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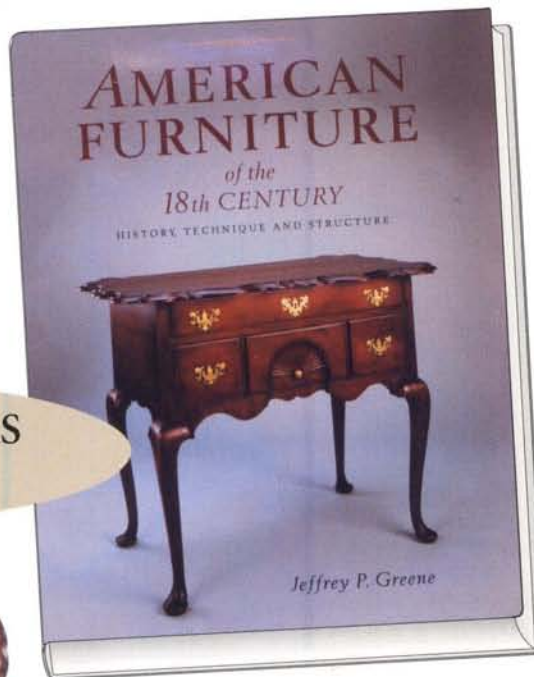
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On the cover: The Mackintosh chairs in this modern kitchen were designed in 1911 for the Ingram Street Tea Rooms in Glasgow. See p. 30. Photo by Zachary Gaulkin.

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MORE CONTEMPORARY PIECES

I am a charter subscriber and have read *Home Furniture* since the first one late in 1994. I enjoy the magazine and believe it to be a valuable source of ideas, facts, inspiration and creativity in the fascinating world of furniture making.

On the minus side, I believe that even though it is difficult to do it in a tasteful manner, it would add a lot to our knowledge if you included retail prices. The second minus, which is the main reason for my letter, is that you do not include enough contemporary-style furniture or enough international coverage. In future issues, I will be looking forward to seeing more contemporary-style

furniture makers, of which you have such outstanding examples in the United States.

—Ezio Cusi, Bannes, France

TOO MUCH MODERN, POORLY JURIED FURNITURE

Your idea was a good one. In two short years, however, you have loaded the magazine with altogether too much modern, poorly juried furniture.

The Summer 1996 issue with James Krenov (and his students) is a good example. Do you have to be a student at the College of the Redwoods to fully enjoy your magazine? I fear that Mr. Krenov has never designed a piece that would appeal to the majority of people involved in the profession.

I canceled *Fine Woodworking* when it featured the infamous one-leg stool with a screw protruding from the seat.

I now notice that you will be publishing six issues. This is a good idea. However, this reader elects not to be subjected to more modern garbage. "Cloud Rise Bed" and "Painted File Chest" in your last issue are tasteless!

—Thomas A. Richardson, Binghamton, N.Y.

WORCESTER CENTER OMITTED FROM LIST

I would like to respond to "The Drawing Board" article on "Where to Learn Furniture Making" (October 1996). Although perhaps not best-known, the Worcester Center for Crafts has a respected School for Professional Crafts.

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Students have 24 hour access to the wood studio and have individual work areas next to the main studio, including individual benches and tool cabinets. Student work is exhibited at the Springfield ACC show and the

International Contemporary Furniture Fair in New York.

A high percentage of graduates remain in the field as designer-woodworkers. Many currently have independent studios throughout New England. The very first issue of *Home Furniture* featured one of our recent alumni, Paul DeCarlo, and an end table that he designed and built. Woodworking alumni shows have recently been held at the Meredith Gallery in Baltimore and the Society of Arts and Crafts in Boston, as well as the Worcester Center for Crafts.

—Maryon Attwood, executive director,
Worcester Center for Crafts, Worcester, Mass.

DON'T FORGET ABOUT COMMUNITY COLLEGES

I would like to respond to the article about where to learn furniture making ("The Drawing Board," October 1996). It would benefit interested potential students to have additional, and more complete, information about community colleges.

As the article says, many community colleges offer woodworking courses that teach "basic technique." However, there are also community colleges that offer comprehensive furniture-making programs where students produce outstanding, advanced work. It is disappointing that community colleges often are viewed as stepchildren compared to

four-year institutions or private schools. Actually, the faculty and the education received at community colleges are, for various reasons, often superior.

The Fine and Creative Woodworking program at Rockingham Community College is an in-depth curriculum in furniture making. The work (both in period styles and original design) being produced by students is of very high quality. Two students here were recently selected as finalists in the Design Emphasis 96 national competition. The woodworking facility at Rockingham is large and complete. The tuition, when compared to schools recommended in your article, is extremely affordable. And finally, the faculty at Rockingham is experienced and passionate about quality education.

I strongly encourage those interested in a formal education in furniture making not to assume that a community college curriculum cannot meet their complete needs.

—David C. Kenealy, instructor, Rockingham
Community College, Wentworth, N.C.

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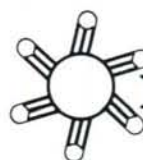


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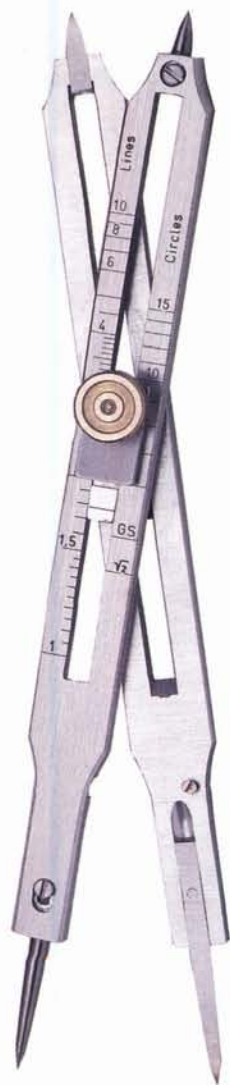
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the drawing board

WHAT ARE PROPORTIONAL DIVIDERS?

I am interested in proportional dividers. How are they used, how accurate are they and is there a way to make them yourself?

—Brian T. Derber
Oconomowoc, Wisconsin

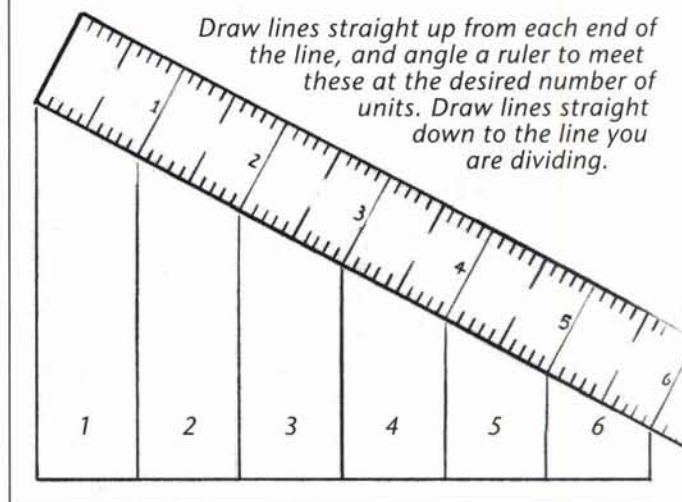


Wil Neptune responds: A good explanation of proportional dividers is found in *The Victorian Cabinet-Maker's Assistant*, first published in 1853 and reprinted by Dover Publications. The book depicts a "proportional compass," a set of dividers in the shape of an "x" with a pin in the middle, allowing them to pivot. The device, according to the book, is used "for facilitating the process of enlargement or diminution."

Two scales on the dividers allow you to set the pivot point to divide a line into equal segments or to inscribe a polygon inside a circle. The line scale divides a given line into equal parts and can be used to mark several points along a given length or to determine a proportional relationship (say, one-ninth of the length of a given object). To do this, the large end of the "x" is set to the length of the line and the small end gives the size of the smaller parts, depending on where the pivot point is set.

The second method, using the circle scale, divides the circumference of a given circle into a selected number of equal parts. This allows you to easily inscribe a polygon (with any number of sides) inside a circle. In this case, the large

SEGMENTING A LINE



end of the "x" is set to the radius of the given circle and the small end steps off the specified points.

Although proportional dividers are expensive (the cheapest I found were about \$100) these are fussy tools and it is probably worth the money to buy them rather than make them yourself. Any errors are quickly and dangerously multiplied, so the layout of the scales and the movable pivot is critical. Even the machine-made variety can easily go out of tune; the *Cabinet-Maker's Assistant* warns of the loss of accuracy from sharpening or damaging the points.

These are useful and elegant tools, but I don't really find them necessary for cabinetmaking. There are simple solutions for pro-

portional division without special tools. To divide a line into equal segments, for example, it is far easier to use a simple scale such as a ruler (see drawing).

Likewise, circles can be easily segmented by stepping off the divisions with a compass. (*The Victorian Cabinet-Maker's Assistant* describes how to do this under the heading "Practical Geometry.") Proportional dividers are more useful for someone who does a lot of drafting and needs quick answers for these problems.

Proportional dividers are available from **Charrette** (800-367-3729), an architectural and graphic arts supply company that offers three styles starting at about \$100. *Wil Neptune teaches cabinet-making at the North Bennet Street School in Boston.*

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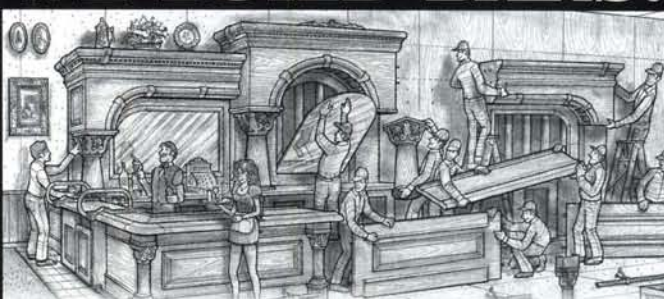
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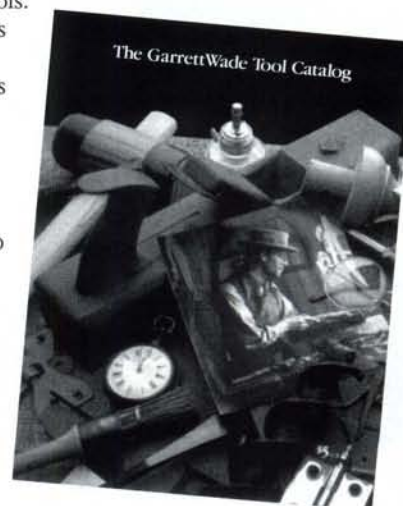
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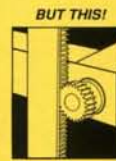
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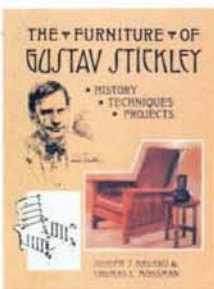
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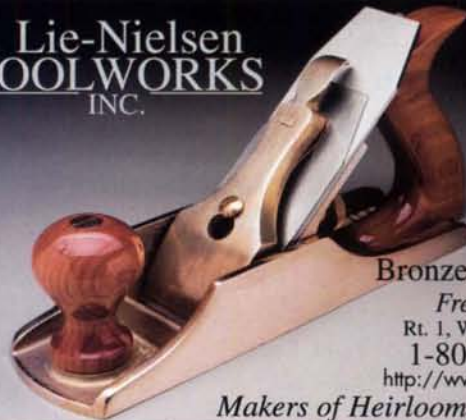
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the finish line

PROTECTING PADAUK FROM THE EFFECTS OF SUNLIGHT

I built a table from padauk to use under a window and finished it with Watco oil and wax. At first the wood was bright burgundy, but the padauk's color has "muddied" under ultraviolet light. Is there any finish known to protect wood from UV light?
—Philip Gavin, Chicago, Ill.

Jeff Jewitt replies: All woods undergo a change in color over time, and ultraviolet light is rarely the only culprit. While UV light is responsible for many problems like bleaching and fading in dark woods, the full range of visible light, oxygen and moisture in the atmosphere all contribute to changes in the color of wood.

Short of installing special yellow filters in your windows to absorb UV light and changing the atmosphere in your room to helium (to displace oxygen and moisture), nothing you can do will stop an eventual change in the color of padauk. Finishes that contain UV blockers will only help to keep the finish from yellowing and flaking. However, there are several things you can do to minimize the "muddying" effects you experienced.

Linseed oil (the major ingredient in Watco oil) darkens over time and does seem to accelerate the natural darkening of wood. It is amber-colored, which pushes the reddish tone of the padauk more towards brown; it also penetrates deep into the structure of the wood. Switching to a non-yellowing and less penetrating finish like water-based acrylic lacquer will help in this regard.

Sand the table until fresh wood is

exposed, and all the Watco oil is removed. Then treat the padauk with a solution of potassium dichromate crystals dissolved in water (about 1-2 tablespoons to a quart of water). This usually emphasizes the wood's burgundy color, but it can be unpredictable; I advise trying it on scraps first. A more controllable treatment would be to strip the Watco oil, sand and then apply a lightfast reddish dye. Seal the dye with a water-based acrylic lacquer. If you absolutely must use oil, switch to tung oil, which darkens less over time.

Neither of these treatments will prevent the original bright color of the wood from changing eventually, but they will minimize the brownish color you find unappealing.

Jeff Jewitt restores period furniture in North Royalton, Ohio. His book Hand-Applied Finishes will be published next spring by The Taunton Press.



Saving the red wood.

Padauk may start out a brilliant burgundy, as in this end table by Colin Reid, but sunlight, moisture and oxygen in the air all work to change its color.

SHOWING THE FIGURE IN TIGER MAPLE

I would like to know the best way to bring out the figure in tiger maple. I have tried potassium dichromate, which faded, and water-soluble dyes, which left the wood too evenly stained. Please help, as I'm running out of scrap wood.

—Michael Foscone, Reading, Pa.

Walter Raynes replies: Tiger maple, one of nature's gifts to woodworkers, is always a challenge to finish.

Whether you are using hard or soft maple can make a difference, as I find that soft maple can be easier to color using relatively simple techniques. Finishing is an art, however, and rarely do I follow an exact recipe.

The suggestions that follow for tiger or curly maple are also applicable to almost any type of light-colored figured wood. I prepare soft curly



Contrast control. The top piece of curly maple was simply finished with lacquer; the middle piece has buttonlac shellac to add a little color; and the bottom piece was stained and sanded to make the curl really stand out.



brown color left just in the curl. In a traditional piece of furniture the brown color left in places like corners, moldings and turnings will give a pleasing patina. Follow this with one or two coats of buttonlac for an overall soft amber tone. The top coat can be wax; otherwise follow with super blonde shellac or lacquer. When finished well, the variety of color resulting from the curly figure will give an almost iridescent effect.

Walter Raynes makes custom furniture and restores antiques in Baltimore, Md.



maple by sanding to 180 grit without skipping grits. To raise the wood's grain, I wet with water between 120 and 150 and again between 150 and 180. I use two methods to bring out the curl. To add just a little color I use a one-pound cut of buttonlac shellac applied two or three times and sanded between coats with 220 or 320 grit. For deeper contrast, I dilute my standard brown mahogany water stain and apply it to the raw surface, sanding when dry with 180 grit to remove almost all of the color except for what remains in the curl.

This is where surface preparation counts, because any scratches from poor sanding will show up as dark brown lines. What should result is a

AGING BRASS HARDWARE

I wanted to darken the bright brass drop pulls that I used on my "East-West Armoire" (p. 58) to give them an aged look and to match the tansu hardware on the lower part of the cabinet. To do this, I used a pre-mixed antiquing solution of selenious and phosphoric acids. This solution gradually darkens the brass; the rate of darkening depends on the temperature of the metal and the liquid, and how long the brass is exposed to the acids. It's a fairly mild acidic solution, but you should wear rubber gloves to avoid skin contact.

I put the solution in a glass jar and dipped the hardware into it for about five minutes. The more the acid is

diluted—one part acid to 10 parts water is recommended—the slower the reaction, making it easier to control the color. Colder water will also slow down the effect.

I removed the hardware from the solution, rinsed it in water and buffed it dry with a soft cloth to remove any residue. You can also use fine steel wool and wax to burnish the antiqued brass. Some pieces required several applications to reach the black finish I wanted. You can, however, achieve anything from a slightly antiqued surface to a deep bronze, to black. If you leave metal in the solution for a long time, the acid will eat into the surface, resulting in a pitted effect.

Both the brasses and the antiquing solution are available from **Whitechapel Ltd.** (P.O. Box 136, Wilson, WY 83014; 800-468-5534).

—Norm Larson



Chemical age. A soak in a mixture of acids will age these brass pulls, from slightly antiqued in a few minutes to black and pitted overnight.

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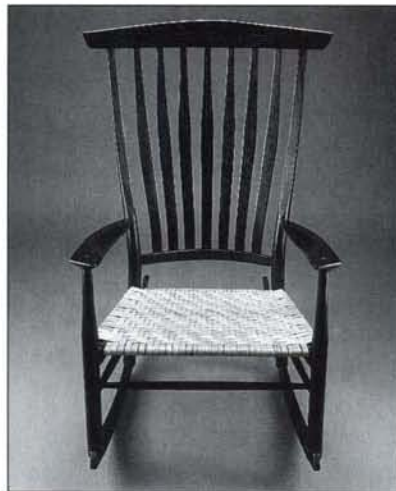
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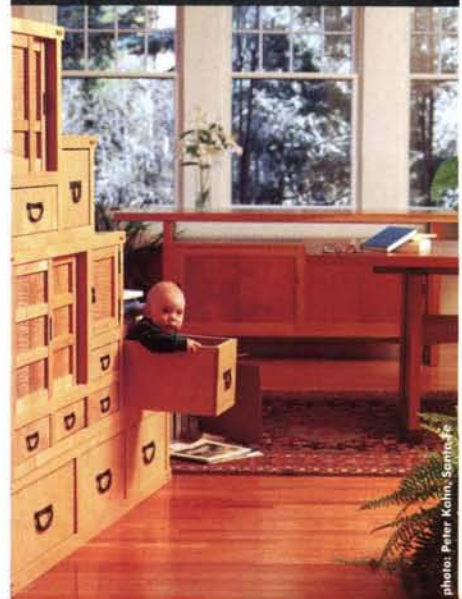


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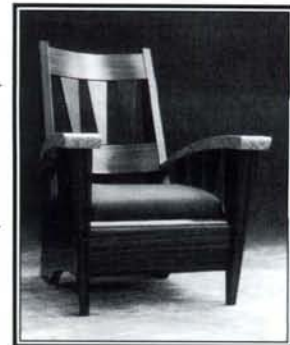
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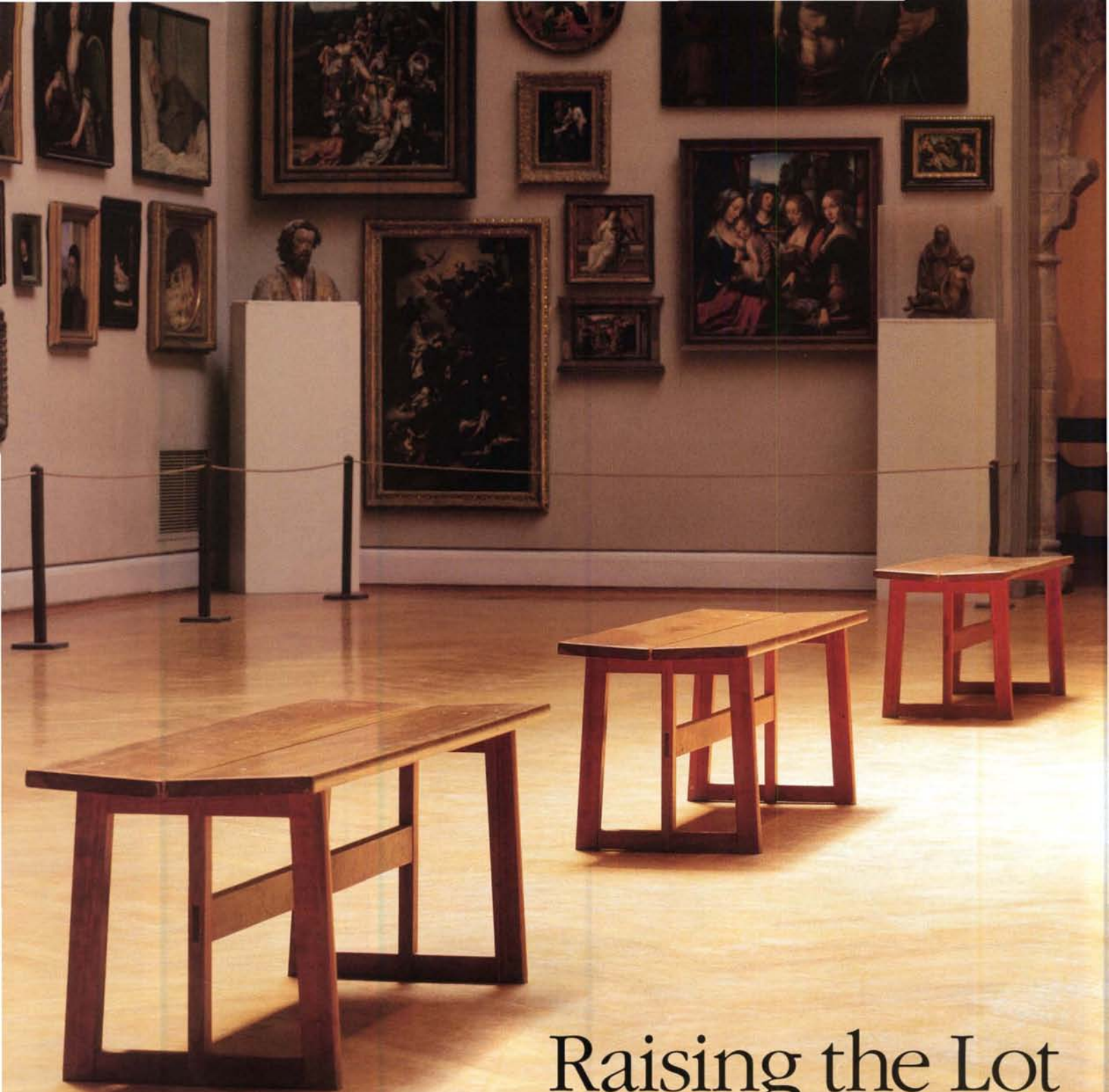
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Raising the Lot of the Lowly Bench

A designer explains why he builds benches

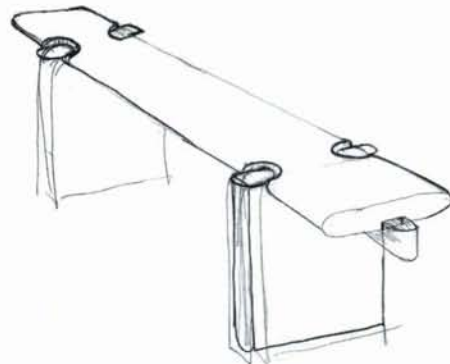
BY HANK GILPIN

benches are a breather. An opportunity to blast off into the open and do some serious fiddling around. If a large cabinet or a chest of drawers is a full concerto, with major themes and minor ones interwoven, then a bench is more like a cadenza, an open section where I can improvise on some of the themes that I've been working out in other pieces. Or else it is a fugue, where I can do something entirely different from anything else on the drawing board.

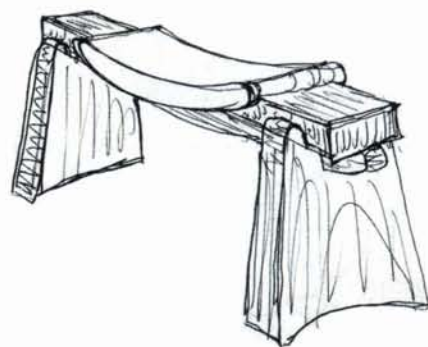
The first benches I built, in 1978, were for the Rhode Island School of Design. The Museum of Art there needed gallery seating. A price of \$2,500

was agreed upon for 10 benches. The resulting benches (see the photo on the facing page) reflect an attempt to simplify design and construction with an eye for profit. I hoped the slight angling inward of the two-plank seat would offer a bit of comfort to the weary museum visitor.

I had never made a bench prior to that commission and I've had very few requests since, but I enjoyed that challenge, and benches started appearing in my sketchbooks with some regularity. Now, whenever my shop has a little window of time for fooling around a bit I will invariably build a bench.



Teaching tool. Gilpin finds benches an ideal school for hand shaping. An apprentice can make a mistake along the way and Gilpin will simply change the design to accommodate it. The bench at left is in white oak; the one below is in elm.



You're sitting on the art. Built 20 years ago and still used in a range of galleries at the Rhode Island School of Design Museum of Art, Gilpin's artfully understated benches (facing page) have proven their durability as well as their adaptability.

A bench is a bench is a table. Gilpin's benches double as tables. Because he thought this one in elm would likely be used as a table, he finished it with varnish to prevent staining.



Designed for production. This maple bench from 1994 harks back to Gilpin's first benches, which were also made in a batch.



QUICK, MAKE A BENCH

One major attraction of benches is speed of construction. It often takes only a day or two to whip up a bench, and I do love achieving resolution quickly. I probe and tweak the ideas, eliminating time-consuming complexity. After a four- or five-week stretch on a large cabinet or desk, nothing satisfies me more than an idea taken from a rough sketch to completion in the wink of an eye.

I exaggerate. More often than not a bench consumes as much time as a small table. But then, many of the benches my shop produces work as tables, too, with the added delight of your being able to sit on them. Both pieces on this page illustrate the idea used quite often in my benches of two planks separated by a gap. Making the seat of two boards reduces stiffness, allowing a modest give or spring when you sit.

Oddly, although I rarely receive a request for a bench, when I go ahead and build them on speculation they usually sell rather quickly. They are often modest in price, and I think they attract buyers who are interested in my work but might be unable to justify the expense of a more elaborate piece.

WOODINESS

Pricing aside, another attraction might be their quality of woodiness. I love the inherent beauty and uniqueness of each plank of lumber. The swirls, curls and whorls all offer delight to the eye. Who *isn't* tempted by the ring-porous oaks and elms with their tales of rapid growth, wide hard-year rings and dynamic face grain? Most of my benches are thinly veiled excuses to show off these wonderful characteristics. Even planks with 'defects' can find welcome form in a bench. Combine simple joinery and a modest working of forms with a beautiful piece of lumber and—bingo—a piece

of furniture emerges that doesn't consume a huge amount of time or expect a huge amount of cash in return. Everyone is rewarded.

PLANKINESS

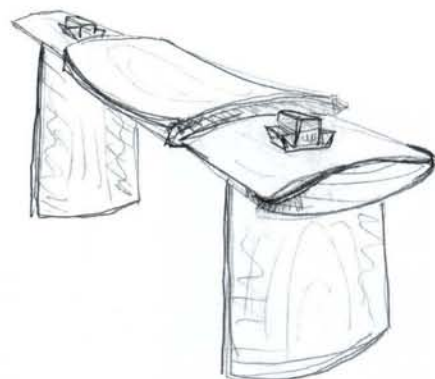
Even in my most elaborate cabinets I avoid bells and whistles, but in making benches I search for even more restraint, making no attempt to disguise what I call the plankiness of lumber. It's very rare that you make a piece of furniture that doesn't distort the plankiness of wood. With a bench, you can make something closer to a naked plank. One plank cut into three parts with two joints—now that's my cup of tea.

I hope my benches draw attention to this ancient means of taming a tree while allowing me a whisper of pleasure in an otherwise rather hectic chase for cash. ■

Hank Gilpin makes furniture in Lincoln, R.I.



Fiddlesticks. Gilpin likes making benches as a relief from the pressure and complexity of larger pieces. This elm bench gave him a chance "to play around with sticks of wood."



Just this side of a plank. When he's got a great piece of wood, Gilpin often plays with what he calls "the plankiness of wood," making only slight departures from the original shape of the lumber.



Beds Built for Comfort

From cots to kings, a bed's most important feature is the mattress

BY G. R. CLIDENCE

a bed may be the most intimate piece of furniture a person can own. We spend about a third of our lives in bed, so at the very least it should be a most comfortable and inviting place. But a bed is often much more. Whether it is a king-size aircraft carrier outfitted with mirrors or a humble headboard attached to a plain metal frame, a bed, for many, is a home within a home.

The requirements for comfortable (and affordable) slumber, however, make designing a bed somewhat rigid. How wonderful it would be to let the imagination loose and design a truly custom-made bed to fit one's body and mind. But what if *that* inspiration also means a custom-made mattress and bedding? This route can be more trouble than it's worth. A bed design in most cases must meet certain stan-



All sleepers are not the same. The height of the mattress is a matter of personal preference and will determine much of a bed's design. Here the author is measuring for the mattress foundation of a queen-size low-post bed.

dards dictated, for better or worse, by the people who make mattresses.

START WITH THE MATTRESS

The smallest common mattress for adults is the twin, a perfectly adequate size for one person and sometimes the only choice if you have to shoehorn two beds into a guest room. A close cousin—but much overlooked—is the 3/4 size which can more amply accommodate a single adult. This size often fits antique beds and is a good choice for colonial reproductions, if authenticity is the goal.

The smallest mattress designed for two sleepers is the double or “full” size, which also happens to have the most pleasing rectangular proportions (something not to be underestimated when designing a bedroom and its furnishings). Moving up the ladder, the queen-size mattress is more generous in both width and length, but the price for this comfort is precious floor space, although most master bedrooms designed today adequately accommodate this popular size.

The next step up (and it's a big one) is the almighty king. A standard king-size mattress gains nothing in length compared to the queen, but it adds a full 16 inches in width, making the proportions almost square. This can look ungainly, and every design decision from the headboard to the quilt should take into account the large amount of real estate a king-size bed occupies. A variation is the “California king,” which is narrower but longer and therefore more appealing in its length-to-width ratio. On the other hand, bedding may be more difficult to find, even though it is considered a standard size.

As important as the acreage of a mattress is its thickness, which will determine much of a bed's structural design, from the width of rails to the height of the headboard. Bedding comes in many forms, from pancake-thin cotton futons to steel reinforced box springs which, when combined with a mattress, are 15 inches thick or



Updating a traditional form. This platform-style bed is slightly higher than today's standard to mimic a colonial look. The queen-size mattress is supported by plywood, eliminating the bulk of a box spring.

more. Size and thickness also depend on the manufacturer, the quality of the bedding and the age of the mattress. I have found that there is no better way to craft a custom-made bed than to design it around a specific mattress that has been picked out in advance.

DESIGN FLOWS FROM THE HEIGHT

With the mattress selected, the structural design can begin. Perhaps the best starting place is to decide how high a mattress will sit. A 15-inch thick mattress and box spring combination that sits 18 inches high would mean the bed rails supporting the mattress would nearly be grazing the floor. On the other hand, a 30-inch high futon frame would look like a tree house.

In the period reproductions I design and build, authenticity sometimes outweighs practicality and beds tend to be on the high side, anywhere from 22 to 36 inches. One reason for the high profile of 17th- and 18th-century beds was to elevate the sleeper away from cold floors and drafts. This, in turn, called

for detailed turnings and carvings on the posts to disguise all that added height in an attractive way.

On the other end of the scale, the lowest practical level of a mattress bottoms out at shoe-tying height, or around 18 inches off the ground (about the height of a chair seat). This makes getting in and out of a bed easy for some people, although others prefer the height of colonial beds.

CONSIDER THE FOUNDATION

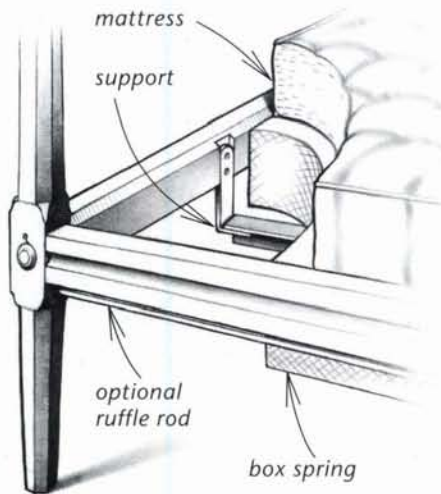
Many design decisions are derived from mattress height, beginning with the type of foundation. The “foundation” refers to the structure supporting the mattress—an upholstered wooden frame, a box spring (a wooden frame with springs), or some type of platform, like slats or plywood. A box spring is a shock absorber for the mattress, giving it a slight bounce and longer life. A platform yields to weight less and can compress and wear out a mattress faster, although some manufacturers make mattresses with extra padding for platform beds.

FOUNDATION OPTIONS

Bed foundations (the structure that supports the mattress) depend on the style of bed, the type of mattress that will be used and the height of the mattress from the floor. The following are some common examples:

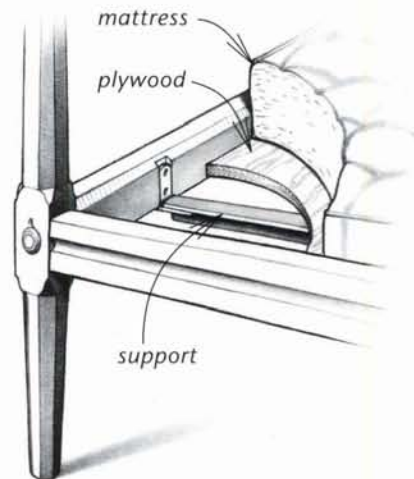
MATTRESS AND BOX SPRING

A mattress and box spring combination can be bulky. In this example, the box spring is below the bed rails and hidden by a dust ruffle. Other options include lowering the rails or making them wider.



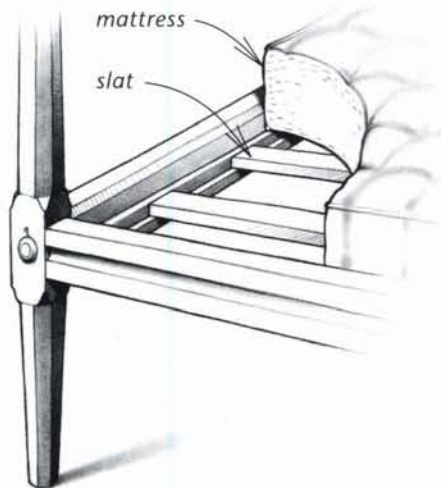
SUNKEN PLYWOOD FOUNDATION

In this example, the box spring is replaced by a piece of plywood. The rails mask much of the mattress, but there should be room around the edges for tucking in sheets.



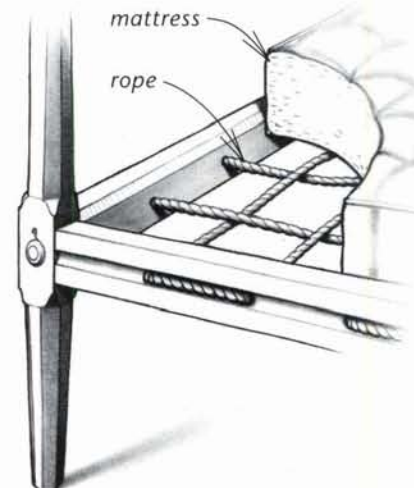
SLAT FOUNDATION

Often used for futon frames, the slats are notched into the inside of the bed rails. In some beds, the slats are bent slightly upward and flex, mimicking the effect of a box spring.



ROPE MESH

Used mainly for period reproductions, rope can be used as a foundation to support a mattress. The bed rails must be thick enough to withstand the stress of the taut rope.



If a box spring is preferred but bulk is a problem, there are a number of ways to disguise its thickness (about 8 inches) and maintain a low profile. The contemporary method is to hide all or most of the box spring behind wide rails, but this gets heavy both visually and literally. A more traditional look can be achieved by sinking the box spring below the rails and hiding it with a dust ruffle, or by incorporating storage underneath, such as draw-

ers recessed under the rails.

Although the common princess-and-the-pea wisdom is to equate thickness with comfort, many people forgo the box spring altogether. This saves money on bedding, it makes the bed easier to move and it gives the designer more flexibility by reducing the amount of mattress bulk that would have to be accommodated or hidden in some way. If a box spring is not part of the foundation equation, there are

plenty of platform options (see the drawings above).

DECORATION COMES LAST

In period beds, decoration almost always followed function. In the days before box springs, bedposts and rails had to be big enough to support canopies and a rope foundation. Headboards were much smaller because few people read themselves to sleep in the evenings. Today, personal

The old way is still the best. Traditional post-and-rail beds were held together by bed bolts and mortise-and-tenon joinery. The tenon at the end of the rail slips into a mortise cut into the post, and is held fast by a threaded bolt. The bolt is then concealed by a decorative cover of stamped brass (below).



Tools of the trade. The only equipment required to break down a traditional bed is a screwdriver to attach the bed bolt covers, a wrench to tighten the bed bolts and a rubber mallet to tap stubborn pieces without marring them.

preference often rules, but function still has a role. A high headboard, for example, provides better support for reading and may even angle back slightly, like the back of a chair. A low footboard won't block a window (or a television) and lets the end of the bed double as a bench for pulling on socks and tying shoes. On the other hand, a higher footboard creates a feeling of security and privacy.

Despite the apparent rigidity in de-

signing a bed of any style, there remain more than enough variables to make each interesting and unique. There is no way to forecast all the possible decorative options in a general way, but after more than 100 bed commissions, I can attest that the differences, not the similarities, are what stand out in the finished product. ■

G.R. Clidence designs and builds furniture in West Kingston, R.I.

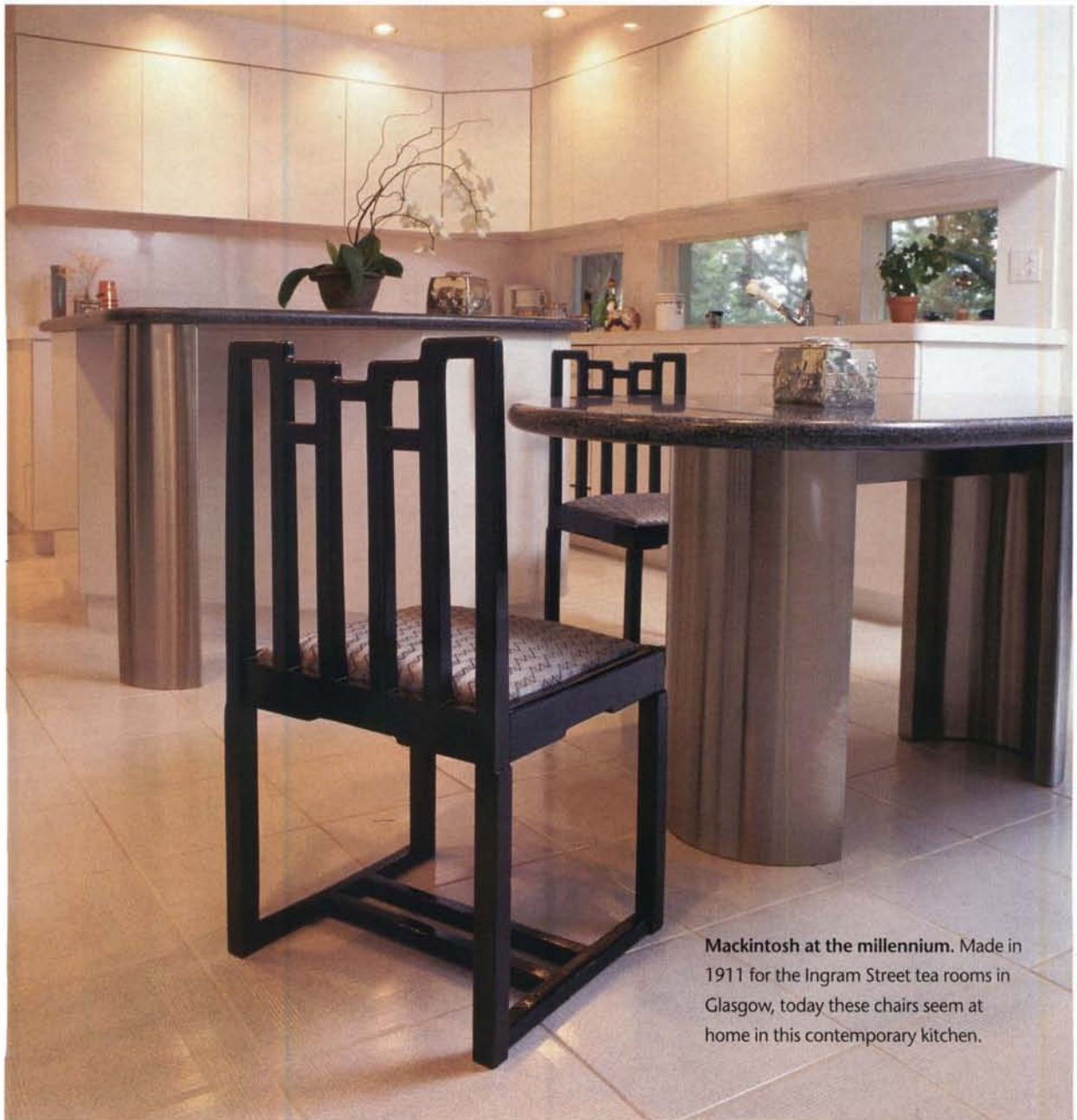
MATTRESS SIZES	WIDTH X LENGTH
<i>Twin</i>	38 x 74
<i>Twin extra long</i>	38 x 80
<i>3/4</i>	48 x 74
<i>3/4 extra long</i>	48 x 80
<i>Full (double)</i>	54 x 74
<i>Queen</i>	60 x 80
<i>King</i>	76 x 80
<i>California king</i>	72 x 84

Note: All dimensions are in inches and they may vary depending on the manufacturer.

Charles Rennie Mackintosh

After nearly a century, an architect's imagination still seems contemporary

BY NICHOLAS GOULDEN



Mackintosh at the millennium. Made in 1911 for the Ingram Street tea rooms in Glasgow, today these chairs seem at home in this contemporary kitchen.

Charles Rennie Mackintosh had the bad luck that afflicts so many pioneers: he was ignored at the end of his life and nearly forgotten for a good deal of time after his death. Until the 1970s, when collectors and furniture manufacturers rediscovered him, Mackintosh was a sleeping giant, an architect whose buildings and furniture were neglected and sometimes even demolished in his native Glasgow.

Mackintosh now sits in the pantheon

of 20th-century architects, his stature as an innovator measured alongside that of Frank Lloyd Wright. In Glasgow today there is no mistaking his influence, even though it wasn't until quite recently that his country embraced him. Not only are there shops full of Mackintosh reproductions and "Mockintosh" souvenirs throughout this industrial city, but many of Mackintosh's buildings have been restored and in one case—the "House for an Art Lover"—

constructed from scratch.

The revival is understandable—few architects traversed as broad a range as Charles Rennie Mackintosh. In a period spanning half a normal working life, Mackintosh designed an astonishing number of objects, from furniture, silverware and carpets to the homes that contained them. In addition to his buildings, he designed more than 400 pieces of furniture including 60 different chairs. His formidable and restless



Function and form both. Utility and decoration work together in this cheval mirror designed for Hill House (top left).

Stark geometry. This writing cabinet (top right) displays both the fluid artistry and the geometric starkness of much of Mackintosh's furniture.

An artist as well as an architect. The drawings and watercolors of Mackintosh (far left) are collected as avidly as his furniture. This watercolor, *Fritillaria*, was made in 1915.

Designing from top to bottom. When Mackintosh was commissioned to build a home, nothing escaped his scrutiny, including the silverware. This fish knife and fork (left) were designed in 1903.

imagination rarely left an idea alone and he often worked out variations for future commissions while the original designs were still under construction. The product of this voracious imagination was a style so fresh and inventive that his furniture still seems modern today.

A DESIGNER IN CONTROL

I went to Glasgow to take a closer look at Mackintosh's work after years of admiring it in books and photographs. Arriving there—an easy train ride from anywhere in England—is like going to

New York or San Francisco after seeing them only as movie backdrops. Although there has been a steady and widening stream of books about Mackintosh, there are many reasons to see his work in person. The practical nature and delicacy of his designs are best appreciated at close range, and Glasgow is the only place to experience his success at integrating furniture and interior design.

Most people know Mackintosh's furniture only from photographs. His stark, graphic designs lend themselves to a two-dimensional portrayal. His

high-backed chairs, displayed (and peddled) as something iconic, are perhaps the best example of the graphic nature of his designs. Face to face with Mackintosh's furniture, however, I found the pieces were familiar but the scale and proportions made much more sense—the chairs, for example, were tall but not outrageously so. Mackintosh seems deliberately to have thrown off our sense of scale with visual tricks, by making one element—such as the backs of his chairs—different from our expectations.

Mackintosh's ability at manipulating proportions to produce a dramatically graphic image no doubt comes from his artistic training. He was a skilled artist and draftsman and his furniture sketches, many of which show corrections and alternative ideas, are minor works of art in themselves. Because Mackintosh did not build his own furniture, he had to work out the details in his drawings. I enjoyed studying these drawings with their penciled-in notes, dimensions and smudges, allowing a glimpse of the real man. He also made scale drawings—simple, almost monochromatic watercolors—of furnished rooms so he could see how the proportions worked together.

He experimented further with pure form by painting or ebonizing the wood. By hiding the grain and construction—something his Arts and Crafts contemporaries considered dishonest—Mackintosh removed distracting patterns and relied on the sculptural quality of his furniture to stand on its own, a severe test. His painted furniture also demonstrates that effective designs need not clamor for attention with flamboyant woods. It is difficult to imagine what his white wardrobes would have looked like unpainted, with their inevitably conflicting grain patterns.

A PRACTICAL ARTIST

Practicality was a byword of the Arts and Crafts movement. Though not a dogmatic adherent to Arts and Crafts



A residential masterpiece. Hill House is considered to be Mackintosh's greatest domestic commission. Built between 1902 and 1903, it has been restored and is now open to the public.

Furnishings form a family. Detailing in the entry hall (above right) and library cupboard (right), both from Hill House, relate to design motifs used throughout the house.



ideals, Mackintosh did absorb this credo and made sure that his designs worked on the practical level first. His refusal to draw house elevations until a successful floor plan was approved—the opposite of the conventional approach at the time—reflects this. His many desks display functional design, with their pull-out writing surfaces and cubbyholes designed for specific items. Even his awkward-looking plank legs, a favorite element, often were designed to double as cupboards or shelves. Practicality extended to wheels under large pieces of furniture



Not all the chairs were high-backed. Even though Mackintosh is known today for his elongated “high-back” chairs, Cassina of Milan is reproducing others like this low version of the Ingram Street chair designed in 1900.

Charles Rennie Mackintosh, 1868-1928

Born into a working-class family in Glasgow in 1868 (his father was a policeman), Charles Rennie Mackintosh was apprenticed at 16 to a local architect. At the same time, he began taking night courses at the Glasgow School of Art, where he studied for nearly 11 years.

Early on Mackintosh considered himself an artist. He changed the spelling of his name, from McIntosh, and dressed in the fashionable clothes of an artist. He and a group of fellow students (together known as “the Four”) pioneered what became known as “the Glasgow Style,” a unique hybrid of Arts and Crafts and Art Nouveau influences. He later married one of “the Four,” Margaret Macdonald, who collaborated with him throughout his life.

After his five-year drafting apprenticeship, Mackintosh joined the prominent Glasgow architectural firm Honeyman and Keppie. In 1897, he won a design competition for the Glasgow School of Art, a prestigious commission which helped establish his early reputation as a pioneer in architecture and interior design. The next 12 years were busy and successful ones for Mackintosh, a time when he designed his most famous buildings and interiors,



including Miss Cranston’s tea rooms (owned by Catherine Cranston, one of Mackintosh’s best patrons) and Hill House, his residential masterpiece.

Despite all these successes, Mackintosh received little attention at home and only slightly more acclaim in Europe. After the completion of the Glasgow School of Art building in 1909, the large commissions stopped coming and Mackintosh left Glasgow for good in 1914. Suffering from depression and possibly drinking heavily, he designed his last significant interiors between 1916 and 1919 and spent the rest of his life painting in England and the south of France. When Mackintosh died of throat cancer in 1928, he was almost forgotten in architectural circles.

and to such innovations as a chest of drawers with a slightly concave top, so that cuff links would roll to the center.

MINING THE IMAGINATION

Having dealt with the practical, however, the artist unleashed his formidable imagination. Throughout his life Mackintosh filled sketchbooks with drawings of anything that caught his eye. His appetite for ideas was omnivorous. He once visited a lab where he

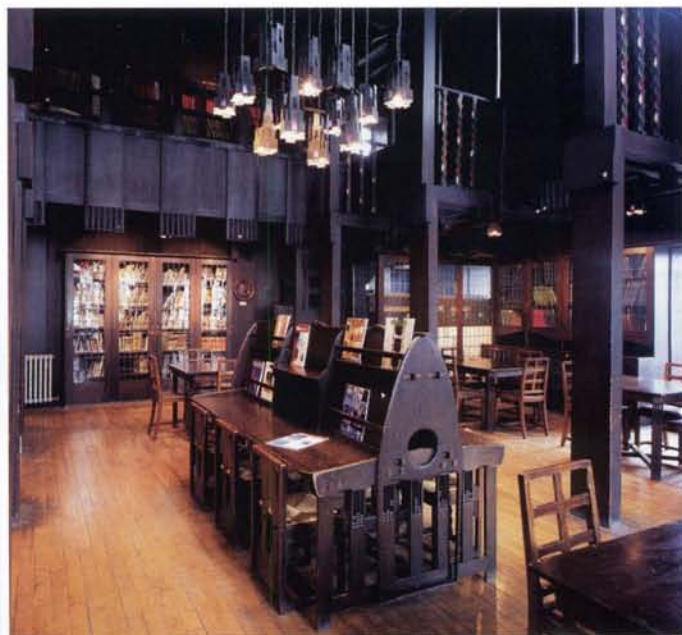
was invited to look through a microscope and he immediately began drawing what he saw. These sketchbooks show that his ideas did not come magically out of the blue but are the inspired application of images seen and recorded.

His early furniture was often decorated with stylized forms from nature, such as bird silhouettes and other organic motifs. These forms gradually gave way to more abstract, geometric

patterns, often cutouts or inlays of squares. Sometimes an entire piece of furniture would be a pattern of squares (this stylistic evolution developed alongside that of Mackintosh's European contemporaries). But once Mackintosh had a new idea he liked, he continued to develop it. His tall chairs are a good example of this—parts are borrowed from earlier designs and playfully used as inspiration for new ones.



Chairs create privacy. Rose-colored glass gives these chairs in the Willow Tea Rooms a light, airy look. The rooms, designed in 1903, have been restored and are open to the public.



Rustic and modern at the same time.

Mackintosh not only studied at the Glasgow School of Art, he also designed its building and library (top right).

A light palette. Mackintosh designed this bookcase in 1900 for his own flat in Glasgow. The flowing lines and stylized seed ornamentation appear in many other designs.



DESIGN SUPERCEDES CRAFT

Mackintosh was not interested in craftsmanship for its own sake and his furniture employs the minimum construction necessary to hold it together. Given the common and unflattering reputation of the furniture's joinery for lacking strength and durability, I was impressed with the visible construction details, such as the through-tenons and dovetailed casework. One is not allowed to touch the pieces on



Still modern after all these years. There is a vibrant market for Mackintosh designs today, particularly his chairs. This high-back chair from the Argyle Street tea rooms, designed in 1898, is manufactured by Cassina of Milan.

public display, however, to see if any of it wiggles.

Mackintosh's designs do not rely on complicated construction techniques, nor do they contain exotic materials. Most of the furniture is made of oak with some of the later, more delicately detailed pieces made of finer-grained woods like maple. Mackintosh relied on the basic structure for ornament, often so skillfully combining the decorative with the functional that the two blend seamlessly together. At other times he used clever (a word used by his contemporaries) tricks to produce an effect much more complex in appearance than the actual method used.

A MODERNIST STILL

Today Mackintosh's interiors may seem elaborate to us. Only by imagining them against their Victorian background can we get an idea of how startlingly austere they must have seemed at the turn of the century. The feeling that I came away with after seeing his furniture and walking around his buildings is one of control—there are no excesses in his designs and it is impossible to take anything away without changing them drastically. If there is a problem with Mackintosh's totally unified interiors, it is that they are too perfect, making them seem inflexible; it is difficult to imagine the clutter of daily living in them and they do not yield easily to the inclusion of outside designs, such as a favorite antique.

Fortunately, the reverse is not true. Mackintosh's individual furniture designs fit quite comfortably in many different environments as much today as when he designed them. Reproductions are manufactured on both sides of the Atlantic and their sculptural qualities lend themselves to the most modern of interiors—surely the definition of a design classic. ■

Nicholas Goulden studied furniture making in England and California and now designs and builds furniture in Petaluma, Calif.

Mackintosh on tour

An exhibit of the art, furniture and interiors of Charles Rennie

Mackintosh, organized by the Glasgow Museums, will be at the **Metropolitan Museum of Art** in New York from Nov. 21, 1996 to Feb. 16, 1997 (212-570-3710).

The exhibit travels to **The Art Institute of Chicago** (March 29 to June 22) and the **Los Angeles County Museum of Art** (Aug. 3 to Nov. 12). Lectures will be offered in New York by the Met, **The Victorian Society** (212-886-3742) and the **Bard Graduate Center** (212-501-3013).

Glasgow is still home to the largest collection of Mackintosh furniture. The Mackintosh Society offers tours and information and all of the following are open to the public (if calling from the U.S., dial 011-44): Charles Rennie Mackintosh Society, Queen's Cross Church (141-946-6600); The Mackintosh House (141-330-5431); The Glasgow School of Art (141-353-4526); The Willow Tea Rooms (141-332-0521); A House for an Art Lover, scheduled to open in October 1996, private tours by appointment (141-427-4617); Hill House, Helensburgh, open April 1 through Oct. 31 (143-667-3900).

Two Bureaus Share a Shapely Leg

BY PETER SHEPARD

Past presence. A well-blended mixture of antique forms and contemporary innovation brings Shepard's bureau its mature, stylish presence.



because my designs are simple, their success relies on using the highest quality stock and on connecting my interpretation of the past to the present. The proportions and scale of both these bureaus have their antecedents in 18th-century pieces. So do some of the details, like the cock beads around the drawer fronts, the frame-and-panel construction on the sides and backs, and the beaded skirts.

The nitty-gritty of both these designs started with the leg. On the dresser the leg has a clearly carved transition from the cabriole-like sweep of the lower part to a more contemporary, guitar-neck section running parallel to the drawers. On the hall chest I stretched the leg to create a sense of lightness, even of animation. These qualities are absent in the dresser, which, with its shorter feet, appears utterly planted. The heavy vein running up the dresser's leg evolved into a more delicate, seam-like detail with the ebony inlay on the hall chest.

Many of these differences were inspired by trying new things, solving new problems. The flat front of the dresser became a bowfront in the hall chest, making the drawers more difficult to produce and the ebony bead on the skirt more difficult to apply because it had to follow a compound curve (see *How They Did It*, p. 84). Small changes to the eye, yet quite a bit more work. But for me, the pleasure is not in revealing the effort behind a piece, but in hiding it completely. ■



Sprightly little sister. Tapering the leg along the case and stretching it out below the skirt gives the hall chest a springy vitality.



By the bench as well as the book. This fresh leg design arises as much from the maker's savvy with his material and tools as from his knowledge of furniture design.

SPECIFICATIONS

DIMENSIONS

Dresser: 29 in. wide, 21 in. deep and 43 in. high.

Hall Chest: 25 in. wide, 18 in. deep and 34 in. high.

MATERIALS

Curly maple and ebony.

FINISH

Tung oil and wax.



Colonial geometry. An oval top on a rectangular base and a mix of turned and square parts give this 18th-century reproduction its poise.

Maple Tavern Table

BY ANDREW
MCINNES

a tavern table wasn't always found in a tavern. The term describes a wide range of small, low, easily portable tables with one-board tops and four legs strengthened by stretchers. Although such tables were certainly used in Colonial taverns, the style was adapted to a variety of domestic settings. Smaller ones might have been used for tea service or as occasional tables; larger ones were used for dining.

I found the table on which I based mine in *The New Fine Points of Furniture*, the revised edition of Albert Sack's classic book known to many by its nickname: Good, Better, Best. The original table, built in Rhode Island between about 1700 and 1730, appealed to my taste for the elegant yet utilitarian. I liked its compact size and its proportions, and I found the splay of the legs and their fine turnings to be stately. I was also drawn to the simple geometry of an oval top with a rectangular frame below.

I built with curly maple to enliven the



Uncommon cant. Legs canted in two directions were unusual on Colonial tavern tables. Introducing even a slight rake can produce a more refined design.

surfaces of the table. This was in the spirit of the original, which had a painted surface. Under a clear finish the silver shimmer of the curly maple's reversing grain is exciting but doesn't compete with the overall geometry of the piece or with the modeling of its turned parts.

I'm pleased with the way the table came out, but that merely reminds me of what Albert Sack said when I met him and praised his new book: "It's only a start." ■

SPECIFICATIONS

DIMENSIONS

28¾ in. long, 20 in. wide and
24¾ in. high.

MATERIALS

Curly maple.

FINISH

Shellac and thinned polyurethane varnish.

Redwood Tansu Chest

BY MARK WALKER



Tansu in wine-seasoned wood. This small tansu chest, only two feet wide, was made out of recycled wood from a California wine cask.

tansu chests are Japanese storage units and this tansu is an interpretation born out of the need to clear a dining room table of clutter. An extensive amount of research—from reading books to studying actual pieces—was necessary before starting the design. Tansu come in all manner of shapes and sizes and this particular one is on the lower end of the scale, measuring just two feet wide.

The redwood for the main carcase is recycled from old-growth lumber that had been used in wine casks, giving the tansu its deep reddish color. Port Orford cedar seemed a natural choice for the drawer bottoms and the compartment behind the sliding doors, owing to its spicy aroma that emanates into a room whenever a door or drawer is opened.

In my research, I found that much of the original tansu were held together by tiny dowels, almost like nails. In keeping with this, I dovetailed the case together dry and used maple “nails” the size of toothpicks to pin all the joints (see *How They Did It*, p. 84). This is a rather crude construction but it works just fine and lends a certain authenticity.

Because this is my interpretation of tansu and not a direct copy, I decided to recess the drawers a bit behind the drawer dividers and chamfer the dividers themselves. This, I think, gives the facade more depth than if the drawers were flush with the case, making it more inviting.

The finishing touches were the hand-forged drawer pulls, made out of recycled 16-penny nails by local craftsmen in Noti, Oregon. The pulls, fastened to the drawers with specially fashioned cotter pins, give the chest an aged look. This tansu is deceptively small (making it easy to pick up and move) but the proportions are such that it may be scaled up to any size. ■



Recycled hardware. Just as the wood is recycled, so is the hardware, custom-made using hand-forged 16-penny iron nails.



Depth perception. Unlike traditional tansu, this chest has recessed drawers and chamfered dividers to add visual texture.

SPECIFICATIONS

DIMENSIONS

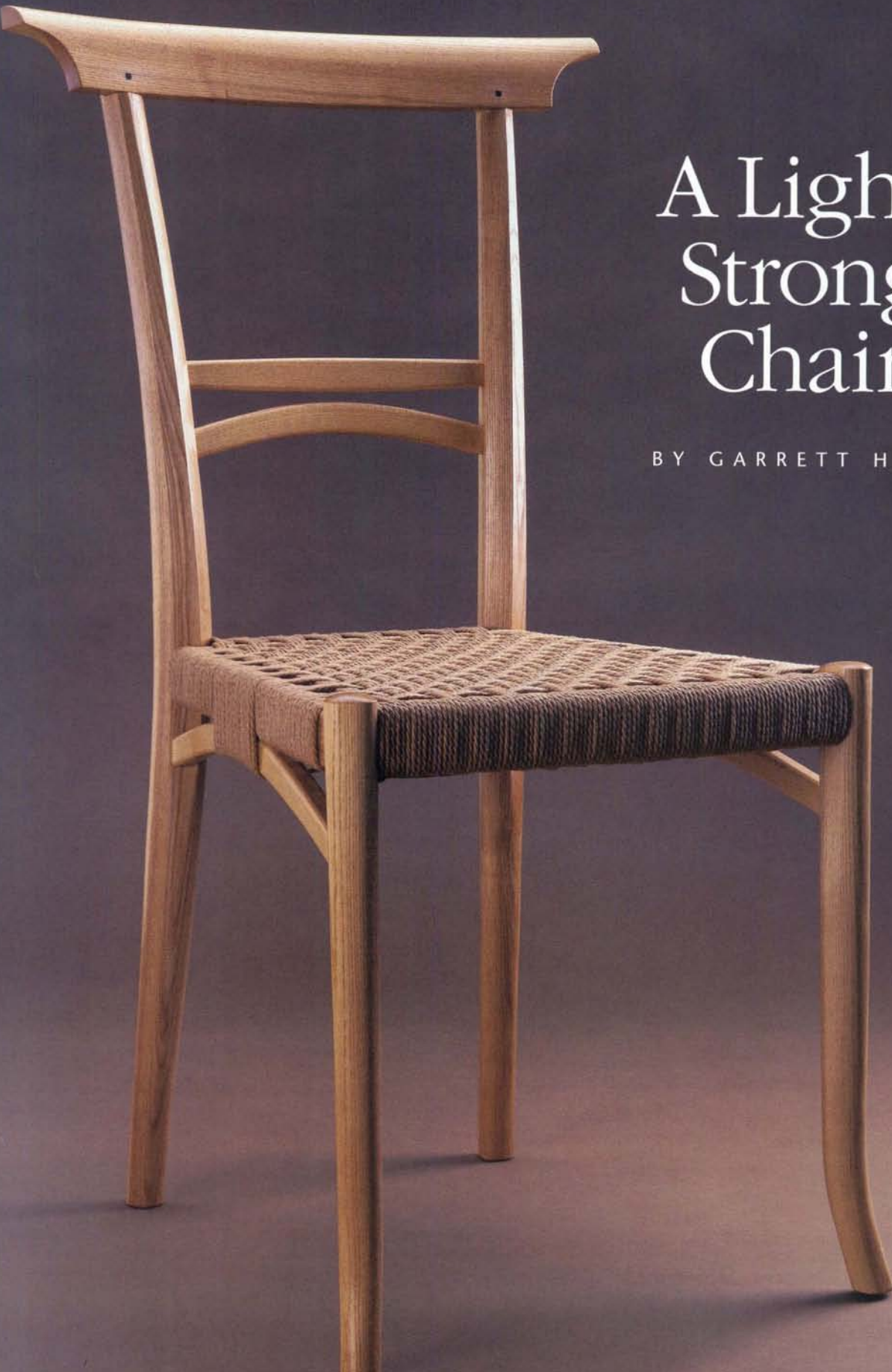
24 in. wide, 12 in. deep and 18 in. high.

MATERIALS

Redwood, Port Orford cedar, maple and iron.

FINISH

Oil.

A light-colored wooden chair with a woven seat, set against a dark background. The chair features a simple, elegant design with a curved backrest and a woven seat. The wood is a light, natural tone, and the seat is made of a dark, textured material. The chair is positioned on the left side of the frame, with its legs extending towards the bottom right. The background is a solid, dark color, providing a strong contrast to the light wood.

A Light, Strong Chair

BY GARRETT HACK

Chairs are the most challenging pieces of furniture to design and build. They need to be strong not only to hold up the weight of a person day after day, but they also need to withstand regular abuse, such as when a person tips one onto its back legs. To give a chair a feeling of lightness the parts need to be slender and few, which makes the joinery critical. (For information about the joinery, see *How They Did It*, p. 84.)

This chair, which I built last year, evolved from a design I proposed while in school 20 years ago—I call it the 7-percent chair. The concept (and that's really all it was; I did no calculations) was to build a chair at least 7 percent stronger than it needed to be. I used curved parts for visual lightness and three-dimensional strength. Glu-

ing thin laminations around a form to create the curves would have been the strongest, most rigid method, but I did not want there to be visible glue lines, so I steam-bent the parts instead. White ash is strong, it bends well and its color and grain contribute to the light look I was after.

To maximize the strength of the joints, I made long tenons on the chair rails that intersect inside the legs. The woven cord draws the joints tightly together and makes a light, comfortable and ventilated seat (see *Sources*, p. 88). ■

SPECIFICATIONS

DIMENSIONS

16¼ in. wide, 16¼ in. deep
and 35¼ in. high.

MATERIALS

White ash, rosewood and Danish cord.

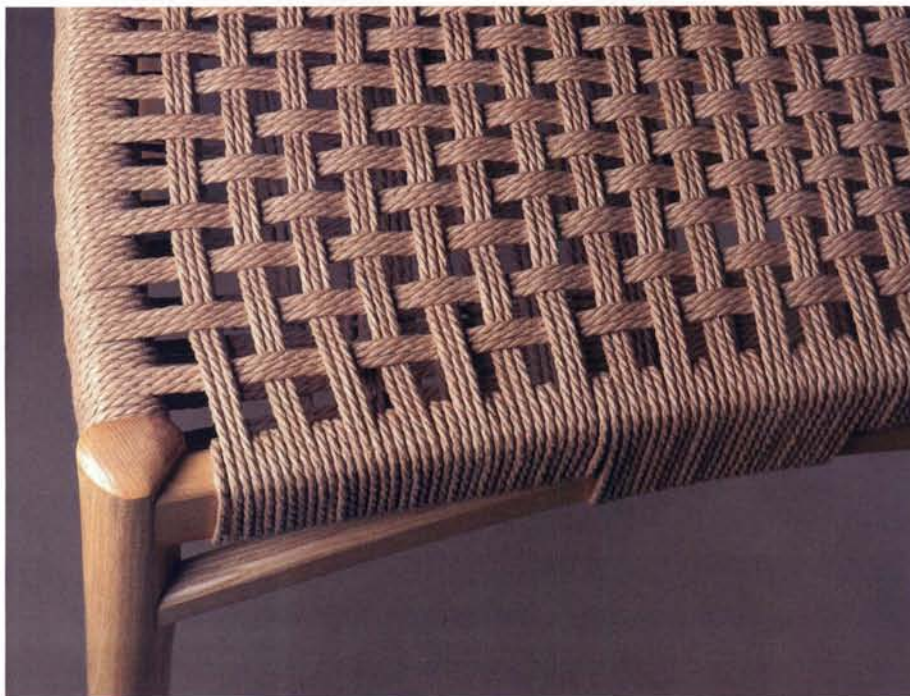
FINISH

Varnish, linseed oil and turpentine
mixture, beeswax.

The 7-percent solution. The author wanted to build a chair “at least 7 percent” stronger than it needed to be, but at the same time he wanted to keep it lightweight.



Functional sculpture. The crest rail, hand-shaped from white ash, is beautiful to look at and a pleasure to touch.



Seat is comfortable and strong. The woven seat, made out of Danish cord, helps to keep the joints locked in place and makes the design more rigid.



Corner Cabinet in Quartersawn Oak

BY MICHAEL COHEN

the decisions that lead me to a design are based partly in business, partly in aesthetics. Before I built this cabinet, I studied successful companies that manufacture top-quality furniture in solid wood. Thos. Moser Cabinetmakers was the primary one. I have followed Moser's progress for the past 10 years, appreciating the

clear designs, natural finishes, and the overall commitment to high-quality furniture made in production. With Moser's example in mind, I began building my own small series of pieces—four corner cabinets, identical except for materials.

I figured that designing furniture in batches for my one-man shop would

afford me economies of scale. Time spent solving construction problems and making jigs for special processes would be divisible by four.

To set my pieces apart from others I decided to build them of quartersawn wood, two of them in white oak, two in sycamore. I relied on the inherent beauty of the wood's grain to provide the unifying element in these simple designs. The dimensional stability of quartersawn wood was a bonus.

One drawback I discovered was how difficult it was to match up the ray flake in adjoining boards. I found it necessary to have double the material required for the piece to get the matches I wanted.

After making the quartersawn figure the strength of the piece, I looked for a finish that would highlight the flake without changing the wood's natural color. I chose mineral oil, which gave very true color and accentuated the depth of the quartersawn figure. ■

Nice and flaky. Discerning selection from a large stock of quartersawn white oak gives the cabinet lively ray flake and continuity at the corners.

SPECIFICATIONS

DIMENSIONS

44⅜ in. wide, 17¼ in. deep and
81½ in. high.

MATERIALS

Quartersawn white oak and white oak
plywood.

FINISH

Mineral oil and butcher's wax.



Townsend Kneehole Desk

BY WILLIAM E. LOCKE



Economy of mahogany. By cutting carefully, the author squeezed all the primary wood for this desk from a single board 12 feet long, 3 inches thick and 26 inches wide.

*t*o call this piece of furniture a desk is misleading. The original was never intended to be used as a desk at all. Most likely, it served as a chest of drawers or a bureau table. Of the 50 or so original examples of the form known to exist, only four have a pull-out, drop-front desk section in the top drawer. Nevertheless, the term kneehole desk or just kneehole is commonly used to describe such a piece. This one is a copy of an Edmund Townsend

blockfront kneehole desk built in Newport, Rhode Island, between 1765 and 1775. The original is now in the Museum of Fine Arts in Boston.

Much of the difficulty in making this reproduction lay in the drawing. The desk is small but quite complex, and I wanted to leave nothing to chance. With the help of the furniture conservation lab at the Museum of Fine Arts

and my teachers at the North Bennet Street School, I pulled together the information I needed and made a comprehensive set of full-scale drawings before I cut the first piece of wood. In addition to direct measurements supplied by the museum, I obtained dimensions for parts such as drawers, dividers and moldings by scaling them from photographs. For other details I relied on writings about Townsend furniture. I found myself trying to take



all these bits and pieces of information, some of them based on guesswork, and make them all fit together, hoping to achieve the harmonious proportion I saw in the original.

After 10 days of drafting, using nearly equal amounts of graphite and eraser, I completed a full-scale drawing. From there it was a matter of applying basic cabinetmaking skills and six months of concentrated effort. ■

SPECIFICATIONS

DIMENSIONS

36½ in. wide, 20½ in. deep and
33½ in. high.

MATERIALS

Mahogany and maple.

FINISH

Shellac.

Not a kneehole, really. You weren't meant to sit down at a small kneehole desk; it was generally used as a bureau.

A Craftsman's Bed

BY RICH PREISS



Craftsman contemporized. Using a familiar motif as a springboard, the author created this modern interpretation of the Craftsman style in untraditional bubinga and walnut.

tradition is not only an inspiration, it is a resource. Tradition, after all, either renews itself or it dies. But despite all the affection shown towards a particular style of furniture, there is often a disdain for modern interpretations, regardless of the quality. Pondering this dilemma, I returned from an Arts and Crafts conference last year determined to make a contemporary object that might charm, if not change, even the most conservative attitude.

My intent was not to reproduce the Craftsman style but to add to what already existed. I wanted to make something whose proportions and construction methods captured the ethos of the period without being slave to its limitations. Given that queen-size beds were unknown at the turn of the century, my bed could not be a period piece. Furthermore, I had a different palette in mind. The surfaces of quartersawn oak were a product of a particular time. I wanted to exploit a contrast between slats and frame with walnut and bubinga.

To prepare for this project, I reviewed my books and notes on Craftsman furniture. I placed my lumber on two sawhorses and studied it. Quickly and disappointingly it became apparent that there was not enough material to use solid bubinga for the entire frame. Rather than resorting to a phone search for more wood, I decided to saw certain planks into veneers for each cross-piece in which the end grain would

not show. I laid out each surface with all the care that I could muster, letting the grain follow the shape wherever possible.

One hundred and seventy-six mortises and tenons later, the bed was almost done. To my eye, the grain figure and reddish-purple hue of the bubinga stands midway between the brown tones of Stickley and the decorative designs of Charles and Henry Greene. The walnut spindles, reflecting my interest in contrasts within darker tonal ranges, add a different kind of figure as well.

The finished piece is a pleasing and much needed addition to our bedroom. Its roots in historic design bring tradition to our lives, a reminder of the values of craft, hearth and home that are part of the Craftsman legacy. Making the bed, for me, brought life to the tradition. ■



Similar details on a different palette. The slats and corbels are drawn from Gustav Stickley, but the contrasting colors in this rendition veer from the customary quartersawn oak of Craftsman furniture.

SPECIFICATIONS

DIMENSIONS

87½ in. long, 73½ in. wide, 50½ in. high (headboard) and 32 in. high (footboard).

MATERIALS

Bubinga and walnut.

FINISH

Synthetic oil-based varnish.



Mimicking a master craftsman. The form of this maple cabinet is based on a lemonwood showcase by James Krenov.

Showcase Cabinet with Marquetry

BY STEVE PETERSEN

this showcase cabinet with V-shaped doors was the result of two ideas. One was an attempt to reproduce James Krenov's lemonwood wall cabinet which appears in his book *The Impractical Cabinetmaker*.

The other idea was to depict a scene, in marquetry, of life and death. The two butterflies, flitting through the air, are oblivious to the danger lurking nearby. With the exception of the dogwood branch upon which the mantis waits, I had used all these figures before; what is new here for me is attempting to depict the struggle for survival.

Krenov's body of work (and by this I include the work of those who have studied under him) has had a major influence on me. I knew intuitively that one of his showcase designs would make a good match with this marquetry motif that had been floating around in my head, as long as I maintained the harmony these cabinets require.

Unfortunately, while I had some experience in marquetry, showcase cabinets were too complex for me at the time. About a year later, I had an opportunity to spend four weeks at the College of the Redwoods, studying at its summer school program where I gained the confidence necessary to attempt this difficult piece. The four weeks were almost entirely devoted to making the two doors. The shadow lines and balance of wood and glass make the doors the focal point of the cabinet. ■

SPECIFICATIONS

DIMENSIONS

27½ in. wide, 7 in. deep and 25 in. high.

MATERIALS

Maple, glass and in the marquetry: rosewood, holly, pear, yew, Macassar ebony, gonçalo alves, myrtle and walnut.

FINISH

Shellac and wax.



A forest of inlay. Eight different species of wood were used to render this idyllic scene.

Struggle in wood. By showing butterflies blithely wandering toward their predator, the praying mantis, the marquetry depicts the struggle of life.



Pear Table and Dining Chairs

BY MICHAEL CULLEN



Furniture fresh from the garden. The author drew inspiration for the shapes of his pearwood dining table and chairs from stems, leaves and petals in the robust gardens surrounding his client's California bungalow.

From the outset, the design for this dining set was motivated by the quiet feeling that I experienced at the client's home and gardens. Nestled in California's Santa Cruz Mountains and surrounded by terraced gardens and mature trees, the house is a comfortable structure composed of simple lines and details. The lovely gardens, which appear natural and well-established, dominate the property aesthetically, gracefully imparting a sense of

harmony and solitude.

Initially, I began designing from sketches of what I had seen in the gardens. My goal was to create something elegant, yet sensitive to its environment. Most of all, I wanted to capture that element that so readily prevails in

nature—simplicity and complexity together in one object.

The design I arrived at was a composition of abstracted natural shapes and flowing curves offset by fine detail and intricate surface patterns. Because the dining room was narrow and served as a passageway, I chose an elliptically shaped tabletop. Although this choice was initially motivated by practicality, the top with its starburst pattern became the focal point of the entire design. Framed in pearwood with a stringing of rosewood, the curly sycamore starburst stands out like a gem, creating a shifting moiré pattern as you walk around the table.

To complement the table, I designed a set of chairs that would be unique, but in no way detract from the table's intricate top or base. I wanted the chairs to look graceful and be comfortable. In keeping with the concept of the table, it was important that they appeared subtle, with detail that only emerged when you looked closely. ■

Pearing off. Cullen uses a pointed elliptical crest rail as well as pearwood with rosewood accents to tie his superbly detailed chairs to the dining table.



"Come into my parlor," said the spider to the fly. The table's shimmering web-like pattern of curly sycamore veneer has a benign purpose—enticing good dinner conversation.



SPECIFICATIONS

DIMENSIONS

Table: 88 in. long, 44 in. wide and 30 in. high.

Chairs: 18 in. wide, 21 in. deep and 39 in. high.

MATERIALS

Table: pear, maple, curly sycamore veneer and rosewood.

Chairs: pear, rosewood and suede.

FINISH

Lacquer (tabletop) and shellac (table base and chairs).



Clean, contemporary lines. The author used cherry left over from another project, along with two kinds of maple, to build this simple design. The basic rectilinear shape is softened with subtle curves.

Contemporary Cherry Credenza

BY JAMES PROBST

to take a break from my full-time, production furniture making, I sometimes need to design and build a piece just for the fun of it. That was the motivation for my credenza. I wanted a cabinet with curved sides, but I also wanted to keep the lines clean, subtle and uncluttered. I had some 8/4 cherry left over from a conference-table project and was able to get the curve I wanted for the sides by bandsawing it into one face of the stock.

SPECIFICATIONS

DIMENSIONS

42 in. wide, 20 in. deep and 30 in. high.

MATERIALS

Cherry, curly maple and hard maple.

FINISH

Tung oil and urethane mixture and paste wax.

I wanted the curve to carry itself around the piece, so I added a cove cut to the underside of the ends of the top. In my drawings for the piece, I continued this detail by sketching a curve to the bottom of the lower rail. However, the final line of the curve was ultimately dictated by the grain of the wood I used. The door pulls are made from the wane of the curly maple boards from the door panels. The pull faces have a pebble-like texture, which I felt added a nice contrast to the smooth finish of the rest of the cabinet. The inspiration for their shape came from butterfly wings. I repeated the shape in the cutouts for the drawer pulls inside. The use of the curly maple for the door panels, while adding visual contrast to the piece, also tended to emphasize the perimeter lines of the cabinet. ■



Details complement each other. This cabinet uses curves on the case's sides, the bottom rail and the edge of the top and also in the butterfly-wing shapes of the door and drawer pulls.

A Windsor the old way. The author's interpretation of English Windsors attempts to capture the character that distinguishes them from their often more graceful American offspring.



English-Style Windsor

BY DREW LANGSNER

Over the dozen years that I have been making American-style Windsors I have occasionally come across photos of English Windsors. Compared to their American counterparts, I thought these chairs looked stiff and awkward. In fact, when I went to England two years ago, I was a bit nervous about how to interact politely with the chair-makers I would meet there. I shouldn't have worried. As I traveled, I found that traditional English Windsor (and post-and-rung) chairs often looked far better in the round than they appeared in photos. And while English Windsors may often be less graceful than their American counterparts, they tend to have more individual character. I fell in love with them.

This chair is my interpretation of an early 19th-century English Windsor known as a low-back or double bow-back. It contains many elements that are typical of English Windsors: the turning pattern, the central back splat, the crinoline stretcher system, the heavy sculpted bows without hand holds, the curved arm posts and the elm seat. I departed from English tradition when I through-mortised and wedged all the back spindles. And my chair has greater back-bow and leg rake than most English Windsors, although the angles I used are not without precedent. The center splats on most English Windsors are decorated with fretwork motifs, but plain splats like mine are found on some old English Windsors.

This was the most challenging chair I have made. The straight spindles of English Windsors require careful align-



Some stretcher. The crinoline stretcher system is fairly common on English Windsors. Here the turned elements are cherry, the bent one is red oak.

ment of both bows with the back of the seat. And the facets on the back bow are twisted, to offer a flat plane for mortising the splat and to increase comfort. I had to make two of these before I caught on to the subtle shape. Saddling the elm seat was also a challenge. Elm is really tough; but the vibrant grain pattern and strength of the seat make the effort worthwhile. ■

SPECIFICATIONS

DIMENSIONS

25 in. wide, 21¾ in. deep and 37½ in. high.

MATERIALS

Red oak, black cherry and elm.

FINISH

Aniline dye, oil and varnish blend and paste wax.

East-West Armoire

BY NORM LARSON



Nepal meets New England. The inspiration for this armoire came in part from the author's travels to Asia, which can be seen in the legs and the hardware.

One of the benefits of running a one-man cabinet shop is having the freedom to travel, and during my travels I've noticed the worldwide use of the armoire. From a hotel room in the Alps, to a teahouse in Nepal, to a gaucho's home in Patagonia, people live with these movable closets. For many years I've longed to build an armoire, and though a customer for one never appeared, I built one anyway—for myself.

The design came to me one morning while lying in bed, looking at my clothes spread out all over the room—in the closet, in the dresser, in boxes. How ideal it would be if they were all in one central spot, I thought. I got up and started sketching while drinking a cup of tea.

Inspired by a trip to Nepal, I wanted to include some Asian elements. But I also wanted it to be simple, not too loud or ornate: Shaker-like. After a few



Door pulls are antiqued brass. These drop pulls, along with the drawer pulls on the inside of the cabinet, have been antiqued in an acid solution to darken the brass.

sketches, however, I realized a true Shaker cabinet was too stark and rectangular for my tastes. I added a curve to the top, which helped some, and then raised the cabinet off the floor with legs similar to a design I had seen in a book of Japanese furniture.

I decided to put drawers on the outside, as well as inside, to give the bottom visual weight and because I don't

like to have to open the doors to get to all the drawers. The hardware is another combination of East and West. The lower drawer pulls are reproductions of Japanese *tansu* hardware, while the knobs on the interior drawers and the drop pulls on the doors are traditional European designs from the 18th and 19th centuries. (For more on the hardware, see *The Finish Line*, p. 14.)

I had been saving cherry planks for a few years, just waiting for something special. One of the planks—16 inches wide—I had used as a bench for more than one Thanksgiving dinner. I finally built this piece during one long Wyoming winter, working in my free time and only when I was inspired. By the end I felt this armoire reflected more of my own style than anything I had ever built for someone else. It was a joy to create something from the memories of my travels. ■



Drawers inside and out. The piece was designed with drawers on the outside, so the doors don't have to be opened to get to storage space. The inside drawers are ash.

SPECIFICATIONS

DIMENSIONS

46 in. wide, 21 in. deep and 77 in. high.

MATERIALS

Cherry, cherry veneer, ash and brass.

FINISH

Oil.



Curves inside curves. Behind the slant top of this bombe desk, very careful use of the figure in the grain—both horizontal and vertical—accentuates the curves of the inside drawers and the details of the desk's pigeonholes.

Reproduction Bombé Desk

BY JONATHAN MCLEAN

as a professional furniture maker, I might wait my entire life for that perfect commission. In the meantime, I try to build one or two pieces a year that I wouldn't mind keeping—even though they will always be for sale. The bombé desk is one of these.

My inspiration for this desk came from a picture in a furniture book. Although the maker was not known, the desk was referred to as the Brinley desk (circa 1770) because of an inscription on one of the lopers suggesting that it belonged to Edward Brinley of Weston, Massachusetts. The piece now resides in the Winterthur Museum in Delaware and is considered to be one of the most highly developed examples of the bombé form. Of the more than 50 original bombé desks that still exist, all were made in or around Boston.

Given that this piece is one of the most complicated I could undertake, a full-scale drawing was appropriate. After scaling the photograph and looking at some other examples of slant-front desks, I decided to make some changes. First, I found that most of the writing surfaces were about 34 inches high and I wanted to lower that if at all possible. I eventually reduced the height of the feet to get the writing surface down to 32 $\frac{3}{8}$ inches.

The next consideration was the lumber. I found a great piece of 12/4 mahogany for the sides and drawer fronts. It was 29 inches wide and more



Slant top over a swelled front. This reproduction of an 18th-century Massachusetts desk with a serpentine front was altered from the original to lower the writing surface height.

than 9 feet long. This helped determine the dimensions of the desk. It ended up being about an inch narrower than the Brinley desk. I also chose to have the center of the drawers protrude $\frac{1}{4}$ inch farther than the sides. These two changes accentuated the serpentine shape of this reproduction bombé desk. ■

SPECIFICATIONS

DIMENSIONS

37 $\frac{1}{2}$ in. long, 20 in. wide and 43 $\frac{1}{2}$ in. high.

MATERIALS

Mahogany, poplar and brass.

FINISH

French polish over linseed oil.



Not a reproduction. Charles and Henry Greene, whose work inspired this table, never designed a backgammon table, but the author used their through-tenon pegged joinery, double-lift aprons and overall look in his mahogany game table.

Greene and Greene Backgammon Table

BY NORBERT HEINOLD

after visiting the Gamble House in Pasadena, California, several times, I got hooked on the designs of architects Charles and Henry Greene and the materials they used.

The detailing of every piece and the craftsmanship of the construction were impressive. I especially liked the way the Greenses designed drawer runners with dovetailed ebony frames screwed onto the top of the drawer. It is unusual but beautiful and practical.

On my Greene and Greene-inspired game table, my choice of mahogany for the framework and drawers was influenced by the wood the Greenses used for their special-occasion furniture and also by the warmth and richness of a glossy mahogany finish.

I also copied a Greene and Greene design element by using a double-lifted shape on all horizontal pieces, which makes the pieces appear light and slender. The table required two drawers to store the game pieces—15 black pieces in ebony, 15 red pieces in amboyna burl, two pair of dice and a doubling cube. On each of the two opposite sides that contain the drawers, there is another drawer with a high bottom to hold a glass or an ashtray. The drawers are interchangeable to fit right- or left-handed players.

After using the table, I had the feeling that losing a game on it was not important, because just playing and using it was a joy. Even though the table is not for sale, people have asked to buy it. Now, after studying more Greene and Greene furniture, I can't wait to design and build another one-of-a-kind piece to match my game table. ■



Drawers with a difference. Two opposite sides of the table have two interchangeable drawers: one for game pieces (seen here) and one with a high bottom for a drink glass or an ashtray.

SPECIFICATIONS

DIMENSIONS

32 in. square and 29 in. high.

MATERIALS

Table: mahogany, ebony and tulip with pear and ebony veneers.

Game pieces: ebony and amboyna.

Dice: ebony, amboyna and brass.

FINISH

Ammonia-based stain and polyurethane lacquer.

China Cabinet in Honduras Mahogany

BY ROBERT LASSO AND JIM BUDLONG

this cabinet was designed around a beautiful collection of china—a family heirloom. The china was unusual, and so was the way in which the commission came about—the top and the

bottom were designed and made separately, nine years apart.

Robert Lasso first designed and built the upper half specifically for this collection of china. The objective was to display all of the pieces in the best way possible, and to use somewhat Asian lines in the shape of the case. The large central door frames the platter and bowl and the 12 smaller bowls are supported by shelf-like frames. Solid

shelves would have created dark shadows on the bowls. The frames, on the other hand, allow plenty of natural light into the cabinet. To keep the higher bowls from screening those below, the bowls gradually recede into

the case from bottom to top. The latticework in the doors also helps frame the objects within.

Due to unforeseen circumstances, the bottom of the cabinet was put on hold. When the time came to finish the piece, Jim Budlong, a woodworking instructor at the College of the Redwoods in Fort Bragg, California, was called upon to make the base. He composed a design meant to complement the earlier work, with slightly curved lines in the base to balance the upward sweep of the top. ■



Grids supplant shelves. The bowls rest on grids which recede from bottom to top, so they do not overlap each other. The grids, rather than solid shelves, allow more natural light into the cabinet.

SPECIFICATIONS

DIMENSIONS

49 in. wide, 15¼ in. deep and 66¼ in. high.

MATERIALS

Honduras mahogany and rosewood.

FINISH

Oil.

A collaborative cabinet. Two craftsmen each built half of this china cabinet nine years apart. The china collection is a family heirloom.



Style Sprung from Structure

Glueless joinery generates
an attractive design

BY JOHN NESSET



Locked up tight. The author's coffee table gets its look from a series of keys and half-lap joints that require no glue. The rails work against each other to hold the table as stable as conventional joinery.

at Sage Creek Campground in the South Dakota Badlands there's no shade, no water, a merciless sun, an outhouse for a bathroom, black flies, rattlesnakes and an occasional herd of buffalo. Nevertheless a dream of mine has always been to pitch a tent there for three or four weeks of uninterrupted writing, reading and hiking. Besides water, a necessity would be a serviceable field table. One stressful night when the primitive solitude of Sage Creek seemed particularly alluring, I lay staring up in the dark, hands clasped behind my head and engineered a simple knockdown table using interlocking members.

To date a retreat at Sage Creek remains a dream. But I made a prototype of the table, and realized that it was widely adaptable, whether as an end table, a writing table or a dining table. Two later evolutions—a side table in pecan and a Norwegian coffee table in silver maple—mark distinct steps in the evolution of this system of joints that not only represents a unique and sophisticated structural design but also results in a beautiful aesthetic design.

The table was to involve 10 members of equal cross-sectional dimension—four legs, two long rails, two short rails and two interior rails—and a top. It was to be assembled in a fixed sequence of interlocking joints, in the manner of a Japanese puzzle. First the short rails would engage the legs. Then the long rails would clamp onto the short rails and slide into the legs, locking the short rails. Finally the interior rails would lap onto the long rails and draw them securely into the legs, locking the system. Attachment of the top to the leg tops was to offer one last



A higher form. The table is 25 inches high, standard for traditional Norwegian coffee tables, but about 8 inches higher than most American coffee tables. The shelf slides out to double as a serving tray.



Fooling the eye.
Nesset tapered the top, legs and rails to keep the table from appearing too blocky and also to give it a comfortable feel appropriate for a coffee gathering.

measure of stability.

The joints, which interlock and hold without reliance on screws or glue, serve like interlaced fingers to project a sense of security. Because the rails extend well beyond the joint and because the joints are partial and not full lap joints, the joinery affirms the independence of each member. For me, the structure was an intriguing metaphor of human interrelationship.

THE COFFEE TABLE

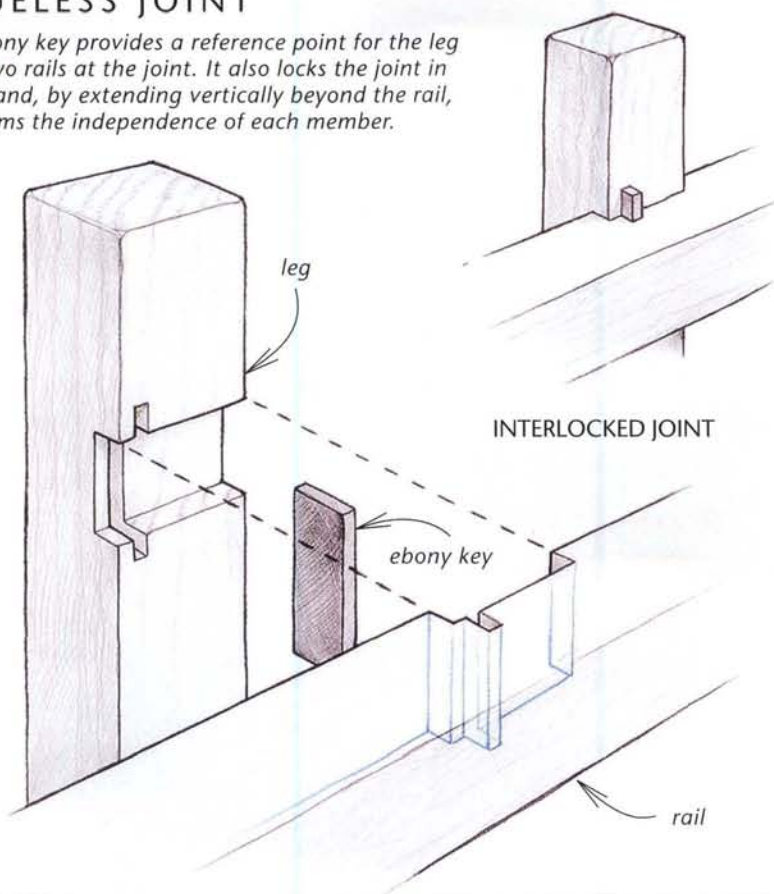
The Greeks knew long ago that with a rectilinear form in particular you have to manipulate the lines to make the overall form appear straight. The legs of the first version of the table (see the story on the facing page) flare slightly, and the top tapers toward each corner. But during construction I was drawn to the possibilities of a more thorough sculpturing of the elements. I was given another chance by a couple who had recently visited Norway. They were charmed by that country's coffee tables, which stand about 25 inches high compared to about 17 inches in America, and they commissioned me to build one in the format of my earlier table. The idea of casual intimacy implied in a gathering for coffee seemed to me a particularly suitable application of the independent but interlocking members. I felt that relaxing the rectilinear form by drooping the elements might give it a comfortable ease that could suit a gathering for coffee.

JOINTS MUST BE TIGHT

The joints of any of these tables need to be cut with a high degree of precision—not only to keep them tight but also to keep the basic geometry square. For the other tables the stock was square, so marking it was straightforward. But for this table I envisioned members having no straight lines or flat surfaces, which made some definite point of reference a necessity. Several ideas came to mind. I settled on eliminating the internal tongue used in

THE KEY TO THE GLUELESS JOINT

An ebony key provides a reference point for the leg and two rails at the joint. It also locks the joint in place and, by extending vertically beyond the rail, it affirms the independence of each member.





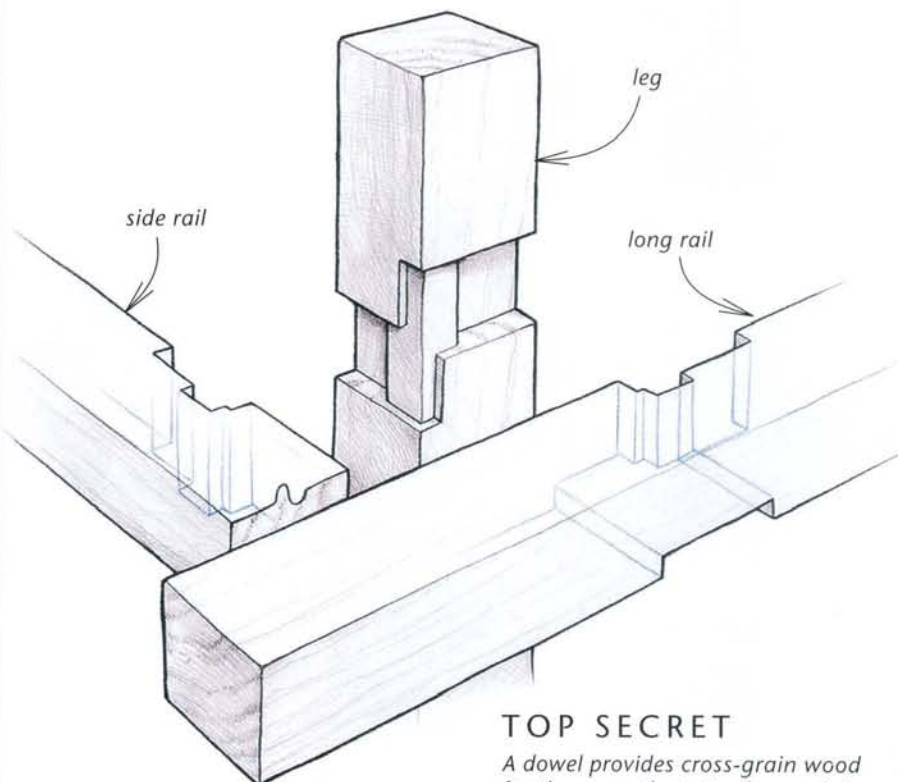
The First Attempt, A Pecan Side Table

The first version of the glueless joinery system was on a pecan side table that I called a torii table because it vaguely resembled the torii gates that lead to Shinto shrines. The legs flared slightly and the top tapered toward each corner. Like the later coffee table, its leg-and-rail construction resembled a puzzle. On the torii table, however, to resolve a potential problem of the lap joints loosening in the dry humidity of winter, I incorporated an internal tongue. On the coffee table, I changed the fixed tongues to external locking keys. Cutting all the joints a hair undersized so that they had to be drawn together gave a final measure of assurance. On the torii table, the shelf that slides between the interior rails can be used for an atlas or dictionary. For this table I developed a plate-and-screw system. A dowel was passed horizontally through each leg top to provide side-grain purchase for a long screw passed down through the plates vertically into the legs and through the horizontal dowels, securing the plates to the tops of the legs. Each plate was mortised into the underside of the tabletop and secured with four screws.

—J. N.

A THREE-PIECE GLUELESS JOINT

This pecan side table, the author's first table with glueless joinery, incorporated an internal tongue to insure extra stability in a joint that traditionally would be stabilized by glue. The half-lap joints must be very tight.

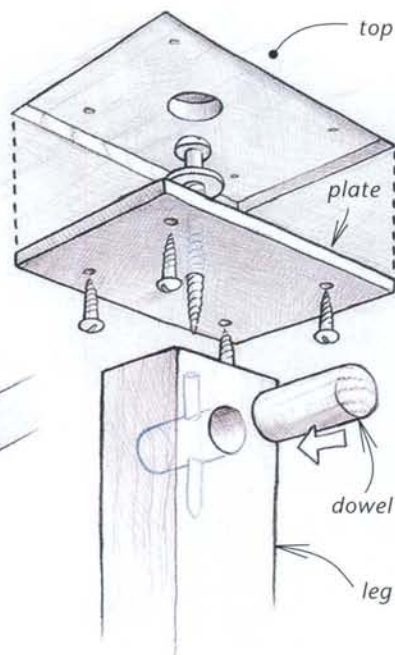
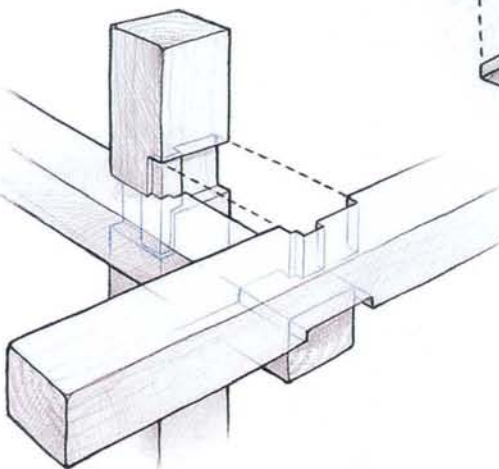


TOP SECRET

A dowel provides cross-grain wood for the screw that attaches a plate to the leg. The unit is then screwed to the underside of the tabletop.

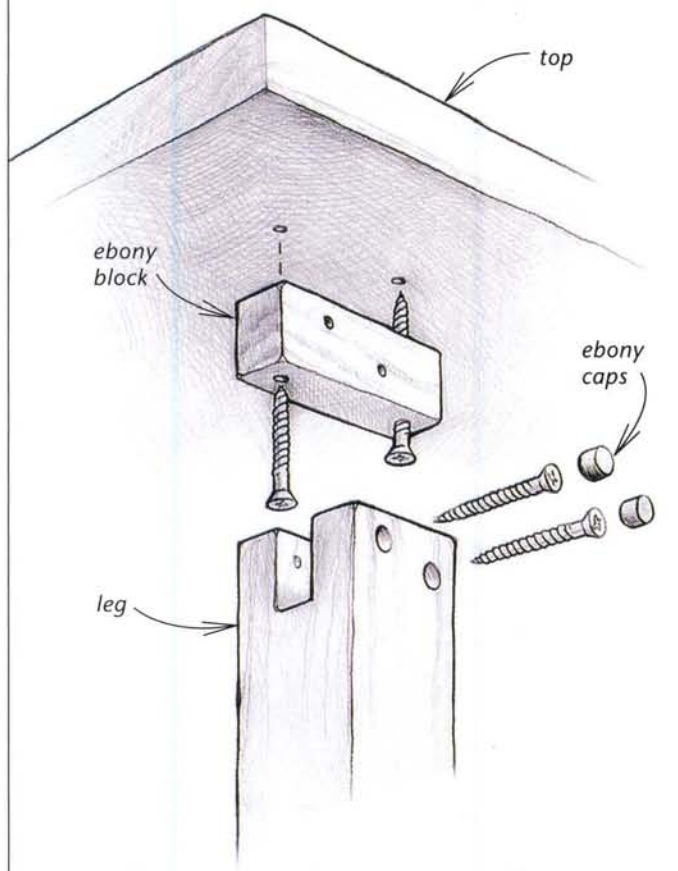
LIKE A PUZZLE

The joints must be cut in order and then assembled in sequence: side rails attach to legs, then long rails slide onto the first assemblage.

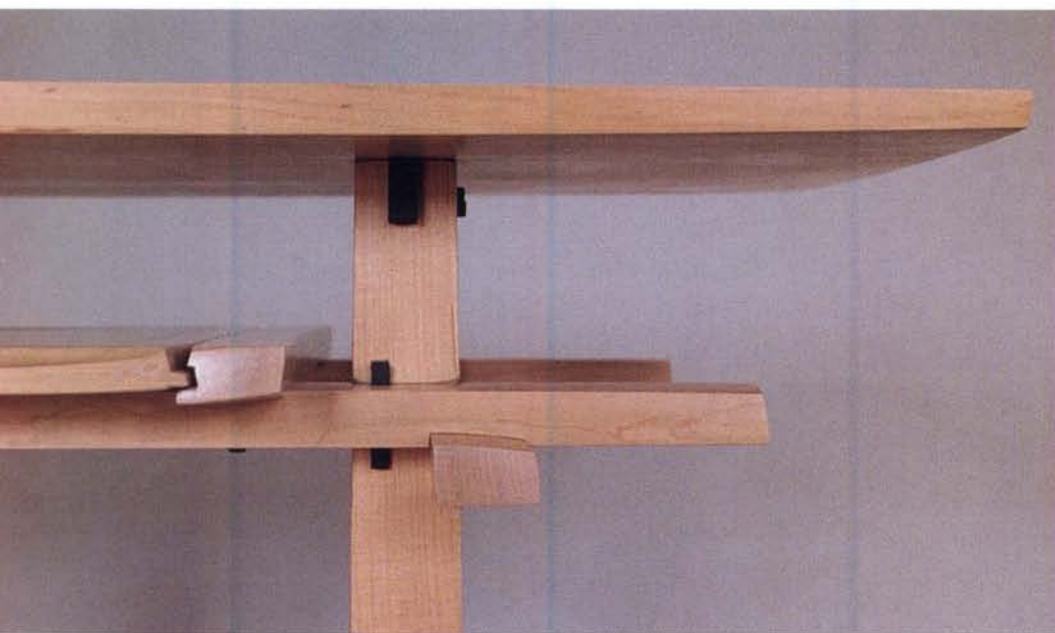


TOPPING OFF A FINE TABLE

An ebony block screwed to the underside of the tabletop slips into a bridle joint cut in the top of the leg. It is held in place by two screws, covered by ebony caps.



The leg bone connected to the ...
The table has 10 interlocking elements. Two short rails engage the legs, then long rails clamp onto the short rails and slide onto the legs. Interior rails lap onto the long rails, locking the structure together.



the earlier table and introducing an external locking key in its place. Besides providing a reference point, the external keys would also underscore the idea of openness and forthrightness by revealing the mechanics of the joint.

Once the keys had fixed the geometry, the members were sculptured and the joints cut. This work had to be carried out in a set sequence so that each joint could be marked accurately off the other. First I sculptured the short rails. Then they were held in position by the keys to mark the slots to be cut in the legs. Once those were cut the legs were sculptured. After that the laps in the short rails were marked off from the legs and cut.

By very gently curving at least one side of several "straight" elements, I not only helped them appear straight to the eye but also gave them a subtle buoyancy. The top was sculptured on the underside to sweep delicately upward at the corners, while the rails were made to sweep downward and outward and the legs to toe out slightly. Except for the tabletop, all surfaces including the end-grain surfaces were rounded. The overall idea was to give a look that evoked a sense of dependable and comfortable openness.

Without the usual surface-to-surface tabletop attachment made possible by the traditional apron, some other workable system had to be improvised for attaching the top. With the coffee table I employed an ebony block and a bridle joint. The block was screwed to the top. A bridle joint was then cut in the leg top and slid onto the block, concealing the screws. Screws introduced from the side secured the leg to the block. Ebony caps then concealed the screws. Both allowed the top to float lightly on the leg tops.

INTERIOR RAILS PROVIDE STABILITY AND SHELF SPACE

The lap joints of the interior rails are cut slightly short so that the tension holds the long rails toward each other and solidly in place. They are then se-



A broad social range. Despite its Norwegian heritage, the table's vaguely Japanese look helps it look natural in an informal family room as well as a more formal living room.

Double-duty shelf.

The shelf that sits between the interior rails slides out and turns over to work overtime as a tray for coffee pot and cups.

cured from underneath with screws, which are, in the case of the coffee table, capped with ebony. Of course a version of the table is possible that does away with interior rails. But the interior rails can double as guides for a drawer or a shelf, as in both the torii table and the coffee table.

In the torii table the shelf pulls out three-quarters and keeps an atlas handy. In the coffee table it comes out entirely and, turned over, becomes a serving tray. The guides for the shelf flare open to make replacing the tray easy. The flat concave arc cut in each end of the shelf restates the "droop" of the rails, but in reverse. It also reiterates the upward sweep of the underside of the top. And when the shelf is removed and turned upside down for use as a tray, the two arcs become handles.



THE NEXT GENERATION

Launching new concepts always seems traumatic—even amid the excitement. While I've tended to feel comfortable with the torii table, the look of the coffee table, in particular the heaviness of the legs and the bunching of activity along the edge of

the shelf, gave me misgivings for awhile. But I've grown very fond of it. My clients are delighted. Yet to my mind the most forthright and consequently more eloquent realization of this table would employ interlocking joints throughout. And one doing just that, though with an entirely different

look, is currently in process. It's perhaps a response in spirit to the frank allure of Sage Creek.

Someday I may even build that field table, load up on water, and go. ■

John Nasset designs and makes furniture in Minneapolis, Minn.



Catering to a client. Fleming's desk, a composition of linked but separate components, is an expression of his client's needs as well as of his own aesthetic.

Expressive Desk

A desk that articulates the problems it solves

BY PETER FLEMING

*d*esigning a successful piece of furniture consists primarily of three steps: asking the right questions, listening to the answers and solving the problems those answers raise. These steps are critical, yet often overlooked. Because much of what we remember about furniture is visual, we tend to forget that designing furniture is mostly engineering. Yet this is the role the designer/maker fills best—responding to a problem with a full understanding of both the needs of the client and the nature of the materials. This desk is an example of my method of answering the questions raised by a commission.

DIFFERENT TASKS, DIFFERENT TABLES

For years my client, the principal of a graphic design firm, had used a modified drafting table as a work desk. When he decided to reorganize his working environment, we met at his office and he provided me with a series of functional requirements specific to his field, along with an overview of the positive and negative aspects of the way he used his current desk.

The first thing he mentioned was that he liked to stand at his desk; that left him flexible to come and go. He did four main types of work at the desk: viewing transparencies; using a computer; sketching and writing notes by hand; and talking on the phone. He liked the way his drafting table kept everything within arm's length, but he was often frustrated by the clutter. I set out to make a desk that provided the optimal surface for each of these activities.

I decided to isolate each task to its own surface. There would be three separate work surfaces: a desk for the computer and telephone with space for other desktop accessories; a light box for viewing slides, built into the top of a drawer unit; and an adjustable, inclined surface for freehand

sketching and note taking (as used by an employee of my client's firm in the photo at left).

In my early sketches I had the three surfaces roughly the same size and linked in a straight line. As I worked through the idea in conceptual sketches, I decided it would be preferable to enlarge the computer surface and angle it toward the center of the desk. I hoped this would create a sweet spot where it felt best to stand and make it easy to reach all three surfaces without moving.

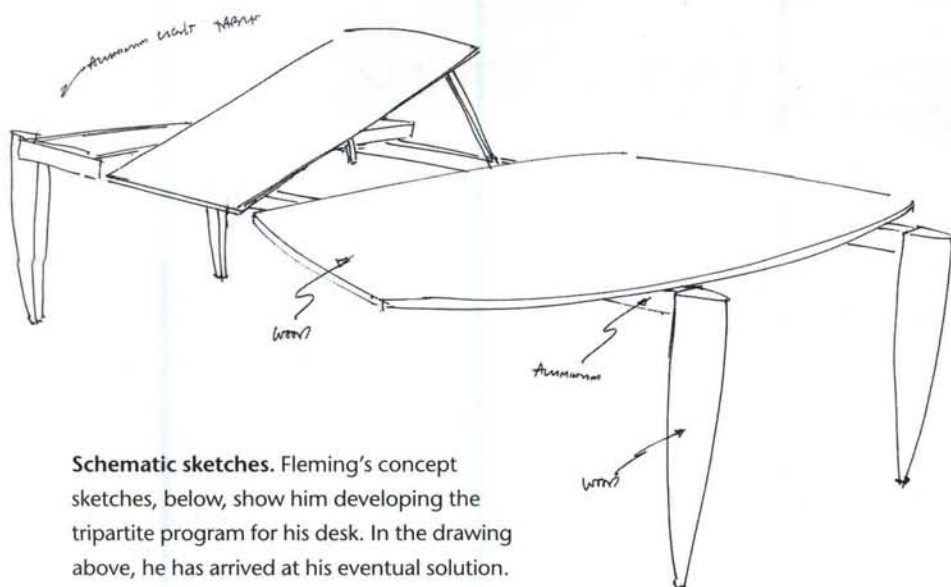
Enlarging the computer surface was partly a matter of symmetry: I wanted a large surface to help balance the visual weight of the block of drawers on the other side of the desk. But it was also practical. Although I built the desk at a height comfortable to use while standing, I wanted to leave open space beneath the writing surfaces so that there

would be knee room if the desk were used with a high stool. I made the sketching surface adjustable so it could be fixed in any position from horizontal to vertical.

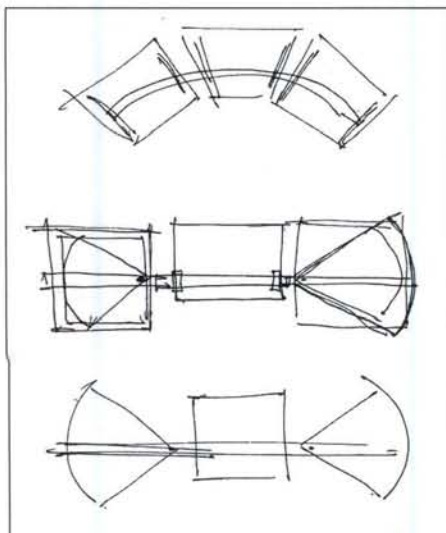
MIXING MATERIALS

I often make furniture using different materials for different parts. I might make a chest of drawers, for instance, with a slate top, a wooden drawer case and metal legs. I like de-





Schematic sketches. Fleming's concept sketches, below, show him developing the tripartite program for his desk. In the drawing above, he has arrived at his eventual solution.



Sheets and solids. Fleming used cherry-veneered plywood to make thin, tray-like writing surfaces (above right) to contrast with the shaped legs and tubular aluminum rails.

Warm and cool composition. Cool, hard anodized aluminum plays off against the softer, warmer touch of cherry.



lineating the various elements this way, but it's important that they don't cause confusion. You want them to look like independent parts working together to form a whole.

In selecting materials I consider how durable a surface needs to be, how strong it has to be, and what shape it will be. And of course choosing materials always has visual consequences. For this desk, I chose to contrast cherry and aluminum. The two materials are worlds apart, and yet I think they work well together. Aluminum is hard and cold but immensely strong and light. In the off-the-rack shapes I buy, it is all planes and right angles. Cherry, on the other hand, is organic, soft, warm in color and to the touch. And it is easily shaped to curving forms.

I chose to delineate the three main components of leg, apron and surface. The cherry legs are curved and tapered in elevation and bullnosed in plan to soften their angularity; they give the desk a delicate and insect-like presence.

The apron is fabricated from hollow anodized aluminum rails that introduced strong straight horizontal lines and also enabled me to run cable through to a power bar at the back, reducing the inevitable wire clutter. The rails in turn support the two desk surfaces and the light table. I used veneered plywood for the sketching and computer surfaces to emphasize the sense that they are just that—surfaces, thin plates. If I could have gotten away with making them an eighth of an inch thick, I would have.

JOINING THE PARTS

The marriage of opposite materials, while solving one problem by using appropriate materials for a given role, creates its own set of difficulties. It is challenging to find suitable and elegant ways to join dissimilar materials. And often the parts must be finished separately and then joined at final assembly. Mechanical fasteners are often the easiest



Where metal meets wood. Fixing wood to metal requires creativity. Fleming used a wooden tenon to join the leg to the rail, gluing it into the leg and screwing it in place inside the rail.

To every task a surface. Each of the three top surfaces was designed to serve a specific function: computer work, freehand sketching, viewing slides.

way to join metal and wood, but they are often inelegant. Glues are not a good long-term solution for joining wood and metal because the materials' differing rates of expansion will often lead to glue failure. This forces me to look for other means, and as a result, many of my decisions about the form of a piece flow from the dictates of joinery.

In this case, I used maple blocks to attach the legs to the aluminum rails. I mortised one end of each block into the legs near the top and glued it, and slid the other end inside the aluminum tubing and secured it with stainless-steel machine screws. I felt this solution was durable and in keeping with the simple aesthetic of the piece. It also allowed the easy removal of the leg for refinishing or alteration.

CUSTOM-MADE FOR MORE CUSTOMERS

Although this desk reflects one person's specific needs, I deliberately built flexibility into it. All of the surface ele-

ments of the desk were simply screwed to the rails, enabling the owner to change the relationship of the parts should the need arise, to suit new technology or a left-handed user.

I intended the piece to be a prototype for further production, so I intentionally eliminated some details that, although seductive in a one-of-a-kind piece, might prove too costly to reproduce in a batch run. I had considered, for instance, making a drawer case with a front that bowed out asymmetrically to play off the curve of the computer surface.

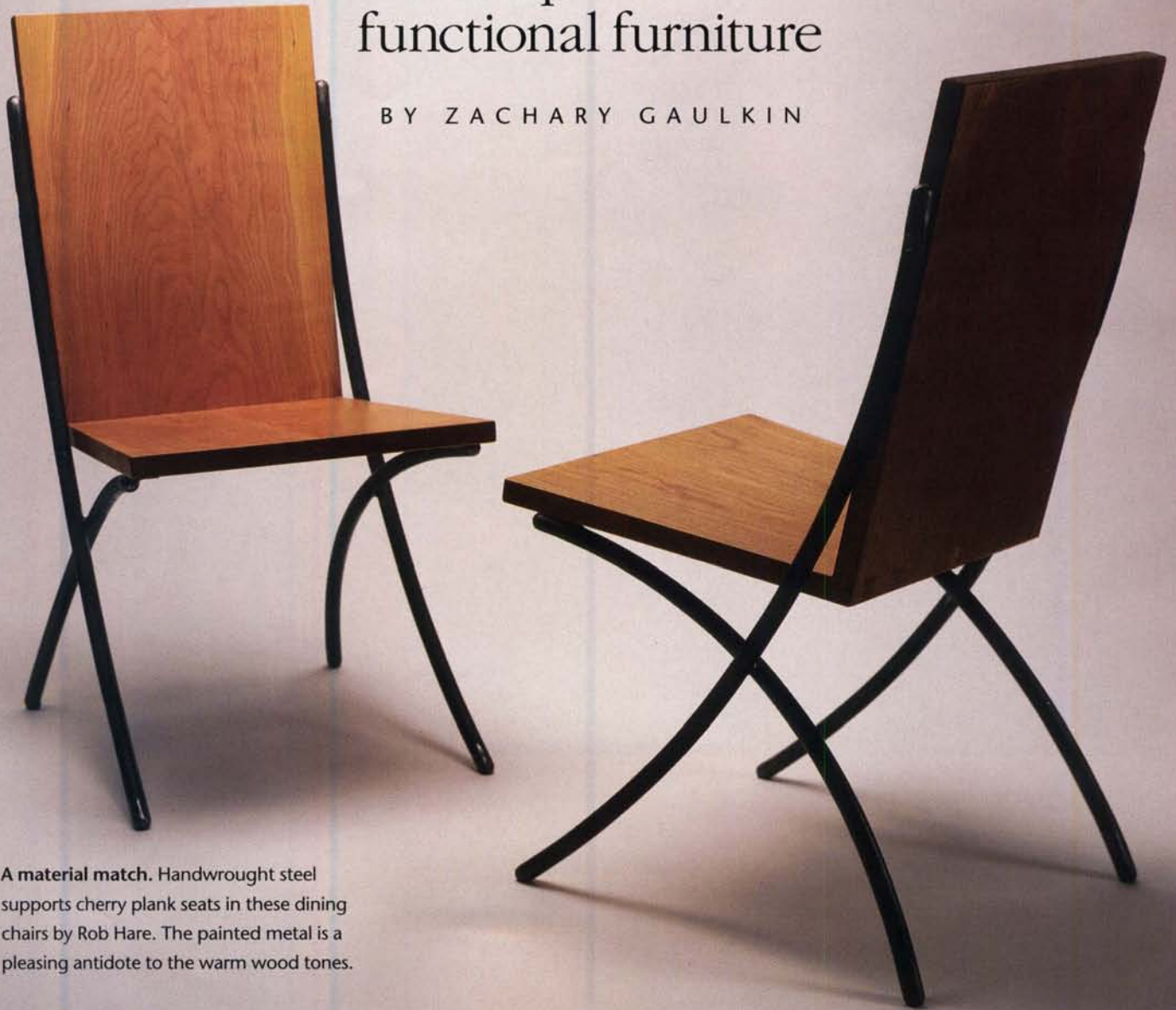
With its loosely linked components, this design could be modified to make desks for other purposes, meeting tables or a whole range of alternate work stations, and so create a line of furniture without changing the basic format. ■

Peter Fleming teaches design and makes furniture in Toronto, Canada.

Pairing Wood and Metal

A sculptor crafts
functional furniture

BY ZACHARY GAULKIN



A material match. Handwrought steel supports cherry plank seats in these dining chairs by Rob Hare. The painted metal is a pleasing antidote to the warm wood tones.

the floor of Rob Hare's studio in New York's Hudson River valley reveals much about the work of this sculptor-turned-furniture maker. Half the floor is concrete and looks like the well-equipped shop of a craftsman in wood. Toward the back of the studio

the concrete abruptly stops, the ceiling opens up to the second story and the floor turns into a darkly inviting gravel pit with the acrid scent of burnt metal hanging in the air.

The concrete and the gravel represent two discrete worlds, one of wood

and the other of metal. The character and properties of these two materials differ in so many ways that few furniture makers attempt to master them both. Trained as an artist and sculptor, Hare didn't stop to think whether he could be as deft with a chisel as he was

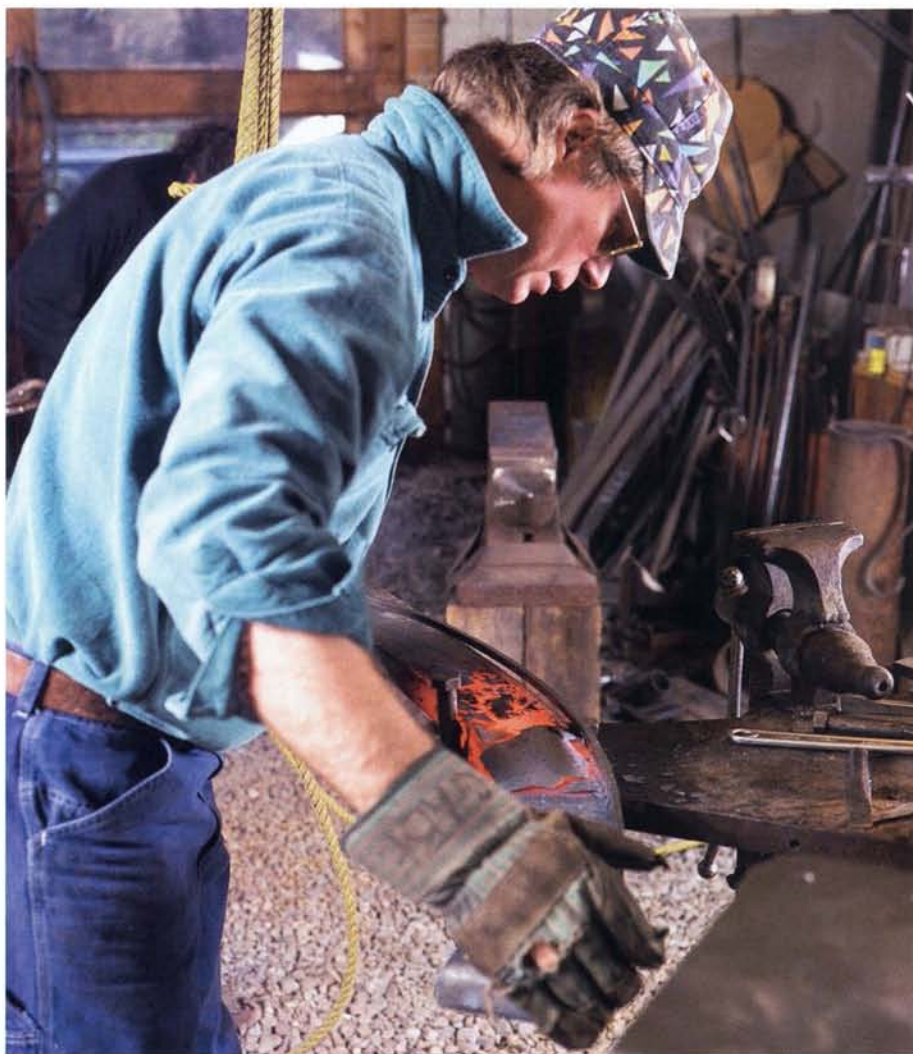
with a cutting torch. He moves around his studio as if it were a single universe. "It never occurred to me that I couldn't do both," he says.

MOVING BETWEEN MATERIALS

The divide in Hare's floor can be found more delicately in his furniture, which is almost always a combination of the two materials, displaying the distinct characteristics of each. His wood and wrought-steel sideboard (see the photos and drawing on the following page) is constructed as if it were a bridge, with steel supporting cherry shelves like girders holding up a roadway. The steel is heated, then bent, hammered and painted black. No attempt is made to hide the stark structure or to blur the connection between wood and metal. In this piece as in much of Hare's furniture it is the metal—the harder, more unyielding material—that contains the hand-hewn feel and the wood—softer and more organic—that often has a rigid, machined look. The result is a pleasing contrast, a partnership of materials rather than a competition.

The polar properties of wood and metal also extend to the craft of shaping them into functional furniture. For Hare, wood poses much more of a challenge. Its tendency to twist and warp long after its roots have been cut seems frustrating compared to metal which, once shaped, remains that way. "They have different natures. There's no getting around that," Hare says. "Metal is much more malleable than wood and problems, if they occur, happen when you are working on it. Wood's problems occur much later."

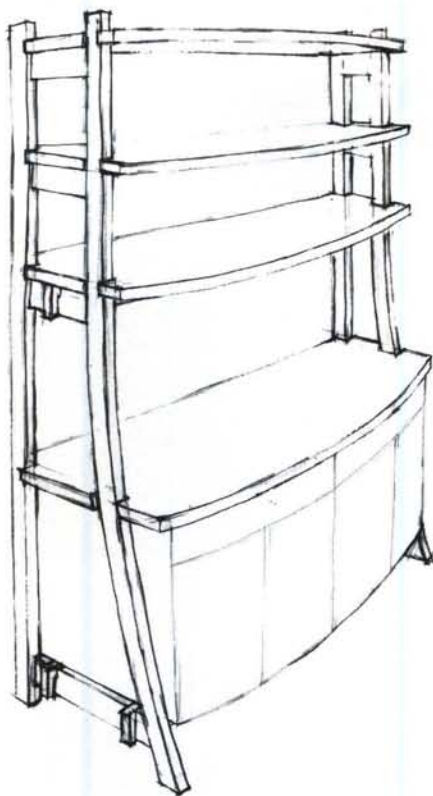
The two materials also require different "energy levels," he says. Working metal, which usually means heating it up in some way to shape it, cut it or weld it together, is "a bit more hectic than wood." It is more backbreaking, too. On a recent afternoon, Hare was toiling away in his gravel pit in order to make curved legs out of a 16-foot steel bar which was dangling by a chain



A foot in two worlds. Hare, shown here in his welder's cap checking the curve in a hot steel bar, moves with ease from woodshop to forge.



Craft for the street. In these wrought-steel and bronze entry doors to the Hotel des Artistes in Manhattan, Hare cast the foliage patterns from an original set of doors.



An artist builds from sketches. Trained in the fine arts, Hare sketches his furniture in perspective before building it.



Metal is malleable. In this sideboard, the metal is hammered by hand. The removable shelves and crosspieces interlock with the sides to keep the cabinet from racking.

Steel superstructure. The maple cabinet with solid cherry shelves is supported by a wrought-steel superstructure and acts as a divider in Hare's lofty dining room.

from the two-story ceiling. To create the arcs, the steel had to be heated in a forge in small sections and then bent around a form. Making one of the four legs took two people half a day of swinging the steel bar back and forth from forge to bench to anvil, where Hare hammered the piece flat before it cooled down. Woodworking, by contrast, "is much more contemplative, but I like going back and forth."

ART BEGINS WITH CRAFT

Hare's interest in making furniture began as art, but his training—like that of

the furniture maker—had always been rooted in the skills of the hand. He grew up in New England, surrounded by antique furniture, "a Connecticut mishmash" as he describes it. An early desire to make things was encouraged rather than extinguished, as is often the case, when Hare went to high school at a small alternative boarding school in the 1960s. There he learned valuable skills, such as metal casting, and he developed an interest in wood sculpture.

This foundation in craft was an asset later in art school and graduate school



at the University of Cincinnati, where Hare studied art and sculpture. All the time he was picking up more metal-working skills: blacksmithing, casting and a variety of welding techniques. After several teaching assignments and a stint as an industrial welder, Hare decided to open his own studio. He bought an abandoned brick boardinghouse in Kingston, New York, gutted it and built his home and studio. Gradually his sculpture took a backseat to furniture commissions and Hare forsook the art world for the more "realistic" (as he says) craft of furniture making.

FUNCTION IS FURNITURE'S PRIMARY ROLE

Although he comes from an art background, Hare draws a clear line between art and furniture. His sculptures—from tabletop pieces to large outdoor installations—are sometimes fluid, other times geometrical, but always abstract. In one series, he placed small sculpted objects—they look like large ingots—into exquisitely crafted traditional boxes, including one *trompe l'oeil* box made to look like a leather briefcase. The boxes, he says, are like the introduction to a story, a way to pique the curiosity, leading the viewer in with something familiar.

Furniture, Hare says, can work in the same way, as long as it serves a purpose. "With furniture, you can let the function of the piece be the opening paragraph," he says. "But you can still get an interesting emotional feel out of it."

Hare's furniture does seem to spring from pure utility, with the beauty of the handworked materials left to shoulder the decorative requirements. In the desk with the curved steel base (see the photos above right), the hammered steel seems to bend under the weight of a single, solid red oak plank. The plank is left perfectly intact except for notches where the base protrudes. "There's something wonderful about a



Decoration in the construction. The single plank of red oak used for the top of Hare's desk is interrupted by notches for part of the base to protrude. The grooves were left by the torch used to cut the metal.

Curves support the load. The base of this executive desk mimics Hare's chair design. The central steel trestle screens the person sitting behind it and pullout writing surfaces (shown here) hide drawers on the other side.



surface like that. You don't need to play with it much." The structure is simple, with the hammered joints and the ridges left by the cutting torch all visible. There is shape, but it serves the function; even the slightly flared metal joints give the appearance of compression under a load. "I've got no problem with a piece of furniture that looks like a beautiful piece of sculpture, but it's got to be functional. If it's not functional, it's not furniture and it's also not sculpture." ■

Zachary Gaulkin is an associate editor at Home Furniture.



A boardinghouse reclaimed. This building was abandoned and in sad repair when Hare bought it in the 1970s. He gutted the space, creating studio and living space separated by a central passageway.

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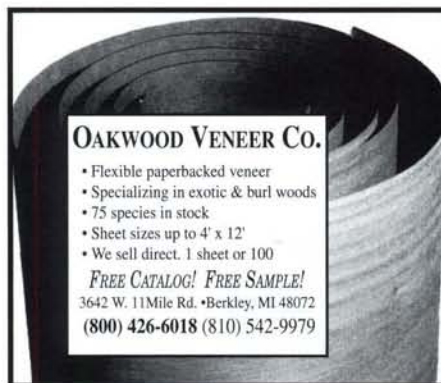
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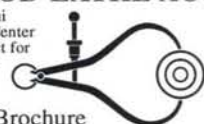
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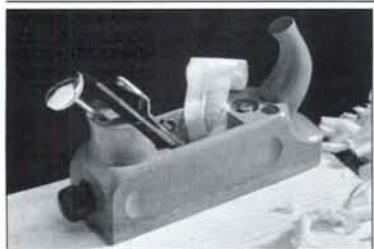
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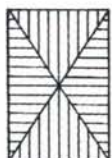
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how they did it

Some furniture makers in this issue have developed unusual or innovative techniques that are important to the success of their projects. *How They Did It* illustrates those techniques.



WOODEN NAILS FOR TRADITIONAL TANSU

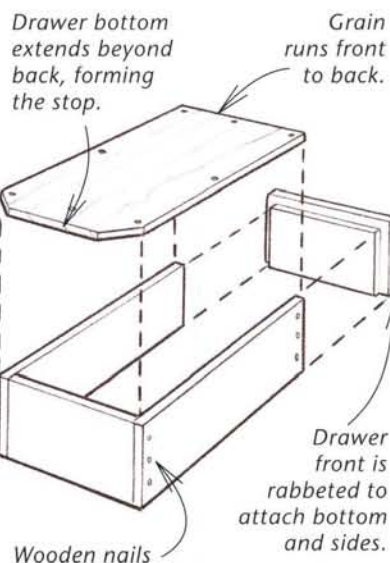
When I was designing a small tansu chest (*"Redwood Tansu Chest,"* p. 40) I wanted to give it an authentic look. I used recycled redwood from old wine casks, which has an aged, somewhat weather-beaten look to it, and the hardware was made by a friend using antique 16-penny nails, which I think captures the look and feel of the iron hardware used on many of these chests.

In keeping with this idea, I wanted to try the glueless joinery that, as I discovered in my research, was used on many original tansu. Rather than using glue to keep joints together, the craftsmen who built these fine pieces often used wooden nails to pin the joints. I wanted to try this method.

Although the Japanese used bamboo for their "nails," I used maple instead. I made tiny toothpick-sized maple nails to pin the drawers (see

A DRAWER WITHOUT GLUE

Toothpick-sized maple "nails" were used to mimic the bamboo used in original tansu chests.



the drawing above), the panel doors and the dovetailed case. I pre-drilled the holes and then cut the little nails off flush with the surface so all you can see is a tiny, light-colored dot. This may seem a crude way to put something together, but it works and the tiny nail heads, to my eye, add just the right amount of authenticity.

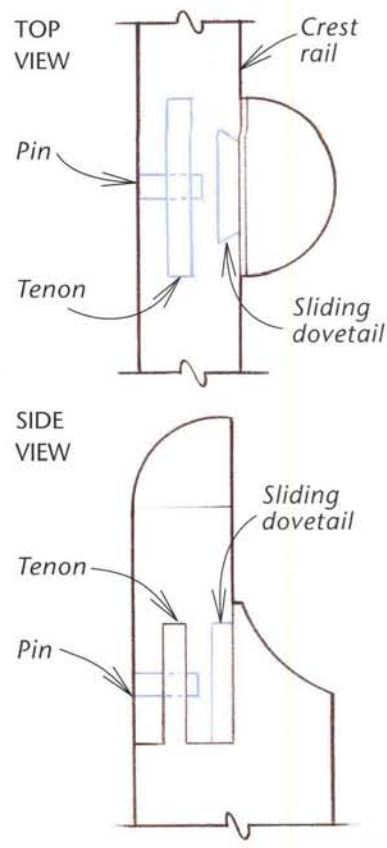
—Mark Walker

STRONG CHAIR JOINERY

Consider how many times you have picked up a chair by the back legs or leaned on a crest rail and you will understand why the joints holding a chair together are extremely important. Chairs take a lot of use and abuse and almost always require a full-scale drawing to plan them out. They also require a lot of careful fitting by hand, but the result, such as my ash chair (*"A Light, Strong Chair,"* p. 42), makes it worth the extra effort.

CREST RAIL JOINERY

Locking tenons and a hidden dovetail provide elegant strength.

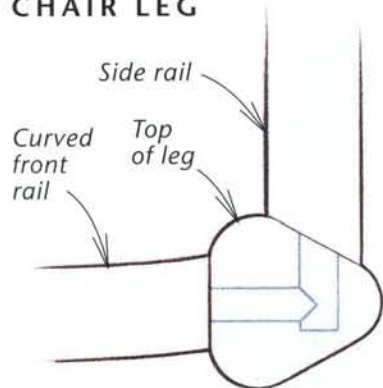


The connection between the crest rail and back legs required some interesting joinery (see the drawing above). Because the curving crest rail is perched atop the back legs and will absorb a great deal of stress, it was important to lock it securely in place. The joint I chose is actually a combination of two joints—a mortise-and-tenon and a sliding dovetail, both of which are angled in line with the splay of the back legs.

To strengthen the joint between the



TENONS LOCK IN CHAIR LEG



seat rail and the leg, I made the tenons interlock (see the drawing above). The straight side rails (which have angled shoulders to conform to the side of the legs) have a small V-groove in the tenon. The mating tenon on the curved front rail comes to a point and nestles into the V-groove, locking the side rails in place. The whole assembly is then reinforced by the woven seat, which ties all the parts together.

—Garrett Hack

INLAYING A BEAD ON A COMPOUND CURVE

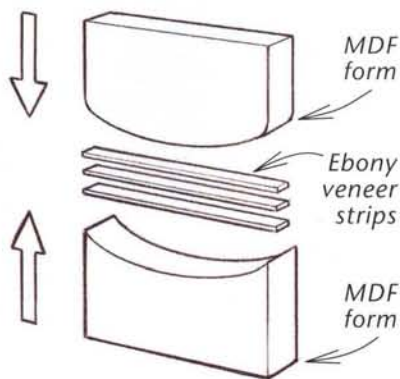
To make the inlaid beads along the skirt of my hall chest ("Two Bureaus Share a Shapely Leg," p. 36) I first laminated strips of ebony veneer. I made mating convex and concave forms from $\frac{3}{4}$ -inch medium-density fiberboard, and waxed the forms before gluing to avoid gluing them to the beads. I used the convex form as a template to rout a dado in the skirt. I bandsawed along one shoulder of the dado, making the skirt board scalloped and turning the dado into a rabbet; the corners where the beads intersect had to be chiseled out by hand. I glued the bead into the rabbet using the concave form as a clamping caul.

I shaped the apron and the bead after the bead was glued in place. I used a scratch stock to shape the bead and a spokeshave, rasps and files to shape the apron to the curves I wanted.

—Peter Shepard

CURVED BEADS FROM VENEER

Strips of ebony veneer are glued up between curved forms to form the skirt beads.



SHAPING A RUFFLED SKIRT

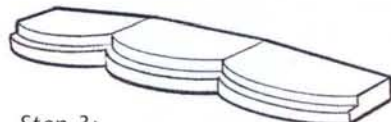
Shepard makes the compound curved skirt of his hall chest in several stages using a mix of hand and power tools. He makes the rabbet for the bead while he still has flat surfaces for the router to ride on.



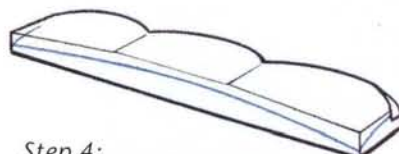
Step 1:
Cut ramps on either end of a block of maple.



Step 2:
Using the bead-gluing forms as a template, pattern-rout dados in the three faces of the skirt block.



Step 3:
Bandsaw away wood to the bottom shoulder of the dado, creating a rabbet; clean up inside corners with a chisel.



Step 4:
Hand shape to match bowfront of chest; use scratch stock to round over top of bead.

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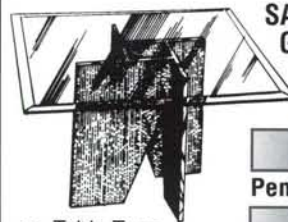
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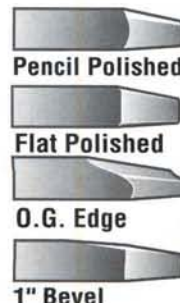
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AMERICAN ELM

They are mostly gone now, the beautiful, towering, vase-like elms that lent dignity and grace to so many city streets and country byways. In Colonial New England the American elm took root and thrived along Main Street and Elm Street and at resting places along stagecoach trails where weary travellers blessed their shade. The lopsided, toothed leaves danced in the sunlight 125 feet above the earth and the solid, slightly buttressed, many-forked trunks often grew to proud six- to 10-foot girths. Some grew much larger.

One elm in Avon, New York was nearly 50 feet in circumference. The current U.S. champion, in Louisville, Kansas, is 26 feet around. They were landmarks and historical markers, becoming great and famous resting and meeting places wherever they grew.

But thousands of these majestic trees, which so dominated the landscape and imagination of early America, were lost in the span of a decade to the insidious Dutch elm disease, a fungus introduced by bark beetles imported to Ohio in veneer logs of English elm in 1931. Despite the ravages of

the disease, you still find stately American elms standing. In forested areas, where many other trees offer competition, the elm does

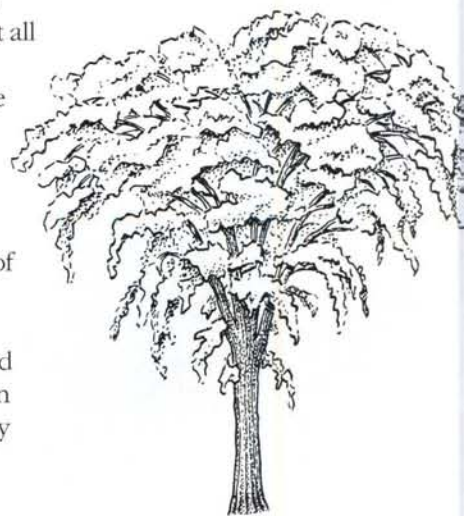
not spread its branches as far as it does in an open area. The main stem is apt to be more columnar and hence a better producer of sawlogs. The light brown color of the wood is attractive and the straight, well-defined grain equally so. (For a look at several pieces in elm, see "Raising the Lot of the Lowly Bench," p. 22.) In addition, elm is strong, resists splitting, glues without problems, and ma-

chines and finishes well. To cap it off, the wood has a bright luster and is dense enough to measure a specific gravity of .50, roughly on a par with cherry.

Elm lumber is available through many hardwood dealers. The lumber is not all from the American elm, and to seek its sources we move from the urban scene and old country roads into the deep forests where we may find six different species of elm that are native to the United States.

Although much reduced in numbers, the American elm still grows all the way from the foggy banks of Canada's Maritime

Provinces to the steamy fringes of the Gulf of Mexico. Westward, the elm's limit of growth extends as far as eastern Montana. Most of the other species can be



found within this range, although not nearly as extensively as the American elm.

The slippery elm, difficult to distinguish from the American elm, has a range nearly as large. (The hairy edges of the flat fruit of the American elm provide one of the major identifying keys.) Many tales are told of the great healing power of the slippery elm. How well I remember my grandmother's great belief in slippery elm cough drops. She always had some available and they were like candy to us. The drops were made from the mucilaginous substance (which gives the tree its name) found in the inner bark of the branches.

At the lumberyard you are apt to be disappointed in attempts to obtain a specific species of elm. Commercially, this wood is marketed as two distinct groups: rock elm and soft elm. Wood sold as rock elm may be *Ulmus thomassii*, rock elm; *U. alata*, winged elm; *U. crassifolia*, cedar elm; and *U. serotina*, September elm. Wood sold as soft elm may be *U. americana*, the prodigious American elm; or *U. rubra*, slippery elm. The two-way commercial split is important from an engineering point of view, as the rock elm species are considerably stronger than

the soft elms. The U.S. Forest Service reports that slippery elm wood is considered inferior to that of the American elm.

All is not lost in attempts to outfox Dutch elm disease. Plant geneticists at the U.S. National Arboretum's Agricultural Research Service in Maryland have developed several hybrids of elms that show promise in resisting the Dutch elm disease fungus. Let's wish them well. *James H. Flynn is the editor of A Guide to Useful Woods of the World (King Philip Publishing Co., Portland, Me., 1994).*

DANISH CORD MAKES A DURABLE, COMFORTABLE SEAT

Danish cord resembles a strand of rope about 1/8-inch in diameter but it is actually made of treated paper. It is manufactured in Denmark and comes in two varieties, laced and unlaced.

According to Bill Fimpler, the owner of Cane and Basket Supply Co. in Los Angeles (see the listings below) and the author of an instructional booklet on weaving Danish cord, the "laced" variety has a rougher texture and is more rope-like (the three paper strands that make up the cord are easily visible). Unlaced Danish cord is

smoother and finer-looking, but both varieties are equally strong.

Best known for its use in chair seats made in Scandinavia, Danish cord can be woven into a variety of patterns by using just a few simple tools (a hammer, screwdriver and wood block as well as special bent tacks to wind the cord around).

In Garrett Hack's ash chair ("A Light, Strong Chair," p. 42), the weave helps to make the design rigid and serves as a handsome seat as well.

Hack purchased the cord for his seat at **H.H. Perkins Co.** (10 South Bradley Rd., Woodbridge, CT 06525; 800-462-6660). A two-pound coil, which contains about 360 feet of cord, is usually required to weave a single seat and retails for \$17.95.

Danish cord is also available from **Cane and Basket Supply Co.** (1283 South Cochran Ave., Los Angeles, CA 90019; 800-468-3966) and **Connecticut Cane and Reed** (P.O. Box 762, Manchester, CT 06045; 800-227-8498).

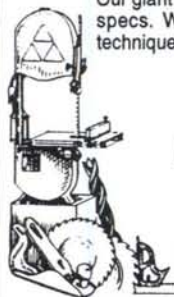


Strength in the weave. A seat woven out of Danish cord yields to the sitter yet gives the chair added strength. The weave is like a rigid glue, keeping the chair frame from racking or loosening.

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about the furniture makers

Home Furniture prints the addresses and telephone numbers of the furniture makers featured in each issue, unless the maker requests that they be omitted.



GARRETT HACK

(above) opened his shop in 1973 after studying furniture making at Boston University's Program in Artisanry. A farmer and writer as well as a furniture maker, Hack is a regular contributor to *Fine Woodworking* magazine (Jackson Brook Rd. Thetford Center, VT 05075; 802-785-4329). "A Light, Strong Chair" on p. 42.

JIM BUDLONG

studied with furniture maker James Krenov for two years in the early 1980s after doing furniture repair and restoration. Today, in addition to teaching with Krenov at the College of the Redwoods in Fort Bragg, California, he builds commissions and speculative pieces of furniture (P.O. Box 1862, Ft. Bragg, CA 95437; 707-964-7232). "China Cabinet in Honduras Mahogany" on p. 64.

G.R. CLIDENCE

builds beds and other traditional furniture in a replica of a 18th-century mill using turn-of-the-century machinery (18th Century Woodworks, 272 James Trail, West Kingston, RI 02892; 401-539-2558). "Beds Built for Comfort" on p. 26.

MICHAEL COHEN

started his woodworking career building custom houses and renovating National Landmark buildings. He now makes custom furniture and architectural woodwork. He built his shop a short walk from the house he shares with his wife, Eliane, and their English Bull Terrier, Emma (P.O. Box 24, Palenville, NY 12463; 518-678-3568). "Corner Cabinet in Quartersawn Oak" on p. 44.

MICHAEL CULLEN

came into furniture making genetically: both his grandfather and his great-grandfather were cabinetmakers. He teaches furniture design and construction at the Academy of Art College in San Francisco and makes custom furniture in a one-man shop (300 N. Water St., Petaluma, CA 94952; 707-778-6301). "Pear Table and Dining Chairs" on p. 52.

PETER FLEMING

studied furniture making at the School of Crafts and Design at Sheridan College in Ontario, and now teaches courses in furniture design there part-time. He designs and builds furniture in a cooperative shop (444 Dufferin St., Toronto, Ont. M6K 2A3 Canada; 416-535-5096). "Expressive Desk" on p. 72.

HANK GILPIN

studied furniture making with Tage Frid, then worked in Frid's shop before going out on his own. His studio is lined with stacks and samples of extraordinary wood from around the world (17 Wilbur Rd., Lincoln, RI 02865; 401-334-2638). "Raising the Lot of the Lowly Bench" on p. 22.

NICHOLAS GOULDEN

built custom homes before attending the furniture-making program at the College of the Redwoods in Fort Bragg, California. He spent the past year visiting furniture makers and studying design throughout his native England (Soaring Productions, 1528 Joan Dr., Petaluma, CA 94954; 707-766-9246). "Charles Rennie Mackintosh" on p. 30.

ROB HARE

is a sculptor and furniture maker. He is the subject of a profile in this issue (20-22 Ravine St., Kingston, NY 12401; 914-331-8051). "Pairing Wood and Metal" on p. 76.

NORBERT HEINOLD

designs and builds furniture in a German alpine village. He began as an apprentice in Germany in 1977, then was a journeyman at several shops until 1986, when he emigrated to the U.S. to start his own business. He returned to Germany two years ago to attend the Masters School for Furniture Making in Munich, and stayed (Holz & Kunst, Kirchplatz 7, 83224 Grassau, Germany; 8641-5492). "Greene and Greene Backgammon Table" on p. 62.

DREW LANGSNER

is the founder and director of Country Workshops, a school for crafts. He is currently at work on *The Chairmaker's Workshop*, a book to be published in 1997 by Lark Books (Country Workshops, 90 Mill Creek Rd., Marshall, NC 28753; 704-656-2280; e-mail: ddl@mhc.edu). "*English-Style Windsor*" on p. 56.

NORM LARSON

runs a one-man cabinet-making shop in Wyoming, and spends much of the spring and summer working as a river-rafting guide and leading mountain climbing expeditions (P.O. Box 778, Wilson, WY 83014; 307-733-6052). "*East-West Armoire*" on p. 58.

ROBERT LASSO

taught woodworking at the College of the Redwoods for seven years. He is now the coordinator of the woodworking program at Santa Fe Community College and also builds custom furniture (Rt. 5, Box 284D, Santa Fe, NM 87501; 505-455-3676). "*China Cabinet in Honduras Mahogany*" on p. 64.

WILLIAM E. LOCKE

is a graduate of the furniture-making program at the North Bennet Street School in Boston. He now operates his own shop, executing his own designs and those of other furniture makers, including Rosanne Somerson and Alphonse Mattia (30 Redlands Road, West Roxbury, MA 02132). "*Townsend Kneehole Desk*" on p. 46.

ANDREW MCINNES

worked in environmental conservation before studying furniture making at the North Bennet Street School. He now manages the wood shop at the Boston Architectural Center (Boston Architectural Center, 320 Newbury St., Boston, MA 02115-2703; 617-536-3170, ext. 205). "*Maple Tavern Table*" on p. 38.

JONATHAN MCLEAN

is a graduate of the North Bennet Street School in Boston and has been woodworking for 22 years. He received the 1994 American Woodworker Excellence in Craftsmanship Award in the professional category (763 Waverly St., Framingham, MA 01701; 508-875-3933). "*Reproduction Bombé Desk*" on p. 60.

JOHN NESSET

grew up around a carpenter grandfather and a father who painted with oils and watercolors. Working only with hand tools, he considers his work more that of a sculptor than of a woodworker (4744 5th Ave. S., Minneapolis, MN 55409; 612-827-4039). "*Style Sprung from Structure*" on p. 66.

STEVE PETERSEN

came up through cabinet shops along the north coast of California. He went out on his own by making small boxes with inlay and marquetry. He is continuing his education and hopes to be able to make furniture full-time (2361 Cochran Rd., McKinleyville, CA 95519; 707-839-5392). "*Showcase Cabinet with Marquetry*" on p. 50.

RICH PREISS

has been teaching furniture design and woodworking at the University of North Carolina at Charlotte for 16 years. A former consulting editor for *Fine Woodworking* magazine, he designs, writes about and builds furniture (1937 Park Rd., Charlotte, NC 28203). "*A Craftsman's Bed*" on p. 48.

JAMES PROBST

is self-taught and now runs a two-person shop that primarily makes Shaker-influenced casework and tables (Box 608, Hwy. 34, Hamlin, WV 25523; 304-824-5916). "*Contemporary Cherry Credenza*" on p. 54.

PETER SHEPARD

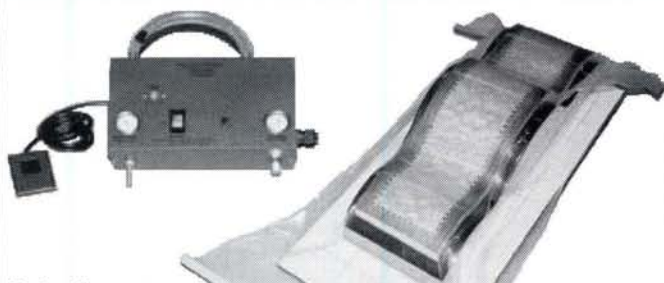
spent 15 years as an book editor in the computer science division of Little, Brown in Boston before leaving to make furniture. His furniture training came in a semester of weekends spent at the North Bennet Street School and nine months of hanging out in the shop of furniture maker John Fox. He now works in a cooperative shop making custom furniture (43 Bradford St., West Concord, MA 01742; 508-369-2403). "*Two Bureaus Share a Shapely Leg*" on p. 36.

MARK WALKER

is originally from Wales, and graduated from Buckinghamshire College in England in 1987 with a degree in furniture design. He and his partner, Peter Alexander, have been creating custom furniture and cabinetry together for four years (P.O. Box 10642, Eugene, OR 97440; 541-343-8304). "*Redwood Tansu Chest*" on p. 40.

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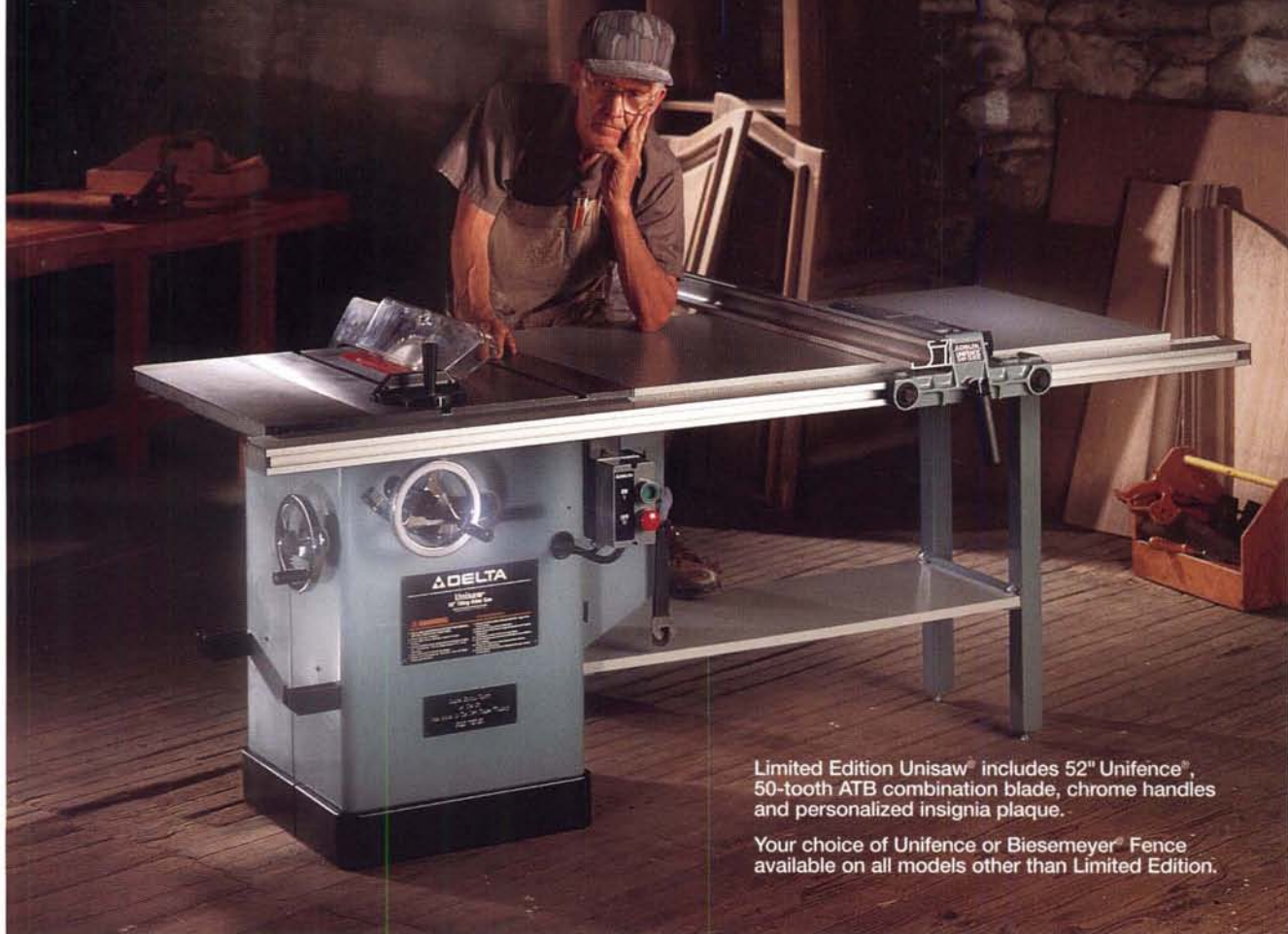
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