JULY/AUGUST 1998

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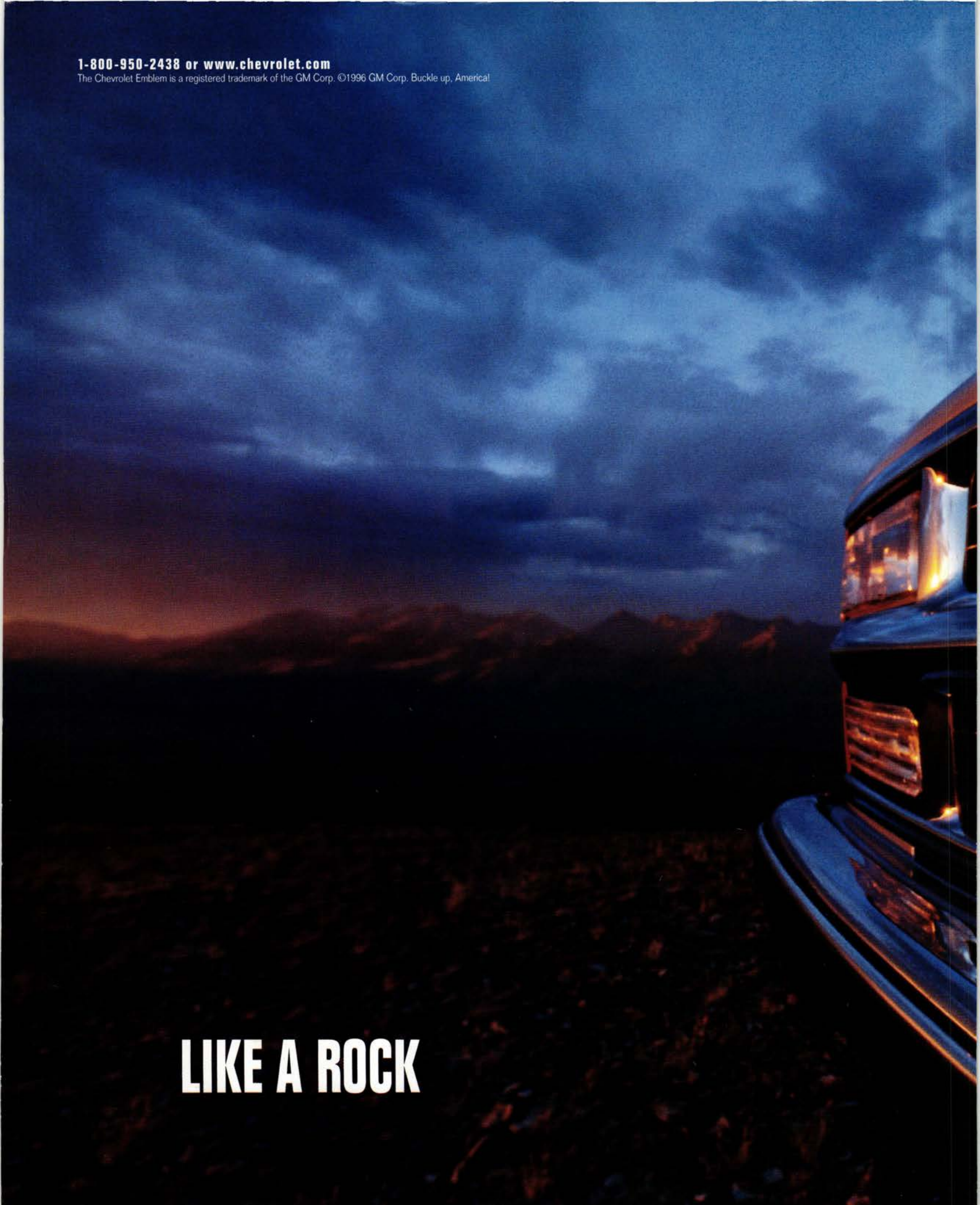
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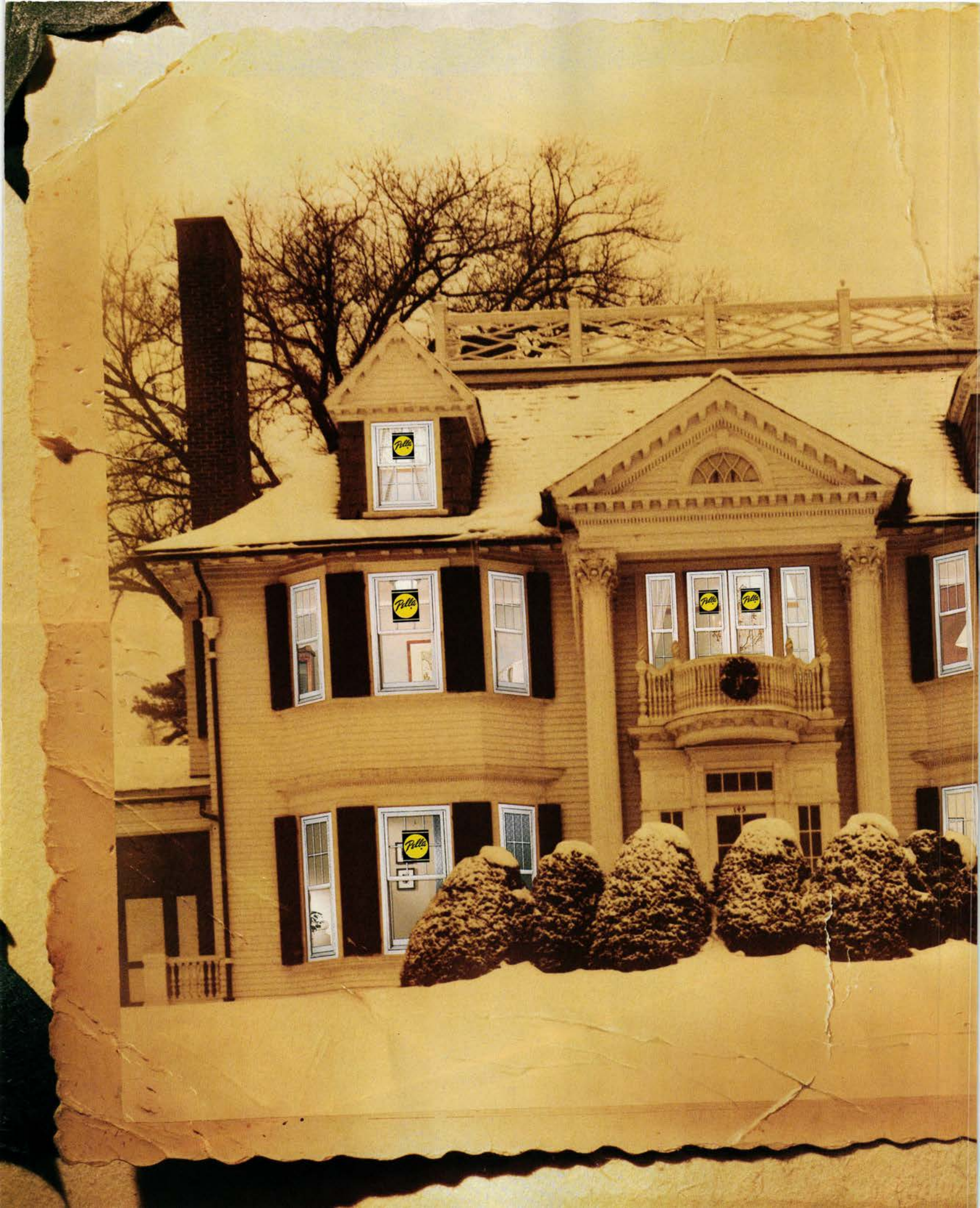
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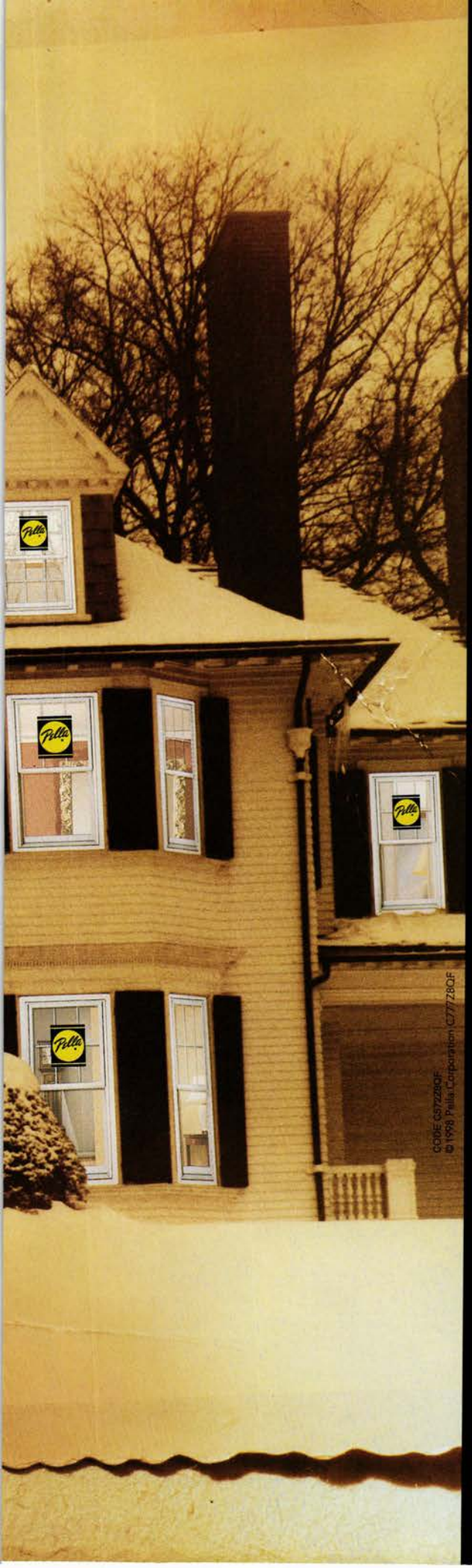

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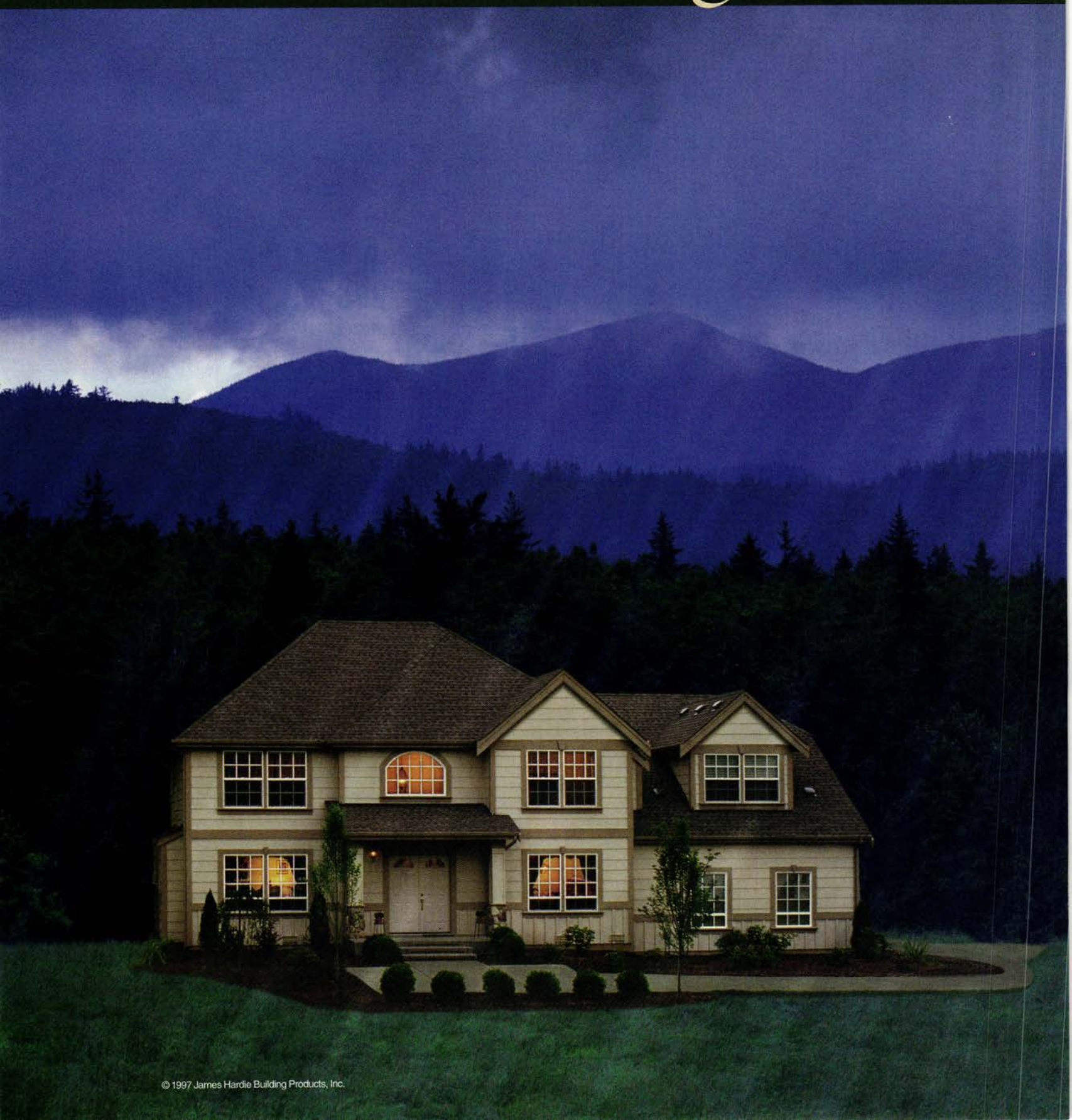

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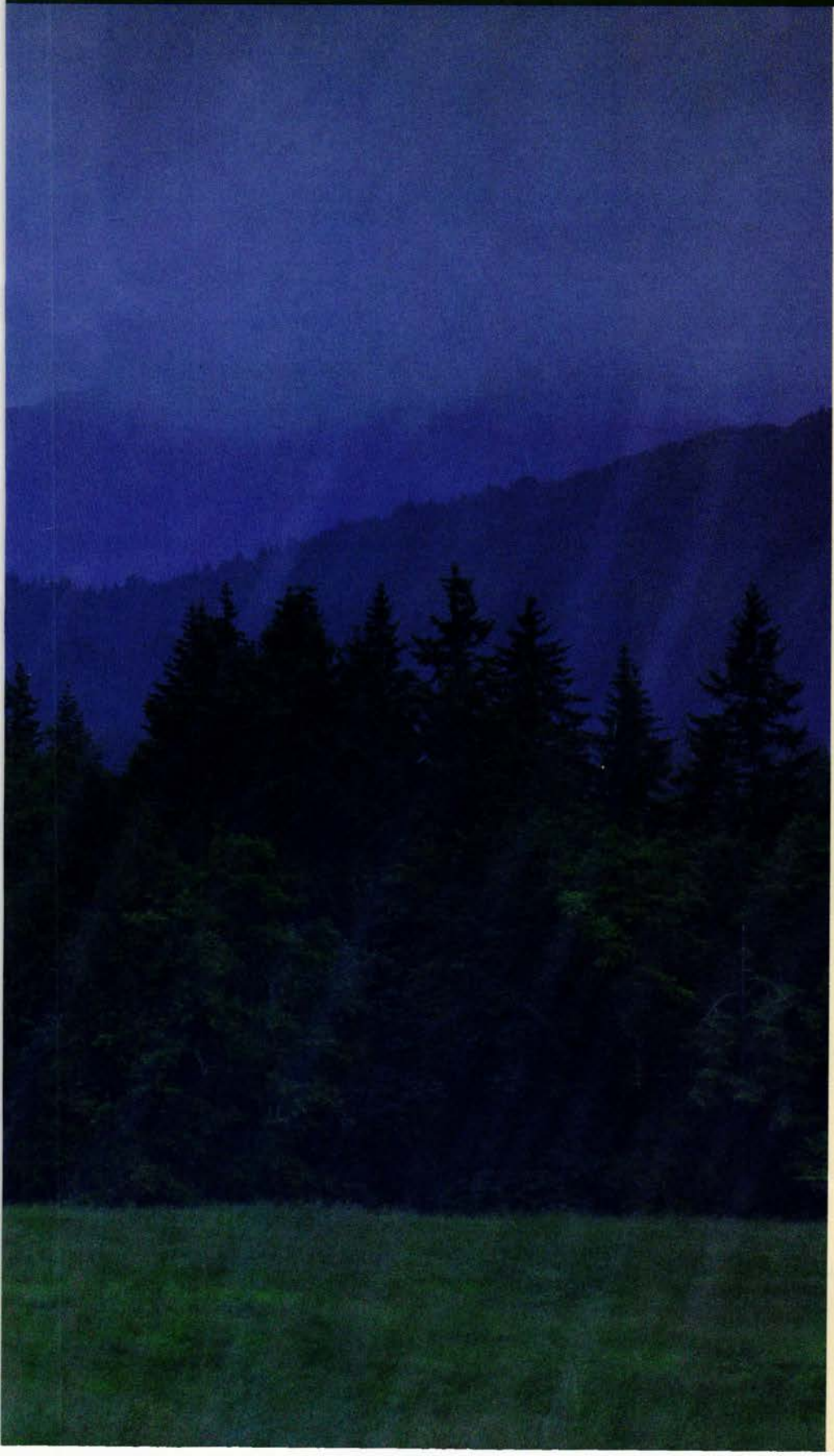

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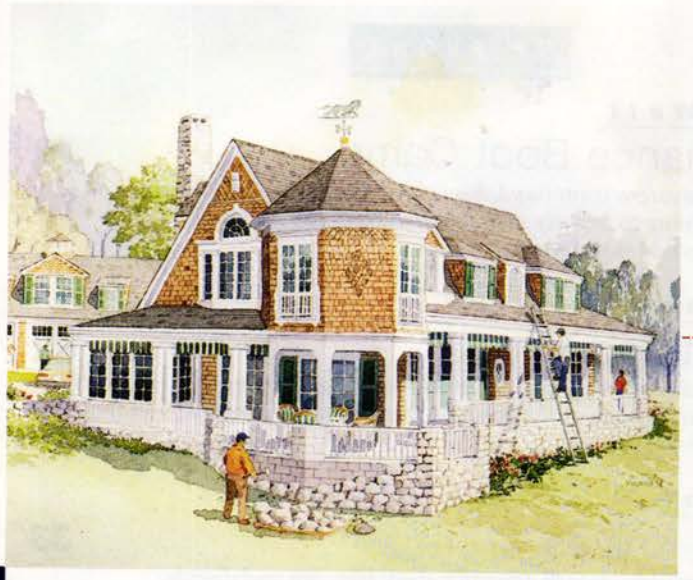

Dream House

This Old House *magazine commissions one of America's greatest house architects, Robert A. M. Stern, to design a house that's old, familiar and warm on the outside but thoroughly modern on the inside.*

BY JENNY ALLEN

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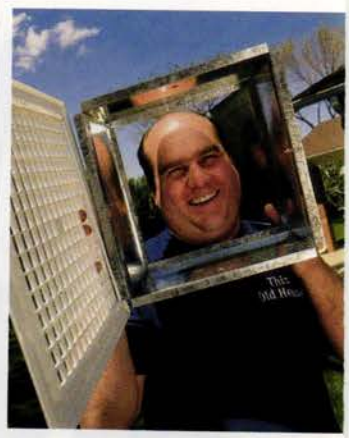
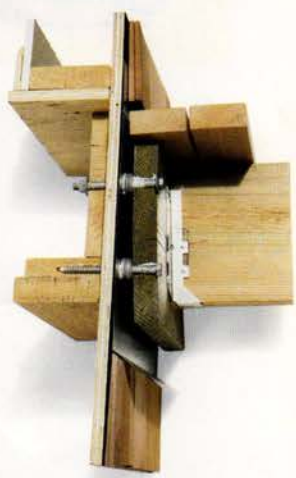
TIE ONE ON, P. 109

FEATURES



CHILL OUT, P. 82



SECURE THAT DECK, P. 102

COVER: MARK DVORAK AND LAURIE ANN BISHOP MOVE INTO THEIR SAN FRANCISCO CHURCH-TURNED-HOUSE. PHOTOGRAPH BY DAVID PETERSON. SEE STORY, P. 86.

(Continued on page 8)

COVER STYLING: MICHI OKIMOTO; ILLUSTRATION: MICHAEL MCCANN. PHOTOGRAPHS, TOP TO BOTTOM: ANTHONY COTSIFAS, ERIC O'CONNELL, MICHAEL GRIMM.

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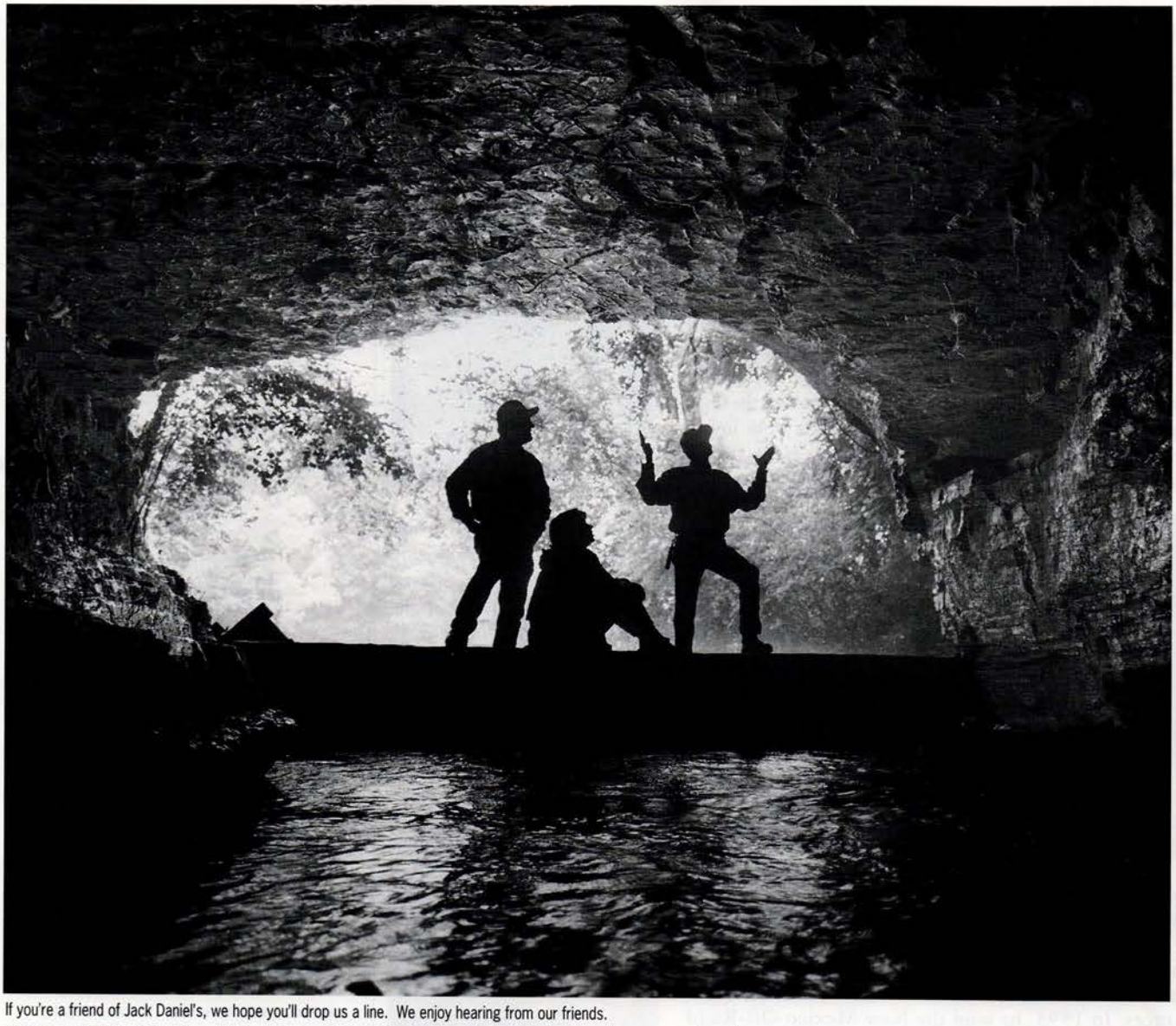
UP FRONT

FROM THE REDWOOD FORESTS, P. 37

PHOTOGRAPHS, FROM TOP: DAVID PRINCE; FOREST HISTORY SOCIETY, DURHAM, NC.

PLUS

FOR MORE INFORMATION ABOUT MANUFACTURERS, MATERIALS, PRODUCTS AND RESOURCES PERTAINING TO ARTICLES, SEE DIRECTORY, P. 117.



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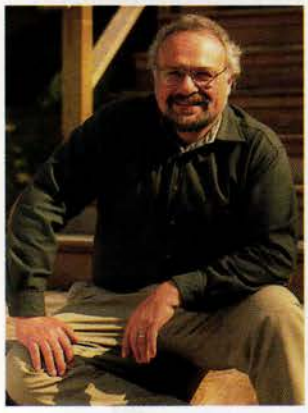
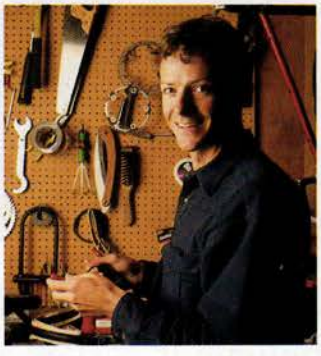
MARY ELLEN MARK's specialty, portraiture, has led her to photograph the poor and homeless of Calcutta as well as the rich and famous of Beverly Hills. Her photographs are appearing in the traveling exhibit "India: A Celebration of Independence." (See Directory for dates and locations.) She also collaborated on the Academy Award-nominated 1984 documentary *Streetwise*. For the American Craftsman feature (page 68), Mark examined blacksmith Charlie Keller's character, partly by looking at his hands. "They were very strong," she says. "By the end of the day, they were black. You could see the soot in the lines of his palms." Readers can find more of Mark's work in her 10 books; the most recent of them is *A Cry for Help: Stories of Homelessness and Hope* (Simon & Schuster, 1996).



"I've got branches lying where they fell five years ago," says **WILLIAM SCHELLER,** who wrote "Mulch Makers" (page 94). "Now I know how to get rid of them." Scheller tested seven chipper-shredders on his 34-acre property in Waterville, Vermont, and believes that any of them could easily substitute for a human groundskeeper. Scheller has spent his career writing about nature and travel. With his wife, Kay, he wrote the New England volume of *National Geographic's Driving Guides to America* (1997), and he has contributed to *Islands, National Geographic Traveler, Yankee* and the *Washington Post Magazine*.



ERIC O'CONNELL, who photographed "Big Chiller" (page 82), grew up in arid Albuquerque, New Mexico, where swamp coolers—not traditional air conditioners—are the favored method of fighting heat. "They're efficient and cost practically nothing to run," O'Connell says. "Just some water and a little electricity." Also a connoisseur of fresh air, O'Connell likes to enter mountain-bike races. In 1995, he won the New Mexico Off-Road Series. His photographs have appeared in *Outside, Prevention* and *Family Life*.

Interviewing architect Robert A.M. Stern for her stories about *T.O.H.* magazine's new dream house, under construction in Wilton, Connecticut (starting on page 74), **JENNY ALLEN** discovered that Stern's priorities extend beyond simply building design. "He cared about the framework of the neighborhood," she says. "He's spearheading the movement away from malls and superstores and back to little downtowns." A resident of Manhattan, Allen spends summers at a shingled cottage on Martha's Vineyard, Massachusetts, with her husband, cartoonist Jules Feiffer, and their two children.

HELP

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PHOTOGRAPHS, TOP TO BOTTOM: GRANT DELIN, MATTHEW BENSON, ERIC O'CONNELL, DIANA HAAS.

MANUFACTURERS · MATERIALS · PRODUCTS · RESOURCES – PAGE 117

Imagine yourself in a Mercury

There's a fine line between being pampered and being pretentious. Fortunately, the 1998 Mercury Grand Marquis Limited knows the difference. That's quite evident in distinctive touches like its exclusive Greystone leather-trimmed interior–in addition to gold accents on the wheels, grille and decklid, and elegant gold stitching on the seats and floor mats. Turn Mercury into gold. Call 1 800 446-8888 or visit wwwmercuryvehiclescom.

respirators

Working on an old house can stir up mildew spores, create clouds of drywall dust and fill rooms with paint vapors. Outside, even environmentally correct pesticides such as diatomaceous earth can cause health problems if inhaled. Using a respirator is wise. In the three years since *This Old House* magazine reported on breathing gear, manufacturers have been preparing to meet new standards from the National Institute of Occupational Safety and Health for respirators with filters that trap tiny particles. The federal agency has not changed its standards for the other type of home-use respirator—masks with specialized cartridges that absorb toxic gases.

Under the new rules, particulate respirators made after July 10 of this year must be classified into one of three categories, depending on whether the filter would be ruined by oily droplets. The three categories are N, for filters not resistant to oil; R, for oil-resistant filters good for only one work shift; and P, for "oil-proof" filters, which have a longer service life. Each of these categories also has three efficiency levels.

Unfortunately, the letter categories do little to help casual users who go to a home center and try to figure out which mask they need. Our experience while shopping for products to use in our own houses indicates that the selection of masks and advice about how to use them have not improved. Recently, when we asked at one store for a respirator to wear while using muriatic acid—a masonry cleaner that releases acidic gas—the clerk pointed us to dust masks (useless, since they only remove particles), then to masks with organic-vapor cartridges (also useless). When we asked for something to protect against an acidic gas, the clerk responded: "What's wrong, you don't like the style?"

Buying a dust mask? Look for the NIOSH label and two rubber bands.

Ron King, regulatory affairs manager at 3M, a major manufacturer, suggests this decision tree: First, determine whether the hazard is tiny particles in the air (dusts) or toxic vapors (gases). For all dusts—lead paint, fiberglass, dry fertilizer—get a particulate respirator. Options include rubberized masks that cover part of the face and paperlike disposables with two elastic bands and the words "NIOSH-approved respirator" on the label. The rubber type seals better but may be harder to find. Labels such as "latex paint respirator" or "drywall dust respirator" are marketing terms; the masks are interchangeable. Avoid disposables labeled "comfort mask" or "for nuisance dusts." These masks, usually with a single elastic band, don't seal well against the face. "We've tested some that are only 5 percent efficient," says Bill Hoffman, a supervisory scientist in NIOSH's respirator program.

For vapors, the gear must suit precisely. Usually, this means buying a rubber mask with interchangeable cartridges capable of deactivating organic vapors, acidic gases, formaldehyde, ammonia or other hazardous materials. To ensure the right match, Hoffman suggests looking at whatever cartridge-type respirators the store sells and calling the manufacturer's technical-advice number, which NIOSH requires on all approved respirators. "We've tried those numbers, and the people give the right answer," Hoffman says.

King says most home owners don't realize that no respirator filters out methylene chloride, common in paint strippers, or isocyanates, found in some spray paints. For these, the only protection is a respirator that pipes in fresh air, available at some rental-equipment companies. One other warning: Guys with beards gain little by wearing respirators that cover only part of their face. "They need one with a helmet or a hood," King says.

—Jeanne Huber

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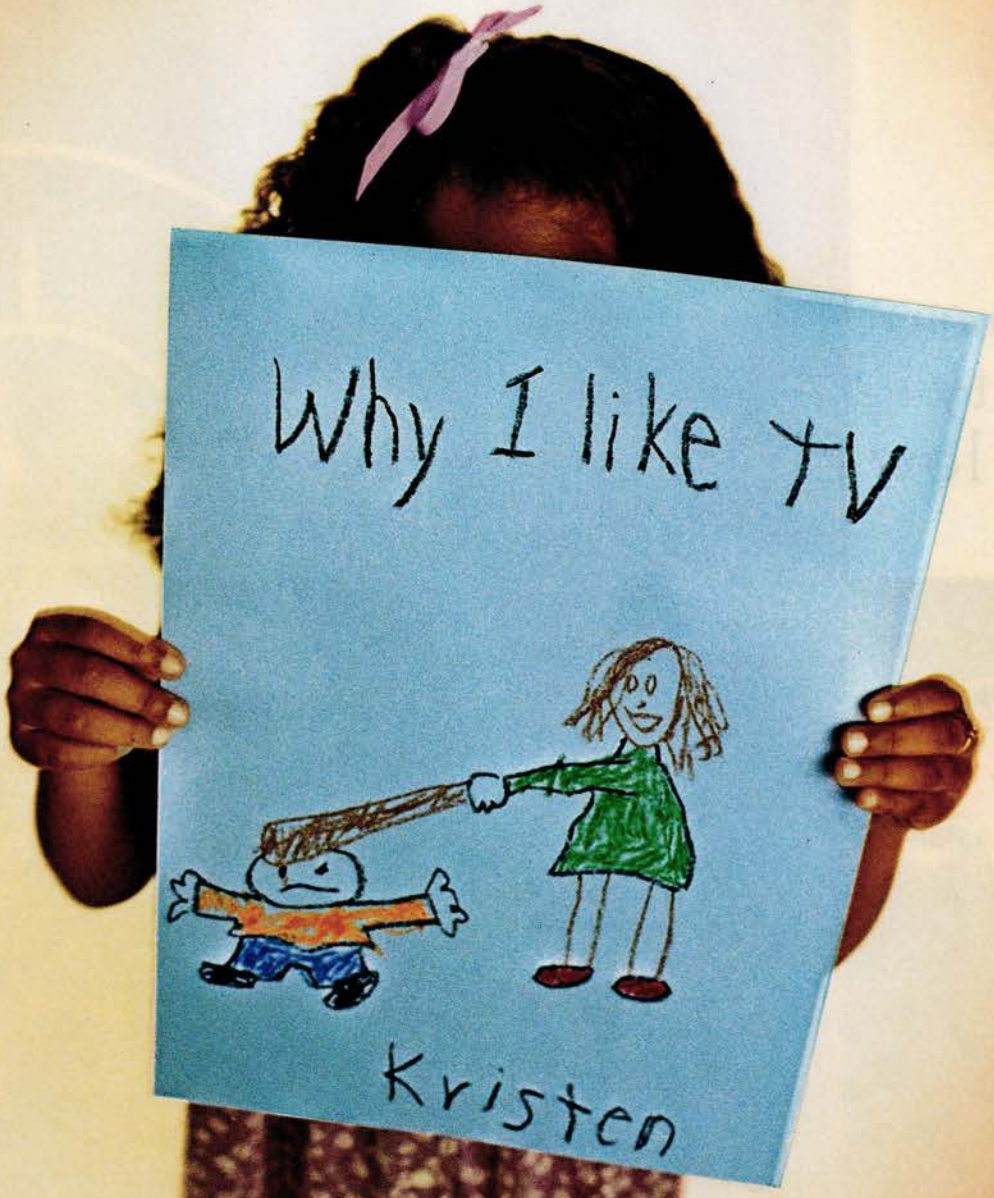

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WEATHER SHIELD

Of Noble Earth

Thank you for the environmentally conscious article "The Best Lawn" in the May 1998 issue. It is refreshing to see that your magazine's modern technological tips and old-fashioned craftsmanship are mixed with sensible guidelines that can protect our own health and that of our planet. In the long run, it will be much easier for folks to maintain naturally self-sustaining living soil than to thoughtlessly administer toxic substances. I am a professional home restorer and am new at this eco-stuff. I'm looking to your magazine to be a source of information on how I might educate myself about the little things I can do to bring the concept of sustainability into my work and personal life.

WILLIAM SHANNON, *Chapel Hill, N.C.*

Too Extravagant?

I have been a viewer of *This Old House* for many years and have restored six old houses in the last 25 years. The vast majority of the episodes show houses and refurbishing that cost far beyond the reach of the average American pocketbook. Most episodes look more like *Lifestyles of the Rich and Famous* than like a guide to restoring an old house. The May 1998 issue of *T.O.H.* shows million-dollar entertainment centers ["Media Blitz"] and a $30,000 basement garage ["Park Place"]! Please show average do-it-yourselfers how they really can make a silk purse out of a sow's ear and at a cost less than that of a contracted-out job.

D.A. KIDDER, *Battle Creek, Mich.*

This Old House television undertakes large-scale projects to avoid hopping from site to site for smaller jobs; this would needlessly inflate WGBH-TV's production costs. "Think of each project as a smorgasbord," says *T.O.H.* producer Bruce Irving. "We're not telling you to eat the whole thing. Just take away what you want." The show purposely seeks out the highest quality craftsmanship and building materials, which—in the long run—save the home owner money, according to executive producer Russ Morash. With this attitude in mind, we portrayed the ultimate media room—although it cost nowhere near $1 million—and offered advice to help home owners scale down the system to fit their own budgets. ("Media Blitz" writer Curtis Rist will offer additional free advice to readers on this subject; send E-mail to crist@toh.timeinc.com.) And although $30,000 may sound like a lot of money to park your car in San Francisco, that parking place added $100,000 of value to the house. The cost of building a new attached garage in that city could have been as much as $60,000. The remodeling budget for *T.O.H.* project houses usually falls into the $150,000 to $350,000 area; the San Francisco house came in at the high end of that range. Morash also points out that consumers who have not recently taken on a do-it-yourself project might be surprised to learn how materials prices have risen—just as he was the other day when he went to a paint store: "Two gallons for $55, ouch."

Belted In

I enjoy your articles on tools and construction equipment and look forward to reading the magazine as soon as it arrives. I was wondering: Why does Tom Silva carry two tape measures on his person?

ART RODRIGUEZ, *Lakewood, Calif.*

T.O.H. contractor Tom Silva says he wears one tape measure on his tool belt and one on his regular belt because he is always measuring up jobs but not always wearing his tool belt.

Tree Tragedy

I enjoyed Sebastian Junger's piece on tree removal ["Out on a Limb," March/April 1998]. Drop-it-yourselfers would be wise to heed his advice on protective gear and keeping one's head up. We just buried an experienced 45-year-old logger who died in his son's arms after being hammered by a falling limb. They don't call dead branches "widow makers" for nothing.

JIM GERMOND, *Sudbury, Vt.*

Maloof: Memories and More

To my delight, I discovered the moving article about Sam Maloof ["Woodworker"] in my March/April 1998 copy of *This Old House*. In the late 1950s and early 1960s, when I served as chair of the interior design committee of a church in Westchester, California, a local artist referred me to Sam. At our request, Sam worked, for his first time, in cherrywood. He designed the pews to match his startlingly beautiful chancel chairs and imposing pulpit. It was probably the most inspiring and satisfying creative experience I have ever known. I am pleased that Sam and Alfreda are still (if only briefly) on their lovely little estate.

MARGARET MILLIGAN, *Davis, Calif.*

You mentioned Sam Maloof's love of growing different types of trees. I also do fine woodworking and acquire most of my lumber from trees destined for firewood, like the live oak my kids used to play in that came down in a snowstorm or the walnut tree that was cleared to make room for a parking lot. So what happened to the trees that Sam grew at his old place? Lumber with a story makes furniture much more interesting.

BRIAN SIMKINS, *Somerset, Calif.*

Although Sam Maloof will have to transport his house in several pieces to its new location, his prized giant avocado, sycamore and deodar trees will remain intact on the site, spared from the encroaching highway; Maloof will leave them there for the aesthetic value they lend to his beloved property. But he will harvest the wood from his old lemon trees—which construction workers will fell—for his workshop.

Trim Is No Whim

My spouse and I decided to fix up a neglected space in our house. When I told the contractor how we wanted the windows trimmed—picture-framed with 1x4 board, no colonial or clamshell molding—he understood but thought it would look too plain. About one month after the job was complete, I saw the cover of *T.O.H.* featuring Norm's workshop [November/December 1997]. Let me just say Norm has great taste in trim and

MANUFACTURERS · MATERIALS · PRODUCTS · RESOURCES – PAGE 117

is in touch with the cutting edge in classy classical home design.

BARBARA BELL AUSTIN, *Upper Saddle River, N.J.*

Piece Pipe

In the January/February 1998 issue, page 88 ["Yankee Ingenuity"] shows a 1¼-inch cross-linked polyethylene pipe encased in an insulating jacket for an underground hot-water system. Where is this insulated system on the market, and is it a do-it-yourself project? I like the contents of this issue and got pointers for our next home, which we hope to build this year.

ROBERT D.A. TURNER, *Langley, Wash.*

The insulated polyethylene pipe was also featured in *This Old House*'s spring 1998 special, newsstand-only issue on the dream house in Milton, Massachusetts. "Laying the pipe isn't really hard," says *T.O.H.* plumbing and heating contractor Richard Trethewey, "but making a watertight connection that will last a lifetime is a job for a professional." (See Directory for product information.)

Paint-on Protection

My wife and I are having a new home built. In the process of selecting a contractor, we toured several construction sites and noticed that all the bathtubs were unprotected—with various amounts of construction debris in them. The contractors said it was a problem, but they did not know of any protective covering other than a heavy cloth [which can trap hidden dirt and cause abrasion]. Do you know of any product on the market that we can pass along to our builder? After paying a lot of money for a cast-iron tub, we don't want it scratched or chipped.

ARTHUR NELSEN, *East Northport, N.Y.*

Before installing a claw-footed or other free-standing tub, it's customary to finish the rest of the bathroom completely. For built-ins, conscientious contractors tape a mover's blanket or heavy cloth over the tub to prevent scratches. Alternately, you might try a new, paint-on coating that can be peeled off when construction ends. The manufacturer claims that the coating guards against minor damage from debris, is easy to use and peels off completely. (See Directory for product information.)

Checking It Thrice

I have worked in electrical power stations for 42 years and have checked many circuits in order to provide a safe working condition for crews. I would like to point out a safety hazard that I see in demonstrations on many home-improvement shows. When making a check for power on a normally energized circuit, you should first check the tester on a circuit you know to be hot, second check the one to be worked on, and finally double-check the tester on the first circuit to be sure it is still working. Also, always know the voltage-level rating of the tester.

JOSEPH DA MOUR, *Dearborn Heights, Mich.*

From Plastic Trees

Do you know of a source for plastic 2x4s, 1x4s or porch spindles?

DICK HECKMAN, *Maumee, Ohio*

In "Treated Wood" in our May/June 1995 issue, we showed a weatherproof boardwalk

made with both fiberglass-reinforced plastic "lumber" and plastic-wood composite decking. You can purchase decorative polyurethane spindles or polyurethane balusters and pickets from a number of manufacturers. (See this issue's Directory for information on all these products.)

Hide Your Hinges

Your magazine and TV program have brought great pleasure to me. Even though I do not reside in an old house, I benefit from the information regarding new products, new methods of construction and the expertise of the craftsmen. In reference to the work done on the old church in San Francisco, I question the advisability of placing the hinges of outside (exterior) doors on the exterior of the house. The beautiful lockset that was installed on the church house's door (a double door) would not prove to be much of an obstacle to an intruder. I like the idea of double doors that open out rather than into the house, but surely there must be a better way to hide the hinges.

RUTH ARUTA, *Hamden, N.Y.*

Master carpenter Norm Abram replies: The general consensus at *This Old House* is that out-swing doors are usually not the best choice for a residential building, primarily because of their tendency to deteriorate quickly with excessive weather wear. As for safety, however, a properly fitted door with out-swing hinges can be very heavy for a would-be burglar to tamper with. For even greater security, there are hinges that are designed specifically for out-swing doors and have hinge pins that are virtually impossible to remove. The out-swing doors on the San Francisco house were maintained with tightly capped hinges to ensure security. They also work well for their original purpose: to give large groups of people an extra-broad exit in the case of an emergency.

Climb a Board

Your March/April 1998 article on pressure-treated wood ["Arsenic and Old Wood"] was timely. My husband and I wanted to build a wooden climber for our 3-year-old son but were not convinced that the standard arsenic-treated woods were safe. On the other hand, we weren't sure we wanted to make an investment in redwood or cedar. We contacted several suppliers listed in the *This Old House* article and found a source of safe treated lumber in Escanaba, Michigan. The lumber was delivered to our house last week.

SUSAN SANDELL, *Haslett, Mich.*

Address letters to Letters, *This Old House* magazine, 1185 Avenue of the Americas, New York, NY 10036. Please include your full name, address and daytime phone number. Published letters will be edited for clarity and length and may be used in other media.

punch list

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

March/April 1998

- "Pilgrims' Progress" (Extras, page 29) incorrectly states that there are no 17th-century houses in Plymouth, Massachusetts. The story should read: "Not a single Plymouth house survives from the 1620s."

May 1998

- The "Bold Basins" Directory listing (page 178) gives an incorrect phone number for the National Kitchen and Bath Association. The correct number is 800-843-6522.
- In "Media Blitz" on page 58, the labels are reversed on the RG6-quad coaxial cable and the fiber-optic cable.

Would you rather decorate your room with a chair that works on your back for a few minutes?

Or the mattress that works on your back all night long.

Compared to what a massage chair can do for your back, a Sealy Posturepedic® Sleep System is indeed a decorator's dream. Its patented coils in the mattress and patented steel beams in the foundation are designed to work together and give your back the correct support it needs. All night. Every night.

And knowing that, why would you treat your back to anything less?

Posturepedic Support. Only from Sealy.®

OFF THE WALL

BY JEANNE MARIE LASKAS

APPLIANCE BOOT CAMP

"Yes, we have nasty lint buildup, *sir!*"

A poster on a wall inside a place known as Sears Boot Camp reads, "Somewhere in America someone is counting on you today." I think: That is so true. Because I am an American. I am an American with an appliance headache. I am also a mere civilian, but I've been invited to spend the day here at Sears Boot Camp, a training ground outside Chicago for troops dedicated to keeping America's appliances running.

Duff Maynard, manager of the place, is touring me around. He has short hair like a drill sergeant, but the smile of a man schooled in customer satisfaction. He tells me that every second of every workday, two home appliances are repaired by one of the more than 14,000 Sears technicians trained right here. They fix all 98 major brands of appliances on the market, not just the kind you buy at Sears. The techs get blue shirts and goggles and must pass test No. 221 (mechanical) or No. 225 (electronics) before signing up for courses such as Water Pumps 4230. Appliance Electrical Diagnosis 9213 is particularly challenging, while Treadmills 0601, they say, is cake.

"Every day you show America they can trust in you," reads a poster behind Duff's head. He says, "Let's go!" and leads me down a long corridor, then clicks on a light. Suddenly we're surrounded by washers and dryers and ovens, stacked four shelves high. Strewn about are refrigerators sawed in half, dishwashers with see-through doors and cross sections of motors. Some date back 20 years. I sense that Duff would like to pull down a space heater and start tearing it apart.

ILLUSTRATION BY PETER HOEY

He looks so happy. I feel pretty great myself.

But then we come to Room 11. Duff introduces me to Dale, the refrigeration instructor. "Ever clean out the space underneath your refrigerator?" Dale asks, handing me a long, skinny brush. I feel an urgent need to lie.

Instead, I say, "Um."

He smiles. "Nobody does. It's the whole problem. You wanna see what kind of gunk gets collected in that compressor?"

"Um," I say.

He tells me to clean under my refrigerator at least once a month. I feel as if I'm at the dentist and this is the flossing lecture.

"Okay, sure, I promise," I say. I don't have the heart to tell him that three dogs and two cats live in my house, so the space beneath my refrigerator is probably scary enough to get me court-martialed. Besides, it's my belief that the gunk under there may be the only thing keeping that baby standing.

Eyeing me, he tries another tactic. "Do you have a vacuum cleaner attachment that would reach under your refrigerator?"

"My vacuum cleaner?" I weigh the merits of confessing that my vacuum cleaner has no surviving attachments, not since the teething of my puppy. I was able to revive my vacuum-cleaner hose, on the other hand, with some fancy duct-tape work. The tape wasn't as effective on my ice maker, however, which is quite a drooler. My dishwasher also leaks, but only during the rinse cycle—when it makes that squealing sound. Which you can't even hear in the summer because my air conditioner's rattling drowns out everything. Which would be worth putting up with if it actually cooled the room enough so the dryer would work, which it doesn't, which is a mystery to me. My dryer works only in the winter months. That's why I have a clothesline out back.

My head begins pounding from all these images of all my needy appliances. I feel shame. We march to the laundry room. Duff introduces me to Sally, the washer and dryer teacher, who has a very impressive manicure for a washer-and-dryer teacher. She tells me dryers are the number one appliance for which technicians get called today. "It's mostly belts," she says, handing me one. "Want to know how to put one on?"

Before I can answer, I have my cheek to the concrete floor and am watching Sally operate on the guts of a dryer. We're like two buddies in a foxhole. A certain trust builds between us. I tell her about my dryer.

Sally sits up, perplexed. I tell her yes, it spins the clothes around, but no, it doesn't dry them. Not in the summer. Yet it works perfectly fine in the cooler months. She asks me if she can ask a personal question. "Do you clean out your lint screen? Because, you know, a dryer has to breathe."

"I swear to God I do," I say.

She looks down and thinks. "Class!" she says, calling over a dozen goggled recruits. "I have a problem for you." They fire one dryer question after another at me. They scratch their heads, run their palms over their lips, look down. She says what about bushes? Are there bushes that bloom in the summer, the foliage blocking the dryer vent? "Brilliant!" says Joel, the heating-and-air-conditioning teacher, who has theories of his own.

But there are no bushes blocking my vent. My dryer has stumped the techs. Sally asks if I will please go home, remove the lower panel from my dryer and fax her a copy of the wiring diagram printed there.

Me? A mere civilian? Can I be called into active duty just like that? I throw my chin back and straighten my shoulders. "It's up to me," I think. I tell Sally that I will accept the mission on behalf of fluffy towels, which you can't get with a clothesline.

When I get home, I pry off the panel and blow on it, but the dust doesn't budge. I get a rag and rub. I'm about to call in the steel wool when the wiring diagram, like an ancient map, reveals itself from beneath decades of gook. I trace it this way and that with my finger, right up to a big, fat rust spot where the diagram trails off to nothing.

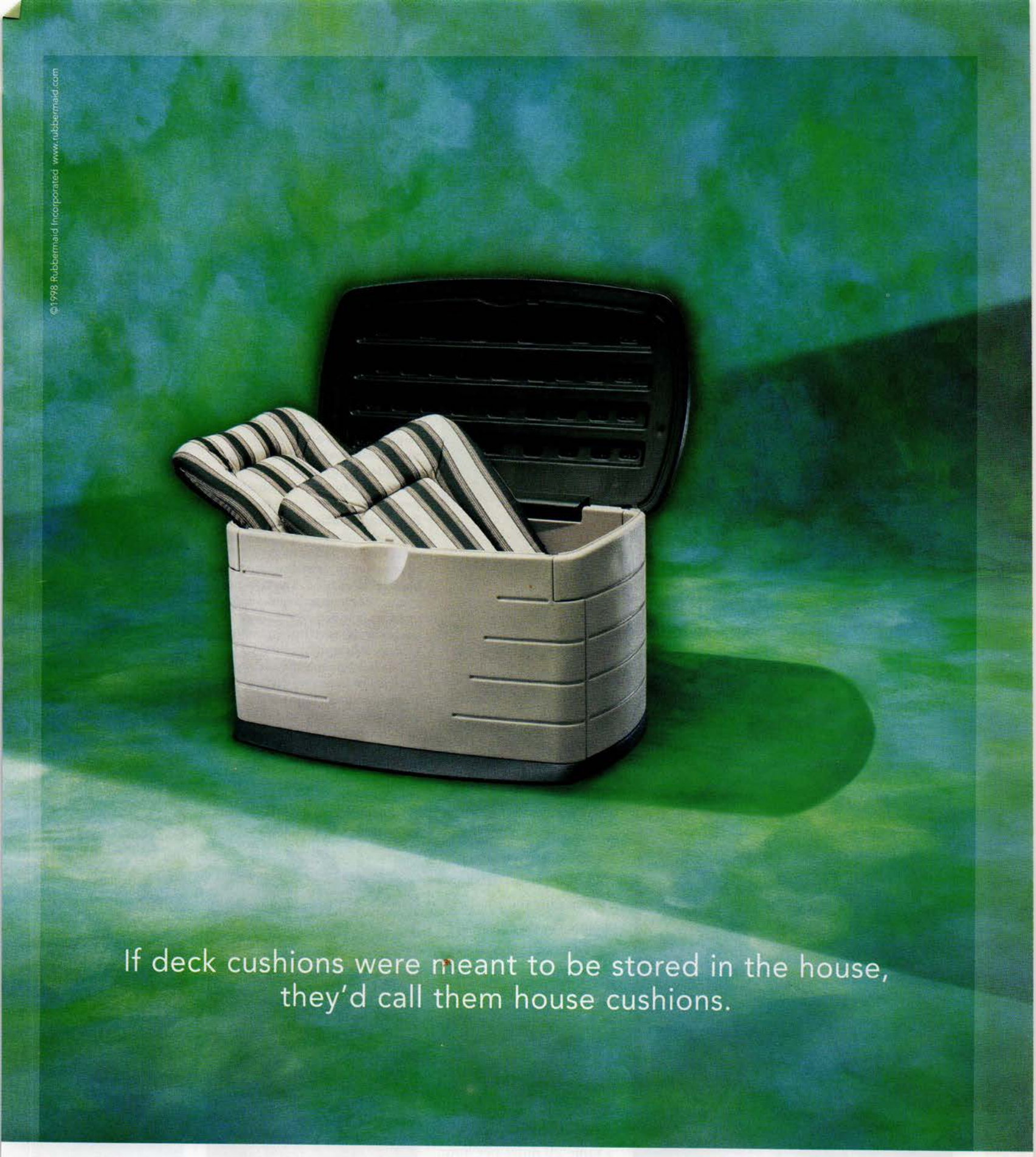
I hang my head. I think about Sally, Duff, Dale and all those commandos-in-training with their goggles of hope. Then I think: Wait a second. How, exactly, did I describe the symptoms of my sick dryer? I told them the dryer spins but doesn't heat up in the summer. But is that correct?

I stand up, push the "On" button. The drum does not, in fact, move.

I can hear Sally saying: "Well, I could understand it if the drum didn't move. That would just be your thermostat."

I can hear me saying, "Oh, but the drum moves fine." Whoops.

I think about all those people in their blue shirts scratching their heads, running their palms over their lips. I think about going AWOL. ■



If deck cushions were meant to be stored in the house,
they'd call them house cushions.

Our easy-to-assemble deck box is specifically sized for lounge chair cushions. But use it for charcoal, citronella candles or anything else you don't feel like lugging inside.

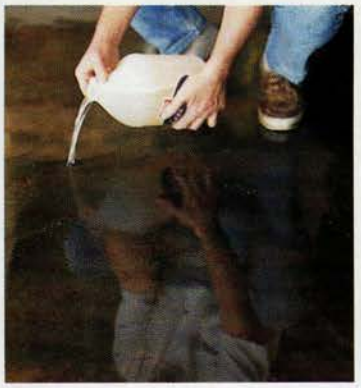
Rubbermaid®

J/A 98 (extras)

Slim down, you move too fast

Almost everyone appreciates the quintessential neighborhood lane—tree-lined and meandering, with cars cruising by at a civil pace. Here's another point in favor of narrow streets: They're safer. A study conducted for the city of Longmont, Colorado, found a correlation between approximately 20,000 accidents and the widths of the streets where they occurred. A 50-foot-wide boulevard, for example, proved 10 times more accident-prone than a 24-foot side street perhaps, says researcher Peter Swift, because straight, broad avenues inspire many drivers to floor it. Making wide streets narrower is easy: "We can push curb lines deeper into the roadway, change parallel parking to nose-in parking and even put in rotary islands at intersections." New roads, of course, can start out slimmer, and that's just what's happening in some developments around the country. Seeking to throttle back residential-zone traffic to a tame 20 miles per hour, developers are making streets 24 to 30 feet wide.

The narrower the street, the safer it is, because car drivers are less likely to put the pedal to the metal.



Garage De-Gooper

Cleaning an old concrete garage floor—impregnated with oil, grease, gasoline gum and other products of a petroleum-based economy—is no job for a perfectionist. Short of excavating and re-pouring, the only way to restore such a floor to pristine condition is to use a high-pressure water sprayer, which unfortunately tends to erode surfaces. But a car-detailing supply company offers a cleaner that does the job better than any degreaser, industrial product or bleach we've tried. The two-part system comprises a non-acidic solution (applied with muscle power and a wire brush) to lift grease, followed by a stain remover. Although the distributor recommends hosing off the second solution immediately, leaving it on for up to 5 minutes produces a brighter floor. In any case, apply the second solution very evenly and dilute with water all at once—or risk splotches. One other precaution: Keep both solutions from splashing on any treasured possessions.

> *"Owning your own home. To me, that is the physical manifestation of everything this country is about."*
>
> —Andrew Cuomo, *U.S. Secretary of Housing and Urban Development*

CITY STREET: JIM CUMMINS/FPG; GARAGE FLOOR: JASON SCHMIDT; FUNNELS: DAVID PRINCE.

Funnel Vision

1. Made of recycled polyethylene, a 7½-inch-wide funnel guzzles up to 3 quarts of liquid and has a leak-proof spout. 2. Built-in handle helps position tin cup; removable and rust-resistant screen traps debris. 3. Accordion spout maneuvers through engine parts; rectangular base holds quart bottles of oil. 4. A slender, detachable 15-inch spout plunges into gas tanks. 5. Stout plastic spout juts out 7 inches for reaching into odd nooks. 6. Ceramic resists corrosion and temperatures as high as 2,012 degrees Fahrenheit, making it ideal for caustic chemicals. 7. A 14-inch corrosion-resistant spout snakes into spots that are hard to reach. 8. Dog food, fertilizers and powders flow through wide heavy-duty polyethylene spout without clogging.

"You never have a funnel when you need one," says *This Old House* host Steve Thomas. "Mine always come from the kitchen—along with my wife's wrath when they come back gooey." The solution is a collection of specialty funnels with snakelike arms that reach elusive gas tanks, spouts that swivel to redirect flow, extended rims to prevent caustic chemical splashes, and screen traps to filter debris. *This Old House* contractor Tom Silva prefers plastic funnels because they don't rust or dent. He's also partial to flexible tube attachments that extend up to 20 inches and, he says, can get into "funny positions, so you can maneuver through the configuration of handles and consoles of a compressor when you're changing the oil."

MANUFACTURERS · MATERIALS · PRODUCTS · RESOURCES – PAGE 117

(extras)

WEB

Brush up on priming, painting and papering

www.zinsser.com

A leading manufacturer of primer-sealers and wall coverings since 1849, William Zinsser & Co. has now entered cyberspace to give consumers tips on the intricacies of wallpaper and wood surfaces, from product choices to techniques. A pudgy painter in blue overalls invites you to click on the applications-and-solutions button, which calls up a chart recommending hundreds of painting-related Zinsser products—or discouraging their use. The list includes primers for exterior wood, aluminum siding, drywall and stucco, plus formulations for beating stains from ballpoint pens, lipstick and tar. A footnotes section dispenses simple advice on how to prepare surfaces for priming (kill mildew first) and how to lighten nicotine stains.

www.paintquality.com

The paint-failures section of the Paint Quality Institute site might just save a wall. Photographs help identify exasperating phenomena—alligatoring, blistering, wrinkling, nailhead rusting. Concise explanations of causes and solutions follow. A performance chart for interior and exterior paints rates durability, color retention, mildew resistance and adhesion. Sponsored by chemical manufacturer Rohm and Haas, the site touches on environmental issues and examines why high-priced paints tend to go on better and last longer.

BOOKS

Down to Earth

Gardens often beckon readers to settle under a leafy tree with a hearty book. But *Keeping the Garden in Bloom: Watering, Deadheading and Other Summer Tasks* demands to be propped open against a trug while you get busy. According to Steven Bradley's wire-bound manual, summer is not only for pruning flowering shrubs and deadheading annuals but also for ambitious projects such as sculpting topiaries or digging ponds. Don't be intimidated by the photos of luscious English gardens—they thrive because they get more rain than most. And note that the instructions to clear grass clippings run counter to American lawn wisdom. • From 1973 until his death from cancer in 1993, Henry Mitchell shared gardening wisdom through his memorable Earthman column for the *Washington Post*. The third and final collection of these essays, *Henry Mitchell on Gardening*, demonstrates why his readers often clipped the articles and sent them to kindred spirits in other cities. Mitchell combined Southern hospitality with passions for gardening and English literature to create intimate writing that welcomed us into into his backyard. *This* is the book to settle down with under that leafy tree.

Cutting Castle Corners

Thirty-year-old electrical engineer Craig Weggel hasn't lost his sense of wonder about sand castles. In February he patented a sand additive that he tested at New Jersey beaches last summer. "You can form balls, arches and structures with radical shapes," says Weggel, who lives near Philadelphia and has worked sand on the Jersey shore every summer since he was 15. Consisting of gelatin and salt as well as colored and white sand, the biodegradable, nontoxic additive improves adhesion among sand particles—a quality that expert sand castle sculptors achieve by pounding sand for hours with tampers. "It still takes skill to squeeze the sand into putty that's just right," says Weggel, who's working on an improved formula. As for the experts, they'll have to keep pounding. In competitive sand sculpting, additives are taboo.

Outlaw Weed

After yanking spotted knapweed bare-handed from his Idaho property, U.S. Forest Service soil scientist Jerry Niehoff developed aggressive benign tumors on his pinky and ring finger. Fearing the painful tumors' spreading, doctors amputated the fingers and speculated that the tumors were caused by *sesquiterpene lactone*, a terpenoid in knapweed sap that causes rashes. Although the link between knapweed and tumors is inconclusive, the weed does have a documented penchant for taking over turf as it competes with grass for water and nutrients. Spotted knapweed, which blooms in July and August in the Western rangelands and scattered areas of the East Coast, is showing up on "wanted" lists of local weed boards. Agriculture officials caution anyone in contact with spotted knapweed—including people using string trimmers—to wear gloves, long-sleeved shirts and face shields. Selective broadleaf herbicides can control the plant, but consult a county extension service before policing the noxious weed.

Purplish, speckled flowers with ½-inch thistles sprouting from the top give away spotted knapweed, now on the most-wanted list of pest plants. Stems grow 1 to 3 feet tall.

BOOKS, WAX AND PAINT: MICHAEL GRIMM; SAND CASTLE: JEFFREY SYLVESTER/FPG; KNAPWEED: DOUGLAS COUNTY, NE, INFORMATION SERVICE; MUIR HOUSE: HELGA SIGVALDADOTTIR.

What's in a Name?

Judging a paint by its color used to be a matter of black and white. Now it's more fun: One person's green is someone else's Sylvan Whimsy or San Juan Spritz. Test your palette prowess by matching names with colors.

1. Blithe Spirit 2. Buccaneer 3. Chesapeake 4. Dead Salmon 5. Flannel Pajamas 6. Fuzzy Navel 7. Golfer's Tan 8. Humpty, Dumpty 9. Loop-t-Loop 10. Rum Runner 11. Squirting Flower 12. Teeny Bikini

Key: 1-I; 2-A; 3-B; 4-C; 5-K; 6-J; 7-D; 8-G; 9-E; 10-F; 11-H; 12-L.

Hot Wax

Back in the 1950s, Dr. Alfred Werner, research director of the British Museum, tested one wax after another in his galleries of antique furniture. He discovered that natural waxes like carnauba and beeswax were porous, turned yellow and contained acids that eventually attacked the object supposedly being protected. Oil finishes darkened furniture and, being sticky, held dust. But one waxy muck produced—"cracked" is the industrial term—during the refining of crude oil seemed different. Werner found that when refined into a glacier-white microcrystalline wax and rubbed into wood, metal or leather, the by-product dried to a hard, clear finish. Today the product coats suits of armor in the Tower of London, oak wainscoting in Windsor Castle and marble sculpture at the Smithsonian Institution. A little goes a long way; a 7-ounce can should be enough to polish a houseful of furniture—not to mention armor—to a regal glow.

Wildfire Fighter

California's summer wildfire season has always posed a threat to the house of naturalist John Muir. About 30 miles north of San Francisco, the 1883 Italianate redwood Victorian is surrounded by dry chaparral. "Three summers ago, a fire came within 500 yards of the place," says buildings and utilities foreman Brian Garrett. "We were out there with garden hoses, trying to keep the wood-shingled roof wet." Now he can put away the hoses. The National Park Service, which oversees the landmark, rigged its rooftop with 20 sprinkler heads. When turned on manually, the system—part of a $250,000 fire-prevention project that includes interior sprinklers—pumps out 440 gallons of water per minute, enough to overflow the gutters and douse any wind-borne embers.

When wildfire nips at the property line, the historic John Muir house in northern California "turns into a real gusher," says buildings foreman Brian Garrett.

(extras)

EVENTS & APPEARANCES

NORM ABRAM

- **August 16-19**—National Hardware Show, McCormick Place, Chicago, Illinois; 888-425-9377; 203-840-5622; www.ahma.org.
- **August 21-22**—International Woodworking Fair, Georgia World Congress Center/Georgia Dome, Atlanta; 770-246-0608.

STEVE THOMAS

- **July 11**—Sacramento Home Show, Convention Center, Sacramento, California; 510-505-7676.

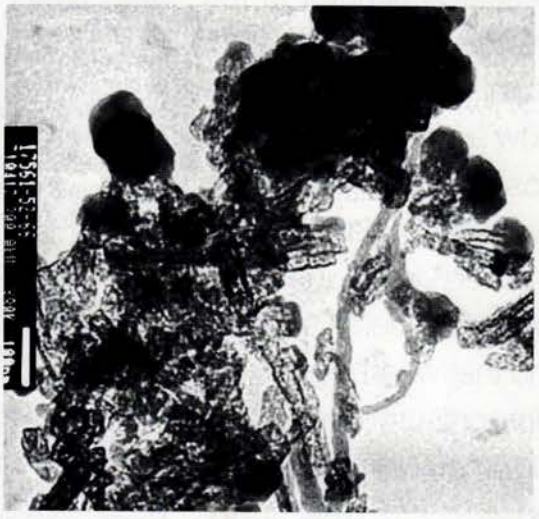
EVENTS

- **July 23-26**—Toward Tomorrow Festival, Westfield State College, Westfield, Massachusetts; 413-774-6051; www.nesea.org.
- **August 12-23**—Southern California Home & Garden Show, Anaheim Convention Center, Anaheim; California; 800-442-7469.

Asbestos Eater

Asbestos has a fibrous structure—magnified here 12,000 times—which makes the material dangerously invasive.

A terror called asbestos, identified as a carcinogen in the 1960s, still lurks in the basements, crawl spaces and furnace rooms of tens of millions of American houses. Removal is expensive and risky because disturbing asbestos can liberate a flurry of microscopic fibers into living spaces. Less expensive and somewhat safer approaches have included encapsulating fibers with a vinyl-acrylic coating or enclosing pipes and furnaces with a gypsum-based wrap. But now there may be a better solution. In conjunction with Brookhaven National Laboratory, former asbestos manufacturer W.R. Grace & Co. has developed a foam that contains phosphoric acid and a fluoride catalyst and that "digests" asbestos. The foam breaks down the material's fibrous structure and converts its chemical composition into benign minerals. Yet the asbestos retains its fire retardant properties. The bad news is that, although Brookhaven scientists believe the foam has residential potential, Grace is now marketing it for use only in commercial and institutional buildings, where asbestos was sprayed on extensively as the fireproofer of choice.



A new foam "digests" asbestos, rendering the material innocuous by altering its crystalline fibers and converting the chemical components into non-invasive minerals, as seen here magnified 80,000 times.

ASBESTOS: BROOKHAVEN NATIONAL LABORATORY; SPACE TOOLS: BERYL STRIEWKI; POSTER, EYE PROBE AND SCREEN TOOL: MICHAEL GRIMM.

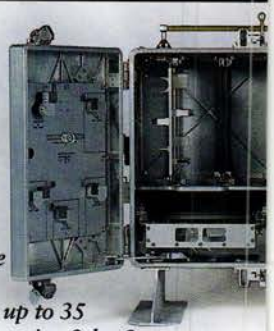
FINAL FRONTIER GEAR

When they build the International Space Station, astronauts will use tools that

Hammer
The earthly version is used for chipping bones in surgery. A modified space model unjams hard metal objects such as stuck doors. Stainless-steel shot in the head minimizes recoil.

Self-locking pliers
Adapted from a stainless-steel medical version, a pair clamps onto objects up to 1¼ inches in diameter. The grips can withstand temperatures from minus 200 to plus 200 degrees Fahrenheit.

Brush
Teflon bristles rid space suits of hydrazine flakes, which could result from leaks of rocket fuel and turn into toxic—and possibly fatal—liquid or vapor back in the pressurized cabin.



Tool box
Opens like a cabinet and holds up to 35 tools. Measuring 2-by-3-by-1½ feet, the 200-pound aluminum and steel chest

Even if people disagree on how to save the rain forests, the poster sure perks up the workshop wall.

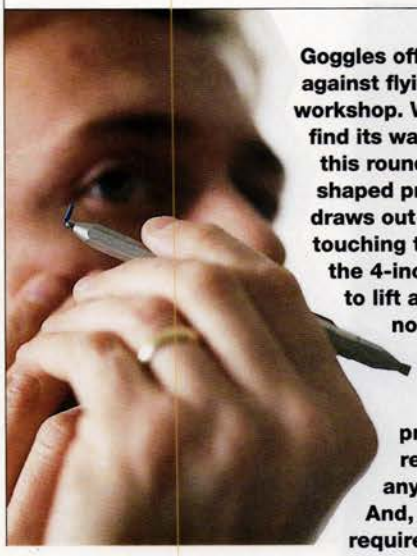
Wood-Be Solution

Considering that rain forests are disappearing at an alarming clip, using endangered tropical hardwoods for crafts projects might seem frivolous. But a British company is encouraging hobbyists to "turn a bowl to save a tree" and has put out a promotional poster featuring exquisitely turned bowls made from 108 rare species including Brazilian purpleheart, Jamaican cocuswood and Sri Lankan satinwood. The reasoning behind the slogan presents a thorny dilemma to woodworkers. Banning exotic woods, the company says, would do nothing to stop developing countries from slashing and burning rain forests to create pastureland. In fact, goes the argument, creating a market for such woods gives nations an economic incentive to practice better forest management: cutting selectively, logging naturally fallen trees and replanting every tree felled. The company says it buys only from suppliers that follow such procedures and it monitors wood sources in conjunction with government organizations. However, only a handful of those suppliers are certified by the Forest Stewardship Council, the international watchdog that many environmentalists consider the ultimate stamp of green approval. Politically correct wood is enough to make one admire melamine.

UNSUNG TOOL

Screen Star

When fixing or replacing a screen on a door or storm window, look for one of these two-wheeled gizmos in the same hardware store that sells the mesh. With luck, the clerk will know it by its proper name: screen installation tool. Otherwise, call it the two-wheeled gizmo for putting in screens. They'll know. Although this one, circa 1950s, has a grip made of cast aluminum—thanks to a post-war glut of the metal—most models today have wooden handles. The tool feels solid in the hand; the body curves in precisely where the fingers curl around it. The edge of one steel wheel is tapered to push the mesh into the slot around the perimeter of the frame. To finish the job, the other wheel is ingeniously grooved—perfect for pushing in ridged rubber or vinyl splines to lock in the mesh.



Eye Aid

Goggles offer the best protection against flying shards and splinters in the workshop. When steel or iron dust does find its way into the eye, however, try this rounded stainless-steel pen-shaped probe. The point magnetically draws out the particle —without touching the cornea. The other end of the 4-inch-long tool has a nylon loop to lift away bits of wood or other nonmetallic materials by breaking the surface tension between the particle and the cornea. Neither end of the probe is recommended for removing a foreign object of any type embedded in tissue. And, of course, any eye injury may require prompt medical attention.

> *In the Middle Ages, even when the structure was wood, they built to await the Second Coming.*
>
> —Alex Karmel, *A Corner in the Marais*

are decidedly high-tech—and, surprisingly, some that are not

has handrails and foot holds so crew members can brace themselves when grabbing or stowing equipment.

Cutter
Resembling "jaws of life" used in auto wrecks, it's handy for snipping cables and electrical wires. Astronauts used a similar tool to cut free the Spektr Solar Array on the Mir space station.

Extravehicular activity (EVA) display
For use outside the spacecraft, a Dick Tracy-style computer cuff holds up to 500 pages of data, including instructions, photographs and diagrams to assist in making spacecraft or space-suit repairs.

Ratchet
The wrench withstands 120 foot-pounds of torque and has a palm wheel that rotates 360 degrees, enabling astronauts wearing gloves to turn bolts and screws. Extensions accommodate hardware deviating from NASA's standard 7/16-inch size.

MANUFACTURERS · MATERIALS · PRODUCTS · RESOURCES – PAGE 117

Ol' Betsy

New Ol' Betsy

F-SERIES CELEBRATES FIFTY YEARS OF BUILT FORD TOUGH.

Over the last fifty years, Ford F-Series trucks have obviously become more powerful, more comfortable, and more advanced. But there's one thing that hasn't changed. It's still the tough truck you can always count on. And that's the best way we know to turn a new truck into an old friend.

F-SERIES 50 YRS BUILT FORD TOUGH

THE BEST-BUILT, BEST-SELLING AMERICAN TRUCKS.*

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Built Ford Tough

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*Based on an average of consumer-reported problems at 3-months' ownership in a survey of Ford and competitive models designed and built in North America. Sales leadership based on Divisional sales.

BY ARNE WALDSTEIN

POINT AND SHOOT

Nailing made easy

Slapping two pieces of wood together has for almost all of history been numbingly slow and laborious, a painfully primitive process of pounding on a steel spike with what amounts to a club. Modern hammers with brightly colored high-tech handles, contoured grips and polished heads haven't helped much. But deliverance arrived in 1968 with the invention of the pneumatic nail gun. Although the first models were clunky, expensive monsters, it has evolved into a light, portable hand tool that pops nails into wood faster than most people can think. Best of all, nailers do so without denting wood, smashing thumbs or putting more money in the pockets of physical therapists.

This Old House contractor Tom Silva was one of the first residential carpenters to get the nail-gun bug in the '70s. "I was watching an ad on TV, and I noticed a gun that shot nails being used in a factory," he recalls. He tracked down the manufacturer, who lent him a compressor and a couple of guns. "We were able to frame the last half of a three-story apartment complex in a third less time than we'd spent hand-

This Old House *contractor Tom Silva power-nails crown molding to the wall as fast as he can pull the trigger. When he's done, there are no hammer marks on the work and no compressor to lug home.*

PHOTOGRAPH BY JOE YUTKINS

nailing the first half," Tom says.

Power nailers aren't merely faster; in many cases, they're better. A nail gun can punch a fastener into place in a single 800-miles-per-hour shot. The wood, caught in a high-tech ambush, has no chance to wriggle or resist. Gun-fired nails penetrate old, iron-hard framing, which bends hammered nails. There's no quaking and shaking; plaster stays put; wallboard doesn't pop. A day's work doesn't create more.

Until recently, every nail gun required an air compressor and a length of hose. A failure of gun, compressor or hose, and it was back to swinging clubs. The biggest aggravation, it turned out, was the hose. If it wasn't getting snagged—in a doorway, on a lumber pile, around a sawhorse leg—then it ended up an inch short of the target, like a dog straining on a leash.

From laptop computers to cell phones to the battery-powered tools that have swept the building trades, people crave portability and the freedom that comes with it. Freedom came to nail guns in 1986, when the Paslode Corporation introduced a nail gun that functions without hose or compressor. The gun is powered by internal combustion, just like the granddaddy of all portable machinery, the gasoline engine.

Pulling the Paslode's trigger releases MAPP gas (methylacetylene propadiene) from a disposable fuel-cell cylinder and injects the gas into the combustion chamber. Simultaneously, a spark detonates the mix and plunges a piston against the nailhead, driving it home in a lightning-quick stroke.

Pressing the nose **(1)** *against the work releases liquid MAPP from the fuel cell* **(2)** *to the fuel regulator* **(3)**, *where the fuel mixes with air, changes from a liquid to a gas and is propelled into the fuel line. Pulling the trigger* **(4)** *sends the gas into the combustion chamber* **(5)** *and generates a spark at the plug* **(6)**. *The gas ignites, driving the piston* **(7)** *onto the nail in the tool's magazine* **(8)**.

Paslode makes its Impulse gas-powered guns in two versions: a framing nailer and a smaller model for finish work. The smaller gun gets about 2,500 shots per $7 cylinder, the larger gun 1,200. Both versions operate similarly. Insert the fuel, snap on a rechargeable battery, load a strip of collated nails and you're in business. The 6-volt battery, which operates the spark plug and a tiny fan, is good for about 4,000 shots between charges.

With any nail gun, hoseless or otherwise, simply squeezing the trigger won't send steel spikes flying through the air. Before a gun will fire, you must press its nose firmly against a hard surface to release the safety. Pressing down the nose of the Impulse also kicks on the fan, which mixes air and fuel in the combustion chamber, then cools and clears the chamber after firing. Pushing down the nose of the Impulse takes more force than a compressed-air gun needs—12 pounds versus 6. And the tool emits a firearm's crack rather than a pneumatic's pop, so ear protection is needed. The bright orange plastic Impulse is 1 to 2 pounds lighter than its metal pneumatic brethren, and it hooks easily on a tool belt.

Last year, Porter-Cable began manufacturing gas nailers called Bammers: a framer, two finish guns, and a crown stapler for assem-

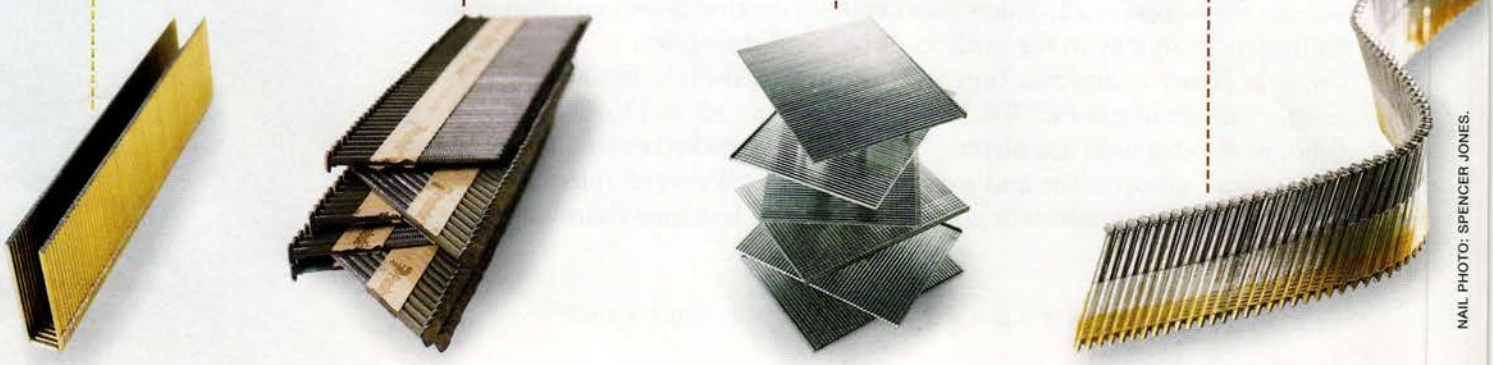
Nail Bandoliers for Every Job

Crown staples from 1¼ to 2 inches long hold better than nails of the same length. Used to fasten sheathing and subfloors.

Framing nails have D-shaped heads so they can nest closely, but codes restrict their use in hurricane and earthquake zones.

Finish nails ¾ to 2½ inches long have blunt tips to minimize splitting, which often occurs near the end of thin wood trim.

Plastic collating material gives D-head finish nails some flex. A shaft coating makes them easier to drive and harder to remove.



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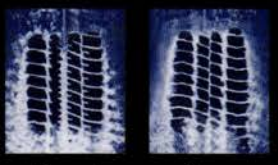

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BATTERY POWERED

FRAMING
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FINISH
5½ pounds

Keep Them Dry, Clean and Cool

Gas-powered nailers breathe air, so it's important that they get plenty of it—clean and dry. A soft foam filter behind a grill keeps dirt from hitching a ride on the incoming air flow to the combustion chamber (or the fan, in the case of the Paslode). If the filter clogs, the gun won't fire. To clean the filter, open the grill. On Porter-Cable tools, it is held by 4 screws; the Paslode's flips up. Shake off the big chunks of grit; rinse the filter with dish soap and water; then squeeze the filter dry between paper towels. Stick it back in, and go to work. Do this every time you replace the fuel cell, and the tool will be less likely to choke. Filters won't stop water, so manufacturers warn against using nailers outdoors in wet weather. If a gun gets too cold (below 20 degrees Fahrenheit), its fuel cell won't maintain proper pressure. If a gun gets too hot sitting in the sun, it may fire intermittently or not at all. The guns are also altitude-sensitive. Paslode's models stop working above 6,000 feet, or above 8,000 feet for framing nailers with a special valve. Porter-Cable reports that its guns are being used at altitudes of 10,000 feet but admits that performance may be erratic.

Jammed fasteners are a frustrating reality of power-nailing, but they're readily cleared in both tools by flipping up the noseguard. (For safety, always remove the fuel cell or battery first.) A light blast of a dry, oil-free spray lubricant such as silicone clears the grit and the bits of paper or plastic collating material that cause clogs. Spraying the magazine, too, helps fasteners march smoothly toward their destiny.

BATTERY FREE

STAPLER
6⅓ pounds

FINISH
6⅓ pounds

bling cabinets and holding insulation. All use MAPP gas in a cylinder similar to the Paslode's, but they operate without fans, motors or batteries. A pressure-sensitive piezoelectric crystal, similar to that in a gas barbecue grill, generates the spark. The air and fuel are mixed and exhausted as the tool is plunged—so cocking the gun requires 23 pounds of push. The Bammer shoots two nails per second, the Impulse shoots three and pneumatic nailers can deliver five.

For a pro like Tom Silva, extra effort and weight can make a day longer. For a home owner who uses a nailer occasionally, the Bammer is a pick-up-and-go tool that cuts down on recharging time. The Bammer requires very little maintenance. Its ignition system is designed to last for about 70,000 shots and to be replaced by the owner. "It's time for a new one when you have to pull the trigger three or four times before it fires," Dennis Huntsman of Porter-Cable says. Gas guns aren't about to make Tom's trusty pneumatics obsolete, but they fill a certain niche. "If we have a small backyard job or maybe some high nailing up on a roof, we'll throw the gas nailers on the truck," he says. "Also, if we're running through a house, nailing up trim here and there, those guns are nice to have. They're handy. No question about it." ■

PHOTOS: SPENCER JONES.

MANUFACTURERS · MATERIALS · PRODUCTS · RESOURCES – PAGE 117

BY JEFF TAYLOR

MUD KNIVES

The trowels that smooth drywall

After a solid month of hard labor, tonight I'm standing inside what will soon be my wife's new glass studio, a small gambrel-roofed building in our backyard. All that remains is to finish the drywall, in one last burst of work stretching over a couple of days and nights. Fortified with a pot of black coffee, some high-energy rock and roll, my collection of shiny taping knives and five buckets of mud, I'm ready to work until dawn.

The raw drywall before me isn't pretty. There are staggered rows of dimpled screw holes, lots of shallow gullies where tapered edges meet, gleaming metal corner beads and a daunting grid-work of open seams covered by mesh tape. My job is to take the mud—a creamy, whitish goo otherwise known as joint compound—and repeatedly butter thin coats of it onto the walls and ceilings. By the time I'm finished, all that drywall will be impeccably smooth, flat and ready-to-paint with no lines, lumps, bumps, holidays, dips or dimples.

Faced with the dirty, repetitive task of making every imperfection vanish, it's tempting to do the same, to walk

PHOTOGRAPHS BY ERIK RANK

Trowel Talk

1. *A neoprene rubber wipe-down knife bends to clean excess mud from inside corners wider than 90 degrees. When corners are out of reach it fits on a pole.* **2.** *Dry, the blister brush's 9-inch-wide felt pads absorb excess water as they smooth mud. Wet, they can feather an edge almost as well as sandpaper, but without making dust.* **3.** *With the flick of its metal lever, the adjustable neoprene round-it tool converts from a straight wipe-down knife to one for bullnose corners.* **4.** *A 1½-inch putty knife is handy for scraping the bottoms of mud pans.* **5.** *The L-shaped blades of the inside corner trowel are angled at 103 degrees, but as it is swept down a corner, they flex to a crisp 90 degrees.* **6, 7.** *Taping knives, ranging from 8 to 24 inches wide, are mounted in a rigid aluminum brace to provide consistent pressure along the blade's edge. Blue steel blades are more flexible and lighter than those of carbon or stainless steel.* **8.** *Joint knives are the first tool used to slap the mud over the joint. They are also the narrowest (ranging from 4 to 10 inches) and the most rigid.* **9.** *Bowed 3/16 inch in the middle, the curved-blade trowel feathers the mud to allow for the shrinkage that occurs as the joint compound dries.* **10.** *An outside corner trowel is made with an 80-degree blade angle, but its flexible stainless steel blade expands to 90 degrees as it slides over a corner. This one smooths bullnose corners.*

out that door and hop on a plane to Hawaii. But having finished acres of drywall, I swear to you it can be almost enjoyable, even creatively inspiring; smoothing drywall is a real picnic compared to hanging it. As a bonus, you get to play in the mud, shaping it with keen sculpting tools.

First among them are the taping knives, whose metal blades range in width from 4 inches (good for deleting dimples and applying the bed coat to seams) to 2 feet (excellent for filling wide hollows or feathering out the hump of mud over butt joints). For most jobs, I require knives with 4-, 8-, 12- and 24-inch blades.

When buying knives, pay extra for quality. A cheap blade probably won't have enough flex, and the handle is almost guaranteed to snap on the first day. Look for blued or stainless-steel blades made of springy tempered steel, and a comfortable paintbrush-style handle of wood or contoured plastic.

Old-timers could sculpt inside and outside corners with only taping knives, but I'd be lost without my corner trowels. I have one for inside corners (think of the corners inside a box) and its mate for outside corners.

To carry joint compound from the bucket to the wall and scrape excess mud off the knife, some drywallers favor the old-fashioned plasterer's hawk, a square sheet of light metal with a handle centered on the bottom. However, it takes practice to keep the hawk level; tilt it even slightly, and the mud will slide off. I prefer a narrow metal or plastic pan designed especially for joint compound, with a shape reminiscent of a baker's bread pan.

Before it goes in my pan, the compound needs a little preparation. When I open a bucket, I first take the lid far away and scrape off the dried mud caked on the underside. If any of these hard specks (called "boogers") fall in fresh mud, they will rake annoying grooves under a taping knife. To thin mud to an easily workable consistency, I add 1 cup of water per 5-gallon bucket and homogenize it with a bladed paddle chucked into a monster ½-inch drill. Thirty seconds and it's ready to go.

Screw dimples are fun to mud but easy to miss, so I always do them first, pressing hard with a flexible 4-inch knife. One quick downward stroke fills them with mud, and a second sideways swipe cleans any excess mud off the wall. I build up speed while practicing my stroke—even pressure, blade angled slightly—until the knife leaves exactly the right amount. Beginners tend to leave too much mud on dimples, as I did long ago. My first finished wall looked as though gum wads had been stuck in rows under the paint.

For both long seams (indented) and short ones (flush), start with a 4-inch knife. Holding its handle a few inches off the wall, skim a bed coat of compound over each joint; if you're using paper tape, immediately embed it into the mud with the same 4-inch blade. Most knives have a slight bow in their blades; I always put the concave side against the wall to spread the first coat on all taped seams and dimples. Mud shrinks as it dries, so this slight hump will flatten out nicely. For following coats, I use progressively wider knives, but with the convex side facing the rock to keep the tips of the blade from dragging lines in the fresh mud. As I build up successively wider strata of mud with successively wider knives, these joints feather into sheer invisibility.

As each layer dries, give it a thorough sanding with 80-grit paper. This is the least fun part of the job, unless you enjoy the sensation of gypsum dust sucking moisture from your nasal passages, but you have to sand to remove boogers, level out ridges, flatten humps and make the edges at the joints and corners disappear. A sanding block on a pole will make sanding ceilings a veritable breeze, at least compared to sanding without one.

Between coats, all tools get scrubbed and wiped dry. It may seem pointless, but using clean, rust-free tools will do wonders for your morale, not to mention your workmanship.

The stars are out now, twinkling to music cranked up full blast. Caffeine is surging through my veins, and the searing white beams of halogen lamps wash the walls with light, revealing the high and low spots. The mud slides easily under my knife blade, smooth as wet satin, white as milk. A few more sessions and this will all be over. My wife will have her studio, and I'll have a lifetime supply of plastic buckets. ■

Like painters dabbing paint palettes, some drywallers use hawks to keep mud at hand. A hawk should have a large surface area and not weigh too much, because it will be held for long periods, in much the same way a bird of prey perches on a falconer's fist. This hawk, made of lightweight magnesium, has a 14-by-14-inch surface etched with concentric circles to keep the mud in place and a rubber handle with a soft foam disk to prevent calluses.

MANUFACTURERS · MATERIALS · PRODUCTS · RESOURCES – PAGE 117

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BY PETER JENSEN

A 136-foot-long, 18-foot-diameter redwood felled in the early 1960s dwarfs loggers Pete Koehler, left, and Herb Breda Sr. The trunk yielded more than 71,000 board feet of lumber, enough to frame five average-sized houses.

PHOTO: COURTESY OF FOREST HISTORY SOCIETY, DURHAM, NC.

RARE WOOD

Great redwood is getting scarcer all the time

On this gray rainy day in Ukiah, California, lumberman Joe Garnero seems as unaffected by the damp as the old redwood piled around his small salvage yard. Clothed in his yellow slicker and baseball cap, he bobs and weaves around rafters salvaged from a warehouse, strides past neat stacks of staves from beer, wine, pickle and olive vats, then stops at a pile of 12x12s. Leaning over one of the 20-foot-long "sticks," as he calls them, Garnero peels at a gray rind of dark wood with a pocketknife, using both hands to steady the blade. Just 3/16 inch below the beam's weathered surface, the knife raises a curling bloom of pure red—the timber's heartwood—dry, fragrant and completely free of decay.

Garnero salvaged the beam from an obsolete 100-foot-tall water tower near Eureka, California. Made from 1,000-year-old redwoods felled about the same time Teddy Roosevelt rounded up the Rough Riders, the tower endured a century without even a protective coat of paint. When it was dismantled, Garnero retrieved its 80,000 board feet of lumber, most of which he sold before the first piece hit the ground. "I sell to builders and home owners who appreciate old-growth redwood for its durability and beauty," Garnero says. "They're also very concerned where the wood comes from. They want history, not newly cut logs."

This rare wood has a fabled history. Before the middle of the 19th century, forests of redwood—*Sequoia sempervirens*—stretched like a patchy beard along a narrow band of coast from southern Oregon to Big Sur. The

Green Redwood

When people tell Jason Grant they feel guilty using redwood, he reminds them, "There are no good or bad woods, only good and bad forestry practices." Grant, a vice president of Ecotimber International in Berkeley, California, stocks redwood lumber from only small timber companies with excellent records of forest management. These companies harvest at a sustainable rate—approximately 2 percent of their holdings might be cut in a year—plucking trees from the forest with minimal disruption to the environment. Their loggers, Grant says, "can wield a chain saw as well as a jazz musician plays the saxophone."

But it's not necessary to take Grant's word for it. Independent auditors examine in detail how these companies manage their forests. If they meet the standards set forth by environmental watchdogs such as the Rainforest Alliance (operating under guidelines developed by the Forest Stewardship Council), they become certified. Sawmills stamp the surfaced boards with an "SCS" or an "SW," but not the individual pieces of rough lumber.

Like food labled organic, lumber labeled as certified assures consumers that the trees have been harvested without long-term damage to the forest and kept separate from the noncertified sources. To date, only a few small companies harvesting mostly second-growth stands have received certification: The big lumbering operations haven't applied.

The price of certified redwood is the same or slightly higher than non-certified, so the biggest obstacle to using it may be finding it. Fortunately for home owners who want to build with a clear conscience, the Rainforest Alliance maintains a list of certified-lumber retailers.

giant trees—the tallest of all living things—speared sunward 350 feet and could grow to 22 feet in diameter. Bunched in dense groves of perpetual twilight, they had few enemies, other than high winds and old age. Even fire could not penetrate their thick, fibrous bark. When they finally fell, some had lived more than 2,300 years. Yet they could lie on the forest floor for centuries more, their heartwood nearly untouched by rot or insects, nursing rows of new trees on their decaying sapwood as clonal offspring sprouted from their shallow roots.

Then came the California gold rush in 1849. Pressed by an exploding population hungry for building material, lumbermen discovered big trees were a source of big bucks. In one instance, a single acre of giants reportedly produced more than 1.4 million board feet of lumber, which today could frame 106 single-family dwellings, each about 2,000 square feet.

The 100-foot tower of redwood near Eureka once held aloft 331 tons of water for a lumber mill. When salvagers dismantled the structure in 1997, most of its 160 12x12 beams were recycled into a 7,000 square-foot house in La Jolla, California.

And what magnificent lumber it was—lightweight, straight-grained, easily worked, nearly impervious to rot. In the tightly packed groves, growing at a glacial pace, redwoods could only sustain branches in the top third of their trunks. As a result, their massive lower two-thirds were clear, pristine wood, some with as many as 40 growth rings to the inch. In 1899, Henry Gannett of the U.S. Geological Service wrote: "One may go through miles of lumberyards at Eureka and examine millions of feet of lumber without finding a knot or, indeed, an imperfection of any kind."

Whipsaws, double-bit axes, donkey engines and doghole schooners—then later chain saws, Caterpillar-tread dozers and Sikorsky helicopters—had their way, inexorably gnawing down and hauling away acre after acre of the tall timber. Sawmills cut their gigantic trunks into grape stakes, fence posts, roof shingles, mudsills and wine vats, all manner of items that had to be inert to the wet and weather. The tight-grained wood also became the framing—as well as the siding, paneling and exterior ornamentation—for California's many Victorian and Craftsman-style houses and countless other buildings. In a little more than 100 years, an estimated 90 percent of the pre-Gold-Rush trees were gone.

Still, many forests grew back. The seedlings and juveniles left behind during the logging onslaught shot up at an astounding pace. Unlike their light- and space-starved ancestors, these new trees grew bushy with branches and reached formidable, harvestable sizes—up to 130 feet tall

For this 18,500-square-foot house in Sonoma, California, all the doors, rafters and some exposed beams were salvaged from a redwood bridge.

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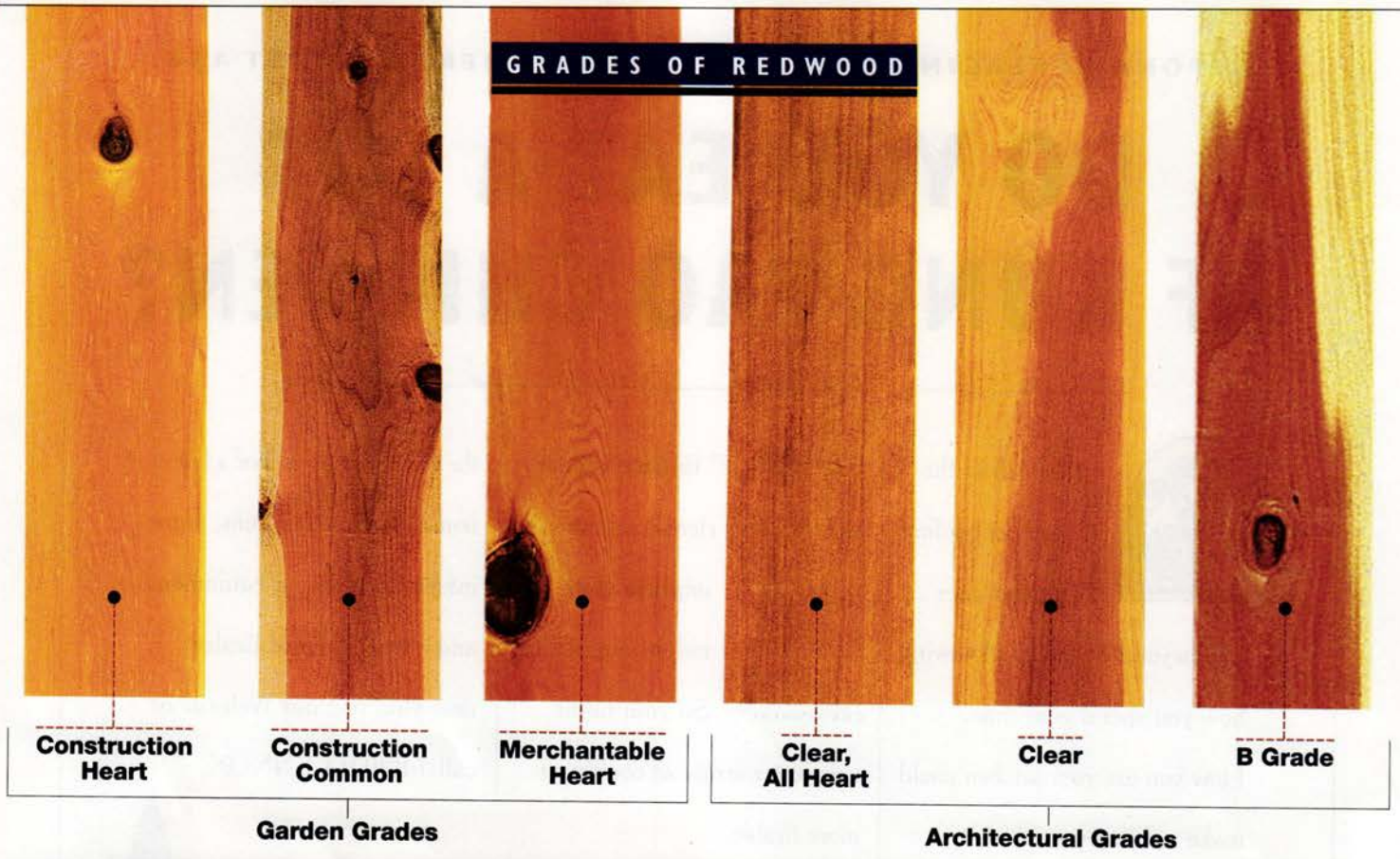

To help sort through the knots and twists in redwood lumber, the Redwood Inspection Service sets up a rigorous lumber grading system, which each mill uses to sort the boards as they are sawn. Garden grades are allowed knots and varied wood grains, while the architectural grades are more consistent and relatively knot-free. Clear, all heart redwood, the most desirable and expensive grade, has uniform reddish hue and no knots. Clear is also knot-free but has splashes of whitish sapwood, a part of the tree with little decay resistance. Avoid wood with pith, unless you plan to cut it out. Grading doesn't indicate whether the wood is old growth or new, or how rot-resistant it is.

and 3½ feet in diameter—in just 65 years.

These young trees, however, yield a lesser quality wood. Untempered by competition, much second- and third-growth wood has widely spaced growth rings—as few as 3 an inch—and an abundance of knots. Gone is the strength, beauty and rot resistance of wood from their ancestors. The heartwood of second-growth redwood is still more durable than many other softwoods, but home owners expecting their decks, fences, gates and siding made from young redwood to last as long as those using lumber from the old trees may be disappointed. The U.S. Forest Products Laboratory reports: "Overall, very resistant wood was about five times more prevalent in old-growth than in young-growth trees."

Despite its limitations, wood from young trees still has many of the vaunted qualities of old-growth wood. Although it is too weak to use as framing, carpenters love its rich reds, light weight, minimal shrinkage and soft satin feel. Redwood has little or no pitch, so tools and hands stay clean and the wood resists fire better than other conifers. The better grades of heartwood are remarkably stable, hardly changing in dimension through great swings in humidity. Joints stay tight; boards don't cup and warp. Woodworker Julian Hodges of Berkeley, California, who specializes in custom-designed garden gates, enjoys redwood's slightly sweet, musky scent when first cut and says the wood shapes with ease. "I find it very accommodating when you carve it into complex shapes with rasps and files." He adds, "It also takes a nice

Toxic Waste We Love

Redwood owes its legendary rot resistance to fungicidal insect-repellent toxins called extractives, which give redwood's heart its characteristic tint. These polyphenolic compounds are produced in the actively growing whitish-colored sapwood that sheathes the tree and gradually migrate inward. "Extractives are waste products, by-products of tree metabolism," says Charles Jourdain, vice president of technical and inspection services at the California Redwood Association. "The older the tree is, the more extractives it has."

The lumber from younger, smaller trees also tends to have a higher percentage of sapwood, which is extractive-free. Richard Waring, professor of Forest Science at Oregon State University, warns, "If you have streaks of sapwood going through boards in your deck, they'll be more susceptible to rot." To forestall the inevitable, treat decks with water-repellent preservatives or pigmented penetrating oils as soon as the wood starts to lose its color.

GRADES: COURTESY OF CALIFORNIA REDWOOD ASSOCIATION.

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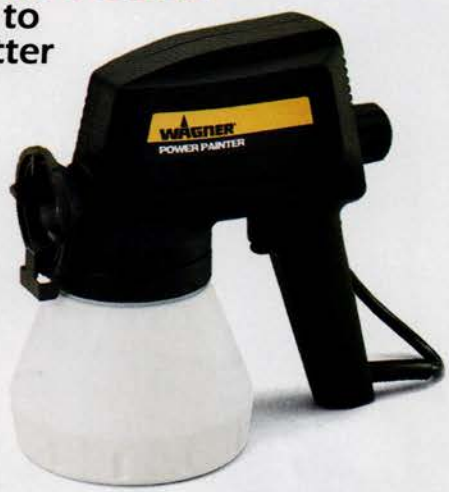

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A 54-foot-long redwood fence in Portola Valley, California, is held together with alloy screws and galvanized staples. Steel fasteners eventually turn redwood black.

edge when you're hand-planing." Working with well-sharpened tools is crucial, Hodges says. Otherwise, the wood's soft fibers are crushed rather than cut.

All redwood takes and holds paint beautifully, but outdoors it first needs an all-round primer coat to stop "bleeding," the rusty stains that surface when water dissolves the wood's decay-resisting extractives. A primer will also hide the marked difference between the light-hued early wood and darker late wood in each ring.

Preserving redwood's just-cut pink hue outside is nearly impossible; left to weather, it naturally turns a soft, dark gray. Hodges stops the graying with penetrating oil sealers. "It starts off looking oiled, but then ages to a fairly intense brownish hue and stays there." But Albert Slendebroek, owner of the Lumber Baron lumberyard near Berkeley, says anyone who applies a penetrating finish is doomed to put it on again and again. Salesmen visit him every year to demonstrate new products that clean and finish decks. Slendebroek points to the gray redwood deck outside his office and tells them to pick a section and go at it. "As you can see," he says, "any finishes and sealers have all worn off and failed." Slendebroek advocates buying the best wood you can find and just "letting it be."

In the early 1900s, Berkeley-based architect Bernard Maybeck first popularized the aesthetic appeal of letting redwood be, using the extraordinarily wide, knot-free and inexpensive boards then available for interior paneling. Left unfinished to darken with age, the wood changed color simply from exposure to the air, shading from a just-cut blond pink to a deep-hued cherry or mahogany. Those who have resided in a Maybeck house liken it to living inside the tree itself.

The cheap, high-quality redwood at Maybeck's disposal is now all but unavailable. Only about 4 percent of the ancient forest remains, either in 350,800 acres of parks protected from logging or on private lands where environmentalists battle to keep loggers out. Old logs scoured from windfalls, river bottoms and seashores are increasingly hard to find, as are the pickings from salvaged structures. "I recently had to go to upstate New York to buy stock, and I got some beer tank bottoms from New Orleans," Garnero says. "But what's left is pretty limited. Frankly, I don't have a clue where my next batch is coming from."

Scarcity is driving up prices: Clear old-growth heartwood, salvaged or off the stump, goes for as much as $4 a board foot, compared to $2 a few years ago, and construction heart, the second-growth lumber commonly used for decking, costs $1.25, up 62 percent in the last decade. The wood that was once America's most plentiful is now in such short supply that building with it has become a mark of status among the wealthy. ■

PHOTO: COURTESY OF MR. DECK

MANUFACTURERS · MATERIALS · PRODUCTS · RESOURCES – PAGE 117

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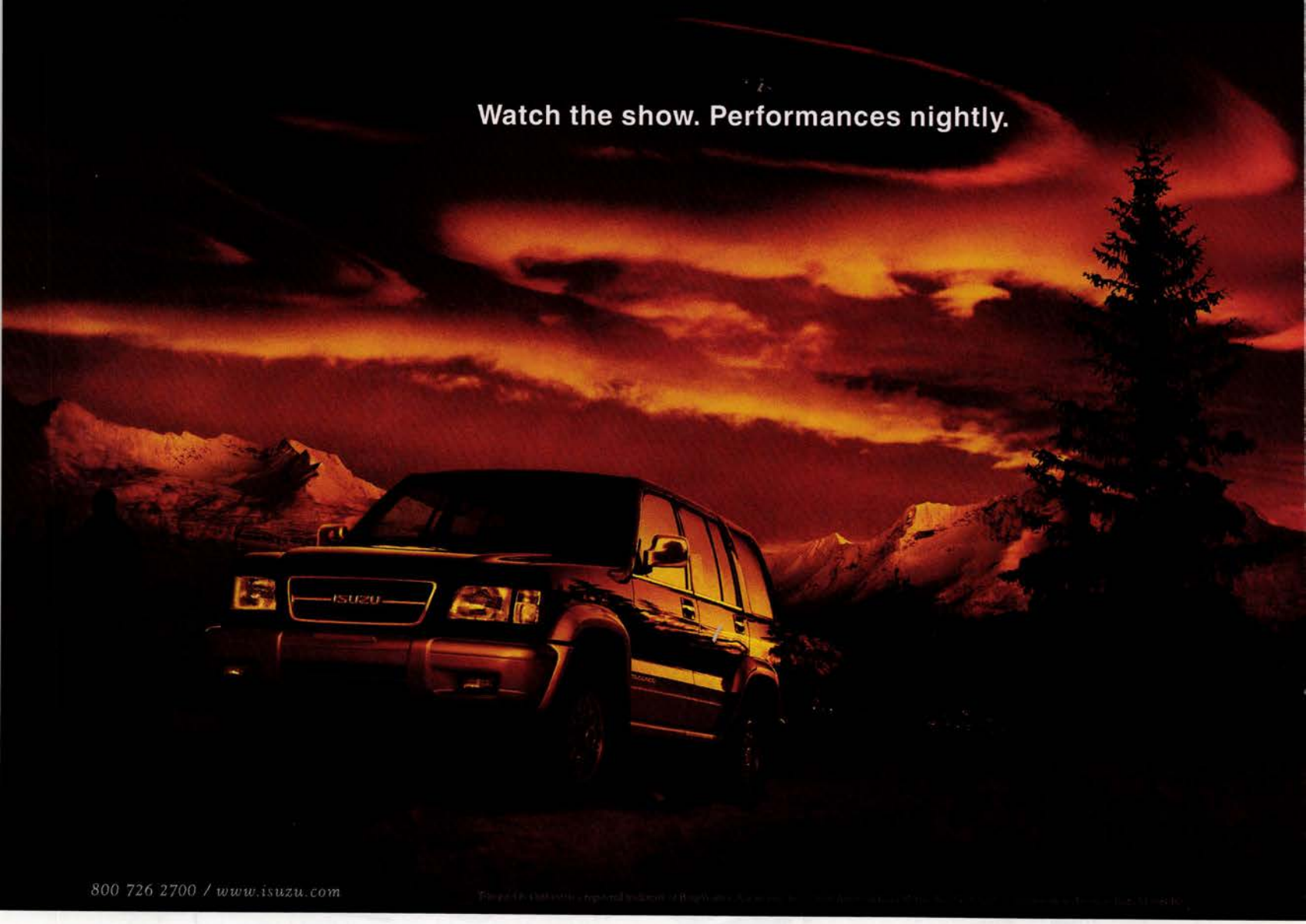

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Lime Is No Lemon

Before the 1870s, when portland cement became commercially available, most masonry structures—the Egyptian pyramids included—were built using only lime and sand. "It's the best mortar ever developed," says Tim Meek, a leading Scottish authority on repointing historic buildings. The key to its superiority is the lime itself. (The ground-up limestone commonly added to masonry cement is something else entirely.) This is kiln-fired limestone, slaked for up to a year, until it turns into custard-smooth brilliantly white putty. Blended with sand, the putty makes a mortar that's permeable to water vapor and flexes with changes in temperature. If hairline cracks form, rain will wash some of the surrounding lime into the gaps, repairing them. Lime mixes are easy to chisel out when the time comes to repoint although, as Meek points out, that time may be a long way off: "I've seen 600-year-old castles with their original mortar, and they're in fine shape."

the original mortar analyzed so he could order the same recipe. The assay revealed the proportion of lime to sand, the size and color of the sand grains and the compressive strength of the brick. The analysis is expensive ($500), but he says he prefers to "know exactly what's in it, rather than guess." Even without the test, he gets a good idea of mortar type just from knowing the year a house was built. He double-checks his hunches by chiseling out a small piece of mortar and dropping it on the sidewalk. A piece containing a lot of cement makes a high-pitched ring; a chunk containing mostly lime makes a muffled thud.

The right repointing technique ensures the work will last. At the Rogers house, John Machnicki takes chisel and hammer and starts raking the joints clean to a depth of 1 inch. He takes care not to break the brick's hard fire-skin, which protects the relatively soft core.

Chiseling is tedious, painstaking and, for cement-covered joints, frustratingly slow. It's easy to see why repointing by hand costs as much as $25 a square foot. Using an electric grinder with a diamond-tipped blade can cut the cost to $5 per square foot, as long as the joints are more than ½ inch wide. But grinders must be handled with skill and restraint—on horizontal joints only, never on vertical—because these powerful tools are notorious for damaging brick. The Machnickis won't use them at all when restoring historic buildings.

Home owners who try to save money by tuck-pointing (patching new mortar over old without chiseling) are throwing their money away, Mario Machnicki says. At best, tuck-pointing leaves a weak connection between old and new mortar layers; at worst, it makes joints wider and more susceptible to water infiltration.

When John Machnicki finishes hand-chiseling, he squares the cut and cleans dust out of the joints with a compressor-powered pneumatic chisel. "The mortar bonds better to the clean, chiseled surface of the brick," his brother says. Mortar can't bond to paint or wood so, between brick and window casings, he leaves a gap to be filled later with caulk. "That's a housepainter's job, not a mason's."

Before the younger Machnicki refills a joint, he mists the wall with water to keep the mortar from drying too quickly. Then he scoops a glob of the sticky gray mix out of a bucket and onto his plasterer's hawk. Holding the hawk up to the wall, he scrapes fresh mortar into the joint with a narrow tuck-pointing trowel. He doesn't fill the joint in one pass. Instead, he makes three to four passes, each time pressing in a thin layer of mortar. When it becomes thumbprint-firm, anywhere from 30 minutes to 24 hours later, he cuts off any protrusions with a pointing trowel. A few whacks with the bristle end of a stiff brush, and the joints match the weathered look of the originals.

When finished, the new patches at the Rogers house are undetectable. As always, both Machnickis are proud of that, although it once caused them some trouble. Mario Machnicki recalls: "We sent a bill to a customer after one repointing job, and he complained, 'You haven't even done the work yet!'" ■

Repointing Rules

1. **Whenever mortar has lost ¼ inch of its original depth, it's time to get out the chisel and go to work.**
2. **Thoroughly rake out and clean joints to a depth twice the width of the joint.**
3. **Do not chip, cut or remove the brick's fire-skin, which will accelerate decay.**
4. **Make sure the brick is stronger than the mortar. In general, houses built before 1930 have softer brick, which makes them likely candidates for old-style lime mortars. To know for sure, have an engineering lab analyze a brick for compressive strength.**
5. **Repoint only when temperatures remain between 40 and 90 degrees Fahrenheit, even at night. Cold makes mortar brittle, while heat dries it out and prevents hardening.**
6. **Keep fresh lime mortar damp for at least 3 days so it can harden before it dries. Taping plastic sheets over repointed areas will slow evaporation. After the sheets are removed, hose the wall periodically during dry spells to speed hardening.**

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BY GARY BELSKY

LAND RUSH

Don't jump too quickly into that great American frontier

Robert Borne and his wife had long wished for a house in the country, for the space and views their city home lacked. To make their wish come true, they bought a 1-acre parcel about a half-hour's drive from Detroit, on farmland that a developer had cut into 30 lots. Then the couple—he's a neurologist; she's a hospice nurse—hired an architect. They liked the architect's design, except that the main rooms faced poor views to the west. No problem, said the architect. He could rotate the house so it looked out over the Bornes' pristine woodlot, if they cut down a 60-foot-high oak that stood where the garage would be. Too bad, but so be it, they said. The architect made the change, and the Bornes were ready to build their dream. Then reality got in the way.

When the Bornes showed the developer their plans, they learned, to their surprise, that he had the right to block construction that involved tree removal. He refused to sign off on their blueprints, so the architect worked out a new plan, which preserved the 100-year-old oak. But because the plan put the garage on a steep slope, the Bornes had to spend an extra $10,000 for structural enhancements. "We thought we'd planned for everything," says Borne. "But until a house is up, you don't know what 'everything' is."

Building on a piece of raw land may be the last frontier fantasy left in America. But it's also "one of the most complicated and potentially costly projects an individual can undertake," says Joe Molinaro, director of land

PHOTOGRAPH BY ERIC O'CONNELL

development services for the National Association of Home Builders. So complicated, in fact, that the National Association of Realtors established the Realtors Land Institute, which trains and accredits brokers who want to specialize in undeveloped property and farmland. That kind of real estate differs from so-called developed plots, which typically come with roads and utilities as well as specific zoning and, as the Bornes belatedly discovered, developer requirements. Deals for both kinds of property must be thoroughly researched, says institute president Roger Heller. But, he adds, "With a developed lot, some of the issues that matter—like the kind of house you can build—are more clearly defined. With raw land, finding out what you need to know takes more digging."

To avoid getting burned by unknowns that turn into tough restrictions, prospective owners should be obsessive about finding out not only what others will allow them to do with their property but also what the land itself will permit. The sales contract, for instance, usually contains the developer's dos and don'ts. From their contract, the Bornes knew that the developer had the right to approve house plans and that he required brick or cedar siding and forbade detached garages and freestanding sheds, but they missed the words about tree cutting.

Other restrictions come from federal, state and local agencies, often in bothersome abundance. "Private property is no longer the sacred cow that it once was in this country," says St. Louis land-use attorney Robert Denlow. "Land is subject to more and more government regulation." The feds, for example, have a great deal of authority over what can and can't be built on designated floodplains. A state may control the way a landowner's road connects with one of its own. A local government typically enforces zoning ordinances that specify how much house can go on how much land and how a well must be dug and a septic system installed. All three Big Brothers may have setback requirements aimed at keeping construction away from vulnerable or sensitive areas such as wetland, coastal, lakeside and riverbank property and Native American burial sites. "State and local governments frequently redefine setbacks and require more and more space between proposed structures and protected land," says Patricia Frisch, a real-estate attorney in Wilton, Connecticut. "If you don't know that when you buy, you could be in for a surprise when you try to build."

Ideally, the seller or the seller's broker will disclose any and all information that could affect the buyer's development plans. Twenty-nine states require full disclosure, and the National Association of Realtors requires the same of all its agents. But a buyer has no way of knowing that a seller or agent has come across with all the facts. To close any information gap, says Winnie Stortzum, a land broker and a member of the Realtors Land Institute, "Go to town hall or the county courthouse to check out all the regulations yourself." Retaining a broker in land deals may not only speed up the basic research but also help you learn about a town's plans for future development—and resulting zoning changes—that could affect your project.

Yet even the most thorough research can't stop regulation-creep. In the space of a single planning and zoning department meeting, land once unfettered can be strangled by regulation. New rules typically don't affect approved building plans, however, as long as they stay the same. "Try to amend your plans, and a zoning board might stop you from doing what you want," says Denlow. It's also important to review a town's or county's master plan. "You may think you are buying an isolated piece of land but find out that, in a few years, you could have a four-lane highway outside your house," says Molinaro.

The county or local government can also be the place to investigate the availability of public services (water, sewer, electricity and roads). When the developer provides those necessities, a buyer need only ask about hookup locations and tax assessments. In remote areas, where the landowner usually pays for the road, the well, the septic system and the power lines, costs can escalate shockingly. Much depends on whether the land lies flat or rises steeply and whether drinking water will come from a shallow or deep, and expensive, well.

Land's immense variability makes it extremely important, before you buy, to test a property's suitability for development.The percolation (or perc) test, which virtually all state and local governments require, determines if the soil drains well enough to allow for a septic system. The property may also need environmental tests to make sure there is no toxic waste or other pollutant on the site or seeping across the property lines. A soil stability test, especially on sloped land, will confirm that the ground can support a house, and a drilling test will show if an adequate water supply can be developed.

Above all, expect to be surprised. When the Bornes' builder dug the foundation for their house, he discovered a large amount of topsoil had been dumped on the lot. "If he had built on it, the house would have settled and cracked," says Borne, "so he had to do much more excavating to get down to solid ground." The Bornes got lucky when the builder didn't dun them for the extra digging and soil removal. They were unlucky, however, to the tune of about $1,000 when their well-driller had to bore down an extra 100 feet to reach water. Still, the Bornes, who moved into their country house 10 months after buying the land, have few regrets. But, says Robert, "If we ever do this again, our eyes will be wide open." ■

A Land Lover's Checklist

Like a house on the market, land should be researched, appraised and otherwise checked to make sure it's not a minefield of hidden development costs and restrictions.

- **Pull a land survey from county or municipal records and look for conditions that could impede development, such as wetlands, easements, utility hookups and setbacks.**
- **Get estimates on how much it will cost to put in a road, and find out about requirements on location, size, drainage and access to the main road.**
- **Check with government authorities to determine if the land is in a protected coastal area or if it is classified as wetlands. Ask about other environmental issues such as animal habitats and tree preservation.**
- **Confirm with the building department that you can obtain a building permit and find out what it will take to get one. If the land survey shows no easements, ask whether any exist for utilities or roads or if there are other restrictions.**
- **Commission an appraisal to assess the parcel's true market value. For $175 to $500, you can learn a lot about selling prices for comparable lots, and you can tap the appraiser's knowledge of what nearby landowners are up to.**

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BY DENNIS WEDLICK

IN TRANSITION

A patio or a deck should connect a house with the landscape

A patio off the family room of a house in Easthampton, New York, is "stamped" concrete with a color wash—a cost effective alternative to stone. The ground has been banked at the front edge of the patio to eliminate the need for steps. The railing will be removed when the inkberry shrubs grow tall enough to provide a visual barrier.

One of the most challenging things to think about in house design is the transition between the inside and the outside. Almost everyone wants some sort of outdoor living space near the house—a terrace, a deck, a patio, a pool area. These places for lounging and eating can make a house feel grander and more permanent, as if it has been there longer. Without them, a house can seem like a bus stop rather than a destination all its own.

Unfortunately, design experts tend to overlook these areas. Take, for example, the patio and steps leading from a house to a yard. Many architects say that's the province of a landscape architect. But many landscape architects say the job should go to the architect. The steps represent the edge of an architect's expertise and the edge of a landscape architect's expertise. Home owners rarely call upon both experts to help with these areas. Yet they are critical to the overall sensibility and success of a house. When designing a new house

PHOTOGRAPHS BY JOHN KERNICK

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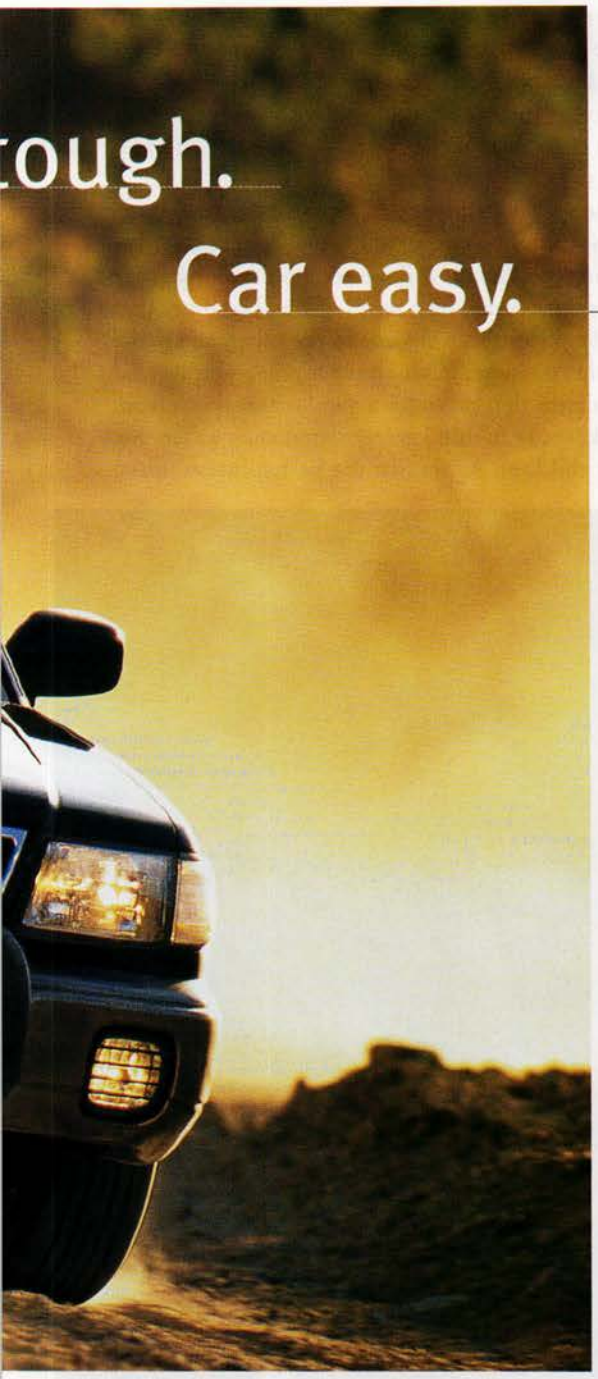

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or renovating, the outdoor spaces must be considered at the very start. Take a good look at the land around the house and remind yourself what attracted you to it in the first place. Then build accordingly.

People often extend their outdoor space simply by ordering up a raised deck and tacking it on the back of the house. That sort of contraption doesn't really respond to the architecture of the house, let alone the surrounding landscape. It creates deep, weird shadows beneath it, and it usually looks as though some sort of scaffolding has been erected. One can't help wondering when the project will end.

A raised terrace or patio of brick or stone can provide considerably more interest than the average deck. Elevated on a bed of sand and gravel and supported with a short retaining wall, it should sit high enough to appear to float above the surrounding land, but not quite as high as the porch or entryway from which it extends. Unlike a deck, a brick or stone patio doesn't sit on stilts, so it doesn't have that dark cavern below. It becomes an elegant, earthbound transition between the house and the grass. There's nothing wrong with trying the same approach with wood and decking materials—particularly in very hot climates, where wood feels cooler than stone after baking in the sun. But keep the same principles in mind. Railings on a deck tend to separate people from the ground, and create a visual jumble where they meet the house. Instead, keep the deck low, and let it cascade to the ground in graduated levels and steps. The final steps or layer should lie no more than a few inches above the land. That way, you can skip the railings altogether.

Nearly level with the interior floor, the terrace in front of Wedlick's house in Columbia County, New York, provides for a larger outdoor space than the original covered porch allowed. A slight curvature of the bricks gives the terrace a basket-weave effect, and the granite used for edging complements the color of the house.

The grading and the landscaping around a deck or patio are as important as the structure itself. For example, if the house is tucked into the woods and you have a low terrace or deck meeting the forest, bring ferns and plantings up to the deck area, then add stepping stones that lead away from the patio to create a pathlike feeling, recommends Margie Ruddick, a landscape architect in Philadelphia. With a wooden deck, try turning the path into a boardwalk. Or take the opposite idea: Suppose the deck or terrace overlooks a large open area and must provide a transition to a meadow or smooth lawn. All too often, this is when the shrubbery is hauled in—an expensive proposition that tends to throw off the scale of the house and detract from the image of the house sitting out and commanding the landscape. A more effective—and usually cheaper—solution is to grade the site cleverly and allow for interesting changes in contour and elevation. The unadorned patio can then stand on its own.

Another nettlesome spot is the steps leading out from the house. The typical approach—building two or three quick steps down—does nothing to unite the indoor and outdoor areas. Far better are steps containing a series of small landings that elongate the transition from one to the other, and make for a gentler passage. If you have a pool, you'll need to create a path that provides a similar transition from the deck, keeping in mind safety issues such as fencing to protect children. Again, for the best solution, unite the pool with the entire area leading from the house to the water, rather than isolating it and handling it separately.

No matter what the site, the key to a good inside-to-outside design is to respect all three parts of the property—the house, the transition space and the land. The mistake most people make is to see them as separate and distinct from each other. The magic occurs when they are linked as a whole, each leading to the next. ■

PHOTOGRAPHS BY MICHAEL LUPPINO.

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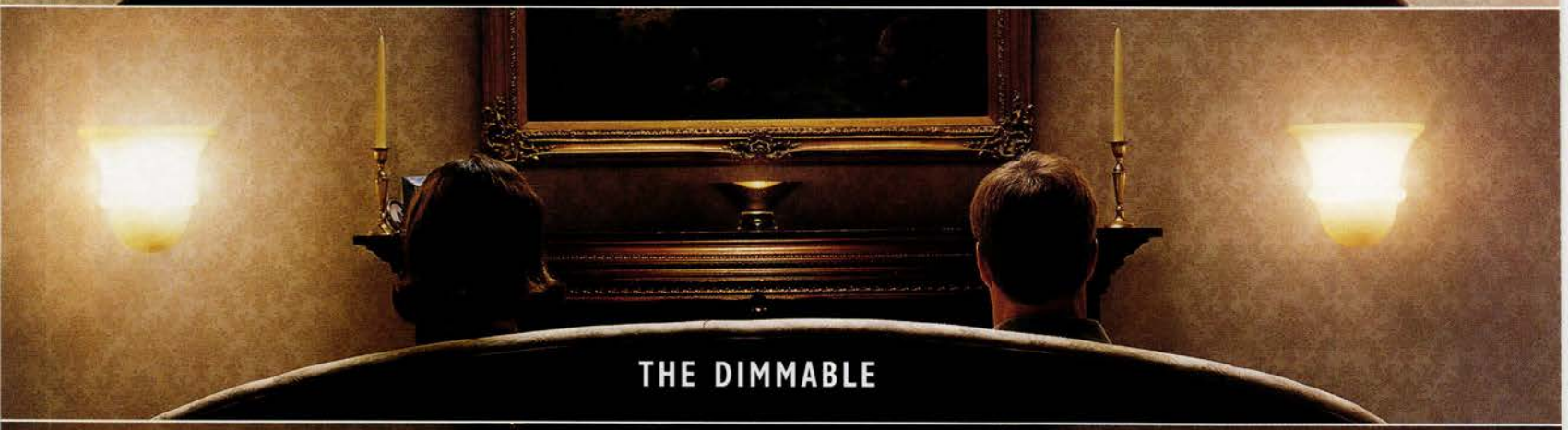

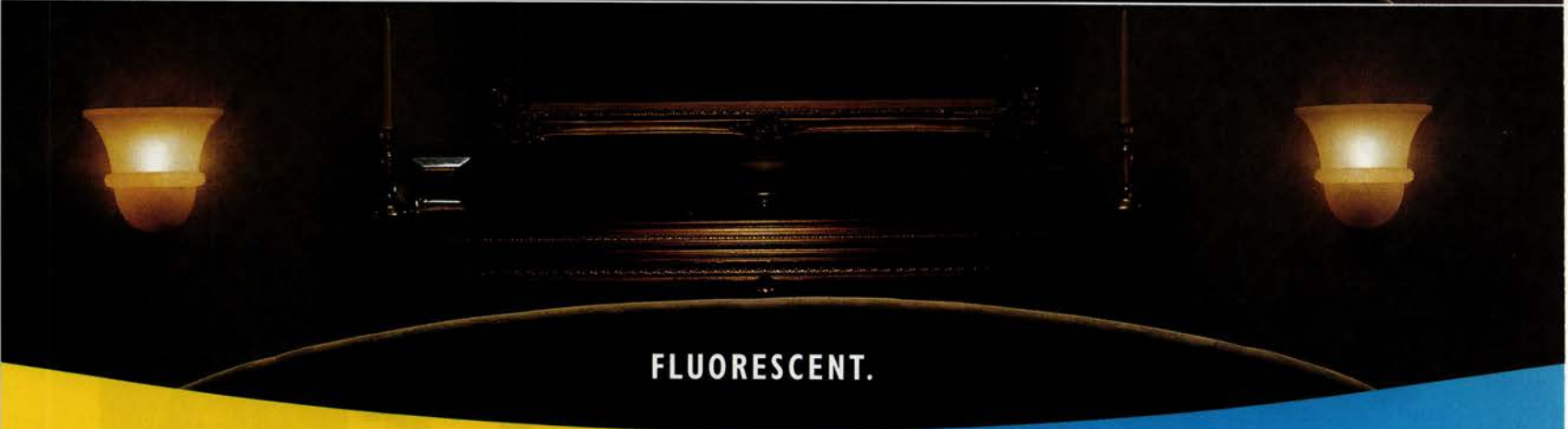

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commonplace and, in many locales, the high on the hottest day of the year exceeds the low on the coldest day by more than 100 degrees. This thermometer joyride causes immense expansions and contractions in old houses. Joints and seams open easily, and there appears to be no easy or inexpensive defense against thermal shock.

When we discovered the wallpaper smudge, Farmstead's chimney had recently been repointed and scaled. The roof, flashing and gutters were not even five years old. The attic had good insulation and ventilation, both of which help to minimize condensation and potential leakage. Yet the smudge was stark evidence that Mother Nature had poked a hole in our armor. Or so it seemed until we discovered a second water spot, near a chandelier in the dining room, directly below the guest bedroom. Maybe water was tracing down the chimney, then along ceiling joists to a low point as far as 15 feet from the presumed hole in the roof. Because old houses are rarely plumb or level, water can meander in directions that defy logic. Or, someone suggested, the leak wasn't coming from the roof and chimney at all. Perhaps the source was an adjacent guest bathroom.

I made emergency calls to the man who had installed the roof as well as to a plumber. But train wrecks, drive-by shootings, volcanic eruptions and meteor showers are easier to predict than the time that a roofer or plumber will show up during a crisis.

The plumber arrived first—two days later. He immediately ripped up several sections of tile floor to see if the leak might lie somewhere in the bathroom pipes. Finding nothing, he attacked the dining room ceiling, thankfully missing the lovely plaster molding and the rare French woodcut grisaille wallpaper. When Pamela returned home, she watched in horror as the plumber drilled three more gaping holes, all of which revealed nothing. Finally, he concluded that bathroom plumbing was not the culprit.

Our roofer, a wiry lad named Scott who is fearless when it comes to heights, surmised that the source of the leak must be closer to the ozone layer, atop Farmstead's 25-foot-high roof. "Roofs leak because they are on top of the house. That's where the water lands," he explained with Newtonian clarity. "I don't care what kind of material you use—the 30-year asphalt shingles many people favor up north, the fiberglass ones they like down south, old-fashioned cedar shakes, Spanish-style tile, copper sheathing. You name it; it'll leak. Old houses are like old bones. They stretch when it's hot. They shrink when it's cold. Trust me: Wherever there's a gable, a chimney, a cupola, a dormer or a ventilator, there's a potential for a leak. Maybe not today, maybe not tomorrow, but it's gonna come."

Over the years, leaks ruined much of the French woodcut wallpaper hung when Farmstead was built in 1912. After Yates redid the dining room with a floral-patterned paper, he preserved a damaged panel of the original wallpaper and framed it with molding.

After two days of poking among the shingles and flashing above the guest room fireplace, Scott found a dime-sized crack in the sealant between the chimney bricks and the side of the house. He slathered asphalt-based mastic roofing cement over the area around the crack, then put down a layer of fiberglass mesh and a final coat of mastic. Meanwhile, Pamela and I muttered incantations to the weather god.

Happily, we completed the repairs before our guests arrived. Fresh wallpaper was in place, and new plaster covered the plumber's futile probings. All was back to normal, save for the $1,120 hole the episode put in my home-owner's insurance policy plus the $500 deductible I paid.

We thought our troubles were over. But 18 months later, what Pamela has come to refer to as "our mother of eternal leaks" returned. The great ice storm that descended on the Northeast last winter apparently made another wound in Farmstead's armor. This time, water stains have appeared on a wall beside the dining room fireplace. I've contacted roofer Scott, who will no doubt come armed with more mastic and have plenty to say about the utter futility of doing battle with Mother Nature. And I've placed another telephone call to my increasingly skeptical insurance agent, who remains mystified by thermal shock. ■

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BY WALT HARRINGTON
PHOTOGRAPHS BY MARY ELLEN MARK

blacksmith

Why Charlie Keller has to think hot

an american craftsman

CHARLIE KELLER IS DANCING between thinking and doing. That's how he imagines his work as he takes up an iron poker and stokes the fire he has just built from soft Pennsylvania coal. The flames gently rise a foot, and the piece of iron Keller has put in the fire glows at 1,100 degrees Fahrenheit. He knows the temperature because the iron is bloodred. When he switches on the forge's blower, the flames lick higher and arc toward the mouth of the chimney. In the next few minutes, as Keller readies his tools, the iron in the forge runs through the spectrum that acts as a blacksmith's thermometer.

Bloodred: 1,100 degrees.
Dark cherry: 1,300 degrees.
Orange: 1,800 degrees.
Light yellow: 2,300 degrees.
Dazzling white: 3,000 degrees.

When hot iron turns the color of dark cherry, the metal is soft enough to reshape with a hammer. At light yellow, it goes slick—resembling a glowing ice cube—and is ready to forge-weld. At dazzling white, it begins to decompose and flares like a Fourth of July sparkler. Keller knows what iron will do at each color as he forges replicas of colonial hoes, spades and rakes; ladles, hasps and potato hooks; and, the tool he is making today for a New Zealand museum, a Kentucky ax.

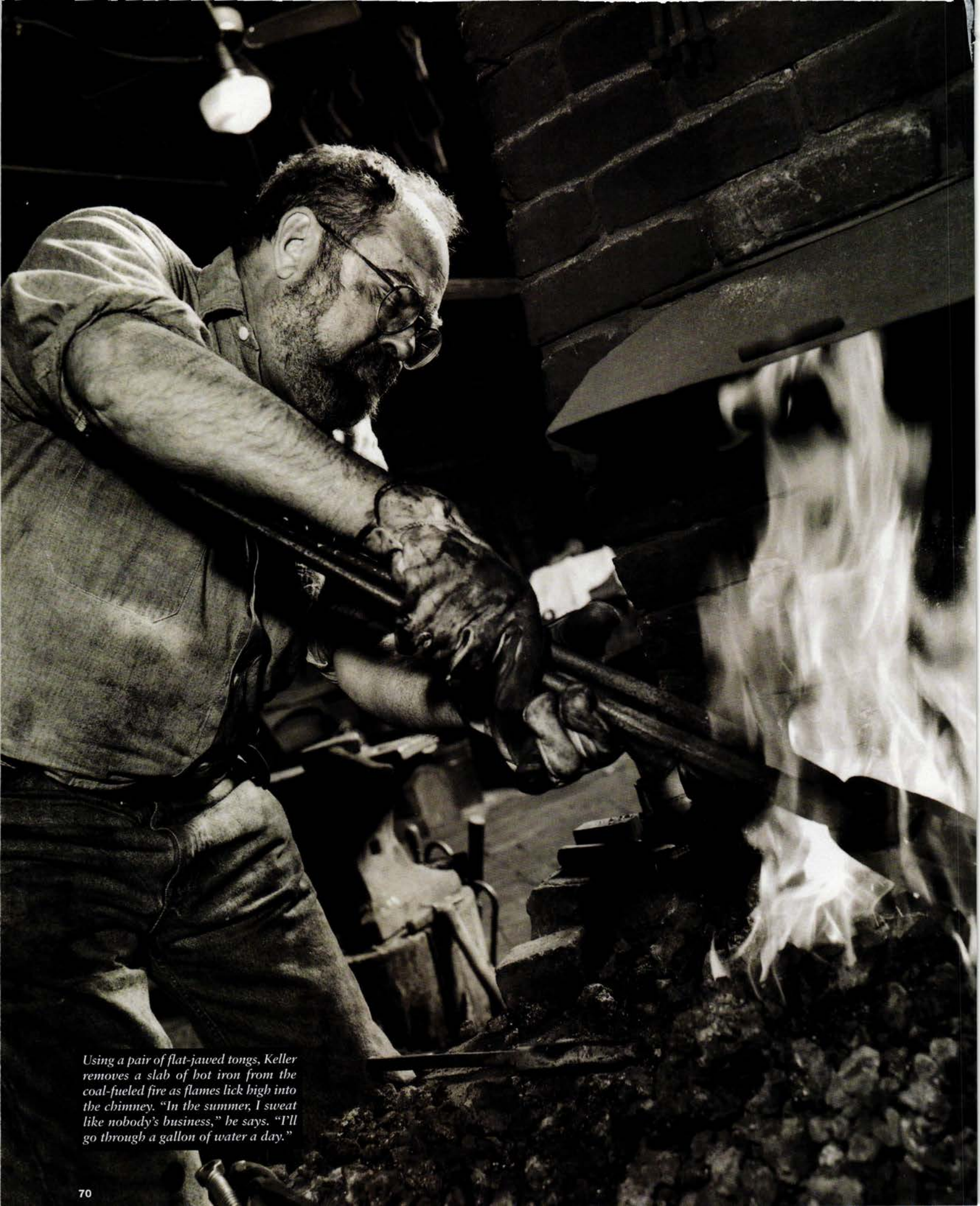
Without giving it much thought, he reads the fire thermometer. This morning, at light cherry, he will hammer indentations where the Kentucky ax handle goes. When the ax head glows orange, he will remove it and pound it 30 times on his anvil with a 2½-pound hammer to begin forging a cutting edge. When the luminescence of the ax dulls, Keller will feel the hammer hitting more solid iron and will hear its concussion clanging at a higher pitch. Then he will know it is time to stop and plunge the ax back into the flames.

He will do these things as instinctively as a speed skater crouching more deeply at the hint of a head wind. No analysis, all sensation, with mechanics and intuition layered upon each other seamlessly. In the way that, away from the rink, a skater could calculate the physics of wind resistance, Keller could check hot iron's exact Fahrenheit readings by turning to a chart in his book *Cognition and Tool Use: The Blacksmith at Work*, coauthored with his wife, anthropologist Janet Dixon Keller of the University of Illinois at Urbana-Champaign.

But he doesn't. In his blacksmith shop in rural Newman, Illinois, the exact temperatures on that chart might as well be written in a foreign language. It is the language of fire—and the language of experience, imagery, *(continued on page 71)*

Keller's tools are similar to those used by Ignatius Streibich, who in 1870 built and opened the blacksmith shop in Newman, Illinois, where Keller works. A 1914 Little Giant trip-hammer delivers repeated blows for forging hot iron.


THE NEW LITTLE GIANT
TRIP
HAMMER.



Using a pair of flat-jawed tongs, Keller removes a slab of hot iron from the coal-fueled fire as flames lick high into the chimney. "In the summer, I sweat like nobody's business," he says. "I'll go through a gallon of water a day."

(continued from page 68) motion, weight, balance, sound, sight and feel—that a blacksmith must read. Years ago, Keller was only a reader of words, a professor of anthropology. His curiosity slowly pulled him into the world of craftsmanship, where ideas can't be distinguished from objects, thought can't be distinguished from labor—doing *is* thinking. Today, his lifework is to help the millions of us who no longer make objects with our hands to appreciate the few of us who still do.

"Humans are makers," says Keller, a short, rounding, muscular 61-year-old with a graying beard and rough, thick hands. This morning as he works at the forge, smoke swirls in beams of sunlight that shoot through his dim shop's few windows. The iron in the fire smells like a cast-iron skillet that's been on a hot stove too long. "We have forgotten that, for two and a half million years, everyone made things," he says. Sometimes, when Keller is listening to an academic colleague argue that a craftsman shapes, say, a ladle as he does because its dipping function requires its bowl-like form, Keller can only shake his head. His chattering colleague usually has no idea how many hundreds of choices and millions of tiny experiences go into the handmaking of even a simple ladle. *Yeah*, Keller will think to himself as the man speaks, *come out to the shop, and I'll give you a hammer.*

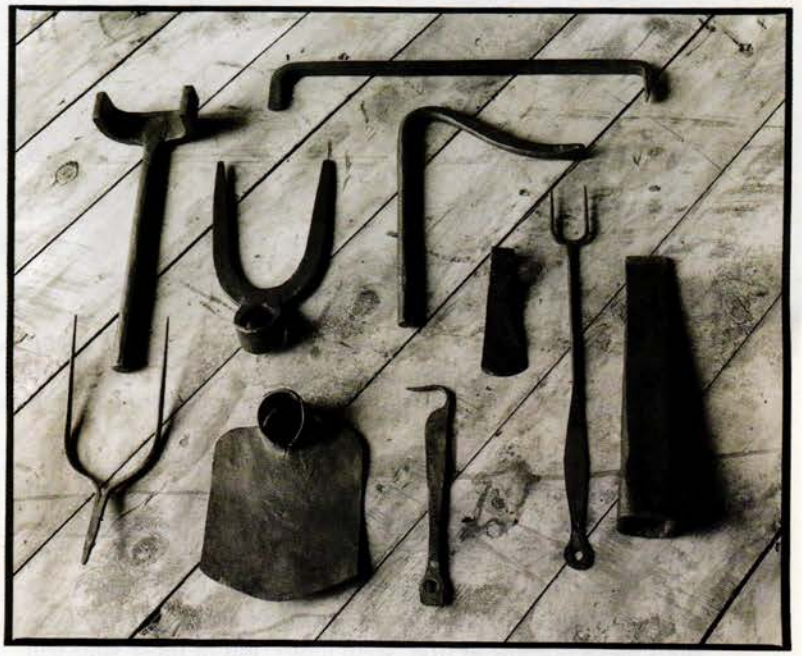
Keller was a California boy who was going to be a trombone player, until he took an archaeology class in college. He got hooked. He earned his doctorate from the University of California at Berkeley and excavated African sites where people had made stone tools 400,000 years ago. His crew's dirt picks kept dulling, so he hired a Tanzanian blacksmith to forge them sharp. For hours on end, Keller found himself watching the old man, wondering exactly how craftsmen *thought* about their work.

Keller was always handy. As a boy, he built model sailboats. As a teen, he rebuilt a '31 Ford. As a man, he worked on his own house, even reroofed it. He loved solving the little problems of workmanship, figuring out just how to file the curve of a sailboat's wooden bow so it would slice through the waves, how to set the old Ford's carburetor to spit just the right mouthful of gas, how to calculate the rows of shingles so they'd end up hanging the correct ⅜ inch over the roof's edge. But he also loved the doing: laying row after row of shingles, the aching in his hammer arm, the smell of tar and sweat, his left hand reaching for a shingle, his fingertips feeling its tacky warmth from the hot sun, sliding the shingle into place, reaching for a nail held in his mouth and pounding the nail in with three dead-on hammer blows. And doing it again, again and again. It was beyond ideas and words.

Yet he knew that, to many intellectuals, physical labor is equivalent to the force that machines bring to bear on a job—blind, brute power. Keller believed otherwise: Physical labor wasn't akin to dumb force but was a kind of intelligence. People often thought that a craftsman was closer to a draft animal than to a thinker, Keller suspected, because they didn't understand the amazing coordination of human senses that accomplishes the work. But he figured there was only one way to unravel the mysteries of thinking and doing.

"I needed to be taught something real."

So 23 years ago, Keller decided to learn a craft. Remembering his fascination with the Tanzanian blacksmith, he moved to Santa Fe, New Mexico, and apprenticed himself to two blacksmiths. He cleaned floors, painted walls, lugged iron—and struggled to learn blacksmithing, which to an observer looks awfully simple: heat, hammer, bend.

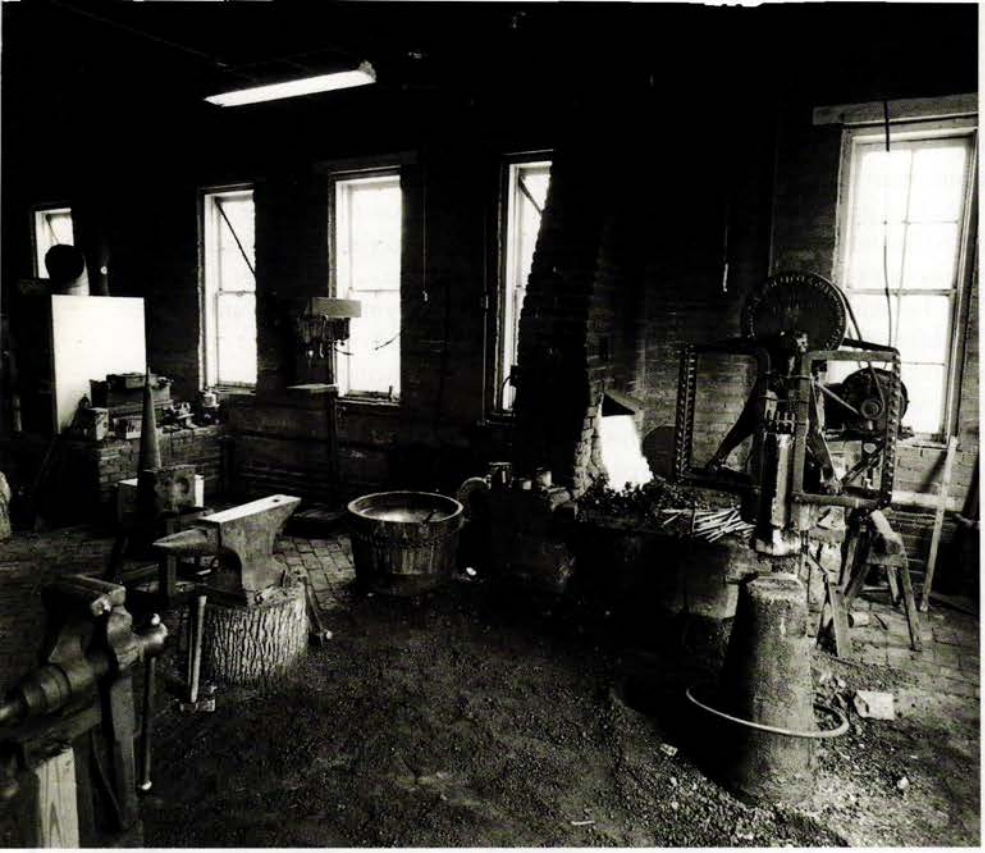


A collection of colonial-era tool and hardware replicas made by Keller. *TOP:* ***a log dog for hewing timbers.*** *MIDDLE:* ***a wagon wrench, a potato hook, a woodworker's hold-down, a hatchet, a toasting fork and a socketed splitting wedge.*** *BOTTOM:* ***a pitchfork, a hoe and a gate hook.***

One day, Keller was trying to read the temperature of a piece of hot iron, hold it with tongs in his left hand and turn it like a slab of meat to heat it evenly, use his right hand to adjust the amount of coal he needed, make certain that ashes weren't building up in the firebox and cooling the fire, watch for the iron to turn light cherry at 1,600 degrees so he knew it had reached forging temperature, figure out what tool he was going to use to shape the iron once he pulled it from the flames. No doubt, he was looking as awkward as a gritty nail-banger in a philosophy class when one of his mentors, standing in the shop, calmly smoking a cigarette, said, "Think hot."

Think hot? What the hell did that mean?

In time, the admonition revealed its meaning. A blacksmith must think as if he were his material, as if his material were, well, alive. Fine woodworkers often imagine that their walnut or mahogany is alive and helping or resisting the craftsman. A fine locksmith will imagine that his locks are talking to him. A coppersmith



Tools and fixtures in Keller's shop include, from left, a vise, an English-pattern anvil atop a stump with hammers leaning on it, a slack tub, a brick forge, the fire, various tongs and a trip-hammer. The dirt floor traditionally accommodated horses brought in to be shod.

will imagine that his copper has agreed to be molded.

A blacksmith must accept the nature of iron and fire and tools—and think as they would, if they could. "Think hot" was practical and metaphorical advice, akin to a music teacher telling a student to relax and enter the music or a veteran race-car driver telling a novice to let the car drive itself. The suggestions mean nothing at first, seem loony. But in those who will someday be the best musicians, race-car drivers and craftsmen, the advice poses a mental and emotional stance toward *doing* that is beyond words.

That day, though, Keller was a long way from beyond anything. He first had to learn that to get the right striking angle he must stand square to his anvil with his feet in a baseball batter's stance; that to thin, thicken, lengthen, narrow or spread hot iron he must use a metal hammer, but to straighten twisted iron he must use a wooden mallet; that the forge's firebox must be large enough to allow most of the oxygen to be consumed, or oxidation will pit the iron; that a ½-inch-thick iron bar heated to 2,500 degrees stays hot enough to forge for only 60 seconds; that when punching a hole in hot iron, he must feel the first strike when the punch no longer indents the iron, because an extra hammer blow will bury the punch in cold iron, like King Arthur's sword in the stone; that a knife blade's balance must be determined by its feel in the hand; and that when iron reaches forge-welding temperature it erupts in almost imperceptible sparks.

And those were mere details. In his head, Keller had to learn to create a picture of the object he hoped to make and then to imagine all the steps between. This imagery, as he came to call it, demanded not only experience but retrospective knowledge: the ability to look at finished objects by other craftsmen and to work backward to unravel the steps taken to make those pieces. From this, Keller learned the unspoken value blacksmiths share: Made objects should look as if they grew that way.

So they must be forged hot in 60-second intervals, because cold-hammered iron looks stiff and lifeless. The revelation to Keller was that blacksmiths don't revere their final objects—they revere what a man must know and master to be able to make the objects. As much as any intellectual, they revere knowledge.

"It's knowing for doing."

People often think of craftsmen as commonsensical mechanics whose skills grow from dexterity, patience and repetition. Keller came to reject that idea. "Craftsmanship is not common sense. What craftsmen do isn't intuition. It is hard-learned and complex and visual and intellectual. Always, there's a risk of failure. That's the rush." Over the years, Keller came to understand why craftsmen are often so bad at describing how they work. "They aren't verbal because the knowledge isn't verbal." Could Charlie Parker have put his saxophone playing into words? Could Laurence Olivier have explained how he became Hamlet? Could Janet Evans elucidate what happened when she hit the water? Keller discovered that competitive swimmers move more slowly when they think too much about stroke mechanics. Musicians play worse. Performers act stiffly.

"A lot of mental people really do think manual labor is of a lower order," Keller says. "But labor isn't just the means to the thrill of being done. There is satisfaction to the labor itself. Passion for the work grows from the feeling you get doing the work." He compares it to the runner's high. "I'm saying that the tactile, visual and physical are as important to developing intelligence as language and that this intelligence is acquired from interacting with objects. This carries profound implications for a society where we no longer produce anything."

Finally, after 15 years of blacksmithing as research, Charlie Keller committed the anthropologist's greatest sin—he went native. He quit teaching and bought a share of an 1870 blacksmith shop that was being used for storage. Today, his tool replicas are in museums and at living-history sites in more than two dozen states and several countries. His tools appear in the film of *The Last of the Mohicans*. A few years ago, *Early American Life Magazine* named Keller one of the finest 200 traditional craftsmen in the United States. Yet, at night, he still writes academic articles about the mind of the craftsman.

"I want the thoughtfulness of these men recognized."

By the end of the workday, Keller is drenched in sweat. The temperature at the forge can rise to 130 degrees. Today, he has put the pieces of his Kentucky ax head in the fire and taken them out again probably a hundred times, forge-welded them together and hammered out the rough shape of a cutting edge. He has swung his hammer maybe a thousand times. He's tired and filthy. Grime is caked under his nails, and muck outlines the wrinkles on his neck. He wipes a streak of ash from his forehead. "That's why philosophers don't want to deal with this stuff," he says, laughing. "It's too dirty." ■

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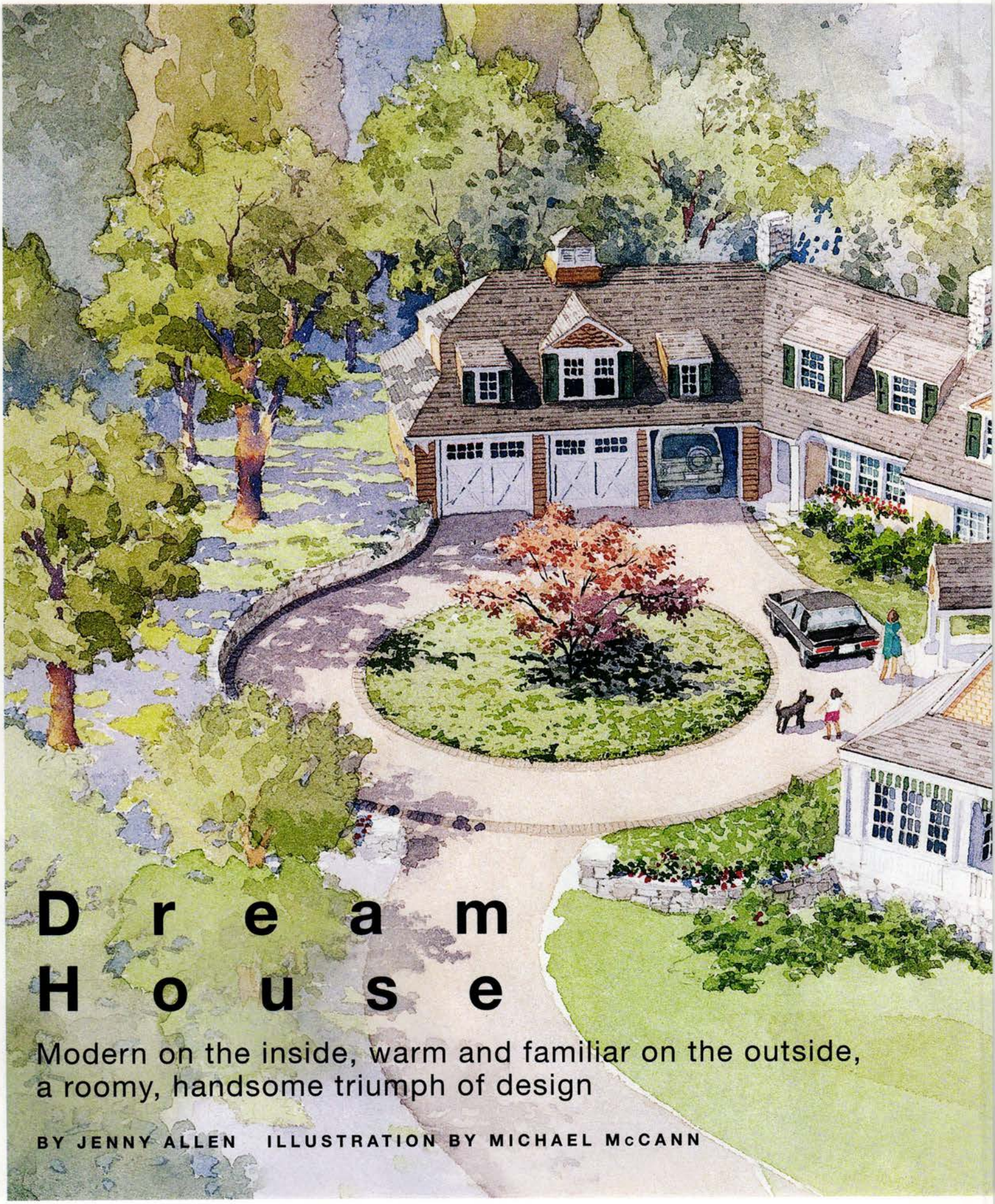
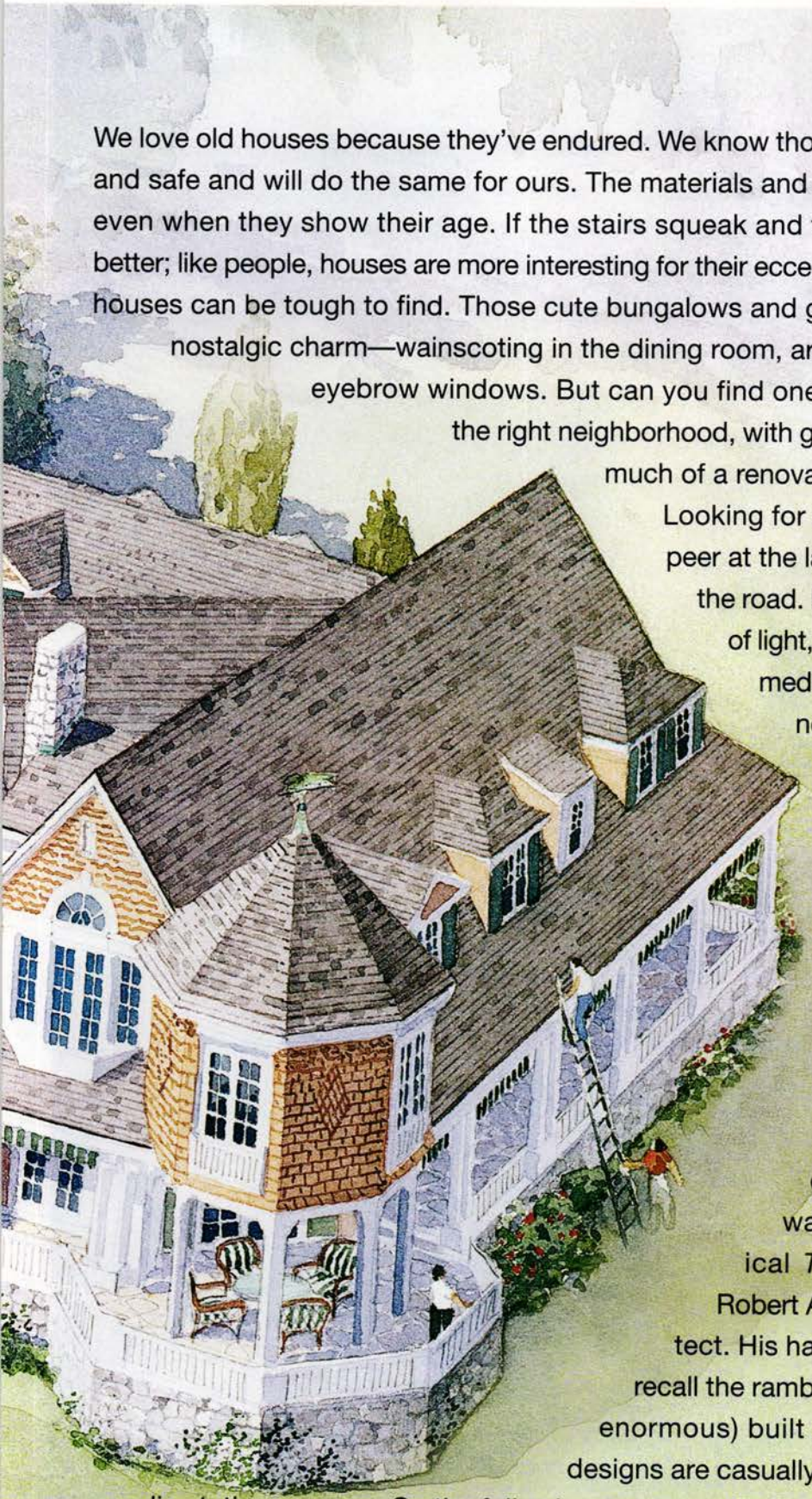
Keller shapes the cutting edge of a Kentucky ax head. He swings his 2½-pound hammer until the blows begin to ring sharply, indicating that the iron has cooled too much and must be reheated.



Dream House

Modern on the inside, warm and familiar on the outside, a roomy, handsome triumph of design

BY JENNY ALLEN ILLUSTRATION BY MICHAEL McCANN



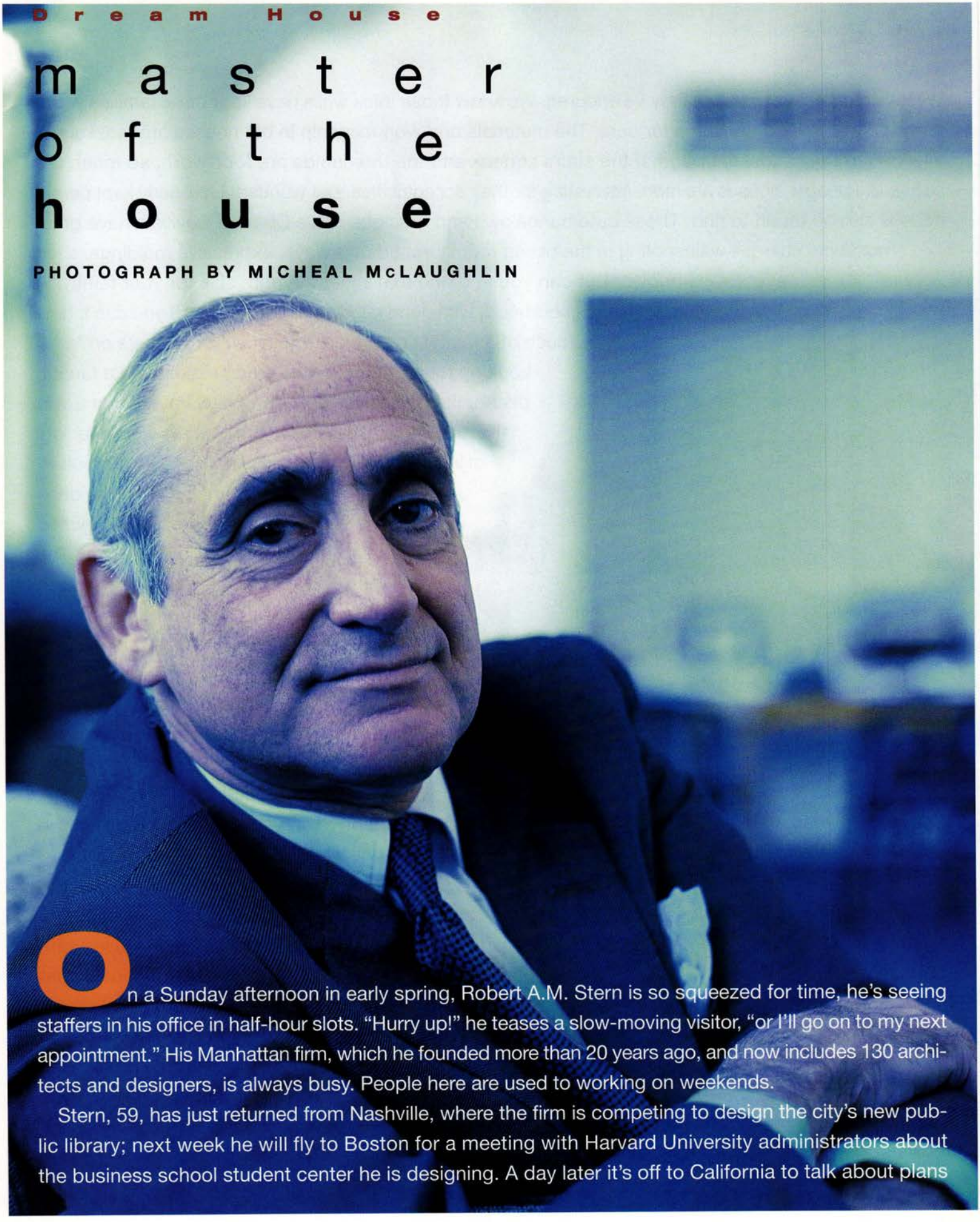
We love old houses because they've endured. We know those thick walls have kept other families warm and safe and will do the same for ours. The materials and workmanship in old houses are reassuring, even when they show their age. If the stairs squeak and the thresholds are foot-worn, so much the better; like people, houses are more interesting for their eccentricities. But wonderful, properly kept period houses can be tough to find. Those cute bungalows and gracious 1920s Colonial Revivals have great nostalgic charm—wainscoting in the dining room, arched doorways, expressive moldings, even eyebrow windows. But can you find one that's just the right size for your family, in the right neighborhood, with good schools close by? And if you can't, how much of a renovation project are you willing to take on?

Looking for a great old house can make even a fanatic peer at the latest development of new houses just down the road. New houses have the features we crave: lots of light, roomier rooms, huge kitchens, master suites, media rooms and walk-in pantries. And they don't need anything but curtains. Yet freshly minted houses tend to be short on character. The rooms have flat and featureless moldings, the windows are divided by plastic snap-in muntins, the floors are covered by carpeting—not hardwood—and the doors are weightless. Worse, many new houses look self-important and silly outside—do you really want to live in a developer's version of a French château?

To show how a new house could be designed with all the charm, reassuring warmth and thoughtful detail found in a typical *This Old House* renovation, we went to Robert A.M. Stern, a premier American house architect. His hallmark: romantic Shingle Style houses that recall the rambling late-19th-century "cottages" (some are enormous) built up and down the Eastern Seaboard. His designs are casually elegant and as familiar as khakis, jazz and woodie station wagons. On the following pages you'll see what the collaboration between Stern, *This Old House* and Connecticut builder Walter Cromwell has wrought—our newest Dream House. Join us as we build it and discover how every room of our house contains ideas that will work in your house.

master of the house

PHOTOGRAPH BY MICHEAL McLAUGHLIN



On a Sunday afternoon in early spring, Robert A.M. Stern is so squeezed for time, he's seeing staffers in his office in half-hour slots. "Hurry up!" he teases a slow-moving visitor, "or I'll go on to my next appointment." His Manhattan firm, which he founded more than 20 years ago, and now includes 130 architects and designers, is always busy. People here are used to working on weekends.

Stern, 59, has just returned from Nashville, where the firm is competing to design the city's new public library; next week he will fly to Boston for a meeting with Harvard University administrators about the business school student center he is designing. A day later it's off to California to talk about plans

for a hospital in Santa Monica. Other projects abound, including the Gap's new San Francisco headquarters, a residential hall for Columbia University and the new National Storytelling Center in Tennessee.

Stern's unrelenting schedule keeps him in perpetual motion, walking briskly through the firm's light-filled, loftlike spaces, calling out instructions, disappearing into the elevator and off to another client meeting. But at the moment, he's actually sitting still, elbows propped on a conference table, fully engaged in talking about the Dream House project. He has designed everything from the table settings for Rockefeller Center's Rainbow Room to Disney's Animation Center (topped by a six-story rendition of Mickey's hat from *Fantasia*), and he has hosted a public television series on American architecture, a subject he teaches at Columbia University. But houses are his favorite topic, and he is an outspoken critic of what has happened to them.

"Americans have been robbed of their birthright!" he says. "After the second World War, our single family dwellings became debased. In fact, saying they're debased doesn't begin to describe it." In the post-war years there were too many houses to build and not enough architects. Design ended up in the hands of developers. And what did they create? "Ranchburgers," Stern says. "Kitsch," lacking in detail and architectural motif, houses dominated by big garage doors facing the street ("like having your garbage out front") and set next to dozens of identical-looking neighbors ("any design repeated endlessly is debilitating"). Interior spaces are too open and ill-defined ("there aren't enough walls; there's no place to put a picture"). Bathrooms, another target of his ire, are either too large (huge master baths "are revoltingly big; they're like triremes,") or too small ("in most powder rooms, you can sit on the toilet and brush your teeth at the same time").

Although Stern's renown, and the bulk of his residential work, rests on the 12,000- to 20,000-square-foot mansions he has designed for wealthy clients, he has created some moderately sized homes as well, including plans for a 2,100-square-foot house for *Life* magazine in 1994 that have been bought by hundreds of people across the country. He has served as town planner for several neotraditional communities, such as Disney's Celebration in Florida, which is dominated by average-sized houses.

With stylistic dexterity, Stern has created spectacular Spanish Colonials, Georgians, mountain log houses and Italianate villas, but his signature designs are interpretations of the sprawling, romantic Shingle Style houses that had their glory days just before the turn of the century. Originally summer homes for the rich—the New England coast is dotted with them—they share an eclectic embrace of classical elements (columns and cornices) and romantic elements (dormers, gables and towers). They're meant to look playful and inviting. "Very few forms are enclosing and welcoming at the same time," says Stern. Unlike, say, the Greek Revival style, which seeks to impress, "the Shingle Style is inherently a cottage style." It's unpretentious: Those unpainted shingles are "meant to show the softening effects of time." The generous porches "are like a living room for all the world to see." Their rambling quality is reassuring and makes the houses seem less large.

Stern's genius has been to intuit that we're all nostalgic for the past, even if our particular past took place in a ranchburger. "These forms—gables, towers, columns—have a strong appeal to Americans whether they're umpteenth generation or relatively new. They're deep in the American culture, and we're colored by the dreams and aspirations of our culture, not just by our literal experiences."

But Stern's houses aren't defined only by their handsome exteriors. "They're a framework for family life," he says, "a response to how people live." He is fanatical about making interior spaces work. Is there enough room for the sofa? Does the bathroom counter have enough space to line up vitamins? The rooms he creates are in perfect proportion, without silly vaulted ceilings or huge baths. His floor plans balance communal spaces with more private ones, "places where you can hide or have a silent moment." Modern architecture's contributions show up in Stern's work, but indirectly. Stern houses have more light, more windows and more bathrooms than Shingle Style houses of the past. But he is reluctant to credit modern architecture with too much: The dramatic interior vistas of his houses are not a tribute to modernism's flowing spaces, as one might assume, but to the Shingle Style itself, rooted in casual summertime living.

Openness "is at the heart of the Shingle Style," he says. "So I guess you could say that what goes around comes around."

STERN STYLE

Much of the warmth and richness in Stern's architecture resides in big and little details that revive and reinterpret classic, familiar forms, such as the ones below, which he incorporated into his own house.

Fish-scale shingles and an oval window add whimsy to a gable end.

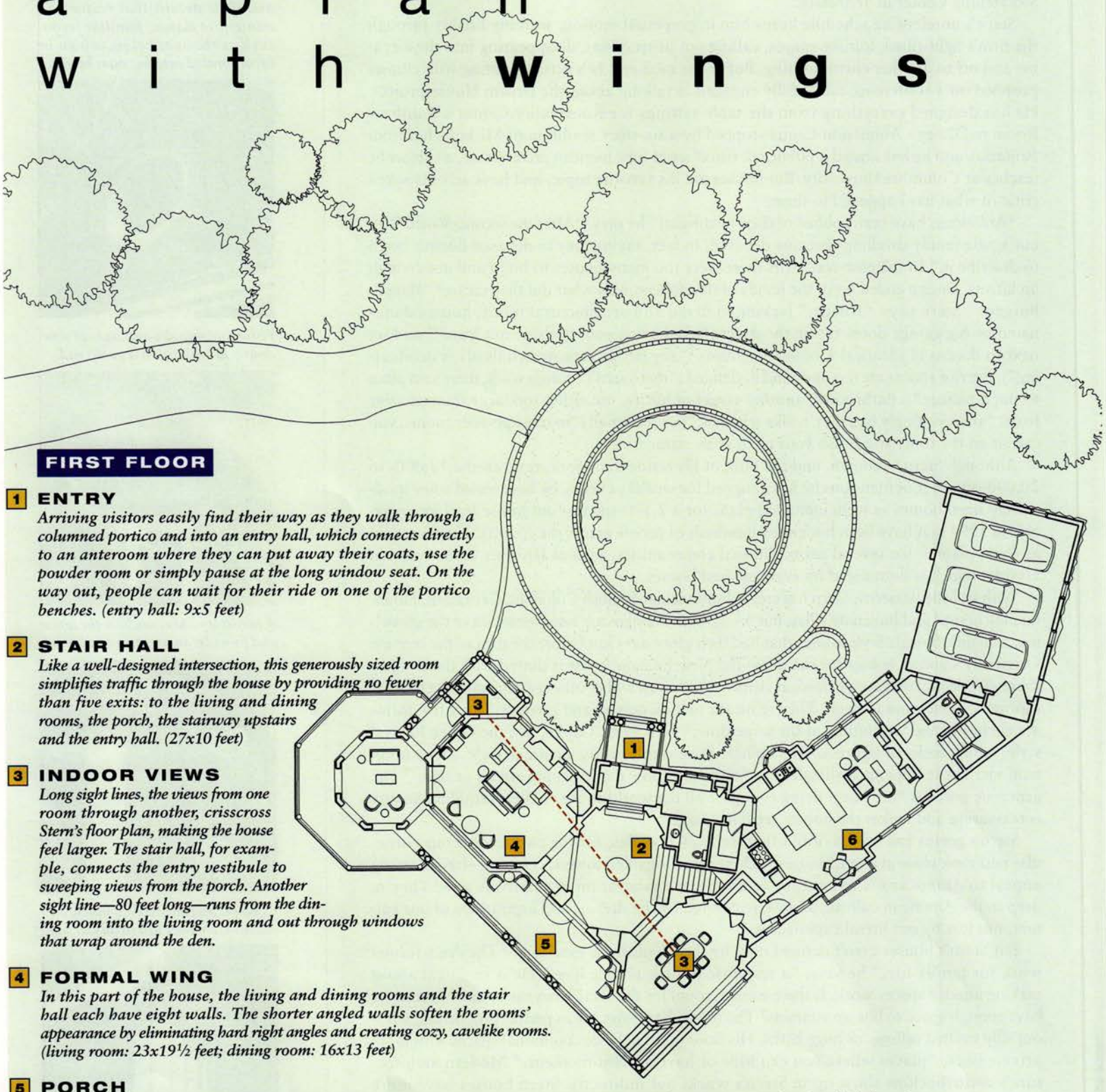
A two-story tower anchors the house and provides an arresting focal point.

Columns and an arched window add classical formality to a small end wall.

A fluted Doric column defines and distinguishes the house's main entry.

PHOTOGRAPHS RIGHT: TODD BOEBEL

a plan with wings



FIRST FLOOR

1 ENTRY
Arriving visitors easily find their way as they walk through a columned portico and into an entry hall, which connects directly to an anteroom where they can put away their coats, use the powder room or simply pause at the long window seat. On the way out, people can wait for their ride on one of the portico benches. (entry hall: 9x5 feet)

2 STAIR HALL
Like a well-designed intersection, this generously sized room simplifies traffic through the house by providing no fewer than five exits: to the living and dining rooms, the porch, the stairway upstairs and the entry hall. (27x10 feet)

3 INDOOR VIEWS
Long sight lines, the views from one room through another, crisscross Stern's floor plan, making the house feel larger. The stair hall, for example, connects the entry vestibule to sweeping views from the porch. Another sight line—80 feet long—runs from the dining room into the living room and out through windows that wrap around the den.

4 FORMAL WING
In this part of the house, the living and dining rooms and the stair hall each have eight walls. The shorter angled walls soften the rooms' appearance by eliminating hard right angles and creating cozy, cavelike rooms. (living room: 23x19½ feet; dining room: 16x13 feet)

5 PORCH
Known for his expansive covered verandas, Stern placed this one in front of the property's best views. Ranging in width from 8 to 20 feet, it contains more than 750 square feet of protected outdoor living space, plenty of room for a crowd. (96 feet long)

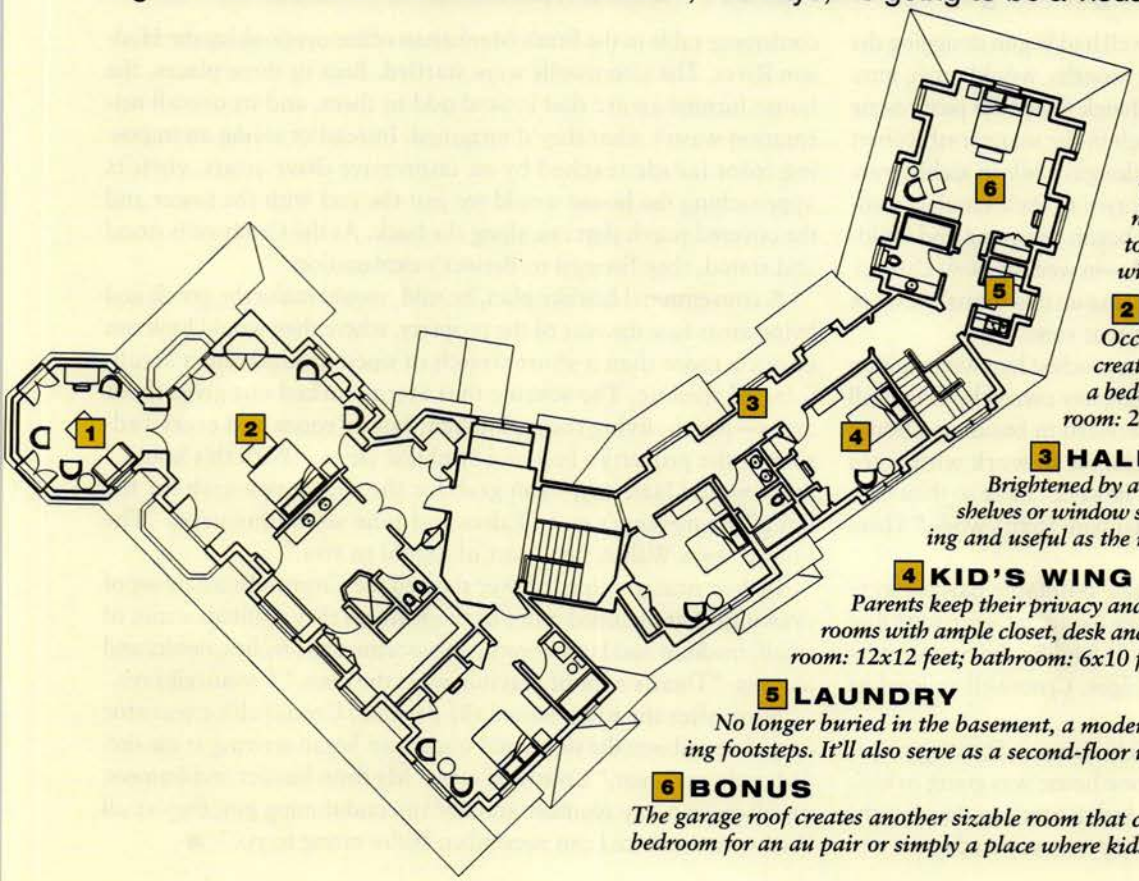
6 FAMILY WING
Placing the garage and the everyday living spaces—the kitchen, eating nook, family room and mudroom—together in one area makes a long house seem shorter and easier to navigate. Stairs from the mudroom provide a quick route to bedrooms, laundry room and bonus room. (butler's pantry: 6x5 feet; kitchen/eating area: 21x13 feet; family room: 15x11 feet; mudroom: 6x11 feet; garage: 31x22 feet)

No one knows what a Robert A.M. Stern house will look like until the floor plan is done. "The house has to work with the way people intend to use it and also with the site," says Dream House project architect Gary Brewer. The elegant dormers, the classic columns and the many other eye-catching elements that typify Stern's designs all await the map of room locations and sizes.

Facing a wall full of Dream House plans, Robert A. M. Stern and project architect Gary Brewer critique and modify their work.

The Dream House floor plan owes little to the boxy rectangle that usually describes a house's footprint. It takes no fewer than three turns, forming an arc that wraps around a circular driveway. And it is long, extending nearly 200 feet from the tower to the garage. The arc's enclosure makes the entry private and intimate, says Brewer, and helps create a sense that the house has been there for a long time. "It will look as though a series of additions have been built on over the years," he says. Local setback requirements also influenced the house's shape and dimension, but Stern and his colleagues played every rule to their advantage in creating a rambling house of wings designed for everyday living and for special occasions. One wing collects the rooms where the family will most often gather: an eat-in kitchen and a mini living room. The other wing will entertain, wine and dine guests in large, formal rooms that extend graciously out to a covered porch.

Stern's plan also conquers boring boxiness on the inside. With more than 50 windows, several window seats, shaped ceilings and lots of built-ins, Stern has created a masterpiece of interior architecture. "Moving from one end of the house to the other," he says, "is going to be a visual adventure." —*Joe Carter*



SECOND FLOOR

1 TOWER
This room's role can change with the owner's needs, from a nursery off the master bedroom to a sitting room or even a bright home office with a superb view. (13½ feet in diameter)

2 MASTER SUITE
Occupying an entire upstairs wing, these rooms create a feature-filled living space complete with a bedroom fireplace, and a pair of balconies. (Bedroom: 20x17 feet; bathroom: 11x13 feet)

3 HALLWAY
Brightened by a trio of dormers and fitted with desks, bookshelves or window seats, this passageway promises to be as inviting and useful as the rooms it leads to. (18 feet long)

4 KID'S WING
Parents keep their privacy and children live on their own in a pair of bedrooms with ample closet, desk and sitting space and a shared bathroom. (Bedroom: 12x12 feet; bathroom: 6x10 feet; bedroom: 11x13 feet)

5 LAUNDRY
No longer buried in the basement, a modern laundry goes where the clothes are, saving footsteps. It'll also serve as a second-floor utility room. (8x7 feet)

6 BONUS
The garage roof creates another sizable room that can become a rec room with a pool table, a bedroom for an au pair or simply a place where kids can play on a rainy day. (13x13 feet)

prime real estate

PHOTOGRAPH BY GRANT DELIN

Walter Cromwell, lucky man, clomps around the field where he'll soon build his dream house. Set a couple of hundred yards back from a twisting two-lane road in Wilton, Connecticut, the rectangular 2-acre lot climbs 38 feet up a gentle slope that almost flattens out at the high eastern end. Reaching the top, where the house will stand, Cromwell looks west to the hills and ridges beyond. "I love this view," he says.

After a mild, snowless winter, spring has come early. Thick, rough grass blankets the land in a rich lime green, as it did a year ago when Cromwell, 32, first saw it. He'd heard that the owner was selling off a couple of acres from a larger parcel and hurried over the next day to take a look. "I stood here and I said to myself, 'I've got to get this guy's phone number.'" Seven months later, the land was his.

Even before the deal was done, Cromwell had begun designing the house that he and Julie, his wife of eight months, would move into. It was no coincidence that they wanted a Shingle Style with picturesque dormers, columns and a tower, very much in the manner of Robert A.M. Stern. Cromwell discovered Stern's designs while in architecture school at Syracuse University and was drawn to their familiar summer-by-the-sea feel. After graduation, he began designing and building houses—still influenced by Stern's work—in wealthy New Canaan. For his own house, Cromwell imagined driving up to a formal entrance that looked out over his field and caught that view.

Last summer, however, the magazine approached him with another idea: Would Country Club Homes—the company owned by Cromwell and his sister, Carolyn Wheeler—be interested in building a house designed by Robert A.M. Stern? The chance to work with Stern appealed to Cromwell. "I was intrigued," he says, "more so than Carolyn or Julie because they weren't as familiar with Stern's work." There was just one problem: finding land.

In an area filling up with mini-estates, buildable parcels were increasingly hard to find. The ones Walter looked at were too close to the road, too rocky or too expensive. "I felt like the opportunity was slipping away," he says. Then one night, Cromwell realized he already had the land, his 2-acre field.

A few weeks after the epiphany, Gary Brewer, Stern's project architect, showed the Cromwells what their house was going to look like. He had visited the site and worked with Stern to develop the clay model and preliminary drawings that now covered most of a conference table in the firm's Manhattan office overlooking the Hudson River. The Cromwells were startled. Bent in three places, the house formed an arc that looked odd to them, and its overall orientation wasn't what they'd imagined. Instead of seeing an imposing front facade reached by an impressive drive court, visitors approaching the house would see just the end with the tower and the covered porch that ran along the back. As the Cromwells stood and stared, they listened to Brewer's explanation.

A conventional boxlike plan, he said, would make the porch and living areas face the rear of the property, where they would look out on little more than a short stretch of open ground and a scrub-infested treeline. The scheme that Stern worked out gives those areas—porch, living room, kitchen, family room and every bedroom—the property's best and brightest views. "With this house," Stern would later say, "you grab for the views, you grab for the light." By meeting's end, Walter and Julie were convinced. "The house," says Walter, "will sort of unfold to you."

In their next meeting, Brewer showed the Cromwells a new set of drawings that included more of the features they wanted: a mix of small, medium and large rooms, an assortment of niches, nooks and alcoves. "There's a lot of playfulness in the plan," Cromwell says.

Soon after the town issued the permits, Cromwell's excavator carved a road into the slope, and tradesmen began arriving at the site. "My subs are great," Cromwell says. "My form builder and framers, my electrician, my plumber and my air-conditioning guy, they've all been with me since I can remember. We're raring to go." ■

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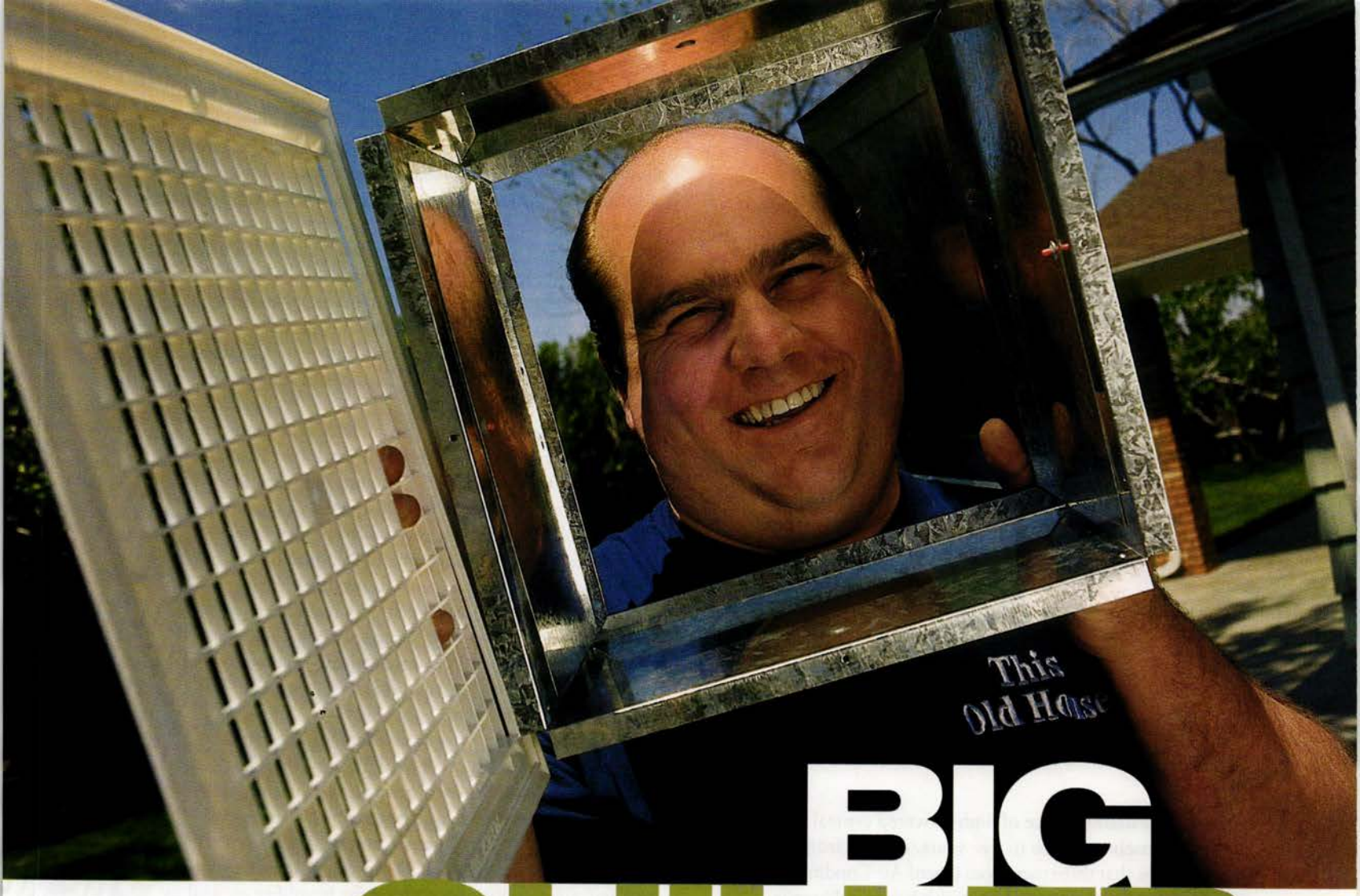
Builders and owners: Standing on their 2-acre greensward, Walter Cromwell, his wife, Julie, center, and Carolyn Wheeler, his sister and business partner, face the same western views the Dream House will take in next spring.

To ensure that the attic-mounted cooler will never be starved for air, the installers cover the opening they've cut with a pair of metal louvers. Screens on the backside of the louvers keep bugs at bay.



BIG CHILLER

Better and cheaper than an air conditioner

ABOVE: This Old House's *Richard Trethewey beams through an up-duct, which mounts in the ceiling and directs warm air into the attic when the cooler runs.*

When the Arizona sun glares down from a sky as hot and dry as a steel griddle and the rattlesnakes slither out to warm their blood, veteran desert dwellers just mop a moist brow, smile wanly and shrug, "But it's dry heat." The shrug helps, but not as much as air-conditioning. Makes you wonder what people did before air-conditioning.

What they did, says *This Old House* plumbing and heating contractor Richard Trethewey, was switch on their evaporative coolers, or "eevaps." Richard says these old-fashioned chillers have benefits for even the most up-to-date home owners. They can operate more efficiently than air conditioners, sucking in great gulps of fresh air all day, cooling it 30 degrees or more and forcing warm air out through windows or ducts into the attic. They cost half as much as central air-conditioning (less than $1,500 to buy and install the largest unit) and consume a third as much electricity. With the energy saved

BY JACK McCLINTOCK PHOTOGRAPHS BY ERIC O'CONNELL

ABOVE: Evaporative coolers often score low on looks—most sit on rooftops, hang on outside walls or sit on the ground. To prevent that blight, the crew stuffs the 32-by-42-by-43-inch unit into the attic. LEFT: Moving the cooler's 6500-cfm output without slowing it down requires a big, 18-inch-diameter duct, which connects to the house's existing air-conditioning ducts.

when they're used in place of high-powered central air, eevaps can pay for themselves in two to five years. All this from a 250-pound louvered cube that three men from Goettl Air Conditioning have just unloaded at Mark and Isabel Tomich's house in Phoenix.

The evaporative cooler exploits a basic physical law with some very simple hardware. The sheet-metal exterior covers a large blower; a thick, layered pad made of corrugated paper; a reservoir, or sump, for water; a float valve like that in a toilet tank; a small pump; and some plastic tubing. Water enters through a copper tube and fills the reservoir to a level determined by the float valve. When a house thermostat issues the order, the pump and blower turn on. The pump pushes water through a plastic tube to the top of the pad, where it dribbles out and wets the paper. The blower sucks hot, dry outdoor air through the pad, which cools the air and propels it into the house's ductwork, cooling the house.

The cooling occurs because the hot air gives up some of its heat on its way through the pad, turning a liquid (water) into a gas (water vapor). A sweaty person in front of a fan feels cooler for the same reason: As sweat vaporizes, it takes heat from the skin. Having absorbed the water vapor, the air that blows out of the box is not only cooler than when it went in, it's also wetter. Dry desert air can absorb a lot of water and thus produce a lot of cooling. In humid regions, the already moist air can't carry much more vapor, which makes evaporative cooling less effective. "You can't get away from physics," says Richard.

Brad Morari, Goettl's general manager, proudly terms the technology "primitive." Richard cheerfully agrees: "I'm all for high-tech, but we've forgotten older technologies like this that make the most of nature and really work. It's refreshing."

Until recently (see story below), little had changed in the way eevaps work. They still work best in arid regions like the American Southwest, but, says Roy Otterbein, an engineer who holds patents on evaporative cooling technology, eevaps are effective "anywhere west of the Mississippi and 30 miles inland [from the Pacific Ocean], wherever the relative humidity stays below 20 percent." A recent Environmental Protection Agency report concludes that only 1 percent of American houses have evaporative coolers, but that at least 15 percent could benefit from them.

An eevap can also work in tandem with an air-conditioning system, as it will at the Tomiches'. In Phoenix, where most houses have evaporative coolers, the rainy season that stretches from July through August produces muggy air. Then the Tomiches, like many other Phoenicians, have to switch on their air conditioners to beat the humidity as well as the heat. But for most of their cooling season, an eevap will keep the house comfortable.

Rated by the amount of air they can move in cubic feet per minute, or cfm, evaporative coolers come in a range of capacities, 3,000 to 6,500 cfm for houses, and the choice depends on floor area, the number and type of windows and the local climate. Otterbein figured that a 2,800-square-foot house like the Tomiches' would need two 6,500-cfm units for complete cooling. But since the goal is to supplement, not replace, 6 tons of central air-conditioning, Morari is installing a single 6,500-cfm cooler and connecting it to the existing ductwork. His workmen will also extend new ducts to a couple of rooms served by a separate air conditioner.

A typical rooftop installation takes two workers less than a day, but the attic-mount job at the Tomiches' house is far more compli-

A Cooler Cooler

For a machine as simple and unchanging as the evaporative cooler, there had to be room for improvement. In the 1980s, industry engineers borrowed a feature from commercial-grade chillers and came up with a better eevap for houses—the two-stage cooler.

In the first stage—the key innovation—water circulates through a heat exchanger that sits in front of the pad. As incoming air passes through the exchanger, it cools down by as much as 20 degrees, but never touches water. When air then goes through the pad—now the second stage—it sheds another 20 degrees, resulting in a chill that beats the temperature drop of the decades-old design by 5 to 15 degrees. And because precooled air picks up less moisture from the pad, air reaching the house is also drier.

The sum of these gains, says engineering consultant Roy Otterbein, bodes well for the future of evaporative cooling. The cooler, drier output of the two-stage machine, he says, greatly expands its geographical territory and extends seasonal effectiveness. "Two-stage technology brings the industry to a higher level," he adds. "It's really the Cadillac of coolers." —*Hope Reeves*

Blower in a Box

Since the 1940s, when Phoenix sheet-metal fabricator Adam Goettl first fitted a straw pad and a fan into a steel box, eevaps have changed little in the way they work. A pump (1) lifts water from the reservoir, or sump (2), to perforated pipes (3), which continually moisten a corrugated paper pad (4). When the thermostat calls for cooling, the blower (5) pulls hot air through the pad and sends cool air into the house. A float valve (6) admits more water to the reservoir whenever the level drops too low.

cated, Morari says. Men on ladders saw a 40-by-80-inch hole in the gable end of the attic, crank the cooler up on a hand-operated crane and wrestle it inside. To reduce vibration and noise, they hang it from the rafters with steel struts and threaded rods, placing the louvered air-intake just a few inches from the outdoor air. Then they put a shallow galvanized-steel pan under the cooler to collect any accidental overflow and run some PVC drainpipe through the wall and down to a flower bed on the ground. With a length of 18-inch-diameter metal duct, they connect the cooler to the air-conditioning supply duct, about 10 feet away (a barometric damper, a sort of one-way air valve, keeps conditioned air from blowing back into the cooler). To bring in water, they use ¼-inch copper tubing and tap into the nearest cold-water line. Getting power to the 1,300-watt blower and pump only requires wiring them to a junction box on the same circuit that powers the air conditioner, which the electrical code allows because the two systems never run simultaneously. To close up the hole, they mount a handsome pair of steel louvered doors in the opening, which will allow the cooler to breathe. Insect screens inside the louvers ensure it won't breathe the wrong things. Yet screens alone won't keep the unit completely clean. With so much water flowing into the reservoir and onto the pad, minerals and airborne dust inevitably collect. In spring, before the onset of hot weather, the sump must be cleaned of mineral deposits. The pad must also be rinsed off and, about every five years, replaced.

It is mid-afternoon and hot in the attic when Richard and the others, sweating and covered with itchy insulation, finish up. A crewman opens the water valve, and the sump slowly fills. Then the pump clicks on, and water dribbles over the pad. Richard climbs down the ladder, goes inside and stands under the living room register with his palm raised like a cartoon traffic cop. The blower begins to spin. Chilly air flows into the room, and Richard smiles. "Lovely," he says. In a few minutes, he reaches for his flannel shirt. ■

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Convert a church into a livable house? Norm and Steve wondered aloud if it could be done, but a final look proves that all it takes is

amazing grace

BY BRAD LEMLEY

PHOTOGRAPHS BY DAVID PETERSON STYLED BY MICHI OKIMOTO

Home owners Mark Dvorak and Laurie Ann Bishop, relaxing in the kitchen, were married just a week before moving in. The 38-by-28-foot living room, left, formerly the chapel, has flooring and trusses made of Douglas fir, arched windows that once held stained glass, and plenty of room for art.

The choice of marble countertops, chunky chrome drawer pulls and open storage reveals an emphasis on both aesthetics and performance. This is "not a delicate, untouchable kitchen," says Dvorak.

"This is a terribly vertical space," said T.O.H. *executive producer Russ Morash when the kitchen renovation began. But the dazzling 20-by-25-foot result shows the wisdom of Dvorak's vision: He tamed the 14-foot ceiling with upper cabinets that unify the room and added open storage and distinctive floor-tile borders.*

HOUSE PHOTOGRAPH RIGHT: SANFORD SHULWOLF.

Grinning like a lottery winner, *This Old House* producer Bruce Irving spreads his arms to embrace the 1,075-square-foot chapel-cum-living room of the TV show's winter project house in San Francisco. Television producers are professional worriers so, when one smiles, the heart gladdens. "In all the years we've done this," he says, his praise reverberating in the expanse, "this is the coolest, hippest project."

Yet Irving and the rest of the *T.O.H.* crew did plenty of brow-knitting during the conversion of this turn-of-the-century church into a young couple's residence. The massively scaled design elements that home owner and designer Mark Dvorak specified seemed likely to be too bold for a house. As laborers schlepped in one and a half tons of marble wainscoting, ½-pound cabinet hinges, a stove that resembles an ore smelter and Clydesdale-size stable doors for the entry, *T.O.H.* plumbing and heating contractor Richard Trethewey fretted along with the rest of the crew: "I thought the place would end up looking like Grand Central station."

Now that each item has been plumbed, nailed, glued, bolted or hung, it's clear that Dvorak—working closely with architect Barbara Chambers—brought inspiring vision to this remodeling project. His secret: setting the institutional elements against

SHOW WATCH
This is our final story about the TV show's winter project, which aired earlier this year (finished house, above). Next issue, we introduce the redo of a mid-1800s house in Watertown, Mass.

It's no accident that this end of the kitchen resembles a bistro. Dvorak and Bishop drew inspiration from a favorite New York City eatery, called Balthazar, which evokes a Parisian restaurant's look.

a minimalist canvas of pristine white walls and streamlined trim. "I had my doubts at first, but it's a fabulous space," says *T.O.H.* host Steve Thomas. "Now, finally, I get it."

Dvorak, a store designer for the Gap, drew inspiration from subway platforms, banks, schoolhouses and other public spaces, particularly those built in the opulent 1920s. As his wife, Laurie Ann Bishop, says, "We both love these buildings. When I'm standing in line at a bank, I'm not bored. I always bring my camera when I go out. I'm looking around and taking pictures."

"Ninety-nine percent of our clients are amateurs when it comes to knowing what they want with a design," says the show's executive producer, Russ Morash. "Here, we were working with a professional who makes decisions like this all the time, and it showed from the first day."

"This is really our dream living room," Bishop says of the chapel, where she and Dvorak have arranged their eclectic furniture—gleaned from flea markets in Paris, London, New York City and Los Angeles. The room's cathedral ceilings peak at 24 feet, creating a yawning space that might overwhelm most home owners. But 15 years of scuttling about in cramped urban apartments kindled big-room fantasies in the couple. At the wrap party for the show's final episode, revelers congregated around the blaze in the new fireplace, a shallow-firebox Rumford design with a 5-foot-high opening faced in Italian slate. The standard-sized fireplace screen that someone scrounged for the inaugural fire appeared a "bit out of scale," Dvorak dryly commented. "I'll have something built. A huge sheet of tempered glass on stainless-steel legs, maybe." Problems with scale had to

STOOLS COURTESY OF ELITE CAFÉ, SAN FRANCISCO

"The idea was to make it institutional yet inviting," says Bishop of the 10-by-10-foot master bathroom. Marble wainscoting and a circa-1940 dental-supply cabinet provide commercial ambience, but a stained Douglas fir floor—warmed by radiant-heat tubing—both looks and feels engagingly toasty.

be solved throughout the house. In the kitchen, Dvorak designed custom-built cabinetry that stretches to the lofty ceiling. He and Bishop will reach the top rank via a 7½-foot stained birch library ladder that rolls on chrome-plated rails. The island's countertop is made of marble slabs recycled from a public rest room. "We sanded it really well," he says with a grin. A 4-by-8-foot chalkboard, the home's message center, gives a schoolhouse accent to a wall.

Upstairs, the 10-by-10-foot master bathroom distills the essence of the couple's adventurous tastes. The beige marble wainscoting salvaged from a hallway in San Francisco's Chevron building sets off a pair of century-old, 200-pound janitor's sinks in vitreous china. The bedrooms, by contrast, are clean and spare. "We wanted to keep it simple," Bishop says. Or, says her husband, "Institutional, but not blatant. That's what we're going for."

Throughout the house's 3,400 square feet of living space, tiny but potent halogens spotlight surfaces and fixtures, rather than washing whole rooms with light. "It's a retail-space approach, and it's very dramatic," says Sean O'Connor, who worked with Dvorak on the lighting design. "You get a 'punch' instead of a big, washed-out space." In a Gap store, punch moves turtlenecks. In the house, it creates intimacy in rooms that might otherwise evoke gymnasiums.

Nearly as impressive as Dvorak's design is the structural remediation that supports it. The building—in San Francisco's up-and-coming Eureka Valley neighborhood—presented challenges. The chapel, built just a few months after the city-leveling earthquake of 1906, featured an ungainly two-story addition from the 1940s. As a whole, the structure was "not pretty," Morash says. "It had no yard or garden whatsoever. It had no deck. It was boxy—it sort of loomed out at you."

At the project's start in January, framing contractor J. Gregg spent weeks reinforcing walls and the foundation with galvanized steel straps and bolts to bolster the original chapel building's earthquake resistance. Most worrisome was the union—or lack of one—between the chapel and the addition. "Really, they just sort of leaned against each other," Gregg says. "There was no structural connection at all." It was time for some seismic engineering.

While Gregg and his team implanted $45,000 worth of earthquake-defying steel, general contractor Dan Plummer concentrated on revamping the cavernous interior. He had to. Week after week, he postponed exterior work as El Niño cloudbursts pounded the clapboards. "It was a challenge, at times, keeping the whole crew busy inside."

Testifying to the detail of Dvorak's vision, four men armed with orbital palm sanders spent three arduous weeks on the chapel's Douglas fir scissor trusses "just to lighten up the color a little," says Plummer, who worried that sand-blasting the trusses would damage the wood. Simultaneously, workers gutted the addition and framed it into three bedrooms, three baths and a kitchen. "The challenge was to make the bedrooms as large as possible," says architect Barbara Chambers, who worked with Dvorak for three months on various layout schemes. "With the living room so spacious, you didn't want to go upstairs and find tiny, cramped rooms."

In the final month, the pace quickened from speedy to blinding to meet the television show's abbreviated winter production schedule. Jeff Deehan installed vintage bathroom fixtures; Ming Seto, Steve Lo and King Lau ran wire through Douglas fir studs; Darin Collins put up 7,000 pounds of tile, including a style used in the New York City subways.

With crews elbow to elbow, hollering in English, Cantonese, German and Spanish over the construction din, the site became a polyglot version of the Marx Brothers' stateroom scene from *A Night at the Opera.* "This is a seven-month job that we had to finish in three and a half months, so we had up to 30 guys here at a time," says Plummer. Through it all, Plummer—who met Dvorak when they were both working for Ralph Lauren in New York City—remained affable and unflappable, regaling the crews with bad jokes and Elvis imitations when energy flagged.

For a chance to appear on the television show, many crews worked at lower-than-standard rates—but even so, overtime accumulated. At the wrap party, Richard Trethewey inaugurated the kitchen chalkboard by writing a facetious schedule for Dvorak and Bishop in the coming weeks: "Monday: Pay bills. Tuesday: Pay bills. Wednesday: Pay bills."

Still, the project came in almost exactly on budget. Renovating the church cost about $400,000, and the purchase price of the building was $440,000. Some $85,000 worth of donated goods and services will be taxed as income to Dvorak and Bishop, adding about $30,000 to their outlay. The couple's out-of-pocket total: about $870,000. "That's very close to what we originally estimated," Dvorak says, as cheerfully as a young man with a huge mortgage can. "From the work that I do, I know the stress that comes along with any project like this, so that never threw me." Realizing a personal, rather than corporate, vision had been Dvorak's dream for years—and he enjoyed the endeavor. "It was fun. I really loved the whole thing." ■

A reverence for balance, Dvorak says, propels successful design. In the 21-by-16-foot master bedroom, right, which includes a new fireplace, "the exposed roof trusses add enough texture, so we made the walls clean, white and simple."

SANFORD SCHULWOLF

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mulch makers

Chipper-shredders transform yard waste into gardener's gold

A chipper-shredder would make quick work of this four-course meal of yard leftovers, counterclockwise from top: a wheelbarrowful of firewood bark; pruned branches and discarded saplings; raspberry canes; and large birch branches felled during an ice storm.

BY WILLIAM G. SCHELLER
PHOTOGRAPHS BY MATTHEW BENSON

The biggest of the seven machines tested for this story, the Mighty Mac 12PT-8, made mulch molehills out of mountains of yard debris. The piles, from left, are leaf mulch, wood chips and bark mulch.

The saplings lay where I had cut them a year ago when I thinned out a wooded area alongside the road to our house in Vermont. Behind the woodshed stood stacks of raspberry canes torn out when we extended the perennial garden, scraps of bark from last fall's firewood shipment and piles of leaves. All these heaps of surplus cellulose looked as if they were going to lie around forever, growing in size and unruliness until they buried the house. Then one day, my wife said she was planning to buy mulch for the perennials. I realized that our property was virtually paved with the raw materials of mulch, free for the taking. All I needed was a chipper-shredder.

Cross a food processor with a trash compactor. Then think in terms of all outdoors. That's the idea behind chipper-shredders. These large gasoline-powered machines greatly reduce the volume of garden and tree debris by regurgitating it as mulch. More mobile than commercial chippers, which are meant to be towed and are sometimes connected by a power takeoff to a tractor engine, chipper-shredders are dual-purpose, have their own engines and seldom pack more than 10 horsepower. The mechanism that does the chipping is a rotating steel disk with one or more blades projecting at a slight angle, like the cutting edge of an oversized cheese slicer. When a branch—which can have a diameter as large as 3½ inches—goes into the feeder, the blades simultaneously draw the wood in and whack it into ½- to 1-inch chips. A separate hopper feeds the shredder, which thrashes leaves, twigs, light plant material and organic kitchen waste with blades or swinging hammer flails or a combination of both. The shredder then forces the ground material through a screen or bar grate. The final product ends up in a cloth collection bag or directly on the ground.

The big Mighty Mac's shredder, pictured with its protective panel removed, attacks yard and garden debris with 24 swinging hammer flails. Suspended from four rotating bars, the hammers rapidly turn branches up to 3½ inches in diameter into finely ground mulch.

Picking a chipper-shredder is largely a matter of deciding what kinds of work it will have to do and how often it will be used. Differences in horsepower are important when chipping is the primary function. A chipper powered by a 5-horsepower engine takes twice as long as an 8-horsepower engine to devour a branch 2 or 3 inches in diameter. That's no big deal when there are only a few branches but could be a drawback after a big ice storm or a lengthy pruning session. Chipping blades should be made of hardened tool steel for durability. They should also be easy to remove for sharpening as soon as the chips begin to appear torn rather than cleanly cut.

When it comes to shredding, the size of the hopper doesn't matter much. Leaves, branches and other dense material tossed into it can only advance through the throat, blades or hammers at a prescribed rate. The more cutting surfaces the better; larger machines come with as many as 24 hammers. Because the hammer edges will eventually dull, it helps to be able to reverse them to expose fresh, sharp sides.

Chipper-shredders for home use have pneumatic or semi-pneumatic

The Magic of Mulch

A chipper-shredder can make a yard look neater in a hurry, but the big payoff is the final product: fresh mulch. A layer of mulch spread 3 or 4 inches deep around perennials or trees—starting 6 inches from the trunk—helps retain moisture, prevents erosion, reduces the number of weeds and nourishes microorganisms in the soil. A thicker layer, 6 to 8 inches deep, will convert a weed patch into a fertile flower bed or vegetable patch. "Wait a year, and you'll have rich forest soil," says *This Old House* executive producer Russ Morash.

The exact composition and consistency of the mulch don't make much difference. Virtually any fresh mulch can be used anywhere in the garden, says Donald A. Rakow, a landscape horticulture specialist at Cornell University in Ithaca, New York. He recommends distributing the payoff from a chipper-shredder immediately or composting it in piles and turning them periodically. "Or keep the piles low, so a source of oxygen continues to be present," he says. "When large piles are kept in place for several months or more and not turned, the material can start to decompose anaerobically, giving off terpenes and alcohols that can be toxic to plants."

Rakow warns that using fresh wood-bearing mulch can temporarily reduce the nitrogen available to plants, and he recommends spreading 5-10-5 or 5-10-10 fertilizer on established beds before the mulch, sprinkling fertilizer at a rate of 1½ to 2 pounds of actual nitrogen per 1,000 square feet of ground. But Christopher J. Starbuck, a University of Missouri specialist in woody ornamentals, says he found that he didn't need to fertilize if he used ground hardwood as mulch, on top of the soil. "Just don't dig it in," he says. "When I tilled it in, I almost couldn't add enough nitrogen to keep the plants healthy."

Although mulched oak leaves and pine needles can make soil more acidic as they decompose, the effect is slight, Rakow says. Annual applications of oak leaves and pine needles will shift the pH of the top few inches of soil by no more than .1 or .2, a difference that most plants can handle.

Preservative-treated lumber shouldn't go into the shredder hopper. Neither should branches killed by fungal diseases: Verticillium wilt and phytophthora collar rot can spread through mulch to healthy plants. A cooperative extension office or a full-service nursery can recommend a lab that tests for these fungi. —*Jeanne Huber*

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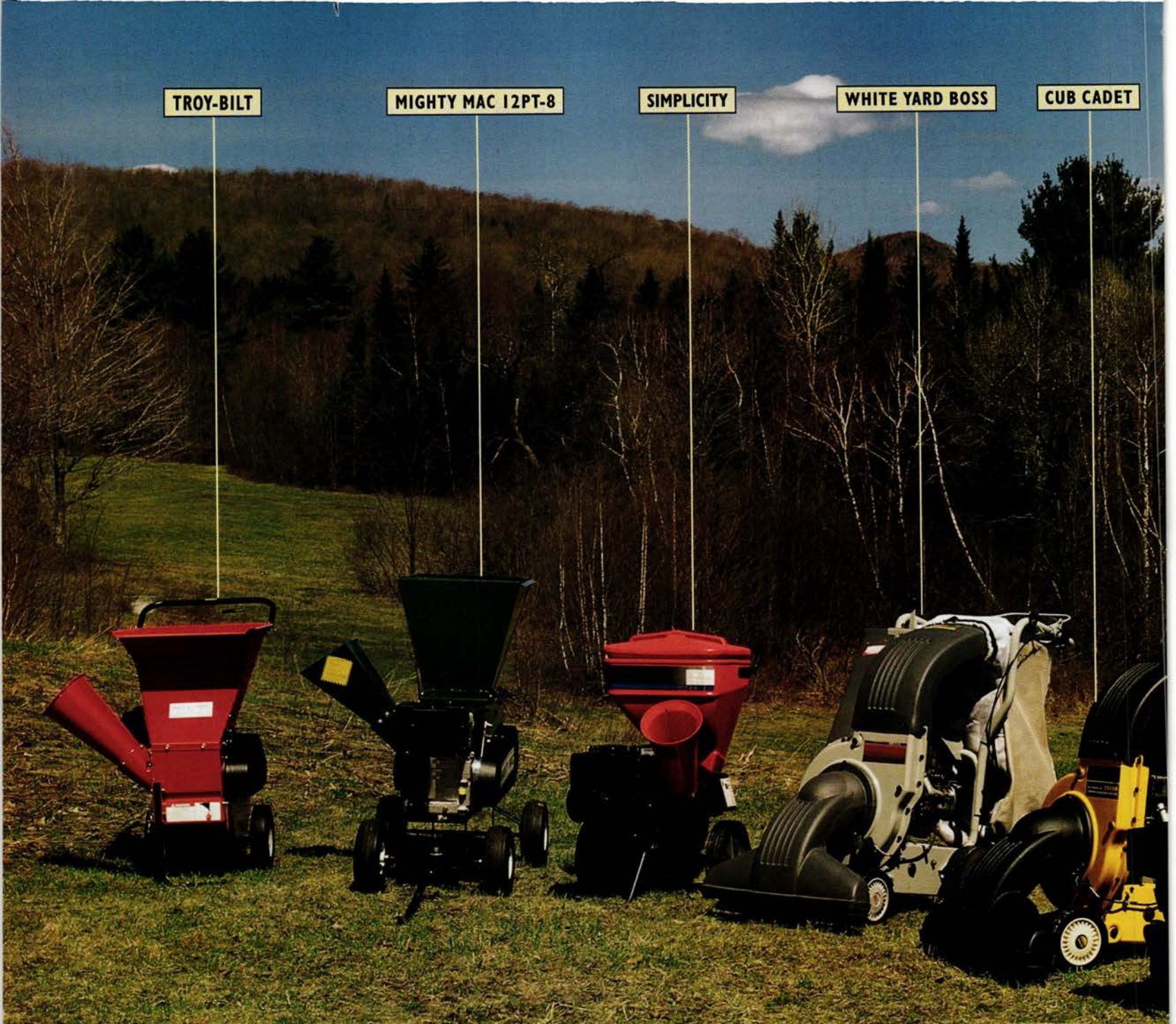
Firewood bark refuse run through a shredder turns into mulch ideal for spreading around perennials or shrubs to retain moisture.



MODEL	LIST PRICE	ENGINE	DIMENSIONS (LxWxH)/WEIGHT	CHIPPER CAPACITY (DIAMETER)	SHREDDER BLADES	FEATURES	WARRANTY
Troy-Bilt 47057	$799	Tecumseh 7 horsepower	32x24x40 inches 180 pounds	3 inches	12 reversible hammers	no collection bag	3 years (engine 2 years)
Mighty Mac 12PT-8	$1,499	Briggs & Stratton 8 horsepower	47x36x44 inches 244 pounds	3½ inches	24 reversible hammers	collection bag and trailer tow-pull options	2 years
Simplicity 8/14	$850	Tecumseh 8 horsepower	31x23x34 inches 119 pounds	3 inches	4 reversible hammers, 2 triangular and 2 J-shaped	collection bag and Vac Kit hose options	2 years
White Yard Boss 950	$999	Tecumseh 9 horsepower	54x25x39½ inches 155 pounds	3 inches	9 reversible hammers, 10 stationary blades	collection bag, 10-foot hose option	2 years
Cub Cadet CSV260	$999	Tecumseh 9 horsepower	54x25x39½ inches 155 pounds	3 inches	9 reversible hammers, 10 stationary blades	collection bag, 10-foot hose option	2 years
Mighty Mac LSC508	$789	Tecumseh 8 horsepower	49x29½x26 inches 144 pounds	3 inches	9 reversible hammers	collection bag	2 years
Leaf Cycler WC5000	$599	Briggs & Stratton 5 horsepower	48x12x36½ inches 128 pounds	2⅞ inches	5 rotating stationary blades	hose kit, collection bag, 150 miles-per-hour leaf blower	2 years

wheels. Only the larger models have four, although I had little difficulty tilting and moving even the heavier single-axle models from place to place. If great leaf clearing is your focus, consider one of the self-propelled chipper-vacs. They can be pushed around a yard like all-terrain Electroluxes, and they feature broad snouts up front that suck up leaves and small debris. They have side-mounted chippers but no shredder hopper.

Most chipper-shredders accommodate cloth collection bags for shredded material. On a self-propelled chipper-vac, the bag is an integral part of the system, collecting material like the rear bag on a lawn mower does. An attached bag isn't essential when a chipper-shredder is used in one place, but a bagless machine has to be moved as shreddings pile up beneath it.

Last autumn, I tried out seven chipper-shredders for *This Old House*, putting an assortment of models through their paces to see how handily they could devour and digest a bumper crop of biomass. Approximately 70 chipper-shredders from 25 manufacturers are on the market. I chose a variety of sizes, prices and horsepower; most are conventional, manual-feed units, but some emphasize convenience features such as suction power for leaf vacuuming. Five of the chipper-shredders—a 7-horsepower Troy-Bilt, an 8-horsepower Simplicity, two 8-horsepower Mighty Macs and a 5-horsepower Leaf Cycler—are stationary models equipped with wheels; the larger of the two Mighty Macs has four wheels, two on a pivoting axle, and a tow-bar option for attaching the monster to a garden tractor. Two self-propelled machines are nearly identical. Made by M.T.D. under the names White Yard Boss and Cub Cadet and sold through different distribution networks, the pair of 9-horsepower units feature six forward and two reverse speeds for far-ranging debris-gathering expeditions.

Every model I tested handled chipping easily. My saplings, mostly birch and cured for a year, went into the maw of each machine with no complaint. The big Mighty Mac, the most expensive machine, worked fastest: 10 seconds for a 2-inch-diameter tree 10 feet high. But none of the other chipper-shredders were significantly slower except the little Leaf Cycler, which still handled a comparable sapling in well under a minute.

Leaf shredding requires more patience. No matter how hungry these creatures seem, they can pack only so much into their mouths at once. Even the brawny Mighty Mac, which features 24 reversible hammers, balked when I put too many leaves in the hopper. The problem isn't power; the hammer mill spun as fast and freely as ever. But if you pack in too many leaves at once, they mat up above the throat and don't make contact with the hammers. The Simplicity, with its narrow throat, seems most prone to backing up. But John Bracken, a Simplicity engineer, explains that the constricted throat dimensions are designed to regulate the amount of material flowing toward the shredder hammers. "By narrowing the throat, you don't get great big clumps that pull down the engine rpm," he says. "Also, we tried to minimize the chance that any material might kick back toward the operator's face."

No material kicked back from the shredder hopper on the models I tested, although I was always careful to feed leaves in at a slow, steady pace—especially if they were wet. While putting bark and other coarse debris in the hopper, I stood off to one side. That was when I really appreciated the sturdy plastic tamper that comes with the Troy-Bilt.

You have to gather leaves and other lawn refuse in big piles before you feed stationary machines. But the smaller of the two 8-horsepower Mighty Macs offers an ingenious system for sucking up brush. The kickstand legs flip forward, lowering the broad fan-shaped steel hopper to the ground. Leaves raked into the hopper are vacuumed toward the shredder and blown into a side bag. Extra care should be taken, however, when emptying a plastic bag of leaves into the hopper. The vacuum is powerful, and it can't tell the bag from the leaves. The result? Ground leaves laced with finely shredded plastic.

A vacuum hose attachment for the Simplicity can be fitted with a wide, ground-level intake mouth that stays put while leaves raked toward it are sucked into the shredder compartment. Once I got the hang of raking at a pace that precluded clogging, the machine scarfed leaves up its hose like soda up a straw. I cleared the occasional clog by flipping the hose into a straight line and tapping it lightly on the ground. The Simplicity's hopper comes with a lid that should be kept on to enhance suction through the hose.

Surprisingly, the 5-horsepower Leaf Cycler, which vacuums up leaves via a hand-directed hose nozzle, is even faster and more efficient than the 8-horsepower Simplicity, but the Leaf Cycler's hose is a nuisance to attach and pulls off easily. This little three-wheeler has yet another function: It works as a leaf blower with air shooting at 150 miles per hour from a side opening, which doubles as the output chute during shredding or chipping.

When it comes to strolling behind the Yard Boss and the Cub Cadet, M.T.D.'s two vacuum models, leaf collection becomes enough of a breeze for me to want to stuff my rake into one of the chippers. Running in first gear with the snout adjusted to ride about 2 inches off the ground, both machines leave a trail of clean grass where the leaves used to be—as long as the leaves are dry. I spread several 30-gallon trash bags of dry leaves on the ground and, after vacuuming and shredding, I put them back in the bags to find they took up about a third to a half their original volume. The cloth collection bags that come with the Yard Boss and the Cub Cadet are easy to remove and empty. Depending on the density of leaf coverage, figure about four to six emptyings for a ½-acre lawn.

All the chipper-shredders make a good show of mulching garden waste and organic kitchen garbage. I even ran two defunct jack-o'-lanterns through the big Mighty Mac and got results I could have put in a pie. The same machine nearly vaporized three ungainly flowering kale plants I had tired of—instant purple coleslaw. Bark is trickier. All the stationary machines handle it well, but the size and thickness of the bark dictate whether it should go in the chipper or the shredder. The former makes nice bark chips, the latter a fine shredded mulch. As for brush and branch ends, the big Mighty Mac is the champ, slurping them down the shredder hopper and transforming them into mulch material that looks like a cross between coffee grounds and granola.

Not long after I fed the last fallen leaves and the last wheelbarrowful of prunings to my pack of chipper-shredders, a heavy early snowfall sent them into hibernation. But I knew that the spring thaw would reveal tons of debris I hadn't dealt with and that a new growing season would provide ample additional fodder for one of these voracious machines. Even if making mulch isn't your priority, it's a great feeling to chomp through all that organic detritus and reduce it to manageable proportions. For anyone who inhabits as fecund and unruly a corner of the world as mine, a chipper-shredder is an ideal wilderness tamer. ■

Watch Where You Stick Your Fingers

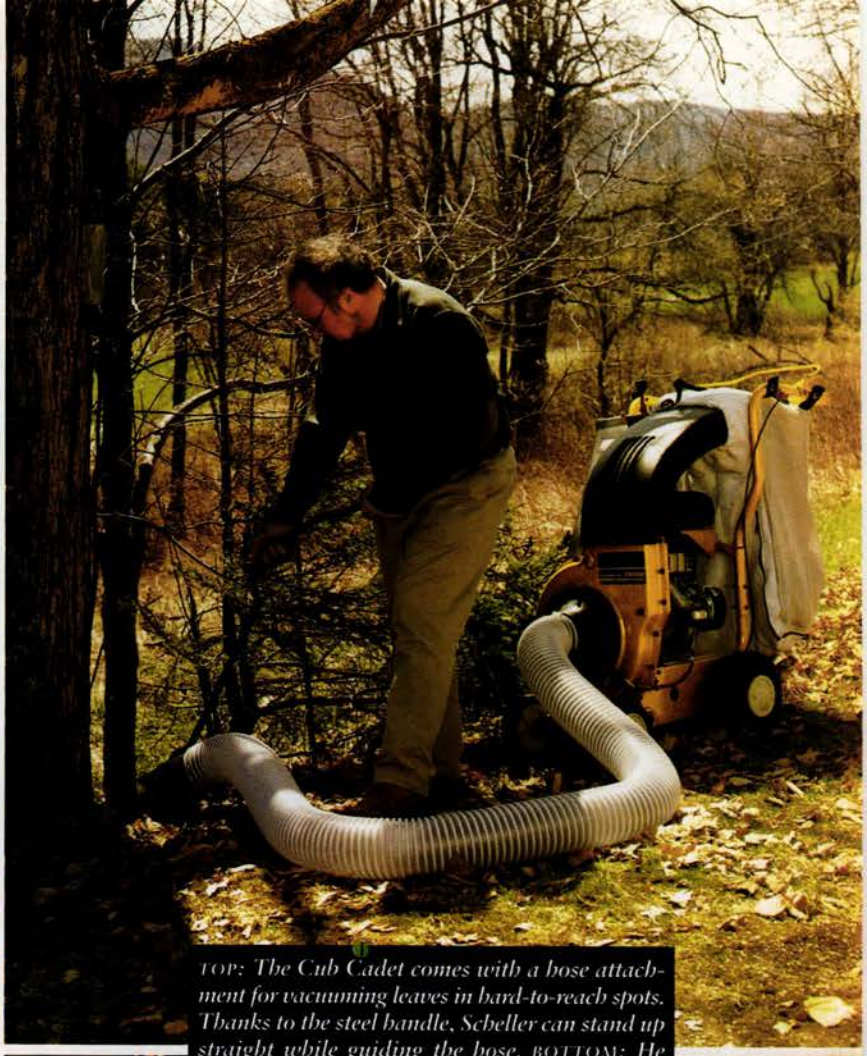
Start up a chipper-shredder, and it bursts into violent, noisy, vibrating action. The machine can roar at 100 decibels or more—well above the Occupational Safety and Health Administration's 85-decibel threshold for hearing damage after prolonged exposure—and can spit back stones, leaves, wood chips and other debris with a force strong enough to take out an eye. Some users have suffered second-degree muffler burns; others have lost fingers or entire hands. For all these reasons, *This Old House* executive producer Russ Morash says, "Chipper-shredders are heavy, awkward machines that are inherently dangerous."

Religiously following the safety instructions that come with each machine is essential. Ear protectors, goggles and heavy gloves should always be worn when operating a chipper-shredder. And be sure to fasten the gloves tightly. Gauntlet-style gloves can easily get snagged on a branch and pulled into the blades. The same is true of loose clothing. "Once your clothing gets caught, in goes the arm," says Morash.

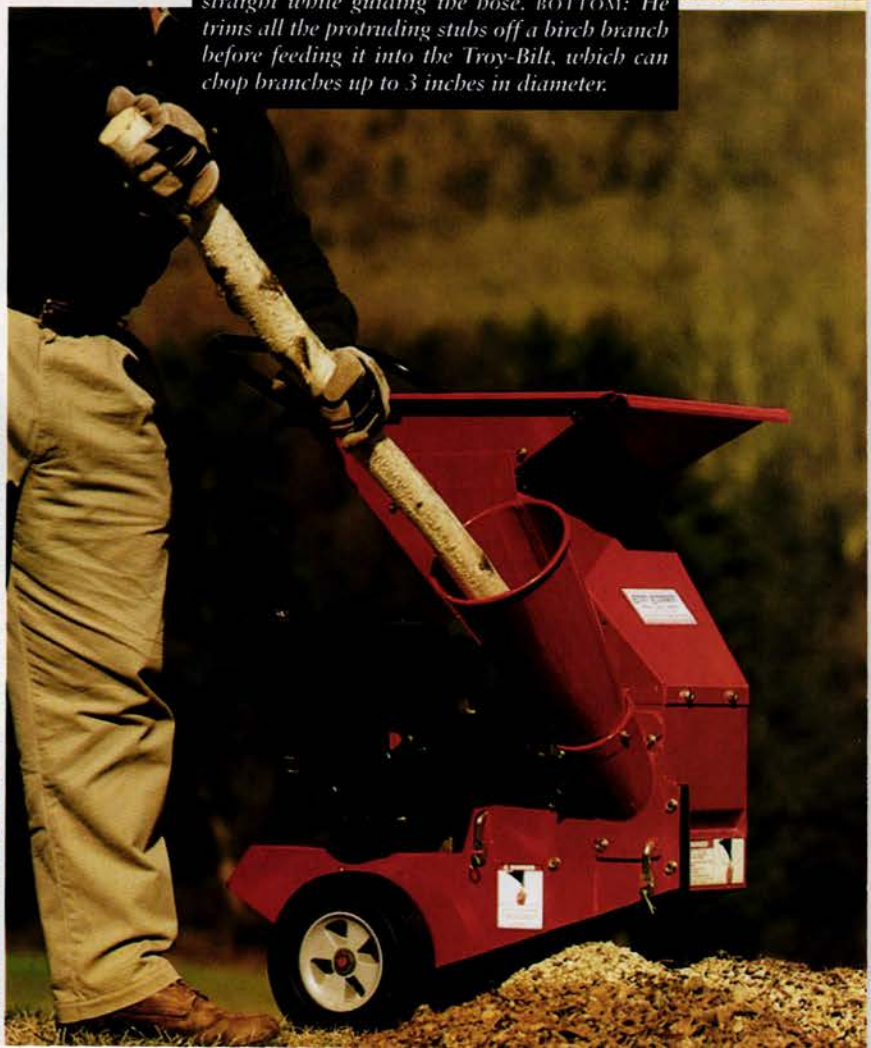
***T.O.H.* contractor Tom Silva says the key to safety is to slow down your movements and feed material gingerly. Chipper-shredders are designed to grab a branch forcefully and pull it in to the cutting blades. Let go of the wood as soon as it's in the feeder position—so a hand doesn't follow. "Make sure that no branches are sticking out 90 degrees that'll come down and whack you on the side of the head," Tom says. "Keep it straight, and don't oversize the piece for the machine. And never put your hand down inside a chipper to clean it out." If you must unclog a jam, first remove the spark-plug wire. Even if you have turned the engine off, an impeller under tension can shoot back and snip off a finger.**

For anyone not likely to use a chipper-shredder more than a couple of times a year, Morash suggests hiring a professional to bring his own machine in and run it for you. If you do buy or rent a chipper-shredder, first get a thorough orientation from the rental agent or salesclerk. "Tell the store if you've never operated one before," says Bob Rouse, a tree specialist with the National Arborist Association. "Some people don't want to admit they've never used something before. Don't lie." —*Sasha Nyary*

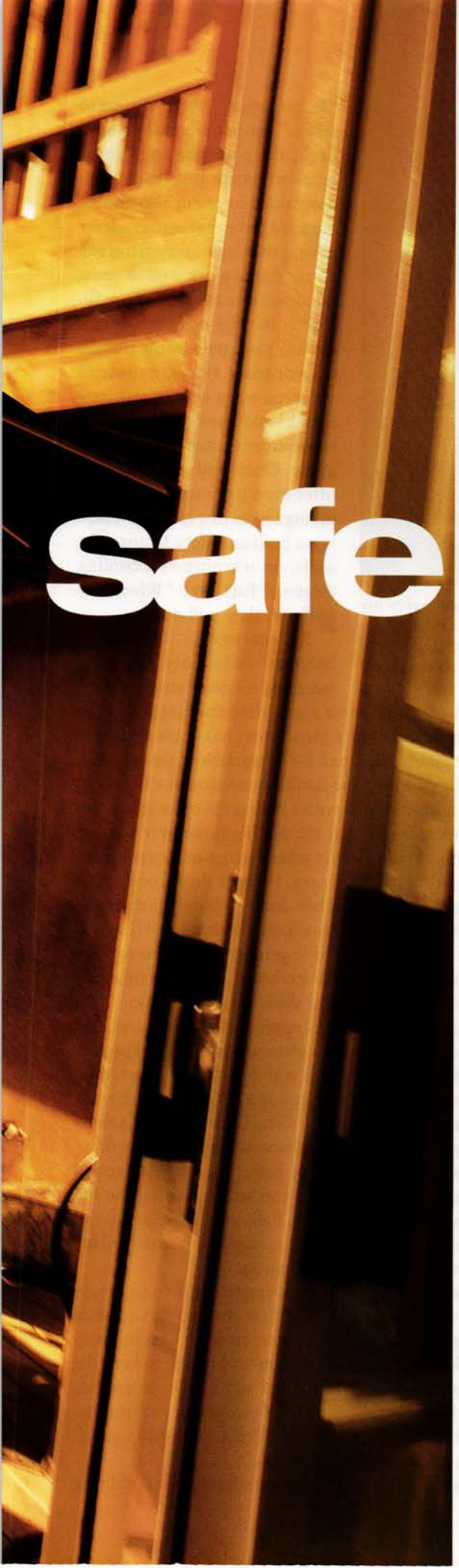
TOP: William G. Scheller goes leaf gathering with a Mighty Mac LSC508. Lowering the hopper to the ground, he rakes a pile of leaves directly into the machine for shredding. BOTTOM: *Rolled across a yard with its vacuum snout 2 inches off the ground, a self-propelled Cub Cadet sucks up dry leaves, depositing mulch in a convenient cloth collection bag.*



TOP: The Cub Cadet comes with a hose attachment for vacuuming leaves in hard-to-reach spots. Thanks to the steel handle, Scheller can stand up straight while guiding the hose. BOTTOM: *He trims all the protruding stubs off a birch branch before feeding it into the Troy-Bilt, which can chop branches up to 3 inches in diameter.*



Decks that extend over a walk-out basement or climb all the way up to a second story make natural places for outdoor entertaining. Safely secured to the side of a house with bolts, this double-tiered redwood deck in Albuquerque, New Mexico, is strong enough to accommodate a crowd.



building a safe deck

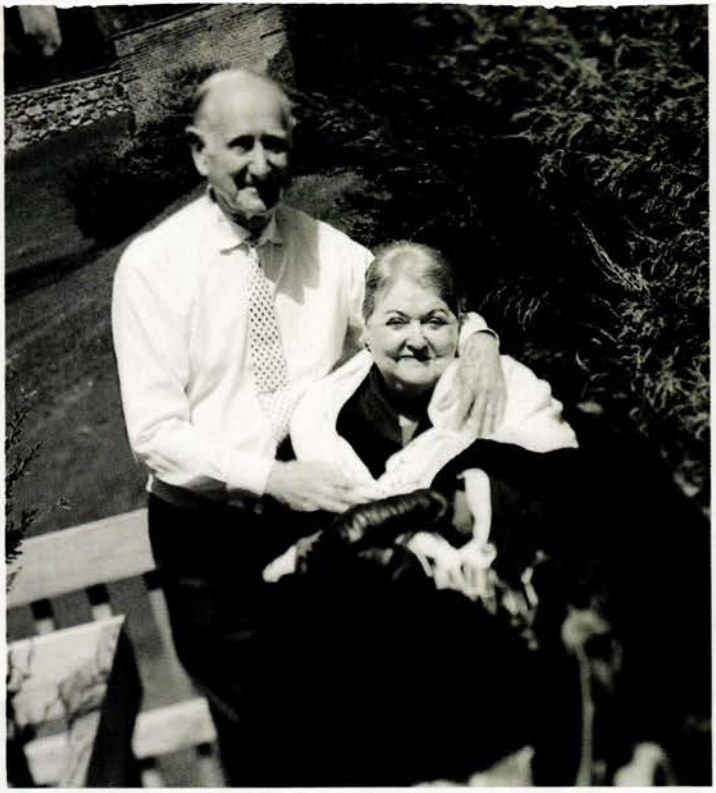
Is yours bolted to the house, or just nailed?

Betty Gerisch was nudging through a dinner-party crowd of Salvation Army members, aiming for a buffet table on the deck of a house in Atlanta one evening three years ago. Just as she and her husband, Robert, stepped through the door, she heard a loud crack and found herself falling through air. The deck had pulled away from the side of the house and collapsed, dumping 60 guests onto a concrete patio 18 feet below and scalding dozens of them in a torrent of overturned grills and chafing dishes. The scene "looked like a battlefield,"

BY CURTIS RIST

PHOTOGRAPHS BY ERIC O'CONNELL

reported one firefighter. Ambulances jammed the street as rescue workers helped people with broken pelvises, broken backs and third-degree burns. Robert Gerisch, 77, a cardiologist, suffered a head injury that would keep him in the hospital for six months. Betty Gerisch, 74, suffered a broken neck and a severed spinal cord. "I fell on lawn furniture and cement planters, and then everyone fell on top of me," she recalls. "I was conscious, but I dearly wished I hadn't been." She would never walk again. Three years later, she remains partially paralyzed and unable to get around except in a wheelchair. "To think that, in one instant, life can change so dramatically," she says. "And all because of a badly built deck."



Wheelchair-bound because of a deck collapse, Betty Gerisch makes her way down a ramp built with some of the $130,000 she and her husband, Robert, won from a court settlement. "I'm not bitter," she says of her catastrophe. "But I sure wouldn't want this to happen to anyone else."

Decks are phenomenally popular in the United States. The National Association of Home Builders estimates they are included in nearly a third of all new houses, and decks are by far the most popular do-it-yourself construction project. Yet structural defects that can bring decks down are frighteningly common. Although no one keeps statistics, "I'd say as many as 10 percent of the decks I've seen have serious design or construction flaws that could lead to catastrophe," says Bob Fennema, a structural engineering consultant and member of the American Society of Home Inspectors. Moreover, deck collapses tend to occur just when the potential for injury is greatest: when a crowd gathers. Near Kalamazoo, Michigan, a 57-year-old woman was killed when a deck crashed on top of her several years ago while revelers upstairs were singing "Happy Birthday." In 1995, at a campground in suburban St. Louis, more than 100 fans of the Grateful Dead rock group were injured, five of them critically, when a covered deck under which they had sought shelter from a thunderstorm broke away from a lodge. And at the New Jersey shore last summer, an outdoor wedding ceremony was disrupted when the deck collapsed as the bride and groom exchanged vows. (They completed the ceremony in the emergency room, where doctors treated most of the wedding guests, including the mayor, who officiated.)

A deck can even handle the rowdiest gang of fraternity brothers as long as the beam that carries the floor joists is properly bolted to the side of the house. By contrast, virtually every deck that collapses has been merely nailed on. Robert Falk, a structural engineer with the U.S. Forest Products Laboratory in Madison, Wisconsin, realized this while researching a deck-building manual five years ago. Falk had heard about the death of the woman in the deck collapse near Kalamazoo, and he wanted to find out the reasons for the failure. Using a database to search five years of newspaper articles from around the country, he found that nearly every collapsed deck had been attached with nails, rather than bolts, and that investigators had pinpointed the nails as the cause of collapse. "On paper, you can calculate that nails will work," Falk says. "In practice, it's a different story." As people gather on a deck, their weight and movement translate not just into a downward force but also into an outward force that acts as a lever prying the deck away from the house. Nails work well to resist the downward force but are no match for the outward force. Held in place only by the friction of bent wood fibers, nails tend to loosen when wood alternately shrinks and swells with changes in moisture content and temperature. Once nails loosen, they offer even less resistance to the prying forces of a crowd. "There is no built-in safety factor with nails, no warning of a coming disaster," Falk says. "When they pull out, they pull out."

A screwed-in connector behaves differently. It gains increased frictional strength from the wedging action of wood fibers along the entire length of the shaft. A lag bolt, which looks like a giant screw, has as much as nine times the pullout resistance of a nail for every inch of penetration, Falk says. Better still is the metal-to-metal connection of a true bolt, inserted in a drilled hole and fitted with a nut on the other side. Placing a washer on both sides spreads the pulling force over a larger portion of the beam. "You'd rip the whole structure apart before those bolts would pull out," Falk says. Both of these connectors offer an extra benefit over nails: They don't suddenly pull out as wood shrinks and swells. But they may loosen over time. If the deck is inspected annually, early signs of loosening will show up as a widening gap against the house. "With bolts, you're more likely to see a problem brewing before your deck falls," Falk says.

Another crucial step is to keep the connection between deck and house dry by adding flashing to drain water away. This will protect both the deck and the house. Holes made in the side of a house, even if filled with bolts, allow water to seep in. Jim O'Brien, who owned a construction company in Peachtree City, Georgia, recalls tearing a deck off a 7-year-old house and discovering that water flowing in had rotted the house. "We literally had a 5-foot section rotted so badly that you could put your hand through it," he says of the exterior wall. Flashing will prevent this, Falk says. He also advises squirting a durable caulk, such as silicone, into the holes drilled for the bolts: "The connection will be waterproof."

Even better, Falk says, is to avoid attaching the deck to the house in the first place. A freestanding deck, built on posts so that a 1-inch gap separates it from the house, allows water to drain with no damage to the house. However, the posts need cross-bracing to keep the deck from wobbling. The bracing gets in the way if the deck extends above a walk-out basement. "But this would be our recommendation in just about every case," Falk says. "From a durability standpoint, freestanding decks are the way to go."

Norman Koplon, the director of Atlanta's Bureau of Buildings,

knew none of this when he looked into the deck collapse at the Salvation Army party. The cause, at first, perplexed him. For one thing, this was no rickety, neglected structure. The deck, only 12 years old, had been built of rot-resistant pressure-treated wood and seemed as solid as the Georgian mansion to which it was attached. The deck wasn't overloaded either; it should have been able to support a crowd three times as large. Searching the rubble, Koplon came upon a small section of the deck that had remained in place. He checked it carefully and found that it was attached with bolts. The collapsed section had been held on with a handful of 12d nails—3¼ inches long. Instead of driving the nails where they would penetrate the solid-wood framing, the builders had simply hammered in about six nails every 16 inches. The result was that the tips of the nails penetrated the ¾-inch siding—but not a fiber of cellulose beyond it. "The wood clapboard was supposed to be holding up the whole deck," Koplon says. "This isn't anybody's idea of a safe situation." In addition, the builders had skipped flashing. The wood behind the beam was rotten and riddled by termites.

Amazed that anyone could have attached a deck by just nailing it into siding, Koplon researched the recommended construction method. Thumbing through the Atlanta building code, he found a definition of a deck—but little else. "I could not find a single substantial detail published on how a deck should be attached to a house," he says. "I just couldn't believe it." The lack of a code on deck attachment is not unique to Atlanta. Of the three main building codes in the United States—all of which are scheduled to be consolidated into a uniform code in the year 2000—not one deals with fastening decks to houses. "You're not going to find any prescriptive details relevant to the structure of a deck," concedes Mike Pfeiffer of the Building Officials and Code Administrators, International, which publishes the BOCA National Building Code. The proposed consolidated code doesn't cover the specifics either: Designed to fit all climates, it focuses on broad building requirements and offers even fewer specifics than the current codes. Home construction manuals also are little help, judging by a review of 19 books with deck plans. Only one contained drawings showing all the details required to properly attach a deck to a house.

When the deck on this house near Kalamazoo, Michigan, fell during a party in 1992—killing a 57-year-old woman standing beneath it—building officials were perplexed: It appeared to have been bolted into place. A closer look revealed that the lag bolts—giant screws—had penetrated only the sheathing of the house and were not anchored into anything solid.

Many home owners expect local building officials to ensure that decks are properly built, but this, too, is a risky assumption. Although nearly all municipalities require decks to be built "to code," many do not inspect home-owner or low-cost projects, often defined as those costing less than $2,500. Bill Satter of Cav-Ark Builders Inc. in Niverville, New York, recalls building a large house in the Hudson River Valley for someone who later added a deck himself. When done, it was obvious that the supporting timbers were too small. The building inspector noticed the flaw and ordered Satter to rip it down. "When I explained the owner built the deck, not me, he let it go," Satter says. "It was okay if it was just something the home owner did."

Some inspectors, however, have become crusaders for safer decks. After several collapses in Peachtree City, Georgia, building director Tom Carty made proper deck-building his mission. He even has a model of a deck, with bolts and flashing, in his office. When anyone applies for a deck-building permit, he says, "I walk them by it and make sure they understand every detail before I give the permit to them."

The Gerisches also turned into reluctant experts in building a safe deck. By the time Robert Gerisch emerged from the hospital, his cardiology practice had withered; he went into forced retirement. Betty lost even more, but she's grateful: Surgery restored her speech, she now moves her arms freely, and her spirits are strong. "She's smart and alert, as always," Robert says.

"It's just a miracle that I'm alive," Betty says. To help her get around, the Gerisches built a deck that slants down to the walkway in front of their house in Bloomfield Hills, Michigan. Betty's proud of the way it's attached: with bolts, nuts and plenty of flashing. "This one doesn't worry me," she says. "Believe me, it's solid." ■

Inspecting Your Own Deck

To check the attachment between a house and a deck, go beneath it and look at the main beam: "If you don't see bolts and flashing, it's because they're not there," says Tom Carty, the building director for Peachtree City, Georgia. Adding lag bolts may make the connection more secure, but often either the beam or the house has begun to rot. Carty suggests sticking a pocketknife into the beam and the wall; if the blade penetrates easily, the wood is rotting and the entire deck-to-house-joint may need rebuilding. If bolts are in place but a gap at the joint appears, it could be a sign they are working loose—or were never attached to anything structural in the first place.

Two Good Ways to Keep a Deck

1. This system, developed by researchers at the U.S. government's Forest Products Laboratory, will keep a deck from prying loose—and it will help prevent rot.

DECK PARTS

1. INTERIOR WALL
2. SOLE PLATE
3. SIDING
4. DECKING
5. BAND JOIST
6. SILL PLATE
7. DECK JOIST
8. JOIST HANGER
9. DECK BEAM
10. SHEATHING
11. BUILDING PAPER

Attached to a House

Tuck flashing under exterior siding. Use galvanized flashing, because copper-laden runoff from pressure-treated wood will corrode aluminum over time.

Use ½-inch-diameter bolts with nuts and washers wherever possible, for extra strength. Insert two to four washers as spacers so deck beam can dry out.

Attach metal hanger with nails specified by manufacturer. To avoid penetrating flashing with long nails, either attach the hangers and hammer over the nail tips before bolting the deck beam to the house, or switch to short, thick fasteners called hanger nails and reduce the load on each hanger as directed by the manufacturer—often by one-third.

Use pressure-treated lumber for beams and joists. Shown is an arsenic-free type.

If the band joist is not securely attached to the structural framing of the house, strengthen the connection before installing the deck beam. Hammer 16d nails at an angle so they penetrate through the sheathing into both the band joist and either the sole or sill plate. Space these nails every 8 inches.

After installing flashing, temporarily hang the deck beam in order to drill bolt holes. Then remove the beam, squirt caulk in the holes and immediately reposition the beam in order to tighten the bolts.

Where access on both sides of the wall is limited, a ½-inch-diameter lag bolt may be used. It must reach at least 1½ inches into solid wood—into the band joist or studs. If the sill rests on the foundation, use expanding anchor bolts.

Extend the sheet of flashing below deck beam and bend the lip out over siding.

2. Tom Silva's System

Adding a deck to a house in Lexington, Massachusetts, *This Old House* contractor Tom Silva pays particular attention to the beam that connects the deck to the house and carries all the supporting joists. "It's where 99 percent of mistakes are made," he says. ***TOP:*** Because a beam pressed tight against a house can trap moisture and encourage rot, Tom creates a gap for air with spacers shaped to fit the recessed foundation of the house. He cuts the spacers from scraps of pressure-treated wood, nails them on and then drills two holes through each spacer and the beam, one hole near the top edge, another at the bottom. ***MIDDLE:*** Tom and his nephew Charlie Silva jockey the beam into position. Aiming through the top holes previously made, they drill into the house's wooden sill and screw in lag bolts. Through the lower holes, they install masonry anchor bolts into the concrete foundation. ***BOTTOM:*** For flashing, Tom uses an adhesive-backed flexible membrane made of polyethylene film and rubberized asphalt. Tom prefers it to metal flashing because its sticky nature makes a watertight seal around bolts that penetrate the surface. Since the material could degrade in ultraviolet light, however, he makes sure to cover it with siding and decking. To prevent rot, Tom constructs the entire deck frame from pressure-treated wood. This wood is usually loaded with arsenic and chromium as preservatives, but he works with a look-alike product treated with a safer preservative, A.C.Q. For the decking, Tom switches to cedar or redwood because he likes the look.

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ASK NORM

"Phillips bits wear quickly, so it's worthwhile looking for hardened steel bits with ribbed tips for a better grip."

SCREWHEAD STRIPPERS

I've seen you use an electric drill and driver bit on wood and drywall hundreds of times. But when I do it myself, I often find that the screwheads strip out. How can I prevent this?

JAMES SPRINGER, *Kettering, Ohio*

Cheap, soft-metal screws or a worn-out bit could be at fault. Phillips bits wear quickly, so it's worthwhile looking for hardened steel bits with ribbed tips for a better grip. There are several other causes of stripping, including failure to keep the drill bit firmly pressed to the screwhead and using the wrong-sized bit. But the most common cause is a failure to predrill holes for the screws. On a job site, I'll hear a bit chatter, and I know immediately that someone has stripped a screw. I'll turn around to see a young carpenter struggling with a screw that isn't fully seated and can't be backed out either. My first question is always: "Did you drill pilot holes?" Inexperienced carpenters often assume that a power tool will drive screws without predrilling. Ordinary twist drills will do for making pilot holes, and some of these tools now have hexagonal shanks for quick switches from drill to driver. Special pilot bits are better. Many are graduated by screw size —number-8 bits for number-8 screws and so on—and they automatically countersink for flathead screws.

SOFFIT STAINS

We're replacing the asphalt shingles on our 23-year-old house. The aluminum fascia and soffit just below the roof are stained by either air pollution or runoff from the old shingles. We want to clean the aluminum before we replace the gutters and downspouts. But how? Once we finish cleaning up, what preventive measures can we take?

REBECCA FRESA, *Bridgeport, W.V.*

Your soffit is under the eaves, so it shouldn't be stained by runoff. That leads me to suspect you have a leaking roof. If that's the case, your new shingles should remedy the problem. The existing stains may require a commercial house-cleaning product but, if you have any mildew, use an ammonia-based household cleaner. Either can be applied with a stiff brush or gentle power-washing, but be sure not to spray water directly into vents. The old aluminum probably needs painting because the finish doesn't last forever. Sand lightly, and prime any bare metal first. Finding compatible paints and primers is easy: Just read the labels.

WINDOW SLIPPAGE

The windows in our 1962 house are giving us trouble. Most won't stay up. Some are hard to raise. And nearly all of them leak. We don't believe our windows are so far gone that they have to be junked. I have the time to do some work, and I'm handy with tools, so please tell me what to do.

JOHN T. CARY JR., *Vernon, Conn.*

One common type of window from that era features a sash that easily pops out for cleaning. On one side, spring-loaded bars in the sash match grooves in the frame; on the other, aluminum ribs in the frame fit into grooves in the sash. After cleaning both sides, adjust the springs with a screwdriver so the sash will stay up but still move easily. It's a fussy job, tricky to get right the first time. If you have spring-balanced sash, you can easily replace worn parts with inexpensive new ones. The hard part is removing the stops: vertical molding strips forming part of the channel in which the sash slide up and down or covering the edge of the balance. Slip a thin putty knife between the stop and the frame; then gently loosen them, inch by inch, to avoid breakage and chipped paintwork. And while you're at it, you might as well weather-strip the top, bottom and meeting rails.

JELLY CUPBOARD

My late father left behind an antique jelly cupboard that's going to be a lot of work for this novice to strip, repair and repaint, but I'm willing to try. Any suggestions?

JEAN SMILINGCOYOTE, *Chicago, Ill.*

Refinishing destroys much of the value of antiques, so consult an expert to find out what you have. If the cupboard

is simply old, rather than antique, light sanding and feathering the edges where it's chipped may be all the preparation you need before repainting. "Old" paint usually means lead paint, so make sure you wear a dust mask and work outside with the cupboard on a disposable plastic sheet, and use wet sponge-type sandpaper or a sander attached to a vacuum with a HEPA (high-efficiency particulate air) filter. Stripping is rarely necessary unless you want to show the wood grain. If that's your aim, check a hardware or paint store for an ecologically friendly stripper, and follow the directions on the label.

WALL INSULATION

I'm in the process of renovating a two-story house that's about 100 years old. It has a large attic and adequate crawl space. What's the best way to insulate my walls? Is it necessary to remove lath and plaster, or will blown-in insulation do? My plaster is in relatively good condition, and I am receiving mixed messages about the lack of a vapor barrier.

PHILIP KROEKER, *Upland, Ind.*

Some people say blown-in cellulose doesn't work because it settles and there's no moisture barrier, but I've found no problems in projects I've checked after five or six years. Using vapor-barrier paint may ease your mind, but a better idea is to avoid generating a lot of humidity. Two musts are: proper installation (no voids) and no exterior leaks. You might also consider insulating the walls with a modified-urethane foam that expands after it's pumped into wall cavities. Originally meant for new construction, this foam is now available for retrofit. We've used it in some recent project houses, and it seems to work well. It doesn't require a vapor barrier.

PANELS

Our older house was built when paneling was popular, and that makes our living room and dining room very dark despite nice-size windows. We want to replace the paneling with drywall someday, but in the meantime we'd like to brighten up the rooms with paint. What kind of paint would adhere well to wood paneling?

PAT JOHNSON, *Granby, Colo.*

Any product made for wood will work on wood paneling. A light scuffing with fine sandpaper will provide a little tooth to grip the primer. But first find out what's beneath the paneling. Removing the cover of an electrical outlet should tell you. It could be drywall or even plaster, needing only a little patching here and there. Your house may be a fashion victim—there was a rage for do-it-yourself paneling in the '60s—so you may be in luck. If the paneling was applied with small nails or brads, it will be easy to remove. But if adhesive was used, the wall behind is probably ruined.

NEW PORCH

We have a nice 1870 Victorian that still has a good amount of gingerbread and detailing. But previous owners did some modernizing and left us with a concrete porch. I guess they wanted something solid that would not rot, as this porch faces Long Island Sound. The nice cutout posts and brackets remain from the original porch, so we wonder whether wood can be installed over the concrete. We like the sound and authentic antique appearance of wood, and we don't like the feel of concrete under bare feet in summer. What do you advise?

DANIÈLE LASSER, *Branford, Conn.*

Installing wood over a concrete porch can be done, but it's a bad idea. It will change the height of the top stair and threshold, producing dangerous trip hazards. You would probably end up replacing the steps too. For drainage, you would need 1x2 treated-lumber sleepers. They would run from the house to the end of the porch, making the floor at least 1½ inches higher. And the floor still wouldn't drain or ventilate very well, possibly leading to mold and mildew. My advice: Removing the slab will be a nightmare, so leave well enough alone except to consult a decorator for cosmetic tips on hiding your maintenance-free and rotproof concrete.

RED-EYE SPECIAL

I've noticed that you use a chop saw with a red laser sighting guide, but I never see it advertised. How can I get one?

J.A. BOLAND, *Moberly, Mo.*

That tool was an idea whose time hadn't come. After three years on the market, it was dropped in 1996. Although expensive—about $360—the design was pretty basic compared to the fancy sliding and compound-miter saws that were introduced at about the same time. The laser had to be switched to the left or right of the blade depending on which side of the lumber was the waste side. Old pros who were accustomed to cutting by eye often forgot, and infuriating mistakes occurred. This Old House *contractor Tom Silva has a laser-guided chop saw, too, and says he likes "everything except the laser. It's hard to see in bright light, and it can't be adjusted. It doesn't let me cheat a line when I need to."*

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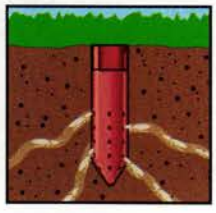
APPLY: *Simply place the stakes in the ground around your home, and TERMINATE does the work.*



FEED: *Worker termites foraging for food find the stakes, eat the insecticide coated food, and die.*

TERMINATE: *Without workers to supply the colony with food, the remaining termites die.*

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*Replace stakes in accordance with label directions. (TOH)

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PHOTOGRAPH: GARY HUSH

This Old House® CLASSICS

Program Guide

Taken by Storm

The crew leaves snow-blanketed Massachusetts to restore a Miami hurricane casualty

Big and beautiful: The Lexington project remains This Old House*'s most dramatic transformation ever; the house started out as a cramped ranch.*

Week 16 (July 4-5)
Despite 2 feet of snow, workers converge indoors and out to finish the project in Lexington, Massachusetts, on schedule. Steve Thomas and Norm Abram maneuver plywood columns into place on the front porch. Tom Silva installs extension jambs on the great-room windows. ***Watch and learn:*** Smoothing a rough concrete slab.

Week 17 (July 11-12)
While stonemason Roger Hopkins finishes laying the granite front steps, Melissa J.H. Guenet discusses inconspicuous halogen lighting. Joe Ferrante installs limestone tiles in the bathroom. ***Watch and learn:*** Fixing a chipped whirlpool tub.

Week 18 (July 18-19)
The kitchen gets a marble countertop, and the yard welcomes a pre-owned tree. Norm trims out a dormer window, while Steve visits the bathroom tiler. ***Watch and learn:*** Making shower stalls and counters.

Week 19 (July 25-26)
In the great room, Jeff Hosking and his crew install a floating floor system. At his workshop, Norm is building the entertainment center for the project and, back at the house, Tom installs maple stair treads. ***Watch and learn:*** Installing stereo speakers.

Week 20 (August 1-2)
On the last day of filming in Lexington, the entertainment center arrives. Don Martini demonstrates the digital-display security system. At last: time for the wrap party. ***Watch and learn:*** Installing wood paneling.

Week 21 (August 8-9)
In the wake of Hurricane Andrew, Steve and Norm cast about Dade County, Florida, for a storm-damaged property to restore. With a time restriction of six episodes, they choose a water-damaged 1919 Mediterranean owned by the O'Donnell family. The budget: $65,000. ***Watch and learn:*** Assessing hurricane damage.

Week 22 (August 15-16)
Architect Julio Diaz and Mary Ellen O'Donnell Frank discuss restoration of the fireplace. Next, Richard Trethewey investigates a hazardous shower stall. ***Watch and learn:*** Securing waterproof membrane on a roof.

Week 23 (August 22-23)
Anthony Sisto explains how he will clean up felled branches. Air-conditioning contractor Drew Chanin introduces Norm to the new system. The crew gets ready to spray some concrete to make a new beam. ***Watch and learn:*** Choosing new windows for an old house.

Week 24 (August 29-30)
Steve visits Mount Trashmore, home to Hurricane Andrew-generated debris. Back on the project site, Norm checks up on the wall plasterers and patchers, while Steve tours the grounds with landscape architect Kevin Holler. Finally: a look at the kitchen. ***Watch and learn:*** Installing windows.

Hurricane Andrew devastated more than 63,000 houses in Dade County, Florida. Luckily, the water-damaged Miami project house can be saved.

ALABAMA

Birmingham
WBIQ-TV
Thu. 8:30 pm, Sat. 8 pm
● WCFT/WJSU-TV
Sat. 6:30 am

Demopolis
WIIQ-TV
Thu. 8:30 pm, Sat. 8 pm

Dozier
WDIQ-TV
Thu. 8:30 pm, Sat. 8 pm

Florence
WFIQ-TV
Thu. 8:30 pm, Sat. 8 pm

Huntsville
WHIQ-TV
Thu. 8:30 pm, Sat. 8 pm
● WZDX-TV
Sun. 7 am

Louisville
WGIQ-TV
Thu. 8:30 pm, Sat. 8:30 pm

Mobile
WALA-TV*
WEIQ-TV
Thu. 8:30 pm, Sat. 8 pm

Montgomery
WAIQ-TV
Thu. 8:30 pm, Sat. 8 pm

Mount Cheaha
WCIQ-TV
Thu. 8:30 pm, Sat. 8 pm

ALASKA

Anchorage
KAKM-TV
Sat. 9:30 am
● KIMO-TV
Sat. 4:30 pm

Bethel
KYUK-TV
Fri. 8 pm, Sat. 8 am

Fairbanks
KUAC-TV
Fri. 8 pm, Sat. 8 am
● KATN-TV
Sat. 4:30 pm

Juneau
KTOO-TV
Fri. 8 pm, Sat. 8 am
● KJUD-TV
Sat. 4:30 pm

ARIZONA

Phoenix
KAET-TV
Thu. 2 pm and 7:30 pm
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● KNXV-TV
Sun. 10 am

Tucson
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Sat. 6:30 pm
KUAT-TV
Sat. 6:30 pm
● KTTU-TV
Sat. 9 am

ARKANSAS

Arkadelphia
KETG-TV
Sat. 12:30 pm

Fayetteville
KAFT-TV
Sat. 12:30 pm

Jonesboro
KTEJ-TV
Sat. 12:30 pm

Little Rock
KETS-TV
Sat. 12:30 pm
● KTHV-TV
Sat. 11 am

Mountain View
KEMV-TV
Sat. 12:30 pm

CALIFORNIA

Chico
● KRCR-TV
Sun. 5 pm

Eureka
KEET-TV
Wed. 7:30 pm
Sat. 10:30 am
● KAEF-TV
Sun. 5 pm

Fresno
KVPT-TV
Sat. 9:30 am, Sun. 7 pm
Tues. 9 pm

Huntington Beach
KOCE-TV
Sat. 4:30 pm, Tues. 8 pm

Los Angeles
KCET-TV
Sat. 5:30 pm
● KABC-TV
Sun. 6:30 am

Redding
KIXE-TV
Sat. 10:30 am

Rohnert Park
KRCB-TV
Sun. 7:30 pm, Wed. noon

Sacramento
KVIE-TV
Thu. 8 pm, Sat. 8:30 am
● KPWB-TV
Sat. 6 am

San Bernardino
KVCR-TV
Thu. 7 pm

San Diego
KPBS-TV
Sat. 11:30 am
● KGTV-TV
Sun. noon

San Francisco
KQED-TV
Sat. 5:30 pm
● KPIX-TV
Sun. 10:30 am

San Jose
KTEH-TV
Wed. 9 pm, Sat. 3 pm
Sun. 4:30 pm

San Mateo
KCSM-TV
Tues. 6:30 pm, Sun. 10 am

Santa Barbara
● KSBY-TV*

COLORADO

Boulder
KBDI-TV
Wed. 3:30 am and 5:30 pm
Sat. 5:30 pm, Sun. 4 pm

Colorado Springs
● KRDO-TV
Sun. 11:30 am

Denver
KRMA-TV
Sat. 2 pm, Sun. 5:30 pm
● KCNC-TV
Sat. 4 pm

Grand Junction
● KJCT-TV
Sun. 11:30 am

Pueblo
KTSC-TV
Thu. 8:30 pm

CONNECTICUT

Fairfield
WEDW-TV
Thu. 11:30 pm, Fri. noon
Sat. 7 pm, Sun. 10:30 am

Hartford
WEDH-TV
Thu. 11:30 pm, Fri. noon
Sat. 7 pm, Sun. 10:30 am
● WFSB-TV
Sat. 9:30 am

New Haven
WEDY-TV
Thu. 11:30 pm, Fri. noon
Sat. 7 pm, Sun. 10:30 am

Norwich
WEDN-TV
Thu. 11:30 pm, Fri. noon
Sat. 7 pm, Sun. 10:30 am

DISTRICT OF COLUMBIA

WETA-TV
Sat. 9:30 am
● WRC-TV
Sun. 5 am

FLORIDA

Bonita Springs
● WGCU-TV
Sat. 12 pm, 12:30 pm
Sat. 1:30 pm, Sun. 5 pm

Daytona Beach
WCEU-TV
Tue. 8 pm and 11 pm
Sat. 5:30 pm

Fort Myers
● WTVK-TV
Sat. 5:30 am

Gainesville
WUFT-TV
Sat. 9:30 am and 1:30 pm
● WCJB-TV
Sun. 1:30 pm

Jacksonville
WJCT-TV
Sat. noon

Miami
WLRN-TV
Sun. 10 am
WPBT-TV
Sat. 11 am
● WPLG-TV
Sun. 8 am

Orlando
WMFE-TV
Sat. 9 am and 1 pm
Sun. 9 am

Pensacola
WSRE-TV
Sat. 12:30 pm and 6:30 pm

Sarasota
● WWSB-TV
Sun. 11:30 am

Tallahassee
WFSU-TV
Sat. 1:30 pm and 6:30 pm

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A Guide to Resources for the "Classics" TV Series

An updated list of suppliers and manufacturers featured in *This Old House*'s projects in Lexington, Massachusetts, and Miami in 1992 to 1993.

Week 16

Excavator: Herb Brockert, Construction Services Co.; 508-429-1410. **Oil tank installer:** Taylor & Murphy Inc.; 781-893-3544. **Expansion tank for water heater:** Amtrol Inc.; 401-884-6300. **Plasterers:** Larco Wallboard Supply Inc.; 978-851-6440. **Concrete refinisher:** M. Solberg Enterprises, Concrete Cutting Service; 781-729-5575. **Forced-air propane heater:** 3500-FAC, National-Riverside-Universal heaters, Scheu Products Co.; 800-325-7057. **Kitchen cabinets:** Century door panel, Adelphi Kitchens Inc.; 800-922-3101. **Kitchen designer:** Glenn Berger, Acton Woodworks Inc.; 978-263-0222.

Week 17

Stonemason: Roger Hopkins, Naturalistic Gardens; 978-443-7572. **Granite flagstones:** Castellucci Stone Industries; 401-294-1200. **Lighting designer:** Melissa J.H. Guenet. **Fiberglass repair:** Donaruma Fiberglass & Porcelain Repair, Hudson, MA; 978-568-8633. **Radiant heating:** Stadler Corp., Bedford, MA; 800-370-3122. **Skylight:** Wasco Skywindows, Wasco Products Inc., Sanford, ME; 800-866-8101. **Router:** Skil-Bosch Power Tool Co., New Bern, NC; 800-815-8665. **Dado cutter:** Freud U.S.A. Inc., High Point, NC; 800-334-4107. **Grout and adhesive:** Custom Building Products, Seal Beach, CA; 562-598-8808. Supplied by O'Brien Associates, Beverly, MA; 978-922-5003.

Week 18

Corian countertop: DuPont Corian, Barley Mill Plaza, Wilmington, DE; 800-426-7426. **Fabricators:** Boston Fabrication, Building 25, Endicott St., Norwood, MA 02062; 781-762-8900. **Granite countertop:** Interstone Inc., Woburn, MA; 781-938-1820. **Glass cooktop:** Whirlpool Corp., Benton Harbor, MI; 800-253-1301. **Traffic tile (recycled glass):** Terra-Green Inc., Richmond, IN; 765-935-4760. **Color galvanizing of railings:** Duncan Galvanizing; 617-389-8440.

Week 19

Floating floor system: Maple Acadia Natural Longstrip, Harris-Tarkett Inc., Johnson City, TN; 800-842-7816. **Stair parts:** Brockway-Smith Co., Andover, MA; 978-475-7100. **Maple treads:** Arcways Inc., Box 763, Neenah, WI; 800-558-5096. Provided by Brockway-Smith. **Custom newel and gooseneck:** Blue Anchor Woodworks Inc., Marblehead, MA; 781-631-2390. **Built-in audio system:** Elan Home Systems, Lexington, KY; 606-269-7760. **Carpet underlayment:** Homasote Co., West Trenton, NJ; 800-257-9491.

Week 20

Painter: George Hourihan, Unicorn Painting Co.; 781-862-1201. **Mirrors:** Banner Glass; 781-245-1206. **Glass shower doors:** Century Shower Door Inc.; 973-785-4290. Supplied and installed by Shelmar; 781-245-1206. **Wallpaper hanger:** Sarai Stenquist; 781-894-5656. **Wallpaper:** Patterns KW6022, KW6012B and KW 6002B, K&W Kids, Vol. III, Imperial Wallcoverings. Supplied by Waltham Wallpaper & Paint Corp.; 781-893-3732. **Security system:** Lexington Alarm Systems Inc.; 781-275-4200. **Front-door hardware:** Baldwin Hardware Corp.; 610-777-7811. **Screen and storm doors:** Combination Door Co.; 920-922-2050. **Carpet installation:** Nigohsian Rug; 781-444-7847. **Carpet:** Karastan (Mohawk Industries); 800-845-8877. **Plumbing fixtures:** American Standard Inc.; 800-223-0068. **Interior-door hardware:** Paul Decorative Products; 718-402-2988.

Week 21

General contractor: Groden-Stamp Construction Inc.; 305-757-4974.

Week 22

Dumpster service: Waste Management Inc. of Dade County, Miami, FL; 305-471-4444. **Architects:** Fullerton Diaz Architects; 305-442-4200. **Roofing contractor:** Advanced Weatherproofing Systems Inc.; 800-438-9102. **Membrane roofing:** Awaplan 170 APP modified bitumen, Tamko Roofing Products Inc.; 800-641-4691. **Plumber:** Eddie Faccaviento, Village Plumbers; 305-534-6511.

Week 23

Air-conditioning contractor: Chanin Air Inc.; 305-865-1729. **Air-conditioning system:** Carrier Corp.; 305-652-4511. **Electrical contractor:** Empire Electric; 305-264-9982. **Windows and doors:** Hurd heat mirror 66, Hurd Millwork Co.; 715-748-2011. Supplied by Califar Sales; 813-264-7377. **Blue-board and other building supplies:** Scotty's Inc.; 800-694-3344.

Week 24

Landscape architect: Kevin E. Holler; 561-392-2688. **Kitchen designer:** Luaces Corp.; 305-887-4502.

WUSF-TV
Wed. 9 pm, Sun. 5:30 pm
● WTVT-TV
Sat. 9:30 am

West Palm Beach
● WPTV-TV
Sun. 6 am

GEORGIA

Albany
● WGVP-TV
Sun. 2:30 pm

Atlanta
WGTV-TV
Thurs. 8:30 pm
Sat. 5:30 pm, Sun. 7 pm
WPBA-TV
Mon. 8 pm, Wed. 2 pm
Sat. 6 pm
● WXIA-TV
Sat. 5:30 am

Chatsworth
WCLP-TV
Thurs. 8:30 pm
Sat. 5:30 pm, Sun. 7 pm

Cochran
WDCO-TV
Thurs. 8:30 pm
Sat. 5:30 pm, Sun. 7 pm

Columbus
WJSP-TV
Thurs. 8:30 pm
Sat. 5:30 pm, Sun. 7 pm

Dawson
WACS-TV
Thurs. 8:30 pm
Sat. 5:30 pm, Sun. 7 pm

Macon
● WMAZ-TV
Sat. 11 am

Pelham
WABW-TV
Thurs. 8:30 pm
Sat. 5:30 pm, Sun. 8 pm

Savannah
WVAN-TV
Thurs. 8:30 pm
Sat. 5:30 pm, Sun. 7 pm
● WTOC-TV
Sun. 5 pm

Waycross
WXGA-TV
Thurs. 8:30 pm
Sat. 5:30 pm, Sun. 7 pm

Wrens
WCES-TV
Thurs. 8:30 pm
Sat. 5:30 pm, Sun. 7 pm

HAWAII

Honolulu
KHET-TV
Thu. 7:30 pm, Sat. 4:30 pm
● KHNL-TV
Sun. 3 pm

Wailuku
KMEB-TV
Thu. 7:30 pm, Sat. 4:30 pm

IDAHO

Boise
KAID-TV
Sun. 4:30 pm
● KIVI-TV
Sun. 6:30 am

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 pm, Fri. 12:30 pm
Sat. 12:30 pm

Champaign/Urbana
● WAND-TV
Sat. 5:30 am
WILL-TV
Thu. 7:30 pm, Sun. 3:30 pm

Charleston
WEIU-TV
Sat. 8:30 pm

Chicago
WTTW-TV
Tue. 7:30 pm, Sat. 5 pm
● WFLD-TV*

Jacksonville
WSEC-TV
Thu. 10 pm, Sun. 1:30 pm

Macomb
WMEC-TV
Thu. 10 pm, Sun. 1:30 pm

Moline
WQPT-TV
Tue. 7 pm, Sat. 5:30 pm

Olney
WUSI-TV
Thu. 7 pm, Fri. 12:30 pm
Sat. 12:30 pm

Peoria
WTVP-TV
Sat. 12:30 pm
● WHOI-TV*

Quincy
WQEC-TV
Thu. 10 pm, Sun. 1:30 pm

Rockford
● WTVO-TV
Sat. 6:30 pm

Springfield
● WICS-TV
Sat. 7:30 am

INDIANA

Bloomington
WTIU-TV
Thu. 11 pm, Sat. 1:30 pm

Evansville
WNIN-TV
Sat. 12:30 pm and 6 pm
Sun. 4:30 pm
● WFIE-TV
Sun. 6 am

Fort Wayne
WFWA-TV
Sat. 10 am

Indianapolis
WFYI-TV
Sat. 10 am, Sun. 6 pm
● WTHR-TV*

Merrillville
WYIN-TV
Thu. 7 pm, Sun. 4:30 pm

Muncie
WIPB-TV
Sun. 4:30 pm

South Bend
WNIT-TV
Wed. 6 pm, Sat. 2 pm

Terre Haute
● WTWO-TV
Sun. 6 am

Vincennes
WVUT-TV
Sat. 1:30 pm

IOWA

Cedar Rapids
● KWWL-TV
Sat. 2:30 am

Council Bluffs
KBIN-TV
Fri. 6:30 pm, Sat. 1:30 pm

Davenport
KQCT
Tue. 7 pm, Sat. 5:30 pm
● WQAD-TV
Sun. 11 am

Des Moines
KDIN-TV
Fri. 6:30 pm, Sat. 1:30 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

Red Oak
KHIN-TV
Fri. 6:30 pm, Sat. 1:30 pm

Sioux City
KSIN-TV
Fri. 6:30 pm, Sat. 1:30 pm

Waterloo
KRIN-TV
Fri. 6:30 pm, Sat. 1:30 pm

KANSAS

Bunker Hill
KOOD-TV
Thu. 7 pm, Sat. 12:30 pm

Lakin
KSWK-TV
Thu. 7 pm, Sat. 12:30 pm

Topeka
KTWU-TV
Sat. 9:30 am

Wichita
KPTS-TV
Sun. 11:30 am
● KSNW-TV
Sun. 6:30 am

KENTUCKY

Ashland
WKAS-TV
Sun. 5 pm

Bowling Green
WKGB-TV
Sun. 4 pm
WKYU-TV
Tue. 1 pm and 6:30 pm
● WBKO-TV
Sun. 6:30 am

Covington
WCVN-TV
Sun. 5 pm

Elizabethtown
WKZT-TV
Sun. 5 pm

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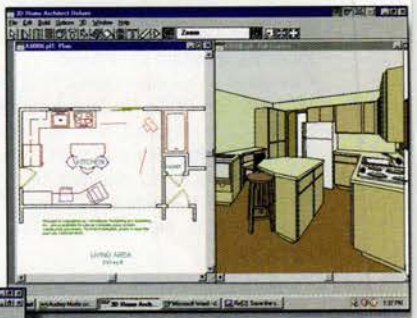

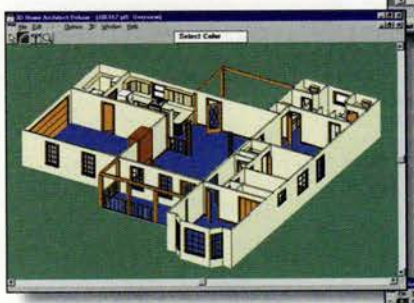

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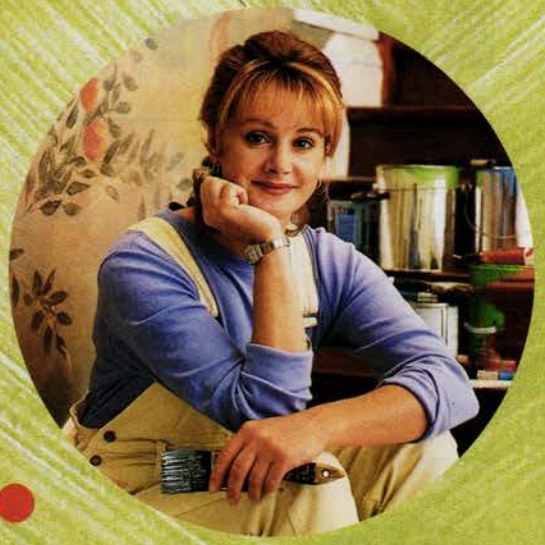
SHE RAGS. SHE DRAGS. SHE SPONGES.



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Sat. 6 a.m.

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Sun. 5 pm
WKPC-TV
Sun. 5 pm
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Madisonville
WKMA-TV
Sun. 4 pm

Morehead
WKMR-TV
Sun. 5 pm

Murray
WKMU-TV
Sun. 4 pm

Owensboro
WKOH-TV
Sun. 4 pm

Owenton
WKON-TV
Sun. 5 pm

Paducah
WKPD-TV
Sun. 4 pm
● KBSI-TV
Sun. 10:30 pm

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Sun. 5 pm

Somerset
WKSO-TV
Sun. 5 pm

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KLPA-TV
Sun. 10 am

Baton Rouge
WLPB-TV
Sun. 10 am
● KWBJ-TV
Sun. noon

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KLPB-TV
Sun. 10 am

Lake Charles
KLTL-TV
Sun. 10 am

Monroe
KLTM-TV
Sun. 10 am

New Orleans
WYES-TV
Sat. 8:30 am
● WVUE
Sun. 6 pm

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KLTS-TV
Sun. 10 am
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Calais
WMED-TV
Sat. 1:30 pm

Lewiston
WCBB-TV
Sat. 1:30 pm

Portland
WMEA-TV
Sat. 1:30 pm
● WPXT-TV
Sun. 11 am

Presque Isle
WMEM-TV
Sat. 1:30 pm

MARYLAND

Annapolis
WMPT-TV
Sat. 4 pm, Sun. 6:30 pm

Baltimore
WMPB-TV
Sat. 4 pm, Sun. 6:30 pm
● WMAR-TV*

Frederick
WFPT-TV
Sat. 4 pm, Sun. 6:30 pm

Hagerstown
WWPB-TV
Sat. 4 pm, Sun. 6:30 pm

Oakland
WGPT-TV
Sat. 4 pm, Sun. 6:30 pm

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

MASSACHUSETTS

Boston
WGBH-TV
Thu. 8 pm, Sat. 5:30 pm
WGBX-TV
Sun. 9 am
● WFXT-TV
Sun. 11 am

Springfield
WGBY-TV
Thu. 8 pm, Sat. 5:30 pm

MICHIGAN

Alpena
WCML-TV
Sat. 2:30 pm

Bad Axe
WUCX-TV
Tue. 12:30 pm, Sun. 5 pm

Cadillac
WCMV
Sat. 2:30 pm
● WWTV/WWUP
Sun. 10:30 am

Detroit
WTVS-TV
Thu. 8:30 pm
● WDIV-TV
Sat. 6:30 am

East Lansing
WKAR-TV
Sat. 1:30 pm, Sun. 5 pm

Flint
WFUM-TV
Thu. 9:30 pm, Sat. 1:30 pm
● WEYI-TV
Sun. 10:30 am

Grand Rapids
WGVU-TV
Thu. 8:30 pm, Sat. 10 am
● WOOD/WOTV-TV*

Kalamazoo
WGVK-TV
Thu. 8:30 pm, Sat. 10 am

Lansing
● WILX-TV
Sun. 11 am

Manistee
WCMW-TV
Sat. 2:30 pm

Marquette
WNMU-TV
Sat. 1:30 pm

Mount Pleasant
WCMU-TV
Sat. 2:30 pm

University Center
WUCM-TV
Tue. 12:30 pm, Sun. 5 pm

MINNESOTA

Appleton
KSMN
Sat. 12:30 pm, Thu. 9 pm
KWCM-TV
Sat. 12:30 pm, Thu. 8 pm

Austin
KSMQ-TV
Thu. 7 pm, Sat. 12:30 pm

Bemidji
KAWE-TV
Thu. 7:30 pm
Sat. 12:30 pm

Brainerd
KAWB-TV
Thu. 7:30 pm
Sat. 12:30 pm

Duluth
WDSE-TV
Sat. 6:30 pm, Sun. 9:30 am

Rochester
● KAAL-TV
Sat. 6 am

St. Paul/Minneapolis
KTCA-TV
Wed. 7:30 pm, Sat. 6:30 pm
● KSTP-TV
Sun. 11:30 am

MISSISSIPPI

Biloxi
WMAH-TV
Sat. 6:30 pm

Booneville
WMAE-TV
Sat. 6:30 pm

Bude
WMAU-TV
Sat. 6:30 pm

Greenwood
WMAO-TV
Sat. 6:30 pm

Jackson
WMPN-TV
Sat. 6:30 pm

Meridian
WMAW-TV
Sat. 6:30 pm

Mississippi State
WMAB-TV
Sat. 6:30 pm

Oxford
WMAV-TV
Sat. 6:30 pm

MISSOURI

Columbia
● KRCG-TV
Sun. 11 am

Joplin
● KOAM-TV
Sun. 6 am
KOZJ-TV
Sat. 12:30 pm

Kansas City
KCPT-TV
Thu. 7 pm, Sat. 12:30 pm
● KMBC-TV
Sat. 6:30 am

St. Louis
KETC-TV
Wed. 12:30 pm
Sat. 6:30 pm
● KTVI-TV*

Sedalia
KMOS-TV
Sat. 12:30 pm

Springfield
KOZK-TV
Sat. 12:30 pm
● KSPR-TV
Sun. 11 am

MONTANA

Bozeman
KUSM-TV
Wed. 11:26 pm
Sat. 11:30 am

Missoula
KUFM-TV
Wed. 11:26 pm
Sat. 11:30 am

NEBRASKA

Alliance
NETV-TV
Sat. 10 am and 5:30 pm

Bassett
NETV-TV
Sat. 10 am and 5:30 pm

Hastings
NETV-TV
Sat. 10 am and 5:30 pm

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

Lincoln
KUON-TV
Sat. 10 am and 5:30 pm
● KHAS-TV
Sat. 5 pm

Merriman
NETV-TV
Sat. 10 am and 5:30 pm

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

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

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

NEVADA

Las Vegas
KLVX-TV
Sat. 9 am and 12:30 pm
Sun. 7 pm
● KTNV-TV
Sun. 8:30 am

Reno
KNPB-TV
Sat. 10:30 am
● KAME-TV
Sat. 11 am

NEW HAMPSHIRE

Durham
WENH-TV
Thu. 8:30 pm, Sun. 10 am

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

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

Manchester
● WNUR-TV
Sun. 8 am

NEW JERSEY

Camden
WNJS-TV
Thu. 8 pm, Sat. 8 pm
Sun. 5:30 pm

Montclair
WNJN-TV
Thu. 8 pm, Sat. 8 pm
Sun. 5:30 pm

New Brunswick
WNJB-TV
Thu. 8 pm, Sat. 8 pm
Sun. 5:30 pm

Trenton
WNJT-TV
Thu. 8 pm, Sat. 8 pm
Sun. 5:30 pm

NEW MEXICO

Albuquerque
KNME-TV
Thu. 7 pm, Sun. 10 am

Las Cruces
KRWG-TV
Sat. 11:30 am

Portales
KENW-TV
Wed. 10:30 pm, Sat. 4 pm

NEW YORK

Albany
● WXXA-TV
Sun. 10 am

Binghamton
WSKG-TV
Sat. 8 am, 1:30 pm
and 6:30 pm, Sun. 7 pm
● WBNG-TV
Sat. 7:30 am

Buffalo
WNED-TV
Sat. 10:30 am
WNEQ-TV
Sun. 7 pm
● WIVB-TV
Sun. 8:30 am

Elmira
● WYDC-TV*

Long Island
WLIW-TV
Sat. 10:30 am, Sun. 8 pm

New York City
WNET-TV
Sat. 5:30 pm
● WCBS-TV
Sun. 7:30 am

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
● WHEC-TV
Sun. 6 am

Schenectady
WMHT-TV
Sat. 10:30 am
WMHQ-TV
Sun. 9:30

Syracuse
WCNY-TV
Sat. 10:30 am
● WSTM-TV
Sun. 6 am

Watertown
WNPE-TV
Sat. 10:30 am

NORTH CAROLINA

Asheville
WUNF-TV
Sat. 5:30 pm, Sun. 9 am

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

Charlotte
WTVI-TV
Thu. 8 pm, Sat. 5 pm
Sun. 11 am
WUNG-TV
Sat. 5:30 pm, Sun. 9 am
● WBTV-TV
Sat. 2:30 pm, Sun 1:30 pm

Columbia
WUND-TV
Sat. 5:30 pm, Thurs. 8 pm

Greensboro
● WGHP-TV
Sat. 6:30 am

Greenville
WUNK-TV
Sat. 5:30 pm, Sun. 9 am
● WLOS/WFBC-TV
Sat. 10 am

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

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

Lumberton
WUNU-TV
Sat. 5:30 pm, Sun. 9 am

Raleigh
● WTVD-TV
Sun. 11:30 am

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

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

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

NORTH DAKOTA

Bismarck
KBME-TV
Thu. 7 pm, Sat. 6 pm

Dickinson
KDSE-TV
Thu. 7 pm, Sat. 6 pm

Ellendale
KJRE-TV
Thu. 7 pm, Sat. 6 pm

Fargo
KFME-TV
Thu. 7 pm, Sat. 6 pm

Grand Forks
KGFE-TV
Thu. 7 pm, Sat. 6 pm

Minot
KSRE-TV
Thu. 7 pm, Sat. 6 pm

Williston
KWSE-TV
Thu. 7 pm, Sat. 6 pm

OHIO

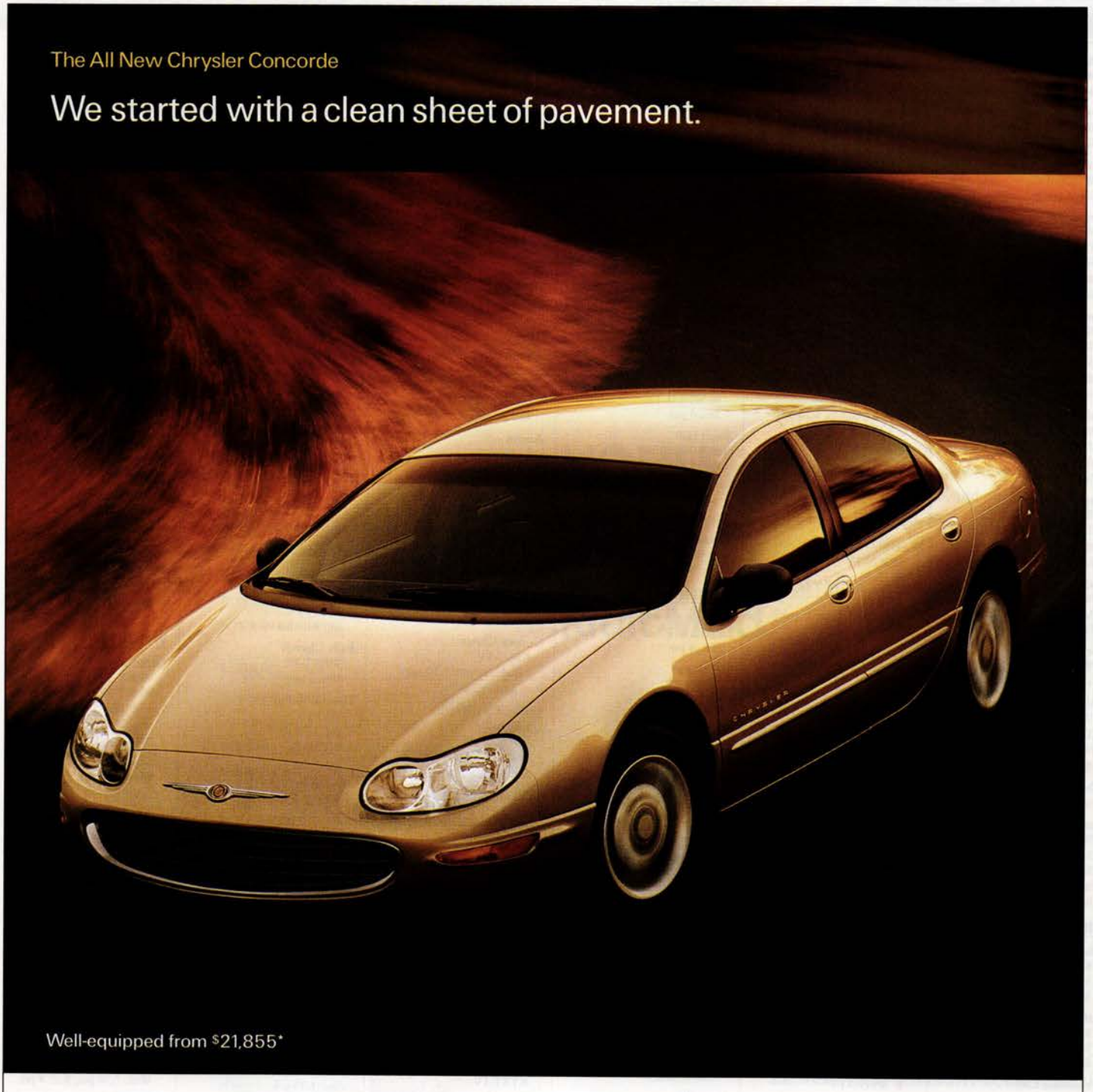
Akron
WEAO-TV
Sat. 10:30 am and 5 pm
Sun. 4 pm

*Check your local listings.

This Old House is a production of WGBH Boston

The All New Chrysler Concorde

We started with a clean sheet of pavement.



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38	ACORN MANUFACTURING *A Decorative Hardware Source*	800-835-0121
39	ALBANY WOODWORKS *Antique Heart Pine Flooring & More*	504-567-1155
40	BATHS FROM THE PAST, INC. *Elegance in Porcelain and Brass*	800-697-3871
41	CLASSIC GUTTER SYSTEMS *"Olde World" Style Gutters & Downspouts*	616-382-2700
42	COLUMBIA HARDWOODS *Hardwoods & Floors*	888-488-PINE
43	COTTAGE LANE ACCENTS *Lighting, Doors & Cabinets, Accessories, Gifts*	888-244-8880
	CROWNPOINT CABINETRY *Handcrafted to the finest quality*	800-999-4994
44	ENDLESS POOLS *Swim At Home*	800-732-8660
45	FINE PAINTS OF EUROPE *Schreuder Paints & Omega Brushes*	888-332-1556
46	GOODWIN HEART PINE CO. *Flooring, Furniture, Architectural*	800-336-3118
47	GORILLA GLUE *Bonds Wood, Stone, Metal & More*	800-966-3458
48	GRANVILLE MFG. QUARTERSAWN CLAPBOARD *Siding, Trim, Flooring & Roofing*	802-767-4747
49	GRATE FIRES *Authentic English Gas Coal Fire Grates*	706-353-8281
50	HARDWARE BATH & MORE *Your source for hardware*	800-760-3278
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52	NU-WAL *Restoration Products*	800-247-3932
53	REJUVENATION LAMP & FIXTURE CO. *Lighting Fixtures*	888-343-8548
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56	STADLER *Radiant Heating & Snowmelting*	800-370-3122
57	STAIRWAYS, INC. *Stairways*	800-231-0793
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58	THE IRON SHOP *Spiral Stair Kits*	800-523-7427
59	UNICO *Central Heating And/Or Central Air*	314-771-7007

CONTRIBUTORS
p. 10

Mary Ellen Mark: The group exhibit "India: A Celebration of Independence, 1947-1997" is appearing until July 26, 1998, at the Virginia Museum of Fine Arts, Richmond, VA. September 4 to November 15, 1998, at the Indianapolis Museum of Art, Indianapolis, IN. December 18, 1998, to February 28, 1999, at the Knoxville Museum of Art, Knoxville, TN. April 1 to June 13, 1999, at the Montreal Museum of Fine Arts, Montreal, Quebec, Canada; October 30 to December 30, 1999, at the Chicago Cultural Center, Chicago, IL. More information on Mary Ellen Mark is at www.maryellenmark.com.

UPDATE
p. 12

NIOSH offers advice about respirator selection, including a list of all certified equipment, at its Web site: www.cdc.gov/niosh. For free advice, call the institute at 800-356-4674; you'll get a menu tree that eventually leads to a person. Or call the institute's certification branch directly at 304-285-5907 during East Coast business hours. For more information on 3M's respirators, contact 3M Occupational Health and Environmental Safety Division, 3M Center, Building 275-6W-01, Box 33275, St. Paul, MN 55133-3275; 800-896-4223; www.mmm.com/occsafety.

LETTERS
pp. 15-17

Piece Pipe: Ecoflex pipe, Rovanco Piping Systems, Joliet, IL; 815-741-6700. **Paint-on Protection:** Scratch Protection, $31.90 for 1 gallon (enough for two 5-foot tubs); 800-789-6633. **From Plastic Trees:** Fiber-

glass-reinforced plastic "lumber," Trimax; 516-471-7777. Plastic-wood composite decking, Trex; 800-289-8739. Decorative polyurethane spindles available from manufacturers including Custom Decorative Mouldings; 800-543-0553. Polyurethane balusters and pickets available from a number of manufacturers represented by the Cheyenne Company; 800-676-8840.

EXTRAS
pp. 22-27

p. 22—Slim Down: The study "Residential Street Typology and Injury Accident Frequency" can be ordered from Swift and Associates, 421 21st Ave., Longmont, CO 80501; phswift@aol.com. *Reported by Joe Carter.*

Garage De-Gooper: Concrete Brightener 11178, $29.95 per gallon; and Concrete Stain & Rust Remover 11179, $34.95 per gallon; Griot's Garage, 3500-A 20th St. E., Tacoma, WA 98424; 800-345-5789. *Reported by Stephen L. Petranek.*

Quote: "Owning your own...": H.U.D. Secretary Andrew Cuomo, speaking at the 1998 International Builders' Show in Dallas. **Funnel Vision: 1.** Black: model 912440, 3-quart capacity, 7½-inch diameter, $6.99, Woodworker's Supply, 800-645-9292. **2.** Tin with handle and orange plastic spout: model 02342, 1½-quart capacity, 6-inch diameter, $9.65; with flexible galvanized-steel spout and plastic tip option, model 02640, $4.22; Pressol Manufacturing; 800-537-4256. **3.** Blue: model 11881, rectangular bowl, 1-quart capacity, 5½-inch diameter, $1.83, Blitz U.S.A.; 800-331-3795. **4.** Red: model 526, attachable 15-inch spout, 1-pint capacity, 4½-inch diameter, $2.45, by R.C. Co., 800-356-7699. **5.** Plastic: model 44700, 7-inch spout, with set of five other differently sized funnels, all $14.95, Griot's Garage, Tacoma, WA; 800-345-5789; www.griotsgarage.com. **6.** White ceramic: model 10356D, 10.8 ounce capacity, 4¼-inch diameter, $36, Fisher Scientific Springfield, NJ; 800-766-7000; www.fishersci.com. **7.** Steel: model 21, 14-inch accordion spout, 1½-quart capacity, 6-inch diameter, $5.11, Behrens, major hardware stores. **8.** Dense polyethylene: Bel-Art H146840000, 20-ounce capacity, 4⅞-inch diameter, $10.82, Fisher Scientific. **Numbers 2, 3, 4, 6, 7 and 8** supplied by McMaster-Carr Supply Company and available through the company catalog, Box 440, New Brunswick, NJ 08903; 732-329-3200; nj.sales@mcmaster.com; www.mcmaster.com. *Reported by Meghan K. Anderson and Thomas Dodson.* **p. 24—Web:** *Reported by Romy Pokorny.* **Books:** *Keeping the Garden in Bloom: Watering, Deadheading and Other Summer Tasks* by Steven Bradley

with photographs by Anne Hyde, $22.50, Stewart, Tabori & Chang, New York. *Henry Mitchell on Gardening* by Henry Mitchell, 1998, $24, published by Frances Tenenbaum (a Houghton Mifflin Company), Boston. *Reported by Sasha Nyary.*

Cutting Castle Corners: Super Sand Beach Putty, $2 per 4-ounce bag, Super Sand Co., Box 452, Abington, PA 19001; 215-659-3280. *Reported by Jill Connors.*

Outlaw Weed: For information on noxious weeds, contact a county cooperative extension service. Most provide publications that deal with specific weed problems. *Reported by Romy Pokorny.*

p. 25—What's in a Name: Dead Salmon 28, Farrow & Ball Paint, imported from England by Davan International, NY; 516-944-6498. Sylvan Whimsy 1602, Blithe Spirit 1374, Buccaneer 2082, Chesapeake 1560, all from Pratt & Lambert Paint, Cleveland, OH; 800-289-7728. Humpty Dumpty 3-K-1, Loop-t-Loop 4-K-3, Squirting Flower 1-K-4, Dutch Boy Kid's Room Paint, Dutch Boy Paints, Cleveland, OH; 800-828-5669. San Juan Spritz 203-3, Golfer's Tan 322-4, Flannel Pajamas 545-5, Fuzzy Navel 115-6, Rum Runner 232-7 and Teeny Bikini 348-6, all from Pittsburgh Paints, from the Voice of Color design collection, available through Pittsburgh Paints dealers; call 888-774-1010 for nearest location. *Reported by Meghan Anderson.*

Hot Wax: Renaissance Wax, 7 ounces, $19; 80-ounce Curator's Pack, $115 plus shipping; Cutlery Specialties, 22 Morris La., Great Neck, NY 11024; 516-829-5899. *Reported by William Marsano.*

Wildfire Fighter: John Muir National Historic Site, 4202 Alhambra Ave., Martinez, CA 94553; 510-228-8860. Open Wednesday to Sunday, 10 a.m. to 4:30 p.m. Admission is $2 for adults, free for children 16 and under. *Reported by Curtis Rist.* **p. 26—Asbestos Eater:** Digestion material asbestos (DMA), W.R. Grace & Co., 800-472-2399. For more information: Environmental Protection Agency, Indoor Air Quality Hotline; 800-438-4318; www.epa.gov/region04/air/asbestos/asbestos.htm; National Safety Council, Environmental Health Center; 202-293-2270; www.nsc.org/ahc.htm. Our thanks to: Jane McGuinness, W.R. Grace & Co. Dr. Leon Petrakis, Brookhaven National Laboratory, Brookhaven, NY. Jim Stump and Mark Knick, Seagull Training (asbestos abatement), Fort Lauderdale, FL. *Reported by John Banta.* **Final Frontier Gear:** For more information on the International Space Station: http://station.nasa.gov/core.html. For space shuttle launch dates: www.ksc.nasa.gov. *Reported by Thomas Dodson.* **p. 27—Wood-Be Solution:** Craft Supplies Ltd., The Mill, Millers Dale, Buxton, Derbyshire SK17 8SN; 011-44-1298-871636; www.craft-supplies.co.uk. Poster available at Shopsmith Inc., 6530 Poe Ave., Dayton, OH 45414-2591; 800-543-7586. Natural Resources Defense Council, New York; 212-727-2700, www.nrdc.org. Forest Stewardship Council, Box 145, Winooski, VT 05404; www.fscoax.org. *Reported by Romy Pokorny.* **Quote:** "In the Middle Ages..." from *A Corner in the*

Marais: Memoir of a Paris Neighborhood by Alex Karmel, $24.95, published by David R. Godine, Boston. **Eye Aid:** Stainless-steel magnetic probe, 11574, $19.95 from Gempler's catalog; 800-382-8473; www.gemplers.com. *Reported by Romy Pokorny.* **Unsung Tool:** Available in hardware stores and home centers. To order by mail: Catalog #1028, $2.80, McMaster-Carr Supply Co., Box 440, New Brunswick, NJ 08903; 732-329-3200; www.mcmaster.com. *Reported by Jeff Taylor.*

POINT AND SHOOT
pp. 29-32

Finish nailer, IM250II, $500, Paslode, 888 Forest Edge Dr., Vernon Hills, Illinois 66061; 847-634-1900. Page 29: Finish nailer, CDA250, $299, Porter-Cable, 4825 Hwy 45 North, Jackson, TN 38035-3304; 800-487-2840. Nails: 16 Ga. 7/16-in. Crown Staples, Porter-Cable. 3-in. d-head framing nail, Paslode. 1¼-in. galvanized finish nail, Paslode. 2½-in. galvanized finish nails, Porter-Cable. Page 32: Framing nailer, impulse compact, $399, Paslode. Crown stapler, CMS200, $299, Porter Cable. Finish nailer, IM250I, $499, Paslode. Finish nailer, CFN250, $299, Porter-Cable.

MUD KNIVES
pp. 33-35

1. Wipe-down knife, $18, Goldblatt Trowel Trade Tools, Kansas City, Kansas; 913-621-3010.
2. Blister brush, $25, Goldblatt. **3.** Inside corner trowel, $14, Marshalltown Trowel Co., Marshalltown, IA; 515-753-0127. **4.** Blue steel taping knives: Wood handle, $15, Goldblatt. Red handle, $18, Marshalltown Trowel Co.
5. Joint knives: Wood handle, $7, Goodell, Minneapolis, MN; 800-373-2269. Gray handle, $8, Red Devil, Union, NJ; 800-247-3790.
6. Curved trowel, $22, Marshalltown.
7. Outside corner tool, $15, Goldblatt.
8. Adjustible tool, $47, Goldblatt.
Pg. 35: 14-in. Hawk, $25, Golblatt.

RARE WOOD
pp. 37-42

Sources of certified/salvaged redwood: For a complete list, contact Rainforest Action Network; 415-398-4404;

www.ran.org.
Joe Garnero, Recycled Lumber Works, Ukiah, CA; fax 707-462-8607. Roger Moore, Pinocchio's, Fort Bragg, CA; 707-964-6272.
Albert Slendebroek, The Lumber Baron, Albany, CA; 510-526-7224.
Jason Grant, EcoTimber, Berkeley, CA; 888-801-0855; www.ecotimber.com.
Resources: Smartwood Network, Rainforest Alliance; 888-693-2784; www.smartwood.org. Environmental Protection Information Center, Garberville, CA; 707-923-2931. The Forest Conservation Program of Scientific Certification Systems, 510-832-1415. Forest Stewardship Council, 802-244-6257. Institute for Sustainable Forestry, 707-923-4719. California Redwood Association, Novato, CA; 888-225-7339; www.calredwood.org.
Organizations working to protect redwood forests: Environmental Protection Information Center, 707-923-2931. Natural Resources Defense Council, 212-727-2700. Sempervirens Fund, 650-968-4509. Save-the-Redwoods League, 415-362-2352. Rainforest Action Network.
Gatebuilder: Julian Hodges, Berkeley, CA; 510-547-8654.
Further reading: *Bernard Maybeck, Artisan, Architect and Artist,* by Kenneth H. Cardwell, 1996, $29.95, Hennessey & Ingalls, Santa Monica, CA.

directory

REPOINTING BRICK
pp. 45-48

Mason: Marion Inc., Chicago, IL; 773-286-4100. **Lime Mortar:** $7.79 per 5-gallon bucket, U.S Heritage, Chicago, IL; 773-286-2100; www.usheritage.com (provides mortar and brick analysis, sand matching and pigmented mortar). **For further information:** *The History of Mortar in America*, available from U.S. Heritage, $14.95 (plus $5 shipping and handling). *Making the Point* video is available for $35, Liner Rolpanit North America Inc., 430 Montrose Ave., Toronto, Ontario Canada M6G 3H1; 416-534-1511. **Our thanks to:** Brian Pfeiffer, Society for the Preservation of New England Antiquities. Tim Meek Associates. Cronarty, Ross-Shire, Scotland.

LAND RUSH
pp. 51-52

For further information: Contact the National Association of Realtors Land Institute, 430 N. Michigan Ave., Chicago, IL 60611; 800-441-LAND;

www.rliland.com. The National Association of Home Builders, 1201 15th St. N.W., Washington, DC 20005; 800-368-5242; www.nahb.com. The Appraisal Institute, 312-335-4100; www.appraisalinstitute.org.

IN TRANSITION
pp. 55-58

Our thanks to: Margie Ruddick, site design, 8122 Shawnee St., Philadelphia, PA; 215-247-7290.
Dennis Wedlick Architect, 133 Fifth Ave., fourth floor, New York, NY 10003; 212-614-9147.

BLACKSMITH
pp. 68-73

Charles Keller: Box 51, Newman, Illinois 61942. Send $5 to purchase Charles Keller's catalog.
Further Reading: *Cognition and Tool Use: The Blacksmith at Work* (This book is subtitled "Learning in Doing: Social Cognitive and Computational Perspectives") by Charles M. Keller and Janet Dixon Keller, 1996, Cambridge University Press.
New Edge of the Anvil: A Resource Book for the Blacksmith by Jack Andrews, 1994, Skipjack Press, Drexel Hill, Pennsylvania.

DREAM HOUSE
pp. 74-81

Further reading on Robert A.M. Stern: *Robert A.M. Stern: Buildings*, and *Robert A.M. Stern: Houses*, both published by Monacelli, New York City, 1996 and 1997 respectively. *Robert Stern*, edited by David Dunster, Academy Editions, 1981; *Robert A.M. Stern: Buildings and Projects 1965-1980*, edited by Peter Arnell and Ted Bickford, Rizzoli, 1981. *Robert A.M. Stern: Buildings and Projects 1981-1985*, edited by Luis F. Rueda, Rizzoli, 1986. *Robert A.M. Stern: Buildings and Projects 1987-1992*, edited by Elizabeth

Kraft, Rizzoli, 1992. *The American Houses of Robert A.M. Stern*, Rizzoli, 1991.
Books by Robert A.M. Stern: *New Directions in American Architecture*, Braziller, 1977. *George Howe: Toward a Modern American Architecture*, Yale University Press, 1975. *Modern Classicism*, Rizzoli, 1988. *New York 1900*, *New York 1930*, both published by Rizzoli, 1983 and 1987 respectively, and *New York 1960*, published by Monacelli, 1995.

BIG CHILLER
pp. 82-85

Brad Morari, Goettl Air Conditioning Inc., Phoenix, AZ, 602-470-4261; www.goettl.com. Installed unit, Mastercool MC 63/64, manufactured by Adobe Air Inc., Phoenix, AZ; 602-257-0060. Two-stage coolers: Mastercool by Adobe Air Inc., Smartcool by Cooltech Industries, $2,100 for home owners; $1,700 for certified contractors; Fair Oaks, CA; 916-536-0902; www.smartcool.com. Other manufacturers: ArctiChill Inc., Newberry, SC; 803-321-1891; www.arctichill.com. Dial Manufacturing Inc., Phoenix, AZ; 800-350-3425, www.dialmfg.com. Tradewinds, Phoenix, AZ; 800-826-2665.

MULCH MAKERS
pp. 86-93

Troy-Bilt: Model 47057 has been replaced by #47321, 10 hp, Garden Way Inc., Troy, NY; 518-391-7000. **Mighty Mac 12 PT:** MacKissic Inc., Parker Ford, PA; 610-495-7181. **Simplicity:** Simplicity Mfg. Co., Port Washington, WI; 414-284-8669. **White Yard Boss:** M.T.D. Products Inc., Cleveland, OH; 330-273-7786. **Cub Cadet:** M.T.D. Products Inc. **Mighty Mac LSC 508:** MacKissic Inc. **Leaf Cycler:** MacKissic Inc. **For further information:** Outdoor Power Equipment Institute (OPEI), Alexandria, VA; 703-549-7600; www.opei.mow.org. Mulch: National Arborist Association, Amherst, NH; 800-733-2622; www.natlarb.com. **Our thanks to:** John Bracken, engineer, Simplicity Mfg. Co. Joel Onderko, engineer, and Ann Norris, M.T.D. Products Inc. Roger Cook, K&R Tree and Landscape Co., Burlington, MA. Rick Dhein, president, MacKissic Inc. Tom Gearing, president, The Patriot Co., Milwaukee, WI. Joel Borowski, American Honda, Atlanta, GA. John Liskey, OPEI, Alexandria, VA. Bill Gordon, quality and product information mgr., Garden Way Inc., Troy, NY. Pat Shannon, Consumer Product Safety Commission, Washington, D.C.

AMAZING GRACE
pp. 94-101

Architect: Barbara Chambers, Chambers & Chambers Architecture and Interior Design, 68 Sycamore Ave., Mill Valley, CA 94941; 415-381-8326. **Contractor:** Dan Plummer, Plummer Construction, 160 Delmar St., San Francisco, CA 94117; 415-313-2236. **Foundation contractor:** J. Leigh Gregg, Under Construction, Box 403, Larkspur, CA 94977-0403; 415-924-5444. **Framing contractor, second floor:** Castle-Rock Construction, Box 3285, Fairfield, CA 94533-0885; 707-224-5698. **Plumbing contractor:** Jeff Deehan, Deehan Plumbing, Box 10133, San Rafael, CA 94912-0133. **Electrician:** Yick Electric Co. Inc, 1235 Stockton St., San Francisco, CA 94133; 415-982-1717. **Lighting contractor:** Sean O'Connor, O'Connor Associates, 938 City Park Ave., Columbus, OH 43206; 614-444-3432. **Tile and wainscot installation:** Infinity Marble and Granite, Fresno, CA; 209-834-4704. **Whole house: Windows and French doors:** Hurd Millwork Co, 575 South Whelen Ave., Medford, WI 54451; 800-2-BE-HURD. **Custom gothic windows:** Castleberry Mill and Lumber Inc., 2010 South Central Expressway, Dallas, TX 75215; 214-428-0266. **Door hardware:** The Estate Collection by Baldwin Hardware, 841 E. Wyomissing Blvd., Reading, PA 19612; 610-777-7811. **Fingerprint security system:** Identix Inc., 510 N. Pastoria Ave., Sunnyvale, CA 94086; 408-731-2181. **Audio system:** Bose, 800-999-2673. **Handcrafted double front doors:** $4,500 without installation or hardware, Peter Good, 1966 Tiffin Rd., Oakland, CA 94602; 510-530-3198. **Sprinkler system:** Advanced Automatic Sprinkler Inc., 30993 Huntwood Ave., Suite 204, Hayward, CA 94544; 510-429-6793. **Faucets:** The Chicago Faucet Co., 2100 Clearwater Drive, Des Plaines, IL 60018-5999; 847-

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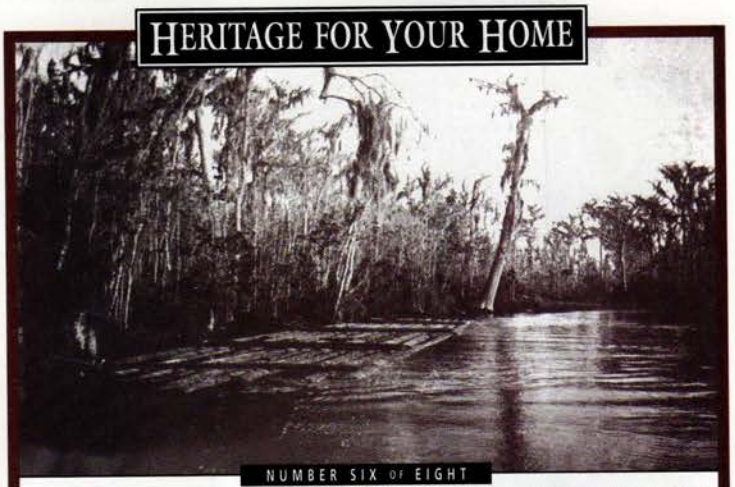

NUMBER SIX OF EIGHT

Photo courtesy: Florida Archives

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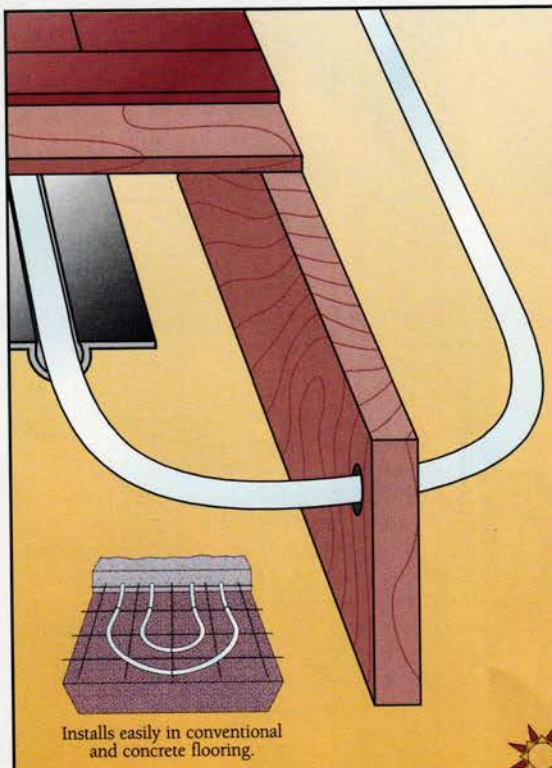

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BY BEN KALIN

PRICE

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LOCATION

334 South 600 East Street
Salt Lake City, Utah

When developers set their eyes on a site and secure rights to the land, the bulldozers usually come barreling in. Not so in the case of the Eber and Mary Ann Mumford Case house. Although itching to break ground on an apartment complex, the American Housing Development Company is holding off the vehicles of destruction until September in the hope of finding a buyer to move this 3,650-square-foot Craftsman-style bungalow.

Although apparently divided into a duplex around 1912—which might explain the two rather old-fashioned kitchens—the house has experienced little alteration since it was built in 1907. Empty since 1997, the house has two fireplaces, original oak floors and four bay windows, two with intricate diamond-paned transoms. Two upstairs bedrooms have dormer windows and long vestibules, which afford privacy. Two more bedrooms and the house's two bathrooms are downstairs. Covered porches in front and back set a welcoming tone.

Moving the structure, now three blocks from Salt Lake City's business district, will cost an estimated $50,000. Updating the kitchen, bathrooms and electrical system could take another $50,000. If no buyer comes forward, the house will be demolished and sold as scrap.

CONTACT

Jeff Jonas, American Housing Development Company
801-534-0184

Eber Case, private secretary to a president of the Church of Jesus Christ of Latter-day Saints, built a brick bungalow, top, in 1907 for his wife, Mary Ann. The building has a sandstone foundation, leaded glass transoms, flared eaves and exposed framing members as well as a high, complex roofline, which distinguishes it from other Craftsman-style houses in the area. Several original interior details survive, including brass doorknobs, left, and a fireplace with an ornate cast-iron surround and tile hearth, right.

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