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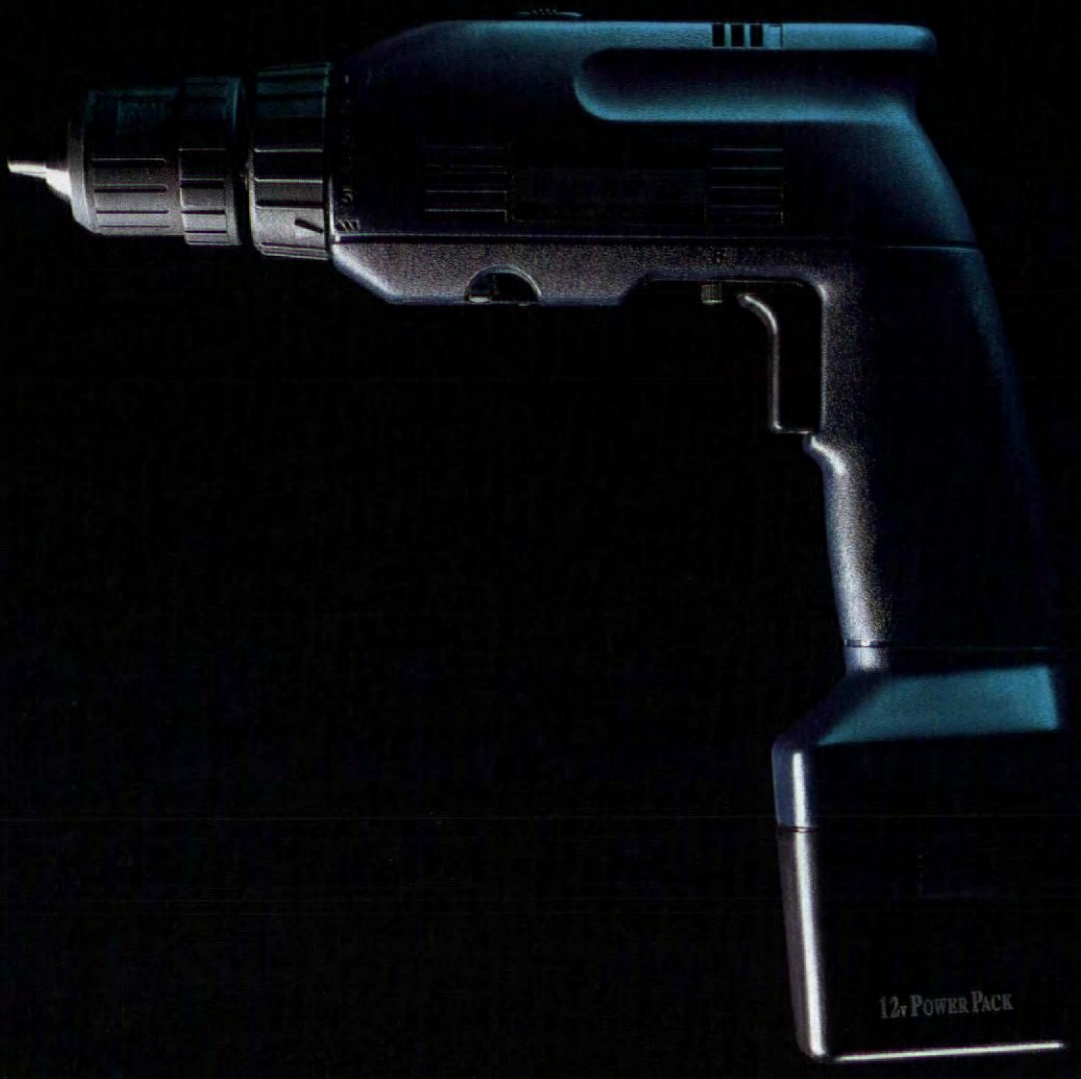

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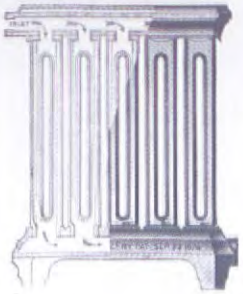
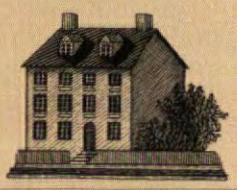
Volume XX, Number 3



DEPARTMENTS

COVER:
Granite basement in an early 19th-century house dry and broom clean. (Gloucester, Mass.). Photograph by Steve Marsel.



OLD-HOUSE JOURNAL

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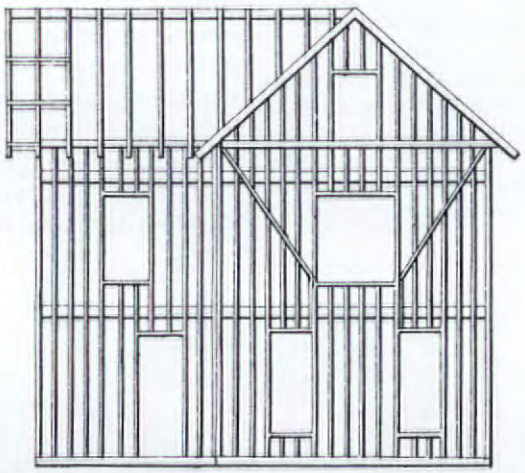
EDITOR'S PAGE

A Do-It-Yourself Editor's Page

"Design for a two-storey cottage" (A.J. Bicknell, 1873) — today, part of a larger design.



Since we've got such a hands-on issue this time, including subjects like battling wet basements and searching for old-house money, the mood seemed right for a little reflection on the notion of doing the work on a house yourself.

In both a historical and practical sense, working on your own house is closely connected with restoration. As a pursuit, it undoubtedly was born out of necessity in colonial, and later, pioneer life when a homeowner either did his own maintenance because paying for it was out of the question, or there was no other recourse for materials or services. However, by the turn of this century it had evolved into something more. The Art &Crafts movement and its newfound appreciation of handicrafts gave working on one's own house or its contents a philosophical dimension. For instance, back in that brief age it was perfectly acceptable (if not downright fashionable) to build your own versions of the mortised-and-tenoned oak furniture so popular on showroom floors. The twist was, many folks who built their own could, indeed, afford to buy.

As times changed, doing your own work was motivated by economics again, especially once the party years of the Roaring Twenties were over. As Shirley Maxwell and Jim Massey chronicle in "The Modern Basement," limited means led folks to tackle many of their own home improvements through the 1930s, and to become self-taught where they lacked training in a particular building trade or craft. This philosophy and can-do attitude stayed with us through the succeeding years until it found a new form in the late '60s and early '70s. At that time, we started to take stock of the rich architectural heritage all around us, and began to preserve it in earnest through the maintenance and restoration of historic houses.

I think we've entered a new phase of doing your own work since then, in many ways one that brings the pursuit back to its origins — but with yet another twist. To be sure, most of us who take on the careful and sensitive rehabilitation of an old house, and put in any amount of our own effort, do so because we don't have bottomless checkbooks. Much of the work of restoration is painstaking and time-consuming, and consequently very expensive to contract out. The catch is, there are some projects you can't get anybody else to do no matter how much you're willing to pay. Or worse, you can't find anyone with the skills to do the job for love or money. Faced with these these brick walls, we're forced to come up with our own, – often unique – solutions and, again, do the work ourselves.

It takes a special breed of individual to restore an old house, to dive in essentially alone and with limited resources and then to see the project through. Yet if we don't do it, who will?

Gordon Bock

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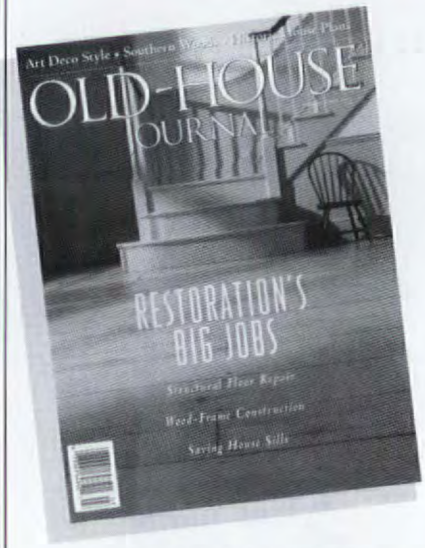
LETTERS



ANOTHER MOVING STORY

Dear OHJ,

A friend recently gave me a stack of OHJs and I have had much enjoyment coming into contact with your magazine for the first time. Where have we been not to have crossed paths prior?

This may be a bit late, but I have to relate a house moving story (re: January/February 1991 issue). My father used to tell us how, when he was a child (c.1905), the house he, his eight siblings, and his parents lived in was moved from one end of their Ohio farm to the other. This was precipitated by the death of his younger sister. The culprit, they thought, was the well water. So, they dug another well at the opposite end of the farm and had the house moved.

One man and one horse did the entire job. He jacked the house up and put sectioned, shaved logs under it. Each day of the actual move, he would drive a large stake into the ground, attach a good-sized rope to the house frame, and run the rope through a large multiple block and tackle. The other end of the block and tackle was wrapped around a winch that was turned by the horse walking in circles. The house would move 20-30 feet per day over non-paved farmland.

Amazingly, the entire family continued to live in the house while it was being moved. Except for hauling drinking water, life went on almost as usual, including cooking meals on a wood stove for his family of nine and the many summer harvesters. Of course, this was an ironical feat. Dad's sister died of dyptheria. The well water was ultimately not the culprit at all!

— R. DAVID WESTFALL
New York, NY

JAPAN VARNISH SOURCE

Dear OHJ,

We read with interest your response to Stephen Robertson in the March/April 1992 "Ask OHJ" inquiring about black Japan varnish. Our "Old Japaner's Pontypool Asphaltum" is the genuine article. It is $22.95/gallon, $8.95/quart, and $5.59/pint, plus postage and handling.

— MICHAEL G. BLACK, PRESIDENT
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GRAINING GAFF

Dear OHJ,

We enjoyed the article on "Graining" in the January/February 1992 issue, and hope that the craftspeople who did the beautiful work in the photographs might be properly credited in print.

The graining in the cover photo was done by Joni Monnich/Lilyguild. The photo on page 20 featured graining by Zane Working/Return to Splendor, and Lincrusta finished by Joni Monnich.

— PAUL E. DUCHSCHERER
Bradbury & Bradbury Art Wallpapers

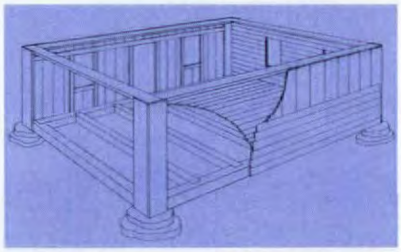
In the course of putting together our "move" issue, we also neglected to mention that Joni Monnich is a former editor at OHJ, and the wallpaper in the cover photos is from Bradbury & Bradbury.
— the editors

NORTHWEST BOXFRAME HOUSE

Dear OHJ,

In your article "The Structure of Wood Frame Houses" (March/April 1992), I was disappointed in the omission of box frame or plank frame construction. A box frame house is constructed of vertical planks set beside each other and nailed to the sill. The planks extend up the height of the house and are nailed to the plate.

OHJ mentioned this technique in the "Vernacular Houses" segment of the November/December 1990 issue on Arkansas Board-Frame Houses. It appears that boxframing was not uncommon in the Northwest, and was both economic and expedient.



Board-frame construction — where walls are a single layer of vertical boards nailed top and bottom to the sill and plate — pops up in Oregon as well as Arkansas.

In our house (c.1860-70), the exterior is clad with clapboards and the interior is finished with lath and plaster. In several abandoned homesteads I have seen in central Oregon, the exterior plank walls were finished with vertical battens and the interior walls were lined with paper or cloth.

I am interested in learning the extent or regionality of this construction type. I would also like to hear from other old-house owners who live in boxframed houses and how they have handled the concerns of insulation, wiring, and maintenance.

— JACQUELINE CHEUNG
The Dalles, OR

[*continued on p. 12*]

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To make sure, take along this quiz when you go window shopping. And then put all the brands, including Andersen, to the test.

1 WHAT'S IT MADE OF?

Sometimes windows are made of materials ill-suited to the job. Aluminum, for instance, isn't an insulator, it's a conductor. That's why they make ice cube trays and frying pans out of it. Aluminum windows conduct cold and waste heat in northern climates, and they conduct the sun's heat and waste air conditioning in southern climates.

This may be the only place you'll have condensation problems.

Andersen® windows are made of wood—nature's best insulator. The wood is protected with our exclusive, low-maintenance Perma-Shield® system. The sash on our casement window, for example, is wrapped in a thick vinyl sheath. It completely covers the wood like a peel covers an orange.

2 HOW WILL IT HANDLE HOT AND COLD?

At some temperature and humidity levels, condensation on windows is as inevitable as it is on your iced tea glass on a muggy day. But Andersen double-pane windows handle weather-related problems like this in several ways.

First, Andersen High-Performance or High-Performance Sun glass tolerates up to 70% more relative humidity than ordinary double-pane glass.

Second, our double-pane glass is permanently sealed at the factory, which helps stop moisture from building up between the panes.

And third, the space between the panes is filled with a revolutionary insulator called Argon gas. Combine that with insulating wood and you'll have fewer condensation problems no matter where you live. You'll be able to sit near the windows comfortably in any weather. And you'll be able to have more windows without turning your home into an icebox or a hothouse.

3 WILL THE WINDOW'S WEATHERSTRIPPING DO ITS JOB?

With weatherstripping, more isn't always better. Window makers that tout

PASS THIS QUIZ, HOW THE TEST OF TIME?

double or triple weatherstripping may be making up for a faulty design. Some of these multi-weatherstrip systems actually trap and hold water against the wood.

Without a dull dissertation of expansion and contraction rates and vinyl compounds, just remember you don't need two or three sets of weatherstrip. You just need a window company that knows where to put the right one. At Andersen we've had over 85 years to learn about things like that.

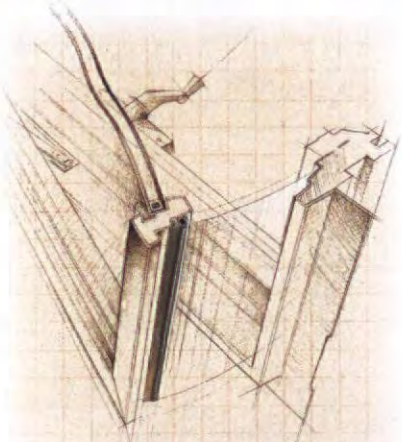
4 COULD THE HARDWARE GIVE YOU A HARD TIME?

Faulty hardware can make a window show its age early.

A stripped operator gear ... a broken lock ... maybe a hinge that sticks.

A lot of these problems occur because so many window companies buy "generic" off-the-shelf hardware. It's not specifically designed for their windows. Or anyone else's, for that matter.

But Andersen hardware is designed



A single piece of weatherstrip can actually be better than two or three.

and performance tested expressly to work on Andersen windows.

Even our hinge screws. They're made with stainless steel. Which means they're corrosion-resistant and much less likely to strip. Every piece of hardware is made to look and work better. So you won't learn about hardware the hard way.

5 DID THE WOOD GET SPECIAL TREATMENT?

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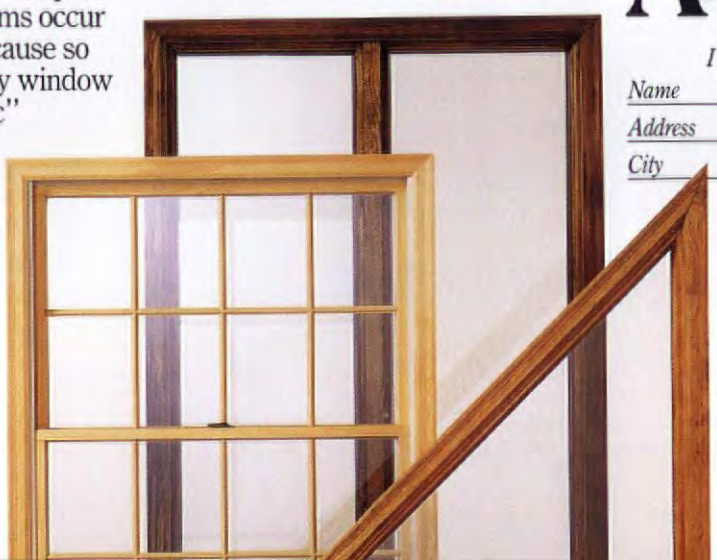

LETTERS

OLD WALLPAPERS SOUGHT

Dear OHJ,

The National Preservation Institute and Richard E. Thibaut, Inc. have begun a nation-wide search for original wallpapers and fabrics to be reproduced in the third edition of Historic Homes of America, a major wallcovering collection scheduled for release in the fall of 1992. As in earlier Historic Homes editions, this one will feature line-for-line reproductions and close adaptations of original papers in document colors. The emphasis will be on authenticity and quality, focussing on "documents" actually used in American houses and historic house museums.

Where will the documents come from? Almost anyplace, if past experience is a guide. A design staff will examine 18th-century through early 20th-century historic papers from all sections of the nation in order to make a balanced representation of American wallcoverings. Previous collections have been inspired by a modest Boston rowhouse, a goldminer's cottage in the Sierras, and the Virginia home of President James Monroe. Original papers or fabrics have turned up in water-damaged walls, behind an 1830s mirror, and in a box of leftover samples in an attic.

Since each house whose papers are chosen for reproduction receives a room's worth of his reproduced paper, homeowners and historic house museums reap an important advantage in their restoration efforts because the costs of reproduction are carried by the manufacturer. The 11,000 sample books distributed to decorating firms and wallcoverings stores here and in several foreign countries, including Japan and Great Britain, will feature color photographs and histories of each house (a bonus for house museums).

The National Preservation Institute will accept samples of the papers or color photographs, along with photographs of the house from which they are taken, at its offices at the National Building Museum, 401 F ST., Washington, D.C., N.W.

— JAMES C. MASSEY
President of the National Preservation Institute

Have you heard? The National Preservation Institute is searching for historic wallcoverings, like this trompe l'oeil paper.

IT'S FINISHED!

Dear OHJ,

I have just finished the total restoration of my 1891 Queen Anne house. It took 4½ years of almost total commitment. Was it worth it? For the feeling I get when looking at and living in my old house, every minute spent was worth it. With your magazine, I waded through foundation repairs and leaks, heat runs for modern furnaces, electrical work, plumbing, plaster, paint stripping, refinishing, insulation, leaky windows, vapor barriers — the whole bit. Your magazine guided me and most importantly showed me that it could be done and that other people were doing it. I put a small sign out in front that said "It's Finished" because people were wondering if I would ever get done!

— DONALD BOCKELMAN
Harrisonville, MO

HOMEOWNERS TAKE HEART

Dear OHJ,

My husband and I read Lori Grace's January/February letter to OHJ with strong emotions. Three years ago, we also went through a similar experience with the U.S. Soil Conservation Service (SCS). Our town, Dixon, Illinois, is located on the Rock River. The river banks are lined with 1 ½ miles of beautiful, naturalistic parks designed by O.C. Simonds, a landscape gardener of national repute. Although not listed and in need of some restoration work, some of these parks are potential candidates for the National Register as well as an integral part of our local history and sentiment.

The SCS proposed a very large flood control project through one of the most beloved sections of park. Like the Graces, we began investigating into the rationale and methodology behind the proposal, and like the Graces, we found innumerable discrepancies and

[*continued on p. 14*]

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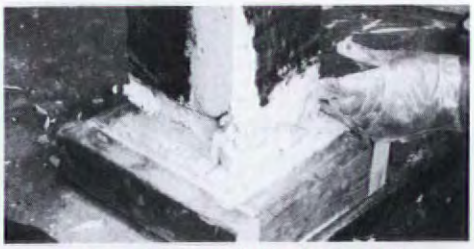

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LETTERS

[*continued from p. 12*]

questionable logic. A long and complicated chain of events ensued, involving Emergency Services Disaster Agency (ESDA), SCS, a local agency of USDA, the school board, the park board, and the city. What started out as a project to protect the adjacent flood plain (a high school football field) from infrequent damage due to ice jams and flooding grew into a boondoggle. The need for flood control was debatable to begin with, but the final flood control plan ended up being a scheme for a 2,150 foot long levee, up to 10 feet high and widening to 90 feet wide at the base, wiping out our scenic riverfront drive.

The impact assessment published by the SCS justified the project on the basis of cost/benefit ratio. According to their projection, an average of some 10,000 user visits per year to the high school athletic field would be saved by building this levee. Their projections, however, did not acknowledge the over 1,000 visits per day to the riverfront park. Installation of the levee and loss of the scenic drive would have eliminated most of these park visits.

Initially, a locally organized professional group offering free landscape architectural and flood control experience services to the project was formed in an effort to suggest some viable alternative solutions. In addition to living with the threat of loss of a park, the community suffered another kind of destructiveness: public input at public hearings was disregarded. Then, a group specifically opposed to the proposed levee design was formed. This group set up an informational booth at the park and created an exact size cross-section of the levee to demonstrate its massive size. They also marked all trees that would be lost and tied yellow ribbons on utility poles to show the actual height of the levee. When the public actually visualized the extent of the project, petitions objecting to it were signed by hundreds.

At one point, we thought the only way to halt the whole process was to go to court. We were prepared to do so when a vacancy occurred on the park board. I volunteered for the position and was appointed as a commissioner, providing the majority vote to stop the project. Within moments of my oath taking,

[*continued on p. 16*]

LETTERS

[*continued from p. 14*]
the board voted 3-2 to withdraw their support of the SCS levee proposal. This action collapsed the project.

I write this offering encouragement to those willing to make their voices heard. My experience was that we, the public, can take officials to task in an effort to preserve not only something of beauty, but something close to our hearts. It isn't easy; in fact, it was one of the hardest, most exhausting (and frightening) involvements I've ever had. When I visit the park, however, I'm reminded by the pleasure I receive from being there that the fight to save it was worth the trouble. Like the Graces, we're afraid if we drop our guard, this or a similar project could be resurrected.

— JANE SHEAFFER
Dixon, IL

AN ANXIOUS GRAINER

Dear OHJ,

When I realized graining would be discussed and illustrated in the January/February 1992 issue, I was so anxious to dive into the article that I tossed it into my briefcase and waited for an opportunity to get a sneak preview.

My wife and I have been searching for a pre-war house since we were married in 1984. We finally found our house last April. It was built in 1848. Originally, we think the doors, doorways, baseboards, and staircase were grained. One side of two doors and one room have the original finish. Now, I'm anxious to attempt to try my hand at glazing, flogging, and stippling! Thanks for a great article.

— JOHN E. GENTRY
Terry, MS

In Mississippi, one of the doors that retains its original Victorian graining

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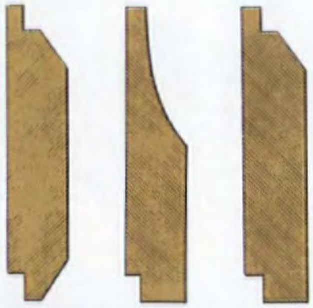
ASK OHJ

DATING DEBATE

Q PLEASE RESOLVE SOME ARGUMENTS for me. I recently purchased one of the earliest homes built in the city of Bad Axe in Michigan's "thumb" area. It appears in an aerial photograph dated 1892 so it's at least 100 years old, but not much older because a fire wiped out the entire town about ten years earlier. Under the clapboard siding appears to be the original siding, which is not clapboard but what is called "Dutch-lap." This is 5" wide and painted a dark olive-green color. My brother-in-law, a contractor, tells me this type of board is just the sheathing and wasn't used as siding then. I tend to disagree because there is another layer of plain 1" board under most of this "Dutch-lap." Was this material ever used as exterior siding between 1880-92? Also, my house has a full, 8'-deep basement. Do you think this was added later? I didn't think they poured cement-and-rubble walls before 1900. I hope you can solve these mysteries.

— GAIL M. MANAS
Bad Axe, Mich.



Popular designs for novelty siding from the May 1882 edition of Carpentry and Building *magazine.*

A IT'S DIFFICULT TO PIN DOWN the introduction of various building materials and practices prior to the 20th century, but your questions are pretty well documented. Novelty siding (also known as German siding, drop siding, and other regional terms) was a popular finish siding material by 1880, and may have been used as early as 1865. The basics of poured concrete wall construction were tried throughout the latter half of the 19th century using lime (notably, the "gravel walls" of octagon house promoter Orson Squire Fowler), but had to wait for the mass production of portland cement in North America after 1871 to become truly practical. Concrete construction in houses was catching on fast by the mid-1890s.

QUEEN ANNE QUERY

Q I AM REQUESTING YOUR help in identifying the style of my 1895 Victorian. Someone had called it Eastlake, but is that an architectural style? I would appreciate your opinion.

— BARRY N. HARLE
Columbus, Ohio

A JUDGING BY ITS CENTRAL hipped roof and lower cross gable, your house appears to be a Queen Anne, and one that features many stylistic elements fashionable after 1890. The porch is often a "Rosetta Stone" for reading Queen Annes and yours, with its classical columns, puts the house in a large subgroup called Free Classic. The way the columns are used in twos and threes and raised to railing height is typical of these houses. So, too, is the use of other classical details, particularly the dentil moulding at the porch roof cornice and the columnlike pilasters at the corners of the building. Free Classic Queen Annes shared many of these details with early Colonial Revival houses, which were becoming popular about the same time.

Queen Annes built through the 1880s generally made use of a different vocabulary of porch and facade ornament, one based on exuberant designs of turned posts, spindles, and beads. This detailing suggested the term Spindlework for this group of Queen Annes, but the ornament itself is also called gingerbread, steamboat, and Eastlake — the last because it resembles the furniture of designer Charles Eastlake.

Classical porch columns used in groups key this house as a Free Classic Queen Anne.

HITTING A PLANK WALL

Q THE SKETCH IN THE MARCH/April 1992 Ask OHJ about backplastering prompted us to write you about what we found inside the walls of our old house (built about 1850 in upstate New York). During the installation of new windows and an attic stairway we found to our amazement that on both the outside and interior walls there was a stack of horizontal planks inserted in between each set of vertical studs. These planks fill the entire cavity. We have made many inquiries and have been told that this type of construction was not done after the mid-19th century. Could this

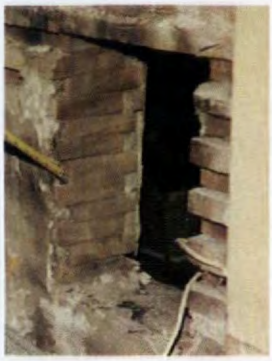
[*Continued on page 20*]

[*continued from p. 18*]
have been done for insulating purposes? Is there a name for this type of construction?

— HELEN AND HARRY THUMSER
Garden City, N.Y.

A THE WALL YOU HAVE DISCOVERED is an example of horizontal-plank construction (also called plank-on-plank). Instead of using a frame, this method employs machine-sawn planks 1" to 3" thick and 4" to 6" or more wide that are stacked one on top of another to build up a wall. Alternate planks are offset an inch or so to create keys for a plaster finish inside, and sometimes stucco outside. The planks are then lapped at corners like shuffled cards and nailed together to hold them in place. Inside walls may be built the same way, and are integrated with outside walls by butting or lapping every other plank. The result is walls of solid wood, not unlike those of a log house.

Horizontal-plank construction was tried in many areas of North America at the close of the 19th century for building houses as well as industrial structures. It relied on a bountiful supply of machine-sawn lumber and much labor, seeing as every plank had to be nailed at corners, intersections, and strategic spots along its length. These expenses, plus inherent structural problems such as bulging of walls, eventually made horizontal-plank construction impractical. The chances are your whole house is built in this manner, and the studs are furring or nailers for exterior siding, which was also used on occasion.



In horizontal-plank construction, boards are stacked to build walls and offset to create plaster keys.

General-interest questions will be answered in print. The Editors can't promise to respond to all questions personally, but we try. Send your questions to: Questions Editor, Old-House Journal, 2 Main Street, Gloucester, MA 01930.

WHO THEY WERE

Alexander Jackson Davis

by Jeff Wilkinson

WHO WOULD BELIEVE that A.J. Davis, one of the most influential architects of the 19th century, came to building design via a starring role in a production of *Alonzo and Imogen — A Newcastle Apothecary versus the Maid of the Inn?*

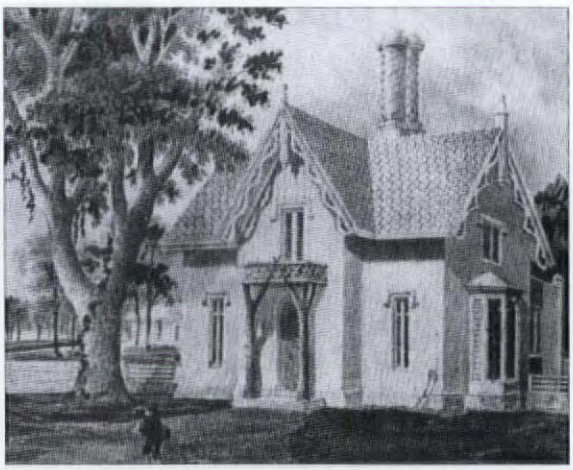
Alexander Jackson Davis was born in New York City on July 24, 1803, to Cornelius and Julia (Jackson) Davis, both from prominent families. Cornelius was the editor and publisher of the *New York Theological Magazine* and intended his son to follow a literary career. After the boy's formal education was completed, he sent sixteen-year-old Alexander to Virginia to learn the printing trade, but the work did not satisfy him and he decided to turn to a "trade of art." It was during this time that he became involved with the theater as both an actor and a set designer.

Davis possessed a natural talent for drawing and contemplated becoming a painter. When he was back in New York at the age of 20, however, the landscape artist John Trumbull persuaded him that architecture was potentially more lucrative. For three years thereafter Davis studied at the Antique School (now called the National Academy of Design), receiving a classical art education. He mastered lithography and began producing scenes of New York City for A.T. Goodrich Booksellers, prints highly valued today for their beauty and historical accuracy.

In 1826 Davis apprenticed to Josiah Brady, at the time the only practicing architect in New York City. Shortly thereafter, Davis travelled to Boston where he spent two years producing lithographs of Boston's notable architecture. Davis's skill as an architectural illustrator attracted the attention of many important architects. One was Ithiel Town, famous for the Town truss (patented in 1820), which had made him a wealthy man. Town offered Davis a partnership and in 1829 Town and Davis was established in New York — America's first architectural firm. The chemistry was solid. Town, nearly twenty years Davis's senior, had travelled broadly and possessed the best architectural library in the United States, a collection of over 11,000 volumes plus thousands of engravings and medieval manuscripts. (In those days the quality of an architect's library decided his worth.) Town was an academist in approach and well-versed in the Greek Revival Style. Davis, who termed himself an "architectural composer," provided the creative and technical talent Town lacked.

The partnership lasted until 1835 and was briefly revived in 1844, the year of Town's death. Together they designed and built more buildings than any other architects of their day. Important public works included state capitols for Connecticut, Indiana, and North Carolina as well as the U.S. Customs House in New York City. The bulk of the firm's work was in the Greek Revival Style, which was too strict for Davis's tastes.

In 1832 Davis got the chance to stretch his imagination. Robert Gilmore of Baltimore had recently visited Abbotsford, Sir Walter Scott's castle-home in Scotland, and he asked Davis to design a similarly styled Gothic mansion. It was to become the first of many such commissions. Davis's next important work came in 1835 when he



Left: The romantic gatehouse at Blithewood, replete with "porch of cedar boles, with rustic trellis balcony." Above: A.J. Davis in 1852.

WHO THEY WERE

remodeled Blithewood, the estate of Robert Donaldson in Barrytown, New York. Two important events came out of this project. The first was Davis's design for the gatehouse in a "rustic cottage style" that captured and introduced the concept of rural domesticity like no other dwelling.

The second was Donaldson's introduction of Davis to A. J. Downing. The two hit it off immediately and it was their eventual collaboration that shaped America's romantic vision of house and garden. Typically, they worked through the mail with Downing sending a simple sketch that Davis would turn into a fully developed plan. Downing would then offer suggestions until he was satisfied. It is Downing's books we remember today, but it was actually Davis's book *Rural Residences* (1837) that inspired Downing. Its pages feature homes in several of the styles in which Davis worked, including Gothic, Oriental, Tuscan, Swiss, and even a Greek temple with log columns. When he began to receive requests for plans and modifications from all over the country, the book led Davis to become one of America's first mail-order architects.

In 1838 Davis began work on Paulding Manor (later Lyndhurst) located in Tarrytown, New York. Built for William Paulding, a former New York City mayor, Lyndhurst is regarded as Davis's masterpiece. As it overlooks the Hudson River, it is the epitome of the 19th-century Gothic-Revival mansion. Davis also designed all of the important pieces of furniture in the home and in 1865 an extensive addition. He continued to design in the Gothic style until he retired in 1874.

Today Davis is regarded as a romantic composer fluent in many popular styles, rather than a breakthrough theorist or visionary, but he can be credited with introducing several innovations to the American home, including the board-and-batten system of siding, the use of bay and oriel windows, and the full-width verandah. He was also instrumental in founding the American Institute of Architects.

Davis remained a bachelor for most of his career until 1853. While working on Llewellyn Park, a planned community in West Orange, New Jersey, he met and married Margaret Beale. The couple had two children and Davis designed a home in the park for his family that he named Wildmont. He passed away there on January 14, 1892.

OUTSIDE THE OLD HOUSE

Gazing Globes in the Garden

by Janet Marinelli

NOTHING RAISES THE BLOOD pressure of the gardening world these days like the mere utterance of two words: gazing globe. Reflective orbs in assorted colors perched on pedestals, gazing globes were all the rage in post-Victorian gardens, particularly during the 1920s, '30s and '40s. For years afterwards, they were forgotten or the object of scorn along with pink flamingos, sleeping sombreros, and cut-out plywood figures of bent-over gardeners. Suddenly, gazing globes are the hottest thing in garden ornament since the designer birdhouse and the teak bench.

The gazing globe is also the Stonehenge of garden ornaments. By all accounts, it simply materialized in the American garden early in this century like some post-Victorian version of the disco ball. Ken Moore, Assistant Director of the North Carolina Botanical Garden, found that mirrored balls were suspended from cottage ceilings in England during the 18th century to keep away evil spirits and bring prosperity and long life. English garden writer Graham Rose has written that reflective globes were "a feature of the more bizarre sections of some 18th century pleasure gardens." Another writer has traced glazing globes back to German gardens of the 19th century.

But how the heck did gazing globes get here? Like so many other elements of American garden design, the gazing globe could have been transplanted from England. Or it could have arrived with immigrants of German descent. Gazing globes are quite popular in Pennsylvania Dutch Country (Dutch as in Deutsch, or German) even today.

Another theory: Gazing globes could have been popularized by *The Wind in the Willows*, English banker-turned-writer Kenneth Grahame's beloved children's story. In Mole's front yard, you may recall, was a small round pond out of the center of which "rose a fanciful erection clothed in more cockle-shells and topped by a large silvered glass ball that reflected everything all wrong and had a very pleasing effect." Soon after its publication in London in 1908, the book became an international bestseller.

Silver globes are best for reflecting flowers and sky.

Gazing globes may have an even more, shall we say, august pedigree. Photographs of Pierre Dupont's Delaware estate (now Longwood Gardens) in the 1920s — no low-brow spread — unmistakably show a gazing globe on a pedestal smack in the middle of the formal flower garden walk. In the *Story of Gardening*, (1934), author Richard Wright traced the ornaments back to formal Dutch gardens of the 17th century. Wright, editor of *House and Garden* for 35 years, sniffed at "gardens with miniature bridges and canals and gazing globes and fantastic topiary work and tiny painted garden figures"

Given this history, could gazing globes have come across the Atlantic with a few wealthy English colonists, who patterned their gardens after the Dutch-like Tudor gardens they left behind? I called Rudy Favretti, the distinguished retired professor of landscape design at the University of Connecticut and the country's leading authority on Colonial gardens. "Seeing as gazing globes have been traced to Dutch gardens, and Dutch-style gardens were so popular among the American colonists," I wondered, "have you ever found evidence of gazing globes in Colonial gardens?" Professor Favretti thundered, "NEVER!!!"

Moral of the story: Put a gazing globe in a Colonial Garden — or any garden — at your own risk.

SUPPLIERS

- **Baker's Lawn Ornaments** RD 5 Box 265 Dept. OHJ, Somerset, PA 15501, (814) 445- 7028. *Globes in 10" and 12" diameters.*
- **Risser's Farm Market,** 328 South 7th St. Dept. OHJ, Akron, PA 17501 (717) 859-1700. *Globes in 10" and 12" diameters, pedestals for mounting.*

Photograph by Felder Rushing

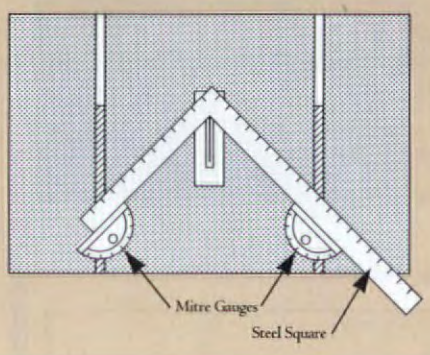
RESTORER'S NOTEBOOK

MITER MAGIC

I HAVE USED EVERY SYSTEM FOR CUTTING MITERS THAT CAN BE IMAGINED, from power and hand miter boxes to shearing machines. The simple process I have come up with uses two miter gauges on a table saw. I like to use a gauge put out by Vega Enterprises (RR 3 Box 193, Decatur, IL 62526; 217-963-2232) as the second gauge because it has both an adjustable fence and stops. I position one gauge on the right side of the table and set it at 45 degrees to the blade, adjusting the fence so that it is close to the blade. Then, I take a steel square and set the left-side gauge at a right angle to the right-side gauge. To make miters, cut the first piece on the left-side gauge, the second piece on the right-side gauge.

I find that with this system it is easier to see the blade in relationship to the cut line than with a miter box. It is also easy to make small adjustments to the cut angle, and then return to the original setup. If I am doing a series of cuts all the same length, I use the stops on the right-side gauge set it at the finished length.

— PAUL BENNETT
Clarkston, MI



PLATING WITH PAINT

I HAVE A LITTLE BIT TO ADD TO THE JANuary/February '92 ASK OHJ about refinishing door hardware. Professional refinishing is not cheap. I've found that brass hardware for a typical door (two knobs, two escutcheon plates, hinges and the exposed part of the lockset) costs about $75 to polish or plate. If you have plated-steel hardware and cannot afford professional refinishing right away (we couldn't for years after buying our house), or do not achieve satisfactory results doing your own polishing, the cheap, temporary solution is a good painting.

The New York Bronze Powder Co. in Elizabeth, NJ sells an aerosol paint called "Nybco 18kt Gold Plate" that works pretty well. To "replate," I clean the metal, prime it with Rustoleum brand auto primer, and spray on this gold paint. The results are satisfactory — at least better than black tarnish. The paint rubs off in about a year's time, but is easy to repaint. In addition, the process is reversible as the first step in any professional refinishing is an acid bath dip which easily removes the paint.

— KEN BOHL
Lombard, IL

PAINTING TIPS

WE STARTED THE EXTERIOR PREP and painting program on our old house last year. Though far from finished, we have discovered some helpful ideas that aren't mentioned in any of the professional literature, but we found vitally important.

Carry A Hand Mirror — If you will be scraping or painting clapboards that meet a roof line on porches, dormers, and the like, a hand mirror will show you the underneath edges of the clapboards. No matter how athletic or elastic you may be, these are places where your eyes will refuse to bend.

Wear Suntan Lotion — If you haven't protected yourself, one day of "fun in the sun" scraping and painting can lead to a week of "moaning in the shade" with sunburn.

Use Drinks With Tops — No, this is not a secret ingredient for paint removal, just a way to avoid roughage in liquid refreshment. There is nothing worse than finding half the wall you just scraped floating on the surface of a much-wanted cold drink.

— STACEY NEWBERRY
Ithaca, MI

UNDOING SCREWING

ONE OF THE BIGGEST ADVANTAGES OF wood screws is that they are designed for easy removal. However, a screw that won't screw out because the wood around it is stripped or rotten can be a messy headache to pry out. Here's a trick for removing these screws that my uncle learned as a carpenter in the 1920s.

First, determine where the threaded part of the screw is as accurately as possible. Next, drive a finishing nail into the wood towards the screw so that the point contacts the thread. Then, turn the screw with a screwdriver. If the nail has hit the right spot, the screw will back out. This trick works with any kind of screw. Heavy screws such as lag screws will need an appropriately heavy nail.

— RIF LERANGE
Butte, MT

TIPS TO SHARE? Do you have any hints or short cuts that might help other old-house owners? We'll pay $25 for any how-to items used in this "Restorer's Notebook" column. Write to Notebook Editor, Old-House Journal, 2 Main Street, Gloucester, MA 01930.

THE MODERN BASEMENT

A Matter of Ups and Downs

BY SHIRLEY MAXWELL AND JAMES C. MASSEY

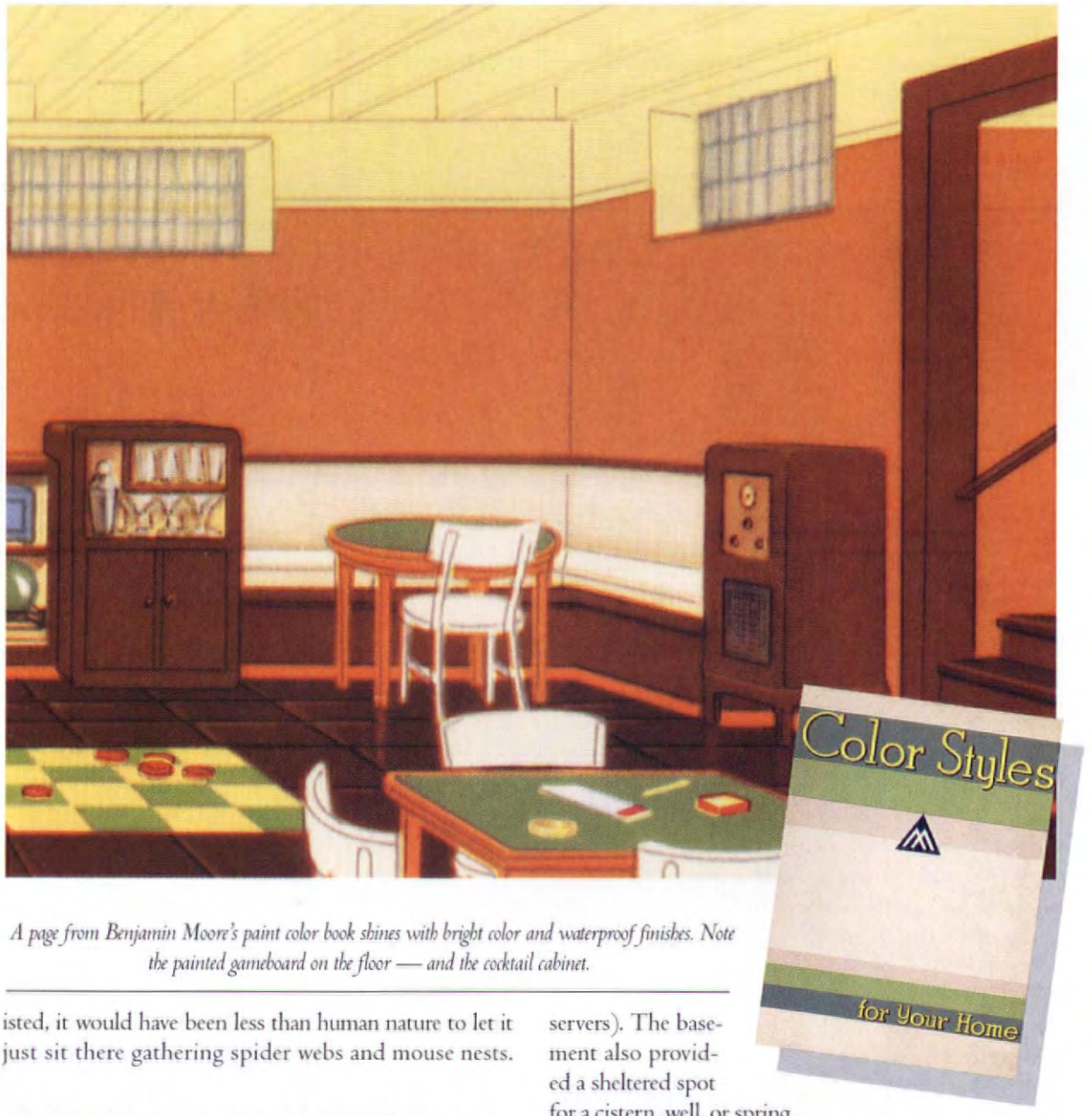
Furnace, c. 1900 — easy to see how this coal-eating monster could dominate the basement, as well as the nightmares of its human caretaker.

ALMOST AS LONG AS THERE have been houses, there have been basements, and from the beginning, there have been the familiar dilemmas about basements. First, how to keep them dry and then, how to make use of them. Fortunately, how to keep them dry is not our topic, since our basements have for the most part been like our babies — periodically damp (only the babies outgrew it). No, our task is to talk about ways in which more or less water-free basements have been used, particularly within the last sixty years or so.

First, let's point out some distinctions between cellars and basements. Although the use of the term "cellar" has persisted, even when the space referred to is really a basement (some folks, like us, recall going "down cellar" to get home-canned green beans for dinner), the two words are not technically interchangeable. The main difference is that a cellar is located entirely below ground level and its use is generally limited to storage, especially of food. Although it does step down a bit from the entrance level, the raised or English basement is really the ground floor of a house. It was intended to hold the guest entrance, a coat-room, and service areas, like a kitchen and the servants' dining hall, which is much too grand for our purposes here. We are concerned about the humble basement, that tantalizing, underground, almost-house space which begs to be used, even though it often thwarts our best efforts. A basement is at least partially above ground with windows to the outside, so it can be used for human activities as well as storage.

Not surprisingly, the popularity of the basement has waxed and waned over the years. The first "basements" were merely excavated spaces for the building foundations and bearing walls that carried the weight of the floors above. Generally, they were only as big as necessary, and not every building had one. However, once such a space ex-

HABS photo by Jack Boucher



A page from Benjamin Moore's paint color book shines with bright color and waterproof finishes. Note the painted gameboard on the floor — and the cocktail cabinet.

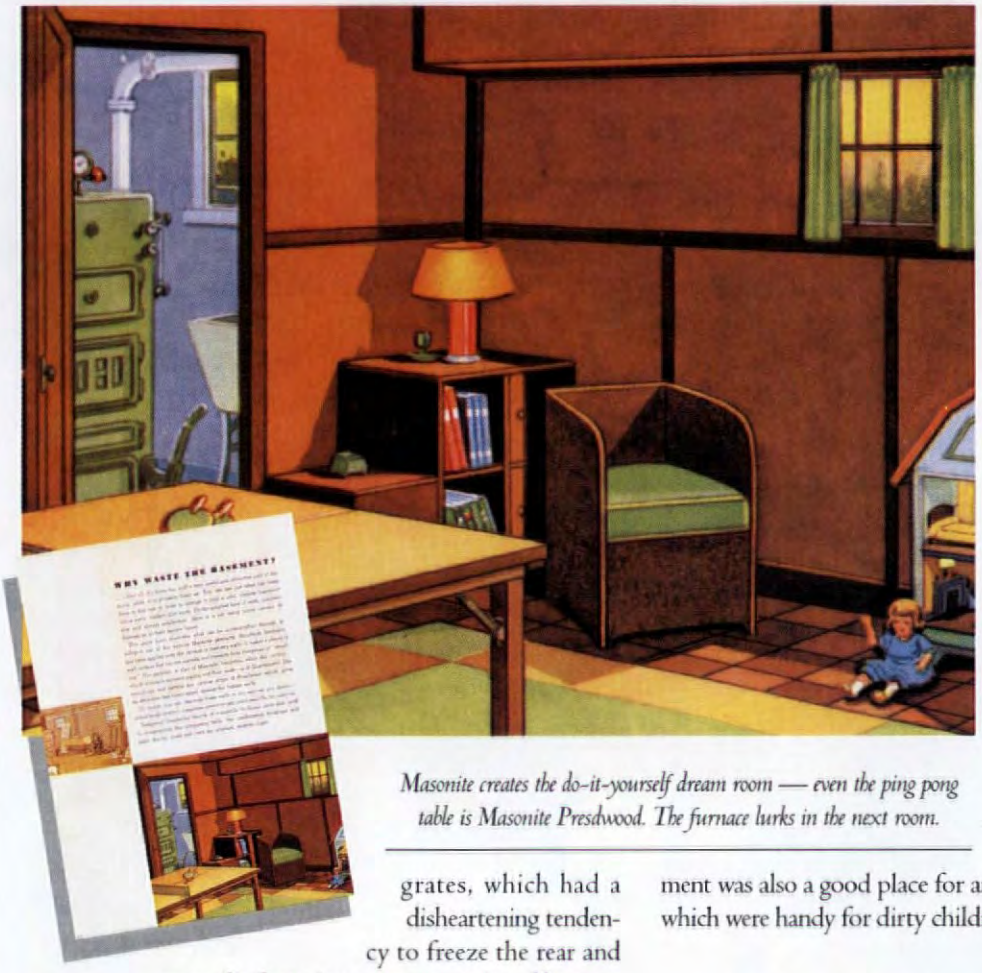
isted, it would have been less than human nature to let it just sit there gathering spider webs and mouse nests.

FUNCTIONALISM AND FURNACES

THE EIGHTEENTH-CENTURY BASEMENT — when there was one — frequently was a full-fledged work space with perhaps a kitchen and/or a laundry and, most importantly, a well-defined area for food storage. In very large houses, it could contain several specialized kitchens as well as a servants' dining room and, occasionally, their sleeping quarters. In some parts of the United States (particularly the South), homeowners preferred separate outbuildings for hot, messy, or smoky jobs like cooking in the summer. In the northern climes, basement kitchens and dumbwaiters helped to avoid many a chilling experience for diners (and servers). The basement also provided a sheltered spot for a cistern, well, or spring.

In the mid-nineteenth century, these food-related functions began to move upstairs, displaced by a new-fangled contraption: the coal furnace. It would reign over the American basement for the next seventy-five years or more. The most up-to-date houses were heated by huge furnaces of brick and cast-iron with hot-air ducts leading to the main rooms. However, a single large grate in the hall directly above the furnace often supplemented fireplaces and stoves elsewhere in the house. With the development of hot-water and steam radiators, furnaces soon became the dominant source of heat.

Without a doubt, this new central heating was wonderful. Compared to old-fashioned wood fires and coal



Masonite creates the do-it-yourself dream room — even the ping pong table is Masonite Presdwood. The furnace lurks in the next room.

were of packed soil or, at best, covered with soil cement (moistened lime and dirt).

House plans of the early twentieth century suggest that partial basements were about as common as full ones. As house furnaces became smaller and more efficient, and as basement construction became less onerous, basements were likely to be broken up into a furnace room, a coal room, and a laundry, often with a large, undefined space left over. A requirement of every good basement was an outside entrance, partly so that the furnace repair man would not track soot through the house. The basement was also a good place for an extra toilet and wash basin, which were handy for dirty children or workmen.

grates, which had a disheartening tendency to freeze the rear and roast the front, it was an unquestioned boon to family health and happiness. Nevertheless, running a coal-fired furnace was a messy, grimy, miserable operation. Tons of coal were poured through the basement window to lie in small black mountains until it was hauled across the room and fed by the shovelful into the belching, red-hot maw of the resident iron monster. Afterward, there was always an ocean of hot, dusty ashes to be removed. The oily soot that covered everything (and everyone) within settling distance surely hastened the upward migration of all other basement functions.

Throughout the nineteenth century, there was no absolute pattern of having a full basement, a partial basement, or for that matter (when there was no furnace) any basement at all. Since digging one was hard work, most basements probably started out under just a portion of the house, but later excavations expanded the usable area. A careful study of your own basement may reveal such an expansion. Most early basement floors

GOODBYE DREARY BASEMENT

AS THE TWENTIETH CENTURY ADVANCED, RELATIVELY clean oil and gas furnaces entered the picture and technology eased the worst problems of coal heating. Automatic central heating systems were enclosed in semi-streamlined, sheet-metal cases. They were

Sunbeam's idealized basement.

fired by oil, gas, or that little-remembered wonder, the electric-powered automatic coal stoker. The Iron Fireman, as one of these compact marvels was named, promised to lift "the whole burden of furnace worries from your shoulders ... (It) lets you sleep later every morning ... keeps the temperature in your home steady all day, without any attention from you." Such innovations essentially cleaned up the basement.

At the same time, social changes made any extra house space look desirable to the modern householder. For one thing, the work week was shortened, and while family size decreased, so did the square footage of the average home. Then, the Depression struck. Few people could afford to move to larger quarters, expand the old ones or escape the space crunch by turning to outside entertainment. There they were with more free time and no space to spend it in. What to do? Two directions beckoned: cheap fun and home improvement. The lowly basement presented opportunities in both areas. Excavating crawl spaces, finishing the floor and masonry foundations, and adding electricity transformed dreary basements into a legitimate part of the family home. With the dirty old coal room partitioned off (or gone completely), a clean and durable cement floor underfoot, and electric lights overhead, the basement was now a fine place to set up a workshop for Dad, install a modern laundry for Mom, and maybe fix up a playroom for the children. (Because of the moisture problem, basements were rarely used for bedrooms.) With those practical matters in hand, attention could be given to carving out a safe — if not very inspiring — indoor spot for the children to play, with their happy clamor mercifully dulled by distance.

But, more frivolous times lay ahead. In popular 1930s women's magazines, home decorating articles began suggesting clever ideas for creating basement playrooms or game rooms for grownups. Granted, the original idea had been to isolate the kids and their racket, leaving the upstairs living room free for peaceful adult gatherings. Soon though, that spruced-up, below-stairs room started to look way too good to be wasted on children.

A 1938 ad by Crane (boilers) touts the basement as ideal for recreation.

MODERN MATTERS OF DECOR

HOWEVER, IN ORDER TO MAKE THE BASEMENT a fun space, additional effort was clearly needed. A plain cement floor and concrete walls might do well enough for a workshop or a laundry, but there had to be a way to inject color, comfort, and easy upkeep for the more social game room. Because few basements are dry all the time, the new asphalt asbestos tiles were an obvious answer to the question of what to put on the floor because they were waterproof (unlike linoleum) and relatively impervious to scuffing. (Asbestos has a bad name as a health hazard now — with good reason — but it was the miracle product of the era.) Another choice, rubber tiles, softened the impact of cement floors and helped to dull the clatter. The widespread availability of new man-made materials for the walls, including easy-to-handle insulation panels and decorative wall panels, plywood, and a ceiling of equally manageable acoustical tile panels made it possible for almost anyone to refinish a basement at low cost.

The real handmaiden of change, though, was electricity. None of this would have been possible without electric power to drive the automatic furnaces, air conditioning units and, since basements have such small windows, the lights to make the rooms cheerful. Clever Depression-era manufacturers were quick to recognize that adding a room to the house was be-

A "fireside chat" of the late '30s? This ad for an automatic coal stoker suggests a cleaner way to handle furnace duties.

yond most people's means. Led by GE, which in 1936 trumpeted its "New American" Home as a triumph of electrically induced miracles, heating and air conditioning manufacturers launched major advertising initiatives in the late 1930s. They found a hundred ways to show consumers how to convert their dingy basements into comfortable living space.

Consequently, gaily decorated basement game rooms offered bright, casual — and not-to-be-sniffed-at — cheap modern living. This determinedly perky approach to matters of decor favored shipboard and seaside motifs, perhaps to suggest the luxury vacations few Americans were able to enjoy during the hard times. Although formal furnishings were usually avoided, sturdy "Early American" furniture and wall paneling of wood or fake wood were perennial favorites. However, games were the real focus. During the 1930s, some favorite games included shuffle board (played on a permanent field painted onto a cement floor or inlaid in asphalt flooring), billiards, ping pong, and of course, card games of all sorts.

Exact dates for the basement's twentieth-century rise and fall are hard to pinpoint, but the modern basement playroom (or rec room, rumpus room, family room, or, at last, TV room) was certainly a creature of the late 1930s, '40s and '50s. Overall, the basement-as-a-playroom was functional, intensely used, and rather short-lived trend. Builders and architects soon began to see the light and, wherever there was enough space, included first-floor playrooms and utility rooms in their house plans. With bigger windows and easy access to the rest of the house, these rooms easily outshone their underground cousins. In the post-war building boom, the recreation room was plucked from its basement home and moved upstairs, just as the kitchen had been elevated a century before. Starting in the 1950s, the basement began a slow decline. Once more used as leftover space, it became home to the furnace, air conditioning unit, and bulky storage.

And now? Well, things may be looking up (or is that down?) again for the basement. It would be a great spot for the home gym and maybe the kids should have a playroom down there, so their parents can hold an occasional adult conversation. There's room for a washer and dryer, too. And, you know, an extra bathroom might fit in that corner . . . .

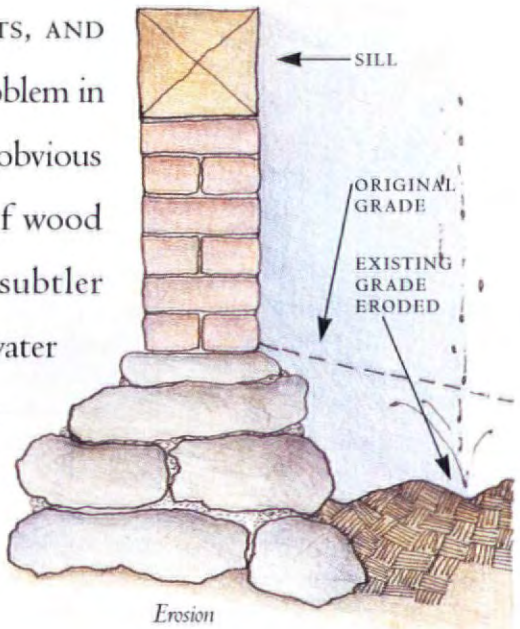
Jim Massey and Shirley Maxwell are the authors of OHJ's long-running series on old-house styles.

WATER IN THE CELLAR

WHERE IS IT COMING FROM? HOW CAN YOU STOP IT?

by John Leeke

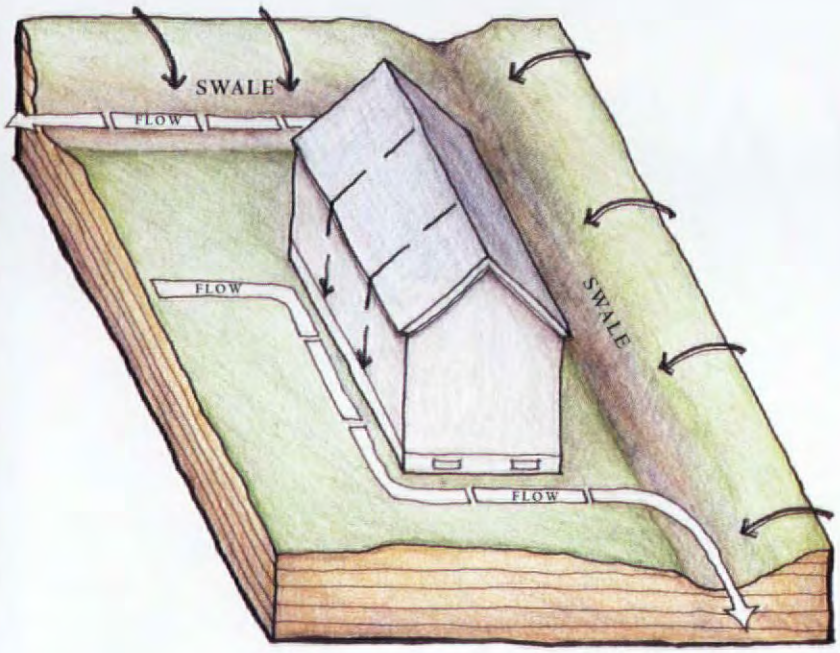
WATER IN CELLARS, BASEMENTS, AND crawl spaces is a common problem in old houses. Excessive moisture causes obvious trouble including the deterioration of wood and masonry. Over the long term, subtler moisture conditions—for example, water vapor rising up into the house—can do serious damage to interior finishes such as paint and wallpaper.



Erosion

Drawings by Lisa Soderberg

SURFACE WATER FLOW



Rain water and drainage from high ground at rear is intercepted by swales, which channel water away from house. But poor grading at front channels surface water and roof run-off toward foundation.

Not all cellars were built to be dry. Here in New England, dry-laid fieldstone foundations were meant only to hold up the house. Water easily flows between the stones and trickles across the dirt floor. Early inhabitants understood and accepted this state. The effect on the building was minor because the water flowed just as easily out the opposite wall, and cellar windows and doors were kept open on dry days during the wet season to let out the damp air.

Modern use of old houses frequently requires a dry basement. Even if not intended for use as a living space or for storage, utility equipment such as electrical boxes and furnaces last longer and are safer to operate in a dry basement. In order to devise effective solutions to cellar water problems, you must first locate and understand the source of the water. Once you have found a source, continue your search because more than one source is often involved.

COMMON WATER SOURCES

SURFACE WATER IS RAIN WATER, snowmelt, and drainage from higher ground that flows along the surface of the ground. Roof drainage that pours off the building adds to surface water, often digging a trench along the foundation. Even when there are gutters, wind-blown water washing down walls adds to the volume. This can amount to a lot of water, especially on three- or four-storey buildings.

Over decades, water flowing along the foundation can erode away inches—and even feet—of soil, exposing it to weathering and undermining its support. Eroded soil is often deposited further along the foundation, building up against wood siding and grade-level window sills and causing decay. At this point, the foundation tends to shift and crack. Then, when surface water seeps or pours through the cracks, you have water in the basement.

Groundwater is surface water that seeps down into the ground and collects over impervious layers of clay, hardpan, or rock. Groundwater levels rise and fall from season to season and year to year. When the groundwater rises above the level of a basement floor, you have water in the building. The water table is the highest point below ground which is ordinarily saturated with water.

When the impervious layer of clay or shale is sloped, the water flows. The flow through broad, flat layers of granular soil may be a few gallons per minute per square foot. In open gravels, flow rates will range up to 40 or 50 gallons per minute, amounting to a slow-moving underground stream or river. This explains why you can sometimes pump and pump a flooded basement and it still stays wet; there will always be more water ready to enter until the level of surrounding groundwater subsides. A cellar that is damp all the time may be located over a depression in an impervious layer. During a dry season, the surrounding groundwater flows away but the depression acts like a reservoir that continues to feed water up into the cellar.

Even when the water table is well below the floor, moisture in liquid and vapor form can rise through the soil and leave you with water in the cellar. With liquid water, the movement is due to capillary action and the smaller the soil particles are, the higher it will rise. In fine sand, water may rise a foot or so; in clay or silty clay, it can rise a few to several feet. Capillary action can even draw water up into the masonry of foundation walls and piers, creating a condition called rising damp.

Other, more apparent sources of water in the cellar are leaking pipes. Not so obvious are broken

pipes outside that can be confused with natural sources such as groundwater. Warm, moist, spring air that blows in and condenses on masonry, metal, and even wood surfaces that are still cold from winter is also a water source.

CONTROLLING WATER

DRAINAGE SYSTEMS ARE PART OF the "environmental envelope" that protects the house from the elements. This envelope begins at the roof with shingles, flashing, and gutters, and continues down the walls with siding, windows, and downspouts. Then, it spreads out across the ground with surface drainage systems, and underneath the house with systems to control water entry. These drainage systems collect water and then channel it away from the building to an acceptable disposal area.

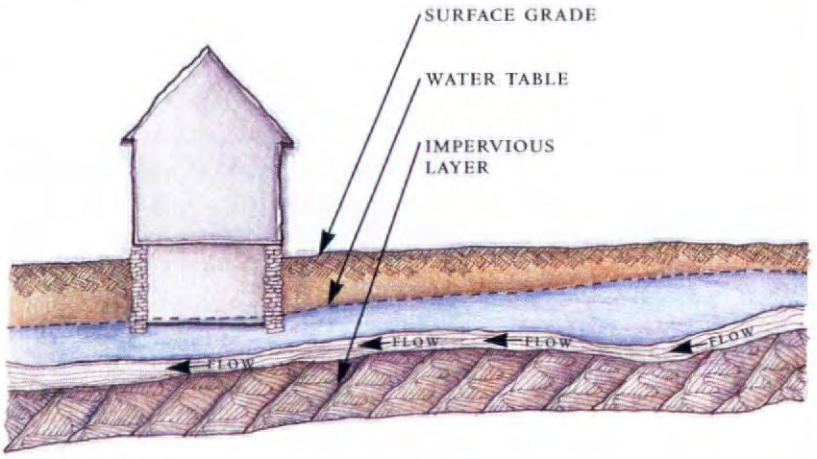
A drainage system must also take into account the surrounding property. Disposal is usually simple in the country, but if you live in town with other houses close by, you can't just run all your water to the lot line and forget about it. If you do, you may hear from your neighbors or their lawyer regarding property damage and drainage easements. Practical matters may force you to hook into a storm sewer or develop your plans for a drainage system in cooperation with your neighbors.

Of course, drainage works both ways. Frequently, building construction or renovation on other properties alters surface water and groundwater flow patterns. Construction next door or even blocks away can directly affect groundwater conditions and you may suddenly find water in your normally dry basement.

The best strategy for keeping cellars dry is to stop water at the environmental envelope. When this is impossible or very expensive, it can make sense to let the water in, control it, and move it back out again. Simple solutions should be tried first. Frequently, regrading around foundations or adding gutters to eaves will control water problems. If these measures don't work, consider more extensive drainage systems.

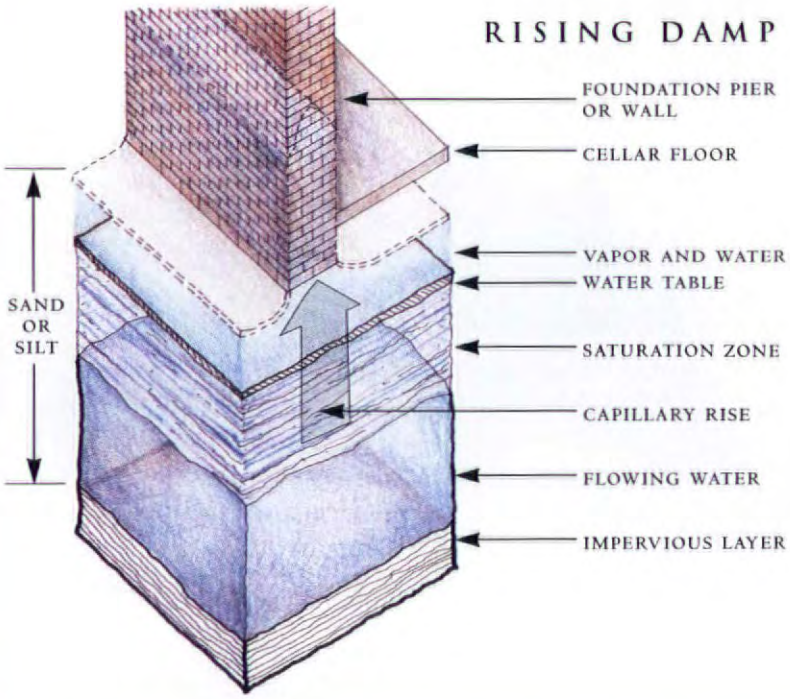
Before spending hundreds or thousands of dollars on a solution, you'll need enough information about your drainage situation to make effective decisions. Similar conditions often exist over a large area, so it can be worthwhile to get the input of neighbors or town planners. Bring in a drainage specialist if simple measures don't work. Often a local contractor

WATER MOVEMENT UNDERGROUND



Water flows along sloped layers of impervious clay or rock — and, in granular soils, the flow can approximate a slow-moving river!

RISING DAMP



Water and water vapor rise from groundwater into the cellar or foundation walls by way of capillary action.

with knowledge of surface and subsurface topography in the area will be able to help best. Geotechnical engineers are trained to understand events underground. They are not inexpensive, but could be invaluable if you have a large project or your situation is unusual or extreme. Twice I have brought a specialist like this into my projects. In both cases they saved the project more than their fees by making recommendations that cut costs or improved the solution to the problem. To find a specialist, check the Yellow Pages under foundation contractors, geologists, foundation engineers, and geotechnical engineers.

As for miracle cures—there aren't any. Many unique waterproofing and dewatering products and methods are marketed to solve cellar water problems. Some of these methods are useful, but no single approach is always the best solution and a few don't work at all. Be wary of the aggressive salesperson who has only one method or product to offer as *the* solution to *your* problem. (That will be $1,676.00, please.) Successful dewatering contractors always draw on several products, methods, and ideas in designing a system that will truly solve your particular cellar water problem.

DRAINAGE SYSTEM TYPES

SURFACE DRAINAGE SYSTEMS ARE created by contouring the finish grade of the ground around the house. They control and move water through a combination of positive drainage slope away from the foundation and swales (shallow ditches). A swale can have as little as a 1" or 2" dip across a 4' or 5' width and still channel surface water effectively. Larger flows of water require comparatively deeper and wider swales. Building drainage systems like gutters and downspouts also do a lot to keep water from reaching the cellar.

There are two basic types of drainage systems used to intercept water once it gets below the surface (see Waterproofing Historic Foundations, page 41). Perforated pipes are buried at the footing level and covered with crushed stone so that they collect groundwater and duct it away. Coatings on the foundation wall, frequently used in conjunction with perforated pipe, waterproof the masonry and prevent water from entering. Interior systems may be less costly to install. Most employ some sort of pipe drain system around the perimeter of the basement that channels the water to a sump hole. A pump then moves the water up and out of the building through a pipe.

A wide variety of products and standard-practice methods are called on to build these types of drainage systems. The two techniques that follow require only readily available construction materials.

CLAY LAYER AND DRIP COURSE

ADDING A LAYER OF CLAY BELOW the grade is an effective way to guide roof water away from the foundation. Water that seeps through the topsoil is led away from the building by the clay layer. Adding a course of bricks or stones prevents water dripping off the eave from eroding a deep channel in the soil. (A drip course is not needed on gable ends or under eaves with gutters.) Although it doesn't protect the side of the building, the clay layer and drip course combination is a low-profile alternative to gutters when they are impractical or historically inappropriate.

Laying the drip course: contractor Mike Tero digs a furrow and then tamps bricks into place

Clay has several advantages as an impervious layer in this treatment. It is sticky and flexible when wet, and a 4" to 6" layer will form a good seal with the irregular surface of a stone foundation wall. If the foundation or surrounding soil shifts position, the clay will re-conform. Clods of clay soil are difficult to dig and move around, but they pack easily to form a solid layer without gaps that excludes water. Best of all, clay is dirt cheap.

Common sources for clay are excavation contractors who stockpile a variety of soils and stones, and brickyards that use clay as a raw material for brickmaking. You may even find the right clay bank nearby to dig your own. Suitable clay feels slippery when rubbed between fingers with a little water. When saturated, the clay is flexible and plastic; when dry, it is hard and crumbly. If you can get only dry clay, leave it out in the rain or sprinkle it with a hose for a few days to prepare it for use.

There are two types of clay: expansive and lean. Expansive clay has a very high liquid limit and can hold up to three times its weight in water before it turns to mud. As it absorbs water, it expands in volume. This expansive force is very strong and has been known to buckle foundation walls when used in large quantities as backfill.. For this reason, it is important to keep layers of expansive clay thin (4" to 6" depending upon the characteristic of the clay and

Photographs by John Leeke

the care of the installation). Expansive clays are commonly found in the Southeast, across the South into Texas, and in the far northern plains. Expansive clay shrinks and cracks as it dries, so it is not the ideal clay to use.

The lean clay found in New England and across the Midwest is more stable than expansive clay and better suited for this treatment. Be careful not to use clay containing more than about 25 percent sand or silt. To learn about the kinds of clay available in your area, contact your local Soil Conservation Service Office (a branch of the Department of Agriculture located in almost every county). They have Soil Survey and Soil Potential Reports that map out soil types and characteristics. These maps also show the depth and duration of water tables.

Bricks or flat rocks can be used for the drip course. Use whatever you have on hand. On this project, we had plenty of bricks from a demolished chimney. We selected the darkest, reddest bricks, those that were hardest and most water resistant. Water-struck bricks or paving bricks are even harder, but they would have added significantly to costs and wouldn't have matched the foundation.

The mortar used to repoint early masonry should not be stronger than the original mortar. On this foundation of granite fieldstone, I used a relatively soft, lime-rich cement mortar modified with an acrylic additive (Acryl-60 by Thoroseal) to make it more adhesive and flexible.

PROCEDURE

To build a clay layer and drip course, follow these steps:

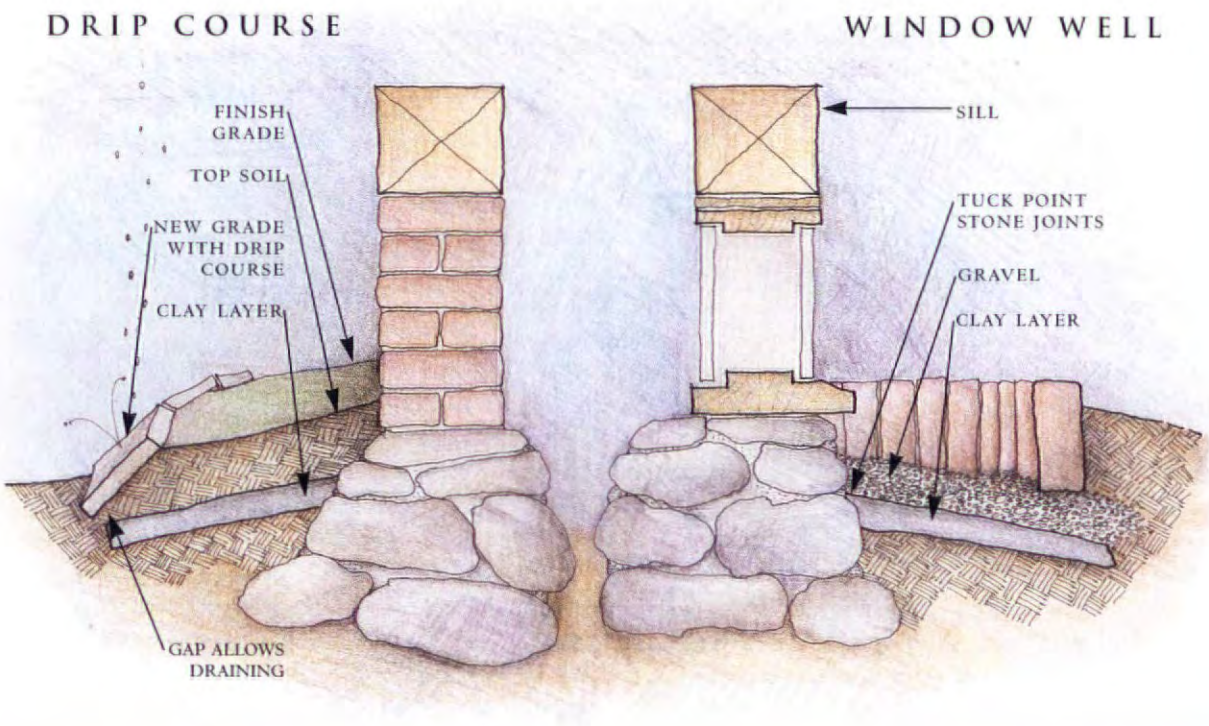
1) Lay out the job. First, dig a few test holes along the foundation to determine the soil conditions. Then, plan the thickness of clay and soil layers and the location of the drip course. Mark the top level of the finish grade of topsoil on the foundation with a chalk line. Measure the distance from the foundation wall to the groove eroded into the soil by the water dripping from above. Record the measurement for later reference.

2) Prepare the foundation. Excavate and expose the first few courses of the wall below the grade. It's important to clean the foundation so that the mortar and clay applied later will adhere well. (I usually wash the stones with a scrub brush and bucket of water; a hose can make a muddy mess.) Now, inspect the wall and make any needed repairs to the foundation. Repointing between the masonry units is an important detail for keeping the wall watertight. Work the mortar into the joints between the foundation stones or bricks with a narrow repointing trowel.

3) Prepare the bed. Measure down from the finish-grade mark to determine the level of the bottom of the excavation. Grade the bottom on a slope away from the foundation (say, a minimum drop of ½" in 12") to form a bed for the clay.

4) Lay in the clay. Shovel in clods of clay and consolidate them with a tamper. Dip the tamper in a pan of water frequently to keep the clay from sticking to it. This consolidation packs the clay to-

Two solutions: Left, a brick drip course and sloping clay layer keep falling water away from foundation. Right, an arch of bricks forms a window well to keep damp dirt off sills.



gether, eliminating voids and channels. It also forms the clay against the irregular stone foundation, making a watertight seal and sloping surface that prevents water from entering the cellar. Cover the clay with topsoil and grade up to the finish-grade line marked on the foundation.

5) Lay the drip course. It's important to keep the bricks or stones centered on the drip line. Use the measurement you took earlier to assure they are the correct distance from the foundation wall. Water falling from above is usually blown over as it falls, so the measurement method works better than just dropping a plumb line from the eave. To keep the water from above splashing back onto the house, set the drip course on a 30- to 40-degree angle. If the step in the finish grade is objectionable and the foundation wall is as durable as granite, the drip course could just be laid flat. Don't lay the bricks down into the clay layer—this would trap water above the clay layer, preventing drainage. See the illustrations on p. 39.

WINDOW WELL WITH CLAY LAYER

A WINDOW WELL IS MEANT TO keep leaves and dirt away from the window's sill, preventing fungal decay. On my recent project, erosion along part of the foundation wall had washed dirt away, exposing the rough fieldstones. The dirt ended up against the basement window sills. Responding to this problem, a previous contractor had installed a corrugated, galvanized window-well unit. He had to leave 4" to 6" of metal showing above grade because of the protruding foundation stones below ground. The shiny finish had a pronounced visual effect that didn't fit the 150-year-old house. So, the owner asked me to come up with something more appropriate. The result was a brick arch to hold the dirt away from the wood sill with a clay layer underneath to channel water away from the foundation.

PROCEDURE

1) EXCAVATE AND PREPARE STONES. I dug a hole in front of the window 20" wider than the opening. I set aside the sod for reuse later. I used a narrow repointing trowel to dig out decayed wood from underneath the sill and dirt from between the stones. Then I repointed the joints between the granite stones as described in the section on clay layer above.

2) Lay in clay and gravel. First, I carefully marked out the level of the new, higher finish grade on the foundation wall with chalk. I measured down from this point to find the bottom of the well, accounting for the the thickness of the clay and gravel layers. Then I packed dirt in up to that level, sloping it slightly away from the foundation to form the bed for the clay layer.

I laid the clay as described in the section on clay layer above. This window well is on the gable end of the house and there is no clay layer running along the foundation, so the window well has its own little layer. I added a 3-inch layer of ½" to 2" diameter gravel for drainage. Note that the gravel is between the clay and the bricks to come, if the bricks were bedded in clay, water would collect in the well and drain under the sill into the cellar.

3) Cut out the form. I built a form to guide the placement of the bricks. The form is made of two layers of plywood spaced apart so the edges define a curved plane. To design a nice arc, I leaned the plywood up against the house and drove two screws into the plywood, spaced at the width of the inside dimension of the window well. Then, I hung a chain between the screws, which fell into an even curve. I traced this curve onto the plywood with a pencil.

4) Lay in the brick. Laying the bricks took only about half a bucket of mortar. I had trouble keeping the bricks against the form, so I backfilled soil against the bricks and packed it in to hold them in place.

5) Regrade and lay sod. To finish the window well, I let the mortar set up for a few days and then regraded along the foundation and replaced the sod.

Top photo shows the anachronistic (and less enduring) galvanized window well. A better idea: New clay layer is tamped down, sloped away from foundation. Next, plywood form edges guide curve of brick course. Then the bricks are laid up in mortar to form an arched soldier course.

WATERPROOFING HISTORIC FOUNDATIONS

A Contractor Describes Modern Materials and Methods

by D. Jameson Gibson Jr.

IN THE PAST HUNDRED YEARS BASEMENTS HAVE BECOME a home for new, moisture-vulnerable necessities such as furnaces, air conditioners, hot water heaters, and lawn mowers. During this time homeowners discovered two things. First, this mechanical equipment needed a dry space. Second, if they had a dry space at or below grade it was a much more convenient storage area than the attic. This evolution has brought us to the point where the basement becomes an valuable living or office space in a historic structure. The old-house owner creates an extra bedroom or study, while organizations like the National Park Service add two offices, a lunch room, and public restrooms. Suddenly, keeping water from invading the basement becomes a top priority. This is never an easy task, but some new products combined with the traditional methods allow us to make historic foundations 100% waterproof without significantly affecting the original building fabric.

Sometime in the past twenty years, the construction industry made a distinction between waterproofed and damp-proofed below-grade surfaces. Simply stated, a waterproofed surface is one that has the ability to block the movement of water. In the case of the historic basement, we are trying to keep water out, but in the construction of fountains, fishponds, and roof decks, we hold water *in* using these same products. Anti-Hydro, Ram-Tough, Sure-Seal, Butyl-Membrane, Claymax, Hydro-Sure, Bituthene, Multi-Thane, Tuff-N-Dri, Volclay Bentonite and sheet lead are all waterproofing products of one kind or another. Most are greatly enhanced systems that go well beyond the traditional parging, asphalt coating, and polyethylene barrier surfaces of a few years ago.

In contrast, damp-proofing products are moisture inhibitors that won't hold water. These products are designed to prevent small quantities of moisture from penetrating a surface, and are not designed for prolonged exposure to large volumes of water. Unfortunately, a wet basement is often the result of sub-

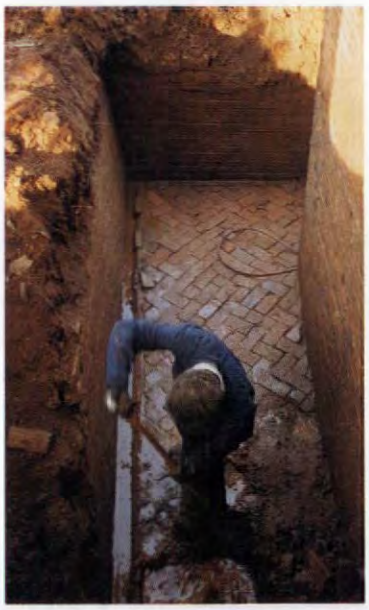
The backhoe begins excavation near the foundation of this Jeffersonian Greek Revival.

surface water standing against a basement wall. As the quantity of water increases, so does the hydrostatic pressure, leading to the failure of traditional damp-proofing techniques.

DIG ONE MUST

THE FIRST STEP IN WATERPROOFing a historic basement—complete perimeter excavation—is without a doubt the hardest. A lot of landscaping will be destroyed in the process, but good planning and a good horticulturist can lessen the impact. Never imagine, though, that it will be pretty. This is war. For two hundred years, that beautiful shade tree has been sending its roots into your foundation to find food and water. Sometimes the roots can be cut back and the tree saved, but don't count on it. The trauma of the project alone may kill the tree. It is usually best to simply take out everything within ten feet of the structure before you start digging.

Aside from landscaping plants and possible artifacts in the soil, there is no salvage value to the excavated material. If it appears to be fairly clean (free of rocks, bricks, metal, etc.), it is usually worth saving a portion for later backfilling and grading. Most often, it is not clean and the later needs are minimal, so it makes more sense to remove the material from the site to provide maximum open space for the ensuing procedures. We find a backhoe is the most efficient tool for this type of excavation. A skilled operator and machine currently cost $50 per hour. We are usually able to complete a house excavation in one or two days.



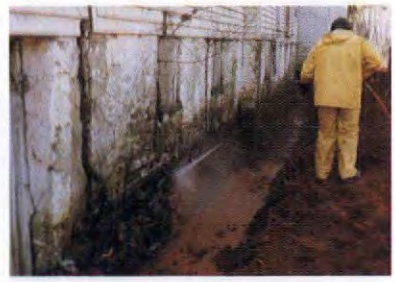
Uh-oh ... the wall collapsed (top) because the earth was all that buttressed it. A structural evaluation should have preceded digging. Above, a historic walkway was discovered during excavation.

As a onetime archaeologist, I appreciate that the "builder's trench" immediately surrounding a house has the potential for being an archaeological goldmine. Although few individuals or historic structure stewards can justify the time and expense (and as a contractor I would consider it a huge concession), some projects might warrant having an archaeologist or other professional documenter on hand to record, photograph, and salvage with the backhoe's cooperation.

Different shoring and sloping techniques are required to stabilize the wall of the excavated trench depending upon the type of soil encountered. For this reason, it is best to have a soil test done prior to breaking ground. The excavation should not extend below the foundation or footing, if one exists. The 1989 OSHA amendments require that all excavations deeper than five feet be sloped at no greater than a 45° from the bottom of the trench. This is almost impossible to comply with at most historic sites, so shoring the earth wall with lumber or other materials is the only alternative. Consequently, each of the following operations will have to be repeated as the shoring system is moved. Since the

other half of the shoring system is the foundation wall, it is also prudent to have a professional analysis of the building's structural integrity.

The next step is to clean the foundation using bristle brushes and high-pressure water. This inevitably reveals a number of small mortar or brick failures, as well as any structural problems. After addressing all of these, it is often advisable to parge the entire below-grade surface to bring it into a fairly smooth plane. (This flat surface will keep the protection board that guards the waterproofing from breaking during backfilling.) A parge made with one bag Type 1 portland cement to 16 shovels of sand is suitable for most buildings. If particularly soft or spalled brick is encountered, it may be better to use a weaker parging mix such as brick mortar and sand. Unless the excavation has been open and the brick washed for more than a week there is generally no need to wet the surface prior to parging. However, before proceeding with any waterproofing, the parging or existing masonry surface must be thoroughly dry. When the weather refuses to cooperate we sometimes use large propane torches and space heaters to accelerate the drying.



Top, the foundation wall is cleaned with high-pressure water before parging. Middle, note the unevenness of the wall below grade. Above, the brick foundation is parged (plaster-coated).

SIZING UP SYSTEMS

AT THIS POINT, IT IS TIME TO choose one of the 20th-century products to apply to the masonry surface. My experience is with W.R. Grace's Bituthene and Owens-Corning Tuff-N-Dri (now sold by Koch Materials Company). With the exception of bentonite (a naturally occuring mineral that swells when wetted to form a blocking membrane) and sheet lead, I think these two are representative of the waterproofing industry today.

Bituthene 3100 is a sheet-applied, rubberized asphalt membrane integrally bonded to a polyethylene film. Originally available only through dealer/installers, it is now sold "over the counter" for installation by contractors or individuals (though this is no light-duty task). Within 24 hours of beginning application, the manufacturer's primer has to be rolled on the wall surface. This primer comes with numerous health warnings, the most significant of which I find to be "maintain proper ventilation." If good air circulation cannot be achieved easily, an air-supplied mask or comparable respirator is necessary.

Bituthene is .060" (60 mils) thick and comes in 3' wide rolls with a peel-away back. It generally requires at least two people to apply these sheets to the primed vertical surface. On old houses, it is best to start the Bituthene as close to the finish grade as possible. The trick is to adhere the material without any crimps or air pockets, a process that is similar to applying decals to a dry surface. Ideally, all of the sheets are hung with a 2½" vertical lap joint. The instructions recommend that the application be doubled at all corners, and all horizontal joints be caulked with Grace's Mastic EM-3000.

While Bituthene 3100 may sound difficult or unforgiving to work with, it is an excellent product and can be mastered. It is ideal for a segmented job since you can stop and start at any time. The one feature which I particularly like about Bituthene is that it bears a strong resemblence to a bicycle inner tube. The membrane is easily defeated by a small hole or tear, but is easy to patch before you bury it and reseed your lawn. To help prevent punctures during backfilling, it is advisable to install a protection board against the Bituthene surface. There are several products available for this purpose, and the primary requirement for any of them is that they be non-biodegradable.

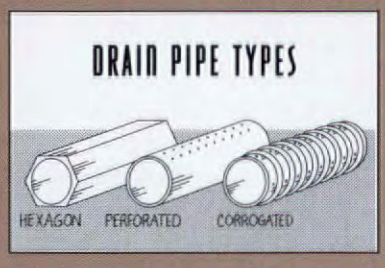
Tuff-N-Dri membrane is a polymer-modified asphalt which is spray-applied at a high temperature. It is resilient, seamless, quick to install, and inexpensive (typically, under $2 per square foot in place). It can be applied at 20° F and remains flexible down to minus 10° F. As with Bituthene, it requires a smooth masonry surface for proper bonding. Tuff-N-Dri is very elastic and can easily bridge non-structural cracks. It is also resistant to mold growth and chemical and bacterial attack.

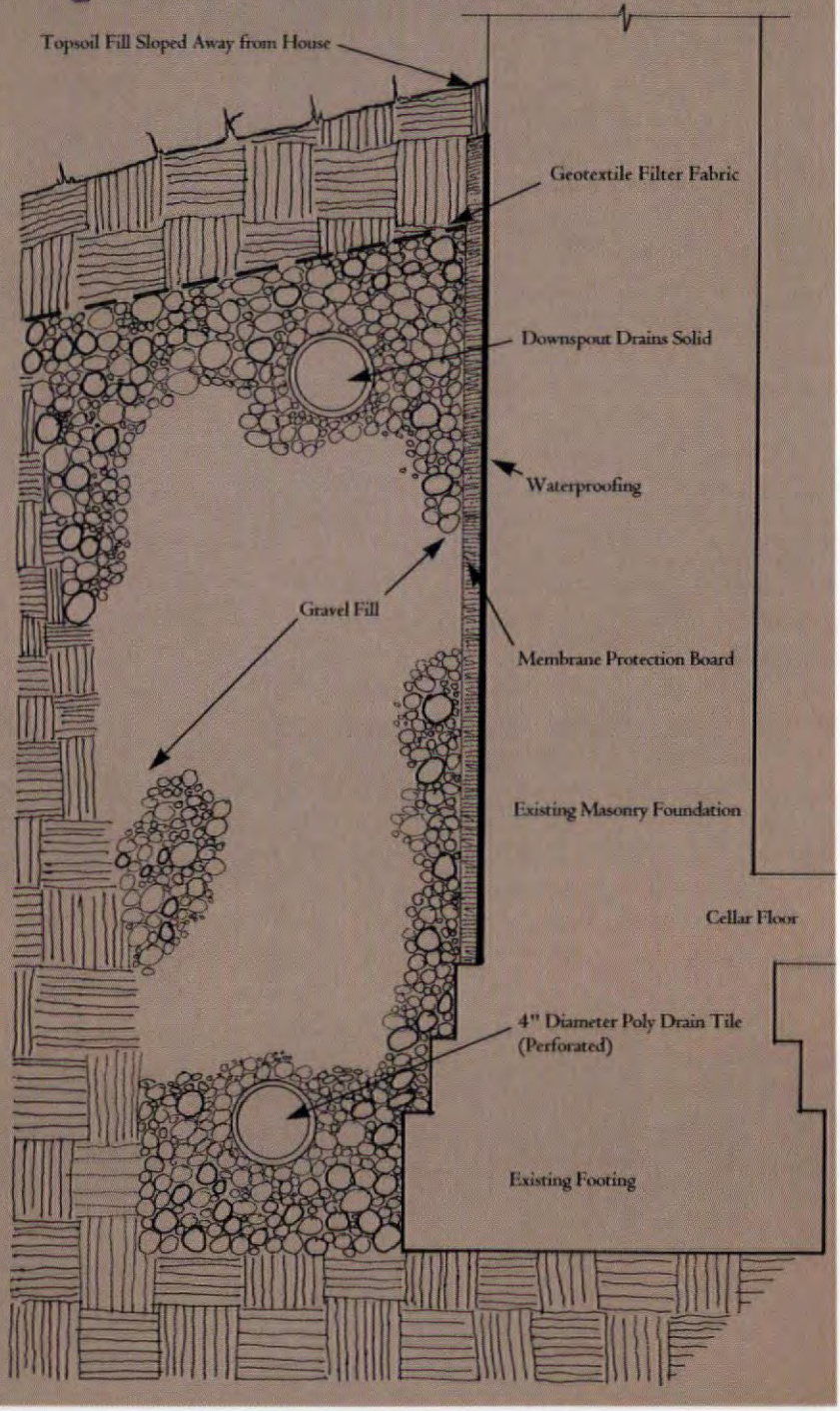
Unlike Bituthene, Tuff-N-Dri is not readily available to the consumer. It requires special equipment for installation,

and as of this writing, is only obtained through licensed distributors. The need to mobilize and set up equipment means that the site has to be 100% ready when the installer arrives or you end up paying for additional truck trips. Cold joints are acceptable, so with good planning a cut-up job can still be feasible and cost-effective.

As a fiberglass insulation manufacturer, Owens-Corning decided to take their waterproofing system one step further. Instead of just providing a protection board for this membrane, they designed an insulation board which channels the water to the foundation drains while providing thermal values of R3.1 to R10. This drain board

Getting Down to Drains





SUPPLIERS

Grace Construction Products
62 Whittemore Ave.,
Dept. OHJ
Cambridge, MA 02140
(617) 876-1400
Bituthene 3100 waterproofing

Koch Materials Company
Coatings & Sealants Division
4900 S. Mason Ave.,
Dept. OHJ
Chicago, IL 60638
(800) 562-1052
Tuff-N-Dri waterproofing

Drawings by Lisa Soderberg; (inset) Lisa Sparks

Top, laying in a graded footing drain. Middle, gravel fill progresses. Bottom, rough backfill is in; topsoil will come above level of Tuff-N-Dri.

also absorbs moderate soil expansion without losing drainage capabilities. (Owens-Corning claims that at 65% compression, the board has the drainage capacity of coarse sand.) One incidental benefit is that the insulation board bonds to the hot asphalt, simplifying the foundation drain and backfill operations.

GETTING DOWN TO DRAINS

III. INSTALLING FOUNDATION DRAINS and backfilling the trench are the last two operations of the waterproofing process, and in most cases should be started soon after the waterproofing product is applied. The foundation drain system is rigid perforated pipe laid carefully on a bed of washed gravel, a minimum of 3" thick. Our first choice for pipe is 4" schedule 20 or "thin wall" PVC, due to its strength and relative cost. Schedule 40 and SDR35 (PVC pipe with O-ring sealed bell couplings) would also be good choices, but are typically more expensive. Corrugated ADS is the popular, all-purpose foundation drain material, but we find it crushes easily and is difficult to grade. Clay drain tile has been made for decades and is still in use. I have removed old drains that were constructed of 4" octagonal terra-cotta tiles roughly 12" long and butted end-to-end. The joints between sections were loose and served the same purpose as perforations do today.

Grading this pipe requires some compromising. In new construction we try to achieve a fall of ⅛" per linear foot of run. However, when working with the restrictions of retrofitting a historic structure we have come to the conclusion that it is adequate to lay the pipe along the foundation with no fall. Then, once the system leaves the corners of the building, we switch to solid pipe which is graded. Whatever the situation, the outlet must be brought to daylight, even if it means a 100' run of pipe to an open trench or a sump-and-pump combination. The old school of thought is that the pipe should be installed with the perforations down to prevent silt build up. I feel the pipe is more effective with the perforations up now that filter fabric is an integral part of the system.

The last step is economical "builder's insurance." The entire perimeter excavation is filled with 36" of washed ¾" gravel. Next, the gravel is covered with a filter fabric (such as Amoco Products AP4545 or AP2006) or a layer of straw. The job is completed with 24" of clean topsoil (or clay if it's to be paved) and the site is ready for finish landscaping.

D. Jameson Gibson Jr. specializes in restoration building with Gibson Magerfield General Contractors (P.O. Box 371, Charlottesville, VA 22901; 804-293-9308)

The Bituthene asphalt/polyethylene membrane in place, with a temporary downspout line visible.

Tuff-N-Dri in place with protection board. Rigid perforated drain pipe is being bedded in gravel.

Gravity Hot-Water Heat (Or, What Goes Up Doesn't Necessarily Go Down). ~ BY DAN HOLOHAN

GRAVITY HOT-WATER HEATING BEGAN QUIETLY IN THE UNITED STATES sometime between 1875 and 1885. It was a Canadian import and a safe substitute for steam heat, which had been earning a notorious reputation throughout the world. Steam systems ran under pressure and, back then, frequently exploded with disastrous results. Hot-water systems, on the other hand, were open to the atmosphere and usually limited to a maximum temperature of 180° F. In those days, you could liken the difference between a gravity hot-water system and a steam system to the difference between a simmering open pot of water and a pressure cooker gone berserk. Gravity hot-water systems were safe, easy to maintain, and most of the time, trouble-free. They quickly became the preferred way to heat large American homes just prior to the turn of the century.

There has never been a heating system so simple in principle, yet complex in installation, as gravity hot water. The only moving part is the water itself, but to get that water to go where it was wanted, a pipe fitter had to have the skills of Mr. Goodwrench and the knowledge of Mr. Wizard. If he did his job well, the system worked beautifully; if he didn't, it became a balancing nightmare.

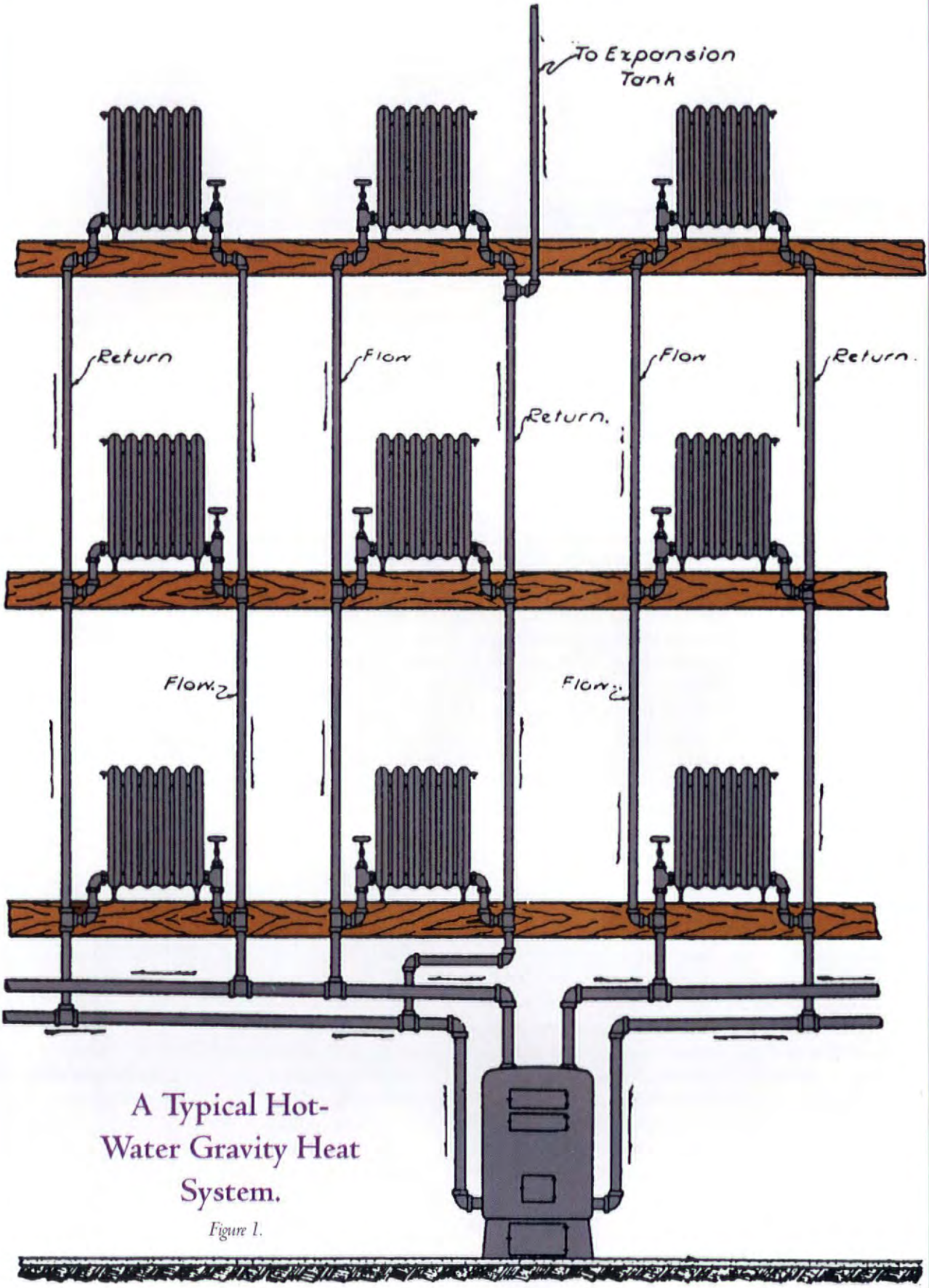
NO MOVING PARTS

TAKE A LOOK AT A TYPICAL GRAVITY SYSTEM IN FIGURE 1. CIRculating pumps, which we use on modern hot-water systems, hadn't been invented yet, so to move water from the boiler to the radiators the old-timers depended on a basic law of physics: Heat rises.

A cubic foot of water at 180° takes up about five percent more space than a cubic foot of water at 40°. It also weighs about two pounds less. This is where the term "gravity" hot-water heat comes in. When you heat water in a boiler, it will rise up into the pipes because it's lighter than the relatively colder water in the system. In turn, that colder water falls back down into the boiler — by gravity. Before long, you have a beautifully simple "Ferris-wheel" flow of warm water moving freely from the boiler to the radiators.

How quickly the "Ferris wheel" turns depends on a number of things:

- THE HEIGHT OF THE SYSTEM — The taller the building, the quicker the flow. However, if the building is too tall the water will cool and slow circulation to the upper floors. A three storey house is the practical limit.
- THE SIZE OF THE PIPES — The larger the diameter of the



A Typical Hot-Water Gravity Heat System.

Figure 1.

pipes, the faster the flow. This is because large pipes offer less frictional resistance to water flow than small pipes. This is the reason why the old-timers used two supply and two return tappings on the boiler. Ultimately, the size of the pipes was also the reason why steam heat replaced gravity hot-water heat in American homes. As years went by, steam heat became safer but large-diameter pipes continued to be expensive.

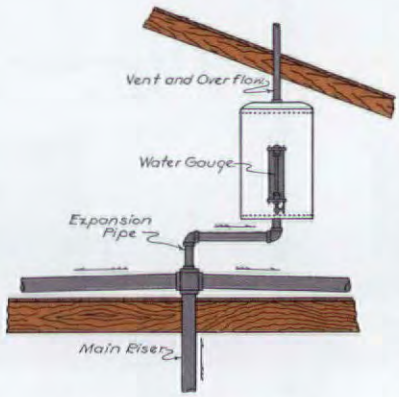


Figure 2. The expansion tank.

• THE CONDITION OF THE PIPES — When pipes are new they're smooth on the inside and offer very little resistance to the slow-moving water. However, as pipes age they develop little nooks and crannies from oxygen corrosion. These tiny internal burrs increase frictional resistance which slows down the flow and the heat. Nowadays, we usually overcome this problem by adding a circulator to the system (see page 51).

• THE DIFFERENCE IN TEMPERATURE BETWEEN SUPPLY AND RETURN — In theory, the hotter the water, the faster the flow. In practice, the old-timers always held the maximum temperature at 180 degrees to make sure the water never approached the boiling point. To get the best efficiency, they limited the maximum temperature difference between supply and return to 20 degrees. This was a function of pipe sizing (the smaller the pipes, the greater the temperature drop, and vice versa). So, on the coldest day of the year if water left the boiler at a maximum of 180 degrees, it would return at a minimum of 160 degrees if the fitter followed accepted piping practices.

EXPANDING WATER

I MENTIONED THAT WHEN YOU HEAT WATER FROM 40° to 180°, you wind up with about five percent more water than you started with. If you don't have a place for that "extra" water to go, pressure will build quickly. Figure 2 shows a typical open expansion tank for a gravity system. It is perched in the attic at the high point of the system and provides the expanding and contracting water with a place to rise and fall. Should you put too much water into the system, it will overflow out the roof vent and onto the roof where there's no harm done.

The water gauge glass indicates the tank's water level. Normally, you should maintain the tank at one-third full when the water is cold. As the water heats and expands, it will rise into the upper two-thirds of the tank. Some tanks have automatic fill valves which are very similar to the ballcock in a toilet tank. With others, you fill the tank manually by opening a valve in either the basement or the attic. Your boiler probably has an "altitude" gauge which shows the height (altitude) of the piping system in feet as well as the static pressure created in the boiler by the water stacking up in the system. The gauge records this static pressure in "pounds per square inch."

To check the level of water in the system with the altitude gauge, first set the movable red needle to the proper height. This will be the difference in feet between the fill valve and the bottom third of the tank's gauge glass. Then, open the fill valve until the gauge's black needle lines up with the red needle. An altitude gauge works on the relationship between water pressure and its ability to lift water vertically. One pound of pressure will lift water 2.31' (28") straight up.

Should you ever have to drain the system completely, take care in the way you refill it. If your system is fed from the bottom up (as in Figure 1), you'll have to bleed air from the radiators. Do this one floor at a time as you refill the system. Leave all the key vents (located at the top of each radiator) open until water reaches that floor. When water flows from the vents on the first floor, close them all and move up to the second floor. To prevent puddles on the floor, you have to be quick — or have a lot of help. Finally, bring the water level in the expansion tank up to the one-third-full mark and you're done.

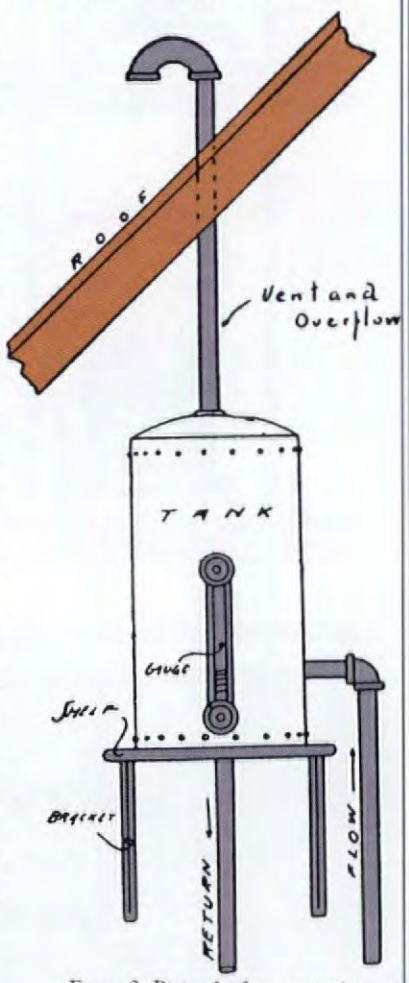


Figure 3. Piping for freeze protection.

After the initial air purge, the overflow pipe sticking out through the roof will act as the system's air vent. Usually, the tank sits atop the main system riser at a high point and will collect any air which the heated boiler water releases. Should some of this air wind up in the radiators instead of in the tank, it can slow the flow of heat to the rooms. For this reason, you should bleed your radiators at the beginning each heating season.

Now because the high point of the system is usually in an unheated

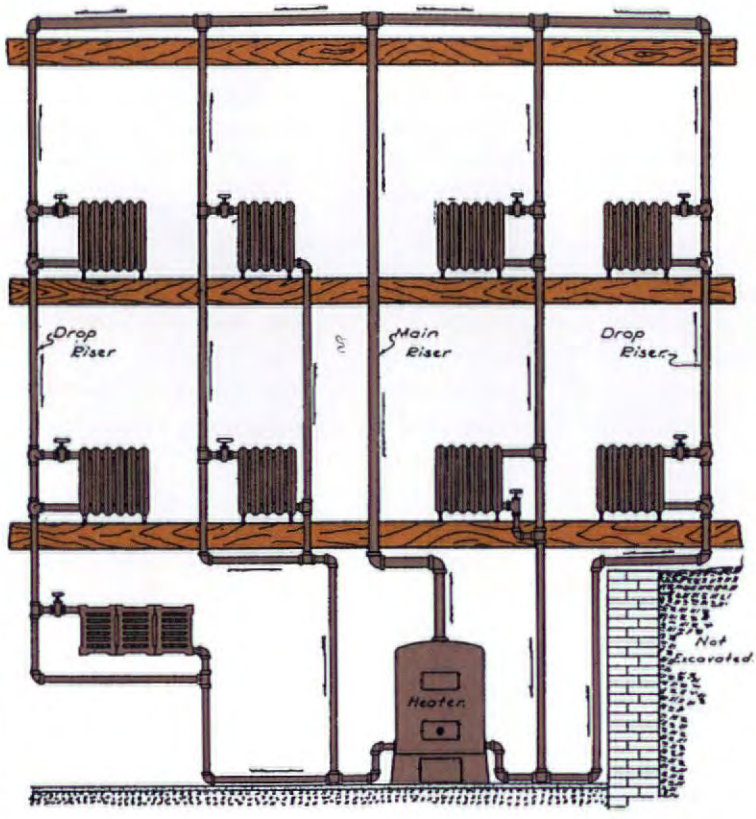


Figure 4. "First-class" overhead gravity system.

attic, there's always the danger that the water in the open expansion tank can freeze. Once that happens, the expanding system water has no place to go. To avoid this potentially dangerous situation, many old-time heating contractors piped their tanks like the one in Figure 3. That second pipe connected into the side of the tank allowed hot system water to circulate through the tank. Because the water was hot and in motion, it was much less likely to freeze. However, piping the tank this way does increase the rate at which water will evaporate from the system. That means you have to keep a closer eye on that altitude gauge when you're circulating the tank.

Should you eventually decide to modernize your gravity system by adding a circulator and/or replacing the boiler, your heating contractor will probably also "close" the system by replacing your open, attic expansion tank with a modern, closed, basement compression tank.

THE OVERHEAD SYSTEM

IF THE ORIGINAL OWNERS OF YOUR home went first-class, they would have installed an overhead gravity system such as the one in Figure 4. In this system, water goes first to the attic (or to a main suspended from the top-floor ceiling) and then feeds down to the radiators. Because the "express riser" is very large, it offers less frictional resistance to the water. As a result, the hot water will move from the boiler to the radiators faster than it will in the first system we looked at.

Another plus is the way the cooler water pulls the hot water through the radiators as it falls down the return risers. This force counteracts the effects of friction and makes the radiators heat faster. As a result, an overhead system costs a lot less to operate. The way the radiators are connected to the mains means you don't need any radiator air vents with this design. The entire system air-vents automatically through the attic tank. It doesn't take long to fill this system, and you don't have to spill any water on the floor either!

With an overhead system, the pipe fitter could connect radiators in two ways. He could either 1) enter the top of the radiator on one side and leave through the bottom of the other side, or 2) enter the top of the radiator on one side and leave through the bottom on the same side. The second method saved a riser, which made for a less-expensive installation. With one down-fed riser, the supply and return water share the same space. To make this configuration work, though, the fitter had to use a special tee to divert water in and out of the radiator. This tee, shown in Figure 5, was called the "OS" fitting after its inventor, Oliver Slemmer of Cincinnati, Ohio. It was another beautifully simple device. Later in the 1930s, the Bell & Gossett Company introduced similar fittings which they called "Monoflo" tees. These tees played a big part in American house heating during the years before World War II.

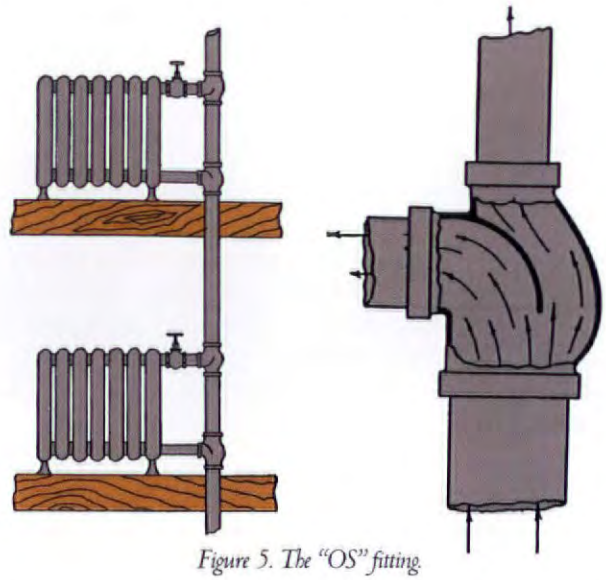


Figure 5. The "OS" fitting.

SO FAR, GRAVITY HOT-WATER HEAT LOOKS PRETTY simple, doesn't it? Except for the water, there are no moving parts. Now let's take a look at how that water "knows" where to go. This is where the pipe fitter's skill (or lack of it) makes itself known.

The pipes in a gravity system are very large and contain a lot of cold water on start-up, but not all of that water is going to get hot at the same time. Because hot water is lighter than cold water, it has a tendency to take the path of least resistance and shoot directly up to the top-floor radiators. If the water goes to the top floor first, the first floor will be cold. So pipe

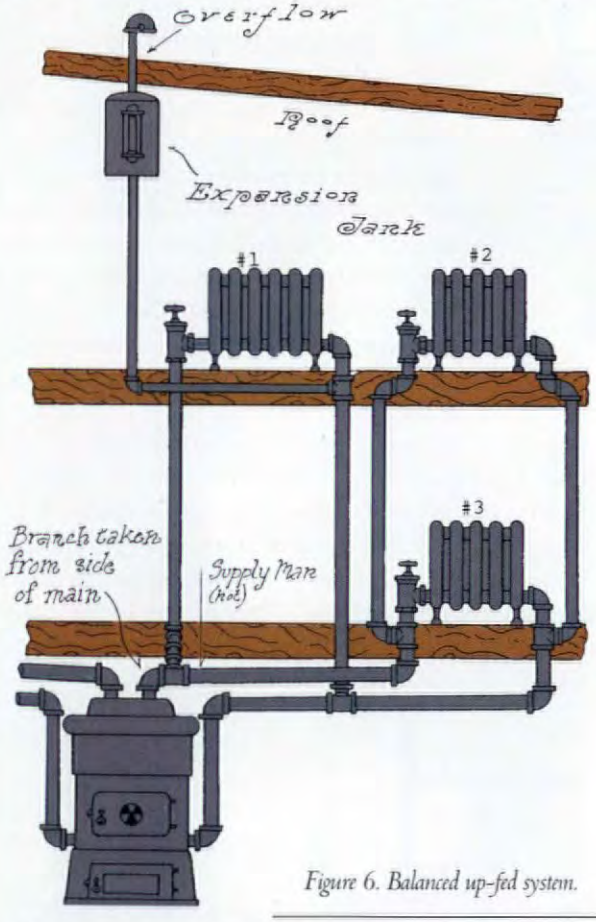


Figure 6. Balanced up-fed system.

fitters sometimes added orifice plates to the top-floor radiator hand valves. An orifice plate is a round piece of metal like the top of an orange juice can with a small hole in its center. Orifice plates increase resistance to flow and persuade the water to go other places. But more often, fitters would pipe the job in such a way as to avoid problems in the first place.

Take a look at the up-fed system in Figure 6. Here we have three radiators — two on the second floor, one on the first. The hot water's tendency is to go to the second floor first. But look closely at the way the fitter makes his lateral take-offs from the supply main. Notice how the hot water supply to Radiator #1 comes off the side of the main. He did it this way because on start-up, the hottest water will be at the top of the supply main. That hottest water wants to go to Radiator #1 but it can't get there right away because the water near the bottom of the horizontal main is cold. It's crowding the hotter water out of the way and driving it toward Radiator #3, which just happens to be on the first floor.

Figure 7. Location of Branches.

Figure 7 shows how the old-timers fed upper-floor radiators from the side of the main and first floor radiators from the top. That way, the system went into a natural balance. Can you see how moving or adding a radiator in a gravity hot-water system can cause a problem to someone not in the know? There's a very subtle balance going on here.

Figure 8 shows a detail of how the old-timers balanced upper and lower radiators coming off a single riser. Lower radiators always received their hot water from the top of the pipe; higher radiators from the side.

It was customary for the pipe fitter to reduce the size of the supply main as it worked its way around the home, but if he reduced the pipe too quickly, flow would stop. What's important is that the area of the main meet or exceed the area of all the attached radiator hand valves. If the main is too small (or if someone adds radiators to an existing main), some radiators won't heat well. The competent installing contractor calculated every job. He knew no two were quite the same.

The return main had to parallel the supply within a distance of 8 to 12 inches and drop only when it reached the boiler room. Returns from first-floor radiators had to enter on the side of the return main. (Remember, they left from the top of the supply.) The return from one radiator could block the return from another if their temperatures were slightly different.

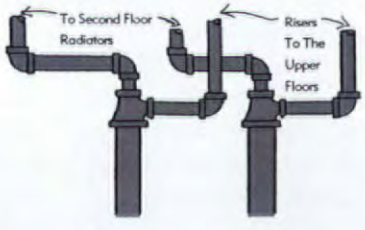


Figure 8. For radiators off a single riser.

When it comes to heating, simplicity equals longevity. You can't get much simpler that gravity hot water. It may not do what you expect, but once you learn the rules, the rest is a snap.

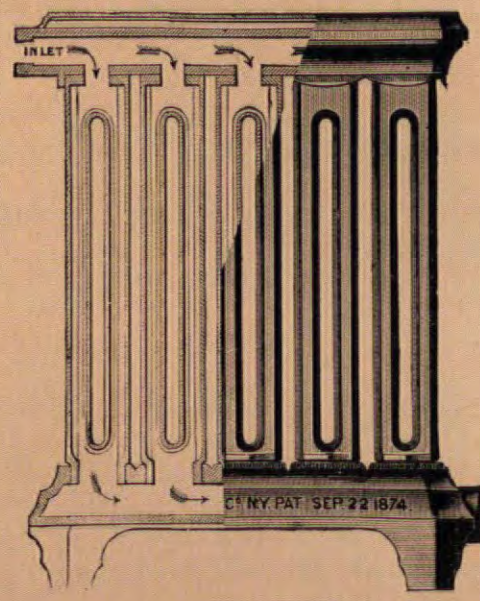
Dan Holohan operates a consulting firm that specializes in older heating systems: Dan Holohan Associates, Inc., 63 North Oakdale Avenue, Bethpage, NY 11714; (516) 796-9276.

Converting to Forced Circulation

WHEN IT COMES TIME TO REPLACE that old boiler, you should consider converting your "gravity" hot-water system to forced circulation. This will save fuel and control the comfort level in your home. Here are some tips:

• SIZING THE NEW BOILER — Have your heating contractor perform an I=B=R heat-loss calculation on your home. I=B=R is the acronym for the Institute of Boiler and Radiation Manufacturers, a 100-year-old industry group. Today, they operate under the title The Hydronics Institute (35 Russo Place, Berkeley Heights, NJ 07922; (201) 464-8200). This group publishes excellent, low-cost technical literature, including a quick heat-loss calculation guide.

In addition to the heat-loss calculation, measure your radiation. The I=B=R guides show you how. Then compare the *current* heat loss to the amount of radiation in your house. From this, you'll be able to calculate the proper design temperature for your new boiler. The more radiation you have, the lower the water temperature will be and the lower the fuel bills (and the more comfortable you'll be!). For example, most conversion jobs in the New York City region run well at a maximum of 160°. There is absolutely no reason to oversize a boiler.



• SIZE THE NEAR-BOILER PIPING — The new boiler needs only one supply and one return main because it's going to have a circulator. Figuring out the right size is simple. Just take the size of the largest existing pipe, divide it in half, and then drop down one pipe size. So, for instance, if you have two 2½" pipes leaving your old boiler, just divide 2½" in half. That gives you 1¼". Now drop down one size and pipe the new boiler according to the manufacturer's instructions with one 1" supply and one 1" return.

Down-sizing the near-boiler piping is important because it gives the new circulator something to work against. Without some resistance, the circulator will be kicking itself off on overload all the time. You'll also need a good air separator because you'll be sealing the attic tank. Spirotherm, Inc. (429 Kay Ave., Addison, IL 60101; (708) 543-5850) makes a remarkably effective one.

• SIZING THE NEW CIRCULATOR — This, too, is easy. The idea is to move a lot of water against a small resistance. The best circulator for this application is a 1750-rpm circulator such as Bell & Gossett's Series 100 or Taco's Series 110. Circulator sizing in modern systems is complicated but for the old system it's simple — one size fits all!

• ADDING BYPASS AROUND THE NEW BOILER — This is to protect the new boiler against thermal shock — that is, the effects of hitting hot cast iron with relatively cold water. Nowadays, most cast-iron boiler manufacturers require a bypass; a competent heating contractor will be well aware of this fine point.

• SIZING THE NEW COMPRESSION TANK — As I said earlier, you'll be sealing the attic tank and replacing it with a modern compression tank in the basement. This will close the system to the atmosphere and stop the corrosion that's slowly been taking place for so many years.

Tank sizing goes beyond the scope of this article; however, I can tell you that a compression tank for a gravity-conversion job will be much larger than a tank for a modern, forced-circulation system because its size is based partly on the amount of water in the system. You can get some guidance on compression-tank sizing from Amtrol, Inc., a major manufacturer of compression tanks (1400 Division Road, West Warwick, RI 02893; (401) 884-6300).

• GAINING CONTROL — Once you've converted the system to forced circulation, you can control each room's temperature by installing thermostatic radiator valves on the radiators. These devices sense the air temperature in each room and modulate the flow of water through the radiator. They're completely self-contained and need no electrical wiring. Thermostatic radiator valves last for years, are relatively inexpensive, and have been around since the 1920s.

For more information, contact Danfoss, Inc. (16 McKee Drive, Mahwah, NJ 07430; (201) 529-4900).

• BALANCING THE NEW SYSTEM — Once you add a circulator to your gravity system you're going to find things change quite a bit. The path of least resistance will become the lower floors, a mirror image of what it was before. Having thermostatic radiator valves will help to compensate for the new dynamics. Without them, you'll have to adjust the hand valves to get the system back in balance.

Old-House Financing in the 1990s

BY CYNTHIA AND DOUGLAS EDMUNDS

FINDING THE MONEY TO RESTORE AN OLD HOUSE HAS NEVer been easy. Even during the late '60s, when "Great Society" government money flowed like champagne (by today's standards), one often had to wade through more red tape than construction debris to secure it. ¶ Today, homeowners are spending more fixing up houses than ever before. Home improvement expenditures rose more than 20 percent between 1985 and 1990, topping $100 billion last year, according to the National Association of Home Builders. Yet while improvements are on the rise, money is harder to find. Many government programs and tax advantages were significantly reduced or eliminated during the 1980s, and the banking crisis has left a credit crunch in its wake in many parts of the country. As a result, financing is now the most difficult aspect of reviving a house for the middle-income homeowner. However, savvy homeowners willing to spend some time digging with a telephone before digging into their projects can still find restoration money from a variety of sources including local banks, government agencies and community based preservation groups. Here are some places to begin the quest.

LENDING INSTITUTIONS

IN MANY CASES, MAJOR REHABILITATION PROJECTS COME hand-in-hand with a house purchase. Yet major structural defects (cracked foundation, rotten or insect damaged frame, disintegrating chimney), substandard systems (central plumbing, heating or wiring, septic system or well) and environmental problems (asbestos, lead paint, underground oil storage tanks) will make an already nervous lender unwilling to finance your project. Approaching lenders with a

Homeowner David Plante stands in front of his Portsmouth, New Hampshire home. HUD money — and a lot of sweat equity — help complete the exterior renovations. *(see box on p. 57).*

"handyman special" thus takes some research and preparation. Buyers attempting to pioneer into neglected neighborhoods will face rejection from lenders apprehensive about bad loans and unmarketable property. Uncertainty about whether improvement costs will be reflected in increased market value also make today's lender "gun-shy" of old houses.

FIRST MORTGAGES — More than ever, it may take some sleuthing to find a lender who sets renovation and the neighborhood as a priority but "they are out there," insists Linda Wilson, Director of Historical Resources for the state of New Hampshire.

Start with local lenders who cater to the immediate community and keep their loans "in house" — that is, in the bank's own loan portfolio rather than sold to the secondary mortgage market. Credit unions also may offer considerable flexibility. Bob Hover, a Troy, Michigan homeowner who won an award last year from the National Trust for Historic Preservation for his work on a fire damaged and condemned Victorian farmhouse, told a reporter that securing financing for the $140,000 project was the most serious problem he faced during the ten-year project. After brush-offs from several local banks, Hover's credit union came to the rescue, agreeing to advance funds in installments for the repairs.

Before and after in Savannah, Georgia, financed through regular bank channels.

While not all local lenders are interested in making such risky and time-intensive loans to individuals, some inner-city or minority-owned credit unions are especially committed to housing upgrade projects. Other lenders may be convinced to work out creative financing agreements with borrowers who are able to, for example, offer additional assets as collateral, or set up an escrow account with enough cash to complete agreed-upon improvements to reduce the lender's risk.

FHA MORTGAGE INSURANCE PROGAMS — Another option open to old-house buyers is to find a nearby lender who participates in the Federal Housing Administration (FHA) 203- (k) Rehabilitation Mortgage program. This program allows the borrower to finance with one mortgage loan the purchase and rehabilitation of owner-occupied one- to four-family properties. These loans are still funded by the approved lending institution, but are backed by the Department of Housing and Urban Development (HUD) to minimize the risk to the lender. Applicants can borrow up to 97 percent of the home's final value, or $124,875, for as long as 30 years. Rehabilitation money is released as work is completed. Since the 203-(k) mortgages are time consuming to administer, relatively few lenders participate in the program. Your HUD field office can provide a list of participants in your area.

FANNIE MAE LOANS — The federal national mortgage association (better known as Fannie Mae) is the largest source of mortgage credit in the United States, and the newest federal government source of loans to old-house buyers. The agency's year-old Community Home Improvement Loan (CHIML) program was designed to give the ailing American housing market a much needed shot in the arm by aiming to reach buyers who have little cash, but a passion for home improvement.

Under the program, participating local lenders can loan up to $202,300 (or 95 percent of the completed value of a property after improvements), giving qualified buyers a mortgage and rehabilitation loan all in one package. Like a construction loan, the rehabilitation portion of CHIMLs is released as work is completed.

The Fannie Mae loans are subject to two major restrictions. First, applicants may earn a maximum of 115 percent of the area's local mean income. Second, "luxury" home improvements are not covered, so don't set your heart on a swimming pool, tennis court or Jacuzzi.

LOCAL REVOLVING LOAN PROGRAMS

AS BANK FINANCING HAS BECOME MORE DIFFICULT TO SECURE, some local lenders have been willing to form partnerships with local preservation and community revitalization groups to finance the purchase and renovation of single-family homes in targeted neighborhoods. These revolving loan programs are more likely to be found in large cities, but don't overlook the

possibility of there being a program in your community. In New Orleans, for example, the Preservation Resource Center has worked out financing arrangements with a consortium of local banks for the renovation of homes in the city's historic Lower Garden area. The Center buys homes in this target area and provides money to individuals through its revolving line of credit (loaned by a consortium of local banks).

Once the house is "up to code", the individual obtains a conventional mortgage from a local bank, repays the Center, then takes title to the improved home. By providing such transition loans, the Center has managed to work around the reluctance of banks to finance dilapidated structures. According to membership director Doug Weiss, the Center's own $200,000 investment in the program has been joined by some three million dollars in private investment during the past two years.

OTHER MORTGAGES

STATE-BACKED MORTGAGES — Many east coast states have issued state government-backed mortgage financing bonds to allow low and moderate income people to purchase homes within the state at slightly less than going bank rates. Some states such as Pennsylvania have mortgage "lotteries" each year where income-qualified individuals submit their names and a sales agreement or other contract for the house to the state. These individuals then wait to see if their name is picked for a mortgage in a random draw. Most of these mortgages are a point less than the average rate, and some have reduced points or closing costs.

SECOND MORTGAGES — Second mortgages are a source of cash for homeowners who have built up some equity in their homes through mortgage paydowns or appreciation. Lenders offer second mortgages with both adjustable and fixed interest rates that average two to four percentage points above first mortgage rates, making them generally more expensive than home-equity loans. With these loans, you receive all of the cash in one lump sum (whether you need it all immediately or not) and pay interest on the entire amount right from the start. Like first mortgages and lines of credit, second mortgages take up to six weeks to process, come with a series of closing costs, and place a lien on your home. In return, they offer borrowers long payback periods (up to 20 years), tax advantages, and the flexibility to use the money as you wish.

LOANS & REFINANCING

HOME-EQUITY LOANS — These line of credit or fixed-rate loans have become popular with homeowners who need large amounts of cash for major renovation. These are liens against the property — that is, loans made on the substantial equity the homeowner has built up in the home over the years. Home-equity loans offer borrowers the flexibility of borrowing whenever they need to and repaying at their own pace, as well as income tax advantages. Interest rates are fixed or adjustable (usually monthly), and generally are one or two percentage points above the prime rate.

On the minus side of the equation, these loans are not available in all states. When they are, they usually require a house appraisal, credit check, points, application fees, and a title search. Many lenders are currently willing to loan only up to 70 percent of a house's value, compared to 80 percent in previous years, meaning fewer homeowners can qualify for the program. Treat all home-equity loans as a second mortgage on the property and be careful about using them to pay off non-building related debt.

HOME IMPROVEMENT LOANS — Suppose all you want is a few thousand dollars to restore your bathroom,

Agency and Organization Phone Hitlist

- **National Level:** Look for your regional office in the Government section of the phone book
  - **Department of Housing and Urban Development (HUD)**
  - **National Trust for Historic Preservation:** also call (202) 673-4000 for the Washington, D.C. office
- **State Level:** Listed under the State Government section
  - **State Historic Preservation Office:** also call (202)624-5466 for the National Council office
  - **State Housing Agency**
  - **State Mortgage Finance Agency**
- **County Level:** Offices listed under the County Government section
  - **Community Development Office**
  - **Housing Office**
  - **Planning Commission**
- **Municipal Level:** Offices listed under the City or Town Government section
  - **Community Development**
  - **Housing**

Free Publications

Guide to Rehabilitation Home Mortgage Insurance 203 (k) *Department of Housing and Urban Development, 451 Seventh Street, N.W., Washington, D.C. 20410.*

Home Equity Loans: A Consumer's Guide *American Institute of CPAs, Order Department, P.O. Box 1003, New York, N.Y. 10108-1003.*

How to Shop for a Mortgage, *Mortgage Bankers Association of America, Consumer Affairs, 1125 15th Street N.W., Washington, D.C. 20005. (send SASE).*

Programs of HUD, *Department of Housing and Urban Development, 451 Seventh Street, N.W., Washington, D.C. 20410. (Programs, eligibility requirements and HUD regional and local field offices; call 1-800-245-2691 for participating lenders in your area.).*

Preservation Tax Incentives for Historic Buildings, *National Park Service, U.S. Department of the Interior, PO Box 37127, Washington, D.C. 20013-7127.*

reroof the porch, or repair the chimney? If you bought your home just two years ago, have no equity for an equity loan, and you want to start work next week, a home improvement loan may be just the ticket.

Home improvement loans give borrowers with good credit smaller amounts of money – usually under $20,000 — for about the same interest rate as a second mortgage. Home improvement loans may be secured (backed by collateral) or, on occasion unsecured, and many carry no closing costs. However, as of January 1 they generally offer no tax advantages. Repayment terms are less generous than those for secured mortgages (three to ten years) meaning that monthly payments are higher. To ensure that the loan is being used solely for home improvement, some lenders may require you to submit work plans and estimates; others may release funds only as you submit receipts.

The FHA also offers federally insured home improvement loans through local lenders. These Title 1 "Property Improvement Loans" give credit-worthy borrowers as much as $17,500 (in 1990) for up to 15 years for almost any project which improves their homes' basic livability or energy efficiency. Interest rates generally fall one to two percent below the standard bank rate for a home improvement loan because of the FHA payback guarantee. Loans over $2,500 are secured by a second mortgage and offer tax advantages. Participating lenders require work plans and estimates as well as "before" and "after" property appraisals, and release funds only as work is completed and inspected.

Unfortunately a dwindling number of lenders are participating in the Title 1 loan program.

Revolving funds from Operation Comeback helped restore this house in New Orleans.

PERSONAL LOANS AND CREDIT CARDS — At the bottom of our list of money sources are personal loans from banks, savings and loan associations and credit unions, and credit card cash advances. Personal loans can give credit-worthy borrowers up to $20,000 within a few days while credit cards offer an "instant" cash option for smaller projects or purchases (usually under $2,000). Neither source offers tax advantages any longer, however, and both carry an exorbitant interest rate – 15 to 18 percent on personal loans, and an average of 19 percent on credit cards. Use these loans only for small amounts and as a stopgap measure. Otherwise, you may wish you had never started swinging that hammer.

GOVERNMENT FUNDS

MOST GOVERNMENT SOURCES OF home improvement funding target specific groups, such as elderly, low- to moderate-income, handicapped, or disabled homeowners whose dwellings are substandard and need to be brought up to code. Federal funds are increasingly rare but there might be some funding available in your community for middle-income homeowners.

COMMUNITY DEVELOPMENT BLOCK GRANT FUNDS — These are distributed by many cities to encourage homeowners to rehabilitate their properties. Many larger cities (over 100,000 population) are designated "entitlement" cities, and receive funds from the federal government without competing for them. Other communities must apply for funds every two years. Each city distributes its grant money differently. In some, only low income homeowners can qualify for grants or low interest loans under the program. In others, income guidelines are less strictly defined, allowing wider access to the program. A number of communities target older, deteriorating neighborhoods, making the money available to any homeowner whose home needs remedial work, regardless of income. Your local planning, housing, or community development office can tell you if your municipality participates in this Housing and Urban Development (HUD) program, and if funds are available to homeowners for restoration-type projects.

OTHER GOVERNMENT SOURCES — In some communities — though fewer each year — homeowners can apply for National Park Service funded grants for facade restorations on homes listed in the National Register of Historic Places.

In Lowell, Massachusetts, important for its nineteenth century textile mills, grants of up to $75,000 are available through the city's Historic Preservation Commission according to city redevelopment coordinator John Mann. Owners must contribute 50 percent of the total project cost.

State energy offices, local power companies, and community groups that administer state-funded fuel assistance programs also offer money, materials, and labor to homeowners making energy upgrades. While not technically considered rehabilitation money, these funds help homeowners complete many common improvements on older homes, such as installing insulation and storm windows or replacing old, inefficient heating systems with new energy saving units.

FINANCIAL INCENTIVES

IN ADDITION TO CASH, THERE ARE SEVERAL FINANCIAL INCENtives available to some homeowners for fixing up old houses.

TAX REDUCTION — Several programs exist which can reduce yearly tax bills. The federal government offers an income tax credit to property owners for historic rehabilitation work on commercial and income-producing residential structures. This credit on the cost of rehabilitating historic buildings applies only to depreciable property (commercial, industrial, or rental residential property) built before 1936 (for a 10 percent credit) or certified as being historic (for a 20 percent credit). The law also permits long-term depreciation of improvements to the property.

State property-tax abatements are an option in several states, including Connecticut, Oregon, Washington, Georgia and Illinois. These incentives allow communities to abate property taxes if the tax burden on an older structure is considered detrimental to its continued maintenance. Several other states such as Maryland, Wisconsin, New Mexico and Rhode Island, offer owner-restorers state income tax credits.

PRESERVATION EASEMENTS — Another possibility is to donate a facade or conservation easement on the property to a nonprofit preservation organization or government agency. An easement allows you to take a federal tax deduction based on the fair market value of the property in return for giving up several significant property rights. Under this agreement, the property cannot be demolished and must be maintained. The easement runs with the land (meaning it is recorded against the deed) and specifies who is the easement-holding organization. Historic groups, preservation organizations and state preservation offices can act as easement holders. They insure that the deed's terms and conditions are upheld, and can provide information to interested homeowners.

LOOKING TO THE FUTURE

MOST LOCAL AND STATE OFFICIALS WE SPOKE WITH EXPRESSED firm belief in the benefits of restoration work, and optimism about maintaining funding dollars and programs at current levels for the next one to two years. It is unlikely, however, that new programs will be introduced in the present economic climate. Still, during the next decade homeowners are likely to see private initiatives such as those in Savannah, New Orleans and Seattle arising in communities across the country to fill the conventional financing gap and keep preservation alive.

Cynthia and Douglas Edmunds are newspaper columnists who live in Kittery, Maine. They are planning to take advantage of some of the above funding sources on their next old-house project.

A Unique Deal and a Success Story

David Plante's McDonough street house in Portsmouth, New Hampshire, stands in a neighborhood targeted for improvement by local planners in 1989. Like his neighbors, Plante received a letter from city housing rehabilitation coordinator Steve Matatics that year asking if he would be interested in participating in the HUD program.

Plante had already completed a number of "nickel-and-dime" projects on the house. He had removed vinyl siding and 1960s paneling from the walls, restored horsehair plaster, refinished hardwood floors, made moulding and built new windows for the entire house. However, work had slowed after 1986 when Plante's family grew by two children.

The invitation from the city ended the three year hiatus, giving Plante's bank account a $10,000 boost. This money allowed him to begin more expensive improvements including installing storm windows, building a new foundation and renovating his kitchen. Matatics also helped Plante stretch dollars by establishing construction priorities and suggesting local contractors willing to work with homeowners who want to contribute "sweat equity" to keep costs down.

Despite Plante's comfortable $40,000 annual salary as an engineer at the Portsmouth Naval Shipyard, city guidelines allow 30 percent of his loan to qualify as interest free, with payment deferred for 20 years or until the house is sold. The remainder is payable over five years and at a low (6 percent) interest rate. "It's the best deal in town, moneywise," touts Plante, who has committed himself to finishing his house this year. While this program is not representative of all cities (and its attractive numbers reflect the affluent '80s), similar funding may still survive in your area — as it does in Portsmouth today.

OLD-HOUSE LIVING AND THE FHA MORTGAGE MAZE

IT ALL STARTED WHEN MY HUSBAND, ALAN MOORSE, AND I WANTED TO BUY AN old house. Preferably, it would be a house that was in need of repair, yet one that hadn't had all its grand features removed. We thought a brownstone with a reasonably sized city yard would be nice, especially if it was within walking distance of downtown and was well under $100,000. With only a few thousand dollars in the bank and not knowing exactly what we were doing, Alan and I set off on a house-buying adventure that led us through the FHA rehabilitation mortgage maze.

THE LOAN *Labyrinth*

(left) Where the adventure began – our front door. (right) Somewhere under years of alligatored paint lay our perfect house.

BY LORI DOYLE / PHOTOS BY ALAN MOORSE

(above) In order to qualify for the mortgage, the basement had to be emptied. At this point, a path had been cleared through the piles of debris. (right) I survey the scene before digging in. By the time we were done, over a ton of junk was removed.

Initially, we gained a general understanding of what's involved in purchasing a house by taking a free six-week course offered by the local Troy Rehabilitation and Improvement Program (TRIP), in Troy, New York. The course covered many financing options and this is where we first learned about the Federal Housing Administration (FHA) 203 (k) rehabilitation mortgage program. The FHA 203 (k) allows a borrower to get financing for both the cost of the property and its rehabilitation. The program is only insured by the FHA; the mortgage funds come directly from the lender.

Nervous that we didn't have enough money saved, we headed for the realtor's office. After scanning the multiple listing book, we spied a house for sale in our area, a three-storey, three-family brownstone south of downtown. From the outside, the house looked like it was in very good condition, but one step inside the front door told a whole different story. Going from room to room, we noticed a broken ceiling medallion, crumbling plaster walls, and wood moulding covered with incredible amounts of alligatored paint. For perhaps 20 minutes Alan and I weren't too sure, and then we just couldn't stop grinning. The place hadn't been touched in decades and it was perfect. On the front steps of the house, the realtor suggested we apply for an FHA 203 (k) mortgage. We tried to be conservative by telling her that we'd think about the house, but by Monday we had called to say that we wanted it — so much for being conservative!

The FHA 203 (k) rehabilitation mortgage enabled us to buy the three-family brownstone house for $52,500, plus add $30,000 to our mortgage to pay for restoration. We put $1,000 down on the house and paid under $4,000 in closing costs. The process was slow — at times agonizing — but with banks requiring a substantial downpayment on such a risky building for a regular mortgage, we saw the FHA 203 (k) as the only way we could buy a house.

Found in the attic, this New York World *newspaper advertised lots for sale by the soon-to-be-built George Washington Bridge.*

THE PAPERWORK BEGINS

THE PROCESS START-ed in the same way as most house purchases. Alan and I went to the realtor's office to fill out the mortgage paperwork. After deciding on a mortgage originator that handled FHA loans, we filled out more paperwork. We then had "our house" inspected for termites and structural problems, as the lender required. After this, things started to get tricky with the FHA 203 (k)-specific items. Part of the application for such a mortgage is a "rehabilitation plan," which must be sent to the FHA, the realtor, and the lender. The first part is a narrative that describes each job to

be done and lists the materials that will be used. At the end of each paragraph, you must list the cost of the materials and labor involved. Here is a typical detailed paragraph from our rehab plan:

Basement: install new lower 6' section of stairs into basement using (1) 2"x 12"x 12' treated for stringers. Use (2) 2"x 10"x 12' treated for the (6) 36" treads. In 2nd and 3rd floor apartments frame 9 lf. of new bathroom wall to expand existing bathroom, using (28) 2"x 4"x 10' SPF. Glue and nail (9) 4' x8' x ⅝" AC plywood to 1st floor kitchen area, 2nd and 3rd floor bathroom areas.

Materials: $266.81
Labor: $320.00

A contractor doesn't have to be hired to do the work (as long as that is in keeping with your local building codes), but the FHA wants those numbers. If you default on the loan, the agency has to be able to hire workers to finish the job and then sell the house. After the narrative comes a list of work stages (four in our case), including the amount of money you should receive for the jobs completed.

As the work progresses, the FHA sends an inspector to verify that it is complete or nearly completed. In our case, it turned out that the report stages were a formality and the work didn't have to be done or inspected in any particular order. We were also able to obtain partial payments for the work in progress, which allowed us to pay contractors and keep our bank account open.

The installation of new front railings and gutters are some of the countless jobs we completed.

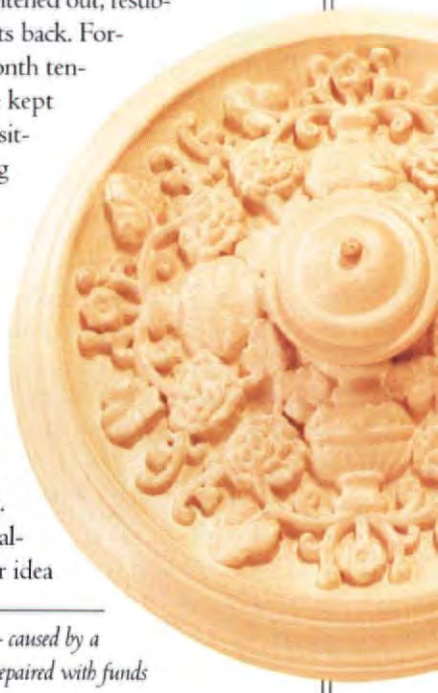
WORK PLANS AND FLOOR PLANS

THE FINAL SECTION OF THE PLAN IS A LIST OF ALL THE materials, grouped by job. A general floor plan of the house must also be included. Depending upon your FHA representative, you can measure and draw the floor plan yourself — it doesn't have to be a blueprint. The costs of your plan are then totalled and, once you actually buy the house, this amount of money is put into an escrow account to draw from as the rehabilitation progresses. The rehabilitation must cost at least $5,000 and must be done in 18 months. (Dollar limits on both the cost of the house and the cost of the rehab vary from region to region.) If you do not complete the work, the house is appraised and if it is far from finished compared to the appraisal, the escrow account is closed and the funds are applied to the mortgage principal.

It sounds like a lot of work for a mortgage application, doesn't it? Since we were first-time home buyers and not house-repair savvy enough to do the general inspection ourselves, we hired a general contractor who inspected the house and wrote the report for $350. I'm not sure we go this route again. The report listed many things we didn't agree with and they were never fixed. No matter how many times we explained, the contractor couldn't understand that we wanted to install a claw foot bathtub with a shower riser instead of a modular fiberglass bathtub and shower unit. As the work progressed, we did find out that we could submit change forms to the lender for big discrepancies or jobs that changed shape over the year.

The length of the application process was also a drawback. We applied for our mortgage in June 1989, and didn't receive our approval until December of the same year. During that time, our work report was sent back with a cryptic note stating that it did not meet FHA standards. It took weeks to get the problem straightened out, resubmit the form, and get the results back. Fortunately, we were month-to-month tenants in our apartment and we kept our landlord up to date on our situation. Since no one was living in the house, the sellers had to check it often and, as winter advanced, fire up the heat. They were not happy as the months dragged on, but they stuck with the sale.

We weren't completely free to do whatever we wanted with the house either, and sometimes this was a drawback. The FHA representative who evaluated our plan decided that our idea



The damage to this ceiling medallion — caused by a broken floor board above — was repaired with funds from the rehabilitation mortgage.

to combine two apartments would change the fundamental nature of the house, which made our plan unacceptable.

After our mortgage was finally approved, an FHA inspector wrote up a list of things that had to be done before we could close on the purchase. His list required proof from City Hall that our three-family house was in an area zoned for such a residence, a written roof inspection stating that the roof was in good condition, a written heater inspection (because the house doesn't have central heat) stating that the heaters were in working order, and that the basement — full of junk and debris — be cleaned and swept.

A letter from City Hall concerning the zoning of our house location was obtained with no trouble and the roof was inspected, but the written report was sent back for rewording. Two of the heaters on the upper floors, it turned out, were not in working condition. They were heated by space heaters and "gas and gas" stoves (gas stoves with space heaters built in), so the seller had one stove repaired and we bought the other. We cleaned out the basement ourselves, which took a month of weekends. In a rented truck, we took a ton and a half of junk to the landfill because the hauler failed to show up twice. At this point, if we had been turned down for the mortgage, we would have lost quite a bit of money for the cost of the rehabilitation report, the inspections, a rebuilt stove, and the cost and effort of cleaning the basement of a house we didn't even own.

Although the sellers said that there weren't any pocket doors, Alan and I discovered this pair during the restoration. Two more sets were found in the other apartments upstairs.

IN THE HOUSE, BUT NOT OUT OF RED TAPE

ONCE WE MOVED IN, WE GOT RIGHT TO WORK AND FOUND a mason to repair one of the parapet walls, which was on its way down, and the three chimneys that we could see through for lack of mortar. Once a job is 90% done, we call our appointed FHA inspector, who comes over a day or two later to look at the work. The inspector mails forms detailing the work to the FHA, which checks them and sends them to the mortgage lender. The lender reviews the forms and we receive a check a week or two after the inspector's visit.

We sometimes had trouble getting contractors and worked quite slowly as we learned how to revive the house. A six-month extension was obtained by writing a letter to our mortgage representative, which was then sent to the FHA. Another problem we ran into was that several of the estimates in our rehab plan were too low, causing us to draw on our contingency fund (10% of the escrow is held aside for emergencies) and put a lot of our own savings into projects. Any unused contingency funds are applied to the mortgage principal after the project is complete.

Our experience with the FHA 203 (k) program really taught us the meaning of "red tape." At the time, not many lenders were involved with the program, mainly because they must service the loan during the house's rehabilitation. Typically, lenders make their money from the origination fees and sell the mortgage, but they can't do this with the 203 (k). Recently, the program is being streamlined to make it easier for FHA offices to administer and to be more attractive to lenders and borrowers. Basically, the FHA is now involving lenders in a direct endorsement program, which means that the lenders are trained to do most of the approval work, and this speeds up the loan approval process.

We would be the first to tell you that there are both good and bad aspects about this program. However, despite its complexity, we would recommend this mortgage to anyone with limited resources who really wants to buy a house and restore it. Compared to the real work of stripping paint and patching plaster, the FHA 203 (k) is simple.

OLD-HOUSE MECHANIC

Anchors and Blind Fasteners

by Gordon Bock

ATTACHING ONE MATERIAL SECURELY to another is simple enough if you have access to both sides: use a bolt and nut. However, if one side is blocked or the material is too thick to penetrate — say, when mounting objects to a wall — you'll need an anchor or a fastener that can secure itself in a blind void. Many products have been devised over the years but most fall into one of four groups.

Molly Anchor

MOLLY ANCHORS

A DEVICE RELATED TO THE TOGGLE bolt and used for many of the same jobs is the molly expansion anchor. Here, the bolt is threaded into a shell. Once the anchor is inserted in a hole, the bolt is tightened. This collapses the shell in the blind area and secures the bolt. Like toggle bolts, "mollies" come in many sizes, including specific shank lengths, and are less effective (or won't snug up at all) if not sized correctly for the project.

ANCHOR SHIELDS

PLUGS MADE OF HARDWOOD OR LEAD have long been used for anchoring in brick and stone by boring a hole, inserting a tight-fitting plug, and then driving in a screw. The same principal is still employed with modern shields. These are mass-produced cones of lead, plastic or fiber material designed to accept fasteners varying in size from wood screws to lag bolts. Anchor shields are usually threaded on the inside, ribbed on the outside, and often designed to spread so that their anchoring ability is maximized.

Anchor Shield

Shields are used for light- to medium-duty anchoring in materials ranging from plaster to masonry. They work best when the hole is true and there is an accurate fit between screw, shield, and hole. Some recent shield designs incorporate cutting points and threads so that they can be installed with an electric drill.

EXPANSION BOLTS

EXPANSION BOLTS ARE ANCHORS made up of large machine bolts and threaded expansion shields. Manufacturing these devices is an extensive industry and there are many proprietary designs. However, most make use of either single or double expanding shields — that is, split sleeves held on the bolt by a wedge-shaped nut. When the anchor is inserted in a pre-bored hole, tightening the bolt draws the nut up into the sleeves, expanding them so that they exert pressure on the sides of the hole and securing the anchor.

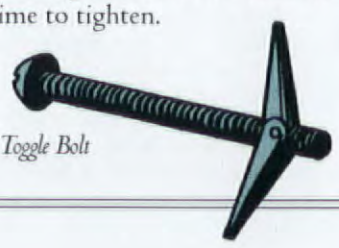
Expansion Bolt

Expansion bolts are normally used for medium- to heavy-duty anchoring in masonry, particularly concrete (reanchoring sill plates to foundations is a typical application). Like any anchor employing a shield, they work best when inserted in a hole that is the correct diameter, true, and clean.

TOGGLE BOLTS

TOGGLE BOLTS ARE ANCHORS USED for fastening to hollow walls (such as a tile or stud wall) or where the other side of a wall cannot be reached. These gizmos are machine bolts onto which are threaded wings that may be either hinged and spring-loaded, or a free-tumbling bar. In use, the wings are first closed around the bolt so that it is slim enough to insert into a hole. Then, once the bolt is in place, the wings open up to anchor it on the blind side of the wall and the bolt is tightened to complete the installation.

Toggle bolts are readily available in assorted lengths and diameters ranging from #8 machine screws to bolts ¼" and over. The key to using toggle bolts effectively is knowing the thickness of the wall or other material. If the bolt is set too short, the wings won't open; if set too long, the anchor takes a long time to tighten.



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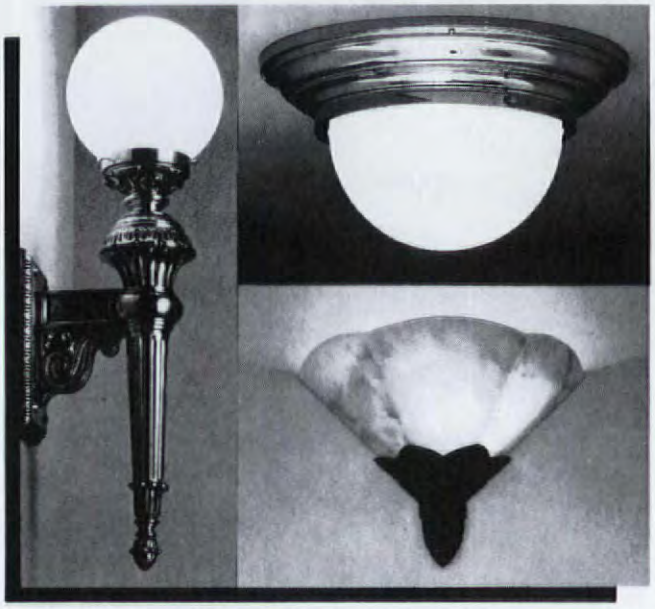

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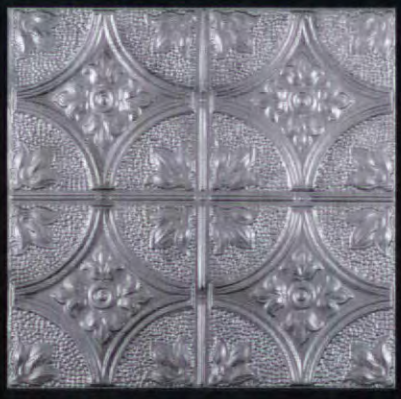

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This Coventry bench is constructed of plantation-grown Honduran mahogany.

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The ball-and-dowel back of this glider is reminiscent of Eastlake furniture.

GRACEFUL GLIDER

WE'VE HAD SEVERAL LETTERS asking for gliders from all eras and finally we've found a "keeper." The Victorian glider (shown above) from Green Enterprises will be the center of attention on any porch. The 4' glider is decorated with a sunburst carving and finials. It is available unfinished in oak or with a white enamel coating in maple. Seat choices are cane or solid wood. Green Enterprises also carries Victorian porch swings, benches, and rockers. The Victorian glider with all the hardware costs $574.50. Green Enterprises, 43 South Rogers St., Dept. OHJ, Hamilton, VA 22068; (703) 338-3606.

RESTORATION PRODUCTS

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The 1886 ceiling fan operates at three different speeds and has an extra strong hanger to reduce vibrations.

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In 1898, ads proclaimed "the handsomest fan on the market" was produced by the Hunter Fan company. They're still in business today and their 1886 Limited Edition ceiling fan duplicates the pleasing lines of the turn-of-the-century original. The spherical motor housing and matching cast blade irons are decorated with a floral design in burnished brass. The hardwood wing-tip blades have a walnut finish. The 1886 ceiling fan can be adapted for lights and the hanger pole is removeable for 8' ceilings. The 52" 1886 ceiling fan costs $399. For a list of distributors, contact the Hunter Fan Company, 2500 Frisco Ave., Dept. OHJ, Memphis, TN 38114; (901) 743-1360.

HANG'EM HIGH

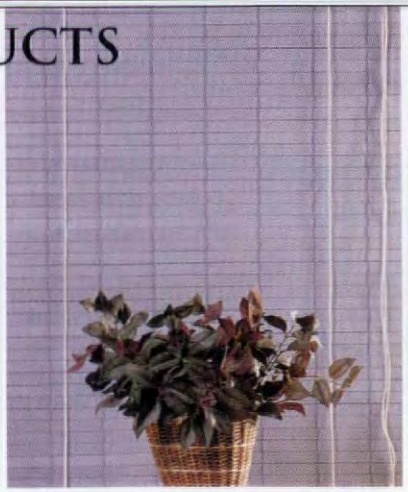
You've just finished restoring the living room and now it's time to hang that turn-of-the-century watercolor and that gilded mirror. One authentic touch is the Queen Victoria picture hanger from Victorian Vignettes. With a cord of three blended, antique gold colors, the picture hanger is appropriate for period pictures and mirrors. The hanger's cord is made of 100% silk that is hand-spun and hand-assembled using the same techniques of 19th-century passementerie makers. Each Queen Victoria picture hanger costs $39, plus $2.50 shipping and handling. For information, contact Victorian Vignettes, Box 466, Dept. OHJ, Cold Spring Harbor, NY 11724; (516) 385-2319.

The trefoil-like design of this picture hanger matches Victorian interiors.

TIME PRESENT & PAST

The school house clock from the Portsmouth Clock Company has a big, easy-to-read face suitable for a period shop, office or a large historic kitchen. The 16 ½" x 16 ½" x 4" case is copied from a 1905 original and is handcrafted using quarter-sawn red oak. The clock face is silk screened on a black-iron steel plate, which is baked to assure the longevity of the design. All of the screws, washers, latches, and hinges are solid brass. The clock's battery-powered movement has a life-time warranty and its motor is easily replaceable. The school house clock costs $289. For information, contact the Portsmouth Clock Company, P.O. Box 4247, Dept. OHJ, Portsmouth, NH 03802; (603) 433-6120.

The movement of these post-Victorian school house clocks are tested to assure accuracy.



All of the installation hardware, including hangers, raising cords, and an automatic cord lock, comes with this basswood porch shade.

A PLEASANT SHADE

Whether you have a Queen Anne wrap-around porch or a post-Victorian sleeping porch, basswood porch shades (shown above) are just the thing to block the glare of the Memorial Day sun. Each shade is custom made in sizes ranging from 3' to 12' wide and 4' to 10' long. Woven with extra heavy seine twine, the basswood slats are available in the standard style or a Rayn-Tite version in which they overlap for weather protection. Oil stain finishes in sylvan green, redwood, light walnut, and washed blue are available as well as custom colors. Repair parts, like weaving cords, cord locks, and hangers with pulleys, are also offered. Depending upon the dimensions, the shades range in price from $48 to $460. For information, contact Devenco Products, 2688 East Ponce de Leon ave., Dept. OHJ, Decatur, GA 30030; (800) 888-4597.

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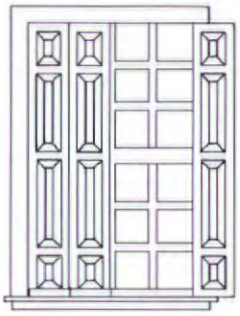

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Historic House Plans

Mail-order plans have a long history in shaping the residential architecture of the country. Of the thousands of house plans available today, few exhibit good design and a grasp of historical proportion and detail. So, in response to requests from OHJ readers, the editors have "done the homework": We've hand-picked plans. In each issue, we offer the most attractive, authentic, and buildable of the historical designs, from all periods of American architectural history. Let us know what plans you're looking for.

You can order actual blueprints for all the houses featured. Plans conform to national building-code standards — however, modifications are usually necessary for your site and local requirements, so you'll probably need the assistance of a professional designer (your builder may qualify) or an architect.

For the houses shown in this issue, blueprints include:
- Foundation plan for basement or crawl space. (Crawl space plans can easily be adapted for full basements by your builder.)
- Detailed floor plans showing all dimensions for framing, plus detailed layout and location of electrical and plumbing components.
- Interior elevations are included in some plans, showing interior views of kitchen, bath, fireplace, built-ins, and cabinet designs.
- Window and door schedule.
- Building cross sections: cornice, fireplace, and cabinet sections when needed to help your builder understand major interior details.
- Framing diagrams that show layouts of framing pieces and their locations for roof, first and second floors.
- Energy-saving specs, including vapor barriers, insulated sheathing, caulking and foam-sealant areas, batt insulation, and attic exhaust ventilators.

Why order multiple sets? If you're serious about building, you'll need a set each for the general contractor, mortgage lender, electrician, plumber, heating/ventilating contractor, building permit department, other township use or interior designer, and one for yourself. Ordering the 8-set plan saves money and additional shipping charges.

Other notes: (1) Plans are copyrighted, and they are printed for you when you order. Therefore, they are not refundable. If you order additional sets of the same plan within 30 days of your original order, you can purchase them for $15 each. (2) Mirror-reverse plans are useful when the house would fit the site better "flopped." For this you need one set of mirror-reverse plans for the contractor; but because the reverse plans have backwards lettering and dimensions, all other sets should be ordered right-reading. (3) Heating and air-conditioning layouts are not included. You need a local mechanical contractor to size and locate the proper unit for your specific conditions of climate and site.

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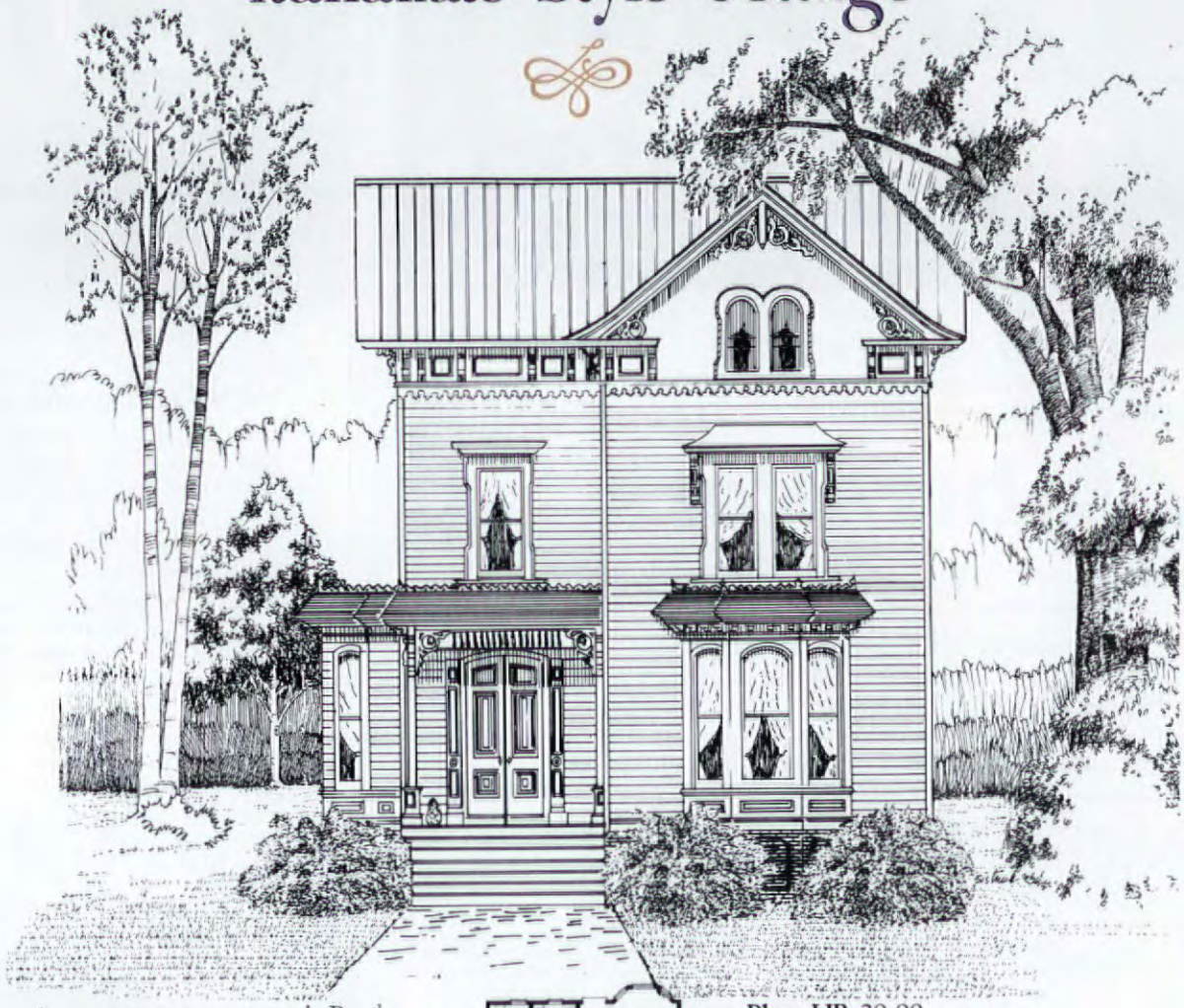
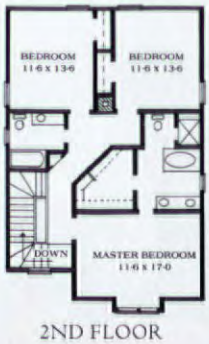
Italianate-Style Cottage



ADAPTED FROM BICKNELL'S *Detail, Cottage and Constructive Architecture* (1873), this delightful Victorian gable-front- and-wing cottage features typical Italianate detailing, such as arched windows grouped under eaves and a trim band incorporating bracketed cornices and elaborated panels. Inside, the modern floorplan is well designed for entertaining with an ample dining room adjacent to the kitchen and living room. Note the accessible laundry room and half bath.

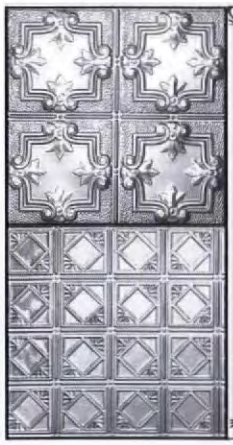
1ST FLOOR



2ND FLOOR

Plan: HR-20-00
Cost: $250
$300 *(set of 5)*
$335 *(set of 8)*

SQUARE FOOTAGE:	2084
FIRST FLOOR:	1105
SECOND FLOOR:	979
CEILING HEIGHT:	
FIRST FLOOR:	10'
SECOND FLOOR:	8'
OVERALL DIMENSIONS:	
WIDTH:	30'
DEPTH:	45'



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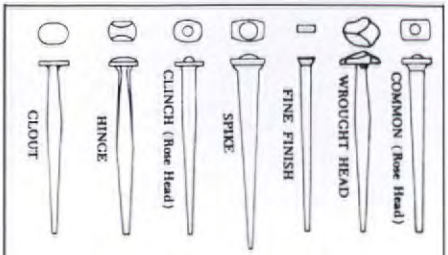

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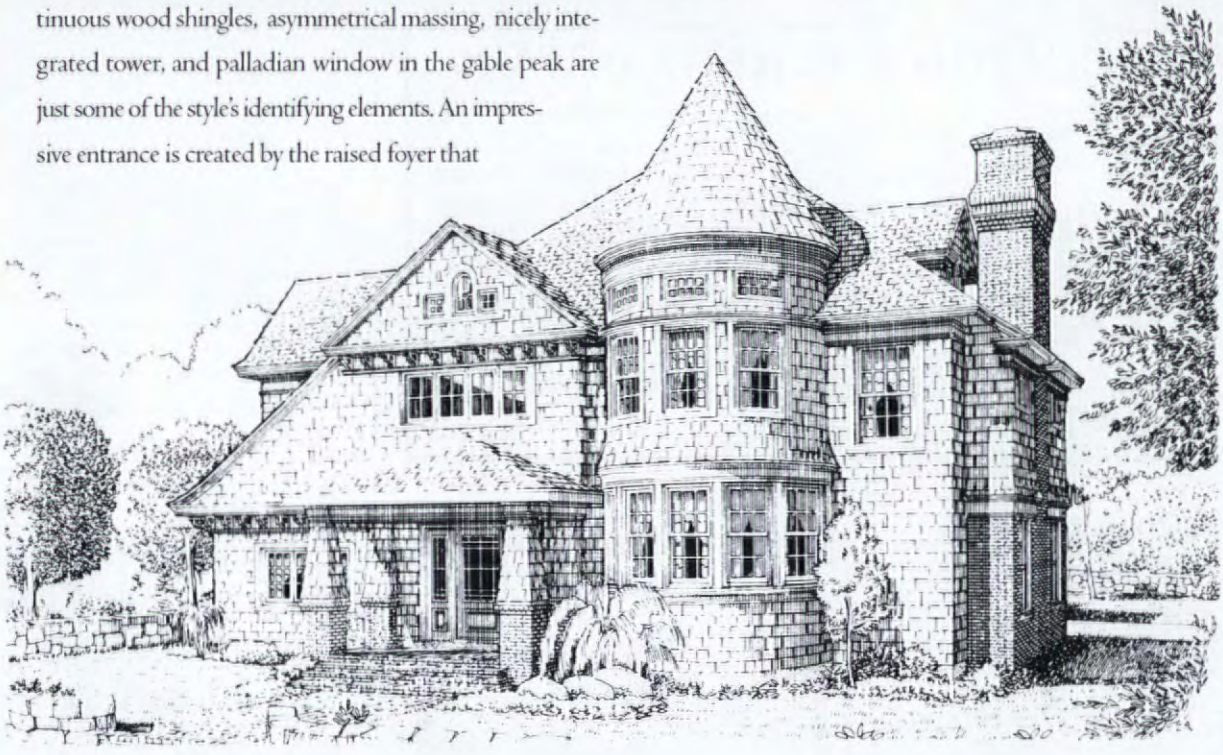
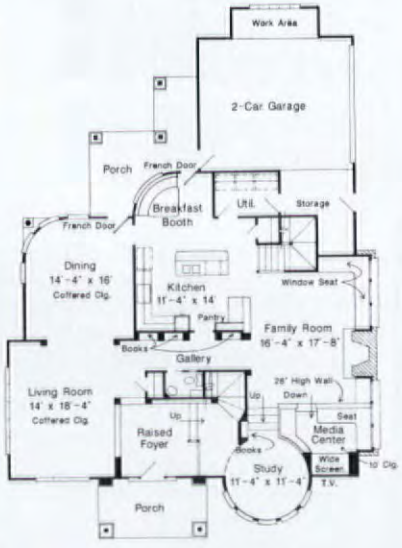
Connecticut Shingle-Style House

INSPIRED BY "THE ROCKS" IN CONNECTICUT (C.1890), this spacious plan incorporates many of the architectural features seen in the Shingle Style. The wall cladding of continuous wood shingles, asymmetrical massing, nicely integrated tower, and palladian window in the gable peak are just some of the style's identifying elements. An impressive entrance is created by the raised foyer that overlooks the living room. Upstairs, each of the four bedrooms has their own charming attraction, such as a window seat or a raised sitting area.





1ST FLOOR

2ND FLOOR

Plan: LG-05-00
Cost: $225
$325 *(set of 5)*
$400 *(set of 8)*

SQUARE FOOTAGE:	3809
FIRST FLOOR:	1812
SECOND FLOOR:	1997
CEILING HEIGHT:	
FIRST FLOOR:	9'
SECOND FLOOR:	9'
OVERALL DIMENSION:	
WIDTH:	49' 2"
DEPTH:	71' 8"

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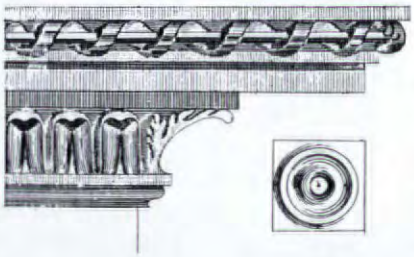

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EMPORIUM

Old-House Journal • May/June 1992

Real Estate

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BRIMFIELD, MA — Circa 1800 Federal. 3 bedrooms, 1-1/2 baths, 2 working fireplaces. Enclosed porch and deck, large 2-car garage and barn. 285 acres. $330,000. Call (413) 245-3293.

CALLICOON, NY — 1900 boarding house on Upper Delaware River. 14 rooms plus 3 kitchens, 5-1/2 baths, wraparound porch. 2 summer cottages, 60-foot storage/garage. $279,000. Call (717) 224-6505.

CANAAN, NH — Historic District 1899 Colonial Revival. 2 fireplaces, 5 bedrooms, large kitchen, 2 parlors, 4-bay carriage barn, 2 porches. 2.5 acres of perennial beds and orchard. Lake and skiing nearby. $330,000. Call (603) 523-7576.

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DOVER, NH — Circa 1890s Victorian mansion. 22 rooms, 17 marble fireplaces, elegant main stairway, fine woodwork. Timber-framed with slate roofs, large carriage house and barn. Presently 5 apartments. $250,000 or b.o. Call (617) 981-3990.

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FORT BRIDGER, WY — 1880s 2-storey Victorian. Needs major restoration and must be moved off site. Price negotiable. Contact Fort Bridger Historical Assn., PO Box 112, Fort Bridger, WY 82933, (307) 782-3842.

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GRIST MILL, CENTRAL MA — Renovated post-and-beam, 5000-sq.ft. mill. Buckets, elevators, belts, pulleys, and millstones still in place. Excellent condition. New heating and septic. Perfect for home, shop, studio. 7.5 acres, pond. Call (508) 464-5494.

HALLIEFORD, VA — "Brooks Place", circa 1904 folk Victorian. 2.579+ acres. Garage with workshop and loft. Shed. Large rooms, 2 fireplaces, double front porch. Convenient to Chesapeake Bay. $129,500. Dave Johnston "The Old House Man", IsaBell Horsley Realty (804) 758-0740.

HARTVILLE, MO — Job transfer halts renovation of 12-room Victorian. Tower room, summer kitchen, original woodwork, 3-4 bedrooms, new mechanical systems. Corner double lot. $44,900. Call (314) 774-2898.

LEXINGTON, KY — 1888 11-room Richardsonian. Front hall, dining room, and 2 parlors all with original marquetry floors and cherry pocket doors. 9 fireplaces framed by Victorian-period tile and carved wooden mantels. $225,000. R.N. Bostrom, 501 North Broadway, Lexington, KY 40508.

LIGONIER, PA — Charming restored Victorian in Historical District. Contact Evelyn Ruffing, PO Box 16, Loyalhanna, PA 15661, (412) 539-2171.

LINDSBORG, KS — Fully restored 1904 Classic Revival and carriage house. 2850 sq. ft., 4 bedrooms, 3 baths, cherry-cabinet gourmet kitchen. Quarter-sawn oak woodwork, columns, and floors, solid walnut master bath, leaded glass. New plumbing and wiring. $187,000. Call (719) 395-2055.

MARIETTA, GA — Circa 1895 totally restored Victorian. 3000 sq. ft., 5 bedrooms, 3 baths, country kitchen, formal entry foyer, veranda porch, 5 fireplaces, high ceilings, heart pine floors. New zoned central heat and air, plumbing, electrical, and roof. Caretakers house, garage. $325,000. Call (404) 427-7695.

MATTITUCK, LONG ISLAND, NY — Beautifully restored 1920s cedar-shingled farmhouse. 4 bedrooms, 1-1/2 baths, country kitchen, formal dining room, living room with fireplace, full attic. Screened porch, detached 2-car garage, tool shed. 1 acre. Walk to beach, marina, tennis, town. $180,000. Call (212) 233-6799.

EMPORIUM

Milwaukee, WI — 1895 Victorian. 5 bedrooms, 1-1/2 baths, natural fireplace, pocket doors, stained glass, original lincrusta, large kitchen. 2-car garage, landscaped cottage garden. 5 minutes to downtown. $84,900. Call Ken Warren or Tim Howard at (414) 933-9119.

Montrose, PA — 11-room Colonial home with 7 or 8 bedrooms. Located in country on 11 acres. Former country inn and former Senator's home in 1800s. Large picturesque barn. $79,000. Manzek Land Company Realty, RD #5, Montrose, PA 18801. (717) 934-2104.

Orange, MA — Circa 1770. Lovely Georgian Colonial on 5 acres of woods and pasture, surrounded by mature maples and stone walls. 5 bedrooms, 2 full baths, newly renovated kitchen. 18th-century detail. $157,000. Call (508) 922-0253.

Nazareth, PA — 1903, double-brick construction in Historic District of a charming Moravian town. 4 bedrooms, 1-1/2 baths, 3rd floor studio, glass/stained glass porch. Garden shed, 10x16 workshop, perennial borders, 30x178 lot. $149,000. Call (215) 759-1669.

New Bremen, OH — 1873 2-storey brick Italianate. 4 bedrooms, formal parlor and dining room, open staircase. Authentically designed and built from original materials. 1-1/2-storey, 4-car carriage house with upper shop. $109,000. Call (608) 754-0852.

New City, NY — Renovated circa 1700s saltbox Colonial. 4 bedrooms, 3 baths, formal dining room, living room with snuggery, great room/kitchen with Marvin windows and state-of-the-art appliances. Wide plank original floors throughout. Separate-income producing cottage. $379,000. Call (914) 354-0645.

Newnan, GA — 1856 Greek Revival. 5000 sq.ft., fully restored, new roof, wiring, plumbing, insulation, central heat and air. Mahogany doors, walnut staircase, leaded glass transom. 30 minutes south of Atlanta. $295,000 (OBO). Call (404) 251-5031.

North Brooklin, ME — 1892 Queen Anne Victorian. Very private location. Clapboard/shingled exterior. 8 rooms, 3 to 4 bedrooms, attached "el" and 2-storey barn. All new systems, insulated, awaiting finishing touches. Asking $185,000. Call (207) 374-2327.

Sparta, GA — Circa 1820. 4 bedrooms, conservatory, parlor, tower rooms. Some cosmetics needed. 1/2 acre plus lot including cooks house. Ghost included. $80,000. Call (404) 444-8331.

Nova Scotia — Resurrected farmhouse by the sea. New cedar shingles, verandah, wiring, plumbing, well, septic, windows, insulation. Beautiful views, nature, and the sound of the sea. $87,000. Call (902) 861-1900.

Mont Vernon, NH — 8.7 acres, 5-acre hayfield, woods, small pond, stone walls, well-maintained gravel road. Abutts 300 acres of conservation land. $85,000. J.Dwyer, 52 Cross Rd., Mont Vernon, NH 03057, (603) 673-1839.

Ocean City, NJ — Guest House circa 1885. Unobstructed ocean views from wraparound porch. 4-bedroom owners apartment, 4 yearly apartments, and 12 summer rooms with running water and ceiling fans. Good rental history. Turnkey. $327,500. Call (609) 399-2632.

Pittsburgh, PA — 1890 Victorian jewel converted to 5 apartments. Beautifully restored Pittsburgh landmark. Richardson Romanesque greystone front with turret. 9 fireplace mantels, original oak woodwork, detached carriage house, and 3-car garage. $2,000/month income. $239,500. Call (412) 322-7032.

Salisbury, NC — Beautifully renovated 3-bedroom vernacular Victorian cottage. All new mechanicals. Heart pine floors and mantels. $129,900. Donald Downs, Route 2, Box 367-A, Advance, NC 27006, (919) 998-7576.

Rahway, NJ — Distinctive 1-bedroom apartments in old houses. Period details, modern plumbing. $500-$600 per month plus utilities. Share backyard. 1/2 hour to Penn Station, NY. Call (908) 499-7506.

Rehoboth, MA — Circa 1745 post-and-beam cape. 7 rooms, bath, pantry, laundry room, closed porch. 90% original woodwork. 2-car garage with room above for apartment or business. 2.71 acres. $179,000. Call (508) 252-4824.

Pevely, MO — Circa 1870s. Historic 2-storey farmhouse. 20 minutes from St. Louis. Lovingly refurbished by heartbroken couple forced to move due to job transfer. $128,000. Call Oliver Sappington, (314) 846-5050.

Pomona, CA — 1895 Victorian cottage. 2 bedrooms, living room with tin ceiling, formal dining room, large kitchen, laundry room, bath with original corner sink and clawfoot tub. New roof, plumbing, paint, electrical, attic insulation, water heater, and rear foundation. $128,900. Call (714) 865-5025.

Warwick, NY — 200 years old. 5 bedrooms, 1-1/2 baths, 3 working fireplaces. Many nice original features. On 1/2 acre, partially wooded, large creek. Some restoration needed. $125,000. Call (914) 986-3154.

Princess Anne, MD — 1770 Federal listed on National Register. Flemish bond brick Manor house on a 160-acre site with a mile of water frontage. 4 bedrooms, 4 baths, 7 fireplaces, and servants quarters. 4 Dependencies were converted to guest quarters. Call (410) 651-1066.

Ten Mile, PA — 1-room school house. 50 minutes south of Pittsburgh. Private country setting on 1 acre. 2 bedrooms, kitchen, great room area 26 x 20. New mechanics, insulated, barn. $55,000. Call (412) 267-3990.

Rumney, NH — Wood working mill. 7500 sq. ft., 3-level granite, large post-and-beam construction. Recession-proof medical supply manufacturer. Machinery, equipment, and inventory, owner will train. $118,000. Contact Ed Openshaw, Box 100, Mill Rd., Rumney, NH 03266, (603) 786-9933.

Sharon, PA — Stately, brick 1909 Edwardian Villa. 90% original. Beautiful woodwork, oak staircase, cherry parlor, 15+ rooms, 4 fireplaces, pocket doors, built-in oak icebox, annunciator. Always single-family, but ideal B&B. $55,000 negotiable. Call Jim at (412) 346-4374.

South Weymouth, MA — Circa 1730 Cape south of Boston. 3 bedrooms, modern kitchen and bathrooms. Original pine flooring and panelling, center chimney, 3 working fireplaces. 3-acre wooded lot. $149,500. Call (617) 337-7953.

Stamford, NY — Queen Anne, centrally located in Catskill Village. 3 stories, 16 rooms, attached 2-car garage. Original staircase, fireplace, leaded glass cabinets, oak panelling. Currently 2 apartments and commercial ground floor. $149,900. Call (607) 652-6778.

Union City, TX — 1927 brick Bungalow of English origin on 3.5 acres. 2 stories, basement, attic. 5+ bedrooms, sun room, restored hardwood floors, covered porch on full front veranda, drive-thru porte-cochere, screened porches, slate roof. $150,000. Call (502) 472-1094.

Port Townsend, WA — Victorian B&B, circa 1870 on the Olympic Peninsula. 6 bedrooms, 5 baths restored. Turn-key operation that overlooks Port Townsend Bay. Room for expansion. $549,000. Call Dale Petzoldt and Windermere Real Estate, (800) 776-9344.

Wheeling, WV — 1840s brick townhouse with riverview. 4 floors including lower level kitchen with fireplace and full 3rd floor with 4 dormers. 90% original 1840s trim, 10% 1900s oak trim. $30,000. T. Podratsky, 711 Main St., Wheeling, WV 26003.

Wheeling, WV Area — 92 Secluded acre. Circa 1851. 3 bedrooms, 1-1/2 baths, gourmet kitchen with appliances. 3-room addition under construction, guest cottage. Barns, springhouse, spring water. Abundant wildlife. $135,00. Contact Tomazin, RD 2 Box 251, Valley Grove, WV 26060, (304) 336-7861.

White Plains, NY — Federal Colonial, circa 1840. Restored by National Trust craftsman. 5 bedrooms, original woodwork, mantels, pine floorboards, hardware, window glass. 2 working fireplaces. Private 3/4 acre property. Low taxes. $585,000. Call (914) 328-0972.

Wilmington, DE — Zoned commercial. 8-bedroom 1867 stone Victorian. Possible inn. Adjacent to Delaware Art Museum, walk to Longwood Gardens, and Winterthur. For lease (sale considered). Call Janet Potter at (215) 430-8068.

EMPORIUM

SUFFIELD, CT — Charming 9-room, center-chimney Colonial, circa 1779. Post-and-beam construction, wide boards, panelled rooms with corner cupboards, 3 fireplaces. Easy access to schools, shops, Interstate, train/air transport. Call (203) 668-5574.

WYANDOTTE, MI — 1898 William Armstrong Queen Anne. 2400 sq. ft., 4 bedrooms, parlor, original fireplace, red oak woodwork including open staircase. Period furniture included. View Detroit River. Possible B&B. $129,000. Call (313) 285-8814.

For Sale

ANTIQUE APPLIANCES — 54" porcelain enamel gas ranges on legs with 4 burners and oven/broiler. One is Sears, circa 1930, green/yellow, needs knobs. Other is Tappen, circa 1920, grey/white. $150 each negotiable, can deliver. 2 circa 1932 "Monitor Top" refrigerators needing service, free. Call (908) 247-4966.

ANTIQUE BATHTUB — With pedestal base. 5 feet, cast iron, nice condition. $125. (207) 324-8284.

ANTIQUE CLAWFOOT BATHTUBS — Dated 1912-1915. Polished brass legs, choice of Kohler colors, hardware optional. (805) 493-4194 or 371-1598.

ANTIQUE FURNITURE — 5-piece Eastlake parlor suite, mahogany hall tree, oak hoosier, medallion-back settee, gramaphone, 2 early 1900s Whittall rugs (9x12) for $700 each or B.O. Call (508) 885-3540 evenings.

ARTS & CRAFTS FURNITURE — Limbert writing desk with pullout drawer, child's slant front desk by Paris Mfg. Co. of Maine, oval top library table from Michigan Chair Co. All auction quality. Contact Chris or Pat at (213) 734-3064.

BARN — To be dismantled and moved. 30' x 40' Appalachian log and oak board. 80 years old. Approximately 120 dovetail logs, loft and siding of 1" thick oak boards. Good condition. Near Andersonville, TN. Call (615) 494-8359.

CLAWFOOT TUB & SINK — Clawfoot tub in excellent condition with original fixtures, showerhead unit, and curtain ring: $2,000. Marble-vanity wall-hung sink with china basin and original faucets: $200. R. Shrode, 8320 T 123, Findlay, OH 45840, (419) 293-2857.

ENTRY DOORS — 1 pair, circa 1910. Pine with beveled glass and horizontal panels. 53" x 87" x 1-3/4". Fair condition. Free to a good home. Call Charlie at (201) 573-4641.

FIREPLACES — Marble, antique, Victorian, circa 1890. Includes facades, mantels, crowns, bases, and edge pieces. 12 available, all very fine condition. Prices negotiable. Photos on request. Call R.E. Dolbec at (617) 981-3990.

HOOSIER — "Deluxe" apartment cabinet, Seller's Mfg. Circa 1920. Small and unusual. Refinished with original etched glass, double doors and tambour above, single door and drawer below. $750. Call (508) 626-4246.

PASSENGER ELEVATOR — Circa 1930s. With elevator car, motor, pulley, switches, cable, etc. Was fully operational before dismantling. $2,800. Contact W. Feeney, PO Box 701, Bala Cynwyd, PA 19004, (215) 667-0606.

KITCHEN WAINSCOTTING — Tongue-and-groove, circa 1890. 60 each slats: 49" high x 3/4" thick x 3" wide. 20 each: 28" high. In good condition, need refinishing. $150 plus shipping and handling (FOB Syracuse). M. Albanee, PO Box 341, Canastota, NY 13032, (315) 697-9582.

PIANO — Circa 1860. Square grand. Gibbons & Stone, Rochester, NY. Carved cabriolet legs and scrolled music stand. All original, good condition. Bench included. $1,000. (716) 624-4943.

POCKET DOORS — 7' wide, 8' high. Pair with rollers, track, trim. Pine/cypress. 6 horizontal panels per door. Call (816) 848-2373.

ROOF TILES & POOL TABLE — Ludowici flat red clay roof tiles. #44 square, Norman-style: $560 per square. Restored antique Brunswick pool table with inlaid woods: $15,000. (612) 259-0294.

ROOF SLATES — Grey Vermont slates, dovetailed. Removed from barn roof. Too beautiful to go unused. Call with an offer (203) 452-1304.

SIX WOOD-BURNING STOVES — Circa mid to late 1800s. Unusual styles, excellent condition. Call Julie at (818) 841-4747 after 6:30pm pst.

TILES, SHUTTERS, & SHADES — Victorian tiles, all original. Victorian walnut interior shutters; one side is raised panel, other is louver. Victorian glass shades and fixtures. Call Joe Sager at (215) 348-8087.

TUB, TOILET, RADIATORS — American Standard, 4-1/2' clawfoot tub: $250. Monaco toilet, 22" wide, 24" long, 40" high: $100. 2 radiators 5" wide: $25 each. Painted picture moulding, 1-7/8". Call (203) 637-3042.

VICTORIAN FIREPLACE — Carved, white marble. Perfect condition. The mantel is 6 feet in length. Must be sold to best offer. Call (914) 246-7598.

WOOD EXTERIOR DOORS — 2 of them. 130 years old. Curved at top with glass light at top. Original hardware. Fits opening of 5' x 8'. $800. Call (607) 687-3509.

WOODWORK — 21 doors/jambs (2 doubles). 21 windows (3 leaded). Dental moulding and scrollwork trim. Pantry built-ins and baseboard. Never painted. Call (603) 448-4804. Photo

Wanted

B&B OPERATION — Couple seeking opportunity to own and operate B&B that could double as horse farm with minimum of 10+ acres. Will consider both existing and high potential properties in Northeast, Mid Atlantic, and West Coast regions. Call (901) 324-8714.

DINER MEMORABILIA — Seeking old diner booth. Also diner, circus, and train (especially "Chessie") memorabilia. Contact Dale Six, 4651 Higel Avenue, Sarasota, FL 34242, (813) 349-6963.

EXTERIOR BACK DOOR — For American Foursquare Bungalow, circa 1916. Completely glass or glass paned top and panelled bottom. 32" wide, 6'6" to 6'8" high, 1-3/8" to 3/4" depth. Pat Kelleher, 171 Blvd, Mountain Lakes, NJ 07046, (201) 299-8477.

OLD SANDSTONE ITEMS — Water troughs, stone sinks, buggy steps, hitching post, etc. Any place in Ohio. Call evenings (614) 392-5833.

HISTORIC STONE HOUSE — 3000+ square feet, 4+ bedrooms, 2+ baths. In good condition, in scenic area attractive to tourists. Send photos, price, and information to M.S. Spangler, 128 Crandell Court, Schaumburg, IL 60193.

PICTURE RAILS — Antique or reproduction. Need not match existing moulding. Contact Bob or Carol Rosenquist, 17029 E. Lindenwood Rd., Lindenwood, IL 61049, (815) 393-3321.

RADIATORS — Three 1910 (approx.) hot water radiators. Wall mounted, 3 panels if possible, 44" long, 22" high. Contact F. Christian, Box 836, Tuxedo Park, NY 10987, (914) 351-5507.

REUSABLE EXTERIOR STORM WINDOWS — Aluminum or vinyl preferred. 36" x 72" (2), 36" x 64" (12), 36" x 54" (3), 28" x 64" (2). NYC area. Will pick up. Contact Box 1330, New York, NY 10009, (212) 995-5749.

Events

STAGECOACH DAYS — May 16-17 in Marshall, TX. Restored Victorian homes for tour, period craft demonstrations, civil war and Texas history. Call (903) 935-7868.

NYC'S CITY HALL EXHIBITION — Building City Hall: Competition, Construction and Context. Architectural drawings, watercolors, prints, manuscripts, books, and one architectural model are on view through June 28 at the New York Historical Society. Call (212) 873-3400.

MOTHER'S DAY HISTORIC HOME TOUR — May 10 in Monrovia, CA. Hosted by docents in period costumes. Vintage cars and skilled craftspeople. Monrovia Old House Preservation Group, PO Box 734, Monrovia, CA 91017, (818) 358-7822.

HOMEBUILDING SKILLS BASICS — June 7-13 and 21-27. An overview of managing the entire building process while engaged in your owner-builder projects. Contact Bear Mountain Outdoor School, Hightown, VA 24444, (703) 468-2700.

6TH ANNUAL LOG CABIN DAY — June 28 in Sodus, MI. A day commemorating Michigan's log cabin heritage with tours and festivals. Send S.A.S.E. to Log Cabin Society of Michigan, 3503 Edwards Rd., Sodus, MI 49126.

AN IDYL ON THE HUDSON — 4th annual Park Hill house tour. May 31 in Yonkers, NY. One of NYC's first planned rail commuter's suburbs and turn-of-the-century home to industrialists and artists alike. Call (914) 963-8772.

Classified ads in The Emporium are FREE to current subscribers for one-of-a-kind or non-commercial items, including personal house or property sales. Free ads are limited to a maximum of 40 words. Free ads and b&w photos are printed on a space available basis. For paid ads (real estate through agents, books & publications, etc.), rates are $125 for the first 40 words, $2 for each additional word, $75 for a photograph. Deadline is the 1st of the month, two months prior to publication. For example: January 1st for the March/April issue. All submissions must be in writing and accompanied by a current mailing label for free ads, or a check for paid ads.

Old-House Journal
Attn: Emporium Editor
2 Main Street, Gloucester, MA 01930

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windows and patio doors, free. Andersen Windows.

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PRODUCTS NETWORK

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REMUDDLING

[*opinion*]

ANTI-GRAVITY GOTHIC

REMUDDLING, IT SEEMS, doesn't recognize borders, as this month's submission from Christopher Jacob of Ontario, Canada shows. Christopher noticed "the odd roof, isolated dormer, and gravity-defying porch roof" of this white house in Waterloo. Indeed, the house's roof doesn't stop when it meets the front wall. Instead, it keeps on going in a massive first-storey overhang — the old-house equivalent of a "monobrow." As a result, the center gable looks like it's slowly melting into the roof's black expanse.

The origin of these unusual features seems to resist explanation until one looks for clues at the brick house next door. Fortunately, the center cross gable of this classic Gothic Revival cottage isn't half-swallowed by its steeply pitched roof, and its church-style lancet window isn't lost to an off-the-rack replacement. The facade also still retains its arched porch with posts that provide a visible means of support. One might say, the difference between these two houses is one of gothic proportions.

Trapped in its overdone overhang, the original form of the house above is hard to identify, until it is compared with its c. 1890 Gothic Revival neighbor in the photo below.

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The Philadelphia Trinity House

Vernacular Houses

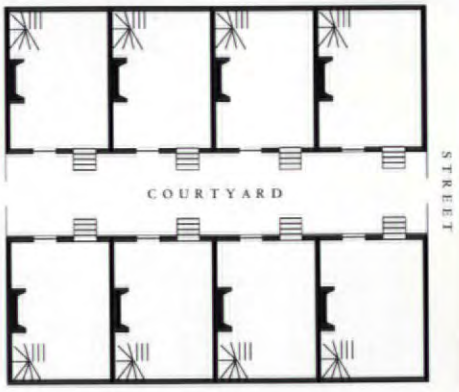
"TRINITIES," SO CALLED BECAUSE most have three floors, are simple brick rowhouses that were built for the working class of urban Philadelphia. They are characterized by the simplest of plans: one room on each floor. At street level, the front door opens directly into what was originally the main living/kitchen space (although some Trinities had basement kitchens). At the opposite rear corner, there are winding stairs, usually standing within a wood-sheathed, closet-like enclosure. On each floor, a small fireplace is adjacent to the enclosed stairs.

Trinities, which are also called Bandboxes, have no architectural pretensions. A panelled front door, double-hung sash windows (often with shutters), a simple cornice, and sometimes a dormer define the facade. The Expanded Trinity — a variation which is two rooms deep on each floor — offers more room, but no added stylishness.

Unlike most rows of Trinities, the uneven roofs of these 19th-century houses probably mean that they were built individually.

Built from the mid-1700s to the last quarter of the 1800s, most Trinities are tucked along back streets or alleys, often in groups of four or clustered around compact, dead-end courtyards. Typically, they occupy the back portions of long, narrow lots belonging to the larger town houses of middle-class merchants. Today, scores of Trinities survive in scattered clusters throughout the city's older neighborhoods, continuing to provide affordable, if modest, housing.

— J. RANDALL COTTON & JEFFREY A. COHEN
Philadelphia, Pennsylvania



Trinities were often built in two groups around a common courtyard. Inside, the fireplace and the stairs were situated on the same wall, opposite the entrance.