



To make ten of Sawyer's chairs, left, one for each of us in the workshop, we started with a 6-ft. length of an 18-in. dia. white oak log. After quartering this with wedges to see the lay of the grain, we bucksawed lengths for chair parts. At top, two students saw a bolt for rungs. Steadying the log are Country Workshop sponsor Drew Langsner and his daughter Naomi. Above, teacher Dave Sawyer demonstrates drawknifing a rung on a dumbhead shaving horse.

## Green Woodworking

How I split and shaved a chair at Country Workshops

by Rick Mastelli

Last summer, amid the Blue Ridge Mountains of North Carolina, I attended a week-long chairmaking workshop that changed my ideas about working wood. Ten of us had come because we were interested in learning to make chairs in an old way. We put aside our electric tools and surfacing machines, and we kicked the habit of using mill-sawn, kiln-dried wood. We retreated from the cabinetmaker's craft, with its jointing and smoothing planes and sandpaper. Instead, we adopted the tools of the country joiner, who rives the wood and shaves it into sticks and panels.

The joiner's craft has been practiced for centuries in peasant communities, where everyone, for at least part of the year, produces food, shelter, clothing, utensils and furniture. Originally a homely craft, it evolved into a specialized profession, which in parts of this country is being revived as part of the modern-day homesteader's diversified livelihood. The country joiner does not employ a sawmill, but goes directly to the local tree and, treating wood like the bundle of fibers that it is, pries it apart with wedges, gluts and froes. He shapes this riven wood with drawknives and spokeshaves, retaining the



*Sawyer produces as many as 50 ladderback chairs a year without using jigs. "In my power-tool phase," he said, "I made some very fancy jigs. But it turned out to be mindless. . . . And I'd be looking for them and fiddling with them, and they'd end up in the fire." So now Sawyer just clamps the posts to the bench, shims to "close enough" and guides his brace and bit with a T-bevel and his eye.*

continuity of the fibers that a rip saw would sever. Riven wood is stronger than sawn wood, easy to work while green, and more resistant to the deterioration of age and weather. Its grain and figure can be felt, not just seen as in planed and sanded wood. Its texture is rich and varied. And when you rive and shave wood, there is no dusty air to breathe. Green woodworking relies upon simple tools, cheap materials and direct processes. The result can be as useful, beautiful and inspiring to make as the chair pictured here.

Our classroom was an old tobacco barn on Drew and Louise Langsner's 100-acre homestead in Marshall, N.C. To get there, you drive along increasingly rural roads, till the last half-mile or so of the Langsner's driveway, which is best walked. "When you come to Country Workshops," remarked Langsner as his truck bounced us up to within reach of the farm, "you come to the country." Each summer, the Langsners sponsor as many as five week-long workshops in country crafts, alternating their workshop responsibilities with their farm chores. We helped a little with those chores, ate three bountiful meals a day of farm produce, and slept in our own tents. We worked long days and into the night, not exploring our individual bents, but practicing craft in the age-old sense. We did not design, for instance, but copied a traditional design. And though we initialed the parts we made, we didn't take the identification too seriously—on the first day we shaved more than a hundred rungs and threw them into a communal pile. In this way we concentrated on acquiring skills and minimized prideful fussing, making extra parts when we were finished with our own, and sharing them readily.

The workshop reflected the character of its teacher, Dave Sawyer, a 45-year-old New Englander who now lives in East Calais, Vt. Sawyer has an M.I.T. degree in mechanical engineering, but he retired from that career at age 28. "If I'd lived a hundred years ago," he said one evening in the barn, while tenoning rungs at the pole lathe to help some of us catch up, "I'd have done fine in mechanical engineering, because then people built what they thought up." The rhythmic slap of the lathe punctuated his words. "But thinking's pretty far from doing nowadays in that field." So Sawyer tried restoring old cars, he spent a half year in Bolivia in the Peace Corps Craft Program, and he worked for a while with the Amish. His turning point was the summer he spent working in the shop of Daniel O'Hagan, another sometime teacher at Country Workshops. O'Hagan's example encouraged Sawyer to do direct, simple woodwork. In 1969 he put together his own shop, and he has been making furniture and utensils from green wood ever since.

The ladderback chair we made is little changed from the first one Sawyer made ten years ago. He took the measurements from the first comfortable ladderback he'd found, a factory-made chair from the 1920s that he saw in an antique shop. After some minor changes in the way he made the first six, Sawyer had his product and his procedures down. I asked him, while he was showing us how to shape the back slats, if he was ever tempted to vary the design, to make a fancy chair with carved slats, for instance. "No," he said, "I don't believe in art. I never carved anything in my life, and I don't believe I ever will." Why, I asked? "Because I have no imagination," he said. "I never got into that individual expression bit, and I never made anything original. I work on the Volkswagen theory. You stay with something that works, and you make little improvements as you see them. I tried making an arty





Top, Sawyer marks the end of a bolt for splitting with a froe. The finished rungs have to be  $\frac{7}{8}$  in. in diameter, and Sawyer lays out squares only  $\frac{1}{8}$  in. oversize. He controls splitting by arranging to split relatively equal portions (figure 2, p. 56), by splitting slowly, and if the split begins to run out, by exerting pressure against the heavier side of the split (figure 3, p. 56, and cover). Above, a student splits rung blanks in a small brake—two boards mounted like scissor blades to hold the work. By the end of the workshop's first day, we had shaved more than a hundred rungs, trying various styles of shaving horses and drawknives. The two horses, top right, are roughed out from thick slabs; the large stone holds them steady. At right, Sawyer loads the rungs into an oil-drum kiln.



chair once. I prefer being productive." I remembered that Drew Langsner had warned me on the way to the farm: "You're going to meet a lot of reactionaries here, people who figure rough woodworking is just fine."

Sawyer's ladderback is fine. It is just as strong-lined and as comfortably proportioned as you'd expect a chair to be that has been unchanged through ten years and hundreds of copies. Its high back is well balanced by the thickening of the back posts below the seat. Sawyer steambends at the thickest part of the legs to increase the chair's stability and to angle the back comfortably. Other ladderback chairs, John Alexander's, for instance (*FWW* #12, p. 46), bend above the seat at the thinnest part of the back posts. Sawyer's chair is stouter than Alexander's elegant rendition. Sawyer's is a professional chairmaker's pre-industrial product, and he makes 20 to 30 of them a year, sometimes as many as 50. It takes him 12 hours

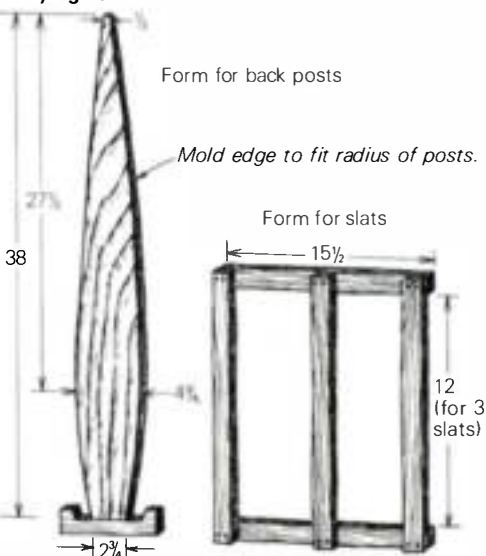
from tree to finished chair, and he gets \$115 for each. When he needs more money he makes wooden hayforks for \$17 apiece. He once made 200 hayforks in two months.

So we learned how to make chairs in batches. For a week we became a green-wood chair shop. Our industry was interspersed with demonstrations and learned, talky meets; the ten of us went home knowing not only how to bust a chair from a tree, but also how to do it efficiently within a daily work rhythm. We began by making rungs because they are easiest to make, and because they want to be drier than the posts into which they are mortised. After assembly, the tenon absorbs moisture from the post and swells while the mortise shrinks, locking the joint firmly. It took us a day to split and shave the rungs, but by the end of that day, the best among us could shave a rung almost as fast as Sawyer, in under 3 minutes. While the rungs dried in a jury-rigged kiln—a



*The chair parts are bent without steel straps. First we boiled the 1½-in. to 1-in. diameter posts in water for a couple of hours (the boiler rests between cement blocks in the background of the photo top left). Then we coaxed the bend into shape on the shaving horse. A pad under the horse's head prevents the stock from being marred. The posts are muscled in pairs onto drying forms, above, and held in place with leather thongs while they set overnight. The slats, left, were also boiled, but only for a half hour or so, then bent on the horse and over the knee until they fit on their own drying form. Plans for the forms are given at right.*

#### Drying forms



70-gal. oil drum perched over a smoldering campfire—we split and shaved the posts. By the third day we were dumping the back posts into a smaller drum full of boiling water to prepare them for bending. We flexed the hot posts on a shaving horse, then strapped them to simple forms and laid them in the kiln to set their curve while we split and shaved slats, which went through the same process. All the parts made, we bored the mortises for the front and back rungs and chopped the mortises for the slats. The evening of the fourth day we turned tenons on the ends of the rungs.

We assembled our batch of chairs on the workshop's last day, banging them together with a lead-filled rawhide mallet wielded over a hefty stump. It was heady stuff. First we pounded the front rungs into the front posts, then the back rungs and slats into the back posts. In these sub-assemblies, we bored the mortises for the side rungs, nicking the front

and back rungs so the side rungs would interlock with them, like Lincoln logs. Tension was high as each of us brought our sticks to the assembly stump, sticks that represented a week's shaping and scraping. Driving oversize tenons into slender posts means real fear in that moment when the mallet is poised between blows. Yet chair after chair popped into being. I asked Sawyer why he preferred this daring finale to a project so painstakingly prepared—why not use clamps? It was easier and faster this way, he said, but also the experience should be intense. "If you can get a chair together without splitting, it's not going to split afterwards," he said. "Assembly is the worst time. It's like being born. If you can survive that, chances are you'll last another fifty years."

For most of us, the workshop was over that fifth night. Whether or not we stayed on for Sawyer's optional seat-





*Assembly is tense. Under that lead-filled mallet a week's work might end up a pile of broken sticks. Everyone went home with a chair.*

weaving demonstration the next morning, each of us went home with a chair, and that alone was worth the workshop's \$175 tuition. But the real value was in what we'd learned, and the chair was there to remind us of that. I left with an appreciation for green woodworking that continues to grow. It was not the first time I'd sat on a shaving horse, but it was the first I'd done enough work on one to get sore. You learn a lot this way, subtle understandings along with plain, common sense. Surrounded by others to watch and new tools to try, the revelations come, and the horse gets comfortable. Here is some of what I learned.

**Measuring**—There's nothing novel about cutting a number of parts to size and checking one against another. It's faster, easier and more accurate than measuring each individually. But many of us feel we need drawings covered with dimensions to be able to build anything. We didn't need a drawing to build Sawyer's chair, and there weren't many numbers to worry about either. All we needed to know was recorded on the two sides of a flat stick. It didn't get wrinkled and messy in the shop, and it was always handy to place on the wood to

lay out tapers, bores, mortises or whatever. Figure 1, on the facing page, represents Sawyer's chair stick, and it's all the blueprint you need to make his chair.

**Getting the most out of the wood**—We split enough wood for ten chairs from a single white oak veneer-quality log 18 in. in diameter and 6 ft. long. We could get a back post and a front post, four short rungs, three long rungs or various other combinations out of the length. With wedges we split the log into quarters, then we read the grain to make best use of the wood. We crosscut the quarters into bolts, pieces the length of the various parts. Then a froe, that long-bladed, long handled, clumsy-looking tool, dimensioned the blanks

faster, neater and more efficiently than a saw could. We were splitting blanks for rungs  $\frac{1}{8}$  in. oversize, blanks for posts  $\frac{1}{4}$  in. oversize, and rarely having to reject a piece. The secrets of the froe are as follows: First, it doesn't need a sharp edge, but the bevel must be properly shaped. The bevel on a new froe is usually





*Scribing a back leg for final trimming.*

too blunt and too angular. It should be no more than 30°, and it should blend smoothly into the sides of the tool to form a single, convex surface. A facet, as in a chisel or plane-iron bevel, tends to stick in the wood and does not rock smoothly during levering.

Second, the froe must be properly placed on the bolt. When you have to make a number of splits in one bolt, don't start at one end and work across, but start in the middle and then again in the middle of each of the halves, and so on (figure 2, next page). With equal portions on either side of the split it's easier to control its direction. The handle of a good froe is about 16 in. long, the blade about 10 in. Make sure the whole edge is in full contact with the wood before you strike—you're liable to shift the froe if it is slightly angled off the surface. Once you start a split (give it a good rap) you have to follow through, so make sure you begin in the right place.

Now, put down your mallet. One or two blows are all that's needed—the rest is levering not severing. You need a rigid, fork-like arrangement of boards or logs, called a brake, to hold the bolt while you bear on it. If the wood begins to split unevenly, place the heavy side of the split down, and use your



*To weave the seat, first wrap the warp in one continuous strip from front to back, splicing your material underneath. Bark and splints shrink as they dry, so leave the warp overnight, then push it tightly together to fit another round or two of warp. The weft can create any number of patterns, here a diamond-shaped berringsbone. The triangular spaces at the sides of the seat will be filled with short lengths woven into the weft.*

**Fig. 1: Chair stick**

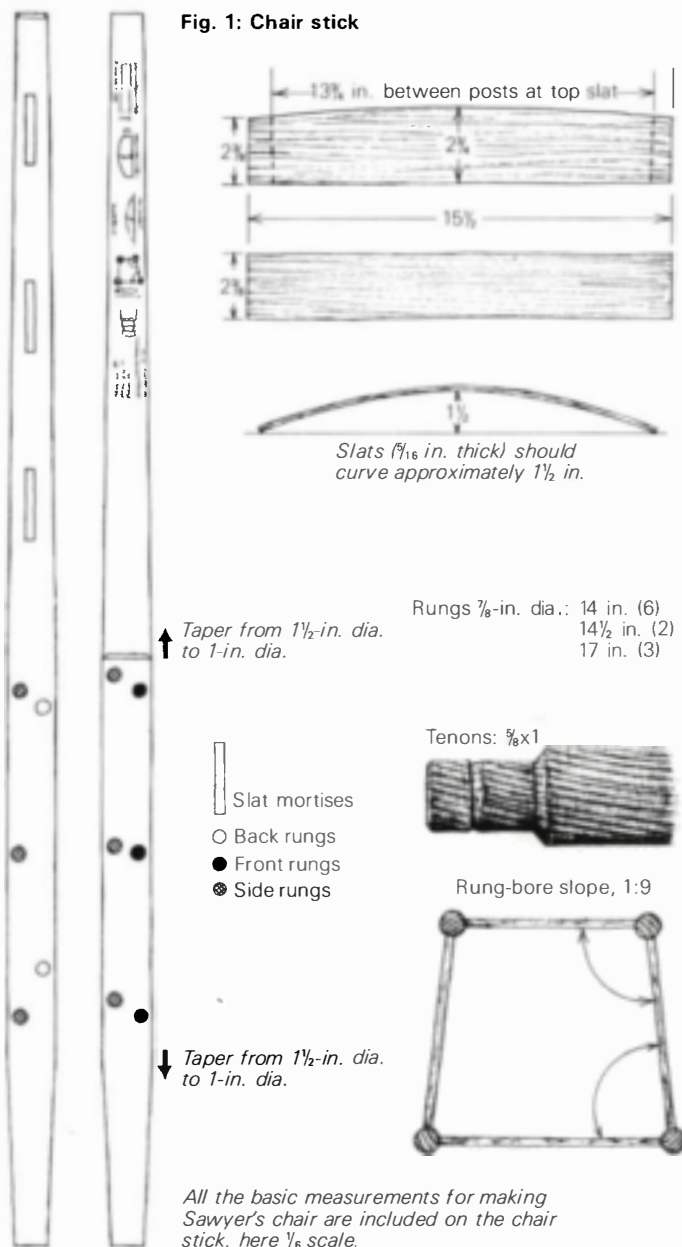
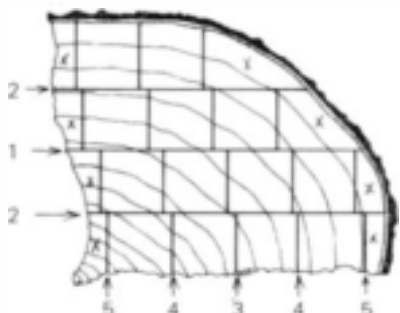


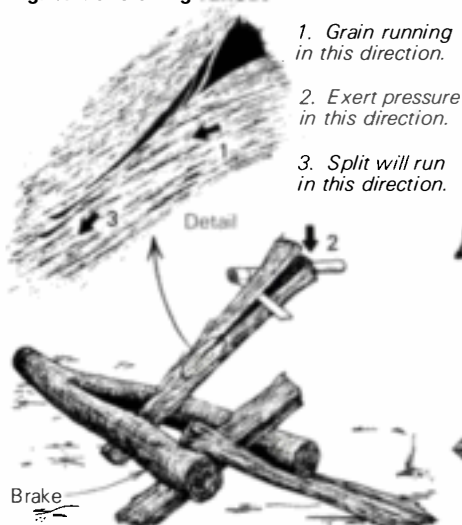


Fig. 2: Splitting order



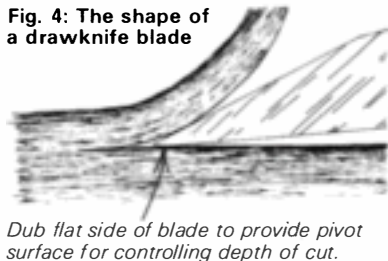
To get maximum yield from a bolt, split in halves. Equal stock on either side of the split will make it easier to control runout.

Fig. 3: Controlling runout



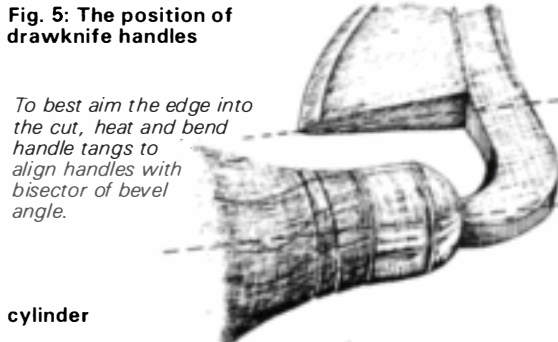
When grain runs off the direction you want to split along, exert greater pressure on the heavier side, and make the split "jump" the grain.

Fig. 4: The shape of a drawknife blade



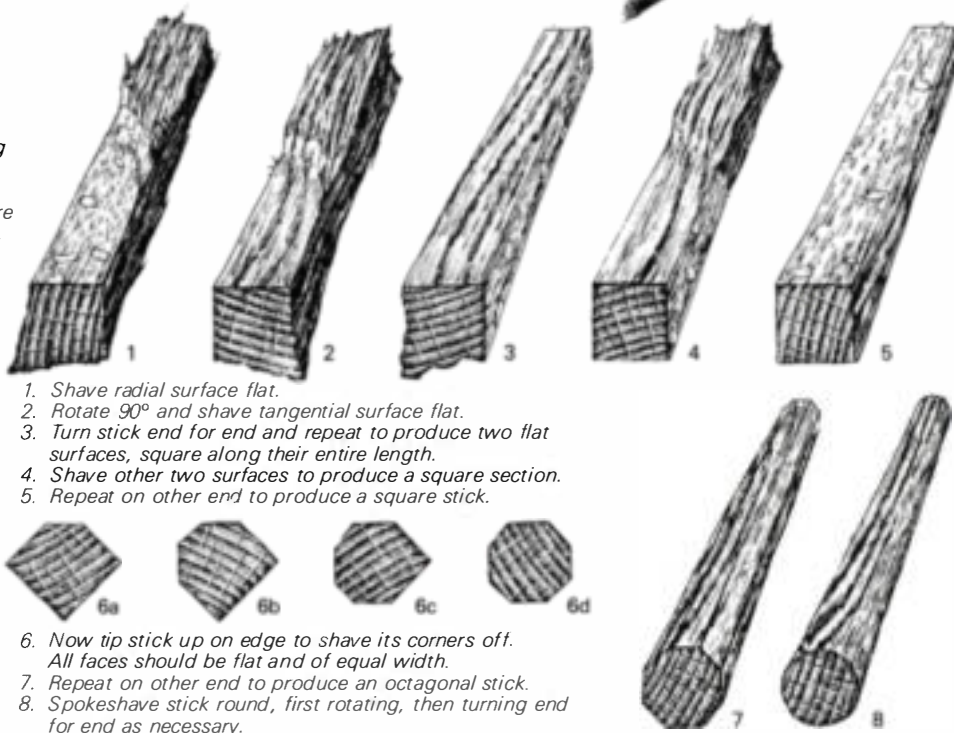
Dub flat side of blade to provide pivot surface for controlling depth of cut.

Fig. 5: The position of drawknife handles



To best aim the edge into the cut, heat and bend handle tangs to align handles with bisector of bevel angle.

Fig. 6: Order of cuts in drawknifing a cylinder



1. Shave radial surface flat.
2. Rotate 90° and shave tangential surface flat.
3. Turn stick end for end and repeat to produce two flat surfaces, square along their entire length.
4. Shave other two surfaces to produce a square section.
5. Repeat on other end to produce a square stick.

6. Now tip stick up on edge to shave its corners off. All faces should be flat and of equal width.
7. Repeat on other end to produce an octagonal stick.
8. Spokeshave stick round, first rotating, then turning end for end as necessary.

hand to bend the heavy side away from the split. Go slowly. You need time to see which way the split is going and to direct it. If you have split firewood only, where you strike a single blow with a maul and pick up the odd pieces, you will be surprised at the control you have with a froe. Sure, wood splits along the grain. But by bending the wood away from the split, you can cause the plane of failure to jump the grain (figure 3 and front cover).

**Shaving wood**—If I never work another piece of green wood, I will still use my new drawknife and the shaving horse I recently built. These tools are surprisingly handy for all kinds of work. The shaving horse quickly clamps stock of various shapes and sizes so you can shave it, plane it, scrape it, or (heaven forbid) sand it. It doesn't take long to coordinate hand and foot: clamp down, take a stroke, release pressure, move the stock, and clamp down again. You can't do this sort of thing as fast with a bench vise. Your whole body works on the shaving horse, not just your hands and arms. The harder you pull with your knife, the more you push with your leg, and the tighter your stock is clamped. And all the while you're on your butt, building a chair while you sit.

I tried a number of different shaving horses and I like the dumbhead horse best (*FWW* #14, p.4). I tried different drawknives too, and it seems most can be made to work well, if properly sharpened (*FWW* #25, pp.93-94). The angle of the bevel should be relatively small, between 28° and 32°. I

dub the edge on the flat side, the sort of thing that you'd never do to a plane iron. A plane iron is positioned in relation to the surface of the work by the sole of the plane. Only the edge of the blade touches the work and dubbing the back dulls that edge. The drawknife, having no sole, is guided by the back of the blade sliding on the wood (figure 4). You can regulate depth of cut—from ½-in. thick slabs to paper-thin shavings—simply by tilting the handles. To best aim the edge and control the cut, the handles should be parallel to a line that bisects the bevel angle (figure 5). You will have to heat the upper portion of the tangs and rebend the handles of most drawknives to establish this relationship. Some drawknives work better bevel-side down, as this surface provides something to rock the blade on. I find that dubbing the flat face produces a fine pivot surface for sensitive work.

Sawyer showed us how to hold the knife diagonally to the stroke, and to slide it sideways, slicing as we pulled it. He liked long, consistently thick shavings from long, even pulls. As we worked, he would wince at the crackling sound of badly cut wood. Good shavings whisper off the knife. □

*Rick Mastelli is associate editor of Fine Woodworking. This summer's Country Workshops will include hand-tool techniques, with Willie Sundqvist; basic country woodcraft, with Daniel O'Hagan; and chairmaking, with John Alexander. For details write Country Workshops, Route 3, Box 221, Marshall, N.C. 28753.*