

# Planing Difficult Grain

BY MARIO RODRIGUEZ

In the course of building furniture, most of your material will have nice, straight, uninspiring grain that's easy to look at and easy to plane. And most of the time you're grateful for its tame nature. But the wood that makes your heart race and your palms sweat is the stuff with swirling iridescent figure; a blistering surface that seems to be alive and filled with light. That's the kind of wood that can transform a mundane little nightstand into a minor masterpiece.

If your previous attempts at taming these stubborn surfaces with a bench plane produced only a swath of tearout, you probably resigned yourself to sanding. Well, don't pull out the belt sander yet. There is a better way. With a handplane you can save time, energy and a cloud of dust. And it's not as hard as you might think.

Most woodworkers express some disbelief when I claim that by practicing good technique and employing a small selection of planes and scrapers, I virtually eliminate sanding—or at least reduce the unpleasant task by as much as 80%—no matter how figured the wood might be. Instead of starting my sanding routine at 80 grit and tediously advancing to 320, I begin at 180 or 220 grit.

When I work highly figured wood, my objective is not to surface the material completely using a handplane and avoid sanding altogether. Realistically, I employ handplanes and scrapers right up to the final stages of surface preparation and then resort to sandpaper to remove any minor tearout and light plane tracks. Using this method, I'm able to achieve a uniformly smooth surface, ready for finishing.

To be successful with this approach, it's important to have a well-tuned plane (conditioned sole, fitted chipbreaker and easily adjustable) with a well-prepared blade (sharp, properly beveled and ground square). You also need to practice good





# With a well-tuned plane and the right approach, tackling tricky figure doesn't mean sanding all day



technique (stance, grip and stroke), even when faced with some wild figure. With this approach, sanding shouldn't take long at all.

## Select and prepare your planes

Most of the time, the boards I work with have been run through a planer, so I'm able to do the bulk of the surface preparation with a single No. 4 smoothing plane. But when you have a board that's too wide

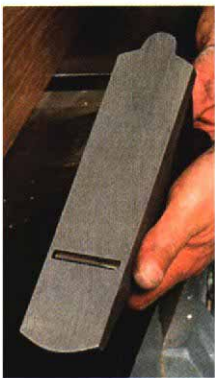
for your planer or one that has wide crotches or is especially figured, which would get chewed up in the planer, you have to thickness it by hand. In these situations, you would no sooner prepare the surface with a single plane than you would play 18 holes of golf with a single club. Milling (and surfacing) lumber by hand is physically demanding and time-consuming. Different planes are employed at various stages to minimize the effort and

produce the best results.

Each plane has a single task or function that it performs better than others. Aside from their physical appearance, planes differ in their weight and the width of their mouth opening. Basically, more weight and a smaller mouth opening help a plane achieve a finer, smoother surface in difficult grain.

On rough lumber, I use a No. 40½ scrub

## Bench-plane tune-up



*Truing a plane. To flatten a plane's sole, the author glues aluminum-oxide sandpaper onto the bed of his jointer (top), then works the plane back and forth until the scratches cover the entire sole (bottom).*

Coaxing even passable performance out of a plane requires a rigorous but simple tuning process. And to handle tricky grain, a plane must be impeccably tuned.

To take a consistent shaving, a plane's bottom must be dead flat. This can be achieved by lapping the plane on a flat surface, such as ½-in.-thick glass or a slab of machined aluminum, covered with aluminum-oxide paper. Once the plane's sole has been covered uniformly with scratches from the coarse grit, proceed to finer and finer grits. Eventually, the sole will read flat and exhibit a nice, reflective surface.

After flattening the sole of the plane, break any sharp edges with a file to prevent scoring the work surface if the plane is inadvertently tipped (these scratches are often mistaken for plane tracks).

The chipbreaker stiffens the blade, reducing vibration and chatter. For the chipbreaker to function, shavings coming off the board must travel smoothly along the back of the blade, over the chipbreaker and up through the throat. If there is a gap between the blade and the chipbreaker, it will capture the shaving. Or if the chipbreaker's edge is blunted, the shaving won't travel up through the throat. In either case the plane will choke and refuse to take a shaving.

The first step is to feather the leading edge with a flat file. Then polish it with fine wet-or-dry sandpaper and wax. Look for gaps between the edge of the chipbreaker and the back of the blade, and file down any high spots. Once the chipbreaker is in good shape, set it ⅛ in. from the edge of the blade.

With the blade assembly removed (if necessary), loosen the screws holding the frog to the plane body and move the frog forward. Once the blade assembly

has been replaced onto the frog, the mouth opening should be reduced. When repositioning the frog, remember that the mouth opening must be greater than the thickness of the shavings, or they won't fit through the opening.

For any blade to perform well, it must be razor sharp. For quick but dependable results, I use a slow-speed grinder (1,725 rpm) outfitted with an 80-grit Carborundum wheel. I support the blade on a tool rest to prepare the edge with a 25° primary bevel. The slow speed of the grinder ensures that I won't burn the edge, and the coarse 80-grit wheel takes care of the task quickly.

I like to grind a camber (a slight convex curve) along the blade's edge. This light curve dramatically reduces the appearance of plane tracks on the wood's surface by cutting back the corners of the blade slightly. I then hone a 2° secondary bevel using Japanese waterstones, progressing from 800 to 1,200 to 4,000 and finally to 6,000. I easily maintain the camber of the edge by applying gentle pressure to one side of the blade and then to the other. Finally, I lap the back of the blade to remove any scratches.

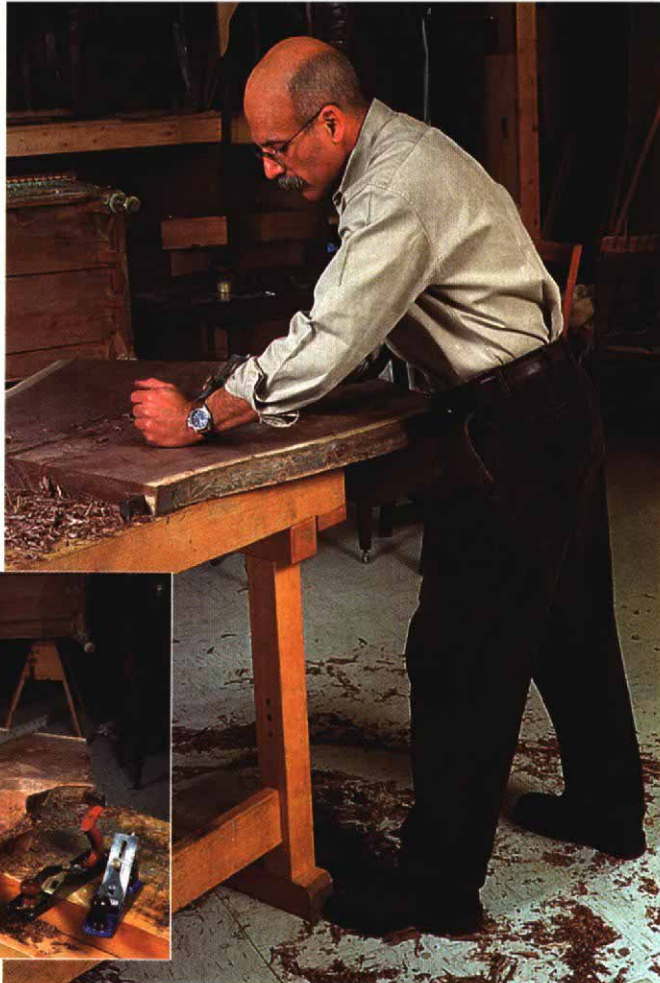
Once the plane is back in shape, set the blade square and for the thinnest of shavings; anything more will cause tearout in figured wood.



*Adjusting the frog. To get an especially thin shaving, loosen the screws on the plane's frog and move it forward, adjusting until the blade has only the slightest opening.*

## POSITION IS EVERYTHING

*Work comfortably. With feet at shoulder width and the workpiece stabilized at a comfortable working height (right), you'll find that the plane will actually telegraph the blade's performance to your hands. To flatten a surface, find a relaxed stance and use a long straightedge to locate high spots that need more planing.*



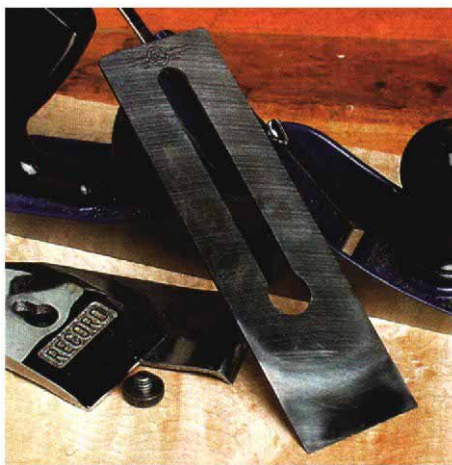
plane to remove material aggressively and to render the board flat. Next, I use a No. 5 jack plane to remove the scalloped plane tracks and tearout left by the scrub plane. After the jack plane, I might use a No. 6 fore or No. 7 jointer plane to get the board dead flat and straight. Finally, I use a No. 4 smoothing plane to achieve a clean and perfectly flat surface.

**A well-tuned smoother is critical**—Because I depend on the smoothing plane to deliver the final surface, its performance must be impeccable. The plane must glide easily over the wood while removing tissue-thin shavings. It must also respond to small adjustments and hold its settings.

Any smoothing plane can be modified or adjusted to perform well on figured wood. When properly tuned, the common Record or Stanley will do much better than you might imagine. But if you're looking for even more effortless planing and are willing to put out a substantial one-time in-

vestment, try one of the higher-end smoothers (see the story on p. 61). Regardless of the plane you choose, be sure that it is well tuned (for more on tuning up a handplane, see the story on p. 55).

I always retrofit my planes with premium-quality blades, made by either Hock (888-282-5233) or Lie-Nielsen (800-327-2520). The blades from these two manufacturers are made to rigorous standards, using thick metals, high-quality alloys and exacting heat-treating processes. These blades typically have longer-lasting edges.



Put one of them in a plane, and I am sure you will notice an immediate difference in the plane's performance.

### Practice good technique

One of the secrets of getting a good performance from your plane is to maintain complete control of the tool. The more physical effort you put into planing, the less control you have over the tool—and the less knowledge you have of what the tool is doing. A finely tuned plane will telegraph exactly what it's doing to the wood, through the sole, right up the handles to your hands. You can clearly feel the kind of surface it's leaving behind.

### Make proper adjustments to the blade

—The most effective way to control the tool is to adjust the blade so that it projects uniformly across the entire cutting edge. The objective is to produce a paper-thin, full-width shaving of uniform thickness. If the blade's edge projects unevenly, it will cut more heavily on one side and possibly choke or jam the plane. And it will leave conspicuous plane tracks in its wake.

Most people think the blade's edge must be clearly visible. But you're better off developing a feel for the blade setting. I rarely sight down the plane's sole for a visual reading and instead rely on my fingertips—carefully strummed over the edge from behind—to guide me. The blade should barely project below the sole. If the plane fails to produce a shaving, advance the blade a little at a time.

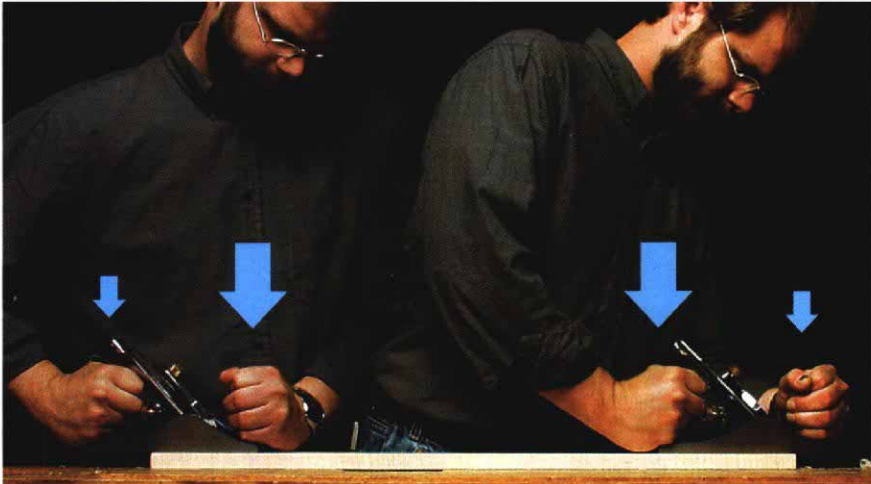
### Stand in a comfortable position

—With the plane tuned up and the blade properly adjusted, it's time to go to work. The workpiece should be positioned at or near waist height. The idea is to find a height that allows you to extend your reach fully without cramping your shoulders or straining your back. As I mentioned, planing is a physically demanding activity, so find a

**Souped-up plane.** While a sharp, standard iron will do the trick, a thicker replacement iron will make it easier.



## HOW TO HOLD AND MOVE A PLANE



**Smooth strokes.** On average grain patterns, begin planing by pressing down on the front of the plane. As you proceed, shift pressure to the back of the plane.



**A sweeping cut.** For difficult figure, such as bird's eye, set the blade for a thin cut and take skewed, arching passes.

comfortable position—you may have to hold it for a while.

It's usually easiest to work near the front edge of the bench. I sometimes allow a couple of inches to overhang for better accessibility. But don't overdo it. Too much overhang may cause the workpiece to tip slightly, dissipating the pressure of the plane's cut.

Once the work has been secured to the bench, place your feet about shoulder-width apart. If you're leading with your left foot, your right foot should be 90° to it for stability. As you advance the plane's stroke, your weight shifts in that direction.

Planing should not be rushed or frantic.

Inspect your work frequently and think about the next step. If you're using the right tool and it has been properly prepared, the work will proceed nicely, and the surface will improve noticeably.

**Grip the plane correctly**—Try to keep the plane blade continuously engaged with the wood, no matter where the tool is on the board. Maintain constant and uniform pressure against the workpiece throughout the entire plane stroke. This is how the plane cuts best, and any change will affect the shaving and the surface.

By gripping the front knob and pressing down firmly upon the wood, you should

produce an even, continuous shaving and leave a smooth surface without chatter marks. But as you approach the far end of the workpiece, let up on the front knob and transfer the pressure to the rear handle, propelling the plane forward instead of downward. This maneuver prevents the plane from taking a slightly heavier cut as the unsupported blade runs off the edge of the board, which could result in a board that is noticeably thinner at one end.

### Try to plane with the grain

I compare planing against the grain with running your hand up the back of your head. Your hair grows down the back of

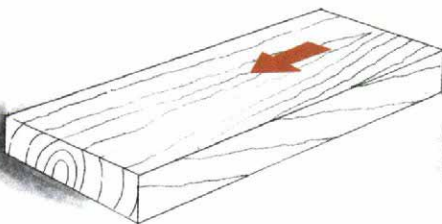


**I RARELY SIGHT DOWN THE PLANE'S SOLE FOR A VISUAL READING AND INSTEAD RELY ON MY FINGERTIPS—CAREFULLY STRUMMED OVER THE EDGE FROM BEHIND-TO GUIDE ME.**

On easy, straight-grained woods, you can get away with a slightly more aggressive cut, but as the grain gets trickier, the cut should get finer.

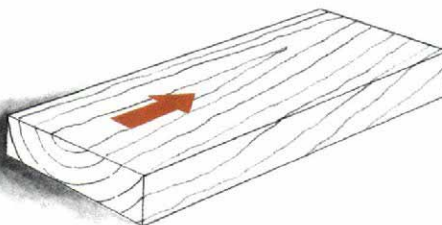
#### WITH THE GRAIN

When the end grain on the board is convex, plane into the peaks.



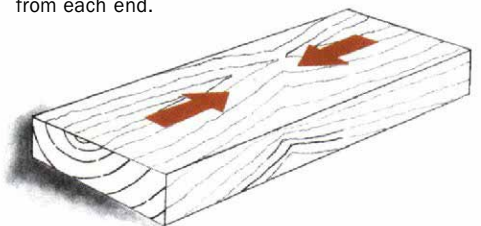
#### AGAINST THE GRAIN

If the end grain curves in a concave, downward pattern, plane away from the peaks.



#### IF THE GRAIN CHANGES

When the grain changes direction, take shorter strokes, approaching from each end.







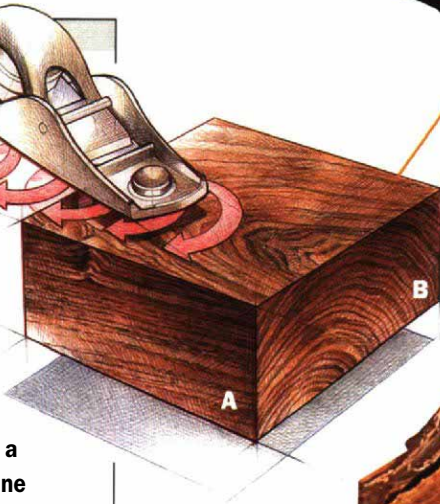
## MANAGING DIFFICULT BOARDS

When I arrange the boards for a piece of furniture, I am not concerned with grain direction but with orienting the boards to give the best appearance. Even if you do figure out the grain direction on two individual boards, when those boards are joined together, their grain might run in different directions. Grain can also change direction within a board. I planed this large walnut crotch without knowing what it looked like underneath the surface. The key is to visualize what might be going on with the grain, then use educated guesses to help you proceed. After planing this slab, John White, FWWs shop manager, cut into a few tricky patches to help illustrate how certain grain patterns are best handled.

### KNOTS

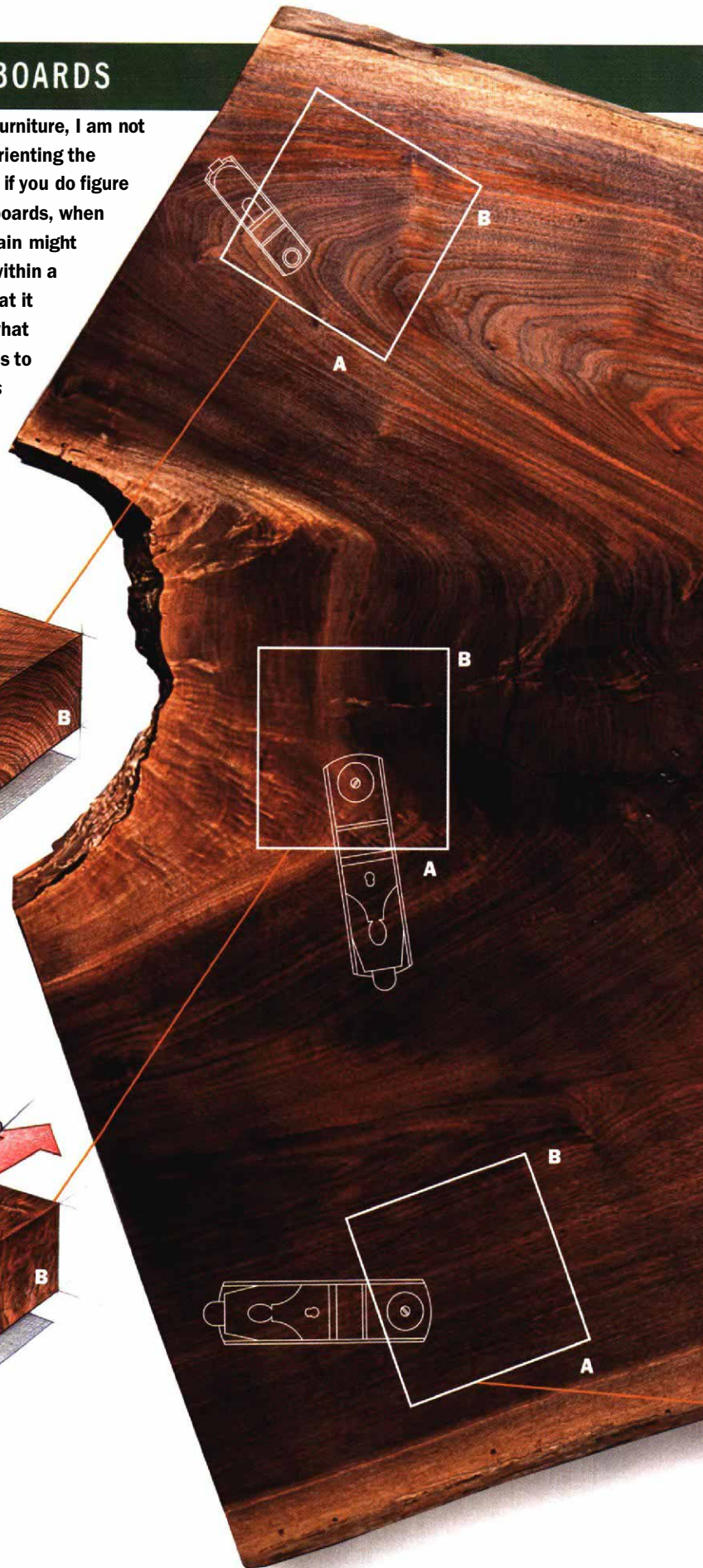
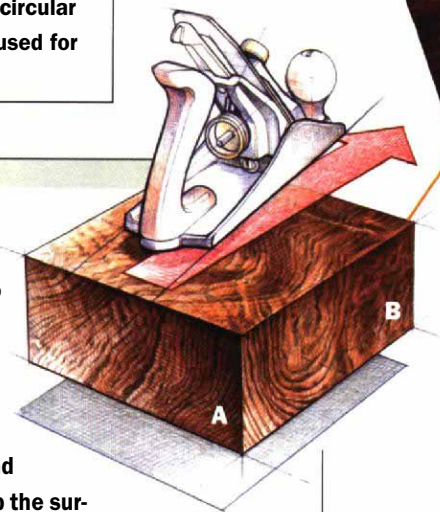
Small knots like this one can often be planed using a heavy bench plane set for the lightest of shavings, but sometimes tearout is inevitable.

When this happens, I grab a small, low-angle block plane rather than a scraper, because a scraper can leave a perceptible dip in the board. Using the low-angle block plane, I take quick passes and light cuts in a circular motion, the same motion used for scrubbing floors.

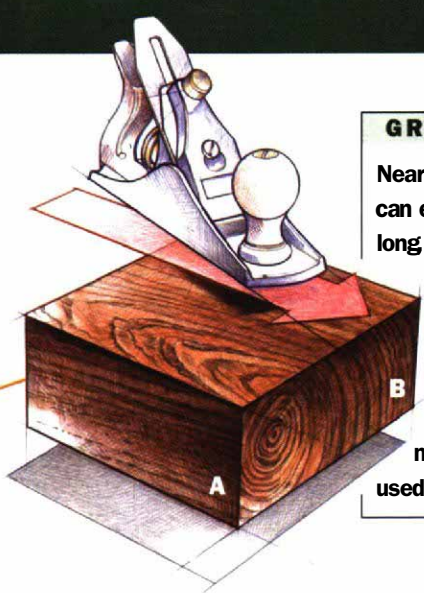
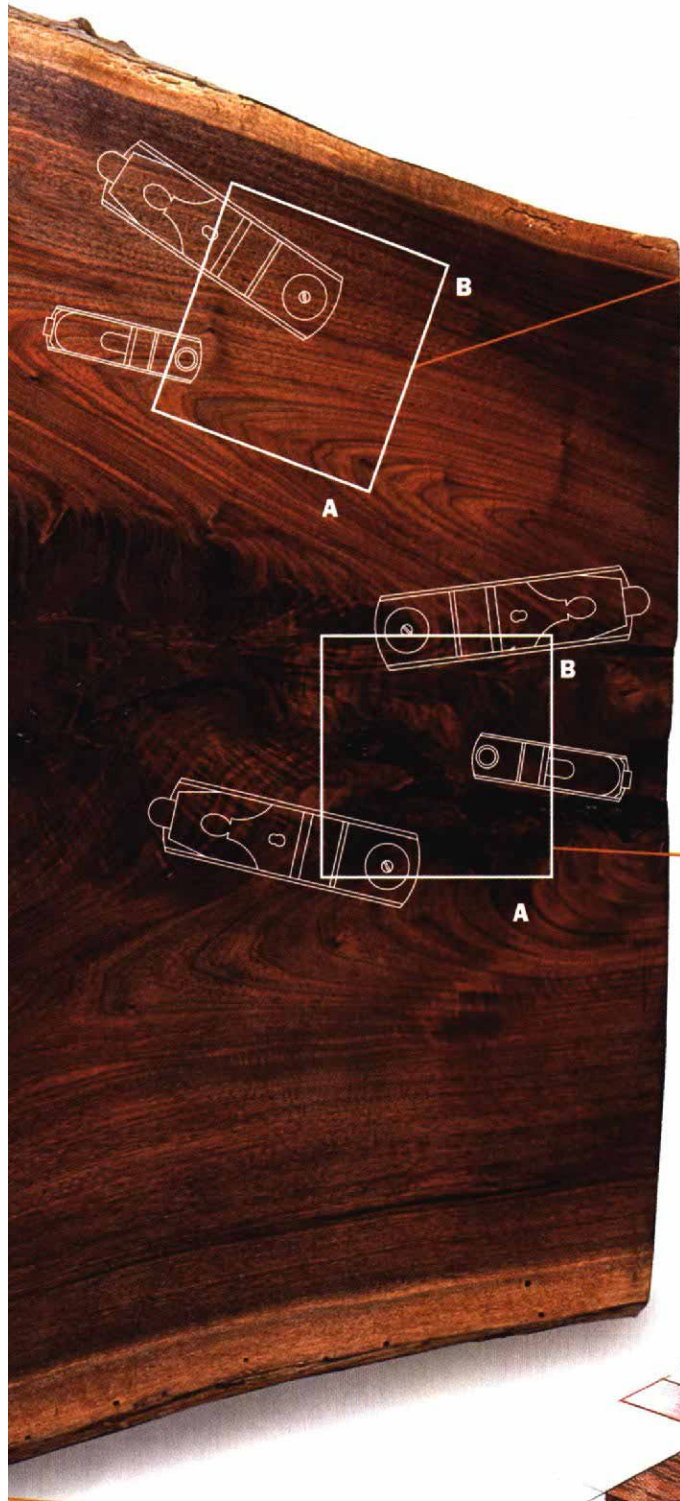


### END GRAIN

I used light strokes at 90° across the board. At the crotch, the grain seems to fan out, so I used a circular slicing cut with the blade set for a very light cut. The trick was to get and keep the board flat and straight while I cleaned up the surface. I proceeded slowly and evaluated the surface often. The only reason why I needed to use a card scraper was to clean up the slight but inevitable plane tracks.

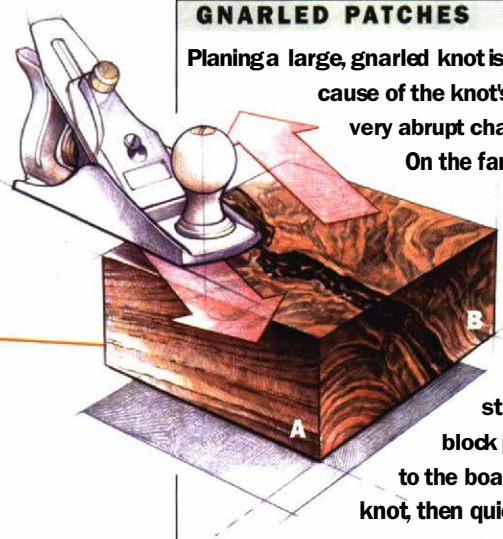






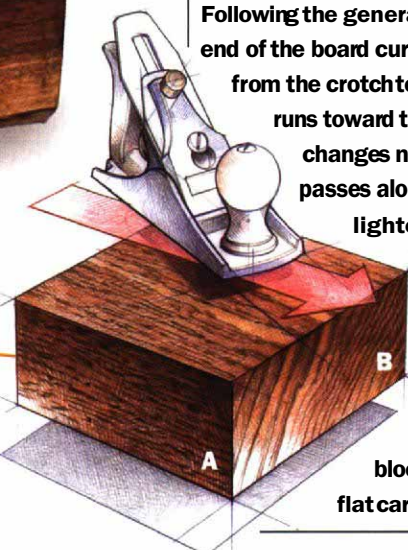
**GRAIN CHANGES**

Near the center of the plank you can expect a grain change. I used long straight passes on the straight grain but a block plane in the tight, tricky spots. With a nimble, little block plane I was able to navigate the tight spots much easier than if I had used a larger bench plane.



**GNARLED PATCHES**

Planing a large, gnarled knot is always difficult because of the knot's hardness and the very abrupt changes around the knot. On the far side of the knot (A), I planed toward the trunk. But on the opposite side (B) I went in the opposite direction. On the knot itself, I used short strokes with a small block plane—I lowered it on to the board, smoothed only the knot, then quickly raised the plane.



**STRAIGHT GRAIN**

Following the general rule for handplaning—if the crown on the end of the board curves upward, plane into the peaks—I planed from the crotch toward the trunk. The grain on this patch runs toward the trunk and along the wany edge but changes near the center of the plank. I took straight passes along the wany, bark edge of the board but lightened up slightly as I approached the center of the plank, where I thought the grain might begin to change direction. Trying to figure out exactly where the grain changes is nearly impossible, so I was prepared for slight tearout in spots. To clean up these rough patches, I used a block plane and circular strokes, followed by a flat card scraper.





**Quick strokes for finicky work.** Taking short strokes with a skewed low-angle block plane is a good way to handle tricky areas where the grain changes direction.

blade scraper supported in a plane-type body. The card scraper is light and flexible, which allow me literally to turn on a dime. I can always see exactly where I'm working. I can turn it 360°, responding to even the smallest blemish or grain change. And I can instantly change the cutting angle and the depth of cut.

I thoroughly enjoy this part of the job. The nimble scraper is versatile enough to handle the sudden changes in grain direction that are the consequence of convoluted grain. It is invaluable in removing any trace of plane tracks, overlooked machine marks, metallic stains left by clamps and isolated patches of tearout.

I also enjoy seeing the lacelike cascade of fine shavings produced by a sharp scraper rolling across wood.

### **Sanding is the final step**

Even though sanding is my least favorite part of the job, I take it very seriously and

your head, and your hand, run in the opposite direction, disturbs and upsets your hair's natural arrangement. It's the same thing with wood. The proper direction would be away from the ends.

On the surface of a board, you can often recognize the peaks formed by the grain. If the end grain curves in a convex pattern, you should plane down into the peaks. If the end grain curves downward (concave pattern), you should plane up and away from the peaks.

Now these rules certainly oversimplify a complicated subject, and they're meant only as a basic guide. The patterns and clues I just described are not always easy to decipher. On crotch, burl or even curly wood, these signs may not be of much help. On highly figured pieces, the grain swirls in different directions.

Ultimately you'll have to rely on the surface quality left by the plane, the cutting sounds made by the plane and the resistance encountered as you pass the plane over the workpiece to tell if you should change direction. All of these tangible clues will tell you whether the plane is cutting with the grain or against it.

In addition to reading these visible clues, you must employ strategies for navigating the swirling grain, as shown on pp. 58 and 59, as well as remedial techniques for repairing any damage to the surface.

### **Use a scraper to repair any damage**

No matter what type of plane you have or how well you've learned to read the grain,

you'll cause a certain degree of unintentional damage, such as tearout, to your workpiece. As the scope of the job becomes narrower, the tools called upon must also become smaller; smaller tools with smaller blades are used to work smaller areas of wood. These tools are also more manageable, allowing you to work very specific problem areas without disturbing completed areas.

The best tool for removing minor blemishes is a handheld flat card scraper. For a few reasons I prefer this tool over a rigid-



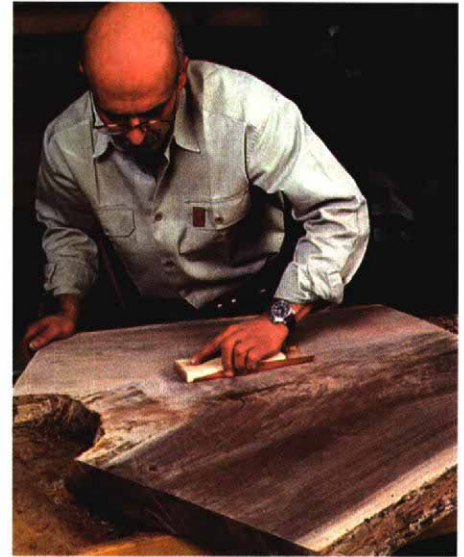
**The nimble scraper.** A handheld card scraper honed with a fine burr makes easy work of tricky areas where the grain changes direction.



## SANDING METHODICALLY



**The final touch.** Once the planing and scraping have been completed, a washcoat of denatured alcohol makes any tearout apparent. Clean up what you can with a scraper, then sand with a padded backer block. The author uses compressed air to clean up between grits.



approach it methodically. First you must evaluate the surface to determine what grit sandpaper you should start with. If, overall, you think 180 grit would do, but there are a few rough areas that require 150 grit, then start with 150 grit. The idea is to produce a surface of uniform smoothness that reflects light and reveals the wood's characteristics uniformly.

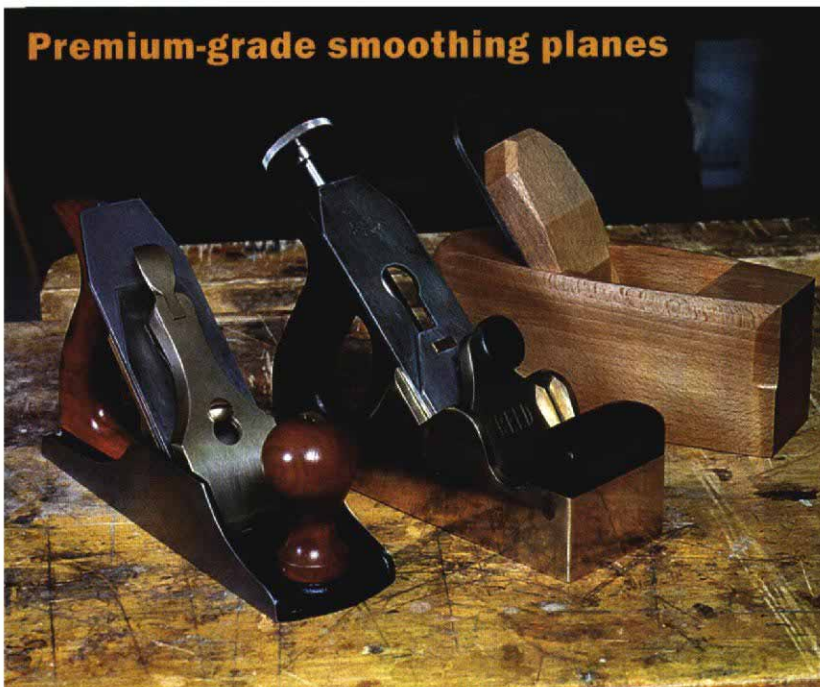
Each grade of sandpaper scores the wood surface with scratches of uniform size. As the sanding progresses, and you switch from a coarse sandpaper to a finer

grit, the resulting scratches become finer and the surface becomes smoother. But as the paper wears, it releases abrasive particles. If errant particles from a coarser grit get trapped between the wood surface and the next finer grit sandpaper, they disfigure the wood surface with random scratches. These singular scratches may pass casual scrutiny but will be glaring when the piece is finished.

To prevent this, blow the surface clean with compressed air (a shop vacuum could be used instead) and then wipe it down

with a solvent such as denatured alcohol. The alcohol flushes the wood surface, making it easier to remove any grit left behind by the paper, and the wet surface highlights any problems that may have been overlooked. When the entire surface is dry, wipe it down with a clean rag, then progress to the next sanding grit. Proceed through finer grits until the surface has a mirrorlike sheen when you view it at a slight angle.

*Mario Rodríguez is a contributing editor.*



**Premium-grade smoothing planes**

These semicustom smoothing planes—a Lie-Nielsen No. 4 (800-327-2520), a Reed smoother (available from antique tool dealers) and a coffin smoother by Clark and Williams (501-253-7416) are designed and produced to perform demanding work to a very high standard. Other specialty toolmakers with lines of quality planes are Robert Baker (207-351-1050), Kelly Toolworks (706-376-4804) and St. James Bay (800-574-2589). These planes are ready to use straight out of the box, needing nothing more than a few passes of the blade's edge over a waterstone before being put to work. But be prepared to pay for this kind of quality—the starting price for one of these tools is around \$200, but they can run much higher.