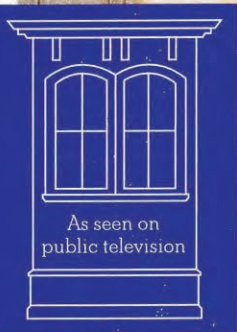


# This Old House

## Renovation IN SAVANNAH

**PLUS:**  
Air Conditioning  
Gutters  
Cordless Drills  
Workbenches  
Plasterwork




Norm Abram with Mills and Marianne Fleming inside their new house, site of this season's TV show.

USA \$3.50 CANADA \$4.50



Walk around to the driver's side of the Plymouth Grand Voyager and you'll find an industry exclusive: an available second sliding door. Now, getting in and out of our



minivan is easier than ever. (So is loading and unloading cargo.) And just wait 'til you see what's behind door number two.  Rear bench seats that

**Where do you find  
the newest thing  
in a minivan?**

**Second door  
on the right.**




glide on wheels, making them a cinch to move and roll away. We call them Easy Out Roller Seats,<sup>™</sup> and they're another industry exclusive. And depending on which seating package you choose, both bench seats now fold flat,<sup>\*</sup> allowing you to carry a



4' x 8' sheet of plywood with the seats in and the liftgate closed.  Front cup holders

\*Excludes base models. †Always wear your seat belt. Big Gulp® is a registered trademark of The Southland Corporation.

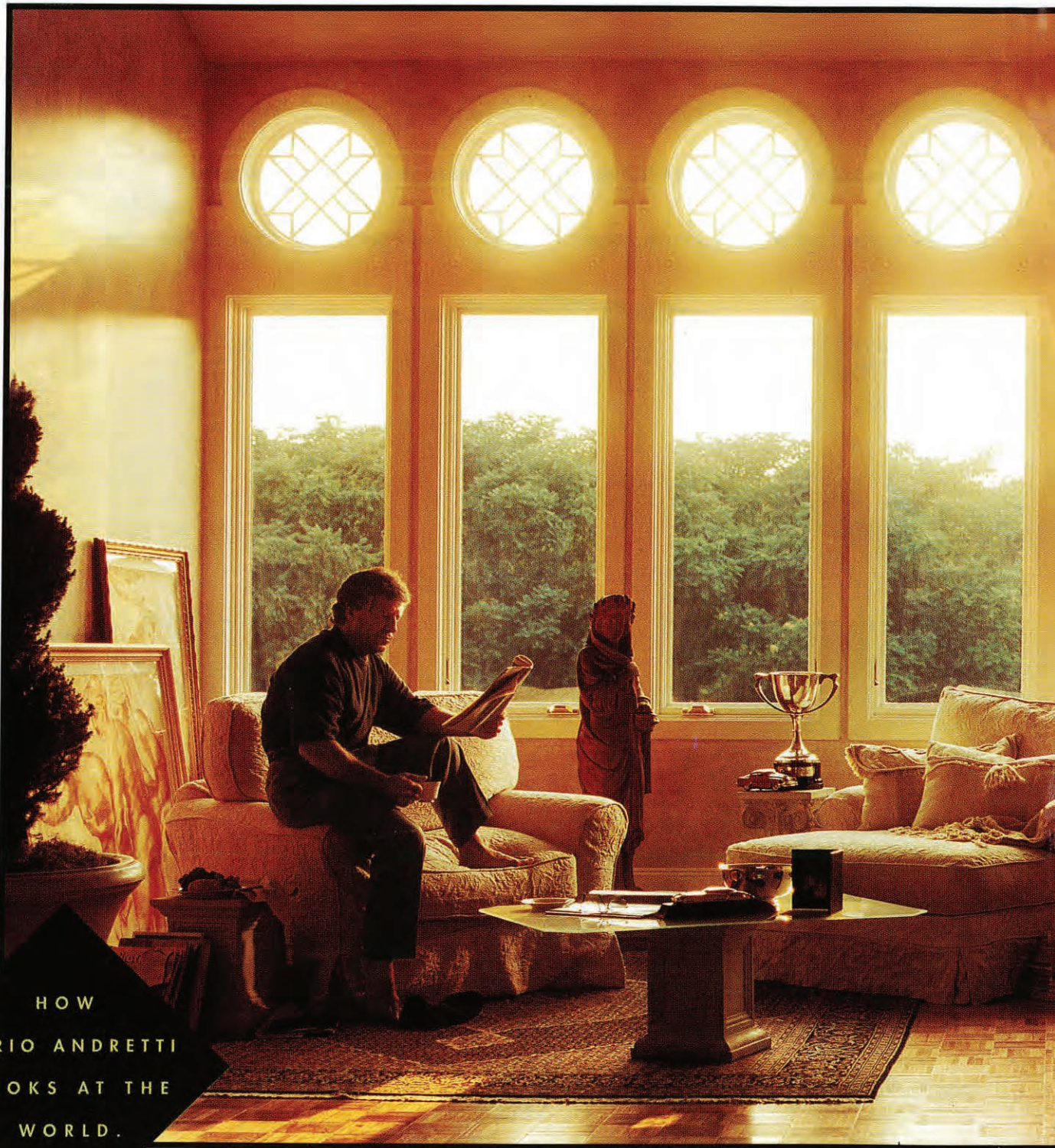
adjust to accommodate everything from a four-ounce baby bottle to a full one-liter jug—another...well, you get the picture. Simply put, the new Grand Voyager is the next generation of the minivan.  All of which says nothing of Grand Voyager's long list of safety features. Like dual air bags,<sup>†</sup> four-wheel anti-lock brakes\* and available dual integrated child safety seats. The all-new Plymouth Grand Voyager. Maybe the



**Plymouth Grand Voyager**

question really isn't what's new—but what isn't?  For more information, see your local Chrysler and Plymouth dealer,  call 1-800-PLYMOUTH, or visit Plymouth Place™ on the Internet's World Wide Web at <http://www.plymouthcars.com>.

**One clever idea after another.**  **That's Plymouth.**



HOW  
MARIO ANDRETTI  
LOOKS AT THE  
WORLD.

*The first time he got behind the wheel of a race car, he won. And Mario Andretti never slowed down. He won the Daytona 500 in 1967. The Indianapolis 500 in 1969. The Formula One World Championship in 1978. In his 36-year career, he has driven nearly*



*every race car there is to drive and won nearly every title there is to win. So when he began looking at windows for the new home he was building in Nazareth, Pennsylvania, second best was not an option. He went with the company that is just as versatile,*



*just as driven to perfection as he is. Mario Andretti chose Marvin. If you want the windows and doors in your home to reflect your unique sense of style and taste, call 1-800-346-5128 (1-800-263-6161 in Canada) or mail the coupon for a free brochure.*

*Complete and mail to: Marvin Windows & Doors, Warroad, MN 56763.*

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Zip \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_\_



1049603A

*Made to order. Made for you.*

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MARCH/APRIL



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**1 PAUL ENGSTROM** (author, "Japanese Saws") is a former editor and reporter for the *San Jose Mercury News* who now freelances out of San Francisco and edits a monthly newsletter about medical uses of the Internet. He spends his spare time renovating the 1948 Marina-style home where he lives with his wife and two growing children.

**2 SIMON WATSON** (photographer, "Ornamental Plaster"), originally from Ireland, works out of New York City. His photographs have appeared in *Travel & Leisure*, *George* and *Metropolitan Home*.

**3 NATHANIEL READE** (author, "Building a Driftwood Boat-house") has written for such publications as *Yankee*, *GQ*, *Men's Journal* and *New England*

*Monthly*. His home renovation experience includes a stressful rehabilitation project on a dilapidated Victorian in Providence, Rhode Island, which he recently sold to move to West Paris, Maine.

**4 JEFF VON HOENE** (photographer, "Low Country Air Conditioning") shares a loft studio in downtown Atlanta

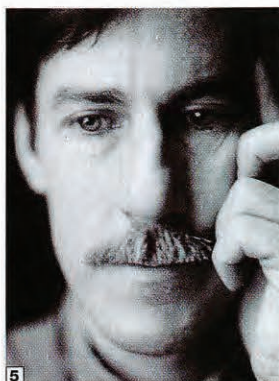
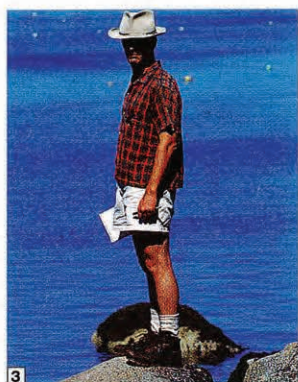
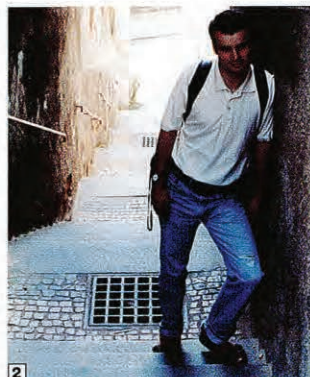
with his wife, Liz. Their latest renovation project included raising the roof and gutting the bathroom of the 1919 brick bungalow where they live with their two children. **5 SPENCER JONES** (photographer,

"Cordless Drills and Drivers") is a native of Greensboro, North Carolina, who has been transplanted to New York City, where he is currently putting the final

touches on his new triplex loft. Specializing in still-life, Simon has worked for *Popular Mechanics*, *Fortune* and *Glamour* and is a regular contributor to *This Old House*. **6 WILLIAM MARSANO**

(author, "Buying Foreclosed Property," "Shower Update") bought a cosmetically

challenged Victorian monstrosity in Wayne, Pennsylvania, in 1973 and began a program of "damage-it-yourself" projects. To date there have been no serious injuries. He is shown here with plumbing expert Richard Trethewey.





“I HAVE TWO LOVES IN MY LIFE...  
I MARRIED ONE  
AND I MOW WITH THE OTHER.”

Most people have strong feelings when it comes to their John Deere lawn tractor.

Maybe it's because over 96 percent of John Deere owners are satisfied with their tractors. Which makes John Deere lawn tractors number one in owner satisfaction, when compared to other brands.\*

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full-pressure lubrication. Or the extra-tight 20-inch turning radius, to name a few.

Then again, there's also the fact that John Deere lawn tractors have the highest resale value of any lawn tractors on the market.\*\* (Of course, getting John Deere owners to part with their lawn tractors is another story.)

But of all the things that make John Deere owners the most satisfied, one thing's for sure. While most people have only one love in their life, John Deere owners are lucky. They can count on two.

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\*Irwin Broh & Associates, Inc. 1995 Customer Satisfaction survey. \*\*Based on resale value information obtained from the Intertec® Outdoor Power Equipment Blue Book®



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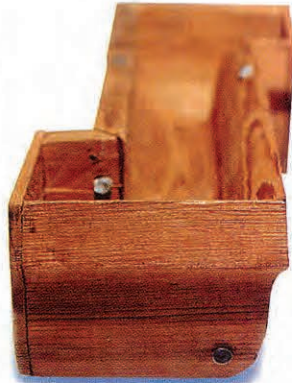
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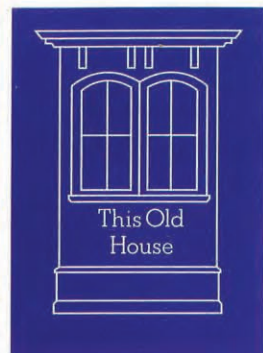
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**This Old House**  
Online

Get **weekly updates** on the **Savannah project** as well as updated appearance schedules for the crew.

*This Old House* can be reached through Pathfinder on the World Wide Web:  
<http://www.pathfinder.com/TOH/>

Cover photograph by  
Thibault Jeanson



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Construction can be dangerous. Think about your safety, and that of others, when you embark on the projects shown in this magazine.

The new  
Saab 900  
Turbo.  
Finally, a



5-door you can really open up.



900 SE Turbo 5-door

Find your own road.<sup>™</sup>

The new Saab 900 Turbo is equipped to increase both your pulse and the distance between you and other cars. Including the Volvo 850GLT and Audi A4.\* Its 0 to 60 in under 7 seconds is pure turbo exhilaration.\*\* And its five doors and spacious interior are pure liberation. So no matter how you open it up, it's huge. No wonder it's a *Consumer Review* "Top 10 Sports Car." †



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In the **May/June**  
issue of *This Old House*

on sale April 22

Plywood  
**Brick pathways**

Chainsaws

**Terne metal roofs**

Clamps

**Identifying pests**

Rescreening

**Building a fishpond**

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*introducing  
a new feature  
on master craftsmen:  
the staircase maker*

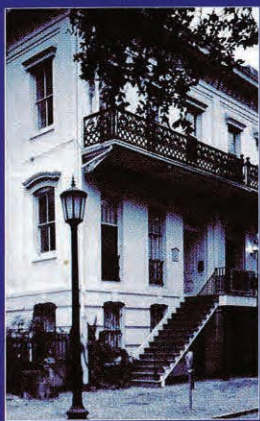
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schedules for the crew.

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World Wide Web:  
<http://www.pathfinder.com/TOH/>



# Letters

from our readers

## How should we find a good contractor?

**Mark and Lorri Freedman**  
via e-mail

"Ask around," says Tom Silva, who puts a lot of stock in word-of-mouth recommendations. Talk to friends and neighbors; ask at the local lumberyard (not a home center) or go to the local building inspector. He may not tell you a particular contractor is bad, "but it's worth his while to point you toward the good guys." Once you've found somebody, make sure he or she is licensed and insured, then get three references—preferably from current jobs—and follow through on all of them. Stay away from low bidders, Tom says: "They're leaving something out."

**I was very disturbed by the comment the Salem official made about Mrs. Guinee—he actually used the word "waddled"! It made my blood boil. Please let Deborah know that I am behind her.**

**Catherine Perz**  
via e-mail

For you and the many viewers who wrote us in support of Deborah Guinee after Salem Councilor at Large William Burns made a reference to the family "waddling into" town, rest assured that the councilor was not reelected in the recent election. While he never apologized, local papers reported

his remark, and many called it inappropriate.

**The "after" floor plan in your November/December "Bathroom Renovation" story shows a master bath with only one fixture, a shower. Was this an oversight, or was the guest bathroom better equipped than the master?**

**Donald Smith**  
Kensington, Maryland

We didn't draw in the master bathroom's fixtures because the article only discussed the kids' bath. Unfortunately, this left many readers wondering the same thing you did. The master bath was fully

equipped, including a sink and the original bathroom's clawfoot tub.

**Fact or fiction? Strips of zinc can be used on a wooden roof to prevent mold formation.**

**Carl John Gerosa Jr.**  
Larchmont, New York

Fact. Did you ever notice a roof with moss or mildew everywhere but near the chimney, where there is metal flashing? Rainwater ionized by runoff from copper or zinc is a good way to kill mildew; you can either use these metals in the ridge cap of a new roof, or nail metal strips under existing shingles, with part of each strip exposed.

**In the Salem house, you installed an automatic shutoff valve for a washing machine. Where can I get it?**

**Ken Hoelmer**  
via e-mail

The valve, designed to reduce the chance of leaks by shutting off the water supply when the washer is off, is made by Watts Regulator Company, 815 Chestnut Street, North Andover, MA 01845; 508-688-1811.

## punch list

*definition: a list of items incorrectly done or remaining to be fixed on a construction job*

- The photographs of insulated glass and heat-mirror glass were switched on page 30 of "Window Glass" (January/February). Our thanks to Bruce Irving, as well as readers Kim Metzger and Geof Sherwood. On page 29 of the same article, Toronto reader Joe Clark points out, the heat-resistant suits worn by glassmakers are made of Nomex, not Momex.
- Clarifying his Salem portico restoration (January/February, page 55), John Dee notes that wood will not necessarily continue to rot if moisture is sealed in. Instead, trapped water prevents the epoxy from properly bonding with the wood—and the water will find a way out, opening a pathway for more rot.
- We confused seconds with minutes in two recent articles. The high-velocity heating ducts installed in the Guinees' home (January/February, page 75), for which air velocity was given as 2,000 feet per second, actually handle 2,000 feet per minute. John W. Wells of North Palm Beach, Florida, notes that the speed we gave exceeds Mach 1.7. And the claim that "a new house is finished every 1.8 seconds in the United States" (November/December, page 27) seemed high to Richard MacIndoe of Pueblo, Colorado. The correct statistic is 1.8 to 2 new single-family houses per minute (1,039,000 completed in 1993), according to the 1994 Census Abstract.

Today, homeowners are looking at windows a lot differently. Gone are the days of choosing just one type of window for your entire home.

### **Fine Tune Your Home With Hurd Windows.**

Now there's Hurd FineTuning. FineTuning lets you select different types of Hurd windows for different sides of your home. The glass in each type of window is specially designed to keep every room more comfortable, day or night. No matter how big or small your castle is. And no matter what part of the country you happen to live in.

### **How Hurd FineTuning Works.**

It's simple. For instance, Hurd Heat Mirror™ TC-88 windows installed on the north and east sides are designed to retain radiant heat by reflecting the inside temperature back into your home. And they keep the cool outside temperature where it belongs—outside.

Hurd Sunbelter™ SC-75 windows on the west and south sides block the sun's penetrating heat and protect against extreme heat gain 50 percent better than single-pane glass without using tints,



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### **Call 1-800-2BE-HURD for more information about Hurd FineTuning.**

We're offering a great new Hurd FineTuning brochure and video for \$6.95, or a free brochure without the video. You can order by phone with a major credit card by calling 1-800-2BE-HURD. Or you can send \$6.95 (check or money order) to Hurd Millwork Company, Inc., 575 S. Whelen Ave., Medford, WI 54451. The video not only includes Hurd FineTuning ideas, but it will also

# How To Make Your Castle More Comfortable.

blinds or shades. Sunbelter SC-75 windows can also help retain heat in the winter as well.

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show you all the things to look for in a window.

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About Windows™



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where and when to see This Old House

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Thu. 8:30 pm  
Sat. 8:00 pm  
**Demopolis**  
WIIQ-TV  
Thu. 8:30 pm  
Sat. 8:00 pm  
**Dozier**  
WDIQ-TV  
Thu. 8:30 pm  
Sat. 8:00 pm  
**Florence**  
WFIQ-TV  
Thu. 8:30 pm  
Sat. 8:00 pm  
**Huntsville**  
WHIQ-TV  
Thu. 8:30 pm  
Sat. 8:00 pm

## Fairbanks

KUAC-TV  
Fri. 8:00 pm  
Sat. 8:00 am

## Juneau

KTOO-TV  
Fri. 8:00 pm  
Sat. 8:00 am

## ARIZONA

**Phoenix**  
KAET-TV  
Thu. 1:00 pm  
and 7:30 pm  
Sat. 5:00 pm  
**Tucson**  
KUAS-TV  
Sat. 11:00 am  
and 6:30 pm  
KUAT-TV  
Sat. 11:00 am  
and 6:30 pm

## Fresno

KVPT-TV  
Sat. 9:30 am

## Huntington Beach

KOCE-TV  
Sat. 4:30 pm

## Los Angeles

KCET-TV  
Sat. 5:30 pm

## Redding

KIXE-TV  
Sat. 1:30 pm

## Rohnert Park

KRCB-TV  
Wed. noon  
Sun. 7:30 pm

## Sacramento

KVIE-TV  
Thu. 8:00 pm  
Sat. 8:30 am

## Denver

KRMA-TV  
Sat. 2:30 pm  
Sun. 5:30 pm

## Pueblo

KTSC-TV  
Thu. 8:30 pm  
Sat. 2:30 pm

## CONNECTICUT

### Fairfield

WEDW-TV  
Tue. noon  
Thu. 11:00 pm  
Sat. 8:00 pm  
Sun. 10:30 am

### Hartford

WEDH-TV  
Tue. noon  
Thu. 11:00 pm  
Sat. 8:00 pm  
Sun. 10:30 am

### New Haven

WEDY-TV  
Tue. noon  
Thu. 11:00 pm  
Sat. 8:00 pm  
Sun. 10:30 am

### Norwich

WEDN-TV  
Tue. noon  
Thu. 11:00 pm  
Sat. 8:00 pm  
Sun. 10:30 am

## DISTRICT OF COLUMBIA

WETA-TV  
Sat. 9:00 am  
and 5:30 pm

## FLORIDA

### Daytona Beach

WCEU-TV  
Tue. 8:00 pm  
Sat. 6:00 pm

### Fort Myers/Naples

WSFP-TV  
Sat. 1:30 pm  
Sun. 5:00 pm

### Gainesville

WUFT-TV  
Sat. 9:30 am  
and 1:30 pm

### Jacksonville

WJCT-TV  
Mon. 8:30 pm  
Sat. 2:30 pm

### Miami

WLRN-TV  
Thu. 7:30 pm  
WPBT-TV  
Sat. 2:00 pm

### Orlando

WMFE-TV  
Sat. 9:00 am  
and 1:30 pm  
Sun. 9:00 am

### Pensacola

WSRE-TV  
Sat. 12:30 pm

## TOM SILVA

March 2-3 in Atlanta, GA  
Atlanta Home Show  
at Georgia World Congress Center  
800-476-4539

March 9-10 in Greenville, SC  
Southern Home and Garden Show  
at Palmetto International Exposition Center  
864-271-6211

March 30 in New Philadelphia, OH  
Living in the Valley Home and Garden Show  
at Buckeye Career Center  
216-343-5000

## Tampa

WEDU-TV  
Sat. 11:30 am  
Sun. 7:30 pm  
WUSF-TV  
Wed. 9:00 pm  
Sun. 5:30 pm

## GEORGIA

### Atlanta

WGTV-TV  
Sat. 5:30 pm  
Sun. 8:00 pm  
WPBA-TV  
Mon. 8:00 pm  
Wed. 2:00 pm  
Sat. 6:00 pm

### Chatsworth

WCLP-TV  
Sat. 5:30 pm  
Sun. 8:00 pm

### Cochran

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Sat. 5:30 pm  
Sun. 8:00 pm

### Columbus

WJSP-TV  
Sat. 5:30 pm  
Sun. 8:00 pm

### Dawson

WACS-TV  
Sat. 5:30 pm  
Sun. 8:00 pm

### Pelham

WABW-TV  
Sat. 5:30 pm  
Sun. 8:00 pm

### Savannah

WVAN-TV  
Sat. 5:30 pm  
Sun. 8:00 pm

### Waycross

WXGA-TV  
Sat. 5:30 pm  
Sun. 8:00 pm

### Wrens

WCES-TV  
Sat. 5:30 pm  
Sun. 8:00 pm

## HAWAII

Honolulu  
KHET-TV  
Thu. 7:30 pm  
Sun. 4:30 pm

## Wailuku

KMEB-TV  
Thu. 7:30 pm  
Sun. 4:30 pm

## IDAHO

### Boise

KAID-TV  
Sun. 4:30 pm  
Coeur d'Alene  
KCDT-TV  
Sun. 3:30 pm

### Moscow

KUID-TV  
Sun. 3:30 pm  
Pocatello  
KISU-TV  
Sun. 4:30 pm

### Twin Falls

KIPT-TV  
Sun. 4:30 pm

## ILLINOIS

### Carbondale

WSIU-TV  
Thu. 7:00 pm  
Sat. 12:30 pm

### Chicago

WTTW-TV  
Tue. 7:30 pm  
Sat. 7:00 am  
and 5:00 pm

### Jacksonville

WSEC-TV  
Thu. 10:00 pm  
Sun. 1:30 pm

### Macomb

WMEC-TV  
Thu. 10:00 pm  
Sun. 1:30 pm

### Moline

WQPT-TV  
Tue. 7:00 pm  
Sat. 5:30 pm

### Olney

WUSI-TV  
Thu. 7:00 pm  
Sat. 12:30 pm

### Peoria

WTVP-TV  
Thu. 10:00 pm  
Sat. 12:30 pm

### Quincy

WQEC-TV  
Thu. 10:00 pm  
Sun. 1:30 pm



## Louisville

WGIQ-TV  
Thu. 8:30 pm  
Sat. 8:00 pm

## Mobile

WEIQ-TV  
Thu. 8:30 pm  
Sat. 8:00 pm

## Montgomery

WAIQ-TV  
Thu. 8:30 pm  
Sat. 8:00 pm

## Mount Cheaha

WCIQ-TV  
Thu. 8:30 pm  
Sat. 8:00 pm

## ALASKA

Anchorage  
KAKM-TV  
Mon. 6:00 pm  
Sat. 9:30 am

## Bethel

KYUK-TV  
Fri. 10:00 am  
and 8:00 pm  
Sat. 8:00 am

## ARKANSAS

Arkadelphia  
KETG-TV  
Sat. noon  
Sun. 5:30 pm

## Fayetteville

KAFT-TV  
Sat. noon  
Sun. 5:30 pm

## Jonesboro

KTEJ-TV  
Sat. noon  
Sun. 5:30 pm

## Little Rock

KETS-TV  
Sat. noon  
Sun. 5:30 pm

## Mountain View

KEMV-TV  
Sat. noon  
Sun. 5:30 pm

## CALIFORNIA

### Eureka

KEET-TV  
Wed. 7:30 pm  
Sat. 10:30 am

## San Bernardino

KVCR-TV  
Thu. 8:00 pm

## San Diego

KPBS-TV  
Sat. 10:30 am  
and 5:30 pm

## San Francisco

KQED-TV  
Sat. 5:00 pm

## San Jose

KTEH-TV  
Wed. 9:00 pm  
Sat. 3:00 pm  
Sun. 5:30 pm

## San Mateo

KCSM-TV  
Wed. 6:30 pm  
Sat. 9:30 am  
Sun. 9:00 am

## COLORADO

### Boulder

KBDI-TV  
Mon. 10:00 pm  
Wed. 5:30 pm  
Sat. 5:30 pm  
Sun. 4:00 pm

# You have a cabinetry Choice Make the right one



## KraftMaid

Expect  
the  
Best



Impressive detailing, uncompromising quality and unique character. The features that you admire in your home are the same qualities that make KraftMaid your ideal cabinetry choice.

KraftMaid offers over 75 door styles in rich woods, beautiful laminates and a selection of up to eight hand-rubbed finishes. Custom craftsmanship, including lifetime warranted concealed hinges and drawer suspension system, provides long lasting durability. Distinctive moldings, decorative hardware and more than 95 optional convenience features offer unlimited versatility.

KraftMaid cabinetry...its timeless appeal is perfect for every room in your home.

See how exciting it can be to plan your kitchen with KraftMaid cabinetry. To receive our colorful brochures and the name of the KraftMaid dealer nearest you, contact the address below.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone \_\_\_\_\_

**MAIL TO:**

KraftMaid Cabinetry, Inc.  
16052 Industrial Pkwy., P.O. Box 1055  
Middlefield, Ohio 44062

TOH 396

See KraftMaid every weekend on the Martha Stewart Living television show. Check your local listing for station, time and dates.

Or call toll free **1-800-581-4484** 24 hours a day,  
7 days a week.  
On the Internet: <http://www.kraftmaid.com>

# television listings

where and when to see This Old House

Urbana  
WILL-TV  
Thu. 7:30 pm  
Sun. 3:30 pm  
**INDIANA**  
Bloomington  
WTIU-TV  
Mon. 6:00 pm  
Thu. 11:00 pm  
Sat. 12:30 pm  
Evansville  
WNIN-TV  
Sat. 12:30 pm  
and 6:00 pm  
Sun. 4:30 pm  
Fort Wayne  
WFWA-TV  
Sat. 10:00 am  
Indianapolis  
WFYI-TV  
Sat. 10:00 am  
Sun. 7:00 pm  
Merrillville  
WYIN-TV  
Wed. 9:00 pm  
Sun. 3:30 pm

Fort Dodge  
KTIN-TV  
Fri. 6:30 pm  
Sat. 1:30 pm  
Iowa City  
KIIN-TV  
Fri. 6:30 pm  
Sat. 1:30 pm  
Mason City  
KYIN-TV  
Fri. 6:30 pm  
Sat. 1:30 pm  
Omaha  
KBIN-TV  
(Council Bluffs)  
Fri. 6:30 pm  
Sat. 1:30 pm  
Red Oak  
KHIN-TV  
Fri. 6:30 pm  
Sat. 1:30 pm  
Sioux City  
KSIN-TV  
Fri. 6:30 pm  
Sat. 1:30 pm

**KENTUCKY**  
Ashland  
WKAS-TV  
Sun. 5:00 pm  
Bowling Green  
WKGB-TV  
Sun. 4:00 pm  
WKYU-TV  
Tue. 1:00 pm  
and 6:30 pm  
Covington  
WCVN-TV  
Sun. 5:00 pm  
Elizabethtown  
WKZT-TV  
Sun. 5:00 pm  
Hazard  
WKHA-TV  
Sun. 5:00 pm  
Lexington  
WKLE-TV  
Sun. 5:00 pm  
Louisville  
WKMJ-TV  
Sun. 5:00 pm

Pikeville  
WKPI-TV  
Sun. 5:00 pm  
Somerset  
WKSO-TV  
Sun. 5:00 pm  
**LOUISIANA**  
Alexandria  
KLPA-TV  
Sat. 4:00 pm  
Sun. 10:00 am  
Baton Rouge  
WLPB-TV  
Sat. 4:00 pm  
Sun. 10:00 am  
Lafayette  
KLPB-TV  
Sat. 4:00 pm  
Sun. 10:00 am  
Lake Charles  
KLTL-TV  
Sat. 4:00 pm  
Sun. 10:00 am  
Monroe  
KLTM-TV  
Sat. 4:00 pm  
Sun. 10:00 am  
New Orleans  
WYES-TV  
Sat. 8:30 am  
Shreveport  
KLTS-TV  
Sat. 4:00 pm  
Sun. 10:00 am  
**MAINE**  
Bangor  
WMEB-TV  
Sat. 1:30 pm  
Calais  
WMED-TV  
Sat. 1:30 pm  
Lewiston  
WCBB-TV  
Sat. 1:30 pm  
Portland  
WMEA-TV  
Wed. 7:00 pm  
Presque Isle  
WMEM-TV  
Sat. 1:30 pm  
**MARYLAND**  
Annapolis  
WMPT-TV  
Sat. 4:30 pm  
Sun. 6:30 pm  
Baltimore  
WMPB-TV  
Sat. 4:30 pm  
Sun. 6:30 pm  
Frederick  
WFPT-TV  
Sat. 4:30 pm  
Sun. 6:30 pm  
Hagerstown  
WWPB-TV  
Sat. 4:30 pm  
Sun. 6:30 pm  
Oakland  
WGPT-TV  
Sat. 4:30 pm  
Sun. 6:30 pm

## RICHARD TRETHERWEY

March 9 in Harrisburg, PA  
Pennsylvania Homebuilders' Show  
at State Farm Show Complex  
800-281-5539

Salisbury  
WCPB-TV  
Sat 4:30 pm  
Sun. 6:30 pm

## MASSACHUSETTS

Boston  
WGBH-TV  
Thu. 8:00 pm  
Sat. 5:30 pm  
WGBX-TV  
Sun. 9:00 am  
and 12:30 pm  
Springfield  
WGBY-TV  
Thu. 8:00 pm  
Sat. 5:30 pm

## MICHIGAN

Alpena  
WCML-TV  
Sat. 2:30 pm  
Bad Axe  
WUCX-TV  
Tue. 12:30 pm  
Sun. 5:00 pm  
Cadillac  
WCMV-TV  
Sat. 2:30 pm  
Detroit  
WTVS-TV  
Thu. 1:30 am  
and 8:30 pm  
Sat. 10:00 am  
East Lansing  
WKAR-TV  
Thu. 9:00 pm  
Sat. 1:30 pm  
Sun. 5:00 pm  
Flint  
WFUM-TV  
Thu. 9:00 pm  
Sat. 1:30 pm  
Grand Rapids  
WGVU-TV  
Thu. 8:30 pm  
Sat. 10:00 am  
Kalamazoo  
WGVK-TV  
Thu. 8:30 pm  
Sat. 10:00 am  
Manistee  
WCMW-TV  
Sat. 2:30 pm  
Marquette  
WNUM-TV  
Sat. 1:30 pm  
Mount Pleasant  
WCMU-TV  
Sat. 2:30 pm  
University Center  
WUCM-TV  
Tue. 12:30 pm  
Sun. 5:00 pm

## MINNESOTA

Appleton  
KWCM-TV  
Thu. 8:00 pm  
Sat. 12:30 pm  
Austin  
KSMQ-TV  
Sat. 12:30 pm  
Sun. 7:00 pm  
Bemidji  
KAWE-TV  
Sat. 12:30 pm  
Brainerd  
KAWB-TV  
Sat. 12:30 pm  
Duluth  
WDSE-TV  
Sat. 6:30 pm  
Sun. 9:30 am  
Saint Paul/  
Minneapolis  
KTCA-TV  
Wed. 7:30 pm  
Sat. 6:30 pm

## MISSISSIPPI

Biloxi  
WMAH-TV  
Sat. 7:00 pm  
Booneville  
WMAE-TV  
Sat. 7:00 pm  
Bude  
WMAU-TV  
Sat. 7:00 pm  
Greenwood  
WMAO-TV  
Sat. 7:00 pm  
Jackson  
WMPN-TV  
Sat. 7:00 pm  
Meridian  
WMAW-TV  
Sat. 7:00 pm  
Mississippi State  
WMAB-TV  
Sat. 7:00 pm  
Oxford  
WMAV-TV  
Sat. 7:00 pm  
**MISSOURI**  
Joplin  
KOZJ-TV  
Sat. 12:30 pm  
Kansas City  
KCPT-TV  
Thu. 7:30 pm  
Sat. 12:30 pm  
Saint Louis  
KETC-TV  
Wed. 12:30 pm  
Sat. 6:30 pm



Muncie  
WIPB-TV  
Thu. 8:00 pm  
Sun. 4:30 pm  
South Bend  
WNIT-TV  
Fri. 10:30 am  
Sat. 2:00 pm  
Vincennes  
WVUT-TV  
Sat. 1:30 pm  
Sun. 1:30 pm  
**IOWA**  
Davenport  
WQPT-TV  
(Quad Cities)  
Tue. 7:00 pm  
Sat. 5:30 pm  
Des Moines  
KDIN-TV  
Fri. 6:30 pm  
Sat. 1:30 pm

Waterloo  
KRIN-TV  
Fri. 6:30 pm  
Sat. 1:30 pm  
**KANSAS**  
Bunker Hill  
KODD-TV  
Thu. 7:00 pm  
Sat. 12:30 pm  
Lakin  
KSWK-TV  
Thu. 7:00 pm  
Sat. 12:30 pm  
Topeka  
KTWU-TV  
Sat. 9:30 am  
Wichita  
KPTS-TV  
Sat. 11:30 am  
Sun. 11:00 am

WKPC-TV  
Wed. 1:30 pm  
Sat. 1:30 pm  
Sun. 3:00 pm  
Madisonville  
WKMA-TV  
Sun. 4:00 pm  
Morehead  
WKMR-TV  
Sun. 5:00 pm  
Murray  
WKMU-TV  
Sun. 4:00 pm  
Owensboro  
WKOH-TV  
Sun. 4:00 pm  
Owenton  
WKON-TV  
Sun. 5:00 pm  
Paducah  
WKPD-TV  
Sun. 4:00 pm

HEAR WHY THE BOSE® WAVE® RADIO WAS NAMED A "BEST NEW PRODUCT OF 1994" BY BUSINESSWEEK.

Tabletop radios are popular for their convenience and small size. But their sound quality leaves much to be desired. No one really expects high-fidelity sound from a radio. Until now.

Bose presents the Wave radio. It's the one radio acclaimed by leading audio critics. Because it's the

our patented acoustic waveguide speaker technology. Just as a flute strengthens a breath of air to fill an entire concert hall, the waveguide produces room-filling sound from a small enclosure. This technology and performance is available in no other radio.

You'll touch a button and hear your favorite music come alive in rich stereo sound. You'll hear every note the way it's *meant* to be heard. The Wave radio measures just



CALL NOW AND MAKE SIX INTEREST-FREE PAYMENTS.

The Wave radio is available for \$349 directly from Bose, the most respected name in sound. Call 1-800-845-BOSE, ext. RIB179, or return the coupon for free information or to learn more about our in-home trial and satisfaction guarantee. When you call, ask about our six-month installment payment plan.



Set six AM and six FM stations.



Easily connect your CD player, cassette player, TV, or VCR.

# HEAR THE RADIO THAT WOKE UP AN ENTIRE INDUSTRY.

one radio that delivers big, rich, lifelike stereo sound *plus* a small, convenient size.

## THE BEST-SOUNDING RADIO YOU CAN BUY.

We think the Wave radio is the best-sounding radio you can buy. And audio critics agree.

*Radio World* called the sound "simply amazing... a genuine breakthrough in improved sound quality." *BusinessWeek* named the Wave radio a "Best New Product of 1994."



The speakers in conventional radios cannot produce lifelike bass, which is essential for great sound.



Only the Wave radio with acoustic waveguide speaker technology produces high-quality sound with full, rich bass.

*Popular Science* called it a "sonic marvel," and gave it a prestigious "Best Of What's New" award. The key is



4.5"H x 14"W x 8"D and fits almost anywhere. So you can listen in your bedroom, living room, kitchen, or any room.

## REMOTE-CONTROLLED CONVENIENCE.

Operate the radio from across the room with the credit card-sized remote control. Set six AM and six FM stations, and switch between them at the touch of a button. You can even bring great Bose sound to recorded music, TV programs, or movies by connecting the Wave radio to your CD or cassette player, TV, or VCR.



*Wired* magazine said, "The clean, sweet sound will have your friends wondering where you've hidden your fancy speakers."

But you have to hear the Wave radio for yourself to believe it. Call today.

## CALL 1-800-845-BOSE, EXT. RIB179.

When you call, ask about our six-month installment payment plan. (Available on telephone orders only.) Also ask about FedEx® delivery.

Mr./Mrs./Ms. \_\_\_\_\_  
Name (Please print)

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

( ) \_\_\_\_\_  
Daytime Telephone

( ) \_\_\_\_\_  
Evening Telephone

Mail to: Bose Corporation, Dept. CDD-RIB179, The Mountain, Framingham, MA 01701-9168, or fax to 508-485-4577.

**BOSE**  
Better sound through research®

# television listings

where and when to see This Old House

**Sedalia**  
KMOS-TV  
Sat. 12:30 pm  
**Springfield**  
KOZK-TV  
Sat. 12:30 pm

**MONTANA**  
**Bozeman**  
KUSM-TV  
Sat. 11:30 am

**NEBRASKA**  
**Alliance**  
KTNE-TV  
Sat. 10:30 am  
and 5:30 pm

**Bassett**  
KMNE-TV  
Sat. 10:30 am  
and 5:30 pm  
**Hastings**  
KHNE-TV  
Sat. 5:30 pm  
and 10:30 pm

**Lexington**  
KLNE-TV  
Sat. 10:30 am  
and 5:30 pm

**Lincoln**  
KUON-TV  
Sat. 10:00 am  
and 5:00 pm

**Merriman**  
KRNE-TV  
Sat. 9:30 am  
and 4:30 pm

**Norfolk**  
KXNE-TV  
Sat. 10:30 am  
and 5:30 pm

**North Platte**  
KPNE-TV  
Sat. 10:30 am  
and 5:30 pm

**Omaha**  
KYNE-TV  
Sat. 10:30 am  
and 5:30 pm

**NEVADA**  
**Las Vegas**  
KLXX-TV  
Sat. 12:30 pm  
and 6:00 pm

**Reno**  
KNPB-TV  
Thu. 8:30 pm  
Sat. 10:30 am  
and 1:00 pm

**NEW HAMPSHIRE**  
**Durham**  
WENH-TV  
Thu. 8:30 pm  
Sun. 10:00 am

**Keene**  
WEKW-TV  
Thu. 8:30 pm  
Sun. 10:00 am

**Littleton**  
WLED-TV  
Thu. 8:30 pm  
Sun. 10:00 am

## NEW JERSEY

**Camden**  
WNJS-TV  
Tue. 8:00 pm  
Sat. 8:00 pm  
Sun. 5:30 pm

**Montclair**  
WNJN-TV  
Tue. 8:00 pm  
Sat. 8:00 pm  
Sun. 5:30 pm

**Norwood**  
WNPI-TV  
Sat. 10:30 am

**Plattsburgh**  
WCFE-TV  
Sun. 11:30 am

**Rochester**  
WXXI-TV  
Sat. 10:30 am  
Sun. 5:30 pm

**Jacksonville**  
WUNM-TV  
Sat. 5:30 pm  
Sun. 9:00 am

**Linville**  
WUNE-TV  
Sat. 5:30 pm  
Sun. 9:00 am

**Fargo**  
KFME-TV  
Mon. 10:00 pm  
Tue. 10:00 pm  
Wed. 10:00 pm  
Thu. 7:00 pm  
and 10:00 pm  
Sat. 6:00 pm

**Grand Forks**  
KGFE-TV  
Mon. 10:00 pm  
Tue. 10:00 pm  
Wed. 10:00 pm  
Thu. 7:00 pm  
and 10:00 pm  
Sat. 6:00 pm

**Minot**  
KSRE-TV  
Mon. 10:00 pm  
Tue. 10:00 pm  
Wed. 10:00 pm  
Thu. 7:00 pm  
and 10:00 pm  
Sat. 6:00 pm

**Williston**  
KWSE-TV  
Mon. 10:00 pm  
Tue. 10:00 pm  
Wed. 10:00 pm  
Thu. 7:00 pm  
and 10:00 pm  
Sat. 6:00 pm

**OHIO**  
**Akron**  
WEAO-TV  
Sat. 10:30 am  
and 5:00 pm  
Sun. 6:00 pm

**Athens**  
WOUB-TV  
Sat. 5:00 pm

**Bowling Green**  
WBGU-TV  
Mon. 3:00 pm  
Sat. 1:30 pm

**Cambridge**  
WOUC-TV  
Sat. 5:00 pm

**Cincinnati**  
WCET-TV  
Thu. 8:00 pm  
Sat. 9:00 am

**Cleveland**  
WVIZ-TV  
Tue. 7:30 pm  
Sat. 1:00 pm  
Sun. 12:30 pm

**Columbus**  
WOSU-TV  
Thu. 8:00 pm  
Sat. 4:30 pm

**Dayton**  
WPTD-TV  
Thu. 8:00 pm  
Sat. 9:30 am  
Sun. noon

**Portsmouth**  
WPBO-TV  
Thu. 8:00 pm  
Sat. 4:30 pm

**Toledo**  
WGTE-TV  
Thu. 8:00 pm  
Sat. 1:00 pm  
Sun. 1:00 pm

**Youngstown**  
WNEO-TV  
Sat. 10:30 am  
and 5:00 pm  
Sun. 6:00 pm

**OKLAHOMA**  
**Cheyenne**  
KWET-TV  
Sat. 9:30 am  
and 12:30 pm  
Sun. 3:00 pm

**Eufaula**  
KOET-TV  
Sat. 9:30 am  
and 12:30 pm  
Sun. 3:00 pm

**Oklahoma City**  
KETA-TV  
Sat. 9:30 am  
and 12:30 pm  
Sun. 3:00 pm

**Tulsa**  
KOED-TV  
Sat. 9:30 am  
and 12:30 pm  
Sun. 3:00 pm

**OREGON**  
**Bend**  
KOAB-TV  
Thu. 8:00 pm  
Sat. 5:00 pm



**New Brunswick**  
WNJB-TV  
Tue. 8:00 pm  
Sat. 8:00 pm  
Sun. 5:30 pm

**Trenton**  
WNJT-TV  
Tue. 8:00 pm  
Sat. 8:00 pm  
Sun. 5:30 pm

**NEW MEXICO**  
**Albuquerque**  
KNME-TV  
Thu. 7:30 pm  
Sun. 10:30 am

**Las Cruces**  
KRWG-TV  
Sat. 11:30 pm

**Portales**  
KENW-TV  
Sat. 3:30 pm

**NEW YORK**  
**Binghamton**  
WSKG-TV  
Sat. 1:30 pm

**Buffalo**  
WNED-TV  
Sat. 10:30 am  
WNEQ-TV  
Sun. 7:00 pm

**Long Island**  
WLIW-TV  
Thu. 8:30 pm  
Sat. 10:30 am  
Sun. 8:00 pm

**Schenectady**  
WMHT-TV  
Tue. 1:30 pm  
Sat. 10:30 am

**Syracuse**  
WCNY-TV  
Thu. 8:00 pm  
Sat. 10:30 am

**Watertown**  
WNPE-TV  
Sat. 10:30 am

**NORTH CAROLINA**  
**Asheville**  
WUNF-TV  
Sat. 5:30 pm  
Sun. 9:00 am

**Chapel Hill**  
WUNC-TV  
Sat. 5:30 pm  
Sun. 9:00 am

**Charlotte**  
WTVI-TV  
Tue. 12:30 pm  
Thu. 8:00 pm  
Sat. 5:00 pm

**Wilmington**  
WUNJ-TV  
Sat. 5:30 pm  
Sun. 9:00 am

**Winston-Salem**  
WUNL-TV  
Sat. 5:30 pm  
Sun. 9:00 am

**Roanoke Rapids**  
WUNP-TV  
Sat. 5:30 pm  
Sun. 9:00 am

**Wilmington**  
WUNJ-TV  
Sat. 5:30 pm  
Sun. 9:00 am

**Winston-Salem**  
WUNL-TV  
Sat. 5:30 pm  
Sun. 9:00 am

**NORTH DAKOTA**  
**Bismarck**  
KBME-TV  
Mon. 10:00 pm  
Tue. 10:00 pm  
Wed. 10:00 pm

**Thou. 7:00 pm**  
and 10:00 pm  
Sat. 6:00 pm

**Dickinson**  
KDSE-TV  
Mon. 10:00 pm  
Tue. 10:00 pm  
Wed. 10:00 pm

**Thu. 7:00 pm**  
and 10:00 pm  
Sat. 6:00 pm

**Ellendale**  
KJRE-TV  
Mon. 10:00 pm  
Tue. 10:00 pm  
Wed. 10:00 pm  
Thu. 7:00 pm  
and 10:00 pm  
Sat. 6:00 pm

## STEVE THOMAS

March 2-3, in Edison, NJ  
Raritan Home Show at New Jersey  
Convention Center (Raritan Expo Hall)  
800-248-SHOW

March 8-9, in Greenville, SC  
Southern Home and Garden Show  
at Palmetto International Exposition Center  
864-271-6211

March 16-17 in Pittsburgh, PA  
Pittsburgh Home and Garden Show  
at Pittsburgh Convention Center  
412-922-4900

# “Amazing.

*In one day, I had my drafty, old windows replaced with Pella® Windows that cost about \$300 apiece!”*

Sam Scopelliti • Ambler, PA



*Exterior is virtually maintenance-free! Cladding available in white and brown.*



*“I love the way these windows tilt in for washing.”*

Charles Honious  
St. Louis, MO

**NEW**

The Pella® Precision Fit™ Replacement Window  
Imagine new double-hung replacement windows that install in about thirty minutes from the inside, without disturbing wallpaper or woodwork . . . Pella® wood windows that are competitively priced against lower-quality alternatives. And only Pella tests each Precision Fit™ Replacement Window at the factory to make sure it's airtight.

Visit the Pella Website @ <http://www.pella.com>

**Quality like this only comes from Pella.**



- Energy-efficient double-pane glass
- Wood interior
- Care-free exterior

**\$300<sup>58</sup>**

36" x 45-1/4" (not including tax & installation; actual dealer price may vary)

© 1998 Pella Corporation, 102 Main St., Pella, IA 50219

Call or write for your free Precision Fit™ Replacement Window brochure and the name of each Certified Pella Contractor™ near you.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP \_\_\_\_\_

PHONE \_\_\_\_\_

Pella Information Center  
P.O. Box 308, Moline, IL 61625-0308

**1-800-54-PELLA**

Code: C572Z6CK



# television listings

where and when to see This Old House

Corvallis  
KOAC-TV  
Thu. 8:00 pm  
Sat. 5:00 pm

Eugene  
KEPB-TV  
Thu. 8:00 pm  
Sat. 5:00 pm

Klamath Falls  
KFTS-TV  
Thurs. 8:00 pm

La Grande  
KTVR-TV  
Thu. 8:00 pm  
Sat. 5:00 pm

Medford  
KSYS-TV  
Thu. 8:00 pm

Portland  
KOPB-TV  
Thu. 8:00 pm  
Sat. 5:00 pm

**PENNSYLVANIA**

Allentown  
WLVT-TV  
Fri. 7:30 pm  
Sat. 6:00 pm

Pittston  
WVIA-TV  
Thu. 8:00 pm  
Sat. 5:00 pm  
and 5:30 pm

University Park  
WPSX-TV  
Sat. 5:00 pm  
Sun. 4:30 pm

**RHODE ISLAND**

Providence  
WSBE-TV  
Tue. 8:30 pm  
Sun. 6:00 pm

**SOUTH CAROLINA**

Allendale  
WEBA-TV  
Sat. 1:30 pm

Beaufort  
WJWJ-TV  
Sat. 1:30 pm

Charleston  
WITV-TV  
Sat. 1:30 pm

Columbia  
WRLK-TV  
Sat. 1:30 pm

Sumter  
WRJA-TV  
Sat. 1:30 pm

**SOUTH DAKOTA**

Aberdeen  
KDSB-TV  
Sat. 4:30 pm

Brookings  
KESD-TV  
Sat. 4:30 pm

Eagle Butte  
KPSD-TV  
Sat. 3:30 pm

Lowry  
KQSD-TV  
Sat. 4:30 pm

Martin  
KZSD-TV  
Sat. 3:30 pm

Pierre  
KTSD-TV  
Sat. 4:30 pm

Rapid City  
KBHE-TV  
Sat. 3:30 pm

Lexington  
WLJT-TV  
Thu. 9:30 pm  
Sat. 12:30 pm

Memphis  
WKNO-TV  
Thu. 7:30 pm  
Sat. 9:30 am

Nashville  
WDCN-TV  
Sat. 4:30 pm

**TEXAS**

Amarillo  
KACV-TV  
Sat. 12:30 pm

Austin  
KLRU-TV  
Sat. 5:30 pm

College Station  
KAMU-TV  
Sat. 12:30 pm

Corpus Christi  
KEDT-TV  
Sat. 12:30 pm  
and 9:00 pm

Dallas/Fort Worth  
KERA-TV  
Sat. 9:00 am  
and 6:30 pm

El Paso  
KCOS-TV  
Tues. 7:00 pm

Harlingen  
KMBH-TV  
Sat. 12:30 pm

Houston  
KUHT-TV  
Mon. 1:30 pm  
Sun. 11:30 am

Killeen  
KNCT-TV  
Sat. 12:30 pm  
Sun. 9:30 am

Lubbock  
KTXI-TV  
Sat. 12:30 pm

Odessa  
KOCV-TV  
Tue. noon  
Sun. 12:30 pm

San Antonio  
KLRN-TV  
Sat. 5:30 pm

Waco  
KCTF-TV  
Mon. 12:30 pm  
Sat. 12:30 pm

Rutland  
WVER-TV  
Thu. 8:00 pm  
Sat. 11:00 am

Saint Johnsbury  
WVTB-TV  
Thu. 8:00 pm  
Sat. 11:00 am

Windsor  
WVTA-TV  
Thu. 8:00 pm  
Sat. 11:00 am

Spokane  
KSPS-TV  
Sat. 9:30 am  
Sun. 5:30 pm

Tacoma  
KBTC-TV  
Thu. 6:30 pm  
Sat. 12:30 pm

Yakima  
KYVE-TV  
Sun. 5:00 pm

## NORM ABRAM

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at Alameda County Fairgrounds  
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## VIRGINIA

Charlottesville  
WHTJ-TV  
Sat. 8:30 am

Falls Church  
WNVT-TV  
Sat. 4:00 pm

Harrisonburg  
WVPT-TV  
Sat. 1:30 pm  
Sun. 10:30 am

Marion  
WMSY-TV  
Sat. 1:30 pm

Norfolk  
WHRO-TV  
Thu. 8:00 pm  
Sat. 8:30 am  
and 2:00 pm

Norton  
WSBN-TV  
Sat. 1:30 pm

Richmond  
WCVE-TV  
Sat. 8:30 am

WCVW-TV  
Fri. 8:30 pm

Roanoke  
WBRA-TV  
Sat. 1:30 pm

## WASHINGTON

Centralia  
KCKA-TV  
Thu. 6:30 pm  
Sat. 12:30 pm

Pullman  
KWSU-TV  
Wed. 7:30 am  
Sat. 2:00 pm

Richland  
KTNW-TV  
Thu. 7:00 pm  
Sat. 2:00 pm

Seattle  
KCTS-TV  
Sun. 5:00 pm

## WEST VIRGINIA

Beckley  
WSWP-TV  
Sat. 1:30 pm

Huntington  
WPBY-TV  
Sat. 1:30 pm

Morgantown  
WNPB-TV  
Sat. 7:00 pm

## WISCONSIN

Green Bay  
WPNE-TV  
Wed. 7:00 pm  
Sun. 4:00 pm

La Crosse  
WHLA-TV  
Wed. 7:00 pm  
Sun. 4:00 pm

Madison  
WHA-TV  
Wed. 7:00 pm  
Sun. 4:00 pm

Menomonie  
WHWC-TV  
Wed. 7:00 pm  
Sun. 4:00 pm

Milwaukee  
WMVS-TV  
Thu. 7:30 pm  
Sat. 8:00 am

Park Falls  
WLEF-TV  
Wed. 7:00 pm  
Sun. 4:00 pm

Wausau  
WHRM-TV  
Wed. 7:00 pm  
Sun. 4:00 pm

## WYOMING

Riverton  
KCWC-TV  
Sat. noon  
and 5:00 pm



Erie  
WQLN-TV  
Sat. 6:30 pm

Harrisburg  
WITF-TV  
Thu. 8:00 pm  
Sat. 6:00 pm

Philadelphia  
WHYY-TV  
Thu. 8:00 pm  
Sat. 6:00 pm

Pittsburgh  
WQED-TV  
Sat. 6:30 pm  
WQEX-TV  
Wed. 8:30 pm

Conway  
WHMC-TV  
Sat. 1:30 pm

Florence  
WJPM-TV  
Sat. 1:30 pm

Greenville  
WNTV-TV  
Sat. 1:30 pm

Greenwood  
WNEH-TV  
Sat. 1:30 pm

Rock Hill  
WNSC-TV  
Sat. 1:30 pm

Spartanburg  
WRET-TV  
Sat. 1:30 pm

Sioux Falls  
KCSD-TV  
Sat. 4:30 pm

Vermillion  
KUSD-TV  
Sat. 4:30 pm

**TENNESSEE**

Chattanooga  
WTCI-TV  
Sat. 1:30 pm

Cookeville  
WCTE-TV  
Sat. 12:30 pm

Knoxville  
WKOP-TV  
Sat. 1:30 pm

WSJK-TV  
Sat. 1:30 pm

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# extras

## a better wrench

In his shop and on house calls, plumber Richard Trethewey has been evaluating wrenches, "always looking for the perfect tool," he says. One of the four shown here comes surprisingly close. The Robo-Grip "seemed kind of gizmo-like at first, but it's easy to use. It self-adjusts as you squeeze the handles, which is great, and the handles are well-shaped." Of riveted, laminated construction, it's also light, and the toothed jaws lock parallel on pipes and nuts. It's available in 9-inch and 6-inch models, with curved or straight jaws. Richard's sole complaint: "The spring-loaded handles tend to stay open in the toolbox, so it's a little clumsy to get out. Still, I'm surprised at how much I use it and like it." He was less enthusiastic about two Knipex imports. Model KN8603 (10½ inches) works well, "but it's heavy and expensive. It doesn't self-adjust, and the handles seem designed to pinch your palm between them. The smooth, parallel jaws are good on nuts but not on pipes." The lighter model KN8711-10 (9¾ inches) is "a lot handier," he says. "The handles are springy and comfortable, and the jaws give you two bites, one for pipe and another for nuts." As for Sunico's EZ-Grip, an 8-inch adjustable wrench with a handy thumb-slide mechanism, Richard says "it's not heavy-duty enough for hard use, but it's a good occasional tool for quickie fixes. It's perfect to keep in the trunk of the car, just so you're covered."



Robo-Grip  
RG9 curved jaw  
\$30

## BUDDING BUILDERS



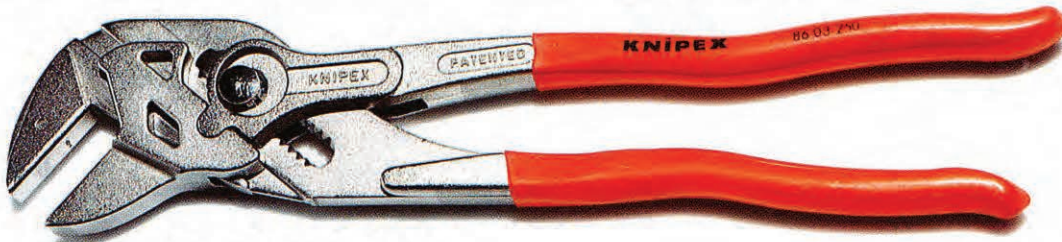
A group of 26 fifth-graders wearing hard hats, goggles and tool aprons sat on the floor in the massive Great Hall of the National Building Museum in Washington, D.C., ready to get a hands-on lesson in building. Through a program called "If I Had a Hammer," the kids were about to become part of a construction crew that would build an 8-by-11-foot house, complete with three working windows, a door and a front porch. Using 30 precut, color-coded pieces, hammers and cordless drills, they got the job done in two hours—and that included one "coffee" break. The children set the foundation, lifted the wall frames and the siding, raised the roof trusses and finally hoisted the tin roof to complete the structure. When it was done, the leader gathered the kids for a group cheer. Then they got to go inside the house and admire their handiwork. "Honey, I'm home," yelled one satisfied builder as he crossed the threshold.

(See Directory, page 112, for details and sources)

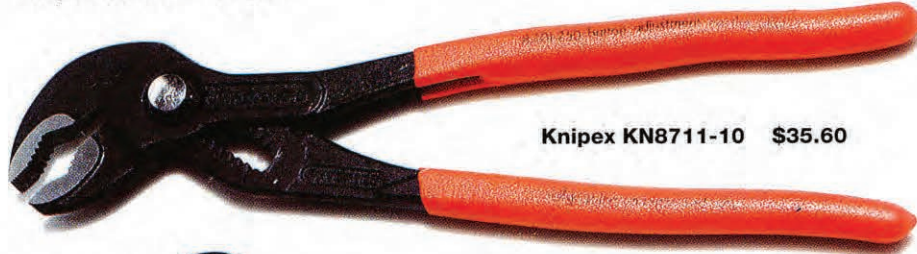
# "Criticism comes easier than craftsmanship."

Xeuxis

Photographs by Darrin Haddad



Knipex KN8603 \$73.50



Knipex KN8711-10 \$35.60



Sunico EZ-Grip \$18

## CFC black market

Enterprising smugglers are turning from guns and drugs to

chlorofluorocarbons, or CFCs. The ozone-depleting refrigerant gas, used in some residential and automotive air conditioners, hit the black market several years ago but became a hot item this year when production and new imports were banned in the United States. Smugglers buy the coolant overseas and sneak it into the country mixed with legal cargo or in fraudulently labeled cylinders. It's then sold to heating and cooling contractors, auto repair shops and industrial users. Street value: about \$20,000 per ton. According to federal officials, more than 1 million tons of contraband CFC have been confiscated and dozens of people arrested within the last year.

### events of interest

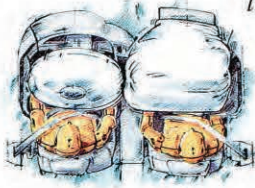
■ **FOR A LOOK INSIDE THE GRACIOUS HOMES OF OLD SAVANNAH**, plan to attend the 61st Annual Savannah Tour of Homes and Gardens, March 28-31. Festivities include walking tours, a jazz lunch and Sunday dinner at Mrs. Wilkes' Boarding House, a local must-visit. For information, call 912-234-8054.

■ **RESTORATION '96**, the largest preservation conference in North America, will be held March 17-19 at the Baltimore Convention Center. The show features 350 exhibitors of products and services and 35 educational conferences on the theme "Moving Into the Mainstream: Making Restoration Accessible to All." Call 508-664-8066 to register.

■ **SPEND THE NIGHT IN AN IGLOO** you build yourself at the University of Calgary's weekend course in igloo and snow shelter construction. The course starts with a lecture on March 19, followed by a hands-on building session March 23-24. Call 403-220-5038 for registration information.

■ **THE MORVEN ESTATE IN CHARLOTTESVILLE, VIRGINIA**, will be holding a three-day symposium on "The Grand Estate: Yesterday, Today and Tomorrow." Attend lectures and tour the 8,000-acre private estate's gardens, orchards and art collections. April 11-13; for information call 804-963-8463.

*Because of Dodge Intrepid's cab-forward design, you won't find the windshield in the usual place. Its leading edge is moved forward and down, to enhance visibility*



*and aerodynamics.*

*The wheels are pushed toward the corners, for greater stability and increased interior room.*

*And this year many features that were options are standard. So now the price of a well-equipped Intrepid may be lower than you'd expect... while resale value is higher than Taurus, Lumina, Camry and every car in its class.†*

# Except for the wheels things are pretty much what you'd expect



e windshield,  
and the price,  
y much where  
them to be.

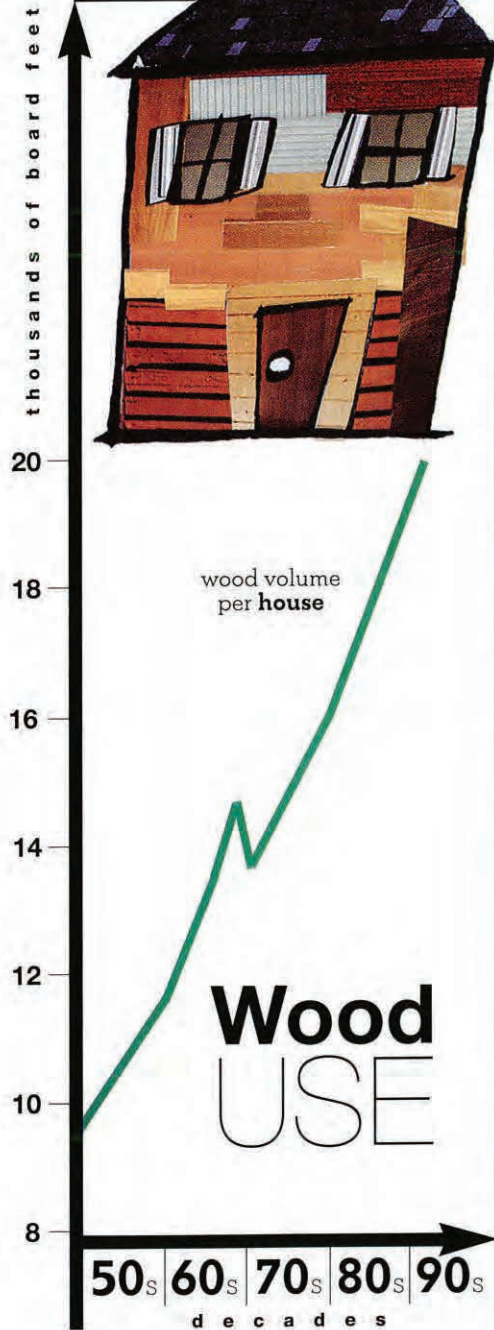
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well-equipped*

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- Standard power windows and door locks
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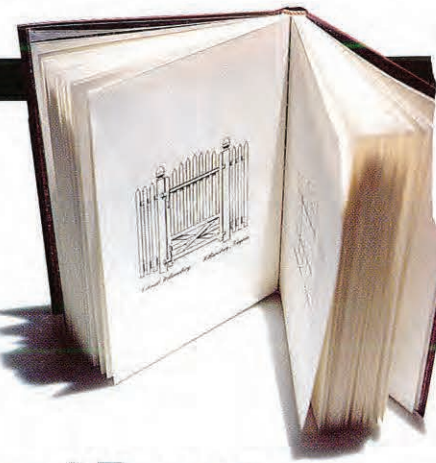


Despite all our talk about saving the forests, Americans are using more wood and wood products in homes than at any time since record-keeping began in 1950. The average new house of 1992 used more than twice as much lumber and wood panels as did the average new house at midcentury. Mostly this is because the average house these days is much larger. But total wood volume for each square foot of finished floor space is also at an all-time high. Forest Service researchers say that's because of more multistory houses, garages and foundations with crawl spaces instead of concrete slabs.

Just the thing for that backyard tiki bar, Tropic Top is aluminum roof thatch that's impervious to just about everything, including rot, bugs, ice and hurricanes. Endear yourself to neighbors and top the whole house with it. The 36-by-14-inch sheets are nailed in place much like ordinary roof shingles, although keeping valleys and curves natural-looking takes skill. The long, skinny teeth tend to stick out at odd angles. You also have to curl the teeth at the edges (wrap them around a dowel or pipe) to keep the roof from looking like it's been overstarched. Tropic Top sells for \$12 per square foot, uninstalled. It comes with a beige finish but can be painted. We suggest pink.

**what will they think of next?**

Tropic Top roof shingles



## Good Fences

Building a fence this spring? For inspiration, look through *Fences* by Peter Joel Harrison. About 15 years ago, Harrison wanted a Colonial-style fence to go with his Colonial-style house in Raleigh, North Carolina. Finding no suitable design guide, he set out to write his own. The result is page after gorgeous page of pickets, finials, gates and whole sections of fencing, all drawn to scale from examples he saw during visits to historic sites in the East. Harrison has done similar books on gazebos and brick patterns. He's currently at work on a collection of Cape Cod fence designs.

## QuickChange Screwdriver Bits

The Snappy Quick Chuck deserves its name: Chuck it into your 3/8-inch drill and you can install or change bits in seconds. Just push in a screwdriver, drill or counter-bore bit, and it locks in place; to remove it, just slide back the locking collar. Problem: grooved hex-end tools are required. No problem:

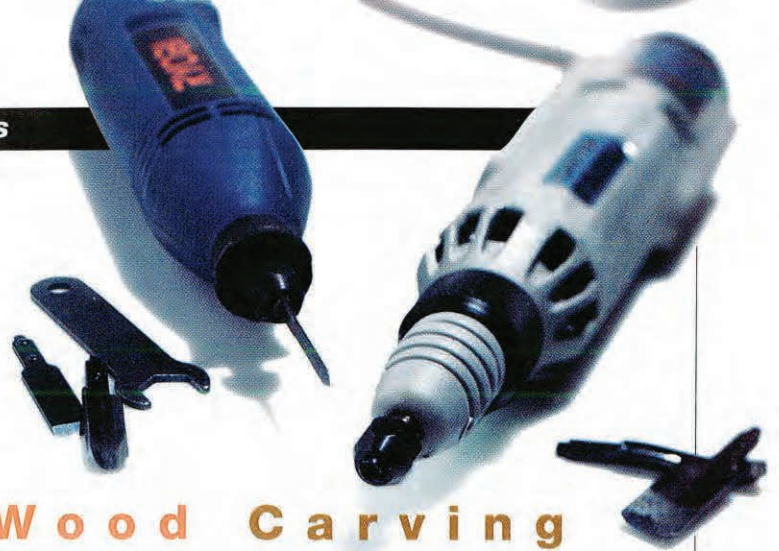
Snappy hex adapters fit round bits from 1/16- to 1/4-inch. Vermont American's "Screw Boss" is a handy tool to use with (or without) the Snappy. Its magnetic holder accepts hex-shank screwdriving bits, and its sliding sleeve holds screws up to No. 10 diameter. The sleeve keeps screws from tipping or wandering as the drill turns. Makita has a nearly identical accessory with a clear plastic sleeve so you can see when the screw is driven home.



CHART ILLUSTRATION BY SCOTT MENCHIN; THATCHED ROOF BY JOHN SYMBOLD



To test detail carvers, we used a Japanese motif. We xeroxed a page from a design book, enlarging it to the size we wanted. Then we ironed it (on the hottest setting) image side down onto a piece of wood, peeling away the paper as we went (black parts stick as the paper cools).



## Wood Carving



It's easier than ever to mimic the Old World skills of a woodcarver, thanks to a relatively new kind of tool: the reciprocating carver. Unlike older rotary carvers, which act more like grinders, reciprocating carvers cut just like hand tools, albeit with more noise and vibration. Interchangeable tips match the shapes of traditional carving gouges, chisels and V-parting tools. When we turned on the Automach HCT-30A and the newer, considerably cheaper version from Ryobi, we feared the vibration might make our hands numb after prolonged use. But traditional carving is even harder on the hands than power carving, we concluded after an evening of doing both. Which tool to buy? The \$330 Automach runs hotter, but its wider blades remove more wood. More substantial than the \$65 Ryobi, it would be the best choice for professionals. But the Ryobi cut well, even in black walnut, and we liked its smaller blades for detail work.

## electric box

Contractor Tom Silva recalls many a makeover in which a homeowner suddenly wanted wallpaper after he'd installed wainscoting—or vice versa. Either way, all electrical outlets had to be torn out and reset. Adjust-A-Box solves the problem with an adjustment screw that can move outlets up to 1½ inches out from the stud, enough to accommodate almost any wall thickness. "They're too expensive to put everywhere in a house," Tom says, "but in kitchens and bathrooms, I wouldn't use anything else. Every contractor should know about them—but no homeowners, please."



In an "everybody wins" program called Jordan Commons, 200 Florida families devastated by Hurricane Andrew are getting new homes. The American Iron and Steel Institute is donating the steel framing materials and in the process promoting its members' products. The National Association of Home Builders is using the materials in weeklong training sessions on building with steel, thus serving its contractor members. The contractors who donate their labor learn new skills they can use to drum up business. And after each session, Homestead Habitat for Humanity gets a framed house for other volunteers to complete.

You think your contractor is slow? This house took 200 million years to build—and it can be yours for \$3.5 million. The Beckham Creek Cave in the Ozark Mountains in northwestern Arkansas was turned into a lavish bomb shelter by John Hay in 1984. Once Hay's fear of attack subsided, he transformed it into a

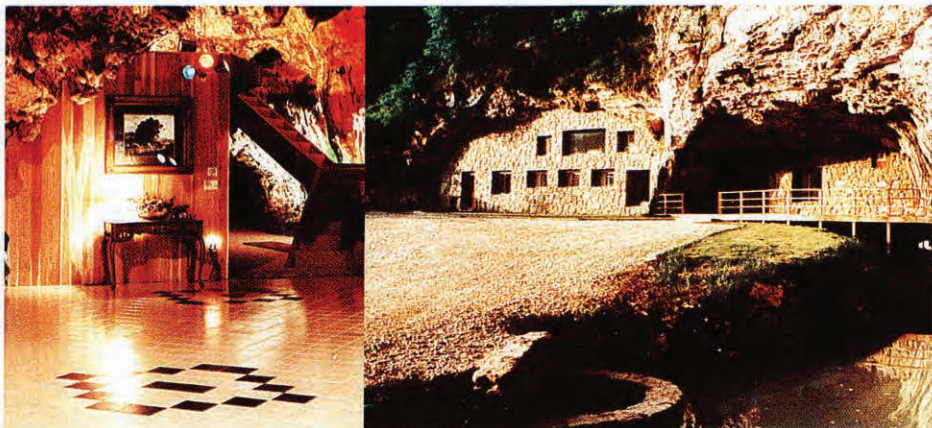
are bombproof and can boast of stalactites and an underground aqueduct?)

The cave sits among 533 acres complete with waterfalls, a fishing pond, a horse barn and a helicopter pad. It continues for miles through a passageway at the back of the house. Hay's wife, Carol, describes exploring its length as "traveling through Alice's looking glass."

## Cave Abode

"luxury hideout." Fully loaded for peacetime, it has 5,500 square feet of living space with five bedrooms, five baths, a gourmet kitchen and tons of unique extras. (How many homes

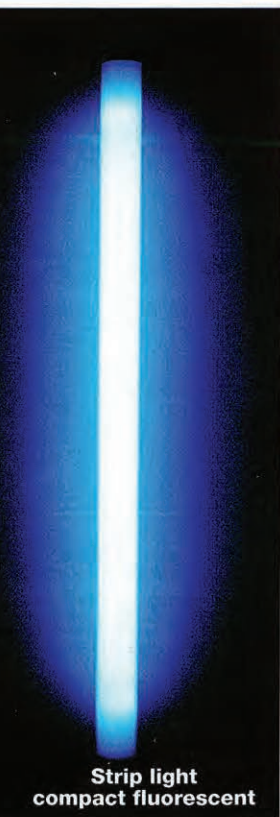
For those who'd like to get a better look without making the hefty investment, rentals are available—although they don't come cheap either. Weekends start at \$895 in season (May through October) and \$745 during the off season. Call 800-335-2283 for more details.



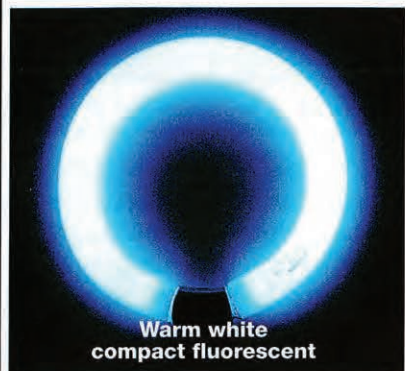
Cuckoo clocks had "been done," so Swiss master carpenter Werner Fluckiger whiled away the Alpine winters by inventing the Top Star jamb adjuster. It's a two-part screw, one part rotating inside the other, that eliminates tedious shimming. To set door and window jambs, simply predrill, then drive the Top Star until the primary threads grab the frame and the secondary threads lock into the jamb. Backing out the primary screw pushes the jamb into perfect (and unshimmed) alignment. A two-part bit makes this a breeze.

## Shedding Light

Lightbulbs (called lamps by tradespeople) come in more shapes and sizes and wattages and lumens than anyone has time to figure out. Here's some illumination: Evaluate the brightness of bulbs according to lumens, not watts—a 15-watt fluorescent and a 75-watt incandescent both put out about 900 lumens. Federal law requires packaging to contain these values. Also check the package for the color rendition index (a measure of the bulb's ability to render



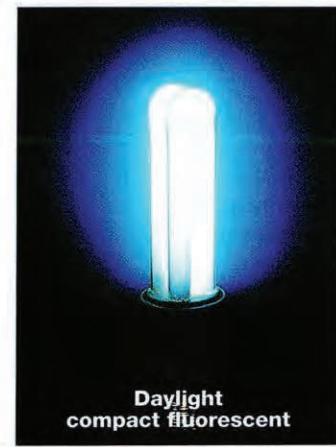
Strip light compact fluorescent



Warm white compact fluorescent



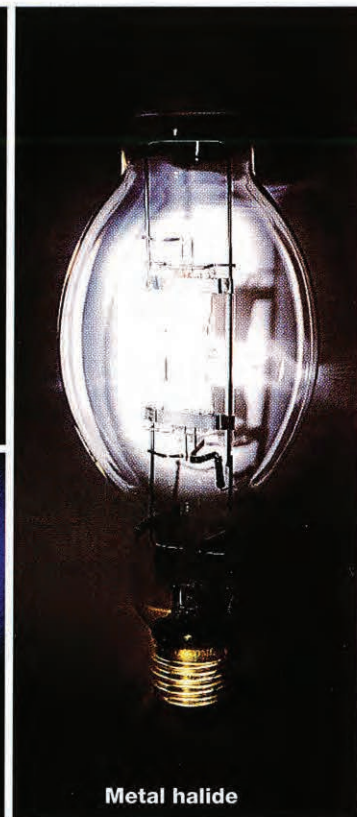
Optional reflector compact fluorescent



Daylight compact fluorescent



"EarthLight" compact fluorescent



Metal halide

Can tool-wielding guy types have delicate hands? Plasterer Jim Marshall (featured in our September/October 1995 issue) does, despite his gritty work. He uses an

almond-scented lotion that softens skin but isn't greasy. "That way I can still control my trowel," he says. This balm of aloe juice and vitamin E was developed for the rough-necks of Texas's oil fields—hence its name: Oil Drillers' Lotion.



**TOUGH  
SMOOTH HANDS  
GUYS**

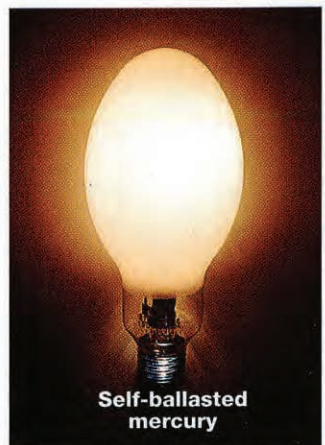
## XMAS in APRIL

For the past several years, the last Saturday in April has been Christmas for thousands of needy homeowners. Christmas in April, a volunteer-supported home rehabilitation program, uses the barn-raising approach to improve the residences of low-income, elderly and disabled people nationwide. Throughout the year, the program recruits volunteers, collects donations and identifies homeowners, who can be referred or submit applications. Then, on the appointed day, swarms of volunteers descend to patch roofs, paint walls, fix cracks, repair plumbing and wiring, build wheelchair ramps and make other improvements.

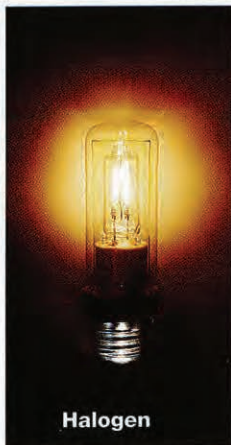
"It's a simple idea that works," says Christmas in April president Patty Johnson. "It's neighbor helping neighbor." Johnson says the hardest part often is getting the homeowner to believe it's for real and for free. The program went national seven years ago; it's projected that this spring 4,300 houses will be rehabilitated by 135,000 volunteers in 480 cities and towns. Call 800-473-4229 for more information.



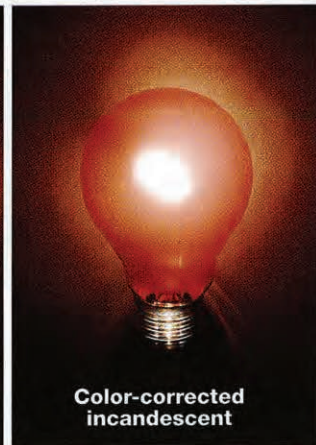
**ENVIRONMENTALLY CONFUSED?** If you're wondering about which plants and grasses are indigenous to your part of the country, have questions about recycling or are concerned about the use of toxic chemicals in home repair, call the folks at American Public Information on the Environment—a.k.a. American PIE. The toll-free service (800-320-2743) offers advice on a wide range of environmental issues. Open Monday to Friday 8:30 a.m. to 5:00 p.m. EST. You can also request information via e-mail at [75143.3373@compuserve.com](mailto:75143.3373@compuserve.com).



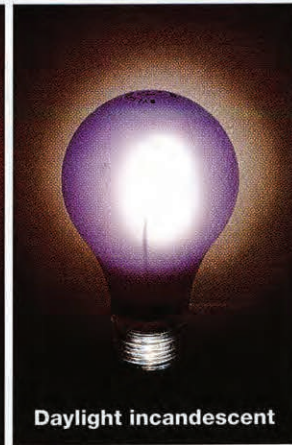
Self-ballasted mercury



Halogen



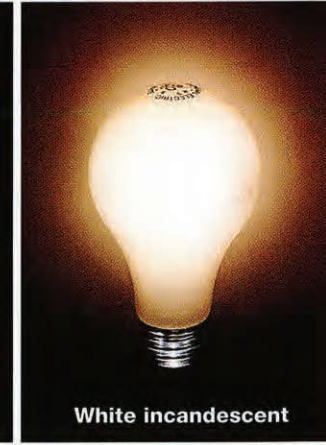
Color-corrected incandescent



Daylight incandescent



Neon



White incandescent

colors accurately) and life expectancy (in hours).

Incandescents are the ones we're used to. They cast a warm glow (especially those with a frosted or tinted glass globe), fit in conventional sockets, generate heat and guzzle energy. Halogens are a more efficient type of incandescent; they generate about 30 percent more light per watt. Neon bulbs are uncommon in residential applications. This novelty neon fits in a conventional socket; most don't. Compact fluorescents produce little heat and

lots of light. They're expensive but efficient and last up to 10 times as long as incandescents. Keep yourself from looking sickly in the light these cast by selecting warm-temperature bulbs—those with a Kelvin rating (check the packaging) below 3,500. This self-ballasted mercury lamp is used for commercial applications; it's the kind of light you see glaring outside the back entrance to a store. Metal halide lamps are used in highway light posts. They're about 16 inches tall with the girth of a grapefruit.

# I can't say enough about Ace Lawn & Garden Supplies...

The oscillating sprinkler. Don't know exactly what oscillating means, but it keeps the lawn watered and the kids cool.

The shovel. "Borrowed" this from Dad when we planted the elm tree a couple years ago. Wonder if he's noticed it's gone?



The hose. Waters the garden, fills the kiddie pool, and washes the car. What more can you ask?

My Lawn Mower "Old Red". Bought this when we bought the house. Starts every time... even when I wish it wouldn't.

Fertilizer. The secret to the best lawn on the block... maybe the planet, although that's probably spreading it on a little too thick.

Ace Brand lawn and garden supplies are made with a satisfaction guarantee. Because all the talk in the world doesn't matter if you can't back it up.

# Cordless Drills and Drivers

A new generation for the job site

BY MARK FEIRER PHOTOGRAPH BY KELLER AND KELLER

# W

hen it comes to drilling holes or driving screws, you can't beat a cordless tool for convenience. "I don't even use a corded model anymore," says Tom Silva, *This Old House* contractor. "Unless I've got a pile of dry-wall to hang or a whole subfloor to screw off, it's faster to grab a cordless and go."

He's not alone. "Plumbers, electricians, the guys who do the ductwork—they've all gone cordless," Tom says. Carpenters don't lug extension cords up and down ladders, heating contractors don't fillet their power cords on the edges of metal ducts, and nobody has to worry as much about the shock hazards of working where it's wet.

A drill/driver is essentially a drill with added features (including a multi-setting clutch) to handle the heavier stresses of screwdriving. That makes it more versatile than an ordinary drill. The batteries and

battery chargers of both tools, however, are a lot better than they once were. Master carpenter Norm Abram's first cordless drill took about three hours to charge and wasn't much better than a Yankee screwdriver for driving screws. These days a drill/driver is ready to go in as little as 15 minutes, more than adequate to keep most people working steadily. Tom, however, packs



**A cordless drill/driver is just right for installing storm windows. The switch on top is for changing speed ranges.**

two batteries on the job. One stays in the charger until the other dies, and he swaps them back and forth all day to minimize downtime. As befits a busy contractor, he owns several drill/drivers with batteries that range up to 14.4 volts. Unless you're using it professionally, though, a 9.6-volt drill or drill/driver will be able to do most anything around your old house.

# The Details

Most cordless drills have a variable-speed trigger switch; slow speeds are for starting holes, fast speeds finish them. Drill/drivers have the same feature but with two separate ranges: a high-speed range for drilling holes and a high-torque range for driving screws. When you shift into screwdriving range, an adjustable clutch inside the tool allows you to set screws at a consistent depth. Most drill/drivers have an electric brake too. When the trigger is completely released, the chuck stops instantly to keep you from overdriving a screw. Whatever its features, a drill or drill/driver should be comfortable to use—but that, Tom points out, is a personal thing. Heft a tool before you buy it, because they vary considerably in weight and balance. The basic types are shown here. Light-duty drill/drivers go for about \$60; contractor-grade models are \$125 to \$300. Standard cordless drills are somewhat less expensive.



VARIABLE-SPEED TRIGGER

AUXILIARY HANDLE

CHUCK

FORWARD/REVERSE SWITCH

BATTERY PACK

1

2

3

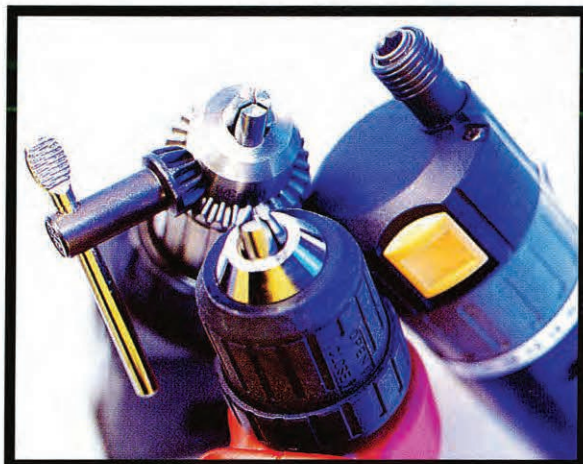
4

- 1 Bosch closed-handle drill/driver
- 2 Metabo pistol-grip drill/driver with removable side handle
- 3 Milwaukee 55-degree-angle drill with two triggers
- 4 Makita T-handle drill/driver
- 5 Hitachi right-angle drill

# The Parts

PHOTOGRAPHS BY SPENCER JONES

## CHUCKS



The chuck of a drill or a drill/driver is what holds the bit (or screwdriver tip) in place. It's rated according to the diameter of the largest bit shank it can hold, from ¼-inch up to ½-inch. The ⅜-inch chuck, however, is standard issue on general-duty drills and drill/drivers (Tom wouldn't use a smaller one anyway). The main chuck decision these days is whether or not to go keyless. A simple key with



The turret of this quick-connect Panasonic drill/driver pivots into tight spots (such as cabinet interiors) and locks into position.

**CHUCK CHOICES**  
A chuck with a key (above left) is still common, particularly on heavy-duty drills and drill/drivers, but a keyless chuck (center) is more convenient. The keyless variation at right is a quick-connect chuck; it accepts only drill bits and screwdriver tips that have a hex shank.

beveled teeth tightens most chucks, and it works fine—if you can find it. “A chuck key is the first thing you lose on a job,” says Tom, even if it's clipped to the drill itself. With a keyless chuck there's nothing to lose: a pair of knurled rings around the outside of the chuck let you tighten or loosen it by hand. “Keyed chucks? I won't miss 'em a bit,” Tom says.

## BATTERIES AND CHARGERS

A battery charger generates heat, and concentrating that heat into the short cycle typical of quick-chargers can damage a battery. The new “smart” chargers get around this by using electronic circuitry to monitor the charging process and minimize heat buildup. Some even refuse to charge a sun-warmed battery until it has cooled.

Other than keeping sawdust out, chargers need little care. “I've replaced a few,” says Tom, “but that's mostly after something fell on them.”

The battery of any cordless tool is actually a collection of batteries, called cells, wired together and fitted into a battery “pack.” Each cell is rated at 1.2 volts; join 10 and you have a 12-volt pack. The greater the voltage, the more work the battery can do before it has to be recharged (and the heavier the tool). Battery packs usually last through 800 to 1,000 charging cycles. Replacement packs generally cost \$50 to \$80. Some battery tips:

- Unlike older nicad batteries, the new nicads can be partially discharged and then recharged without any ill effect. You'll get more life out of one, though, if you recharge it only when the tool starts to feel sluggish. But don't wait until it stops dead—you can damage the cells if you discharge a battery too deeply.
- A battery loses 1 to 3 percent of its charge every day, even if a tool isn't used.
- It's against the law in some states to throw battery packs in the trash; contact the manufacturer for recycling instructions or call the Portable Rechargeable Battery Association at 800-225-7722.
- A few batteries include a built-in LED readout that tells you how much charge is left at any given moment.



5

CLUTCH

HIGH/LOW  
SPEED RANGE  
SWITCH



# Drill/Driver Techniques

PHOTOGRAPHS BY KELLER AND KELLER

Simple things, like drilling a hole perfectly straight, can be surprisingly tricky, just as simple tools are often the ones you have to watch out for. "You might be holding a board for a quick hole and end up drilling through your hand on the other side," cautions Tom, so pay attention to where your hands are at all times.

## DRILLING HOLES



**STRAIGHT DRILLING**  
Sight down the drill to line it up with the workpiece, and start the bit slowly. For greater precision, Tom sometimes holds a small square alongside the bit as a guide. "Another way is to have someone else eyeball for you—they can tell you to move the drill one way or another."



**ANGLE DRILLING**  
**Step 1.** Drill in straight a half inch or so, then remove and reposition the tool to drill through the side of the starter hole. That gives the bit something to bite into, and it won't wander. If you're using a spade bit, your starter hole has to be a little deeper.



**Step 2.** "When you find your angle, stick with it," Tom says. Don't change, or you'll bend the bit and probably ruin the hole. Keep a good grip on the tool to prevent it from twisting. Push the drill firmly into the hole, then pull it out while the bit is still turning.

## DRIVING SCREWS



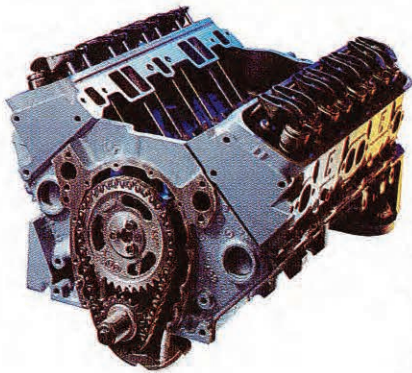
Tom prefers pistol-grip drill/drivers because he can put his muscle directly in line with the bit. He centers his hand high on the tool and pulls the trigger with his lower two fingers. Though it's not always possible, he tries to keep his forearm aligned with the screw to minimize wrist strain and improve control.

To drive a screw with a drill/driver, switch the speed range to low to increase torque, or turning force, and adjust the clutch so it disengages the motor when the screw is fully set (you'll probably have to fiddle with the clutch setting a few times until you get it just right). Then line up the bit with the screw—Tom's 4-inch extension bit gives him something to sight down, making alignment easier to judge. Start the screw slowly, increase speed once it's on the way and maintain firm pressure to keep the bit from spinning loose.

Predrilled screw holes actually make for a stronger connection: The screw shank won't crush wood fibers as it enters, and the threads get a better bite. The pilot hole diameter should be slightly less than the diameter of the screw shank.



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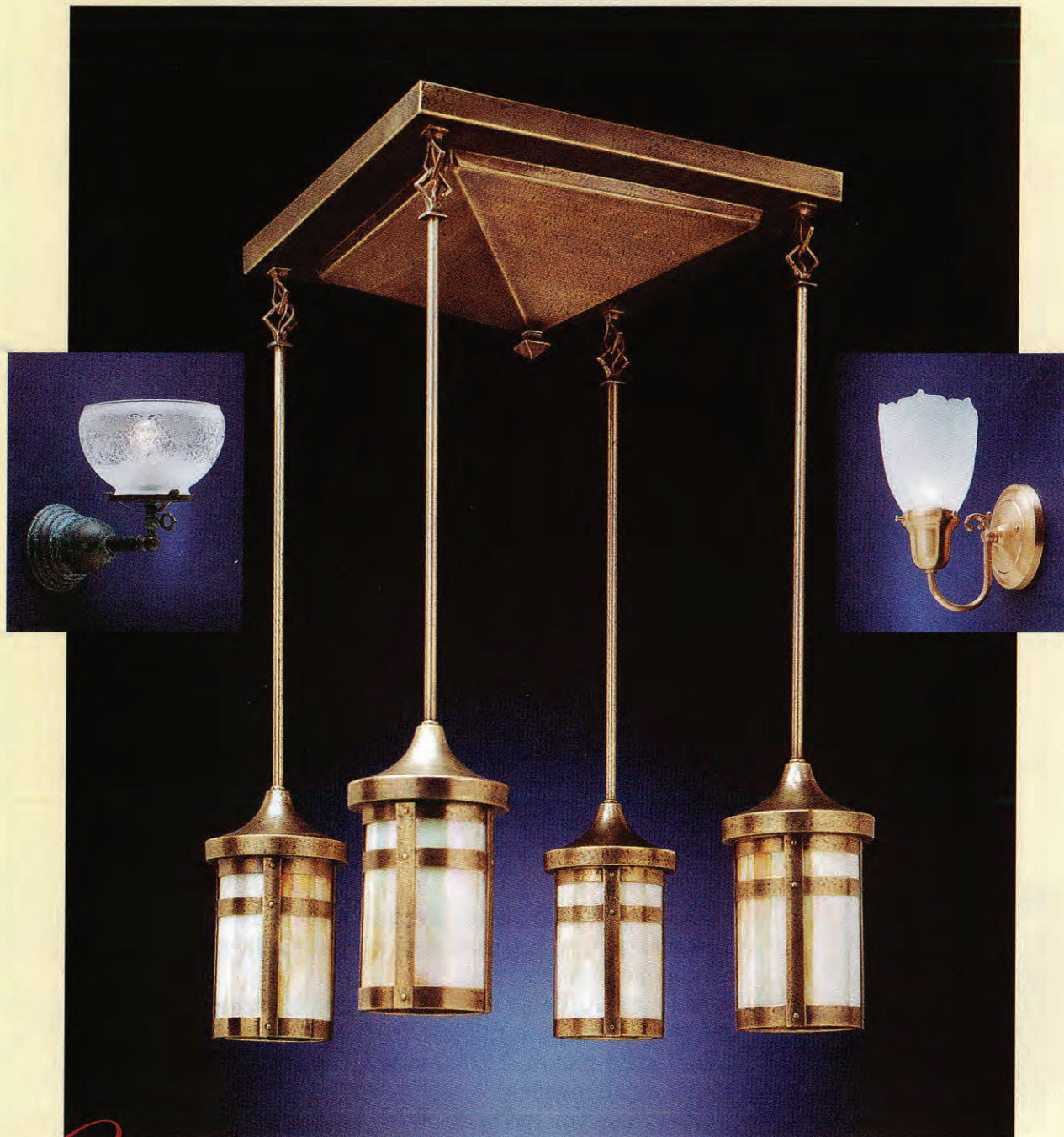
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# Shower Update

Installing a low-flow head and an antiscald device

BY WILLIAM MARSANO PHOTOGRAPHS BY DOUGLAS ROSA

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## choosing a showerhead

A good guide to low-flow showerheads is the February 1995 *Consumer Reports*, which rated 29 models. Among regular showerheads, Teledyne Water Pik's SM-62-P (\$42) and SM-82-W (\$59) finished one and two, ahead of models priced as high as \$51 and \$65. Resources Conservation's ES-181 and Pollenex's PS50 (both only \$7) also beat the \$51 head. Among handheld or "personal" models, Teledyne's SM-85 (\$69) was first, followed by Pollenex's PS420 (\$35) and Interbath's B1933AWW (\$59), which tied. Caveats: One, low water pressure can halve the legal 2.5-gallon flow, dampening your spirits but little else. (Solution: a head with a removable flow-restrictor ring.) Two, the risk of scalding increases if a low-flow head is installed but a temperature-control valve is not. That's because the too-hot water backs up behind the head and takes longer to get through.

**W**ith federal water-conservation laws limiting new showerheads to a flow of 2.5 gallons per minute, plumbing expert Richard Trethewey suggests installing a low-flow head as a weekend project. "It sounds like a job you can knock off during commercials on a sports telecast, but there's more to it than screwing the old one off and screwing the new one on," Richard says. "If you're not careful, you'll have more than a weekend project on your hands.

"And," he adds, "you can update your shower by replacing the old faucet—the kind with separate hot and cold valves—with an antiscald or temperature-control valve. Most homeowners don't realize it can be done without ripping out all their tiling."

If Richard had his way, "there'd be an antiscald valve in every shower in the country." The reason is safety. Flushing a toilet, using the sink or starting the dishwasher can divert cold water from the shower. Without an antiscald valve, you'll get a blast of hot water—up to 140 degrees Fahrenheit, which can cause third-degree burns in a matter of seconds.

Antiscald valves are made for both tub and stall showers, and they're simple to use. Set the desired temperature on the valve, wait a bit for the mechanism to blend the hot and cold flows, then step in and lather up.



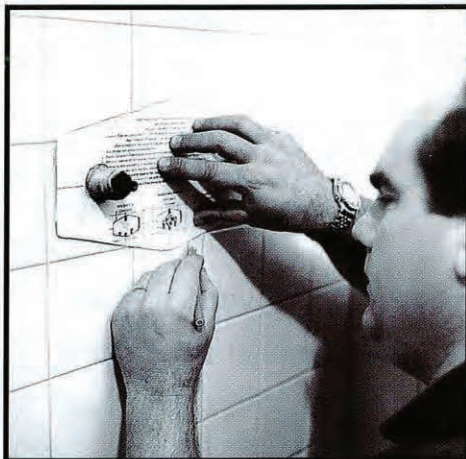
# Step-by-step Installation



**BEFORE**

First **shut off the hot and cold water lines** to your bathroom and open all bathroom taps to break the vacuum in the pipes. Then pry the index caps (marked “hot” and “cold”) from both knobs, remove the screws underneath and take off the knobs. If the knob simply slides off (unlikely), fine. If not, use the handle puller. Unscrew the escutcheons (decorative sleeves covering the valve bodies) and flanges (trim rings behind the escutcheons).

- 1** Center the modification plate's paper template: Position it over the valve stems, press down hard with your fingers and poke a hole through it into the stems' screw holes. On a countertop, center an escutcheon over each hole, outline it in pencil and cut out the circle. **Position the template over the valves and outline it with pencil or china marker.** The outline marks the no-go area: Don't go outside the lines.
- 2** **Drill closely spaced pilot holes** through the tiles around the valves. To start, press the bit firmly against the tile and drill slowly so it won't skip erratically across the surface.
- 3** **Chisel out the tile:** a few blows on one side of each hole, a few on the other. Or use an electric tile saw to cut within the outline.
- 4** Now you can see the three joints that must be disconnected. Rising from the middle of the faucet body is the supply tube for the showerhead. Cut it with an imp cutter (or a hacksaw blade—but watch your knuckles). At left and right are the hot and cold



**1**



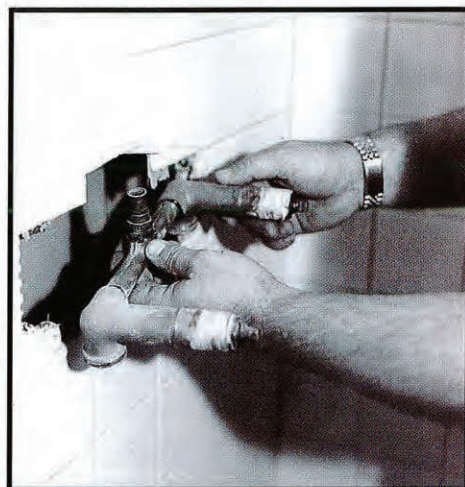
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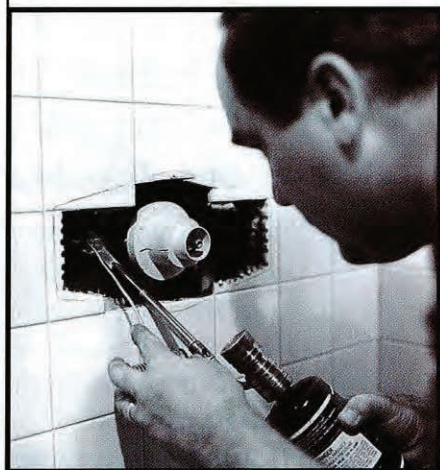
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water supplies. If they're sweat-soldered, a torch will unsweat them. If they're “union” joints (with large locknuts), use a wrench. **Remove the faucet body** and, if necessary, unsweat the rest of the union fitting on each supply (use pliers to handle these hot parts). When using a torch, it's wise to put a fireproof plumber's cloth behind the work.

- 5** **Install the antiscald valve.** Reconnect the hot, cold and shower piping to the new valve body, using appropriate copper fittings and cutting tubing as necessary. Often it's difficult to make these connections in such a confined space. Two special fittings may be required: a copper union or a copper slip coupling. Clean all tubing and fittings with emery cloth and apply flux at each joint. Use the plastic rough-in plate (which resembles a cup) to make sure the valve is level and plumb. The “service stops” (screwdriver-slot shutoffs on the front of the valve) should be fully open (counterclockwise). The spindle (central valve stem) should be removed. **Apply torch to each fitting until the flux bubbles,** then apply solder to the opposite side until the fitting is filled. You'll know it's filled when you see the solder come toward the front or flame side.



**4**



**5**

- 6** **Flush the valve to remove any flux, solder or sediment.** The following steps may seem obscure and confusing, but trust Richard and do exactly as he says. (a) Close the service stops and turn on main hot and cold supplies. (b) Slowly open the service stops, allowing water to flush the valve. (c) Close the stops, reinstall the spindle and reopen the stops. If all is well—no leaks at the joints—install the modification plate and trim. Apply silicone caulking or plumber's putty to the back of the plate. The plate comes with two bolts and two spanner bars, which should be tightened equally (don't



**6**

For fiberglass showers, the steps are largely the same. Make shallow cuts to avoid pipes. For maximum control, use a jigsaw with a fine-tooth blade.

overtighten). Follow manufacturer's instructions for installation of trim ring, escutcheon and handle.

- 7 Remove the old shower-head from the pipe** ("shower arm"), which is threaded at both ends. Over time, threads can fuse; if you force them, they'll break inside the wall, ruining both your weekend and your budget. Avoid this by using two wrenches: one on the shower arm, the other on the head. Unless you really want the neighbors to know you did the job yourself, use duct tape so the wrenches won't scar the chrome. Holding the shower arm steady with one wrench, gently unscrew the head with the other. **Screw on the new head**, taking the same precautions. If it lacks a washer, wrap the threads with a turn or two of Teflon pipe tape to prevent drips. Personal showers install the same way, but some have a wall fitting for the head. Using the fitting as a guide, mark screw holes, drill them, insert anchors (included with the shower) and mount the fitting. Test for leaks; remove duct tape and excess caulking. Put your tools away and take a shower. You'll need one about now.



7



AFTER

## Tools & Materials

Don't be daunted by the many tools listed. Several are included just in case: You can't know exactly what you'll need until you can see inside the wall.

**Tools:** wrenches (adjustable, vise-type, pipe, channel-type); variable-speed power drill and quarter-inch masonry bit; hammer and sharp cold chisel; electric tile cutter (optional); propane torch with fine or "pencil" tip; screwdrivers (Phillips and plain); fireproof plumber's cloth; handle puller (for removing shower knobs); tubing cutter (a small "imp" for working in tight spaces).

**Materials:** Teflon pipe tape; lead-free solder; flux; bucket of water and/or small fire extinguisher; duct tape; silicone caulking; emery cloth.

**Equipment:** antiscald valve; modification plate; low-flow head; a foot or two of 1/2-inch copper tubing (Type L) and half a dozen miscellaneous copper fittings (elbows, couplings, 45-degree angles, copper unions or slip couplings; assorted "ream-style" adapters in the event that you have brass pipes). Note: If you're only an occasional solderer, review the article on sweat-soldering in the May/June 1995 issue of *This Old House* (see Directory).

## other shower gadgets

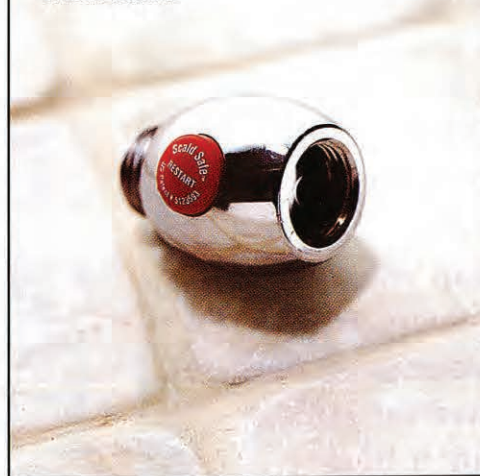
**t**here is an almost endless variety of shower fittings.

Grohe's antiscald Chiara model (\$650), for tub showers, offers the simplest installation. No tile-cutting here: Just shut off the water supply, remove knobs and valve stems and screw the fixture onto the hot and cold valve bodies. Another easy option is Resources Conservation's Scald-Safe



**GROHE CHIARA  
ANTISCALD  
TUB SHOWER**

### RESOURCES CONSERVATION SCALD-SAFE SHOWERHEAD



thermostatic shower-head (\$14). It's the least expensive if also the least convenient: It just shuts off too-hot water rather than controlling temperature. Other fixtures also provide safety and comfort. Soap-on-a-rope is one answer to the danger of soap on the floor; a better one is a wall-mounted dispenser for liquid soap, shampoo and lotions,

whether plainly functional, like Better Living's The Dispenser (\$25), or decorative, like those from Earth Preserv (\$40 to \$75). To remove skin-drying chlorine, install a Rainshow'r filter (\$40), which screws on between the shower arm and head. For the young, elderly and handicapped, consider grab bars and wall-mounted fold-down shower seats like those from American Standard.

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by **Richard Eisenberg**

and the editors of *Money* magazine

# Japanese Saws

For fine joinery, their sharper, thinner blades outperform Western-style saws

BY PAUL ENGSTROM PHOTOGRAPHS BY MARKO LAVRISHA



Paul Discoe was drawn to Buddhism when, en route to Japan to study carpentry, he met Shunryu Suzuki, an inspirational Buddhist teacher. Woodworking, says Discoe, is body and mind concentrated on one point. Meditation helps him achieve that single-point focus. **LEFT:** He pauses before an altar in his Oakland workshop. **RIGHT:** Novices might picture the mind-body-saw alignment as an elastic band from the sawyer's navel to the saw's handle; the band stretches and contracts with every pull and push. **BELOW:** Discoe's Buddhist name, Zengyu, inscribed on a saw handle.



**P**aul Discoe isn't meditating. He's sawing. But one look at this bearish Buddhist priest and master woodworker—at his intensity, at his alignment of eye, body and mind with the Japanese *ryoba* saw and length of Port Orford cedar that yields to the double-edged blade as bread yields to a knife—might lead to another conclusion.

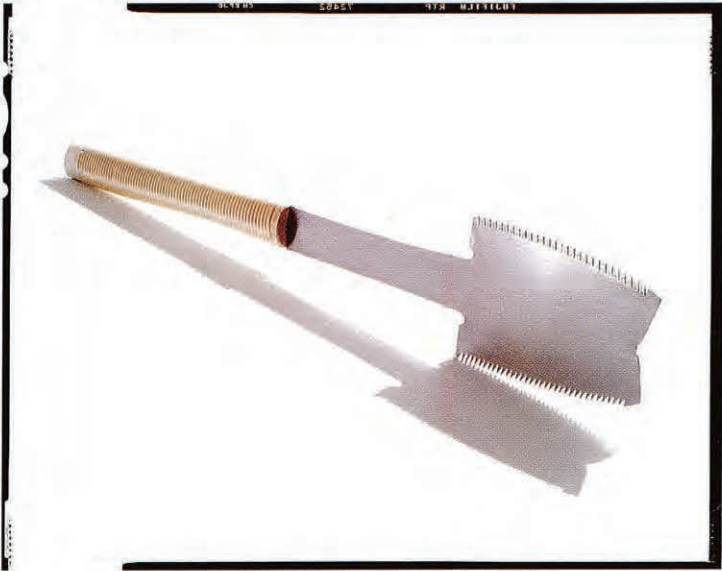
His undeviating concentration is made that much easier by the *ryoba*. Like other Japanese saws and in contrast to the Western variety, it cuts on the pull rather than the push stroke. That means the blade is under tension rather than compression, enabling the use of thin blades for easier, straighter cuts.



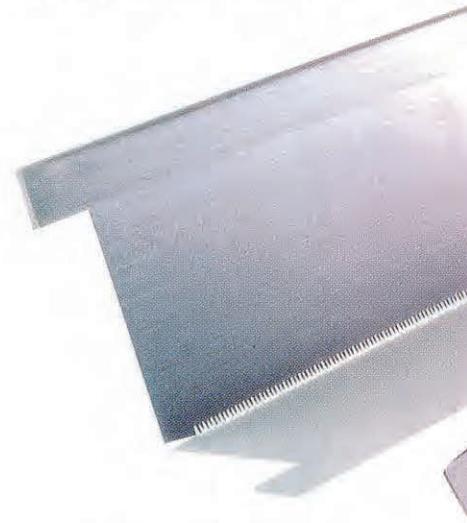
“You have to be totally focused on that line you’re cutting, like a laser beam,” says Discoe, owner of Joinery Structures in Oakland, California. “The tension has to be right down the line of that cut. You can’t be thinking about food, your sex life or something else and still saw a straight line.”

Why do Japanese saws enjoy such a loyal following in the West, particularly given the convenience of power tools? The sight-sound-feel connection between the craftsman and his handsaws is one big reason. Jay van Arsdale, the son of a fifth-generation Kentucky blacksmith and owner of another Japanese joinery business in Oakland called The Pull of the Saw, puts it this way: “The more mechanized you are, the more distance there is between you and your

**THE SAWS** Because a pull stroke puts less stress on the blade, Japanese saws can be made with a harder, though more brittle,



**LEFT: The azebiki noko giri is designed for cutting mortises, grooves in midpanel and sliding dovetails, like the one pictured above. It is especially useful when the craftsman must maneuver in a tight area without damaging adjacent work.**



work. What makes traditional Japanese-style woodworking special is the relationship between the tools you use and the kind of work they allow you to do.”

Such work often calls for intricate joinery, whether the project is a shoji screen, a garden pavilion or a modern-day palace of Japanese design. The great variety of Japanese saws means the seasoned woodworker can use just the right blade for a specific type of cut.

“These tools are so responsive, so perfectly balanced, your personal skill is all that separates you from the wood you work,” says van Arsdale. “Japanese tools put the focus back on the magic that exists between the craftsman and his craft.”

steel. This allows for sharper teeth and a thinner blade. A thinner blade makes for an easier cut because less wood is displaced.

## How to Cut a Tenon

*A two-handed, whole-body approach to perfect joinery*



Discoe marks his cuts using a Japanese ink pot and *suma shashi*, or bamboo pen that has been sharpened to a very fine edge. The special ink doesn’t penetrate the wood, so any remaining lines are easily removed with a hand plane.

1



Bracing the wood with his knee, he grips the 11-inch ryoba with **both hands** to begin the left vertical cut at a 30- to 40-degree angle. He starts with the small teeth near the heel, then shifts to the bigger middle teeth, using longer strokes and a steeper angle.

2



The right vertical cut follows. The **low height** of the Japanese-style sawhorses—15 inches, versus the 24 inches of many Western sawhorses—enables Discoe to use his body weight for more leverage. As a result, his arms do less work.

3



**TOP:** With a blade thickness of only 0.010 inch, the *Shindo dozuki* is designed for fine cutting of miters and the shoulders of tenons and dovetails. The rattan-wrapped handle enhances grip.  
**ABOVE:** The *Gomuguri* is a multipurpose crosscut saw with a less expensive plastic handle and a replaceable blade, which eliminates the need for sharpening.

**BELOW:** This *ryoba noko giri* has 10 crosscut teeth per inch on one edge, 5 rip teeth per inch on the other. Rip teeth increase in size from the heel (near the handle) to the toe of the blade, while all crosscut teeth are identical.



STILL LIVES BY DARRIN HADDAD



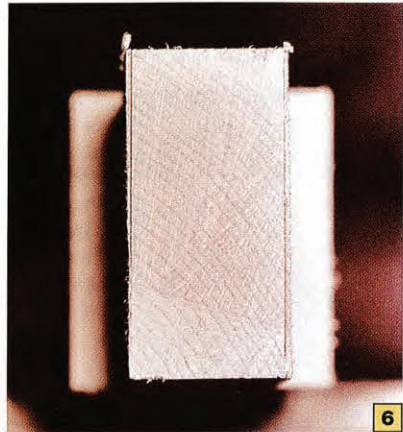
For the first shoulder cut, Discoe is at a **perpendicular angle** to the wood. Again, he starts with the small teeth and centers his body weight over the cut, this time using his left arm as an anchor.

4



He finishes with the saw level, then flips the piece over for the final cut. He stays just **outside of the line** so the tenon is a bit larger than it needs to be. Typically, these rough cuts are finished with a Japanese chisel for a tight fit of mortise and tenon.

5



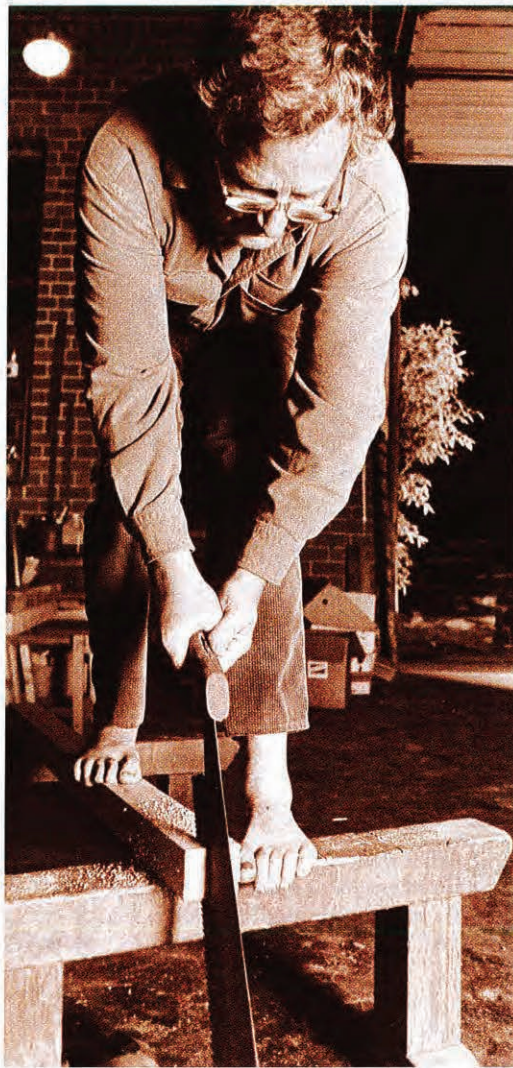
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# the difference... Western and Eastern

Discoe uses Western saws for crude cuts, preserving his Japanese saws for finer, more sophisticated tasks. Either way, his Japanese training leads him to use his whole body, rather than clamps, to hold work steady. He leaves feet bare to keep wood free of debris.



The **push stroke** of the Western ripsaw requires strength and control in one arm—and puts a lot of strain on it. Here, Discoe's body weight is to the left of the line of cut.



The **pull stroke** of the Japanese saw takes full advantage of the user's body weight, which is above and aligned with the cut. Discoe grips with two hands for more power and greater control.



Western

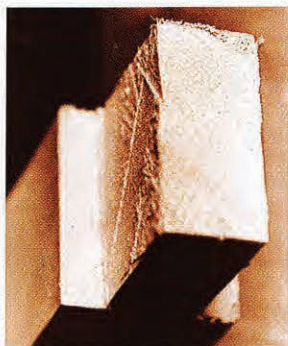


Japanese

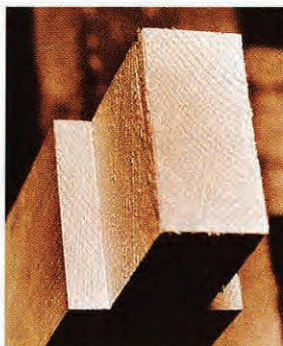
## THE WIDTH OF THE CUT

The blades of Japanese saws generally are thinner and have finer teeth than those on their Western counterparts, so they produce a narrower kerf. When Japanese saws are made, the heat-treated, high-carbon steel of the blade is scraped so it is slightly thinner at the heel than at the toe and in the center than at the edges. This discourages binding. The difference in teeth is such that lightly running an index finger along the blade of a Western saw should not cause a wound. Doing so along the teeth of a Japanese saw, however, would be much riskier.

## THE QUALITY OF THE FINISH CUT AND EDGES



The Western saw renders a **rough end cut**. In the traditional manner, the cut is from one side of the wood straight through to the opposite side.



The Japanese saw leaves a **smoother finish**. In the traditional manner, the wood is rotated during the cut so each partial cut acts as a guide for beginning the cut on the next side.

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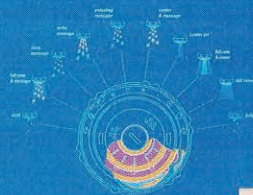


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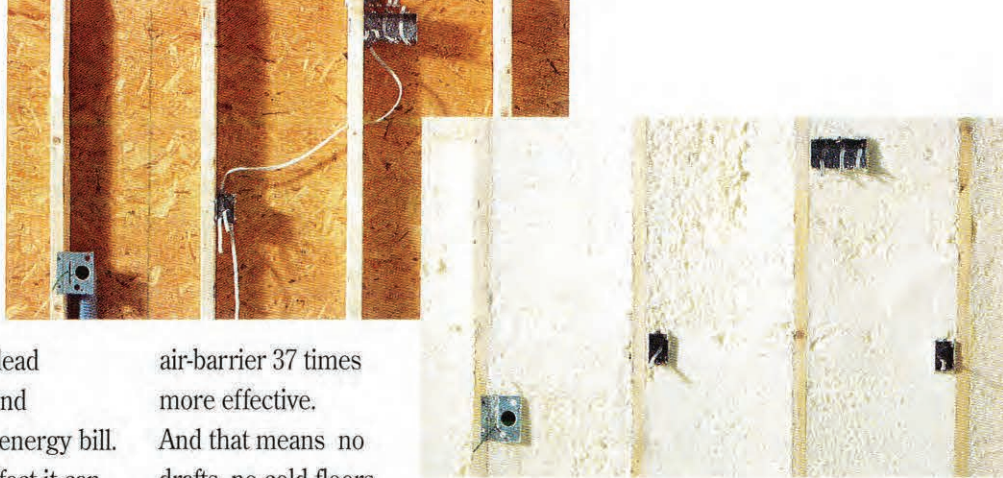
to drafts, cold floors and ultimately, a growing energy bill. Not to mention the effect it can have on your family's health.

Unfortunately, replacement is simply too expensive an option. Achieving optimum comfort means insulating right the first time.

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Technically speaking, it's called polyicynene. A unique spray-in-place or injectable foam insulation which expands up to 100 times its original volume, bonding itself to the surrounding building materials. Now granted, that may not sound very exciting, but consider how it can dramatically benefit

both your lifestyle and your sense of comfort. Unlike conventional insulation, Icynene fills every nook and every cranny, creating an



air-barrier 37 times more effective. And that means no drafts, no cold floors and no potential condensation damage.

### Take a breath of fresh air.

Beyond heating and cooling, Icynene's air-seal helps you achieve maximum indoor air-quality. No pollen. No dust. No outside contaminants. Not even annoying noise pollution.

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In short, The Icynene Insulation System provides you with a comfortable, controlled living environment.

### We put our money where our mouth is.

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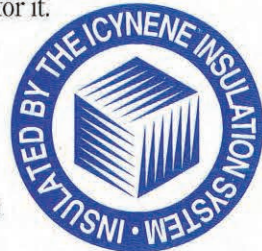
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But don't just take our word for it.

The Icynene Insulation System has been the insulation of choice for a number of major renovation projects seen on national TV. So, whether you're starting fresh, adding-on or renovating, Icynene is the ideal solution for any insulation problem.

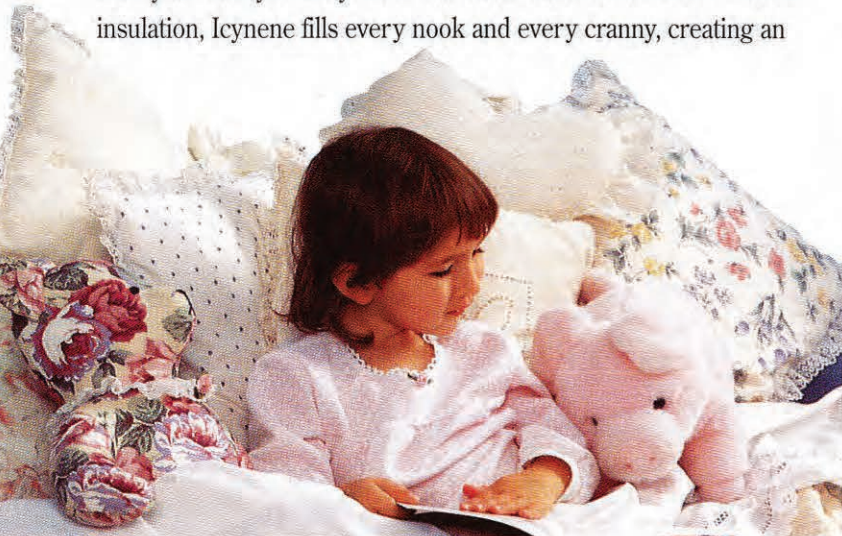
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# Sandpaper options

Traditional types may not be the best choice

BY JEANNE HUBER PHOTOGRAPHS BY MICHEAL MCLAUGHLIN



In nature, garnet is a gorgeous deep red, its crystals clumped against a sparkling background of black hornblende streaked with white feldspar. No wonder the best specimens are set in gold, prized as January's birthstone.

More ordinary crystals, though, are destined for duty in that most utilitarian of tools: sandpaper. A century after the first synthetic abrasives were invented, garnet sandpaper still figures prominently in many hardware store displays. We reach for it because it's what our fathers used, and because it works. But is garnet the best product for today?

Not really. Garnet wears down faster than synthetic abrasives such as aluminum oxide and silicon carbide, so it's never used in the more highly engineered sandpapers sought out by professionals. These sandpapers don't work better just because they have different abrasives: The type of backing, the kind of adhesive that holds the abrasive to it and the frequent presence of special coatings are at least as important, as we saw during a tour of 3M's sandpaper research center in St. Paul, Minnesota.

For example, there's a new light-green paper that minimizes clogging even on water-based finishes and polyurethanes. Its secret is not its abrasive (aluminum oxide, invented in 1897) but a soaplike coating that sloughs off, carrying sanding debris with it. *This Old House* master carpenter Norm Abram raves about a different 3M aluminum

## RINGS OF GARNET

Garnet from the Adirondack Mountains, like these circular clumps, works well in sandpaper because numerous fissure planes make it crumble easily. Jewel-quality garnet is a deep burgundy and contains fewer fissure lines.

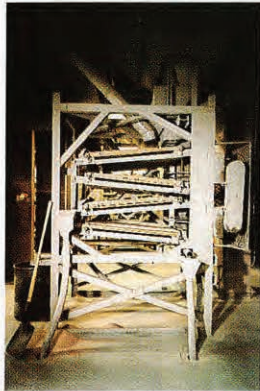
oxide product for his random-orbit sander. He knows it as “micron paper,” after the dimension used to measure grit size. First developed for the computer industry, micron papers have a waterproof polyester film base, used because the superfine particles needed to polish parts would sink into paper or cloth. Grit size is closely controlled, so virtually all grains are the same size, compared with up to 50 percent “filler” particles in standard sandpaper. The better backing and more uniform sizing give

Norm the finish he wants faster.

But micron papers are hard to find. 3M sells its Imperial Microfinishing Film to the furniture industry, where manufacturers willingly pay more for a product that delivers fast, consistent results even if workers lack experience. Sounds like a perfect product for do-it-yourselfers, right? Curiously, 3M doesn't market the paper to home-oriented stores because it believes consumers shop by price alone.

A different strategy explains why another superior sandpaper—made with a 3M synthetic mineral called ceramic aluminum oxide—is marketed to professional floor finishers but not to companies that

rent floor sanders to do-it-yourselfers. Rental stores want sandpaper that wears out fast so they can sell lots of it, says Galen Fitzel, 3M's technical service specialist for floor sanding products.

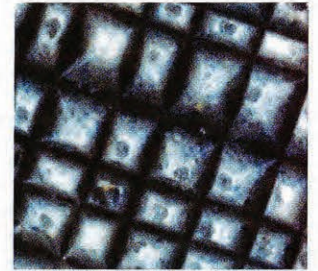


Garnet is sorted for size by shaking the crystals through a series of progressively finer screens.



Family run since 1878, the Barton Mines Corporation blasts garnet from this 2,100-foot-high mine near North Creek, New York.

Perhaps the most amazing sandpaper, light-years from being just rocks glued on paper, is a new kind that the head of sandpaper manufacturing for 3M promises “will revolutionize the industry—and that's not hype.” Its abrasive is molded (by a process called microreplication) to make consistent scratches without the chance of deep gouges. The art of sanding, after all, is to make successively shallower scratches until they're too small for the eye to see.



New microreplication sandpaper is made by molding abrasive into a uniform pyramid pattern.

## How to Read Sandpaper

**SAFETY WARNING**—Yes, a disc can fly off a random-orbit sander or a belt can break.

**PRODUCT NUMBER**—Here it's 130N. This allows a user to reorder the exact sandpaper or call the manufacturer to inquire about its characteristics. These numbers are scattered around to make sure at least one label remains on each item when 4-foot-wide rolls are cut into belts, discs and sheets.

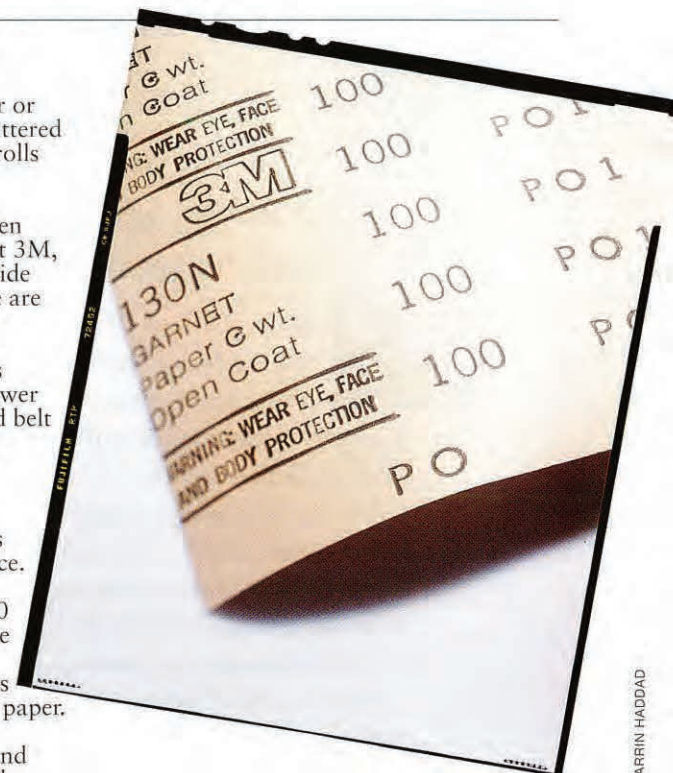
**ABRASIVE**—Garnet and other natural abrasives are usually listed, but synthetics are often identified just by trademarked names. For translations, call the manufacturer. At 3M, Three-M-ite and Production are aluminum oxide; Imperial can be aluminum oxide or silicon carbide; Tri-M-ite is silicon carbide; and Cubitron, Regal and Regalite are ceramic aluminum oxide.

**BACKING**—Most hand sanding sheets are backed with paper. “A” weight, the lightest, is for hand sanding with fine grits. “C” and “D” weights are for hand and light power sanding of wood and drywall. “E” and “F” weights are used mainly in drum and belt sanders. Other backing options include cloth (most common for home use is “J” weight, also called jeans cloth), fiber and polyester film.

**OPEN COAT**—Sometimes abbreviated OC, this means abrasive particles cover 40 to 70 percent of the surface. The other option is closed coat, which means the surface is completely covered. Open-coat papers clog less quickly but leave a rougher surface.

**GRIT SIZE**—100 grit, like this example, means particles passed through a screen with 100 openings per inch (10,000 per square inch) but were trapped by a finer screen one grade up, with 120 openings. A “P” before the number signals a more tightly regulated European standard. A U-like micron symbol before a grit number means the least size variation. Micron No. 60 is equivalent to standard 220- to 240-grit paper.

**LOT NUMBER**—The PO1 would allow the manufacturer to trace this sheet to the time and conditions under which it was manufactured, useful when problems develop. Belts have a second lot number, in a different ink, to identify the splice.

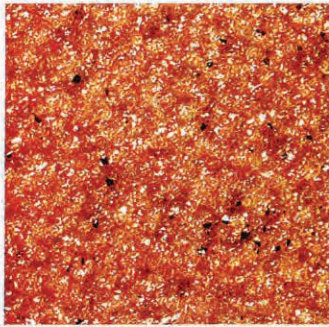


# the choice of abrasives

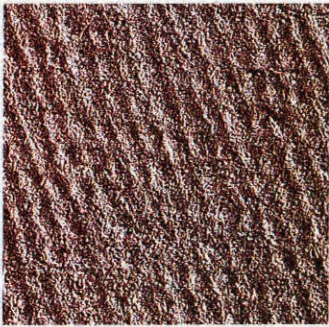
PHOTOGRAPHS BY GREG ANTHON

Virtually all abrasives are crystals that break down during use, so sharp, fresh surfaces are repeatedly exposed. Abrasives are rated on two qualities—toughness (how hard it is to get the crystals to break) and hardness (how resistant they are to wearing down). Examples are magnified to show detail.

## Natural



**GARNET**—Softest and least tough of all common abrasives. Crystals fracture under light pressure, so garnet works well for hand sanding of wood. It's probably the best option for difficult power sanding jobs where other papers might burn the wood, such as sanding end grain of hardwood. Garnet is unsuitable for use on metal.



**EMERY**—Good for polishing metal but unsuitable for use on wood because the edges tend to dull rather than chip. The second hardest natural abrasive after diamond. Emery, a combination of corundum (a natural aluminum oxide) and iron oxide, is usually used with an oil lubricant.

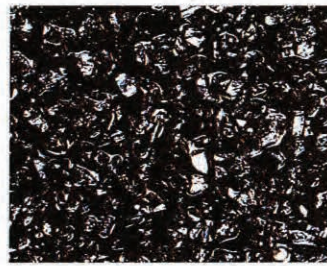


**CROCUS**—An iron oxide, natural or synthetic, with a small amount of silicon dioxide. Like emery, crocus is used to clean and polish metal. But crocus is considerably softer than emery, so it is used where only very slight stock removal is desired. The same abrasive is the basis of rouge, often used to polish or buff metal.

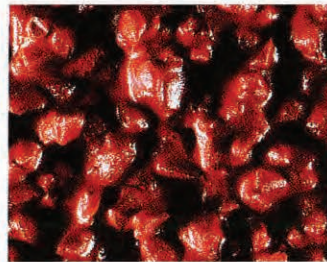
## Synthetic



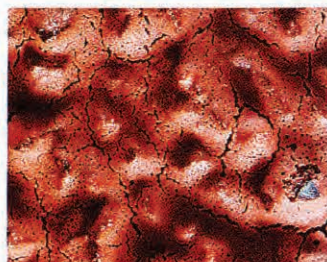
**ALUMINUM OXIDE**—The most common general-purpose abrasive for wood and metal. First made about 1897 from bauxite. The formula can be varied to produce crystals with very different characteristics. Here they are wedge-shaped (and embedded in a thick resin) to stand up well for floor sanding.



**SILICON CARBIDE**—The second most common abrasive, it is harder than aluminum oxide and produces a smoother surface on wood. It's the best choice for sanding between tough finish coats. Lubricate fine grits with water or oil to keep the sharp slivers from clogging up before they wear down. Also used on nonferrous metals.



**CERAMIC ALUMINUM OXIDE**—A new kind of aluminum oxide, two to three times tougher than the standard kind and with a more uniform crystalline structure. Good for power sanding of metal, wood and many other materials. Sought out by professional floor sanders. Often mixed with regular aluminum oxide for belt sanding.



**ALUMINA ZIRCONIA**—Blocky, sharp crystals remove a lot of material fast. Good for shaping and grinding wood and metal, but not for polishing. Often sold in wide "planer" belts that sand boards to a desired thickness. Made from oxides of aluminum and zirconium.

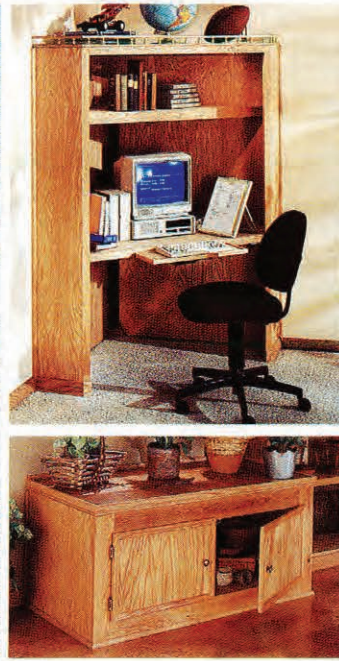


**DIAMOND**—The hardest abrasive, excellent for shaping and smoothing metal, glass and other hard materials. Pointless to use on soft materials such as wood. Made with synthetic diamonds to reduce cost (but it's still about \$2 a square inch). The dot pattern shown here minimizes clogging by allowing plenty of room for sanding debris.

## The other parts of sandpaper

**THE BACKING:** The stiffer it is, the faster the sandpaper will cut. Select a product that is no more flexible than it needs to be to conform to the shape being sanded. To increase the effective stiffness of thin sandpaper, use it with a rigid sanding block or pad.

**THE ADHESIVE:** Sandpaper has two layers of adhesive, one to anchor the grains and a second to lock them in place. The choices are two coats of hide glue, two coats of resin or a coat of resin over hide glue. Hide glue generally sets faster and is more flexible, but resin resists moisture and heat better. Paper with hide glue works well for sanding complex shapes, but moisture—even high humidity—can make it virtually useless. For power sanding and sanding with a lubricant, go for resin. Resin over hide glue produces sandpaper that starts out and stays sharpest the longest. The adhesive type is rarely specified, so one test is to exhale close to the surface and then sniff; if it stinks, the sandpaper contains hide glue.



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# Workbenches

The one tool no woodshop can do without

BY WENDY TALARICO

PHOTOGRAPHS BY DAN BORRIS



**S**tuck at home with the flu, most kids would content themselves by staring at the television. Not Norm Abram. As a child, the *This Old House* master carpenter once spent the better part of a sick day busily carving his initials into the mahogany headboard of his parents' bed. A woodworker was born.

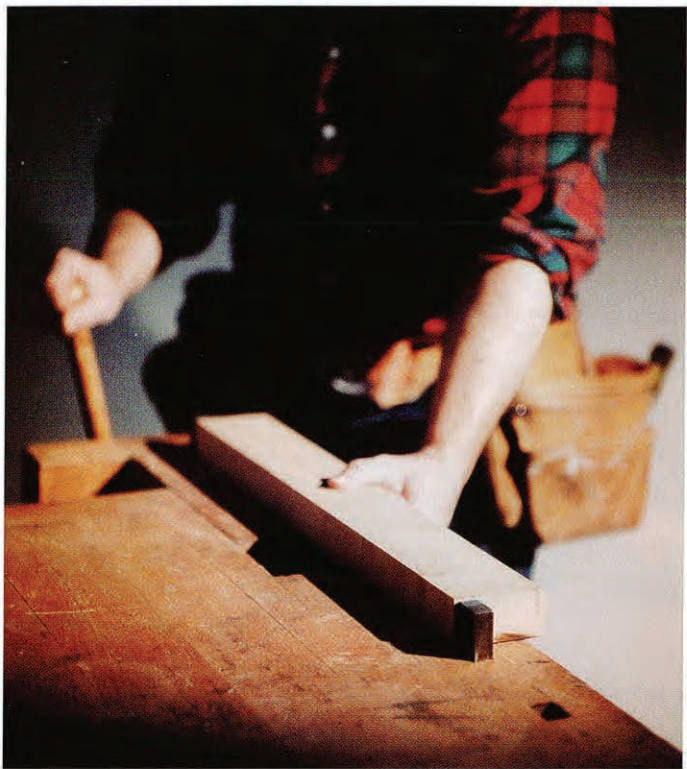
Norm's first workbench, so to speak, was one of those toy woodworking sets that children pound on like crazy, trying to force clunky, round

pegs into square holes. From there he graduated to a small homemade bench in his basement where he worked on model cars and glued up furnishings for his sister's playhouse. After college Norm started his own construction company, specializing in restoration. To make cabinets for his clients and to cut and mill trim for windows and doors, he rigged on-site benches from sawhorses and plywood.

He started using the Ulmia bench, pictured above, about 10 years ago. The difference between it and the field-built benches was a revelation. "Nothing comes close to this in the field," he says, thumping the top of the Ulmia. "I don't know how I managed without it."

**Ever practical, Norm eschews the fancy gewgaws available through woodworker catalogs and keeps his workbench simple and clear, except for an array of spring clamps.**

# Norm's Bench at Work



## THE BENCH DOGS

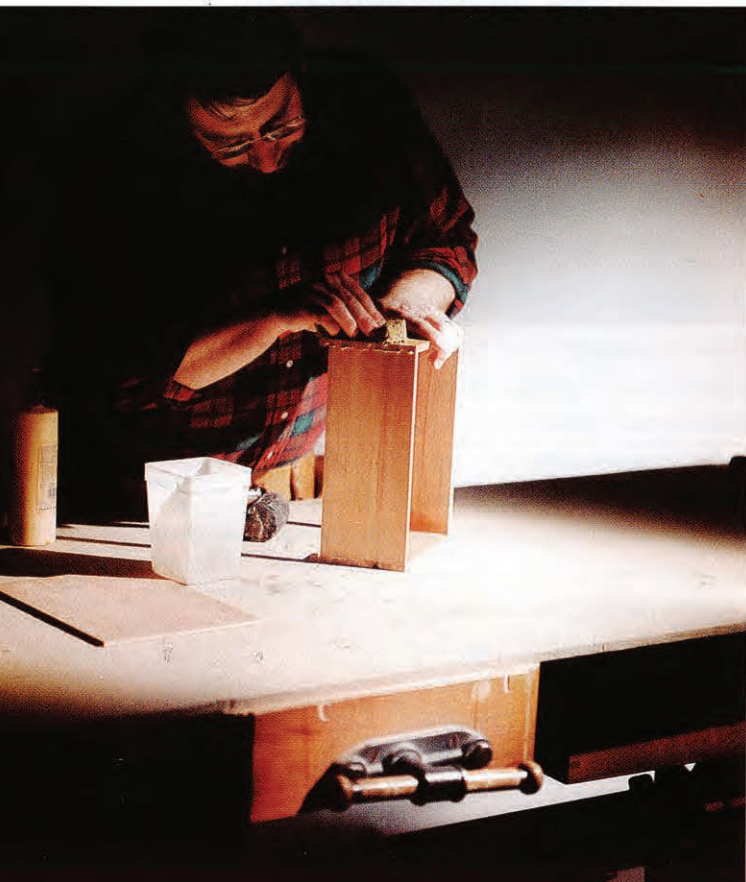
**ABOVE:** Bench dogs are movable stops that, paired with vises, secure projects to the bench surface. Which type of dog works best is debated endlessly among woodworkers. Metal dogs don't

break like wooden ones, but they mar the edges of stock and are more expensive. Round dogs permit clamping from any angle, but square ones offer better holding power. And so on.

## THE ACCESSORIES

**BELOW:** There are hundreds of bench accessories, only some of which are really useful. Some woodworkers swear by specialized stops and jigs. Norm gets best results with off-the-

shelf clamps. Here, he uses them to secure a long section of a tabletop while cutting slots with a biscuit joiner. The weight of the bench keeps it from hopping across the room as he makes the cuts.



## THE BENCH TOP

**LEFT:** A well-made bench is a beautiful piece of furniture. Some woodworkers spend more time sanding and oiling the bench top than working on it. A few cuts from a stray blade give character, but Norm uses a sheet of cellulose fiberboard, such as Homasote, to protect the top during messy work, like gluing up projects.

## THE TAIL VISE

**RIGHT:** Visas, simply put, keep the wood from moving while you work it. Without them, the workbench is little more than a glorified table. Pieces of stock are typically wedged between bench dogs located on the tail vise, which opens off the end of the bench, and the bench top.





### **THE WORKSTATION**

**ABOVE:** The workbench is a tool, but it is also a workstation for the router, the mini-lathe or, in this case, an orbital sander. Norm uses a section of rubber mesh (like the mats that keep area rugs from slipping) as a router pad and, here, to anchor the project that's being sanded.

### **THE FACE VISE**

**RIGHT:** Another debate among woodworkers is over what type of vise works best: wood or metal. Wood jaws, shown here on the face vise (on the side of the bench), won't leave marks on the project being clamped. Wood screw mechanisms are traditional, but metal is superior because it won't fatigue, Norm says.



## **Sturdy, stable, heavy and large**

To withstand all the pounding, pummeling, pushing and pulling that's done on it, a workbench must be strong. The base should be broad, with trestles or braces to keep the bench from racking. The joints—mortise and tenon are best—should be tight. Most important, the top should be made from a close-grained wood, such as maple, birch or beech, to add weight (Norm's bench is a hefty 300 pounds) and keep the bench from skittering and bouncing while you're planing a board or cutting dovetails. A dense wood is

more dimensionally stable than a soft one; the top won't shift around as much with changes in humidity. And a good, thick top can be planed if it's marred.

Whether you plan to buy a bench or build your own, try one on for size first. The bench should suit your working habits and maximize your efficiency. It should be tall enough to prevent backaches and low enough to provide leverage. Select the largest workbench your space can hold. Like a desk or the kitchen table, benches have a way of filling up with stuff quickly.

## Four Good Benches

Someday you'll find the time to design and build your own perfect bench. We know that. Until then, here are a few ready-built models and plans to choose from. Incidentally, Norm's German Ulmia is no longer made. But Ulmia has a similar model, a cabinetmaker's bench, available through several catalogs. Suggested retail is \$1,395.



### **VERITAS**

**\$795 suggested retail; \$9.95 plans; \$49.95 basic bench kit; \$299 deluxe bench kit (includes top)**

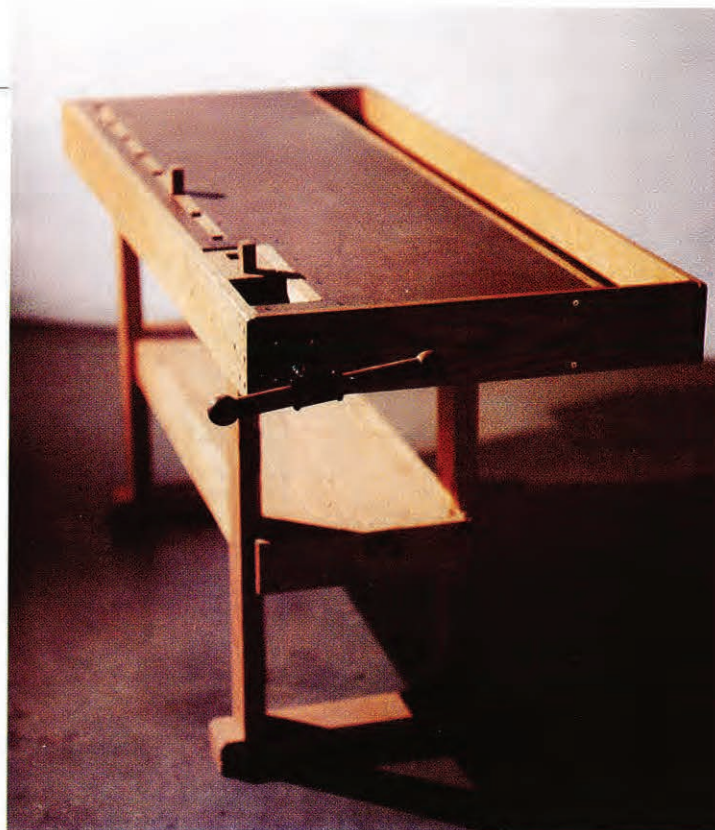
This Canadian-built model, available in kits or fully assembled, is good enough for woodworkers who make a living off their bench. It features a maple top, a twin-screw vise and a sturdy trestle base. Total weight: 200 pounds.



### **BLACK AND DECKER WORKMATE 200**

**\$124 suggested retail**

Built for site work, the top of the portable Workmate opens to form a vise or closes to create a work surface. The collapsible steel frame includes a footstep that you use to give the bench stability and weight.



### **BUILD-IT-YOURSELF WORKBENCH**

**\$10 plans, \$125 approximate cost for parts**

Building your own bench is a good first project for budding woodworkers. This one incorporates several different types of joinery, including dados and rabbets. You can add vises and other accessories as you need them.

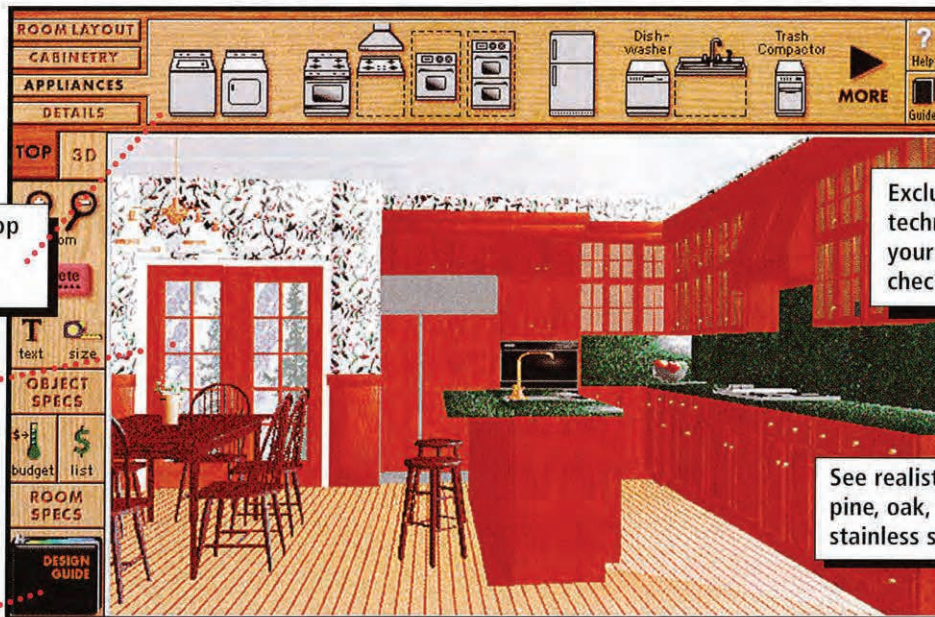


### **SJOBERGS**

**\$390 suggested retail**

Weighing in at 125 pounds, this Swedish-built, birch-topped bench isn't as beefy as the professional models, but it's fine for the semiserious woodworker. It comes with two vises, plastic dogs and plenty of storage space in the base.

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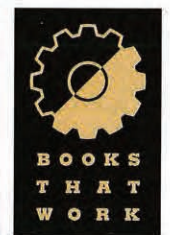
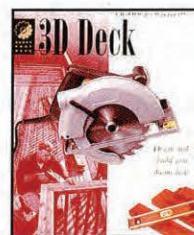
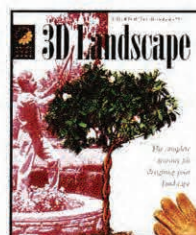
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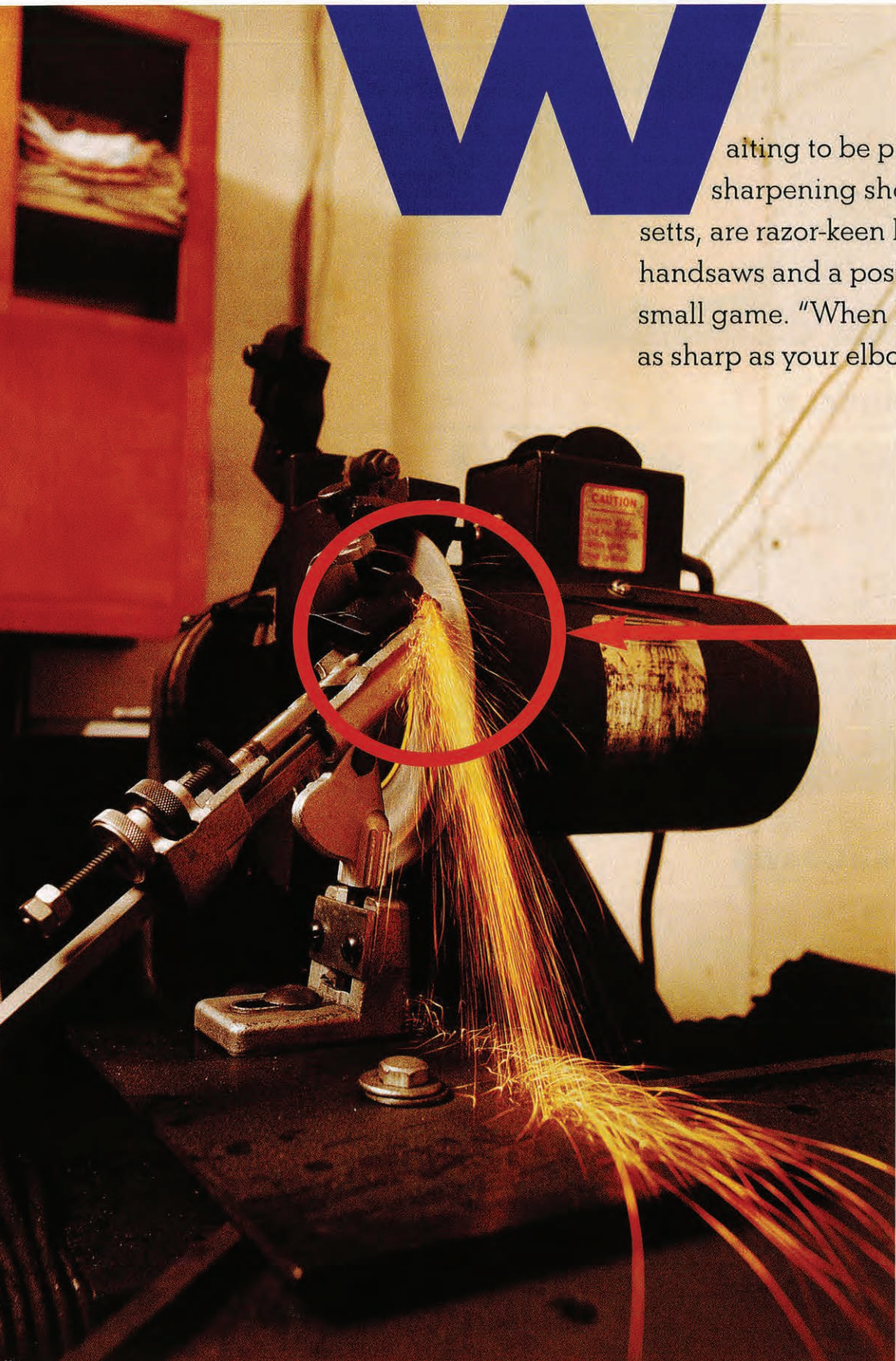
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# Sharpening

Jerry Cormier masters the grind

BY BRAD LEMLEY PHOTOGRAPHS BY DAVID BARRY



W

aiting to be picked up in Jerry Cormier's sharpening shop in Woburn, Massachusetts, are razor-keen loppers, perfectly honed handsaws and a posthole digger that could flay small game. "When I get this stuff, it's about as sharp as your elbow," he says.

Any weekend warrior with a \$65 bench grinder can improve a blunt rotary mower blade. But



Norm Abram and other satisfied customers count on Cormier to negotiate the complex geometries of modern tools.

Sharpening is actually two processes: forming an edge and forming a bevel, which is the

## DRILL BITS

Cormier uses a bench-mounted jig to sharpen twist drills. The jig clamps bits securely and lets him hold the two cutting lips to the abrasive wheel at the precise angle required (59 degrees for most twist drills). American-made, high-speed steel twist bits used only on wood can go years between sharpenings.

angle of the two planes that meet at that edge. The goal of the former process never varies—to bring the edge's width as close to zero as possible. But the optimum bevel varies widely depending on the alloy involved. For example, because steel is softer than tungsten-carbide, steel tools need wider bevels (and incur some loss of cutting power) to keep their edges from bending over or crumbling. The bevel should also match the task. A chisel used to cut mortises in hardwood needs a wider bevel than one employed to peel shavings from softwood.

Cormier says inexperienced sharpeners tend to overheat edges by dry-grinding. This makes the edge lose its temper, or hardness, and degrade quickly in use. Cormier wet-grinds on the large, water-cooled wheel in the back of his converted-garage shop. Home versions of wet-grinders are now widely available. Norm Abram recently added one to his workshop. "We're getting the hang of it," says Russ Morash, director of *This Old House*.

# How to Sharpen

*Two secrets: the right machinery and steady hands*

## CIRCULAR BLADES



Cormier removes pitch, scorch marks and detritus with a **bench-mounted wire wheel**. This is the first step with every blade he sharpens. Clean blades are less likely to bind and overheat. "They also look better," he says.



## CHISELS



Chisels dull easily, and even new ones often aren't optimally sharp. To set the basic bevel angle, Cormier holds the chisel at 30 degrees against a **medium-abrasive dry wheel**. A jig can also help to hold a chisel at the proper angle.

## HANDSAWS



Cormier clamps a crosscut handsaw in a **carrier bar**. The bar holds the saw as it advances automatically through the filing machine. Though they are frustratingly brittle, antique handsaws up to 100 years old have been sharpened in Cormier's shop.





He mounts the blade on a **revolving jig** and grinds the faces, then the tops of the carbide teeth, using a diamond-dust-impregnated wheel. Tops can be tricky, as they come in a wide variety of configurations. On this blade, the tops slant in alternate directions.



Using a **micrometer**, he checks to make sure that all the teeth have been uniformly ground.

He dips the tips of the sharpened blade into a **molten plastic** called Peel-Coat. It solidifies to a protective coating that keeps the blade from dulling until it is used.

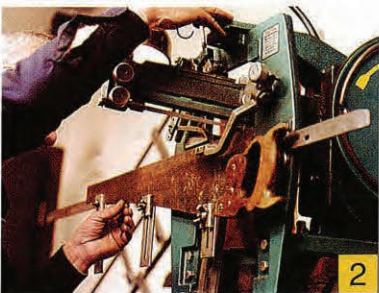


He finishes off the bevel with the big **wet wheel**. Cold water drips on the back of the wheel and keeps the steel cool, so its temper is retained. The water also flushes out potentially clogging bits of metal and stone, known as "swarf."

Cormier spreads a light oil on the back of an **oilstone**. Like water on the wet wheel, oil floats debris out of the stone and helps preserve its abrasiveness.



He flattens the back of the chisel—a process called "**lapping**"—by sliding it in a circular motion on the oilstone. It's best to start with an 800-grit stone and finish with a 6,000- or 8,000-grit stone.



He sets the **reciprocating arm**, which holds a triangular file, so that the teeth will be ground at the proper angle—in this case, 15 degrees.

The curved bar drops into the valleys between alternate teeth and pushes the saw forward. The **triangular file** sharpens every other tooth, then the saw is reset for a second pass.



Cormier checks **the set**—the distance that the teeth tops are bent away from the plane of the blade. For this saw, they should be alternately angled at .015 inches off true center.

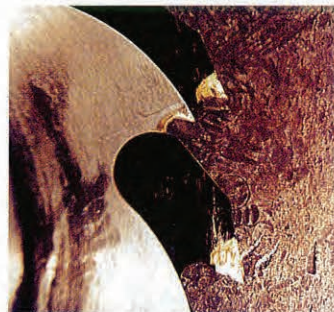
## Blade abuse

"About 90 percent of tools are abused," says Cormier, who has collected a dispiriting pile of blades that were battered beyond sharpenability. His suggestions:

- Buy top-quality blades and get them sharpened regularly instead of buying cheap blades and chucking them when dull. Take them to a pro. It's not that expensive; Norm says he spends about \$20 a month.

- Choose the right blade for the material. The fastest way to ruin woodworking blades is to run them through metal. When remodeling, use blades rated to take nails in stride.

- Operate tools at the right speed. Most drill bits should be spun slowly, as their buried tips easily overheat. But the faster a circular saw



blade spins, the more effectively the teeth are air-cooled (never exceed the rpm rating).

- Store tools carefully. Hang planes or lay them on their sides. Don't stack circular saw blades. Hang them by their arbor holes.

# Buying Foreclosed Property

It can make you a hero and save you money

BY WILLIAM MARSANO PHOTOGRAPH BY TOM WOLFF

# a

foreclosed property can be a bargain: the house of your dreams, or something pretty close to it, at a dream of a price. Getting one takes some luck and much looking—but what about a strong stomach? To many people, the very word “foreclosure” suggests the unpleasant business of putting a luckless family out of its home.

“That’s the wrong attitude,” says Robert Johnson, executive director of the International Real Estate Institute in Scottsdale, Arizona. “You’re not a villain—you’re a hero. Buying a distressed house can save property values on a whole block, and the neighbors would rather live next door to you than to a vacant, rapidly decaying eyesore.”

Okay, now your conscience is clear, but you need to know how to proceed.

Time is of the essence (expect to invest a lot of it), but so is timing. When do you buy?

Buying before the foreclosure auction—direct from the defaulter—takes a certain amount of

chutzpah. The seller is in distress to begin with, and real estate pros may have called as soon as the notice hit the newspapers. The defaulter may be in door-slamming mode.

But maybe not, says Ted Dallow, author of *How to Buy Foreclosed Real Estate for a Fraction of Its Value*, “because you’re a would-be homeowner, not someone out

to steal his house and pick his bones. He’ll also get a better price from you than the pros will offer, and a deal will spare him a ruined credit rating and further humiliation.”

Still, this can be a risky and time-consuming process and more trouble than it’s worth. But buying at the auction itself is even riskier. You’re swimming with the sharks here—professional investors and

## SOME PEOPLE HAVE ALL THE LUCK

Jeff Lee, a landscape architect in Washington, D.C., got a foreclosed bargain without even looking for it. In 1992, he wanted a two-bedroom condo for himself and his cat. His agent, Elizabeth Blakeslee, found a place on Logan Circle, near Lee’s office and the White House. It wasn’t a condo but a house: full rentable basement apartment, three floors above and an attic—total, 4,000 square feet. “The price was \$189,000, but Elizabeth said the house was probably worth \$300,000. She insisted I take a look,” Lee says.

Cleaned and painted, the place looked so good he had to find excuses not to buy. But it was his friend Shinn Back, an appraiser, who convinced him of its real value. “Finally,” Lee says, “she took me aside and said, ‘If you don’t buy this house, I’ll kill you.’”

Logan Circle is a transitional neighborhood, but the house’s quality outweighed Lee’s concerns. “It was built in 1897 and was in good shape,” he says. “The same family owned it until the 1970s, when it was sold to a couple who began renovations. They were careful—they took down all the fine details and wood moldings and stored them in the attic—but ran out of money.” Later, a developer turned it into a boardinghouse. When he

*continued on next page*

**Jeff Lee picked up this 4,000-square-foot townhouse at a price about 40 percent below its estimated market value. Wife Barrie Kessler, daughter Samantha and pets came later.**



speculators—and you are the bottom of the food chain. Even if you win, you can lose: Amateurs are stunned to learn that almost invariably they must close in 30 days, the foreclosing lender won't refinance and their 10 percent cash deposit is nonrefundable.

Other snares await the unwary. “You could buy a \$250,000 house for a \$50,000 bid,” Dallow says, “only to find the house has a \$170,000 first mortgage on it—which you're responsible for.” And when you buy a house that's in foreclosure, or buy a tax lien on a house whose owner is in arrears on property taxes, the place is likely to be occupied. It will be your job to carry out (or at least order and pay for) the eviction process.

All in all, there are so many tricky aspects to buying in foreclosure that it's best to take Dallow's advice instead. He suggests buying houses that have already been foreclosed upon. These houses, known as OREs or REOs (for “owned real estate” and “real estate, owned” respectively), have already been auctioned and are now owned by the lenders.

Chances are they didn't want them in the first place. At a foreclosure auction, the bank usually offers the opening bid (called the upset bid), which equals the mortgage balance, late fees, legal fees, taxes and other charges. Often, nobody counterbids and the lender “wins.”

Typically that's because the house isn't worth the debt—and *that's* often because, beginning in the hot market of the mid-1980s, a lot of houses were overfinanced. Instead of borrowing purchase money (the difference between sale price and down

payment, plus a little contingencies cushion), people borrowed up to 95 percent of the appraised value—far more than was needed and, when the market cooled, more than they could repay.

Banks and other lenders (including FHA/HUD, the Veterans Administration and the Resolution Trust Corp.) own a lot of those houses today, and whether they call them OREs or REOs, they can't wait to get rid of them. To the lender, an ORE represents red ink. No monthly checks are coming in, and the bank is responsible for taxes and upkeep. To get out from under, many lenders will even offer financing if you want to buy. In sum, that overworked label “motivated seller” at last comes into its own.

In buying an ORE, you can get a vacant property (thus eliminating worries about eviction) and can inspect it thoroughly. That's often impossible during foreclosure, with the defaulter still in residence. Inspection

**couldn't make the payments, the lender foreclosed and the house went into the Federal Housing Administration's owned real estate stock.**

**The house drew a bid about 45 minutes after it was listed, but the bidder wanted the FHA to install heating (there were no radiators on the first and second floors). The FHA said take a hike. Blakeslee called Lee even before the house was relisted, and Back said, “Don't dicker for a few thousand dollars—bid the asking price.” He did, and the house was his. The FHA also took back a 30-year mortgage at 7.6 percent (10 percent down) and covered 80 percent of closing costs.**

**The house was a tad large for a man and his cat, but soon a kind of Jane Austen Effect kicked in, along the lines of “it is a truth universally acknowledged that a single man in possession of a good house must be in want of a wife.” Says Lee, “I must have looked ready to settle down, because I moved in July 1 and by September had met my wife.”**

**More good luck: While seeking advice about his unheated first and second floors, Lee was referred, coincidentally, to a man who had previously worked on the house. “There's heat in there all right,” the man told him. “Dad and I put radiant heating under the floorboards.”**

**Some bad luck: “Before painting,” Lee says, “the FHA sent some guys over to clean out all of the boardinghouse junk. Unfortunately, they also emptied the attic.”**

is important: Foreclosure can be a protracted process, and during that time the house can deteriorate. Its condition affects your offer, because an ORE is typically sold “as is.” There are other advantages. The bank has clear title to an ORE; no other creditors have claims against it, and any “right of redemption” by the defaulter (available in some states) will have expired before the property was offered for sale.

What if you find an ORE and decide it's a keeper? Make an offer somewhere below your top price and be ready to negotiate. The lender's asking price will be somewhere between the upset price and market value. To get an idea of how hard you should negotiate, find out from the county clerk or registrar when the auction was held. That tells you how long the bank has owned the house, which is how long it's been losing money on it, a good clue to its eagerness to sell. And if a cash deal will get you

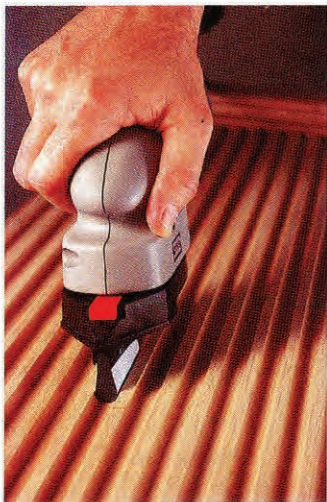
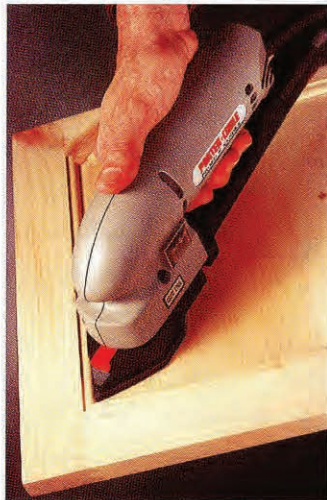
a better price, be prepared to get financing elsewhere. Then—bargain hard.

## Where to find foreclosed houses

**The FHA alone forecloses on approximately 29,000 properties a year, and more are owned by the Veterans Administration and the Resolution Trust Corp., which handles the foreclosed residue of the savings and loan scandal. Private lenders have their own stock. The government agencies will provide you with lists of their properties and local real estate agents authorized to represent them (see Directory); they also periodically advertise in newspaper real estate**

**sections. Beware of ads offering to sell listings: They're placed by entrepreneurs who charge for information that the government provides free. You can also go directly to agents to see what's available on their multiple-listing service. Ted Dallow advises going straight to local banks. Ask to see the officer in charge of foreclosure; the department may also be called “delinquent mortgages,” “asset recovery” or something similar.**

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# This Old House

Ten years ago, my wife and

I were living quite contentedly in a condominium. Then we started a family. "We need a house and we need it now," Evy commanded. "It has to have a driveway"—something rarely found in our historic town—"and a yard, and I want it renovated. Now."

I found a house and spent the next six months renovating it. Over time we have continued to alter and renovate. We've cut in new doors and windows, planted a garden and built a Japanese fountain and a formal courtyard, among numerous other projects. The house has grown and changed to reflect who we are and who we want to be. Once in a while my wife and I discuss buying and renovating another house, but our son refuses: He will never move, he claims. He intends to raise his children here.

Ours is a modest Georgian Colonial with a large, hidden backyard. When we first saw it from the street, Evy said, "I hope we like the inside because I think we're going to buy it." And we did. It was the major purchase of our lives, and when I look back at how quickly we bought it, I shudder at our impulsiveness.

Mills and Marianne Fleming, homeowners of our current television project in Savannah, Georgia, are not impulsive people. Mills is a lawyer, Marianne a doctor. When Marianne became pregnant, they started a methodical house hunt. They looked at new construction in the suburbs, calculated current and future real-estate prices, evaluated the schools. Then they

saw the 1884 townhouse on Monterey Square in Old Savannah. "We made the decision at first sight," Mills says. "We loved the feeling of the elegant front rooms with views of the square, and we could picture giving parties, raising our family." The house needs major renovation: new kitchen and bathrooms, heating, cooling, electrical and plumbing systems. But Marianne and Mills bought for love, not logic. To steal a line from Robert Frost, the house belonged to them before they belonged to the house.

If I could have foreseen how much time and money I would put into our house, I never would have bought it. Even now, I kick myself for "overinvesting"—we will never get an acceptable return on our investment. But then again, we couldn't buy the feeling our house gives us. It is a member of the family. It's okay to buy a house for love. How else could you make a human choice?

**Steve Thomas**



**Mills and Marianne Fleming with the townhouse that is their new home and our new project.**



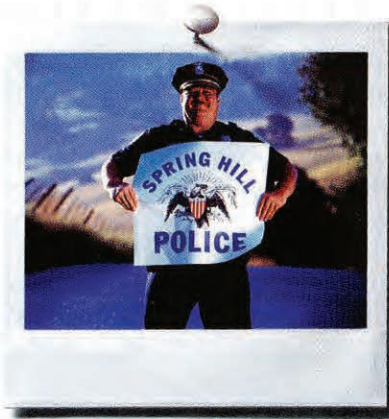
“  
The  
fastest color  
is red.  
”

Gops will tell you that a sporty-looking car is what catches their eye. But everyone knows that it's

engine, which can eat up a stretch of highway in practically no-time flat. Ⓢ Add to that ABS and traction control, which, by the way, are now available on all Saturns with both manual and automatic transmission, and you've got one sure-footed, free-revving automobile. Ⓢ And to keep things running at their peak, the new Saturns also feature an onboard diagnostic

what's under the hood that counts. And technically speaking, the new Saturns have something called

torque-heavy tuning, which, to the average law-abiding driver, translates into: they're pretty darn quick off the line. Ⓢ Now, we could go into all the nuts and bolts of how this happens, but that would be kind of like someone going on at



*Police Chief Steve Thomason says,  
"I sure wouldn't mind having one as a patrol car.  
I've already got the decal."*

system, something the government calls OBD II (what is it with the government and acronyms anyway?), which is so exacting it's meant to alert you (and your Saturn service technician) to the slightest fluctuation in powertrain performance. Ⓢ

length about how your toaster makes toast. It's just not all that interesting. Especially when all you really want is just a great piece of toast, which, in this case, we're calling performance.

Oops, are we getting into the toaster thing a little too much here? Sorry. It's just that we're pretty excited about this new car. Maybe Saturn owner Cheryl Weigle of Lynchburg, Virginia summed it up best: "It's not a putt-putt." Ⓢ Yeah, there you go.

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## **This Old House:** *The Fleming house, Savannah, Georgia*

**7 WEST GORDON STREET**

**MONTEREY SQUARE HISTORIC DISTRICT**

**BUILDING DESIGNER:**

**JEFFREY VERHEYEN, JWV & ASSOCIATES**

**CONTRACTOR:**

**J.T. TURNER CONSTRUCTION COMPANY**

**BY WENDY TALARICO**

**PHOTOGRAPH BY JEFF VON HOENE**

**g**ROVER CLEVELAND WAS running for president, iceboxes kept food chilled, and most people read by gaslight and believed fresh air was unhealthy back in 1884, when the current season's project house was built. Reconciling the needs and tastes of that era with those of Mills and Marianne Fleming, the new owners of the house on Monterey Square, is what makes a respectful renovation difficult.

Despite its 112 years, the three-story, brick and stucco residence was in remarkably good structural condition when work began. The most significant challenge was to update the small, dismal kitchen and add bathrooms and closets—all without compromising the architectural integrity of the house. The heating, ventilation and air-conditioning system was rudimentary and inadequate. The plumbing lines were a hodgepodge of materials, and the wiring system was undersized and dangerous. These needed to be brought up to code, and an overall facelift, inside and out, was in order.

Putting the kitchen and baths in a three-story addition off the back, after demolishing the termite-ridden porches there, meant the bulk of the new plumbing could be concentrated in the added space. Great care was taken to match existing moldings, fixtures and materials. New wiring, ductwork and plumbing lines installed in existing walls were, whenever possible, fished through small holes, existing chases or places that needed replastering anyway. The garden level, which previously housed a physician's office, was converted into an apartment. The Flemings will rent out the space for now, but as their family grows they'll convert it to a play area for children.

The problem with floor plans is that they change. Take them on site, and what looked good on paper suddenly seems wrong in actuality. At the same time, contractors uncover hidden conditions that make it difficult to follow the plans exactly. What we've printed here was tweaked and refined in the field as the job progressed.



**PULL OUT AND OPEN HERE**

Floor plans and  
specifications for

---

# the fleming residence

---

## **Square footage**

Garden level 1,415 Addition 237 sq. ft.

First floor 1,415 Addition 458 sq. ft.

Second floor 1,415 Addition 458 sq. ft.

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Total after renovation: 5,398 sq. ft.

## **Construction**

Load-bearing masonry; wood partition walls, roof and floor systems; exposed brick and stucco exterior with a wood cornice and cast-iron window and door pediments

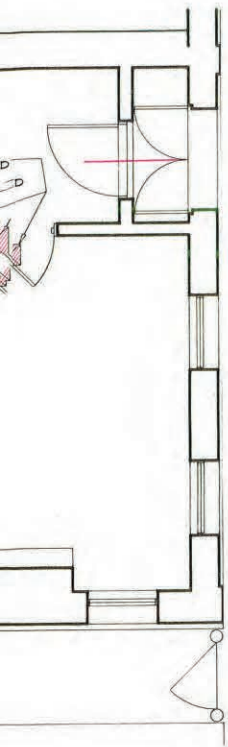
## **Year built**

1884

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**This Old House**

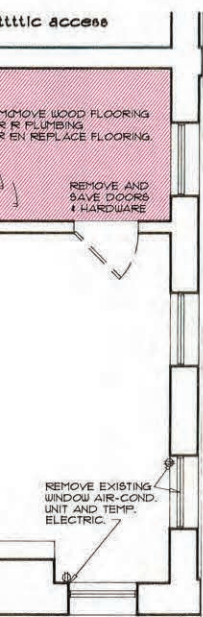




## 1<sup>st</sup> floor plan (before)

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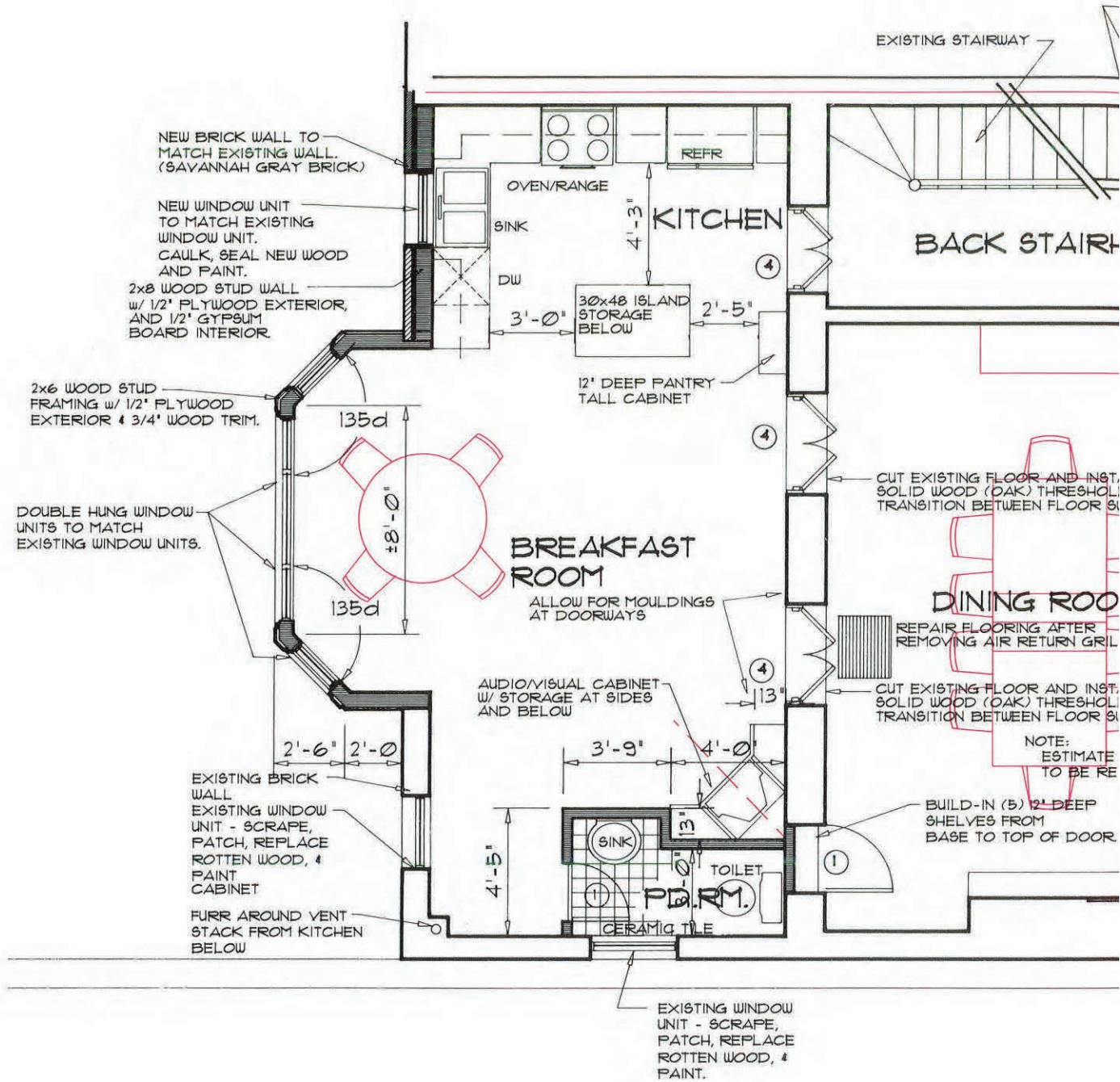
The original kitchen was located on the garden level so that the living space upstairs stayed cool. It was relocated to a wing adjacent to the dining room in the 1950s, but the kitchen's small size—8 by 12 feet—along with the lack of modern appliances made it unsuitable for a growing family. The existing powder room was not only cramped, you had to go through the porch to get to it. Some finish work was needed throughout. The plaster in the hall ceiling was in poor condition, the mantelpieces needed to be stripped and repaired and the floors required refinishing.



## 2<sup>nd</sup> floor plan (before)

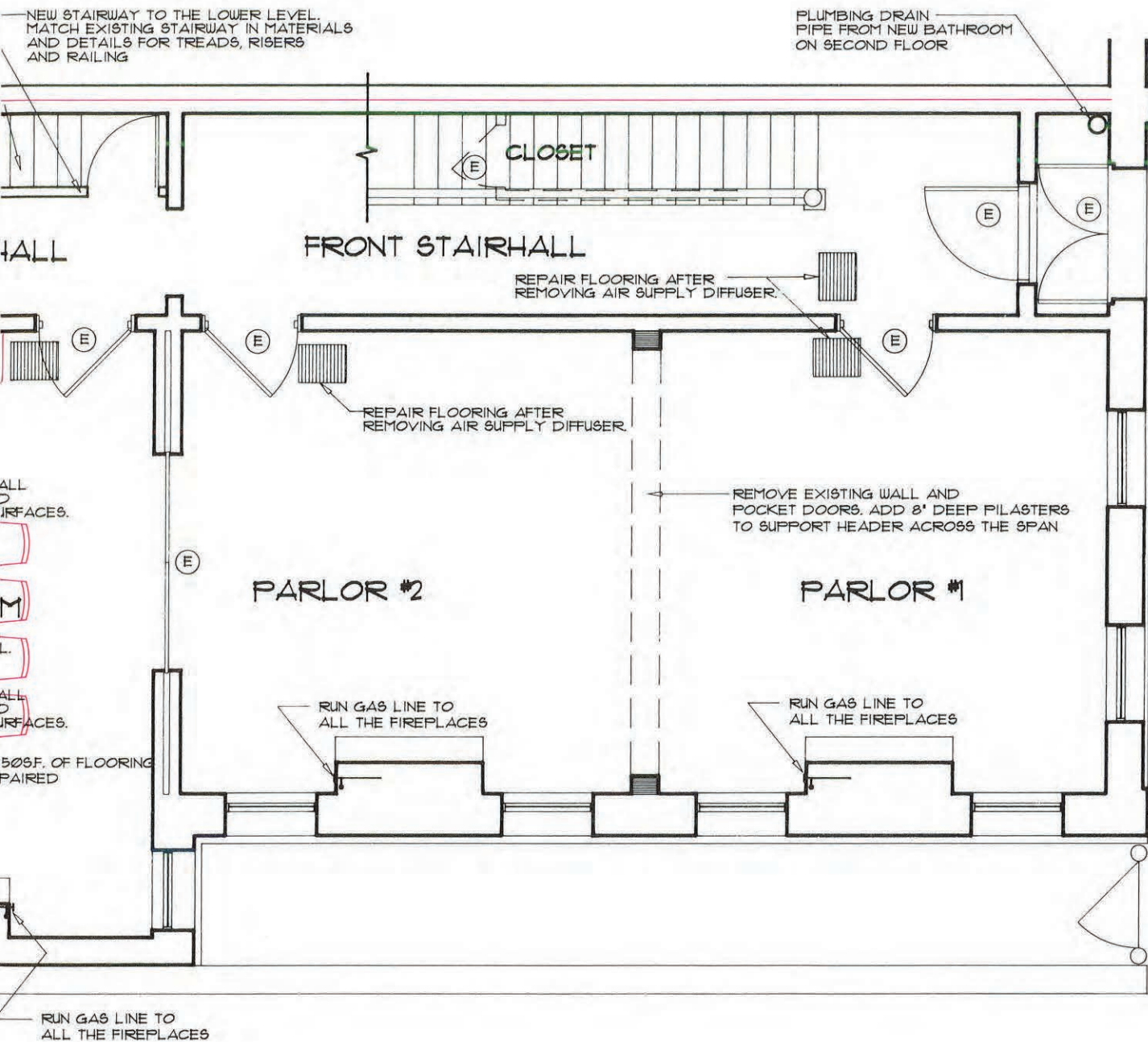
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The second floor featured three spacious bedrooms but tiny bathrooms and even tinier closets. The plaster crown molding was damaged in several spots (thanks to roof leaks), the doors and the heart-pine flooring needed refinishing and the ceiling-to-floor windows didn't operate smoothly. Years of neglect left the rooms dingy and the wall coverings mildewed and peeling.

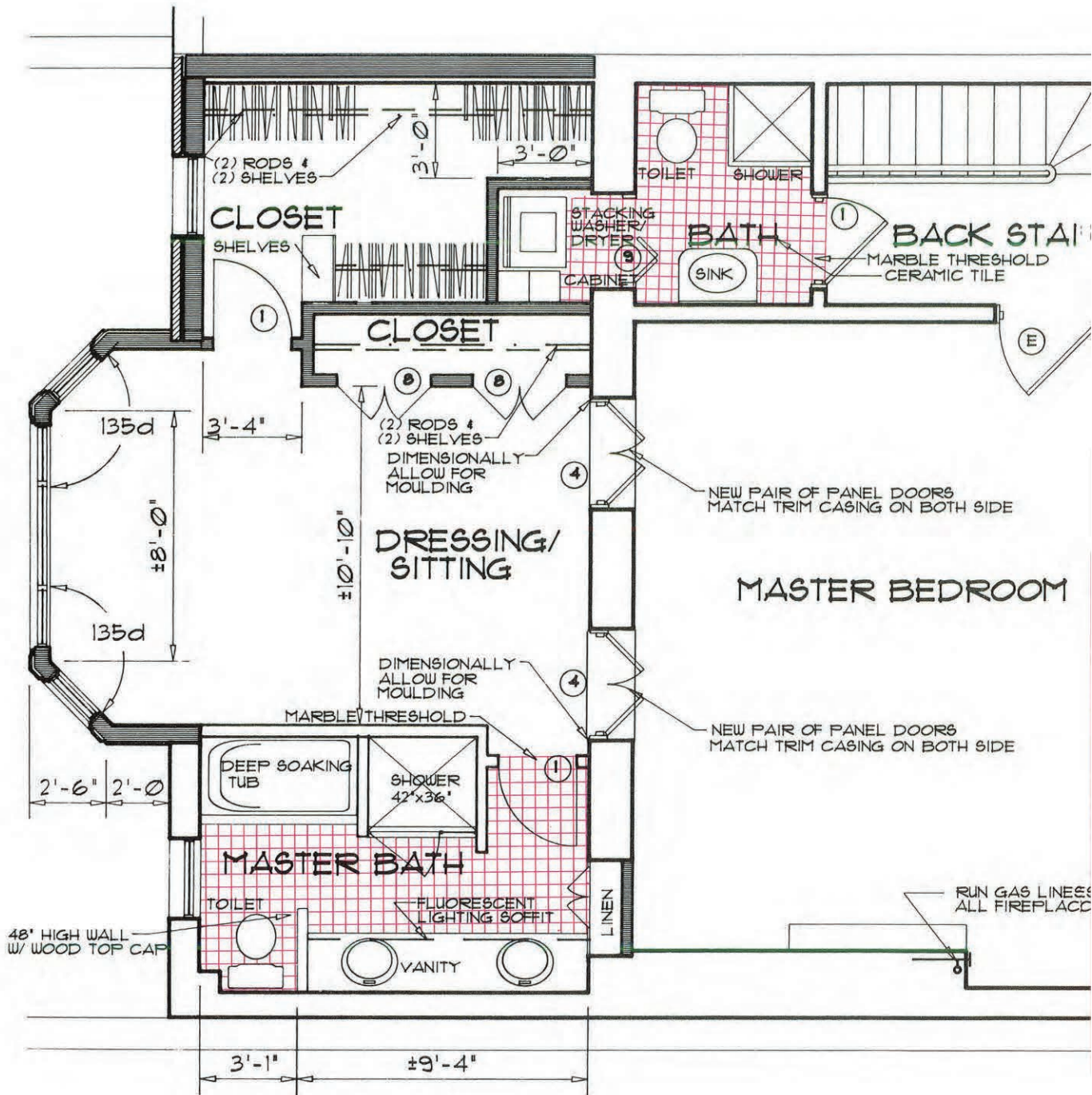


# 1<sup>st</sup> floor plan (after)

The addition holds an open kitchen with an eating area, an island and a good-sized pantry. There's also a built-in decorative archway was restored. Installing a new high-velocity heating and air-conditioning system that vents

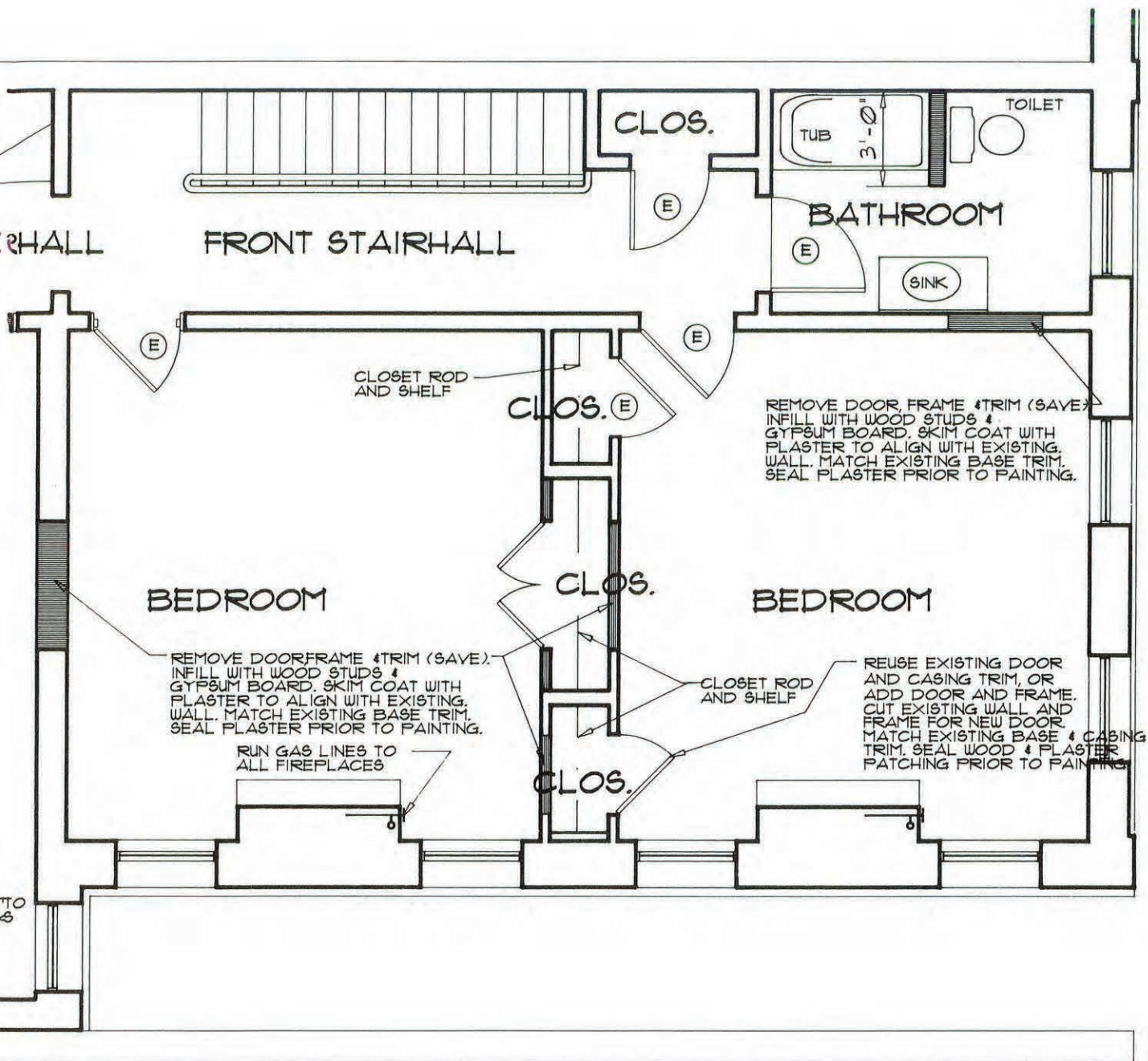


in entertainment center and a new powder room. Pocket doors between the parlors were removed and the original through the ceiling allowed for the removal of floor grilles. The resulting holes were patched with salvaged wood.



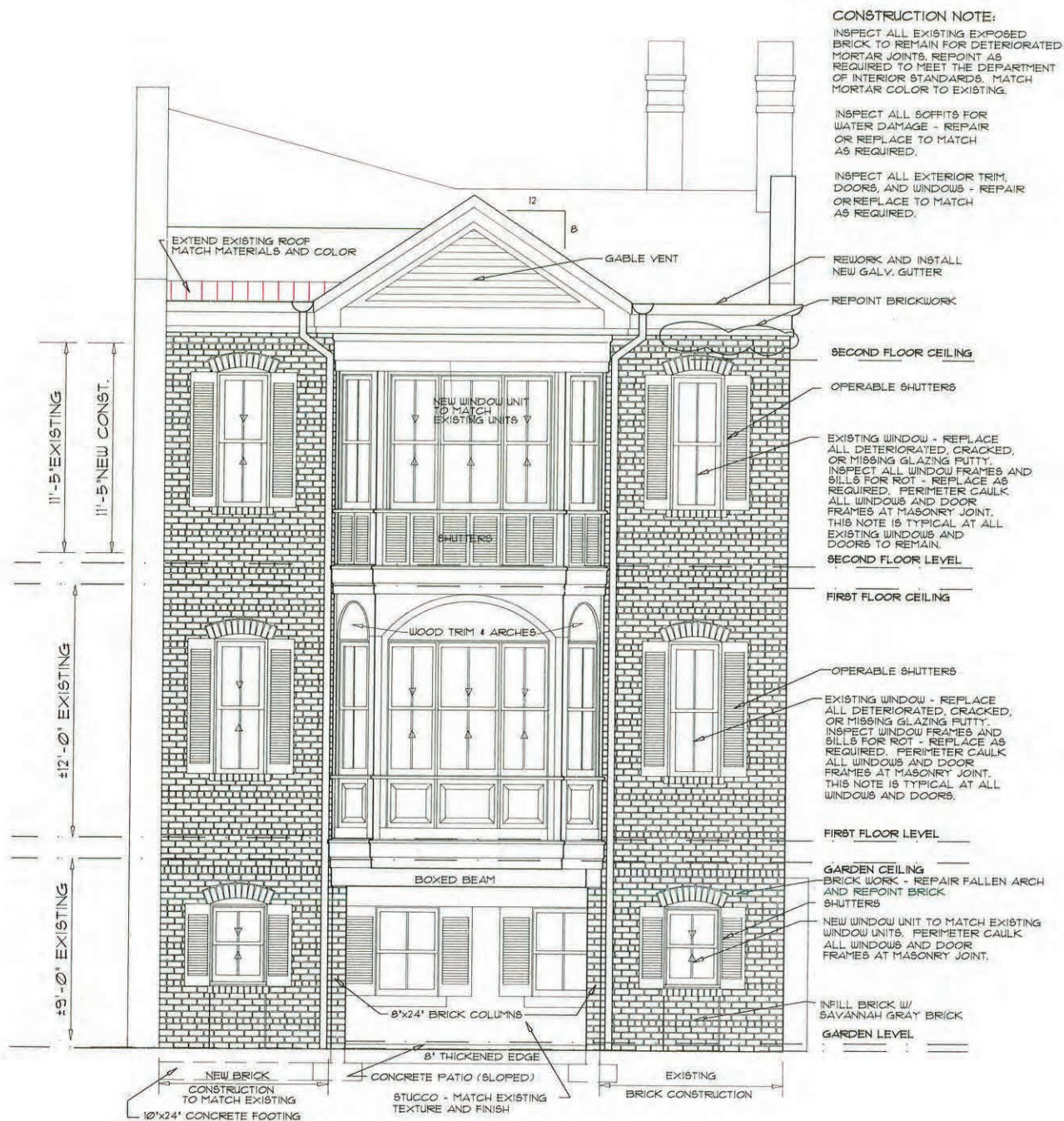
# 2<sup>nd</sup> floor plan (at

The addition contains two much-needed closets, a master bathroom with two sinks, a laundry area and a combi children's rooms. In the front corner, a 7-by-10-foot space known as the trunk room (where luggage was traditi



ter)

ined dressing room and sitting area. Closets were also added to the other two bedrooms, destined to become  
 nally stored), became a third upstairs bath. The existing bath, which was updated, is intended for guests.



## rear elevation (after)

Porches on the first and second levels, damaged by years of neglect and termite infestation, were demolished before construction of the addition began. The brick was recycled from the demolition; the new mortar was carefully matched to the existing for both color and consistency. All other finishes, including the new terne metal (a lead/tin alloy) roof and stucco, were designed to match existing materials.





the making of  
**Brick**

Clay



K

Grind shale into a fine "flour." Mix with water until plastic, then shape into a rectangle. Fire for eight hours at 2,100 degrees; let cool. Build.  
By Thomas Baker / Photographs by Bernd Auers

Fire

A power shovel's bucket scrapes the crumbly 60-foot headwall of Shanesville pit, mine No. 4, dislodging an avalanche of shale fragments.

"We have the glaciers to thank for all this," says Lauren Gonser, a manager at the Belden Brick Company and my guide through the company's brickmaking process. "The glaciers scraped the soils off Canada and deposited them right here," he says, gesturing to the rolling hills surrounding Sugar Creek, Ohio. For 110 years, Belden Brick has been mining or "winning" clay and shale from pits covering 2,400 acres of eastern Ohio. From the 517,000 tons of raw material it extracts per year, Belden can produce 220 million brick—the oldest and most durable of man-made building materials.

The scree left at the base of the headwall may appear to be so much rock, but to the ceramic engineer in charge of brickmaking, it is composed of distinctly different minerals that ultimately determine the appearance and performance of the brick. One pit can yield very different kinds of clays. At mine No. 4, the headwall actually has numbers pinned to it so the shovel operator can dig out the desired ingredients.

The next step is to pulverize the rock into gritty dust. Trucks arriving at plant No. 8, one of Belden's six brickmaking facilities, dump their loads into the crusher, where giant steel



teeth grind the rock into small lumps. A series of conveyor belts ferry this detritus to the grinder, where a pair of 7-ton, 5-foot-diameter muller wheels crush the lumps much the way millstones grind wheat into flour. Particles small enough to pass through three layers of vibrating 14-mesh screen travel up into holding bins. Belden quarries two basic materials: a whitish fireclay and a soft brown shale. Each type is kept separate so they can be mixed in precise proportions to produce brick of a particular color.

From the holding bins, this clay "flour" travels to the pug mill, where it is blended or "tempered" with water. A brickmaker can take this mud and press it into molds (either by hand or with a machine) or extrude it. Before 1863, nearly all brick was molded, using "soft-mud" clay with a 20 to 30 percent moisture content. Then Cyrus Chambers Jr. invented the first commercially successful steam-powered machine that extruded a continuous bar of "stiff-mud" clay (12 to 15 percent moisture content), like a noodle out of a pasta maker.

At Belden's extruder, an auger drives the pugged clay into a vacuum chamber, where air is sucked out of the mix. A die or "bell" on the end of the chamber



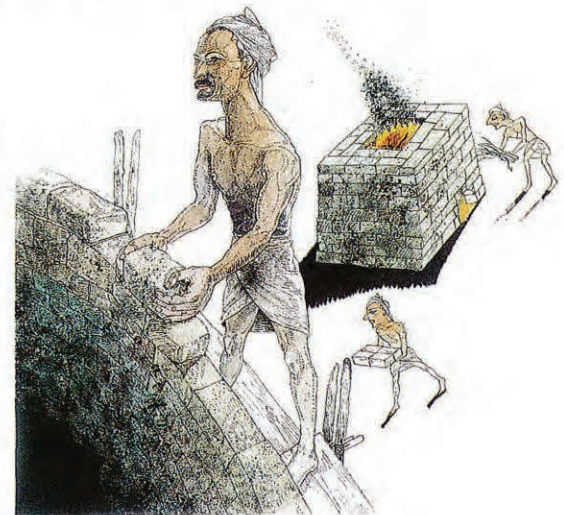
## The History of Brickmaking

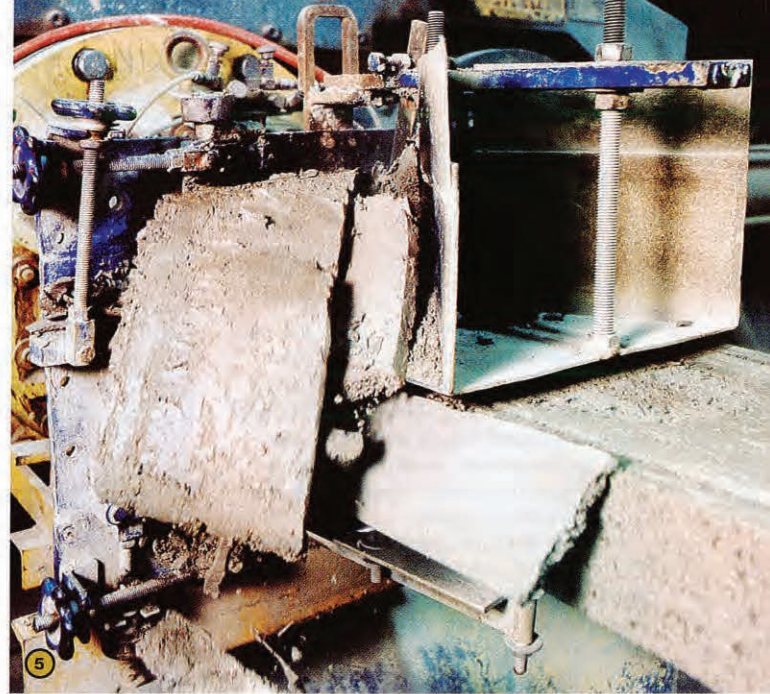
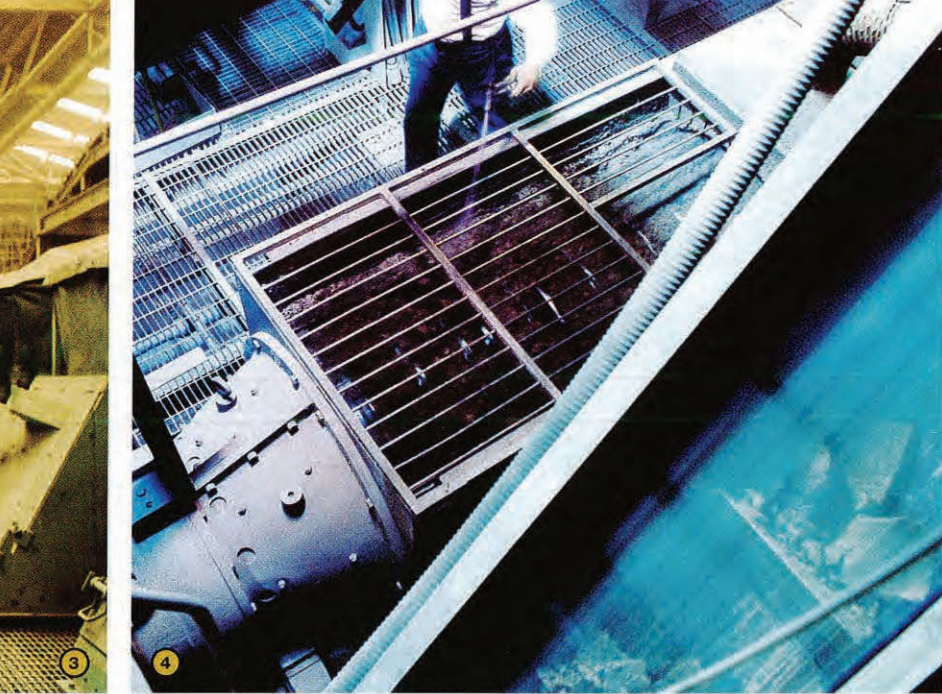
ILLUSTRATIONS BY JACK UNRUH



8000 BC—  
LEFT: Man's first brick, shaped like a potato, is sun-dried by the Sumerians.

3000 BC—  
RIGHT: In India, the first fired brick is burned in wood-fueled scove kilns.





**BRICK'S PROGRESS: FROM MINE TO MUD**  
 (1) Raw shale is scraped off the headwall at the quarry. (2) After it is crushed into small chunks, the rock is run through the steel muller wheels of the grinder, which pulverizes it into a clay "flour." (3) In the dust-filled screening room, three layers of vibrating 14-mesh screen sift out lumps and send them back to the dry pan for regrinding. (4) The pug mill's rotating knives blend water into the clay, making it plastic enough to be molded or extruded through a die. An auger in the pug mill forces clay past a vacuum chamber and through the die at 1,000 psi. The die extrudes a continuous column of clay at 45 feet per minute; 14,400 brick per hour can be made using this method. (5) Stationary knives scarify the surface of the moving column, giving the finished brick a textured face.

funnels the clay down to face plates that control the size and shape of the extrusion. Subjected to 1,000 pounds per square inch of pressure, the clay exits the face plate as a smooth column, traveling at a continuous 45 feet per minute. The moving clay exits the die on a thin layer of oil injected into the face plate; without oil, the inside of the column would move faster than the outside, causing it to delaminate.

To cut the column into brick, Belden uses a machine called a reel cutter. Its four banks of 18-gauge stainless steel wire, stretched taut within a cylindrical frame, give it the look of some strange stringed instrument. The reel moves along at the same speed as the column, slicing the clay into 26 "green" brick with each quarter turn, then returns to its starting point. Workers stack or "set" the brick into "chimneys" atop rolling cars for the trip through the kiln (pronounced "kill").

Belden's tunnel kilns are 530-foot-long sheds, open at both ends, with a pair of rails running through them. Kiln cars stacked high with 5,200 green brick roll from one end of the kiln to the other through the gas-fueled firing zone—what Gonser calls "hell for brick." For eight hours, the brick are subjected to temperatures as high as 2,100 degrees Fahrenheit. This draws out all the water, then partially liquefies or "vitrifies" the clay to the point known as the "ceramic heat of fusion." The brick are

**continued on page 72**



**100 AD—**  
**LEFT: The**  
**Romans**  
**introduce**  
**brickmaking**  
**to the**  
**British**  
**Isles.**

**1611—**  
**RIGHT:**  
**Colonial**  
**America's**  
**first brick**  
**kiln begins**  
**operating in**  
**Jamestown,**  
**Virginia.**



## The Brick That Built Savannah

It is the "cinderblock of Savannah," the ubiquitous brick known as Savannah Grey. Most of Old Savannah, including the Fleming house, was built with it. Contractors decry its softness, porosity and irregularities (laying a straight course is no easy task). But this brick was made nowhere else—the last ones were produced nearly a century ago—and Savannahians have come to love its salmon to reddish-brown hues and rough, mottled texture.

Why call a pink brick "gray"? No one is sure, but Chris Phillips, a restoration brick mason in Savannah, believes the name describes the color of the deposits near the Savannah River where the clay was mined. Slaves dug, pugged and molded the clay from the 1730s until the mid-1800s; the Lovell Brick Co. made the brick from 1885 until 1910, when the quarries tapped out.

A typical Savannah Grey is big—5 by 3½ by 9 inches—yet surprisingly lightweight. This may have been a boon to the fellow hefting the hod, but the low density of this brick makes it as absorbent as a sponge. "They'll soak up their weight in water," says Phillips (below, cleaning mortar off a Savannah Grey with a brick ax). "You couldn't use this brick up north. The freezing and thawing would kill it." In Savannah's hot, humid climate, he says, a porous, breathable brick is a plus. Traditionally,



SIMON WATSON

walls of Savannah Grey were stuccoed. Then, in the early 1900s, exposed brick became fashionable.

There's only one way to build with Savannah Grey nowadays—by extracting it from old buildings; salvaged brick can be had for about \$1.25 apiece. The Flemings, though, won't have to pay for theirs: Demolition for the new addition to their Monterey Square house yielded several pallets of the brick, which they plan to use for the renovation.

### STANDARD-SIZE FACING BRICK

Face 8" Length

End 2¼" Height

"Something that we can

## GLOSSARY

**Facing Brick** Brick made to be seen; often with a textured or specially colored surface.

**Building Brick** Brick that will be hidden from view, with no special texture or color. Formerly called common brick.

**Paving Brick** Abrasion-resistant, low-absorption brick for streets and walkways.

**Clinker Brick** Distorted or bloated brick caused by almost complete vitrification when firing.

Curved striations are created by wires on a reel cutter. Grain and color are affected by the blend of clays and minerals and their firing in the kiln.

Coring lightens the brick and allows for more thorough firing of its interior.

Bed  $3\frac{5}{8}$ – $3\frac{3}{4}$ " Depth

handle and that's not too heavy."

Louis Kahn, architect



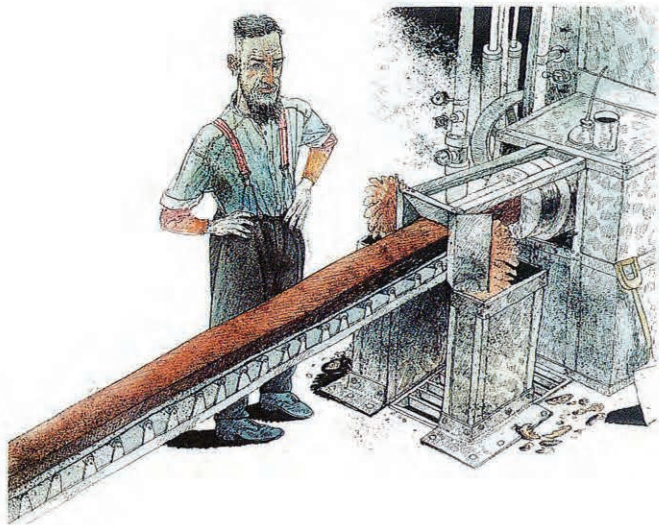
then moved away from the heat so they won't melt into distorted "clinkers." Getting everything right—the blend of clays, the amount of water and the firing temperature and time—is the brickmaker's biggest anxiety. "You don't know for certain how things will turn out until brick comes out of the kiln," says Robert Belden, great-grandson of the company's founder. "And at that point, it's too late to do anything."

Belden also operates several periodic downdraft kilns, known as beehive kilns, to produce specialty brick. These kilns, which work more like cooking ovens, give the brickmaker the greatest control over the final product. The fireman can increase the length of time in the kiln ("soak time") to get a low-absorption brick for industrial uses, or add coal, zinc or manganese to the kiln to modify the brick's color. But because it takes about 30 days to load, fire, cool and unload a beehive kiln, brick fired in this way are more costly to make than those from a continuous kiln.

Even after firing, there is one final step: blending. Fired brick varies widely in color depending on its composition, its position in the kiln and the amount of heat it's subjected to. To make sure whatever is built with the brick has a uniform shade overall and doesn't look patchy, the chimneys are taken apart by hand, randomly sorted by machine, then restacked into 525-brick cubes for shipping.

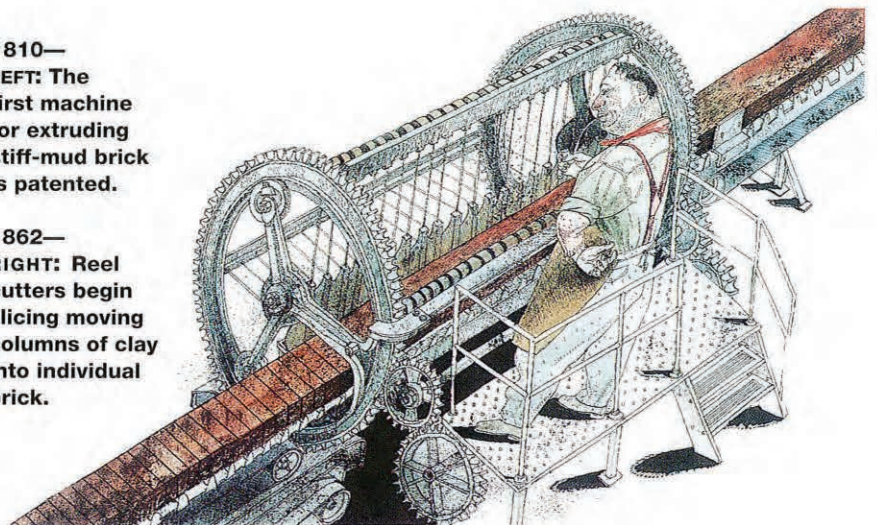
**BRICK'S PROGRESS: CUTTING AND FIRING**  
**(6)** As the column of clay exits the extruder, a reel cutter slices it into 26 brick at one time. The five holes in the bed of the brick, called coring, are formed by metal plugs in the extruder's die. **(7)** Borne by a kiln car rolling at an inch per hour, chimneys of unfired "green" brick enter the 530-foot-long tunnel kiln. **(8)** They exit the kiln 72 hours later, having been subjected to temperatures reaching 2,100° F. **(9)** Old beehive kilns are still used to fire hard, low-absorption brick or to produce special colors, but unlike a tunnel kiln, which runs 24 hours a day, a beehive has to be shut down to remove the fired brick. Time between each beehive firing: 30 days. **(10)** In the factory's brickyard, brick—from buff to burgundy—await shipment to local distributors.

## The History of Brickmaking (continued)



1810—  
**LEFT:** The first machine for extruding stiff-mud brick is patented.

1862—  
**RIGHT:** Reel cutters begin slicing moving columns of clay into individual brick.

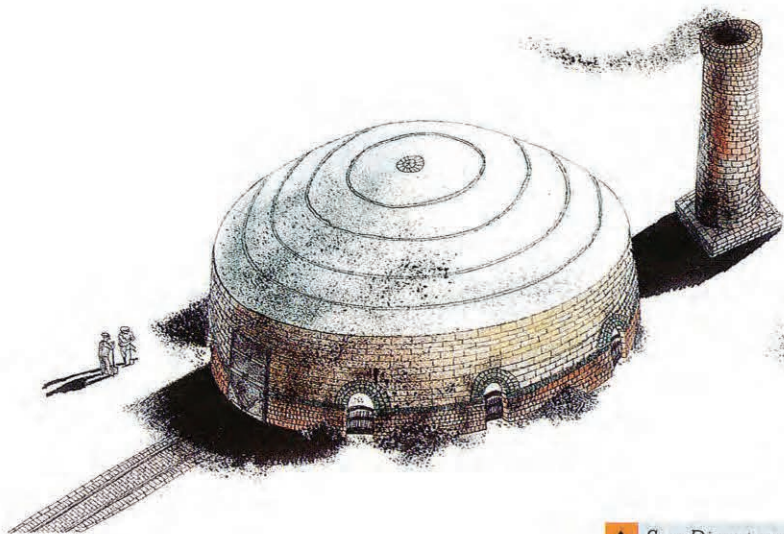
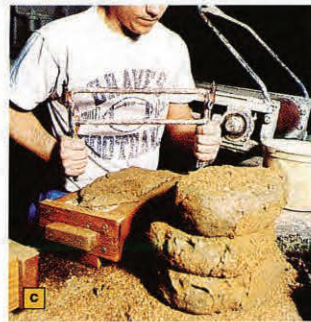




## Hand-molded Brick

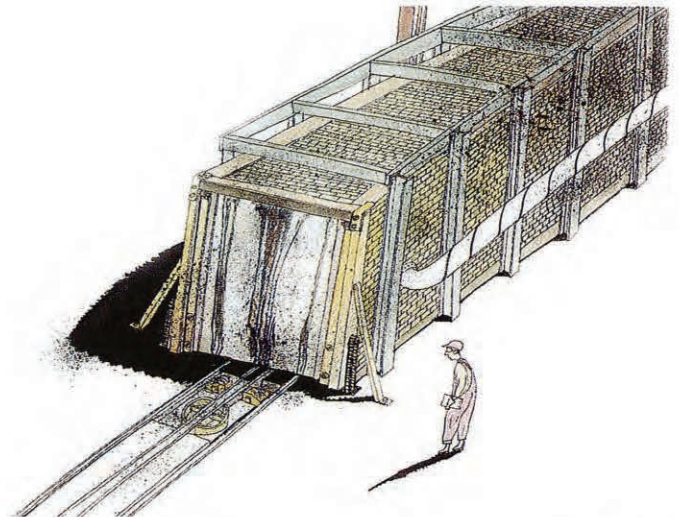


Using age-old techniques, Belden makes hand-molded brick for restoration projects. First, a mold from the hundreds in inventory (a) is washed, soaked and sprinkled with sand to help the clay release. The molder takes a wad of soft clay and bounces it on a sand-covered table to form a "slug." A thrower (b) lifts the 8-pound slug overhead and heaves it into the mold. He presses the clay into the corners with his fingers, then (c) uses a wire "strike" to remove excess. Finally he shakes the mold and (d) inverts it to pop out the green brick. A four-person molding crew (one washer, one molder, two throwers) can produce about 100 brick an hour.



1880—  
LEFT:  
Periodic  
downdraft  
("beehive")  
kilns are  
widely used.

1903—  
RIGHT:  
Continuous-  
firing  
"tunnel"  
kilns begin  
operating in  
the United  
States.

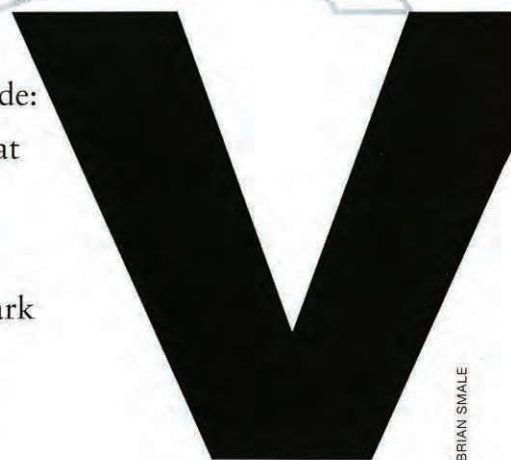
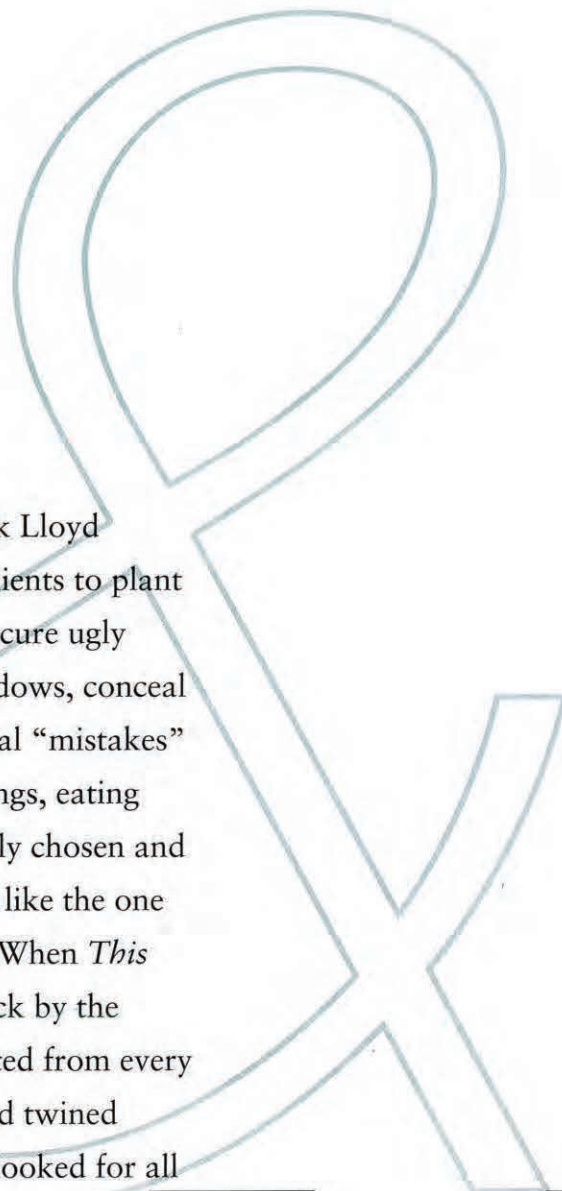


# TRELLIS



BY KEN DRUSE

“A physician can bury his mistakes,” said Frank Lloyd Wright, “but the architect can only advise his clients to plant vines.” Vines hide a multitude of sins. They obscure ugly views, disguise downspouts, link unrelated windows, conceal pipes and utility boxes and can turn architectural “mistakes” into vertical gardens. Don’t they damage buildings, eating mortar and prying up clapboard? Not if properly chosen and properly supported (by a *Victory Garden* trellis like the one we show on the following pages, for example). When *This Old House* first visited Savannah, we were struck by the profusion of vines: Wisteria and clematis sprouted from every tiny side yard, clung to pergolas and trellises and twined about the ironwork. In late summer, Savannah looked for all the world like those pictures of the Hanging Gardens of Babylon. But all Southern beauties have their pragmatic side: As we sweated through a September week, we realized that vines are natural awnings. Years ago, many a porch and breezeway had a trellis covered with Dutchman’s pipe (*Aristolochia durior*), a deciduous climber whose huge, dark green leaves lend summer shade. Plant some this spring: Think of it as doing your bit to combat global warming.



BRIAN SMALE



There are vines for quick cover, like the annual morning glory, and herbaceous vines that die to the ground each year and return again to cover a trellis in one season, like golden hops. But most of the climbers we crave are woody: English ivy, climbing hydrangea and wisteria. These plants will be around for decades, so design them into the garden as if they were elongated shrubs. Be patient—they can be slow at first. Then stand back. There's an old gardener's saying that compares vines to babies: first year sleep, second year creep, third year leap.



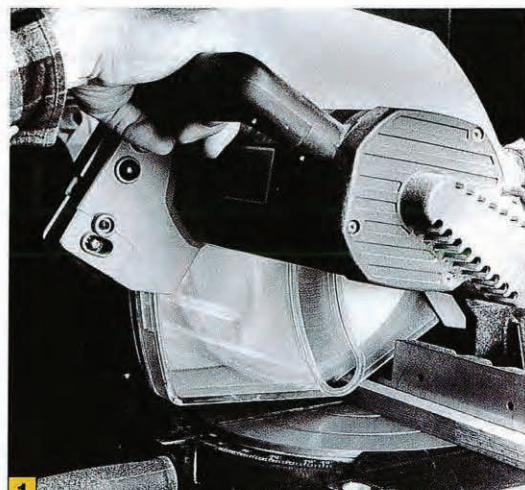
The clematis (pronounced *klem-a-tis*) is the queen of all climbers. There are hundreds of varieties, climbing from 3 to 30 feet, with flowers that range from 1 to 10 inches across and bloom, depending on variety, from spring to fall. This is a *Clematis viticella* hybrid, which climbs using leaf tendrils, as illustrated above.

# VINE

# TRELLIS

PHOTOGRAPHS BY BRIAN SMALE

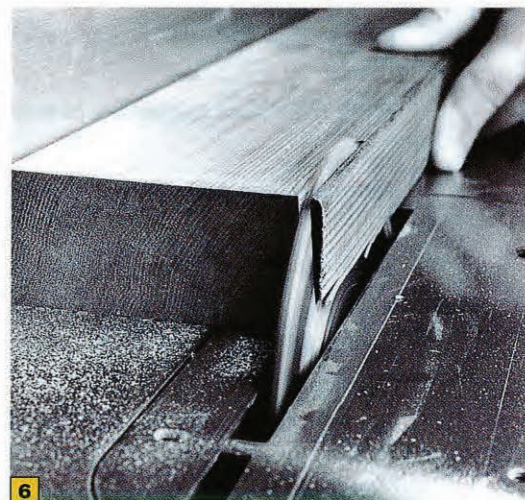
Kip Anderson, gardener for public television's *Victory Garden*, has devised a method of making trellises out of redwood grounds: finger-jointed lengths of stock, sold at good lumberyards as thickness guides for plasterers. Sturdy and rot-resistant, they cost about 20 cents a foot. Openings need not be square; rectangles work too, says Kip, but 8- to 10-inch spacing usually looks best. This trellis has  $7\frac{1}{4}$ -inch openings—8 inches counting the  $\frac{3}{4}$ -inch stock.



Kip cuts lattice pieces with a miter saw. To figure length, he starts with two 4-inch overhangs, then adds the number of openings that fit on the wall and  $\frac{1}{4}$  inch to allow for the width of the final crosspiece.



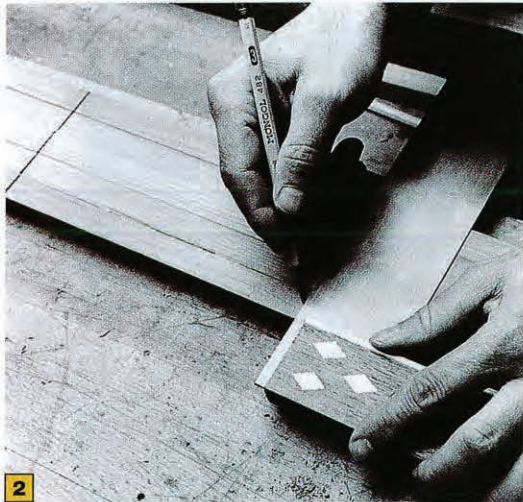
He assembles the trellis from the back on a large, flat surface. He lays the horizontal pieces face down (marks up), then lays the verticals on top and drives  $1\frac{1}{4}$ -inch all-weather screws into each joint. He starts at a corner, then works all the way down one side and across the bottom to keep pieces steady.



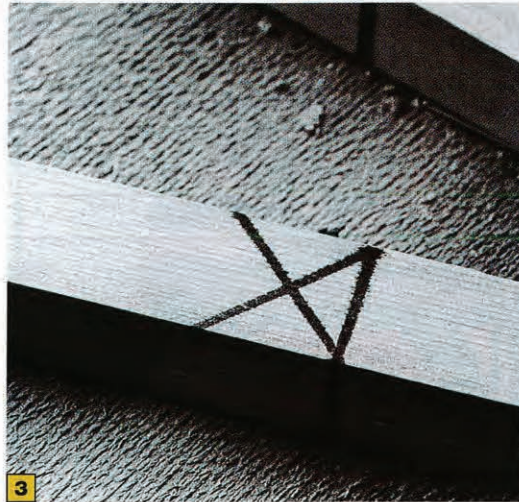
He trims the edges of a redwood 2x4 at an angle, then cuts it to the width of the trellis to make a supporting cleat. Generally two are needed, one near the top of the trellis and one near the bottom.



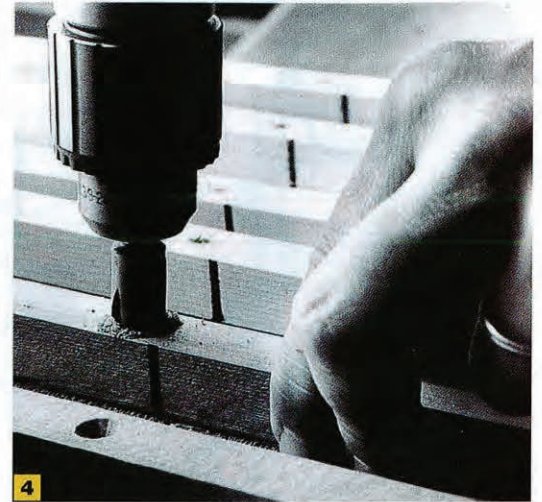
He attaches cleat to wall with  $3\frac{1}{2}$ -inch screws, then screws trellis verticals to cleat with 2-inch screws.



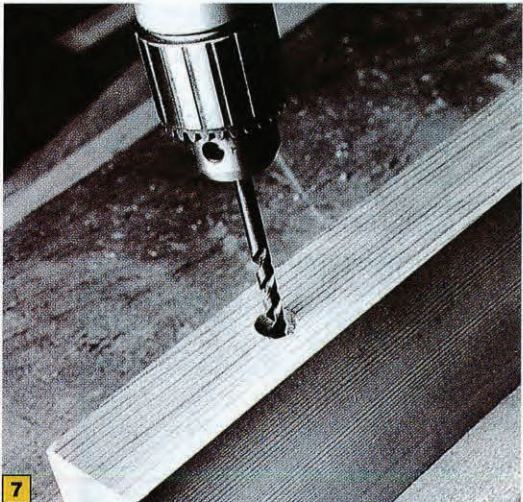
He uses a square to align pieces at one end and clamps them so he can **mark all horizontals** in one pass and verticals in another. On horizontal pieces, he marks the best face without finger joints.



**Vertical pieces** are marked on a finger-jointed side but rotated for assembly so a more attractive side will face out. This way, marks on horizontals and verticals will meet. An X shows where the crosspiece will lie.

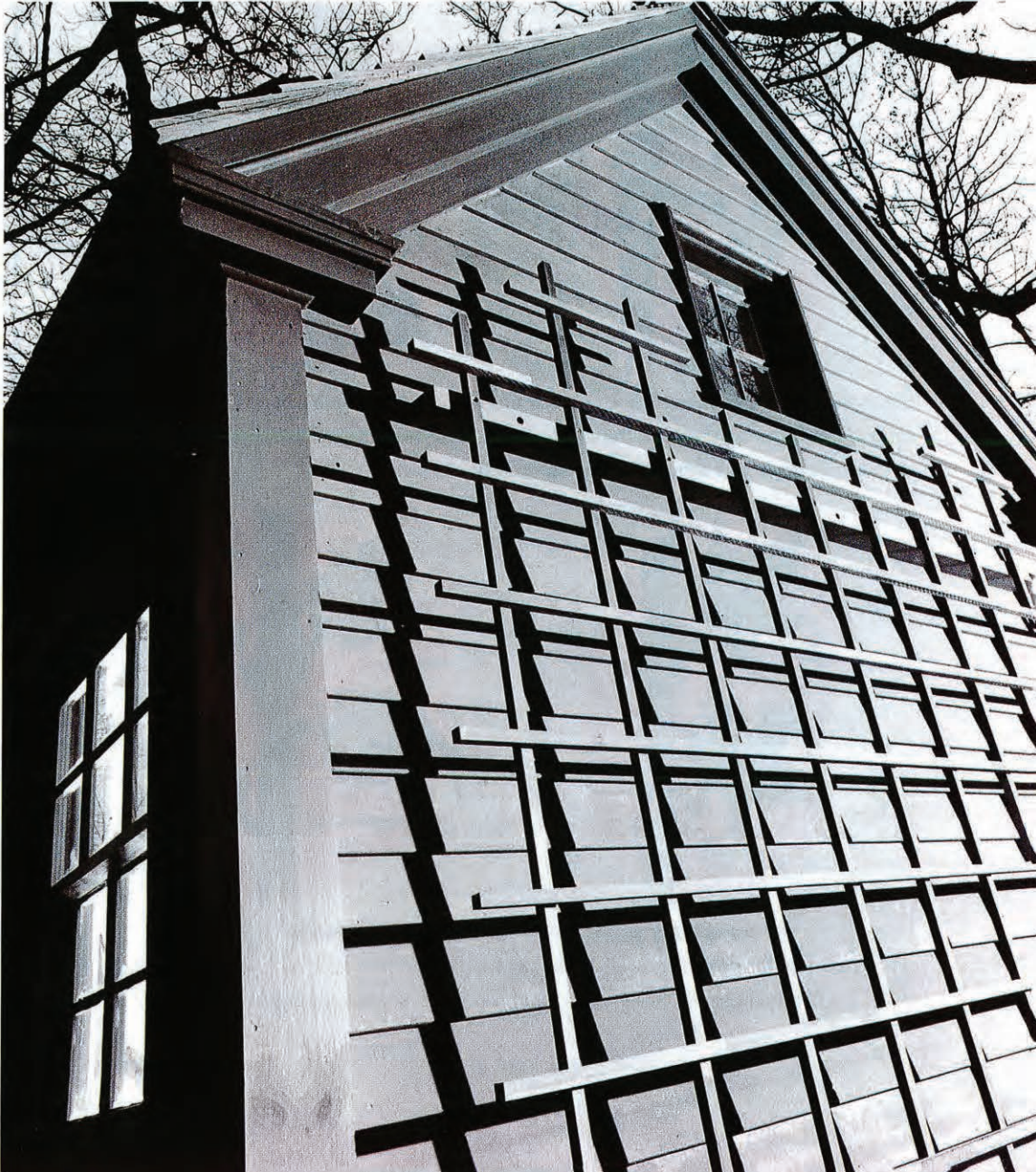


To ensure that screws seat securely and don't show on finished trellis, he drills **shank holes and counter-sinks** into the backs of the verticals, at roughly the center of intersections. A scrap piece is underneath.



The cleat is attached to the wall so that it **slopes downward** and sheds water away from the building. Kip drills two shank holes and 1/2-inch counterbores on the outside edge of the cleat, locating them so they will hit studs inside the wall.

Kip has made redwood-ground trellises of different sizes for the Victory Garden and New Yankee Workshop. Some have stood for five years now with no signs of decay. This one was attached to a shed built by Norm Abram. Kip says it's sturdy enough to hold clematis, morning glory or even pole beans. Wisteria and other woody vines would need stronger supports.



# HOW THEY CLIMB

Illustrations by Tim Carroll



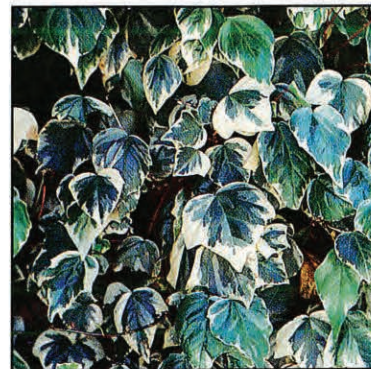
Most vines **twine** to climb toward the sun. When the stem meets an obstacle, cells grow faster on one side, causing the stem to wind (above left). Other plants, like climbing roses, send up **shoots** that get tangled in trellises or simply rest on supports (right).



Some plants, like grapevines, climb with **tendrils**—modified leaf stems that twine around supports (above left). A few, like the passionflower, even produce curly springs along the tendrils (right) to act as shock absorbers for weight and wind.



Vines like ivy and climbing hydrangea have modified roots or **rootlets** along the stems (above left) that grow into the rough surface of supports; others, such as Boston ivy, develop **disks** like tree-frog toes on their rootlets (right) that will even stick to smooth surfaces.



*Hedera canariensis* 'Variegata', variegated **Canary Island ivy**. Zones 7-10, rootlets. Large waxy leaves.



*Passiflora jamesonii*, **passionflower**. Zones 8-10, tendrils. Evergreen in subtropical climates. Vigorous grower.



*Ampelopsis brevipedunculata* 'Elegans', **porcelain berry**. Zones 4-9, tendrils. Avoid the invasive solid-green variety.



*Lonicera sempervirens* 'Paniculata', **honeysuckle**. Zones 4-8, twining. A well-behaved North American native.



*Ipomoea purpurea*, **morning glory**. All zones (grow as annual), twining. This purple one is a Japanese hybrid.



*Schizophragma hydrangeoides*, **Japanese hydrangea-vine**. Zones 5-9, rootlets. Great on tree trunks.



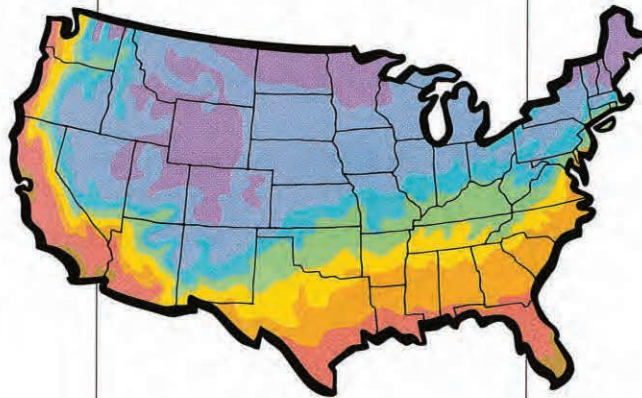
*Jasminum polyanthum*, **jasmine**. Zones 8-10, twining. Sold up North in pots, does much better outdoors.



*Rosa hybrid*, 'Golden Showers', **rose**. Zones 6-9. Not a true vine; long shoots can be tied here and there.

## VINE ZONES

Vines are most lush in the South, but they will grow in any state of the nation. Annuals will grow for one season, but if you want a permanent vine, choose one that is hardy in the place you live and garden. Hardiness refers to the plant's tolerance of average minimum temperatures in a zone as shown on the USDA map below.



## Hardiness Zones

minimum winter temperatures

- Zone 3 -40° to -30°F
- Zone 4 -30° to -20°
- Zone 5 -20° to -10°
- Zone 6 -10° to 0°
- Zone 7 0° to 10°
- Zone 8 10° to 20°
- Zone 9 20° to 30°
- Zone 10 30° to 40°



*Actinidia kolomikta*, **actinidia**. Zones 4-9, twining. Relative of kiwi; males have variegated white and pink leaves.



*Campsis radicans*, **trumpet vine**. Zones 4-9, rootlets. Not for the faint of heart; will take over if not maintained.



*Clematis maximowicziana*, **sweet autumn clematis**. Zones 5-8, leaf tendrils. Lots of flowers in late summer.



*Aristolochia durior*, **Dutchman's pipe**. Zones 6-9, twining. Huge shingle-like leaves, tiny pipe-like flowers.

PHOTOGRAPHS BY KEN DRUSE; MAP BY TIM CARROLL

# low country air conditioning

KEEPING AN OLD HOUSE IN THE DEEP SOUTH COOL

The heat in Savannah, Georgia, is something to do battle with. From mid-May to late September, it's always



there, always at you like some mean kid with a point to prove. It's not just the high temperatures (an average of 93 degrees in July) that make people feel so miserable.

Humidity, which hovers near 90 percent throughout the summer, makes the air heavier. Simply moving through it takes effort.




**The Fleming house is a virtual Swiss cheese, with 4-by-6-inch ventilation holes punched in the dentil molding at the fascia (above) and along the foundation (right), just above grade. The fascia holes, which are typical of old houses in the South, ventilate the attic while the foundation holes pull cool, ground-level air into the crawl space.**

In the renovation of the 112-year-old Fleming residence, this spring's *This Old House* project, new heat pumps for cooling (as well as heating) were installed. The house also incorporates passive cooling—the use of building materials and design to prevent hot air from entering the home in the first place. Ventilation from windows, wall vents and other nonmechanical sources is an important component of

**BY WENDY TALARICO**

**PHOTOGRAPHS BY JEFF VON HOENE**



**These keep out the sun, as well as the peering eyes of neighbors, and still admit plenty of outside air. Operable shutters are used on windows for the same purpose. They also protect the glass in case of storms.**

louvered doors



passive cooling; it exhausts the heat produced by ovens, dishwashers and other appliances. At the same time, moving air makes people feel cooler by evaporating the perspiration from their skin. Passive cooling techniques are still used in new home design to

increase comfort and lower energy costs—as significant to Southerners in the summer as heating expenses are to Northerners in the winter.

The Fleming house has 16-inch-thick exterior brick walls that slow and dissipate heat as it moves from the outside to the inside. Twelve-foot-high ceilings take advantage of the natural upward flow of hot air to keep rooms cool. On the second floor, transoms over bedroom doors improve air circulation while wide passages between the first-floor parlors let breezes blow from the front windows to the back of the house.

On the exterior, vines, shrubs and overarching live oak trees shade the walls and yard. Cream-colored stucco and a silver terne metal roof reflect heat. Studies by the Florida Solar Energy Center show that reflective roofing, which includes metal, light-colored tile and composition shingles covered with a reflective coating, reduces air-conditioning energy consumption by up to 20 percent.

Passive cooling lowers temperatures but does little to mitigate humidity. As a result, unpleasant moldy things grow inside the house. That's when air conditioning becomes essential. While credit for the invention of air conditioning is variously ascribed (many attribute it to Willis Carrier, who in the early 1900s came up with a widely used compressor design), it wasn't until after World War II that it became commonplace. Central air conditioning, in which a single unit cools the entire house, became popular in the 1960s.

All types of air conditioning operate essentially the same way: Warm air is pulled from the house and passed over an air handler, which consists of coils filled with a refrigerant that absorbs heat. Residential units use hydrochlorofluorocarbon as a refrigerant. It's safer and less deleterious to the ozone layer than its notorious predecessors, chlorofluorocarbons (CFCs). The condenser—the noisy part that sits outside the house—cools the refrigerant and cycles it back through the handler. Air conditioning dehumidifies by causing moisture in the warm air to condense when it hits the cold coils. The water drips into a collection pan beneath the handler.

To calculate the cooling load—the amount of central air conditioning needed in the Fleming house to maintain an average interior temperature of 75 degrees—*This Old House* plumbing and heating expert Richard Trethewey used a standard industry formula that takes into account the number of occupants, the size of the house, the amount of insulation, the number of windows and doors and other sources of ventilation, including kitchen and bath fans. It also factors in a worst-case scenario: The system must be able to handle a 93-degree day with

## double-hung windows

**These can be opened from the top or bottom. Opening from the top evacuates hot air while preventing children from falling from second-story windows.**



## porches

**Wide porches offer summertime living space and shade for windows. Many old Southern homes have a porch on every floor. Fans keep insects away and create welcome breezes.**



## transoms

**Air is permitted to circulate even when the doors are closed for privacy.**

90 percent humidity. The resulting figure is expressed in tons; in the early days of air conditioning, the load was calculated according to the fact that it takes 12,000 Btus to melt a ton of ice.

Because the Fleming house is large (5,470 square feet) and Savannah humidity levels are high, the load is “dramatic,” Richard says. Three

heat pumps provide the necessary 13 tons of cooling capacity—3 tons on the garden level and 5 tons each for the top floors. The electrically powered heat pumps are high-efficiency, and passive cooling measures help, but the Flemings can still expect significant electric bills.

An air-conditioning system is only as good as its distribution method. Ductwork should be well-sealed to avoid air leaks. It should be insulated where it passes through unconditioned space, such as the attic. In Savannah, Richard specified the same slender, 3½-inch-wide ductwork used to heat last fall’s *This Old House* project in Salem, Massachusetts. The flexible ductwork is appropriate for old homes because it can be snaked through wall cavities without having to add bulky soffits or tear out plaster. The air is vented through unobtrusive, 2-inch-diameter outlets. The ductwork is also encased in insulation to keep the air it delivers cool.



portholes

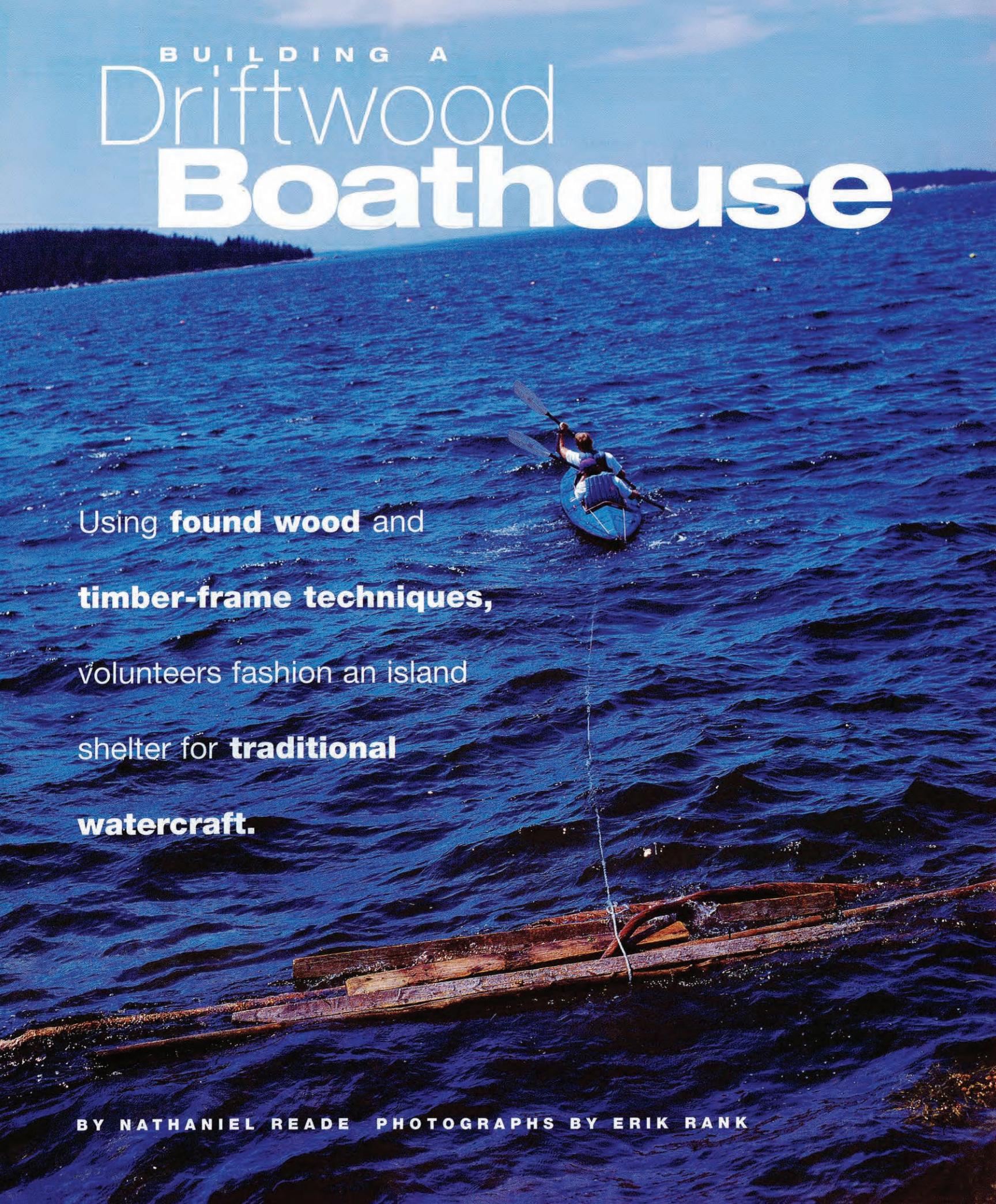
Rows of pivoting, 5-by-12-inch windows, located in the stairwell of a house near the Fleming residence, bring in cool air and light.

## Unconventional Cooling

Throughout history, desperate people have devised all kinds of contraptions for keeping cool. Evaporative or swamp coolers, most of which feature a fan blowing through a wet cloth or filter, blow a fine mist of water through the air, cooling those in its path. In the early 1900s, theaters advertising “refrigerated air” simply positioned fans behind large piles of ice. In Savannah, the Green-Meldrim house, built in the early 1850s, has an elaborate, dome-topped ventilation system (right). The dome, which measures 15 feet across at the base, is completely contained within the attic. When the house got unbearably warm, the glass top of the dome and a corresponding hatch in the roof were opened and 96 gas jets ringing the dome’s base were fired up. Rising air was heated by the jets, which increased its velocity and sucked more air into the dome. With all the doors and windows open, cooler outside air was drawn into the house. The system was crude and fraught with problems. The roof hatch leaked occasionally (it’s been replaced with a skylight) and the gas jets were a fire hazard. But it generated a stiff breeze and was considered progressive in its day.



◆ See Directory, on page 112, for details and sources



BUILDING A  
Driftwood  
**Boathouse**

Using **found wood** and  
**timber-frame techniques**,  
volunteers fashion an island  
shelter for **traditional**  
**watercraft.**

BY NATHANIEL READE PHOTOGRAPHS BY ERIK RANK



Instructor Mike Goldberg (second from right) supervises the raising of a tie-beam onto the already erected walls, using pike-poles (staves with nail points in one end) and tackle attached to a gin-pole.

Lance Lee's problem wasn't exactly ordinary. He needed a home for two 40-foot wooden boats—a reproduction of a 1796 French admiral's barge and a whaleboat from the Azores—that would protect them from rain and snow but not allow their hulls to dry out. He wanted it built on land he owns on a rocky island in Maine's Penobscot Bay that has no phone service, electricity or running water and where all supplies must come by boat. Oh, yes—and it would have to be cheap.

But Lee, 57, a former Marine and the founder of a wooden-boat-building school called the Apprenticeship of Rockland, Maine, is nothing if not resourceful. For a design, he would use the traditional Norwegian *naust* (rhymes with “doused”), whose dirt floor and open ends provided ideal humidity and air circulation for the Vikings' longboats. For the frame, he knew he could collect driftwood logs. And to build it, he had his students, along with friends in high braces: the Timber Framers Guild of North America, experts in post-and-beam construction.

“Boat-building and timber-framing kinda go hand in hand,” said Mike Goldberg, a timber framer from Woodstock,

Georgia. He was addressing about 20 volunteers and apprentices who had camped out amid the island's gulls, lobster pots, granite boulders and conifers for two weeks last August to build the *naust's* frame.

Post-and-beam construction—which uses solid timbers and pegged joints instead of “sticks” of 2x4s—employs not only the same materials and joinery as boat-building but also the same tools: axes, adzes, spokeshaves, chisels, mallets, gouges, slicks. In old America, the ship-builders often *were* the house builders; a timber-frame house, after all, isn't that different from an upside-down boat. Both trades carry on these time-tested methods not because they're quaint but



**ABOVE: Lance Lee (foreground) shows how to “fish driftwood.” The crew rolls the wood into a rising tide, Lee yelling, “To the sea!” Once they've towed the logs to the building site with sailboats and kayaks, workers move them with timber-carriers.**

**RIGHT: Goldberg cuts a post to length using a two-man bucksaw.**

because they work. “There's a struggle today between the hard-fought wisdom of the old ways and brash, high-tech culture,” Lee said. “We want to use the best of both.”

While Lee led an expedition to gather driftwood, Goldberg and fellow instructors Curtis Milton of Jackson, New Hampshire, and Will Beemer from the Heartwood School in Washington, Massachusetts, found a way to squeeze the 20-by-44-foot structure into its sloping, tree-filled site. Using a water level, they marked a level “datum line” with a string that started from the base of an apple tree at the rear of the site and ended about chest-high on a spruce in front. From this benchmark they determined the measurements for the rest of the frame.

The posts in the front, for instance, ended up about four feet longer than those in back.

To prevent rot, the posts had to stand on stone piers. This required rolling and muscling 10 granite boulders, some of them three feet across, into position. Apprentice timber framer Mike Murphy then cut two-inch-deep holes into the top of every stone using nothing but a star drill and a three-pound sledgehammer. He spent the better part of three days banging the drill, turning it slightly and banging again. Later he'd insert six-inch pieces of rebar between stones and posts, pinning wood to rock.

The driftwood supply proved somewhat disappointing. Lee rejected several logs as “better left to the worms”; they'd washed up too high for





**"This is a lot harder than running to the hardware store," says Lance Lee. "But the price is right."**

**“The sea is as generous as  
anything I know.” —Lance Lee**





**ABOVE:** The naust's rocky island home in Maine's Penobscot Bay.  
**BELOW:** The completed boathouse. Rough-sawn 1x10 spruce boards, carried to the site by barge, sheathe the roof and sides.





the salt to preserve them. The group did procure enough long logs to make the 40-foot top plates (horizontal members above the posts on which the rafters sit), but the wood was too brittle for fancy scarf joints. Instead they used simple lap joints secured with half-inch steel bolts. They filled out their wood supply with a few of the island's trees, cut down with a two-person saw and felling ax.

Into the top of the posts, workers cut tonguelike tenons, and into the plates they drilled and chiseled matching mortises. Gray logs revealed interiors of cedar, hemlock, redwood, pine, maple and oak. When they drilled holes for the pegs through tenon and mortise, Goldberg showed how to "draw-bore": He marked where the hole through the mortise would hit the tenon, then removed

the post and drilled the hole a quarter-inch lower. This way, the peg would pull the joint together more tightly. Even with all the volunteers and apprentices working, the only sounds were of chatting, chopping, sawing and singing. No loud circular saws, no smell of generator fumes—just balsam, fresh-sawn wood, blueberries and seaweed.

"Always make 'em purty," Goldberg said as he tied off clove hitches and started his lashing job. He was joining two 24-foot spruce poles to make "shear legs," an inverted V they would use to hoist the 1,500-pound plates. "If they're not purty,

they're not right." "It's the same law in boat-building," Lee said. "If it looks right, it is right."

When 10 teenagers and two instructors arrived in an open boat from the Outward Bound School on nearby Hurricane Island, the crew swelled to 34, enough for a raising. As an occasional red squirrel trilled its annoyance, Goldberg and Milton used guy



**ABOVE:** While one worker fine-tunes a tenon, another drills a completed mortise with a brace and 1-inch bit. **RIGHT:** A timber framer gouges out the bottom of a post so that it will fit the contours of its stone pier. A diagonal "brace" fitted between vertical post and horizontal plate gives the frame rigidity. **BELOW:** Workers add rafters and braces to the nearly completed frame.

ropes to erect two pairs of shear legs, one over either end of the plate's final destination. Then crews pushed with pike-poles while others pulled on the block and tackle attached to the crotch of the shear legs. The massive plate rose, swaying above the stone piers, while groups of four lifted the posts and settled them onto rebar and rock.

When Goldberg gave the command to lower the plate, mortises and tenons creaked contact. A few taps and the wall was tight, plumb and ready to be fastened with one-by-eight-inch oak pegs. It looked like a wooden Stonehenge. They

repeated the process on the other side—"same song, second verse," Goldberg said—joined the two walls with tie-beams and spikes, then added rafters and braces. Eleven days after they'd begun, the frame was done.

Some European frames have survived for more than a thousand years. Beemer gave the naust at least 500—provided it had a protective skin. So a month later, the Apprenticeshop crew returned with a bargeload of 1x10 spruce planks (virtually the only purchased materials) and sheathed the building. Now the completed naust provides a proper home for its barge and whaleboat—an extraordinary solution to no ordinary problem.

Said Lance Lee, "I'm tickled pink."





The 39-foot whaleboat slides into its new home.



# ORNAMEN PLA

**With techniques from the Italian Renaissance, a ceiling becomes an eye-catching canvas for three-dimensional artistry.**

**BY THOMAS BAKER    PHOTOGRAPHS BY SIMON WATSON**

The rubber mold is peeled back to reveal a new plaster ceiling medallion, an exact replica of the one in the parlor of Mills and Marianne Fleming's Savannah home.

# TAL S L T E R

MILLS FLEMING ADMIRERD the ceiling medallion in the parlor of his new old house at 7 West Gordon Street in Savannah. Its deep Georgian-style relief, complete with doves and fruit, added an air of elegance and distinction to the room's high ceiling. "Wouldn't it be nice to have something like that in my upstairs bedroom?" he wondered. It so happened that restoration work at the nearby Lucas Theatre, an entertainment palace built in 1921 by Fleming's great-grandfather, had brought ornamental plaster craftsman Jean-François Furieri to town. Furieri agreed to create a replica of the parlor medallion and to mount it in the Flemings' bedroom, and he invited *This Old House* to follow every step of the process.

A third-generation artisan, Furieri is passionate about plaster. "You know, this is a very sensuous

material," he says as he works wrist-deep in the stuff. It's easy to see what he loves about it: its transition from slippery liquid to stonelike smoothness, its radi-



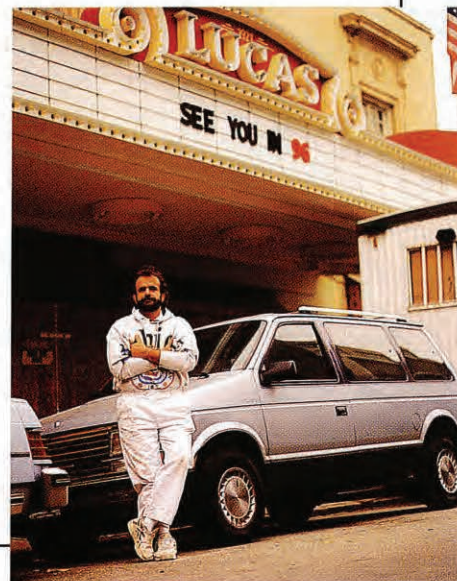
**Eight pairs of griffins surround the 6½-foot-diameter ceiling medallion of Savannah's Lucas Theatre. All the plaster ornaments in the theater were restored by Jean-François Furieri.**

ant warmth as it sets and the satisfaction that comes when a mold is lifted and its mirror image, still damp, lies exposed. Ask Furieri about similar ornaments made with polyurethane foam, and he sneers. "Look at the vapors the adhesives emit. Look at the toxic chemicals it releases when it burns. Look how soft its edges are compared with a crisp plaster profile. And how do you repair it if it's ever damaged?" By comparison, plaster is stable, repairable, nonflammable and nontoxic. "I eat the dust all the time," he says with a laugh. The only

serious enemy of gypsum plaster is water. "Keep it dry," says Furieri, "and it will last forever."

## MASTER OF PLASTER

Like the skilled *stuccotori* who fanned out from Renaissance Italy to decorate the palaces and manor houses of Europe, ornamental plasterer Jean-François Furieri is a guy who moves around. Born in Algeria, this son and grandson of Italian sculptors learned his trade the old-fashioned way: in his grandfather's studio. "Every day I hear the same thing—'Do it this way. Do it over again'—until my ears are full." He and his family joined the exodus of  *pieds noirs* to France after the Algerian Revolution. He lived in Spain for a while, won laurels in national judo competitions and studied law, but ultimately the family trade lured him back. Then he followed his wife to her native Toronto, where he established Iconoplast Designs. So far, this multilingual 39-year-old has restored the plaster in 11 theaters in North America, often starting with nothing more than an old photo or plaster shards. With his work on the Lucas Theatre nearing completion, he's on the lookout for new jobs, perhaps in Charleston or New York City. Fortunately, his skills and studio are easily transported: "You could build a whole theater with the tools in two suitcases," Furieri says.



# Making the **Mold**



## 1

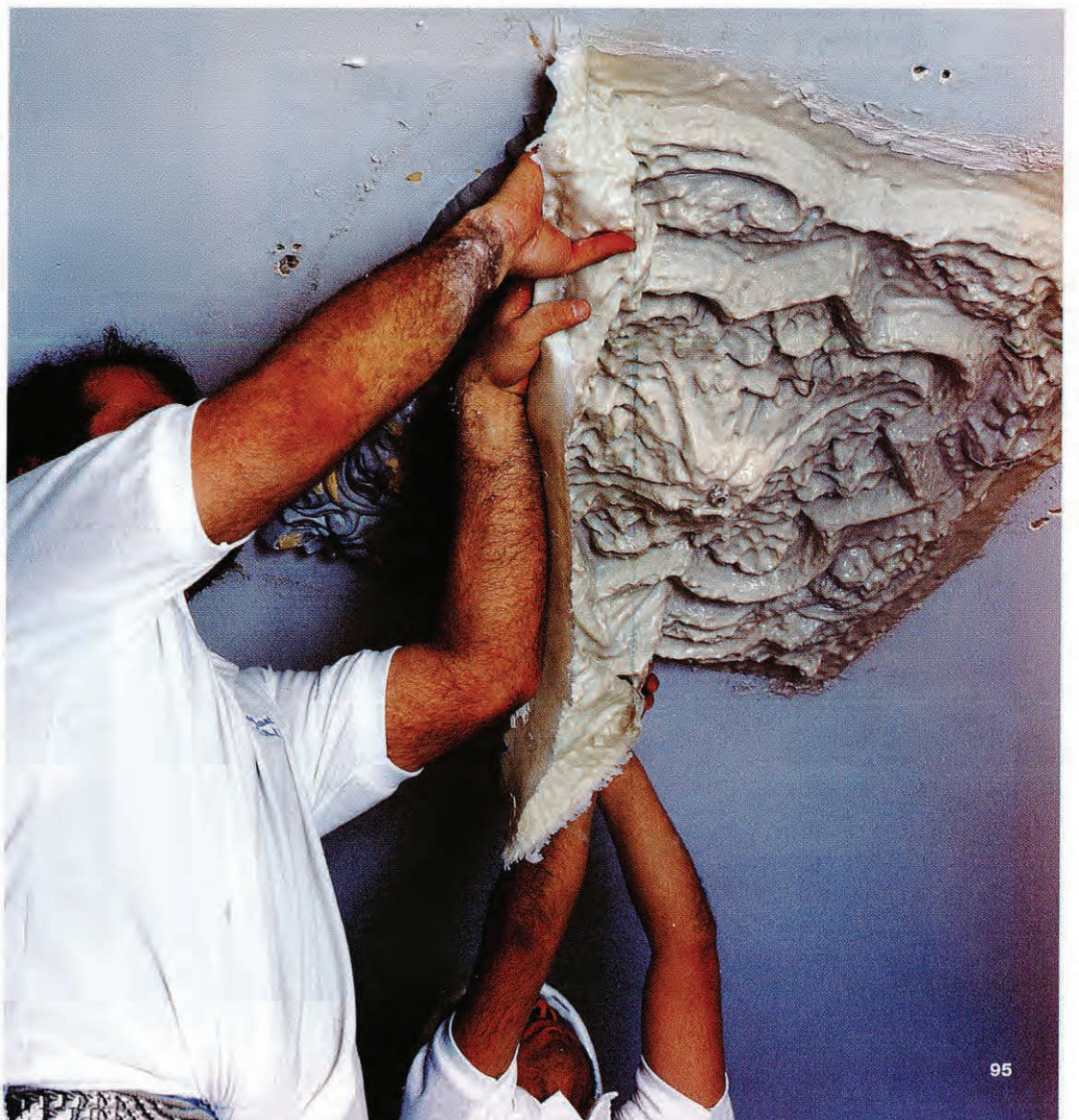
To duplicate this ceiling medallion, Furieri first makes a rubber mold in situ by brushing layers of two-part polyurethane rubber into every crevice and three inches out onto the ceiling. Nine coats of rubber, each about  $\frac{1}{4}$ -inch thick, were required to make the mold thick enough, an operation that took nearly eight hours.



**2** ↑ After curing overnight, the mold is covered with a plaster "mother case," a stiff, 3/8-inch-thick shell built up with coats of brushed-on plaster reinforced with layers of plaster-soaked burlap. The case will cradle the rubber mold when the cast is made.

**3** →

A wood rack makes it easier to take the mother case off the ceiling and supports the case during casting. Furieri steadies the rack with wires attached to the ceiling, then anchors the frame to the case with burlap ties sopped in plaster. Once the ties set, Furieri and his assistant, Tomás Silva, cut the wires and pop the case off the mold.



**4** →

Furieri and Silva peel the mold from the medallion. A release agent, sprayed on the medallion before the rubber is applied, makes removal possible.

# Casting the Medallion

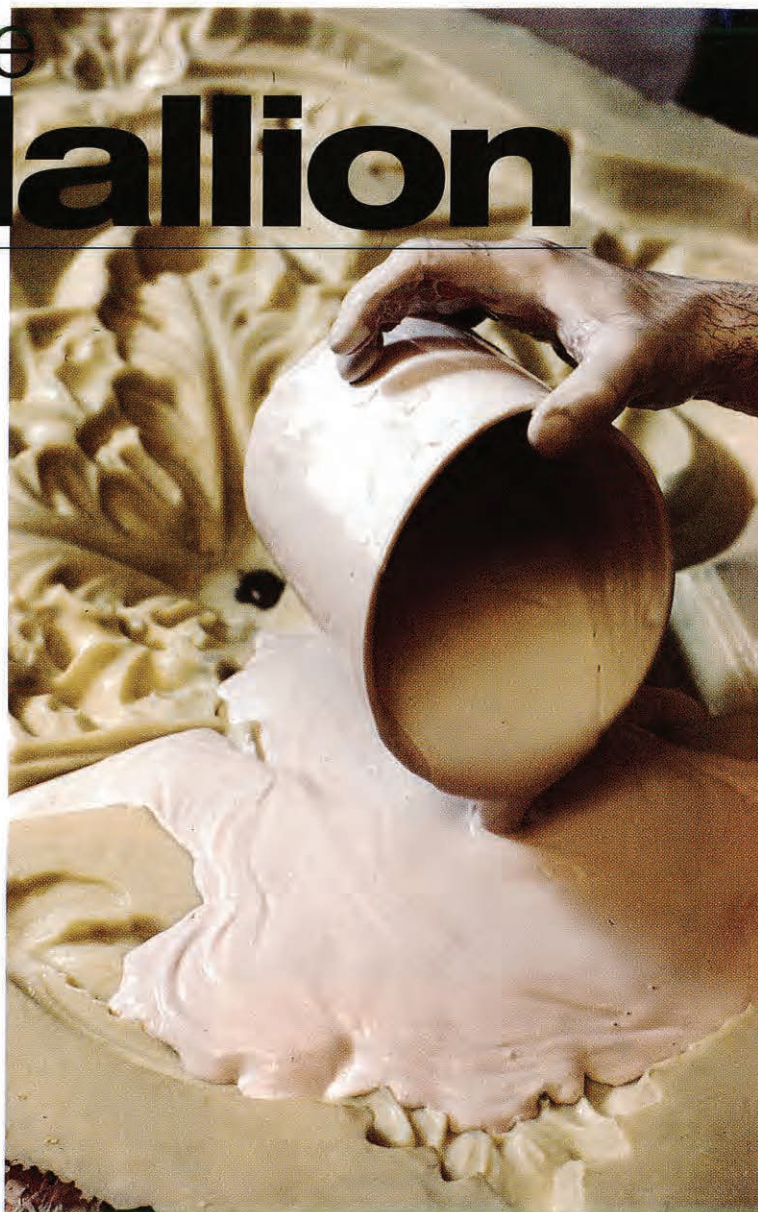


1

“The secret of plasterwork is in the gauging,” Furieri says. He slowly sifts molding plaster into about six quarts of clean, lukewarm water, stopping only when a layer of dry plaster (called *fleur d'eau*) remains on top. After slaking (soaking) undisturbed for about five minutes, the plaster is ready to be mixed.

2

Furieri mixes small batches of the wet plaster, called the gauge, in a separate container by stirring it vigorously with his fingers. This keeps air out of the mix and makes it easy to find and break up any lumps. The longer he mixes, the shorter the setting time and the stronger the finished product.



3

Creamy plaster flows into the medallion's rubber mold, held upright by the mother case. To avoid trapping air between mold and plaster, Furieri first sprays water on the mold, then brushes a thin layer of plaster over its surface and thumps the case on the table. “You need a perfectly intimate mix,” he says. There's no need for a release agent.





**5** ↑ As the plaster's working time nears an end, Furieri quickly builds up thickness along the medallion edge. Before the plaster sets, he will level the edge with a metal joint rod (which resembles a cabinet scraper), then score or "key" the plaster for a better bond with the ceiling.



**6** → The moment of truth: Once the plaster sets, the mother case is removed and the mold is peeled off to reveal a perfect replica of the Flemings' medallion, right down to surface irregularities caused by paint.



**4** ←

Furieri presses a layer of burlap reinforcement into the wet plaster. For this medallion, he lays down two pieces of fabric, making sure to brush the back of each with a layer of plaster for greater adhesion and strength.



## PLASTER HISTORY

While plaster has covered walls since the days of the pyramids, Greeks in the fifth century BC were the first to mold plaster for ornament. The Romans adopted the craft, but it died when the empire dissolved. Then, the story goes, a 13th-century Italian monk accidentally spilled plaster on a marble statue and rediscovered the material's marvelous molding properties. By the 15th century, at the height of the Italian Renaissance, plaster craftsmen known as *stuccatori* were busily filling orders for classical decoration. Little has changed since. Brushable rubber has replaced animal-hide gelatin for molds; fiberglass reinforcing mesh can substitute for burlap (hemp), sisal or goat hair; and polyvinyl acetate is added to improve adhesion. But the techniques, and the gypsum plaster itself, are no different from those used in Donatello's time.

## Installing

← Furieri and Silva hoist the 60-pound medallion into place on the bedroom ceiling. Chalk lines, which mark the center of the room from the breast of the fireplace, and nails align the points of the medallion's spandrels. The back of the medallion is bonded to the ceiling with a thick layer of plaster mixed with polyvinyl acetate (PVA) wallpaper adhesive. Galvanized deck screws also fasten the medallion to ceiling joists through predrilled, countersunk holes. The screw holes and ceiling-medallion joint will be disguised with plaster.

# Portfolio: Savannah Plaster

Little is known about the 19th-century plaster craftsmen whose three-dimensional artistry enriched Savannah's ceilings, but their skill is plain to see. To make even the most intricate medallion or cornice, they took relatively simple components, or "cast enrichments," and assembled them into artful groupings around chandeliers, over doorways or along ceiling joints. At first, enrichments were all cast in local studios; by the mid-1800s, such items could be ordered by mail. At the site, artisans glued the pieces in place and filled any joints with wet plaster. The result: a perfectly seamless, integral ceiling decoration.



↑ At the Champion House (230 Barnard Street, 1843), a floral medallion composed of husks and rosettes decorates a chandelier's base.



→ Italian plasterworkers created the florid spandrel and intricate cornice with ribbed-flower adornments for the Green-Meldrim House (14 West Macon Street, 1853).





Coffered panel moldings at 2 East Taylor Street (1880) set off a richly detailed medallion with palmetto leaves, pearls and rosettes. This style resembles the handiwork of the Summerlin family, Savannah plasterers whose craftsmanship can also be seen in the city's cathedral.

Cherubs and swags with ribbon and wreaths, executed in 1896, add a touch of rococo whimsy to the ceiling at 12 East Taylor Street (1867).



The Ionic capital and entablature of panel-molding cornice and modillions—all made of plaster—proclaim the Greek Revival influence at the Isaiah Davenport House, 324 East State Street (1815-20).



Plaster lyre and akroter enrichments alternate along a cornice at the Champion House.



This medallion's turned acanthus leaves and enriched surround show off the Regency styling in vogue when the Wayne-Gordon House (142 Bull Street) was built in 1818. Note the rosettes arrayed across the ceiling.

A newer medallion added to the Wayne-Gordon House in 1886 is perforated with holes that vent gas-lamp fumes.

# R U N N I N G gutters

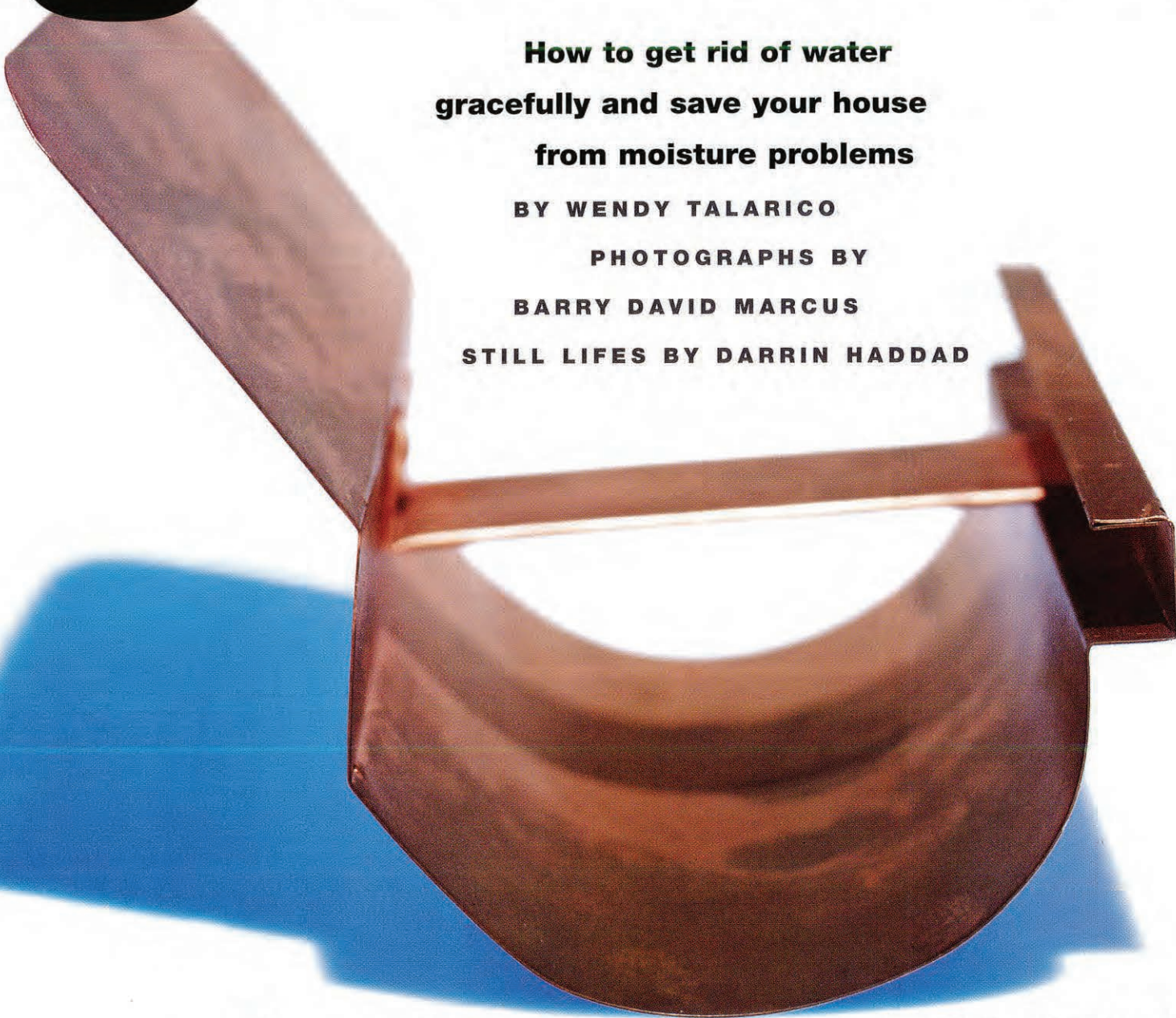
**How to get rid of water  
gracefully and save your house  
from moisture problems**

**BY WENDY TALARICO**

**PHOTOGRAPHS BY**

**BARRY DAVID MARCUS**

**STILL LIVES BY DARRIN HADDAD**



Frankly, it's hard to get excited about gutters. They seem like one of those elements that just comes with the house, like walls and rafters and the front steps. But live through a rainy season without them and you realize how helpful, if not exciting, gutters are. Moisture is always out to attack your house. Water running off the roof ruins the paint, warps and rots the doors and window frames and erodes the soil around the foundation. Gutters capture water and direct it to downspouts, which conduct it safely away from your home. In regions where rainfall is light and porous soil drains water quickly, you can get by without gutters. But in much of the country, a house without gutters is asking for moisture problems.

**OPPOSITE: Who says gutters can't be beautiful? The copper ones on this Savannah, Georgia, house look like decorative moldings. The shiny copper will acquire a verdigris patina within 5 to 10 years.**



## INSTALLATION

Gutters aren't standard on all homes. Some houses are designed with deep eaves that broadcast rainfall away from the house. Good grading and drain tile (perforated pipe) buried around the perimeter of the house also disperse water. If these precautions aren't taken, problems are inevitable. The Savannah house pictured here, built without gutters, is three years old and already the wood window sash and garage doors are rotted. The builder replaced the decayed wood, and subcontractors installed copper gutters.

**1.** Nothing looks worse than a gutter that's askew. "You can see it from a block away," says installer Stephen Lancaster. The solution: plan the installation, **measure carefully** and snap a chalk line along the fascia as a guide. Some slope—1 inch per 20 feet of run—is necessary so water flows to downspouts. Seams and downspouts should be symmetrical and unobtrusive.

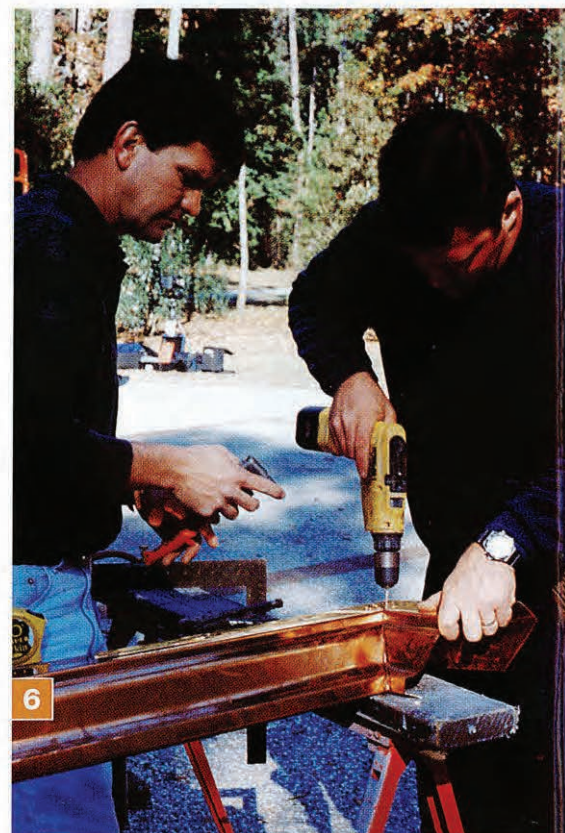
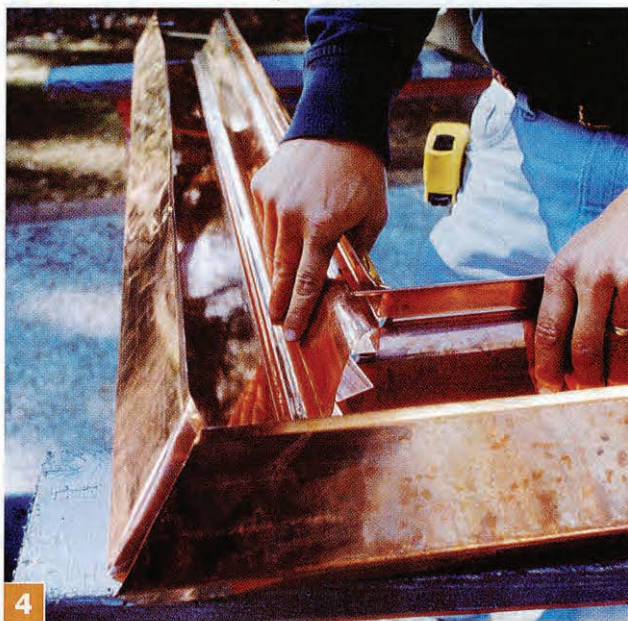
**2. Copper makes great gutters.** It's handsome, it won't rust and, with proper care, will last as long as the house. Because this roof is steep and large, Lancaster used a 6-inch-wide trough instead of the more typical 5-inch. The back of the gutter is taller than the front so water will spill away from the house.

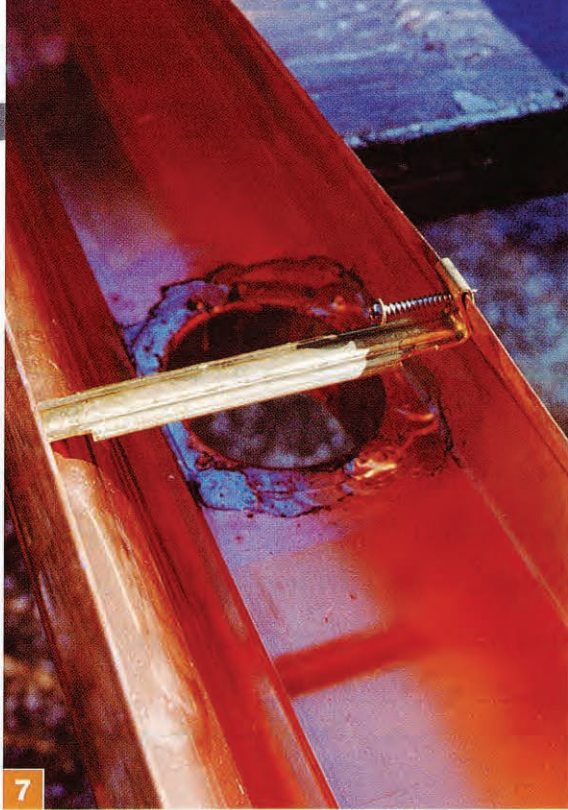
**3.** Copper is trickier to install (and therefore more expensive) than other materials. **Assembling a corner** is a five-step process. One end is cut to size with tin snips.

**4.** After fitting the corner pieces together, **joints are riveted and soldered.**

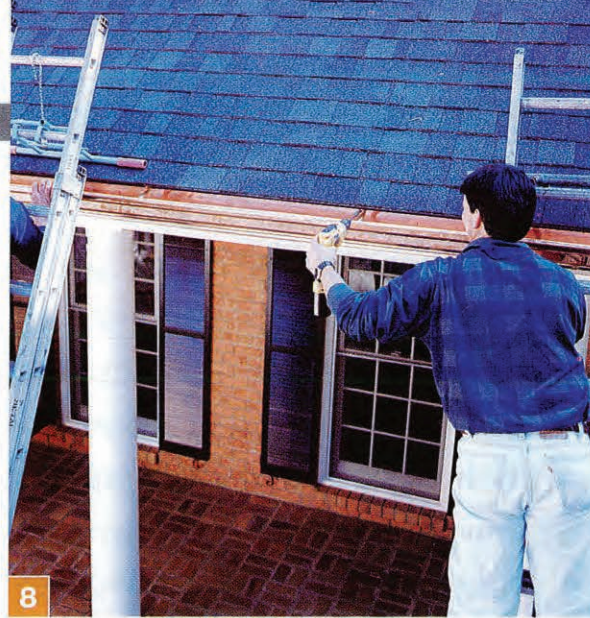
**5.** Downspouts are connected to the troughs with **drop tubes.** These are soldered to keep them firmly in place and to prevent water from leaking through the joint.

**6.** Sections of gutter are **assembled on the ground** and lifted into place. This saves the installer from hanging in the air to solder joints.





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**7. Fasteners** are designed to hold the gutter securely to the fascia or the eaves, even when the troughs are loaded with snow and debris. They come in a range of configurations; the best one for the job depends on what type of gutter is used and what the drip edge and the roofing are like. Lancaster selected fascia-mounted hangers because they don't disturb the roofing material. Unlike straps, which wrap around the exterior of the gutter, these brass hangers are invisible once installed. They're slid into place before the gutter is mounted.

**8.** The gutter is **attached to the fascia** just below the drip edge at 36-inch intervals. Lancaster uses 1½-inch stainless steel screws.

**9.** The gutter above this bay window includes several **odd angles and awkward jogs**. Measuring, soldering and installing this small section took two workers half a day to complete. The straight runs go more quickly—an average-size house can be completed in a day or less.

**10.** The size and frequency of the **downspouts** is determined by the area and steepness of the roof. As a rule, for every 100 square feet of roof area, add 1 inch to the diameter of the downspout. A 3-inch-diameter downspout can carry rainfall from 300 square feet of roof, for example. Downspouts should be spaced a maximum of 40 feet apart to prevent water from backing up.

**11. Soldering the seams** on these elbows prevents water, which always takes the path of least resistance, from leaking out and invading the eaves. Aluminum, plastic and wood gutters rely on caulk to keep joints watertight.

**12. Screening** keeps leaves, pine needles, granules from asphalt roofing and, in Savannah, clumps of Spanish moss from collecting inside the gutters.

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## gutter choices

Selecting gutters is just slightly less complicated than choosing wallpaper. You'll be amazed at the range of materials, prices, profiles, colors and fasteners. Aluminum gutters, like those used on the *This Old House* project in Salem, Massachusetts, are generally available in three sizes, four stock profiles and a dozen colors, including a new finish from Alcoa Building Products that imitates copper but costs only \$9 per lineal foot, installed (versus \$15 to \$20 for the real thing). Here's an overview of common gutter materials. Prices are suggested retail, include installation and are based on the lineal foot.



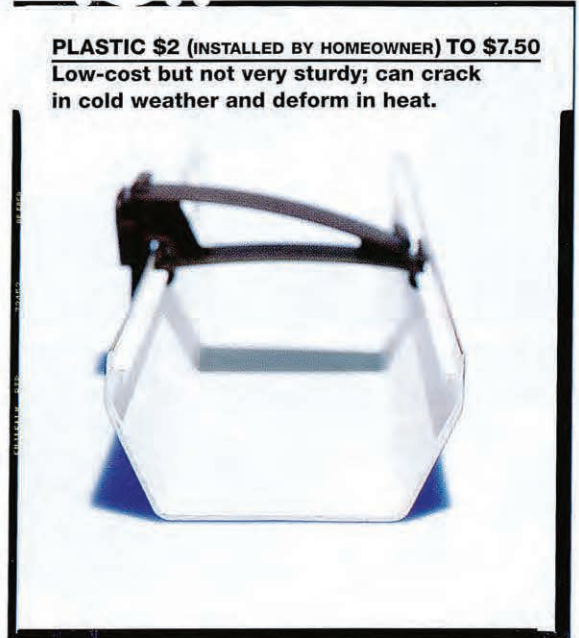
**ALUMINUM \$5 TO \$9**  
Select the thicker variety (.032 inch) for greater stability and strength.



**GALVANIZED \$6 TO \$10**  
Steel coated with zinc (the galvanizing layer), these are sturdy but prone to rust.



**WOOD \$12 TO \$20**  
Redwood or Western red cedar will last 50 years or longer if oiled regularly.

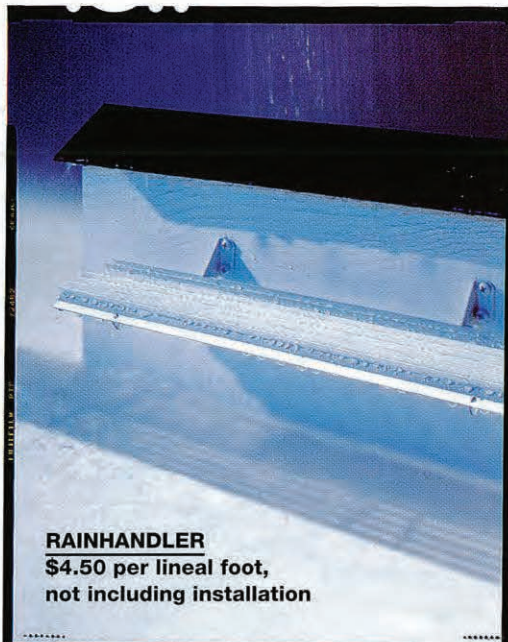


**PLASTIC \$2 (INSTALLED BY HOMEOWNER) TO \$7.50**  
Low-cost but not very sturdy; can crack in cold weather and deform in heat.

## keep the muck out



**LEAFGUARD**  
\$7 per lineal foot,  
including installation



**RAINHANDLER**  
\$4.50 per lineal foot,  
not including installation



**GUTTER HELMET**  
\$9 per lineal foot,  
including installation

Cleaning gutters is loathsome. What could be less fun than dipping your hands into a sodden pile of dirt, decomposed leaves and who knows what else while swaying on a ladder? Manufacturers have caught on to the fact that many people will pay dearly for a product that keeps them out of their gutters. LeafGuard and Gutter Helmet (installed on the Salem house during last season's TV series) take advantage of surface tension to pull water into the gutter while deflecting debris. Both are made of aluminum.

Gutter Helmet is installed over existing gutters, while LeafGuard is a complete gutter system. Rainhandler isn't a gutter—it's a "rain dispersal system." That means the aluminum louvers disperse water as it falls from the roof, projecting it away from the house. Leaves simply wash away. Do any of these products actually work? Norm Abram is skeptical. "They have yet to invent a maintenance-free gutter," says the *This Old House* master carpenter. "When they do, I'll buy it."

## minding the gutters

Gutters do more harm than good if they're leaky or jammed. If it can't flow out, water backs up under the roof and makes its way into the house. Clear your gutters every spring and fall—take your garden hose up with you and flush the troughs clean or use a child's rake, a rubber spatula or your fingers. Use the hose to flush out the downspouts. If they're clogged, clear them with a plumber's snake. Inspect the gutters for holes and cracks; if you find any, call the manufacturer for advice on repairs. (Leaks at joints and seams can be filled with caulk.) Wood gutters should be coated with wood preservative or thinned raw linseed oil to prevent cracking. Sagging gutters are the result of broken fasteners. You can buy new ones at a home center, but be sure they're compatible with your gutter (some types of metals react).

If you find yourself skipping or postponing maintenance, hire someone to do it. Many gar-

dening and remodeling companies clean and repair gutters. They'll come to your house twice a year, do the work and bill you \$100 or so, depending on how high the gutters are, how big your house is and what kinds of repairs are needed. It's worth it.

**BELOW LEFT: Clogged gutters give new meaning to the term "rooftop garden."**  
**BELOW RIGHT: Painting galvanized gutters helps prevent rust.**





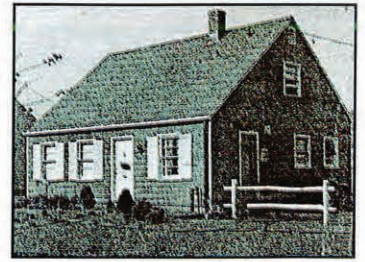
# LEVIT

*HALF A CENTURY LATER*

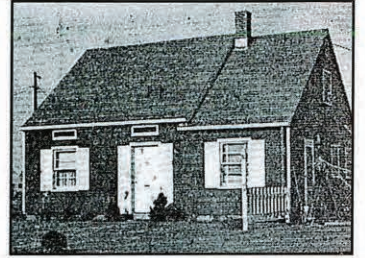


JOE SCHERSCHEL, LIFE MAGAZINE; COPYRIGHT TIME INC.

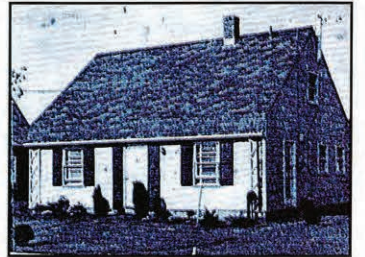
In 1947, William Levitt changed America with a community that was new from the ground up. Built on a potato field on Long Island, 30 miles from New York City, it began with 6,000 Cape-style homes in five almost identical models (pictured at right). Levitt pioneered the use of the assembly-line approach he had observed during the war in the production of peacetime housing: His creations were built at a clip of one house every 16 minutes at the peak, totaling 17,447 houses in four years. Levitt's bare-bones Capes and ranches were easily scorned as "cracker boxes," but to returning GIs and their families, the houses were a stake in the country they'd fought for, and something like a miracle at just \$90 down.



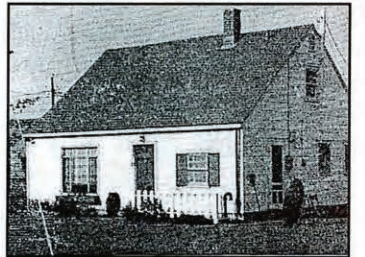
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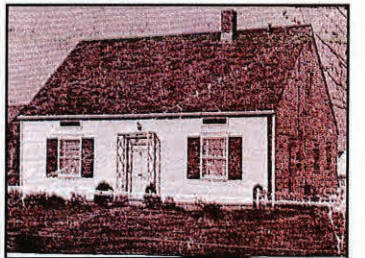
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# TOWN

BY BROOKE DETERLINE

PHOTOGRAPHS BY MICHEAL McLAUGHLIN

# LEVITTOWN How it began...

The first houses were available as rentals for \$65 a month. The following year they were offered for sale at \$7,990—\$90 down (refundable after three months) and \$54 a month. In another first, the houses came with appliances already installed.

Many owners added rooms as they added children, doing a lot of the work themselves. The simple form of the 725-square-foot Cape helped. “We gave them a foundation, and they built on it,” Levitt said later. A town magazine, *Thousand Lanes: Ideas for the Levitt Home*, offered features such as “New Living Room,” “Plenty of Room Here!” and “This Was Their Carport!” In 1957, homeowners could buy a finished attic, the most popular alteration, for \$499 up front or \$15.82 a month for 36 months.

Tom and Louise Kenny remember the beginning. They married in 1945 after Tom, a paratrooper, came back from the

war. They lived in the back of a store in Merrick, New York, then in an unfinished attic. In 1948 they saw an ad for Levittown and went to see the model. “For \$90 down we grabbed it, getting fruit trees and an oak as part of the deal,” Tom says. His father thought they were nuts for wanting to buy a

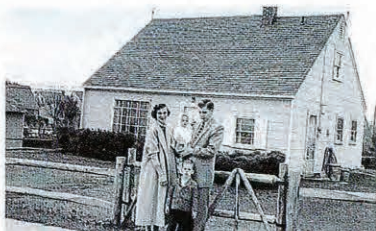
“cracker box.” But when they walked into their new home, Louise remembers, they were overjoyed. “It was just fun to be free and alone. It was mine.” Over the years, they added two bedrooms and a bath upstairs, a dining room that houses Louise’s prized owl collection and a screened porch in place of the original carport. Tom did most of the renovations.

Skeptics questioned the quality of such mass-produced construction, but the houses have appreciated at rates comparable to those in nearby towns. A basic Levittown model costs about \$125,000; souped-up

versions, \$180,000 or more. One original roof was replaced only this year. As the roofer left, the owner joked about seeing him in another 40 years. “Oh, no,” the roofer replied. “They don’t make ’em like this anymore. See you in 10.”



An almost original Type 4 Cape today. The only exterior change in nearly half a century is the addition of a rain shelter over the front door.



## THEN AND NOW: A Family House With a Future

**Levitt’s vision continues: When it was new, this Cape was home to a family of four. It still is, though now it has a second story, added in the 1970s. Greg and Theresa Faughnan thought its four bedrooms and two baths seemed perfect when they moved in two years ago with one baby, Greg, and one on the way. But with the new arrival, Sean, they dream of making their own changes. They hope to extend one side of the house, expanding the kitchen and adding a storage area to the first floor and a bedroom to the second.**



This Cape, now adorned with two diamond-pane bay windows, got its side dormer in 1978 and its shed extension in 1985.



This house grew with the addition of a dormer in 1970 and a 4-by-12-foot side extension the following year.

## ...and how it changed

An extension on one side created a larger kitchen for this Cape in 1960. The front extension was built in 1969.



Levitt didn't believe in housing cars before people. This house got its 20-by-22-foot garage, at right, in 1957.





An almost original Type 2 Cape has a stepped-down roof and faux windows (now painted over) above a real window and the door.



An attached garage was a popular addition. This ranch got one, along with other alterations, in 1970.

*“We gave them a foundation,*

Once a ranch, this house was transformed by a new second floor and porch in 1995. A two-car attached garage was added earlier.

Different siding styles show how this ranch grew. The garage and front vestibule were added in 1954, a bath and rear dormer in 1971.





This Cape has taken on the look of an Italian villa, thanks to extensive brick and stone work. Two lion statues sit over the entryway.



Beginning in 1970, this Cape evolved a style all its own. Changes include a full second floor, two-story pillars and an attached garage.

*and they built on it.* —WILLIAM LEVITT

This home has been altered so much that only one original wall remains. Keeping it, though, reduced building permit fees.



A spacious porch, eyebrow window and landscaping give this Cape unusual elegance. Inside are two added rooms and a half bath.



# Directory

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Extras pp. 20-27



p. 20—Wrenches: Robo-Grip, RG 9 curved jaw or straight jaw, \$29.95; RG 6 straight jaw or curved jaw, \$27.95; *Applied Concepts Inc.*, 120 Marshall Dr., Warrendale, PA 15086; 412-776-5595. Knipex #KN8603, \$73.50 (manufacturer lists it as 250 mm., we measured it as 10½ in.); #KN8711-10, \$35.60 (manufacturer lists it as 250 mm., we measured it as 9¼ in.) and #KN8711-7, (manufacturer's listing 7 in.), \$31.70; *Knipex, Anglo American Ent. Corp.*, 403 Kennedy Blvd., Somerdale, NJ 08083; 800-223-8600. EZ-Grip, \$17.99; *Sunico Inc.*, 13727 Excelsior Dr., Santa Fe Springs, CA 90670; 800-483-1788.

“If I Had a Hammer” program: *National Building Museum*, 401 F St. NW, Washington, DC 20001; 202-272-2448.

Our thanks to: Joyce McGhee, public affairs manager, and Eileen Langholtz, Youth and Family Program coordinator, *National Building Museum*.

p. 21—Events of Interest: Savannah tour: Basic walking home tour, four days, \$22; *Savannah Tour of Homes and Gardens*, 18 Abercorn St., Savannah, GA 31401; 912-234-8054. Baltimore Restoration '96 conference: March 17-19; call 508-664-6455 for more information. Igloo course: March 19 and 23-24, \$65; *Program Center, University of Calgary, Campus Rec.*, 2500 University Dr. NW, Calgary, Alberta, Canada T2N 1N4; 403-220-5038.

Morven: The Grand Estate symposium: April 11-13, \$345; call 804-963-8463 for information.

p. 24—Tropic Top, \$12 per sq. ft.; *Tropic Top*, 2028-3

Eastbourne Way, Orlando, FL 32812; 407-273-0069.

Fence book: *Fences: The Architects and Builders Companion*, by Peter Joel Harrison, 1993, 145 pp., \$30; Dietz Press, available from the author; 2021 Fawndale Dr., Raleigh, NC 27612; 919-676-0659.

Screwdriving accessories: Snappy Quick Chuck, #40011, \$9.95; *Poly-Tech Industries*, 20610 Commerce Blvd., Rogers, MN 55374; 800-334-7472.

Screw Boss, #16062, \$9.10; *Vermont American Tool Co.*, Box 340, Lincolnton, NC 28093; 800-742-3869.

Vision (clear sleeve), #784814A, \$9.20; *Makita USA*, 14930 Northam St., La Mirada, CA 90638-5753; 800-462-5482. Wood use chart data compiled by David B. McKeever and Robert B. Phelps, USDA Forest Service, in *Forest Products Journal*, vol. 44, no. 11/12, Nov./Dec. 1994.

p. 25—Detail carvers: Automach HCT-30A, \$330; *Sugino Corp.*, 1700 N. Penny Lane, Schaumburg, IL 60173; 708-397-9401.

#DC500 with five chisel bits, \$65; *Ryobi*, 5201 Pearman Deary Rd., Anderson, SC 29625; 800-525-2579.

Woodcarving design on page 58 of *Japanese Design Motifs*; 4,260 *Illustrations of Heraldic Crests*; 1972, 231 pp., \$11.95; Dover Pictorial Archives Series, *Dover Publications*, 31 E. 2nd St., Mineola, NY 11501; 516-294-7000, no phone or credit card orders. Adjustable electric outlet: Adjust-A-Box, single-gang plastic, \$1.99 each; *Veco Products Inc.*, Box 692, Lyle, WA 98635; 800-688-0890. Steel-framing classes: Feb. 5-9, March 11-15, April 15-19,

May 13-17; \$75 for five-day class; National Association of Home Builders, 1201 15th St. NW, Washington, DC 20005; 800-368-5242 (Bill Young x 409). Homestead Habitat for Humanity, 10 Palms Pl., Homestead, FL 33030; 305-247-0847. American Iron and Steel Institute, 1201 15th St. NW, Washington, DC 20005-2800; 800-797-8335 (engineer available to field technical questions) or 202-452-7100. AISI steel-framing manuals: RG 930, general steel framing, \$40; RG 921A, geared toward builders, with a technical information kit for steel framing, free; RG 923, directory of manufacturers, free; RG 921, homeowner's kit that includes RG 923, free; “Jordan Commons” framing manual, geared toward home builders, free; all available from AISI, attn: *Publication Orders*, Box 4327, Chestertown, MD 21690.

p. 26—Beckham Creek cave rentals: Realtor Glenn Vigil of Coldwell Banker. Call 800-335-2283; in Colorado, call 303-413-2364. Jamb-adjustment screw: Top Star 2½-in. screw, \$1 each, \$99.50 for 100-piece box; *GRK Canada Ltd.*, RR #1, 1499 Rosslyn Rd., Thunder Bay, Ontario, Canada P7C4T9; 800-263-0463 or 807-475-9601. Lightbulbs: GE Softwhite, 60 watt, \$1.45-\$2.20 for 4-pack; *GE Lighting, National Customer Service Center*, 4400 Cox Rd., Glen Allen, VA 23060; 800-523-5520. Daylight incandescent, 60 watt, \$5.49; *Osram Sylvania Inc.*, 18725 N. Union St., Westfield, IN 46074; 800-544-4828; “Chromalux” color-corrected incandescent,

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## Extras pp. 20-27 continued

60 watt; *Lumiram Electric Corp.*, 335 Fayette Ave., Mamoroneck, NY 10543; 800-354-5596. "Halolux" 250-watt halogen, \$24.66; *Osram Sylvania* neon, \$10 plus tax and shipping; *Just Bulbs*, 936 Broadway, New York, NY 10010; 212-228-7820. Self-ballasted mercury, 250 watt, \$150; 160 watt, \$94; *Philips Lighting Co.*, Box 6800, Franklin Sq. Dr., Somerset, NJ 08075; 800-555-0050. Metal halide, \$93-131; *Osram Sylvania Inc.* Day light compact fluorescent, 15 watt, \$16; *Century Lighting Industry*, 40-22 College Point Blvd., Flushing, NY 11354; 718-939-1198. Earth-Light compact fluorescent, 15 watt, \$36; *Philips Lighting Co.* "Northlux Tri-Power Twist" optional reflector

compact fluorescent, 20 watt; *Duro-Test Corp.*, 9 Law Dr., Fairfield, NJ 07004; 800-289-3876. "Circline" warm white compact fluorescent, 8 in., 22 watt, \$25; *Osram Sylvania Inc.* Strip light compact fluorescent, similar 13 watt model, \$11; *Osram Sylvania Inc.*

### p. 27—Oil drillers' hand lotion:

4-oz. bottle, \$2.25; 12 oz., \$3.98; *Oil Drillers' Hand Lotion Co.*, 50880 Ovallo, Laguna Hills, CA 92653; 800-645-3755. **Christmas In April:** 1225 I St., NW, Suite 601, Washington, DC 20005; 202-326-8268.

**Our thanks to:** Patricia Riley Johnson, president, and Sam Lawson, San Francisco program director, *Christmas In April*.

## Cordless drills and drivers pp. 29-32



**DeWalt T-handle cordless drill/driver:** #DW991K, with 14.4v battery, 3/8-in. keyless chuck, electric brake, two speed ranges and adjustable clutch, \$338; *DeWalt Industrial Power Tools*, 626 Hanover Pike, Hampstead, MD 21074; 800-433-9258.

**Bosch closed-handle cordless drill/driver:** #B2300, with 12v battery, 3/8-in. keyless chuck, electric brake, two speed ranges and electronic adjustable clutch, \$286; *S-B Power Tool Corp.*, 4300 West Peterson Ave., Chicago, IL 60646; 800-815-8665.

**Metabo pistol-grip cordless drill/driver:** #BEAT 100/2, with 9.6v battery, 3/8-in. keyless chuck, electric brake, two speed ranges, adjustable clutch and additional lightweight screwdriving chuck; with case and battery, #00297, \$279; with 1-hr. charger, case and battery, #00296, \$339; and with 10-min. charger, case and battery, #00298, \$459 (up to 3,000 charges); 1-hr. charger

separate, #31.163, \$75; 10-min. charger separate, #ICS10, \$185; *Metabo Corporation*, Box 2287, West Chester, PA 19380; 800-638-2264.

**Milwaukee cordless 55°-angle drill:** #0478-6, with 12v battery, 3/8-in. keyless chuck, electric brake and one speed range, with 2 battery packs, charger and carrying case, \$415 (available in June); *Milwaukee Electric Tool Corp.*, 131135 West Lisbon Rd., Brookfield, WI 53005; 800-274-9804 or 414-781-3600.

**Makita T-handle cordless drill/driver:** #6202DWG, with 9.6v battery, 3/8-in. keyless chuck, electric brake and adjustable clutch; *Makita USA Inc.*, 14930 Northham St., La Mirada, CA 90638; 800-462-5482.

**Hitachi cordless right-angle drill:** #DN10DY, with 9.6v battery, 3/8-in. keyless chuck and one speed range; *Hitachi Koki USA, Ltd.*, 3950 Steve Reynolds Blvd., Norcross, GA 30093; 800-598-6657.

**Panasonic cordless offset**



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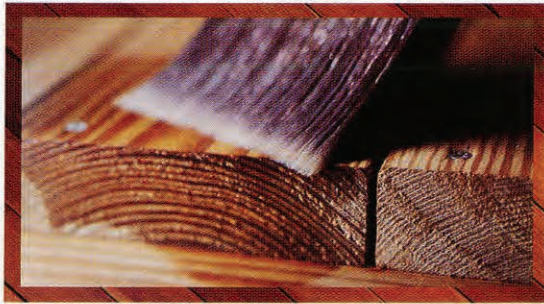
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### Cordless drills and drivers pp. 29-32 continued

**drill/driver:** Corner Master #EY6780EQK, with 9.6v battery, 1/4-in. hex quick-connect chuck, electric brake, one speed range and rotating turret, \$373;

*Matsushita Home and Commercial Products Co., 1 Panasonic Way #4A-3, Secaucus, NJ 07094; 800-338-0552 or 201-392-6655. Extension bits and other screwdriver*

**bits:** Various lengths and types can be found at hardware stores and home centers or *Vermont American Tool Co., Box 340, Lincolnton, NC 28093; 800-742-3869.*

### Shower Update pp. 35-37



**Antiscald valve:** #BP-56-1, pressure-balance mixing valve with showerhead, arm and flange, \$98.10; *Symmons Industries Inc., 31 Brooks Dr., Braintree, MA 02184; 800-796-6667.*

**Shower fittings (heads, personal showers and antiscald valves):** American Standard Inc., 1 Centennial Ave., Piscataway, NJ 08855-6820; 800-524-9797. Delta Faucet Corp., Box 40980, Indianapolis, IN 46280;

*800-345-3358 or 317-574-5663. Grohe America Inc., 241 Covington Dr., Bloomington, IL 60108; 708-582-7711. Interbath Inc., 665 N. Baldwin Park Blvd., City of Industry, CA 91746; 800-828-7943 or 800-423-9485 (in CA). Kohler, 444 Highland Dr., Kohler, WI 53044; 800-456-4537. Moen Inc., 25300 Al Moen Dr., North Olmsted, OH 44070-8022; 800-553-6636. Pollenex, 217 E. 16th St., Sedalia,*

*MO 65301; 800-767-6020. Regent International Inc., (Ugenex and Premier brands; no antiscald devices), 600 Industrial Dr., Cary, IL 60013; 800-210-7054. Resources Conservation Inc., Box 71, Greenwich, CT 06836; 800-243-2862 or 203-964-0600. Symmons Industries Inc., 31 Brooks Dr., Braintree, MA 02184; 800-796-6667. Teledyne Water Pik, 1730 E. Prospect Rd.,*

## Shower Update pp. 35-37 continued

Fort Collins, CO 80553-0001;  
800-525-2774.

### Wall-mounted soap dispenser:

#71450, large four-button, \$29.99;  
#71355, three-button, \$27.99;  
#71250, two-button, \$24.99;  
Better Living Products, 150 Norfinch  
Dr., Toronto, Ont., Canada M3N  
1X9; 800-487-3300.

The Bath Jar: #8324-2, single-mount

chrome, \$39.99; #8325-2, double-  
mount chrome, \$59.99; #8324-3,  
single-mount brass, \$49.99; double-  
mount brass, \$74.99; Earth Preserv,  
500 Decker Dr., Suite 204, Irving,  
TX 75062; 800-932-7849.

### Scald-Safe showerhead: Resources

Conservation Inc., Box 71, Greenwich,  
CT 06836; 800-243-2862 or  
203-964-0600.

Shower seats and grab bars: American  
Standard Inc., 1 Centennial Ave.,  
Piscataway, NJ 08855-6820;  
800-524-9797 or 908-980-3000.

Chlorine filter: Rainshow'r Filter #RS-502,  
\$39.95; #RS-502DS, showerhead and  
filter, \$59.95; Pacific Environmental  
Marketing & Development Co.,  
421 S. California St., Unit D,  
San Gabriel, CA 91776; 800-243-8775.

## Japanese Saws pp. 39-42



Azebiki Noko Giri,  
#15.121.20, 4¾-in.  
blade, \$24.95;  
Shindo Dozuki,  
#05.117.18, 8-in.  
blade, \$225;  
Ryoba Noko Giri,  
#01.111.30,  
11½-inch blade,  
\$85.75; The Japan Woodworker, 1731  
Clement Ave., Alameda, CA 94501;  
800-537-7820. Gomuguri, #GNG-  
265, 10½-in. blade, \$21.95; Tajima  
Tool Corp., 64 Hill Circle, Waterford,  
MI 48328; 810-681-6423.

## Sandpaper Options pp. 45-47



Green sandpaper  
for water-based  
finishes and  
polyurethanes:  
Professional  
Painters' Abrasive,  
#235U, 80 cents  
to \$1.05,  
depending on grit

size, for 9x11-in. sheet; 3M  
Construction Markets Division, 3M  
Center, Building 225-4S-08, St. Paul,  
MN 55144-1000; 800-480-1704.

Micron sandpaper: Imperial Micro-  
finishing Film, #258L, 100-micron grit,  
\$27 for box of fifty 5-in. discs;  
R.S. Hughes Co., 1162 Sonora Court,  
Sunnyvale, CA 94086; 408-739-3211;  
manufactured by 3M Abrasive Systems  
Division, Building 223-6N-01, St. Paul,  
MN 55144; 800-742-9546.

Microreplication sandpaper: 3M Apex,  
#207EA, 180 grit, \$239.75 for box of  
25 2x132-in. belts; Industrial Tool &  
Supply, 1177 N. 15th St., San Jose, CA  
95112; 800-366-4281 or

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## Sandpaper Options pp. 45-47 continued

408-292-8853; manufactured by 3M Abrasive Systems Division; 800-742-9546. For more information: Sandpaper museum, with exhibits on early abrasives, more than 200 kinds of sandpaper and an 8x8-ft.

quilt made of different sandpaper types; 3M/Dwan Museum, run by Lake County Historical Society, 201 Waterfront Drive, Two Harbors, MN 55616; 218-834-4898.

## Workbenches pp. 49-52



**Ulmia bench:** Ulmia no longer makes a bench identical to Norm's, but a similar model is the company's new cabinetmaker bench #91A02.01, available for about \$1,395 through several

catalogs, including *Garrett Wade*, 161 Avenue of the Americas, New York, NY 10013; 800-221-2942. **Build-It-Yourself Workbench:** #NY1021, plans only, \$10; #NY1022, video and plans, \$24.95 plus shipping and handling; Box 9345,

S. Burlington, VT 05407-9345; 800-892-0110. **Veritas bench:** \$795, plans for \$9.95, basic bench kit for \$49.95, deluxe bench kit for \$299; *Lee Valley Tools*, 12 E. River St., Ogdensburg, NY 13669; 800-871-8158. **Sjobergs bench:** \$390, available through several catalogs, including *Trend-Lines Inc.*, 135 American Legion Hwy., Revere, MA 02151; 800-767-9999.

**Workmate 200:** \$124; *Black & Decker*, 701 E. Joppa Rd., Towson, MD 21286; 800-762-6672. **Cellulose fiberboard:** #440, ½ in. 4x8, \$16; ⅝ in., 4x8, \$17; 4x4 comfort sheet, \$10; *Homasote Co.*, Box 7240, W. Trenton, NJ 08628; 800-257-9491.

## Sharpening pp. 55-57



**Professional sharpening:** *MMR Sharpening*, 26A Green St., Woburn, MA 01801; 617-938-9399. Further reading: *The Complete Guide to Sharpening*, by Leonard Lee, 1995, 256 pp., \$34.95; *The Taunton Press*, 63 S. Main St., Box 5506, Newtown, CT 06470; 800-888-8286.

## Buying Foreclosures pp. 58-59



For listings of foreclosed houses, see local banks and real estate agents and these government agencies: **HUD/FHA**,

451 Seventh St. SW, Washington, DC 20410; 202-708-3554; **Dept. of Veteran's Affairs**, 1120 Vermont Ave., NW, Washington, DC 20421; 800-827-1000 or 202-273-5400. To order The General Services Administration's "U.S. Real Properties Sales List": *Property Disposal Division-1PR*, 10 Causeway St., Room 1079, Boston, MA 02222; 800-755-1946.

**Further reading:** *How to Buy Foreclosed Real Estate*, by Theodore J. Dallow, a succinct and realistic guide for would-be homeowners, 1993, 152 pp., \$7.95; *Adams Media Corp.*, 260 Center St., Holbrook, MA 02343; 800-872-5627. *Buying Real Estate Foreclosure*, by Melissa S. Kollen, has good detail but is aimed more at the investor, 1992, 214 pp., \$14.95; *McGraw-Hill, Order Services*, Box 545, Blacklick, OH 43004-0545; 800-722-4726. *The Homeowner's Guide to Foreclosure: How to Protect Your Home and Your Rights*, by James I. Wiedemer, has detailed explanations and a glossary of legal terms plus a useful summary of foreclosure laws of all 50 states, 1992, 185 pp., \$15.95; *Dearborn Financial Publishing Inc.*, 155 N. Wacker Dr., Chicago, IL 60606; 800-252-0866.



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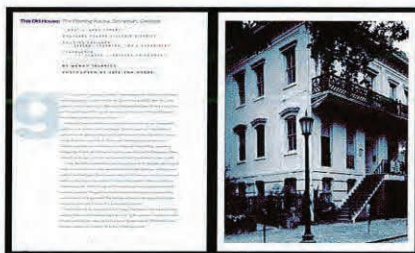
...or at The ASHRAE Show in January, BOOTH #4350

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## Savannah Project pp. 64-65



**Building Designer:** Jeffrey Verheyen, JWV & Associates, Box 30123, Savannah, GA 31410; 912-897-6750.

**Contractor:** J.T. Turner Construction Co., Box 10046, Savannah, GA 31412; 912-356-5611.

## The Making of Brick pp. 66-73



For further information: *Bricks and Brickmaking: A Handbook for Historical Archaeology*, by Karl Gurcke, 1987, 326 pp., \$13.95; *University of Idaho Press*, 16 Brink Hall, Moscow, ID 83844-1107; 800-847-7377. *Masonry: How to Care for Old and Historic Brick and Stone*, by Mark London, 1995, 208 pp., \$12.95, *John Wiley & Sons*, 1 Wiley Dr., Somerset, NJ 08875; 800-225-5945.

Best one-stop source for literature and information on brick, including the specifications for facing, building and paving brick: *Brick Institute of America*, 11490 Commerce Park Dr., Suite 300, Reston, VA 22091; 703-620-0010.

Background information on Savannah Grey: *Georgia Historical Society*, 501 Whitaker St., Savannah, GA 31499; 912-651-2128.

**Our thanks to:** Robert F. Belden, president, and Lauren Gonser, manager of marketing, planning and special products, *The Belden Brick Co.*, Box 20910, Canton, OH 44701; 216-456-0031. Brian Trimble, senior engineer, and J. Gregg Borchelt, director of engineering and research, *Brick Institute of America*. Christopher Phillips, *Eighteenth-Century Fireplaces*, 711 Leaning Oaks Dr., Savannah, GA 31410; 912-897-9667. Kimberly Ball, archivist, *Georgia Historical Society*.

## Trellis & Vine pp. 74-79



**Mail-order nursery sources for vines** (prices given are for catalogs): Heronswood Nursery Ltd., \$4; 7530

288th St. NE, Kingston, WA 98346; 360-297-4172. Wayside Gardens, free; 1 Garden Way, Hodges, SC 29695; 800-845-1124. Carroll Gardens, \$3; Box 310C, Westminster, MD 21158; 800-638-6334.

**For further information:** *Vines: Burpee American*

*Gardening*, by Suzanne F. Bales, 1994, 202 pp., \$9; *Macmillan Publishers*, 201 W. 103 St., Indianapolis, IN 46290; 800-428-5331. *Flowering, Fruiting & Foliage Vines*, by Chuck Crandall and Barbara Crandall, 1995, 144 pp., \$27.95; *Sterling Publishing Co.*, 387 Park Ave. S., New York, NY 10016; 800-848-1186. *Clematis* by Barry Fretwell, 1989, 160 pp., \$24.95; *Capability's Books*, 2379 Hwy. 46, Deer Park, WI 54007; 800-247-8154. *Climbing Vines*, by Mimi Luebberrmann and Faith Echtermeyner, 1995,

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### Trellis & Vine pp. 74-79 continued

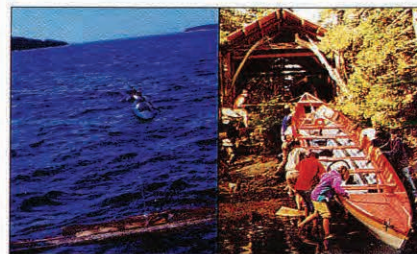
108 pp., \$12.95; *Chronicle Books*, 275 5th St., San Francisco, CA 94103; 800-722-6657. *The Lattice Gardener*, by William C. Mulligan, 1995, 192 pp., \$35; *Macmillan Publishers*, 201 W. 103 St., Indianapolis, IN 46290; 800-428-5331.

### Low Country Air Conditioning pp. 80-83



Our thanks to: Danny Parker, principal research scientist, *Florida Solar Energy Center*, 300 State Rd. 401, Cape Canaveral, FL 32920; 407-638-1000. Bruce Davis, senior project manager, *North Carolina Alternative Energy Center*, Box 12699, Research Triangle Park, NC 27709; 919-361-8000. Proctor Engineering Group, 818 Fifth Ave., Suite 208, San Rafael, CA 94901; 415-455-5700. Ben Gerow and Marjorie Mingeldorf, *St. John's Parish House/Green-Meldrim House*, 1 W. Macon St., Savannah, GA 31401; 912-233-3845.

### Building A Boathouse pp. 84-91



The Apprenticeshop of Rockland, Maine, part of the Atlantic Challenge Foundation, provides two-year apprenticeships and various other programs in wooden boat-building; Box B, Rockland, ME 04841; 207-594-1800.

The Timber Framers Guild of North America, a 750-plus-member nonprofit organization, publishes the quarterly magazine *Timber Framing* and provides company referrals and sponsors educational conferences and workshops in Canada and the U.S.; Box 1075, Bellingham, WA 98227; 360-733-4001.

The Heartwood School, in Washington, MA, teaches various workshops in timber-framing and house-building; Johnson Hill Rd., Washington, MA 01235; 413-623-6677.

Further reading: *The Timber-Frame Home*, by Tedd Benson, 1988, 233 pp., \$24.95; *The Taunton Press*, 63 Main St., Box 5506, Newtown, CT 06470-5506; 800-888-8286. *Build a Classic Timber-Framed House: Planning & Design, Traditional Materials, Affordable Methods*, by Jack Sobon, 1994, 208 pp., \$19.95; *Garden Way Publishers*, Box 445, Pownal, VT 05261; 800-441-5700. *Joiners' Quarterly*, Box 249, Brownfield, ME 04010; 207-935-3720.

Tools: Barr Quarton, custom toolmaker, *Barr Specialty Tools*, Box 4335, McCall, ID 83638; 800-235-4452. Woodcraft Supply Catalog, with special section on affordable timber-framing tools; Box 1686, Parkersburg, WV 26102-1686; 800-535-4482. Hida Tools, Japanese tool supplier, 1333 San Pablo Ave., Berkeley, CA 94702; 510-524-3700.

## Ornamental Plaster pp. 92-99



**Polyurethane mold rubber:** Polygel 40 RTV Brush-On Rubber, 4 lbs. \$25; 16 lbs. \$78; 80 lbs., \$360; *Polytek Development Corp.*, 55 Hilton St., Easton PA 18042; 610-559-8620.

**Molding plaster:** #1 (50 lbs., \$9.50; 100 lbs., \$18); *U.S. Gypsum Co., Industrial Gypsum Division*, 125 S. Franklin St., Chicago, IL 60606; 800-487-4431.

**Mail-order medallions:** Free catalog; *Felber Ornamental Plastering Corp.*, Box 57, 1000 W. Washington St., Norristown, PA 10404; 800-392-6896. Catalog #130, \$4; *The Decorator's Supply Corp.*, 3610 S. Morgan St., Chicago, IL 60609; 312-847-6300.

**Further Reading:** See "Veneer Plaster," by Thomas Baker, in the Sept./Oct. 1995 issue of *This Old House*. Also "Award-Winning Medallions," by David Flaharty, in *Old House Journal*, Sept./Oct. 1995; 2 Main St., Gloucester, MA 01930; 508-283-3200. "Ornamental Plaster Restoration," by David Flaharty, in *Fine Homebuilding*, Dec./Jan. 1990; *The Taunton Press*, 63 Main St., Box 5506, Newtown, CT 06470-5506; 800-888-8286.

**Our thanks to:** Jean-François D. Furieri, owner, *Iconoplast Designs, U.S.A. Inc.*, Box 2463, Savannah, GA 31402; 912-238-0264.

David Jenkins, executive director, *Lucas Theatre*, Box 9437, Savannah, GA 31412; 912-232-1696.

Stephen Bohlin-Davis, curator, *Wayne Gordon House (now site of Juliette Gordon Low Girl Scout Center)*, 142 Bull St., Savannah, GA 31401; 912-233-4501.

## Running Gutters pp. 100-105



**Copper:** \$15-20 per lineal ft. installed; *South Side Roofing & Sheet Metal*, 290 Hanley Industrial Ct., St. Louis, MO 63144; 314-968-4800. **Aluminum:** \$5-9 per lineal ft. installed; *Alcoa Building Products*, Box 3900, Peoria, IL 61612; 800-962-6973. **Galvanized:** \$6-10 per lineal ft. installed; *South Side Roofing & Sheet Metal Co.* **Wood:** \$12-20 per lineal ft. installed; *Blue Ox Millworks*, 1 X St., Eureka, CA 95501-0847; 800-248-4259 or 707-444-3437. Leaf-

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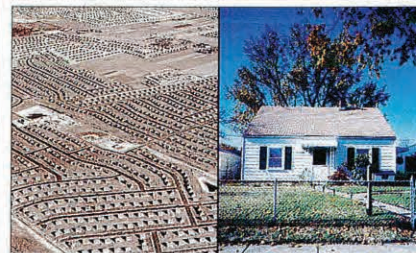
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## Running Gutters pp. 100-105 continued

Guard: \$7 per lineal ft. installed; *Englert Inc.*, 1200 Amboy Ave., Perth Amboy, NJ 08862; 908-826-8614. PVC: Snap-Seal Contemporary, \$3 per 10 ft.; Snap-Seal Traditional, \$5 per 10 ft.; *GSW Thermoplastics Co.*, 1735 Highwood E., Building J, Pontiac, MI 48340; 800-662-4479. Rain handler: 5-ft. with mounting materials, \$21.90; *Savetime Corp.*, 2710 North Ave., Bridgeport, CT 06604;

800-942-3004 or 203-382-2991. Gutter Helmet: \$9 per lineal ft. installed; *American Metal Products, Masco*, 8601 Hacks Cross Rd., Olive Branch, MS 38654; 800-423-4270. Our thanks to: David L. Gunnels, president, *Coastal Roofing*, 88 N. Coastal Hwy., Port Wentworth, GA 31407; 912-966-2524. *Port City Metals*, 7 Hanger Ct., Garden City, GA 31408; 912-966-5777.

## Levittown pp. 106-111



For more information: Levittown Historical Society, Box 57, Levittown, Long Island, NY 11756.

Further reading: *How Buildings Learn*, by Stewart Brand, 1995, pp., \$20; *Penguin USA*, 120 Woodbine St., Bergenfield, NJ 07621; 800-253-2304. *Expanding the American Dream: Building and Rebuilding Levittown*, by Barbara Kelly, 1993, 284 pp., \$21.95; *State University of New York Press*, c/o CUP Services, Box 6525, Ithaca, NY 14851; 800-666-2211. Our thanks to: Lynn Matarrese and Anne Martin, *Levittown Historical Society*. Tom and Louise Kenny of Levittown. Greg, Theresa, Sean and Daniel Faughnan of Levittown. Ken Sparacino, supervisor, *TITLESERV*, 45 Executive Dr., Plainview, NY 11803; 516-349-0600.

## Save This Old House p. 132



Our thanks to: Barbara and Richard Sandburg, board members, *Moline Preservation Society*, Box 9141, Moline, IL 61265. Craig Anderson, community development coordinator, *Moline City Hall*.

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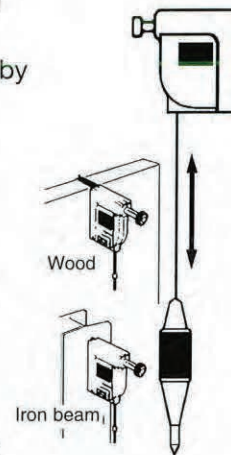
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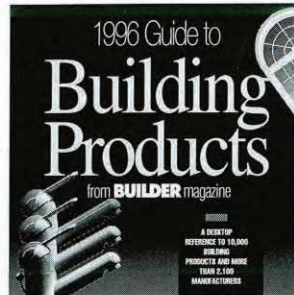
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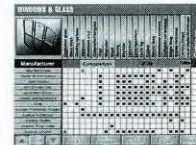
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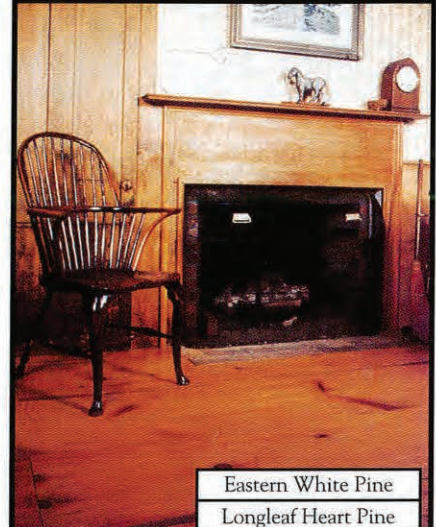


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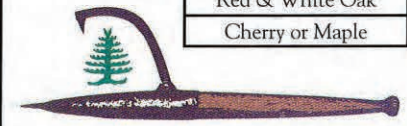
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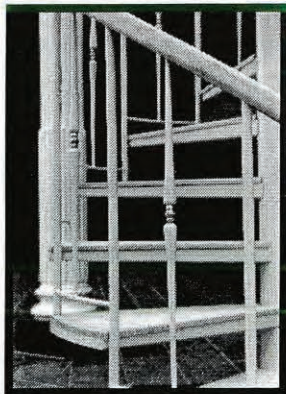
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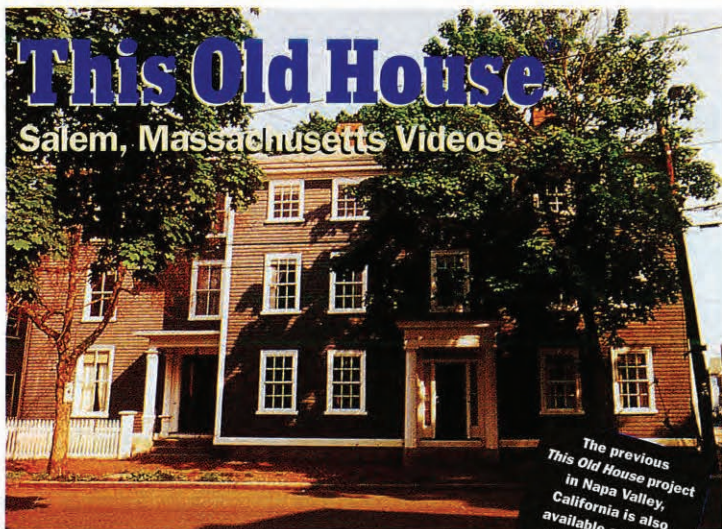
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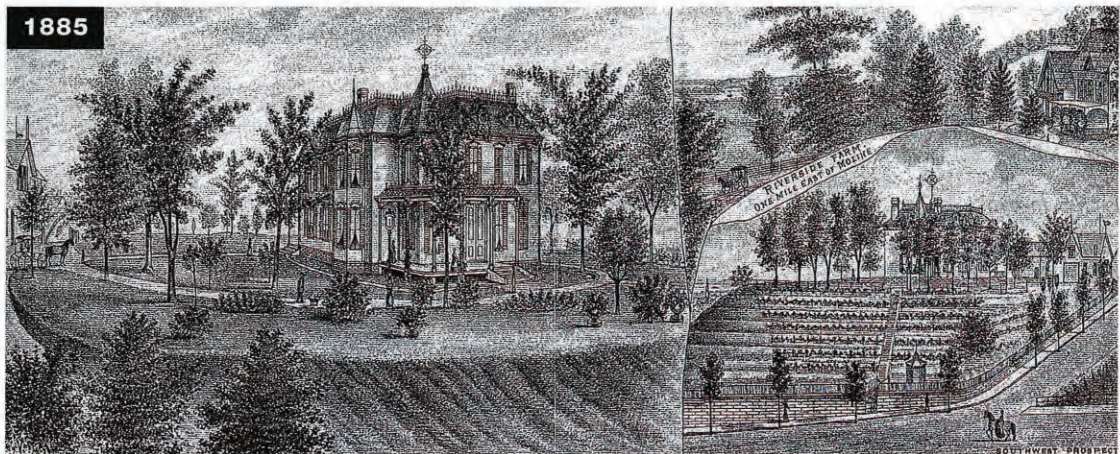
## CONTACT

**Craig Anderson**  
Moline City Hall  
619 16th Street  
Moline, Illinois 61265  
309-797-0491

If you know of a house that should be saved and have evidence of its original condition, please write to us at:  
Save This Old House  
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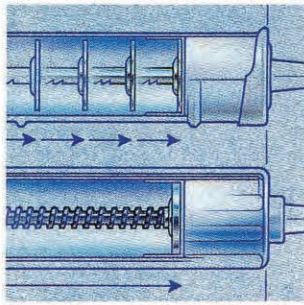
Despite the much-altered exterior, many of the original interior details remain, including intricate parquet floors, a walnut newel post and carved scrollwork over a transom. The illustration below, from an 1885 biographical album of Rock Island County, shows the early grandeur of the Deere estate.





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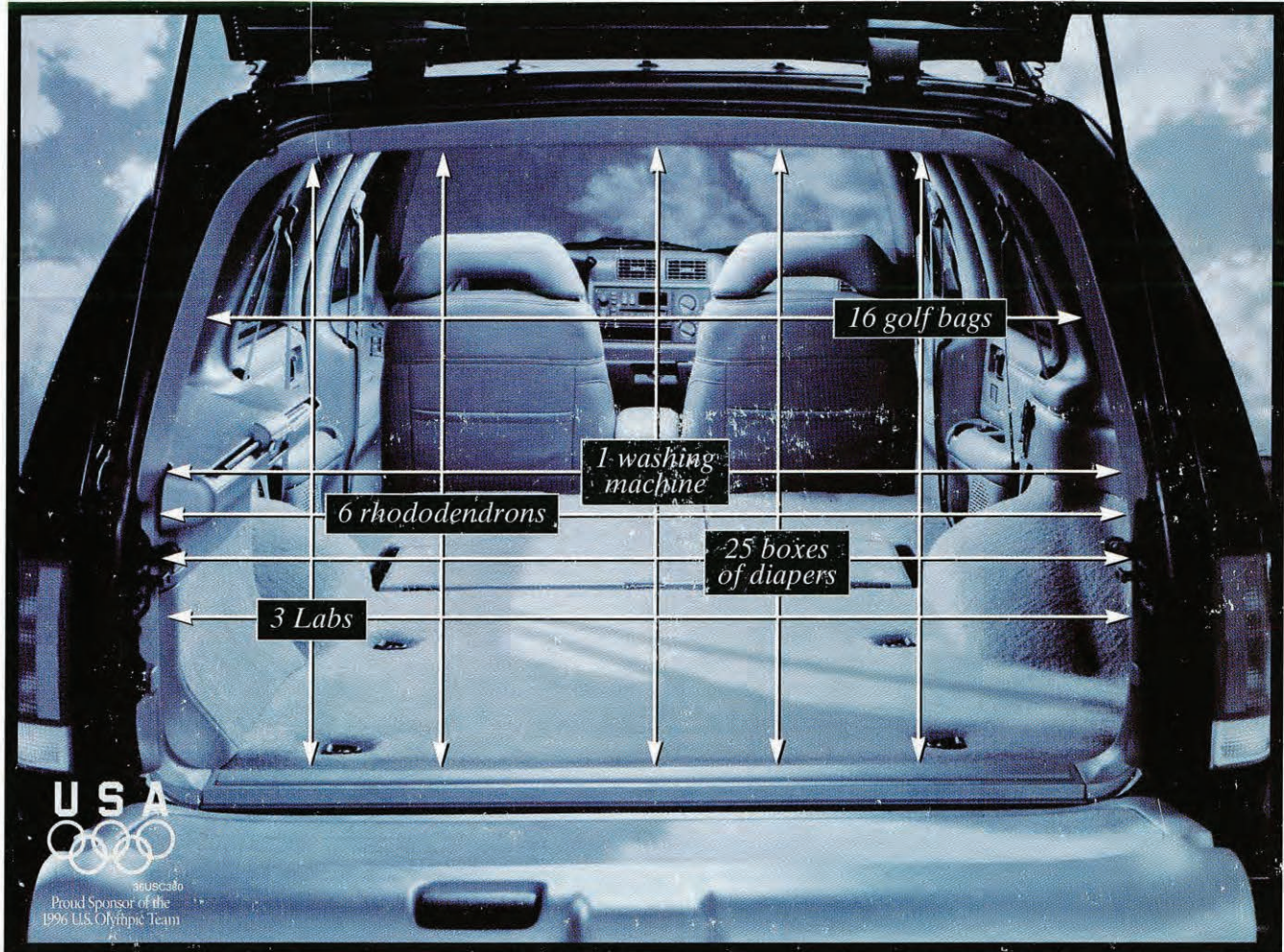
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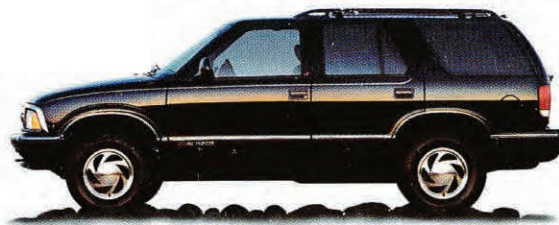
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