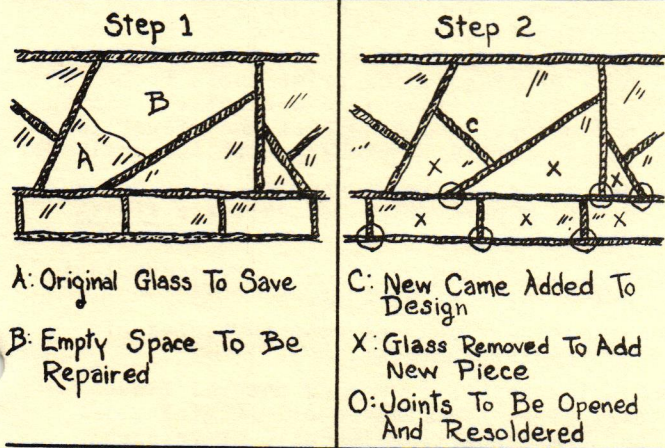
IF THE MISSING PIECE is well inside a complex design, then an alternative solution is possible. This requires a very gentle touch because the narrow lip of lead that holds the glass in place must be raised up all around the space so the replacement piece can be dropped onto the lip below. Pliers or a fat-ended instrument can be used but it takes some skill and patience not to chew up the lead. Also, the solder joints must be nipped so the corners of the new piece will fit into place. Often it is necessary to file or scrape out little protrusions in the lead that keep the new glass from fitting snugly in place. Care must be taken not to apply too much

pressure as adjoining sections might crack.



ONCE THE GLASS is placed flat into the opening, the lead lip is gently folded back down. Use a wooden stick or a small roller. Here the trick is to get even pressure behind the lead; this sometimes takes two people and the window standing upright. Once the edge is back down, re-solder the joints and re-putty as necessary.

Repair Glass By Adding New Came To Design



THESE ARE THE USUAL METHODS of mending leaded glass windows. I have, however, found or heard of a few others, especially for facilitating repairs on windows that are to be kept in their frames. For example, cracked glass can be satisfactorily repaired by using a strong, clear glue such as epoxy. This can hold pieces firmly without additional lead support and is a big help in preserving as much of the original glass and color as possible. The epoxy can even be colored if required to fill up small spaces where white light shines through. A film of epoxy over a small shattered area can also be a lot easier than trying to replace a whole piece.

INSTEAD OF SOLDER, the epoxy metal putties found in hardware stores work well if soldering is difficult. This material will dry dark

like the over-all patina and is also good for filling spaces where the glass and lead have parted and can't be pushed back together.

IF A PIECE OF GLASS MUST be replaced but isn't seated in more than one lead channel, it is possible to cut a new piece and work it into the open space. This isn't easy, but it can be done if care is taken not to put too much pressure on the surrounding area. Then a layer of epoxy putty or solder can be laid over the exposed edges, thereby creating a "false lead" which will serve to cover the gaps and not really be noticed unless it dramatically distracts from the design.

ONCE YOUR LEADED GLASS windows are in good condition, the next step is to display them. Think of them as artwork rather than architectural details set into a certain spot, and

use them as dramatic decorative accessories throughout your house. Just set your leaded glass in front of your present window, resting on the sill or secured to the sash and see what a difference it makes. Then add a few plants around it and above it and you have an art object that will change and mellow every day of the year. Leaded glass windows are also attractive as light screens in a bedroom or bathroom, as room dividers or fireplace screens.

H. Weber Wilson is a dedicated preservationist whose interest in recycled house parts grew from a hobby to a business. He is presently moving to London where he will report on restoration activities in Europe for The Old-House Journal.

(Paint Restoration—cont'd. from page 1)

or yellow ochre. The lime was soaked overnight in a covered container with warm water. The resulting slaked lime was thinned with more water, and any other ingredients were then added. Whitewash was applied with a large, firm horsehair brush. Thickness of the dried whitewash varied from place to place, depending upon the ingredients used and the coarseness of the lime. Whitewash was not limited to plaster and masonry surfaces; many fences, wood beams and partitions also got a coat or two of this liquid plaster.

THE OTHER TYPES OF WATER BASE PAINT are called distemper paints. In these, the hiding pigment and coloring materials are mixed with a vehicle of water and a binding agent of glue size, egg white, casein or vegetable gums. The most common distemper paints were calcimine and casein (the latter also referred to as buttermilk paint).

CALCIMINE is a white or tinted (often blue) wash of whiting (chalk), glue size and water—used especially on plastered surfaces, particularly ceilings. Casein itself is a phosphoprotein produced when milk is curdled by rennet (an enzyme found in calves' stomachs). Casein paints were made by adding curdled milk as a binder to a distemper solution. Besides coloring pigments, such things as berry juice or animal blood could then be added to provide color. It was in these water base paints that most experimentation took place, and most geographical areas had their own recipe, depending upon cost and availability of materials.

Uncovering The Original Colors

COLORS OF THE FIRST PRIME AND FINISH coats of paint applied to a surface are referred to as the Original Paint Colors. If an individual is trying to accurately restore a room or building to its original appearance, then he or she will have to determine what the original paint colors looked like.

WHEN A PROFESSIONAL is researching the original color scheme, the following tools and instruments are used:

- Binocular microscope of 20 to 70 power magnification
- Surgeon's scalpel or X-acto knife
- Illuminating lamp with a variable intensity transformer
- 7 to 10 power magnifying visor
- Chemical solvents
- The Munsell Color Books

THE PROCEDURE BEGINS with the magnifying visor worn on the head, the illuminating lamp in one hand and the surgeon's scalpel in the other. Looking at the illuminated surface with the magnifying visor, the scalpel is used to carefully cut through the accumulated finish coats to determine the approximate number of paint layers. This is done on all surfaces—wood and plaster—and on all areas of: Walls, ceilings, doors, windows, door and window jambs, mouldings, cornices, ceiling medallions, wood corner beads, chair rails, paneling, baseboards, fireplaces, floors, stair treads and risers, balusters and handrails.

ONCE THIS INVESTIGATION IS COMPLETE and a feeling of the "paint history" (layers and colors) has been obtained, then more thorough research follows. Returning to the beginning, small samples (¼" square) are cut out from unobtrusive locations of the areas described above. The samples are placed under a high-magnification microscope so that the nature of the first finish coat can be established. Distinguishing prime coats from finish coats is impossible without the binocular microscope, which enables the viewer to see (while carefully probing with the scalpel):

- Any grease or dirt accumulation on the surface of a paint film indicating a finish coat;
- The lack of any grease or dirt accumulation indicating a prime coat;
- Large hand-ground pigment particles of 18th century paints;
- Glazing layers of either natural linseed oil, pigmented linseed oil (having color but remaining translucent), or varnish;

- An idea of the color of the paint films. (The precise original color is not significant at this point.)

THIS PROCEDURE IS REPEATED until all areas have been researched and the approximate colors of the first finish coats and their locations have been noted.

Accurate Color Matching

TO DETERMINE THE COLOR of the first finish coats with some degree of precision, a relatively large area (1 to 2 sq. in.) of the first coat (and/or second and third coats if desired) must be exposed so the color can be perceived by the naked eye. When it is difficult to scrape manually to expose the finish coat, careful use is made of chemical solvents.

FOR ACCURATE DESCRIPTION OF COLOR, the Munsell System of Color Notation is used. Using a combination of letters and numbers to represent color in terms of Hue, Value, and Chroma, the vague verbal description of color is replaced with a precise notation. The Munsell System of Color Notation is to the sensation of color as the musical scale and notes are to the sensation of music. The Munsell Book of Color* has enabled today's restorationists to research and document historic paint colors with a much higher degree of accuracy than our predecessors.

ALL ARCHITECTURAL PAINTS discolor with age due to yellowing of oil mediums, fading and/or darkening of light-sensitive pigments, air pollution and continuous oxidation reactions. Even when these factors are accounted for by the experienced color analyst through use of instruments (including a spectrophotometer), there will always be a degree of uncertainty and area of tolerance in matching the original paint color to a Munsell Color Notation under standard conditions of illumination.

WHEN ALL SAMPLES HAVE BEEN ANALYZED and all colors accurately matched to a Munsell Color Notation, the professional's research is complete. Findings and conclusions are compiled in a report along with any documented historical reference to the colors in the structure.

A PAINT AND COLOR ANALYSIS can also assist in answering questions about the originality of certain architectural fabric. For example, consider a room in which all wood surfaces have 10 layers of paint with the first finish coat being a moderate blue, except for the closet door, which has only 5 layers of paint with the first finish coat being a yellowish white. Then one may suspect that the closet door is a replacement. (This assumes that there hasn't been any paint removal—a possibility that can be checked out.)

*There are two Munsell Color Books. The Glossy Finish Book contains 1,452 removable color chips and is priced at \$350. The Matte Finish Book contains 1,135 permanently mounted color samples and is priced at \$250. Both are available from Munsell Color Co., 2441 N. Calvert St., Baltimore, MD 21218.

Limits Of Do-It-Yourself Analysis

BECAUSE OF THE GREAT EXPENSE of the instruments used by the restoration professional, the old-house owner is limited in the extent to which he or she can do accurate paint color analysis. When the object is to faithfully restore the original colors, the individual can carefully select, remove and identify (verbally and diagrammatically) samples from representative areas. The samples can then be sent to a paint specialist for an instrument analysis that will determine colors of the prime and finish coats by a Munsell Color Notation.

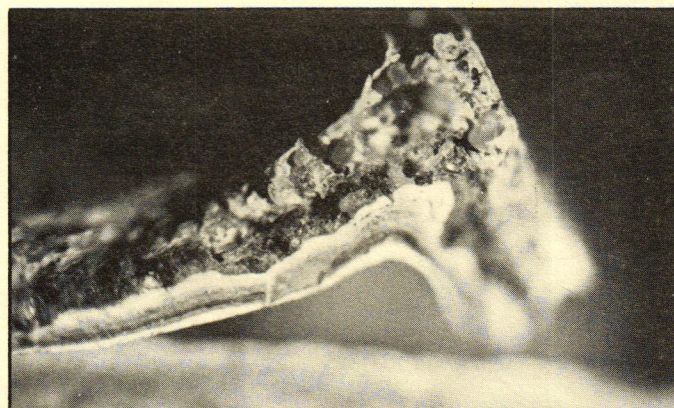
THE HOMEOWNER can start a paint investigation with a magnifying glass and an X-acto knife. Carefully scrape through all layers of paint to get an over-all feeling of the paint history as described above. There are two signs of previous paint stripping: (1) When any architectural fabric, known to be original, has only a few coats of paint on it; (2) When dry, crusty or pock-marked areas of old paint are visible in cracks and corners where a scraper couldn't reach and were therefore painted over.

TO FIND THE BEST POSSIBLE PAINT SAMPLES, look for cracks and corners where wet paint could have dripped and/or accumulated in small globules. This gives the investigator the most to work with. In collecting samples, the old-house owner should also be aware of: (1) The possibility of architectural painting such as marbling, graining, stenciling and hand-painted wall designs; (2) Any evidence of wallpaper should be saved and carefully noted.

SIZE OF SAMPLES sent to a paint consultant can vary from a ¼-in. square chip to a chunk of plaster, a full stair bracket or an exterior clapboard. Remember also that the substrate (the material that the paint lies upon) must always be removed along with the paint layers.

COST OF MAIL-ORDER PAINT ANALYSIS is quite moderate. An old-house owner with 5 to 10 samples to have analyzed would expect to pay less than \$100 for this service.

AFTER PROFESSIONAL ANALYSIS has determined the original colors, the next step is to contact



Binocular microscope shows color and character of layers in a paint sample.

the Munsell Color Co. in Baltimore. They will mail you the color standards specified in the analyst's report.* These color standards (3" x 5" or 6" x 10" in matte or glossy finish) are then used by the painter, paint store or factory as the sample to which the color of the required amount of paint is mixed and matched. The standards are not formulas for any specific type of paint; they are merely color samples.

Repainting

MATERIALS USED IN MAKING A NEW PAINT to reproduce historic colors are guided by several factors. For example, lead-based paints for residential architecture are now prohibited by Federal law. So oil-based paints must be mixed according to modern lead-free formulations. Historic water-base formulations can be reproduced—but generally with much added time and expense. In most cases, present-day water-base (latex) paints are more suitable.

ACCURATE REPRODUCTION of original gloss and texture is also important. For example, don't use a high-gloss enamel if research shows the original has a semi-gloss or flat finish. If you decide to remove all the old paint before repainting, you should leave certain areas untouched to preserve the full paint layering for future reference by other restorationists.

Case History: The Marshalton Inn

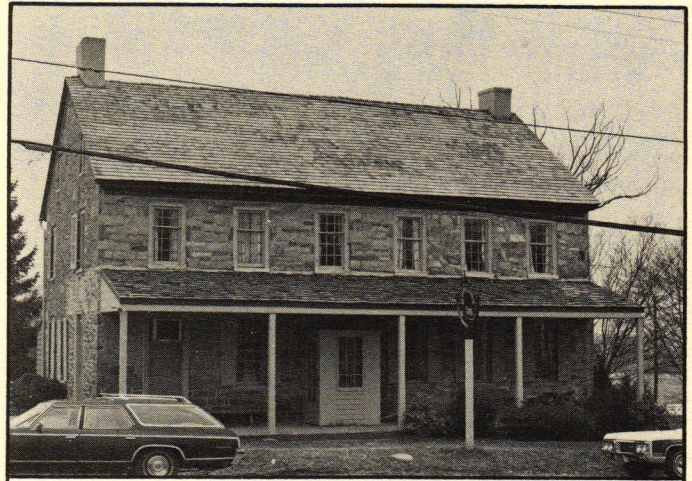
THE MARSHALTON INN, located on the Strasburg Road, just southwest of West Chester, Pa., opened as an inn about 150 years ago. It continues to serve fine food and drink today in the same cheery atmosphere weary travelers found a century and a half ago.

BOTH FOOD AND ATMOSPHERE are due to the efforts of the present owner of the Inn, George Mershon. Mershon is deeply interested in restoration, and so after the reconstruction of the c. 1825 porch on the front of the Inn, there was concern about how it should be painted. Mershon didn't want to just choose an "historical" color from a paint chart. Seeking to determine the original c. 1813 paint colors, Mershon contacted me.

THREE VERY INTERESTING DISCOVERIES were made during the paint analysis. The first was that the original 1790's structure was unpainted. This was determined by examining the original third-floor gable window frames, which were covered and protected from the weather by the construction of an addition in c. 1813. Their exterior surfaces had never been painted.

SECOND IMPORTANT FINDING was that the cornice of the original 1790's structure whose bottom face board has a punched and carved design on it (typical of the Federal period) was copied in c. 1813 and carried across to the new addition. The only clue to the newer copy was a slight difference in the spacing of the

*Munsell charges \$3 for the 3" x 5" samples, \$10 for the 6" x 10", with a \$10 minimum.



Restored exterior of the Marshalton Inn. Reconstructed 1825 porch has been painted in the original 1813 color scheme to harmonize with the rest of the structure.

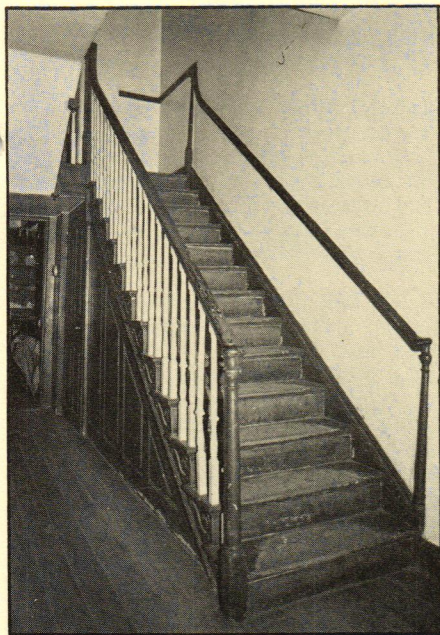
holes. The paint layering on both the older and newer cornice is the same, again indicating the unpainted condition of the original structure.

THE THIRD—AND MOST IMPORTANT—DISCOVERY was that in 1813 there were two colors used simultaneously on the Inn. After all the wood trim was primed with a cream color paint, the windows, shutters and doors were finish painted with a light grayish brown (Munsell: 7.5 YR 6/2). The cornice and bargeboards, however, were repainted a dark reddish brown (Munsell: 2.5 YR 2/4). This color scheme gave the building a striking appearance: The light grayish brown brought out the natural colors of the stone; the dark reddish brown highlighted the cornice and gave the Inn an elevated appearance.

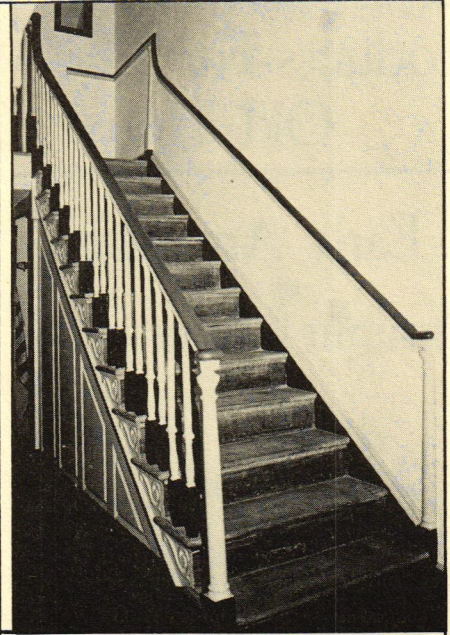
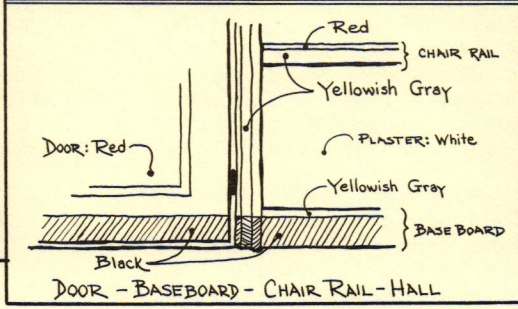
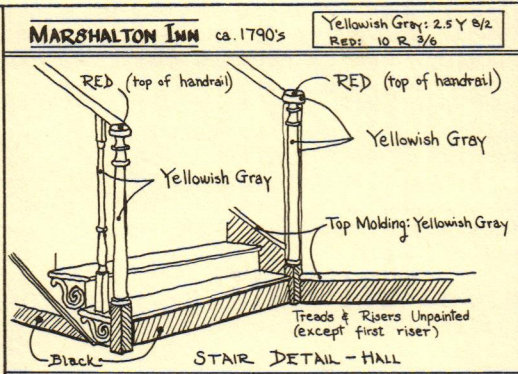
THE RECONSTRUCTED PORCH, however, dated from c. 1825. It presented the problem of how to adapt the two original 1813 colors to this later structure. This was a question of choice, design and aesthetics. It was decided to paint all major surfaces of the porch with the light grayish brown color, using the dark reddish brown only on the bargeboards—to carry the effect of the dark cornice above.

ON THE INTERIOR, the only area that has had its original paint colors researched and restored so far is the center stair hall. Investigation showed that the plaster walls were

Frank S. Welsh is a paint and color consultant specializing in the history of paint, its manufacture, and its use in the restoration of historic architecture. His consulting services include the research of original paint colors, color consulting and the supplying of paint for restoration projects. He was previously associated with the National Park Service in Philadelphia. Any inquiries can be directed to Mr. Welsh at P.O. Box 214, Ardmore, Pennsylvania 19003.



BEFORE



AFTER

Research on the paint layers in the central stair hall at the Marshalton Inn provided the evidence Frank Welsh needed to prepare a detailed diagram showing the original

colors and distribution (center). This information guided the mixing of paints that were then used in repainting the hall in the original manner (right).

originally left unpainted. The wood trim was finish painted with three different colors.

THE COLORS USED AND THEIR DISTRIBUTION in the staircase area are shown in the illustrations

above. The stairs and floor boards were originally unfinished natural wood. Now that the hall has been repainted, its restored appearance presents an authentic 18th century atmosphere that evokes a warm feeling of the past.

Repairing Stone Steps

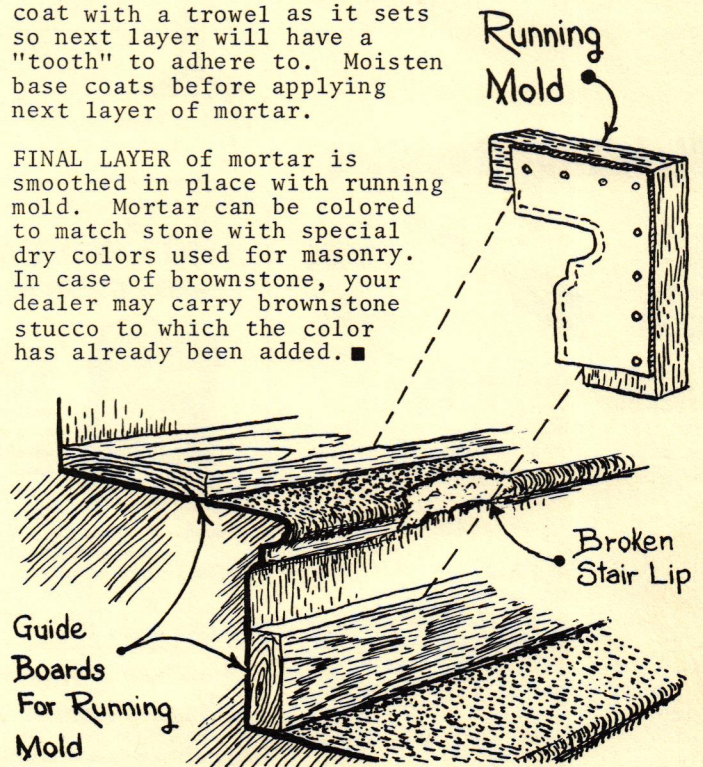
BROKEN STONE STEPS (an especially common problem with brownstone) can be repaired with a running mold—the same technique used in making plaster cornices. (See *The Journal*, Feb. 1974, p. 7.) The first job is to make a metal template to fit the curve (or square edge) of the step. It is cut from sheet metal with snips and smoothed with a file.

NEXT JOB IS TO CUT THE BACKING BLOCK. Select boards that will be used as running guides; these govern the over-all dimensions of the backing. The profile of the metal template should overhang the backing block $\frac{1}{4}$ in.; much more and the mold will chatter when run back and forth.

WHEN THE MOLD IS READY, you can start patching. The hole should be filled with mortar (the type you'd use for bricks) to within $\frac{1}{4}$ in. of the final surface. A latex bonding agent will improve adhesion to the stone. If there is several inches to fill in, use two or more separate coats of mortar, allowing each to set

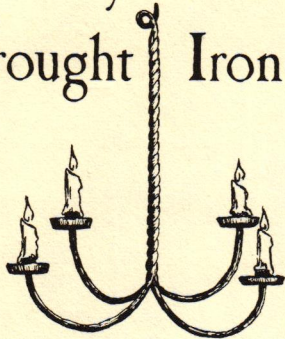
at least 24 hr. Scratch each coat with a trowel as it sets so next layer will have a "tooth" to adhere to. Moisten base coats before applying next layer of mortar.

FINAL LAYER of mortar is smoothed in place with running mold. Mortar can be colored to match stone with special dry colors used for masonry. In case of brownstone, your dealer may carry brownstone stucco to which the color has already been added. ■



Products For The Old House

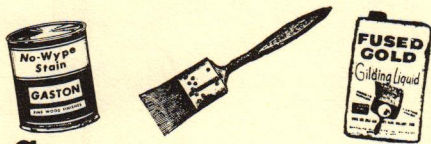
Early American Wrought Iron



STEPHEN WINSLOW PARKER is a blacksmith who forges all his pieces in the authentic 18th century manner. His reproduction pieces include: tall candle stands, chandeliers, shutter latches, strap hinges, door hardware and fireplace accessories. He also reproduces a Shaker Parlor Stove that is completely utilitarian. Finishes are natural, flat black or stove black.

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THEY HAVE 35 sample color panels that have been finished with combinations of stains, waxes and other finishes. The colors include: Natural or brown walnut, light, dark brown or red maple, cherry, distressed pine and antique white.

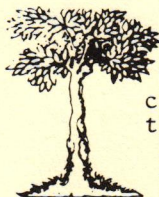
ANY OF THESE PANELS, listed by number and color in the Gaston catalog, can be ordered for 15¢. They are 1 in. x 8 in. and show each step from the natural wood used up through the final rubbing, and come with specifications for each of the products used to obtain the finish—stain, wax, sealer, etc.

ALSO IN THEIR catalog are some special decorating items like lacquer and glazing stain (as mentioned in the article on Graining in the June 1975 issue of The Journal) and powdered and fused gold. Hardware items like locks, keys, doorknobs and drawer pulls are also available.

BECAUSE THEY CARRY everything from the exotic to the mundane (sandpaper, sealer, etc.) the home craftsman can order everything needed for a finishing project.

TO RECEIVE THE Gaston catalog, write to: Terry Thompson, Gaston Wood Finishes, Inc., P. O. Box 1246, Bloomington, Indiana 47401.

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