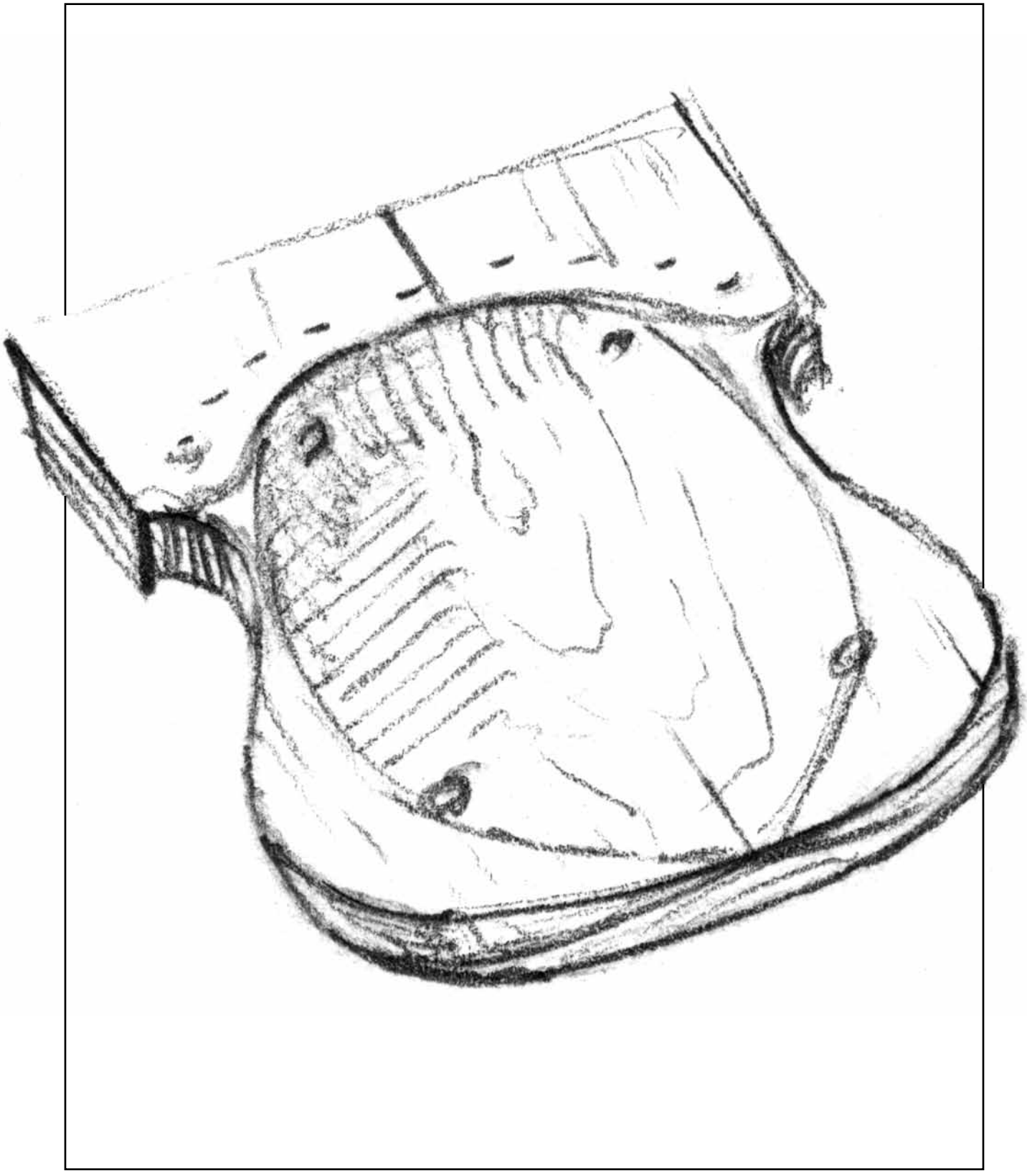


19

Carve the Seat

When I set out to make my first chair, there were parts of the process that I did not even know existed. But there was one part that I knew I wanted to do: carve the seat.

I got into woodworking for this kind of fun. Watching the shavings fly as the seat shape comes into focus is hypnotic and thrilling. Making a chair should begin with the various green wood parts so that they will be dry when the seat carving is done, but I suspect that most folks head right to the seat carving and build the rest of the chair around it. And when I started out, I was no exception. I couldn't even wait to build an actual chair, so I glued up a bunch of 2x4s and used a gouge and a bent piece of steel to hog out a crude seat.

Beyond referring to a seat as oval-, D- or shield-shaped, it actually is an "un-nameable" shape. While it has hollows and humps that follow a distinct logic, there is no simple way to describe it. I think of it as a landscape, full of hills and valleys. To arrive at this complex shape in a consistent and timely way requires a set of steps, each one paving the way for the next. No single step is ambiguous; in the end, the overall shape, while tough to describe, is consistent and clear.

Carving the seat affects just about every surface of the workpiece, so being able to hold the seat in a number of positions is critical. I always leave the extra material adjoining the back of the seat in place until the last step of carving the underside at the back. This way, I can always clamp the waste area without dinging the soft pine, and when I clamp it to the corner of my bench, I can easily move around the seat to come in from the desired direction.

Before I carve under the front edge of the seat, I can clamp the seat between the vise's dog and a bench dog

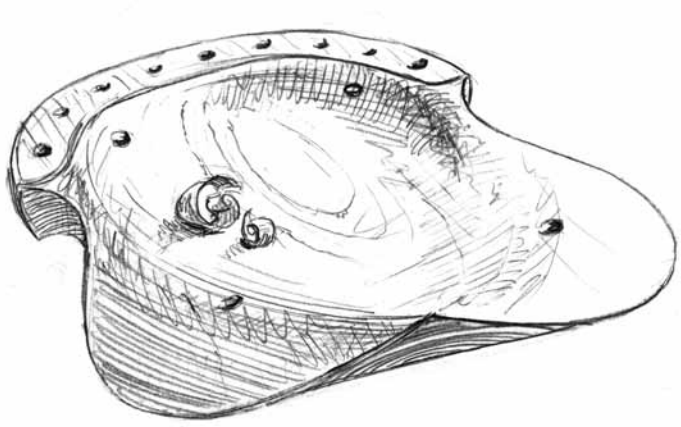


FIG. 19.1 *Carving the seat.*

because the material being compressed gets carved away later. For the initial adze work, I clamp the seat to my shavehorse, which puts the blank at a comfortable height to use the small hand adze that I prefer.

I've also had great success using a podium-type support that sits on my bench. This is great when using the small hand adze because you can flip the seat in various orientations without having to move clamps, plus the force of the blows is countered by the lip at the bottom of the holding platform.

When Steel Meets Wood – Tips for Clean Cuts

Once you've begun to envision the wood as a bundle of fibers and understand how a tool is configured to cut them, it's time to put these two bits of knowledge together

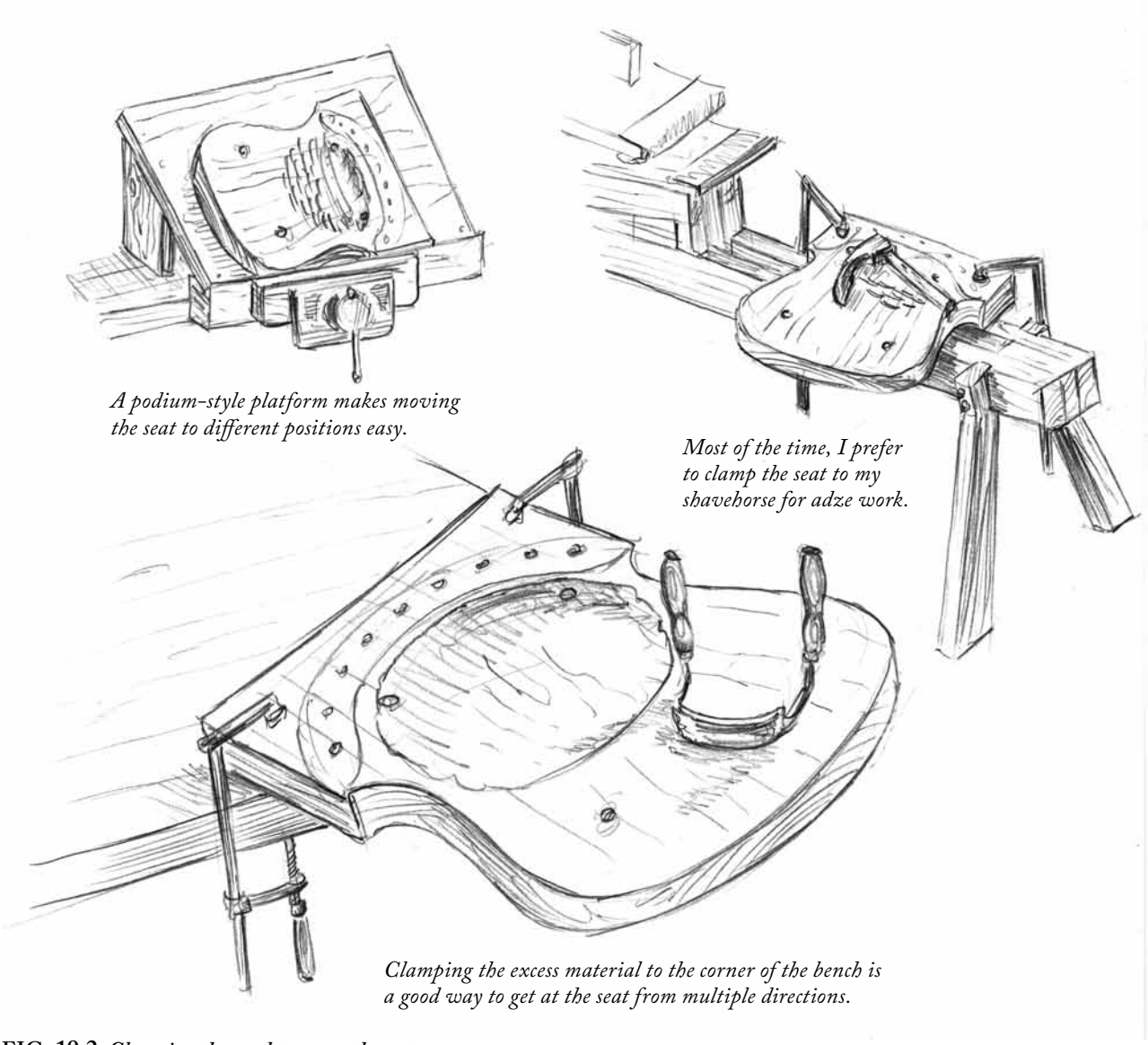


FIG. 19.2 ***Clamping the work to carve the seat.***

to get proper results. Regardless of which type of tool you are using, it's important to know there is always a technique that can deliver clean, controlled cuts.

Clean results when carving are usually achieved by moving or pointing the tool in a specific direction. Cutting in the wrong direction usually leads to rough and uncontrollable results as the tool slips between the fibers and causes the wood to split in advance of the cutter.

In the chapter Shaving & Shaping Parts, I introduced shaving, which is like controlled splitting, but for now, let's focus on achieving clean cuts when cutting across the fibers.

Looking back to the structure of the wood, it's important to note that any time you see a surface pattern other than long strips running perfectly from one end of the board to the other, you are looking at exposed end grain. This is the common "cathedral" patterning seen on the surface of most sawn boards. Because the surface has exposed end grain, a specific direction of cut will yield good results.

Most folks encounter this concept when deciding which direction to plane a board. I think of planing a board as a form of carving because the same rules of grain direction apply – you are simply "carving" a flat shape.

When planing a board, the direction that the fibers ascend from the lower face determines the best direction to plane the surface. This is usually referred to as cutting "downhill."

When pushed "uphill," the cutting edge slides between the fibers, follows them and causes a splitting action to occur ahead of the cutter. The damage is limited by the depth of cut, the sole and the chipbreaker, but the increased effort and diminished surface quality are not desirable.

A favorite comparison when contemplating planing is to think of petting a cat or dog. If you stroke the fur from head to tail, it lies down smoothly and your hand never slips down to the skin. If you pet from tail to head, your hand slides under the fur, causing the fibers to stand up and the animal to get annoyed. I'm pretty sure we've all had a cat and board glare back at us after such a transgression.

While you can determine the direction of cut based on the orientation of the growth rings and the pattern on the faces and edges of the board, this can lead to confusion because boards from twisted or bowed logs can have multiple direction changes on each surface. In such cases a few light cuts are best to help determine the best cutting direction for each area.

When assessing the direction when carving more complex shapes, I opt for a different comparison.

I like to think of running my finger along the edge of a slant-cut paint brush. There is only one direction to do it smoothly: from the shorter fibers toward the longer ones. This also holds true for shapes in wood.

For instance, take a look at half-circle shapes cut into a board in two places in Fig. 19.5. Take note of which fibers extend further into the area being cut.

Even though the cutouts are the same shape, the cutting directions are opposite. When cutting the area at the end of board, the tool must start at the deepest point of the hollow and head toward the shallowest points, while the hollow cut on the edge of the board is the opposite.

To help visualize this, imagine the fibers as part of a paint brush. By imagining the brush aligned with the fibers and oriented so that the slant of the brush matches the shape, I can determine the direction to cut.

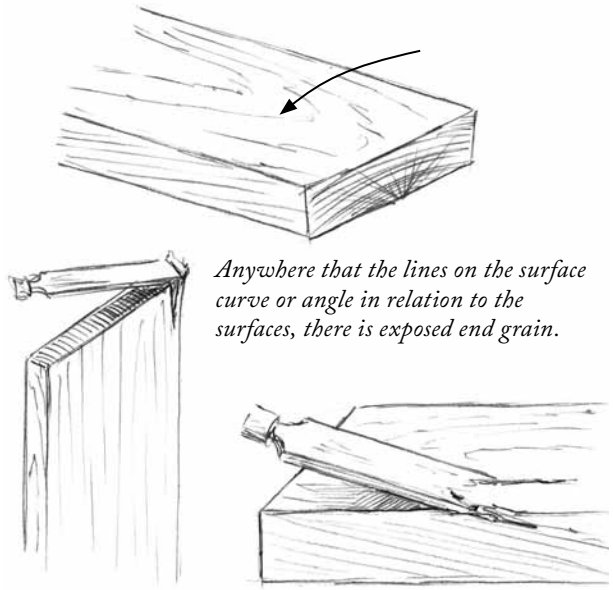


FIG. 19.3 *Learn to read the fibers of boards.*

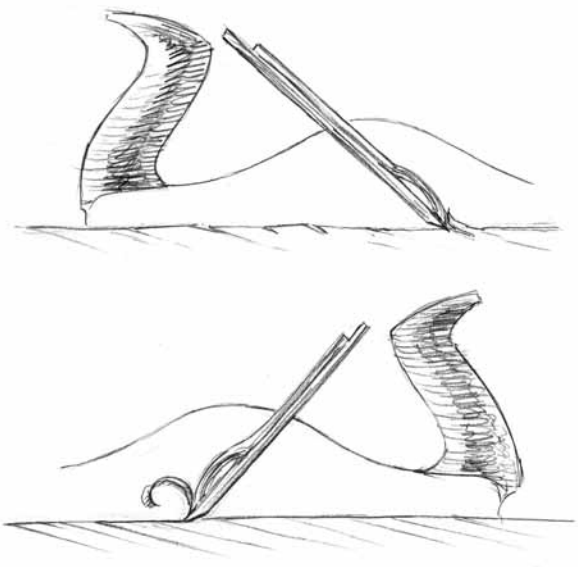


FIG. 19.4 *How to plane "downhill" (bottom image) by following the fibers in a board.*

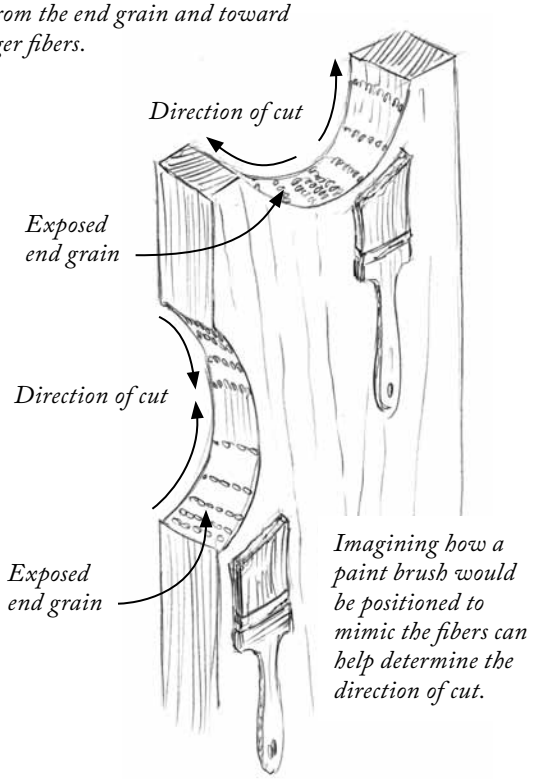


FIG. 19.5 ***It helps to imagine a bevel-edge paint brush on the board to point out the correct direction of your cut.***

Another issue that affects the direction to cut arises in the regions of each shape where the direction of cut reverses. As shown in Fig. 19.6, you must change the direction of the cut before the fibers change direction. This transition creates trouble if you try to take a cut directly from one end of the shape to the other. You'll run into this issue when carving bowl shapes, such the one that begins the seat carving.

Ending the cut before you engage the fibers on the opposite slope is tough, and if you go past a certain point the tool will dig in and begin a split. You may find yourself in the unenviable position of trying to dig your way out of a hole.

My preferred way to make these cuts is by cutting across the fibers while keeping the blade skewed in the orientation that I would cut if I were cutting "with the grain." While I am showing an inshave here, this applies to all carving tools.

STEP 1. CARVE THE GUTTER

I'm often asked, "what's the point of the gutter"? While I might not have historical insight that would stand up to scrutiny, I have found practical reasons for including a gutter and I'm sure most would agree. The gutter provides a transition from the shapely seat carving to the flat spindle deck.

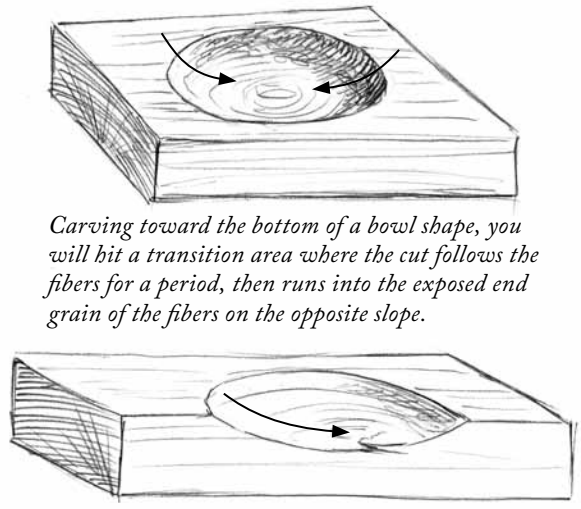


FIG. 19.6 ***Carving a bowl shape can be tricky at the point where the fibers reverse direction.***

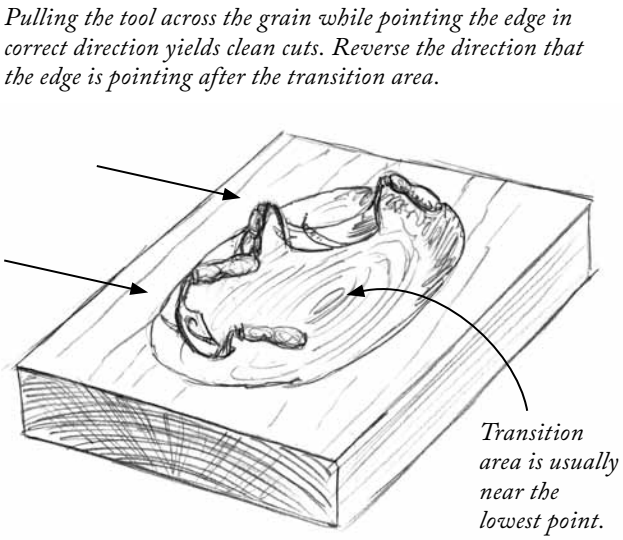


FIG. 19.7 ***Cutting across the grain with the tool properly skewed will result in clean surfaces.***

It's like trim, providing visual interest while freeing you from the need to achieve perfect carving. On chairs that I make that don't include the gutter, only the shaping at the back of the seat carving defines the transition edge; that requires much greater level of exactness.

I use an 11/7 veiner to carve gutters, but there are a variety of sweeps and widths that work fine. Chairs don't fall apart because of the shape of the gutter, so work with what you have. Besides the gouge, good lighting is key to carving the gutter. I set up a raking light, and I dim the shop lights to get a clear view of my results.

I like to carve my gutter before carving the seat, but I'm sure there are others who wait. Carving the gutter requires a gouge that is well-sharpened at a low angle, around 17°. To ensure that the edge is strong enough, I gently round the interior of the gouge, which brings the included angle above 20°.

If you are new to carving, practice in the excess material outside of the pattern. Start by drawing a curved line. Then draw a parallel curve that's 1/4" outside of that line. These are the limits of your gutter's width. The depth will be determined by your gouge. The gutter will be a consistent depth when the groove reaches the lines.

I begin carving the gutter by taking a light cut in the center, between the lines. This light cut allows me to steer the tool easily, and when I take a second pass, I can then smooth and refine the groove.

I like to work the whole gutter to one depth, then return for additional passes, which makes it easier to keep the curve fair. I hold the gouge in both hands, but each hand plays a different role. I always keep one hand in

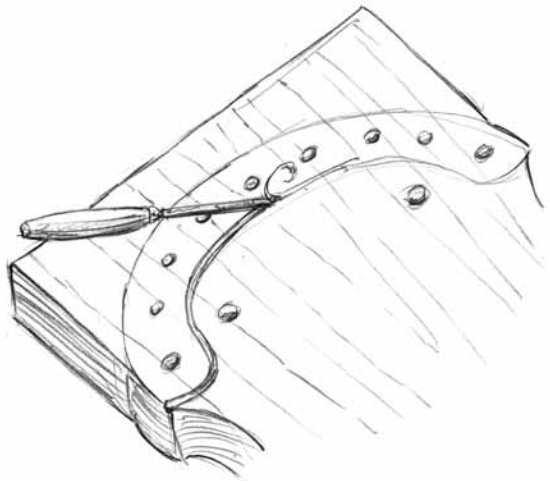


FIG. 19.8 *Carving the gutter in front of the spindle deck.*

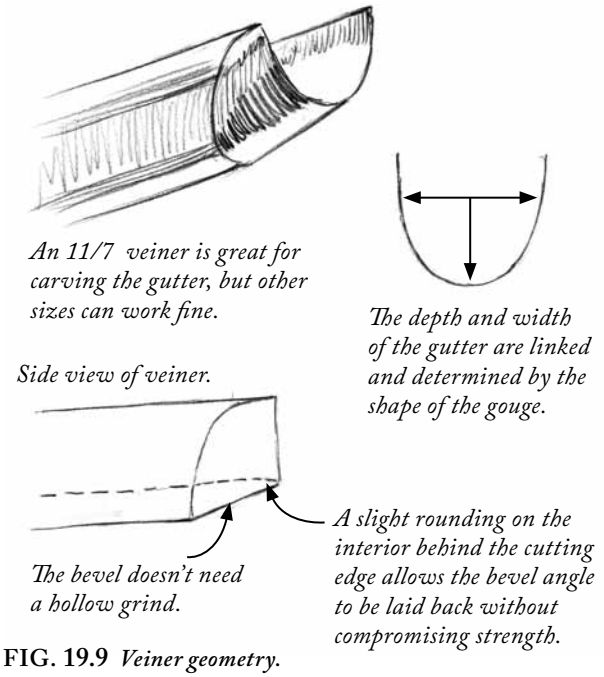


FIG. 19.9 *Veiner geometry.*

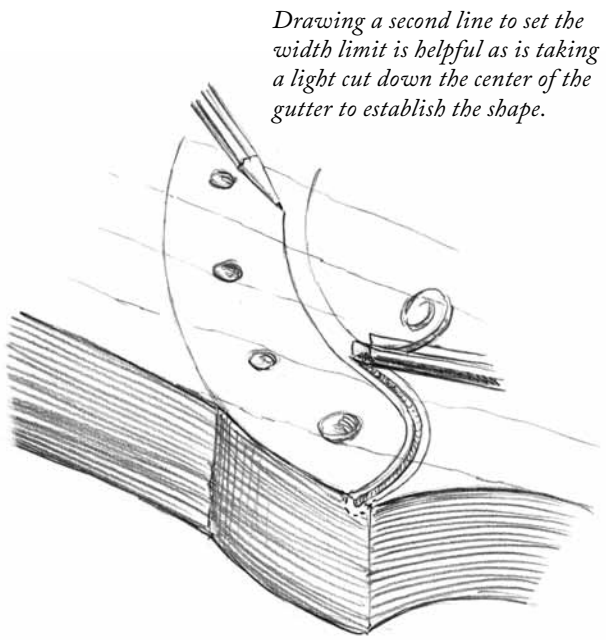


FIG. 19.10 *How to begin carving the gutter.*

FIG. 19.11 *Body position while carving.*

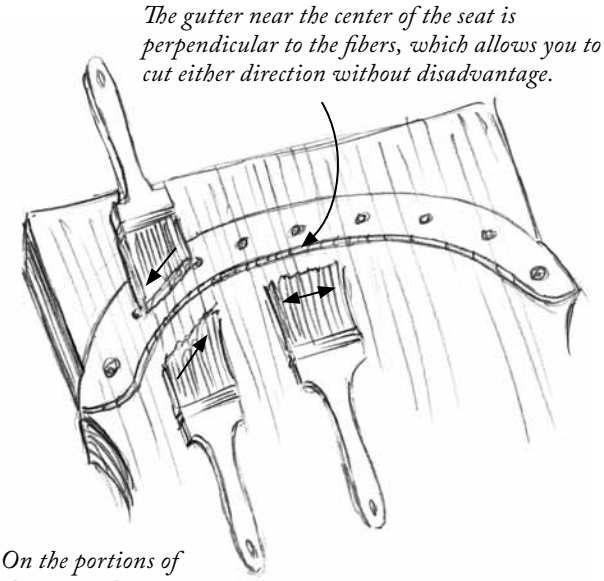


FIG. 19.12 *How to deal with the changing grain while carving a gutter.*

contact with the seat, which helps me control the trajectory of the tool. I push and steer the tool with the other hand. Keep your arms close to your body and use your whole body to move the tool.

While carving, you will likely notice that cutting directly across the grain is the easiest, because the fibers don't pressure the tool to drift. Once you begin cutting along the fibers, which will happen somewhere on a curved line, the tool will try to slide between the fibers and follow them, rather than follow the path you want. Besides keeping the tool in the correct path, you might notice that the surface quality on the side that is heading into the end grain wants to grab or tear out. You can avoid this by shifting the handle slightly toward the side that is tearing and focus on cutting the other side of the groove. Then come from the other direction to cut the problem side, which will then have support to shear cleanly.

I carve the gutter right off the end of the pattern at the sides. Once the gutter is established, I take light cuts until it is as deep as it can be without going beyond the limits of my lines. If you are cutting and the tool starts following the fibers or gets bogged in a deep cut, a slight wiggling and rotating of the handle can help it slice its way free. My goal is to make the gutter look as though it was cut in one pass.

Assuming that I'll do something perfectly isn't much of a plan, so whenever possible, I try to leave room for another chance. There is a second chance to refine the gutter after the seat is carved and legged up when I plane the spindle-deck area. This reduces the depth of the gutter and gives me another shot to clean up the shape and depth.

STEP 2. CARVE THE BOWL

Shaping of the seat begins with carving a "bowl" shape at the rear. I drill holes at the locations marked on the seat pattern to locate the deepest part of the bowl (see the pattern for the depth-hole locations). I drill those with a regular 1/2" twist bit and make 7/8"-deep holes. I use a black marker to mark the deepest point of the holes after drilling so I know when I am close to reaching final depth. The deepest part of the seat will end up at 15/16"

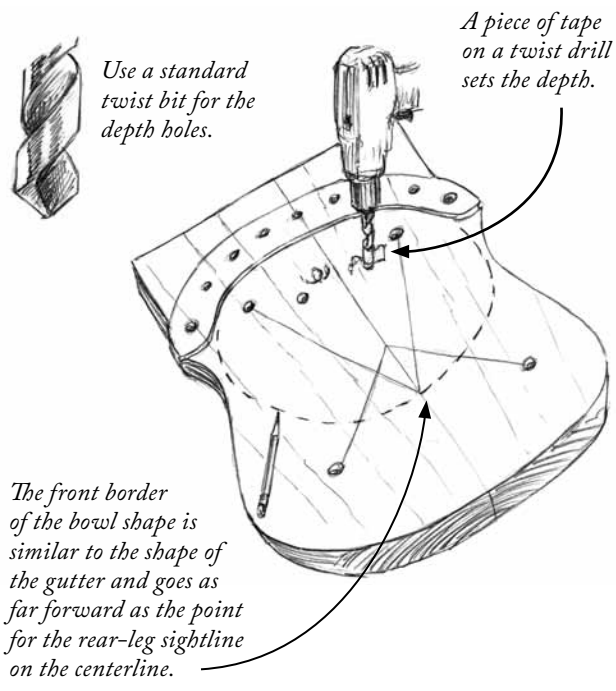


FIG. 19.13 ***Drill holes to set the depth of the bowl.***

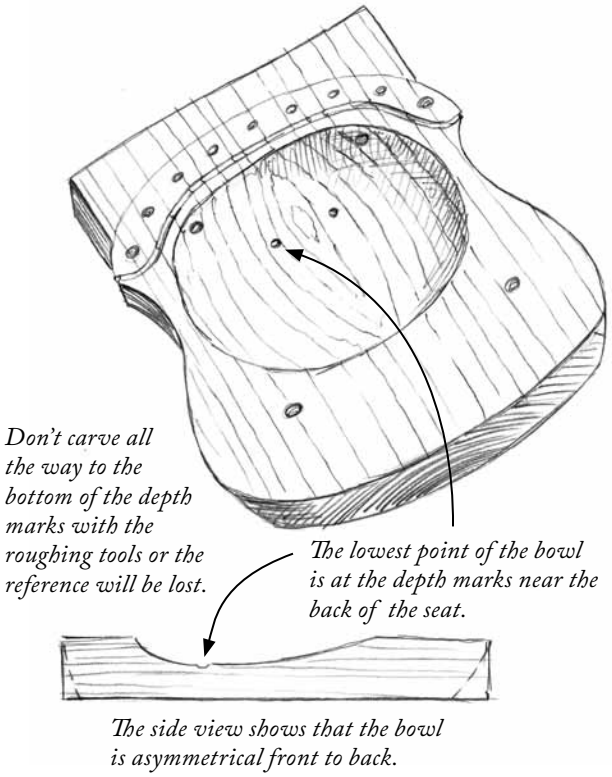


FIG. 19.14 ***The lowest point of the bowl is off-center and toward the back of the seat.***

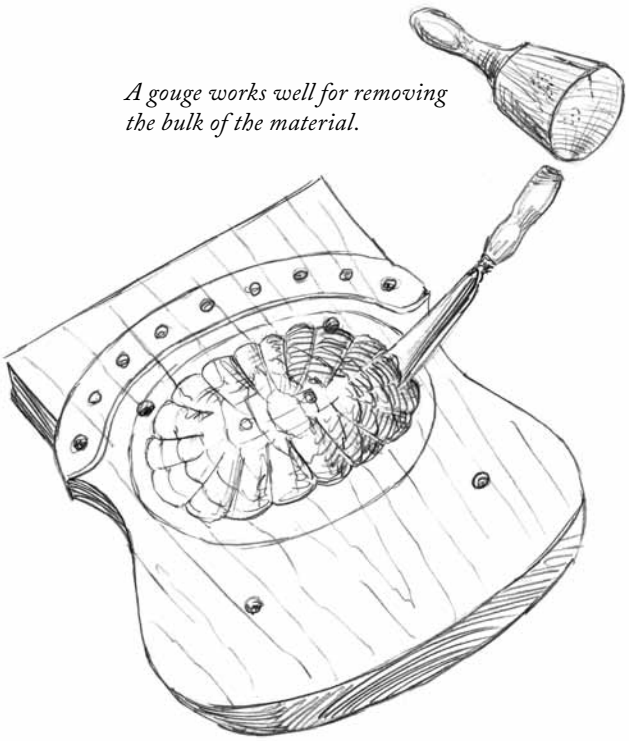


FIG. 19.15 ***You can use a gouge and mallet to rough out the bowl.***

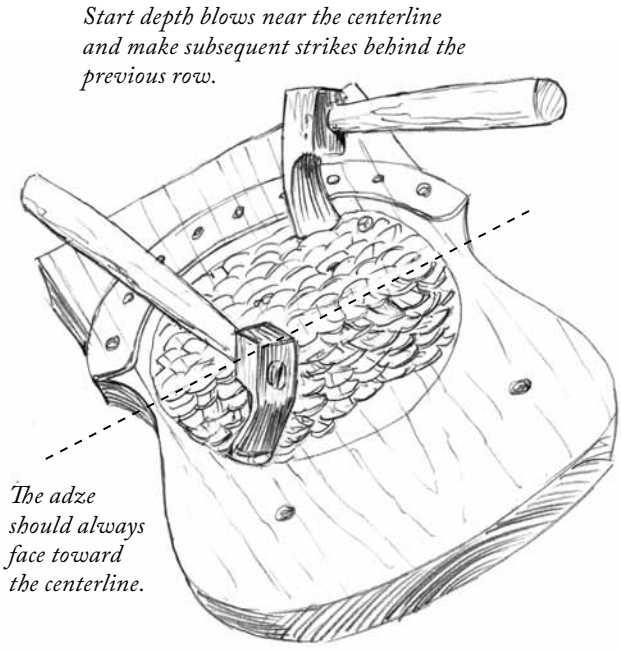


FIG. 19.16 ***Adzing the seat by working with a centerline in the bowl.***

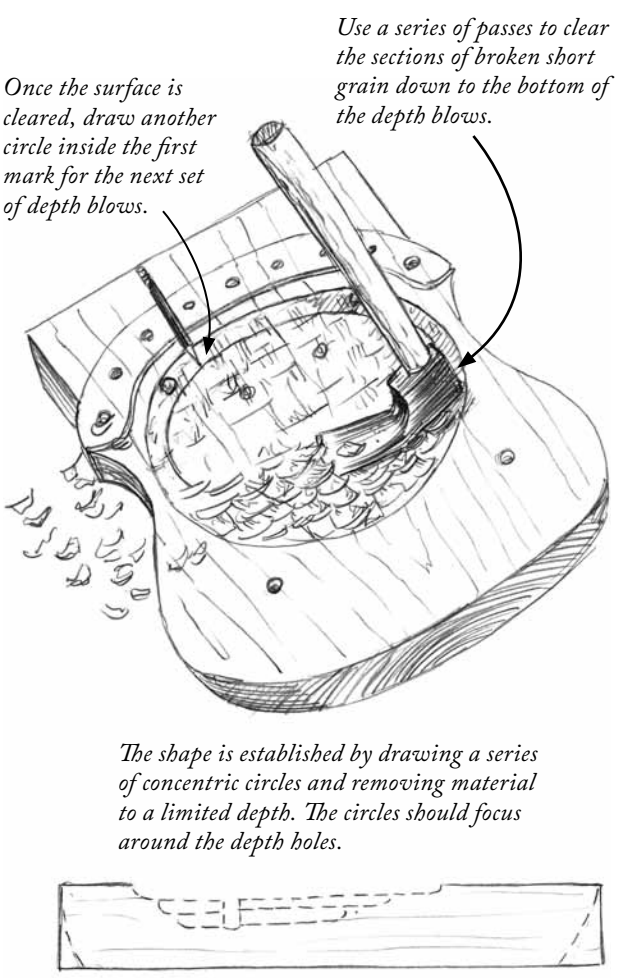


FIG. 19.17 ***Following a series of steps creates a consistent shape.***

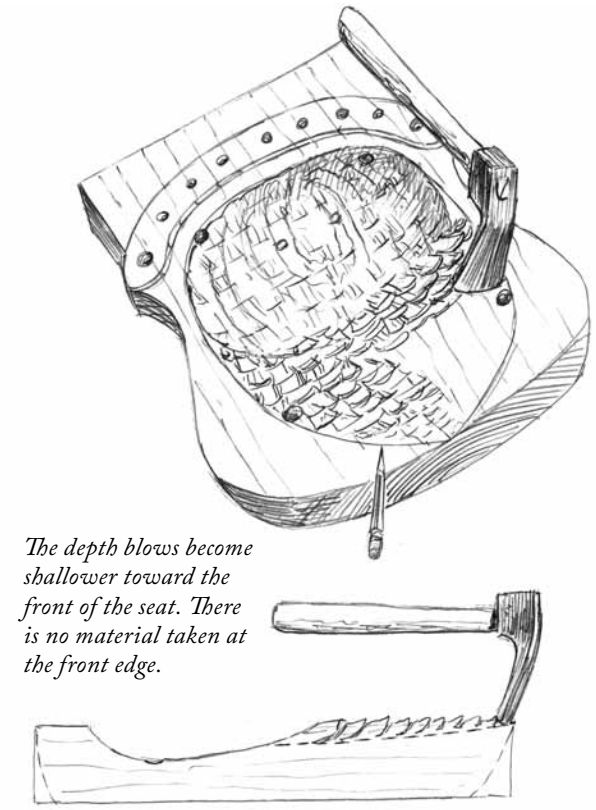


FIG. 19.18 ***After creating the bowl, adze a ramp up to the front edge of the seat.***

or 1" deep after carving down to the marks and scraping the surface.

The gutter defines the back of the bowl, and by drawing a line that echoes the gutter in the area to be carved, you create a perimeter for the other edge of the bowl. Note that the lowest point of the bowl is off-center (shifted to the rear of the seat) and take care not to carve the portion near the front of the bowl as deep as the depth holes.

While I use an adze to remove the bulk of the material and refine the shape, it's also reasonable to do this step with a mallet and a gouge, or an inshave.

Regardless of which tool you use, always face your cuts toward an imaginary centerline that goes across the grain in the center of the bowl; this will keep the tool from breaking out beyond the perimeter. Then make a series of depth blows in rows behind the first row.

The depth cuts are similar to hammer blows, coming in nearly perpendicular to the surface, but using a slight angle toward the previous row will help break the chips. This allows the tool to dig in to the surface. It's vital that each row of depth cuts is behind the previous one, because the gap created during the cut of the first row allows the second to break.

Once this "fish scale" pattern is complete, reposition the adze in relation to the seat so that it can swing in and out of the cuts and clear the chips by swinging cross-grain. The uncut layer should be exposed and any short grain cleared. If the tool digs or glances off the surface, adjust the height of your hand to suit.

The next series of cuts will stop about ¼" in from the border, and the process repeats until you have a bowl shape. Don't worry about getting right up to the lines at the edge when clearing the material. Once the bulk is

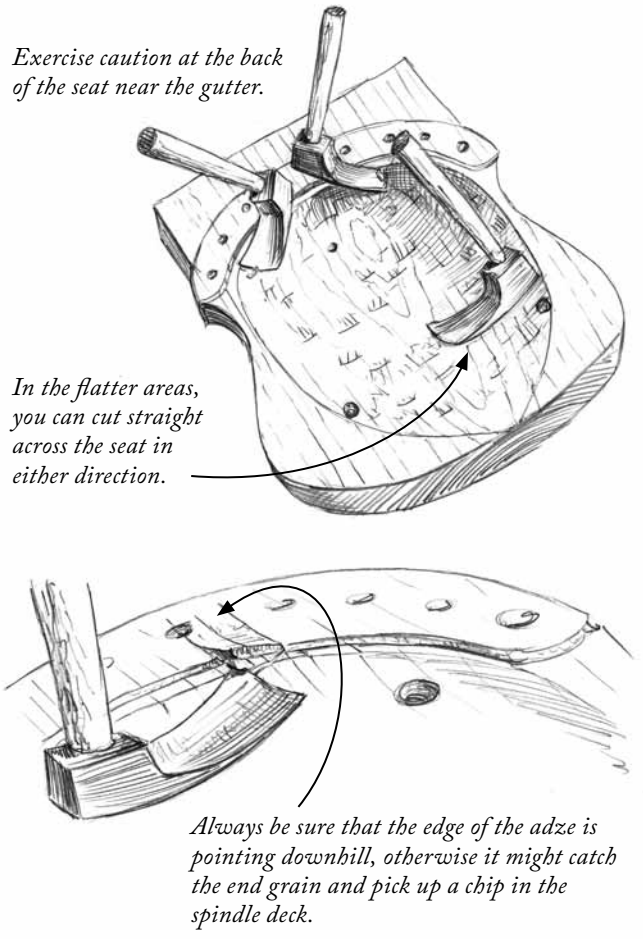


FIG. 19.19 *Refine the surface with the adze.*

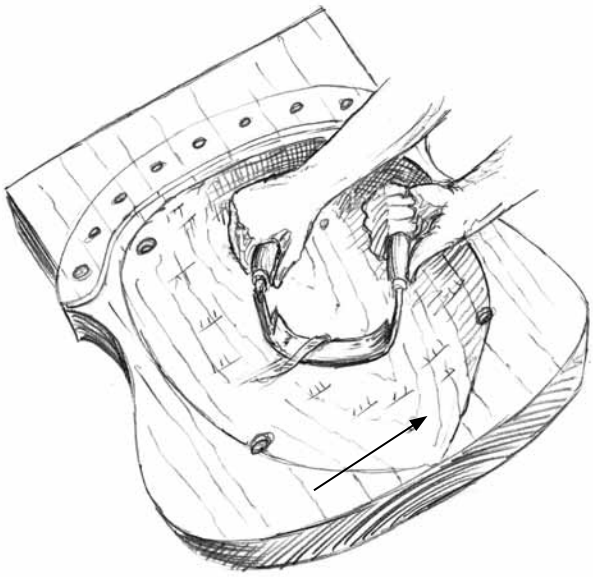


FIG. 19.20 *Correct hand position helps when skewing the inshave.*

removed, you can fine-tune the shape and get closer to the edge by cutting across the fibers.

Most newcomers to the adze usually prefer to use the inshave to sneak up to the edge, but with a little practice and daring, the adze can be effective there as well.

STEP 3. CARVE THE RAMP

Once the bowl is carved, it's time to remove material from the front half of the top to make a shovel shape. The shape is like a flat ramp leading from the bowl to the front of the seat as shown. Make a series of cuts in rows that decrease in depth toward the front.

Remove no material from the very front edge. Then clear the shavings and refine the shape until it has a clear geometry.

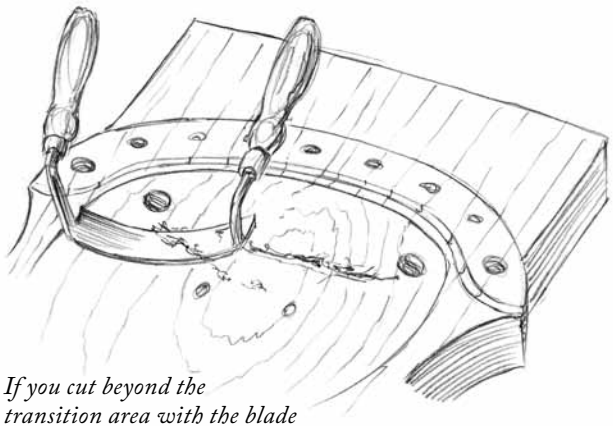
STEP 4. REFINE THE SHAPE WITH THE INSHAVE & TRAVISHER

THE INSHAVE

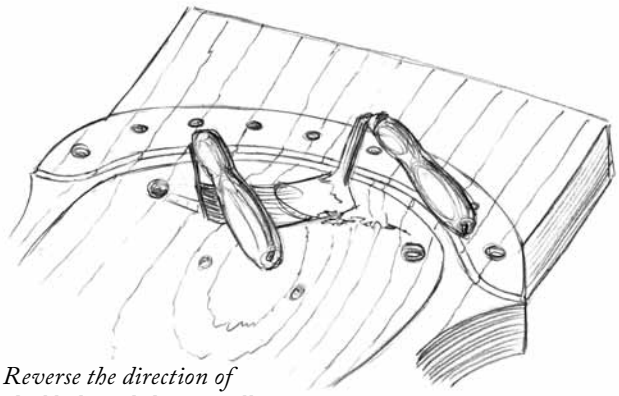
The inshave can do all the work of the adze, though more slowly, and it can leave very little cleanup for the travisher or scraper. I stay slightly above the bottom of the depth holes in the center of the seat when using the inshave. Later, with the travisher, I cut all the way to the bottom of the depth holes.

The inshave is a carving tool, but the path that the tool follows is not intuitive. As a symmetrical tool with two handles, it's easy to get the impression that the tool should be evenly pulled along the fibers. But the most effective way to use the inshave is to let one hand lead and skew the tool as it's drawn across the fibers. Awkward at first? You bet. But there are multiple advantages to this technique.

Unlike split and shaved parts, where cutting direction is always thick to thin, inshaves carve seats that are sawn from the log. So the direction of a successful cut along the length of the fibers will depend on whether the fibers are ascending or descending on the surface. And as is usually



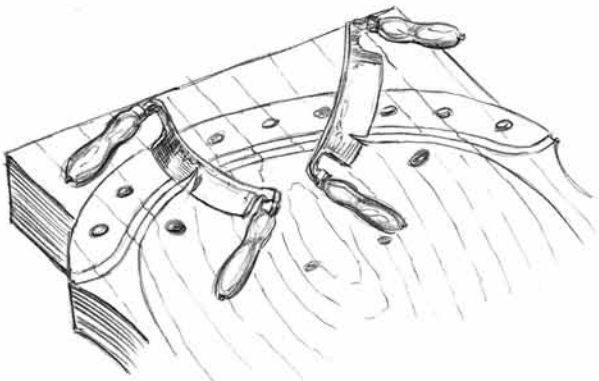
If you cut beyond the transition area with the blade facing the exposed end grain, the surface will be rough.



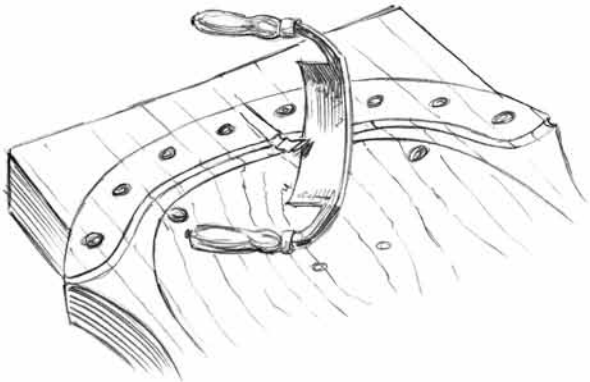
Reverse the direction of the blade and the cut will be clean.

Note: It's not the direction that the tool is pulled in this instance, it's the direction that the edge is in relation to the end grain exposed on the surface.

FIG. 19.21 ***The quality of the cut depends on the direction the cutting edge is facing.***



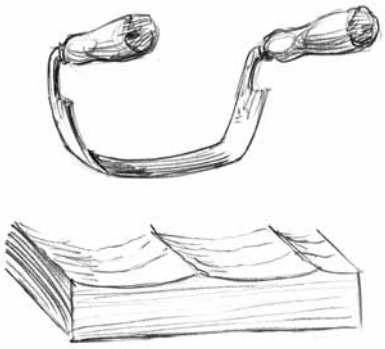
Cutting close to the gutter is fine as long as you face the edge of the inshave downward and work away from the center.



If you point the edge up, or work toward the center, it is likely to dive into the end grain and pick up a chip from the spindle deck.

FIG. 19.22 ***Cutting the cove at the back of the seat with the inshave.***

A tight radius is great for hogging out material, but takes more strokes to achieve a smooth surface.



A flatter shave with rounded corners is the best of both worlds, capable of hogging and smoothing.

FIG. 19.23 ***Different inshave radii affect the results.***

the case when hollowing a seat, there will be a transition where it will reverse, driving the tool head-on into the end grain of the opposing fibers. This calls for constant interpretation of the shifting surface and fibers, and can also lead to some tear-out in the transition areas.

When the tool is pulled across the board, the position of the user is always the same; only the skew direction of the inshave changes. The direction of skew will always be the direction of the descending fibers. A light pass and examination of the surface quality will get the ball rolling. When the tool starts to pick up the end grain of fibers coming the other direction, simply change the skew and continue across the seat. The skewing will leave a clean surface.

Deeper cuts can also be made with more control and power across the fibers without fear of a split running ahead of the cut. As the seat carving progresses, the shape of the surface will require slightly more care in choosing the direction of cut, as well as the skew angle, especially at the back of the seat.

The effort to smooth the shape will depend on the shape of the inshave. If your tool has varying radii, you can use the flatter portions to your advantage at the end of the process to fair the surface. If it has only a single tight radii, you will spend more time taking smaller cuts to reduce the size of the scalloping, or simply do more work with the next tool, the travisher.

SMOOTHING WITH THE TRAVISHER

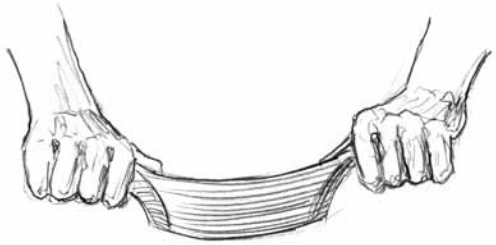
The next job is to smooth the carved portion of the seat until there are no distinct bumps or transitions, leaving a surface ready for scraping. For this, I reach for a travisher.

Some users prefer a compass plane, and when I started I made and used one. In my experience, the travisher is a more versatile tool, so my compass plane sits rarely used. The compass plane does excel, however, at getting even curves at the back of long settees.

The travisher can be tough to get used to because folks often roll the tool back while pushing it to find the cutting edge; this makes the tool take a heavy cut and jams the throat with shavings. Using a travisher or spokeshave requires a movement that is counter-intuitive and must be practiced.

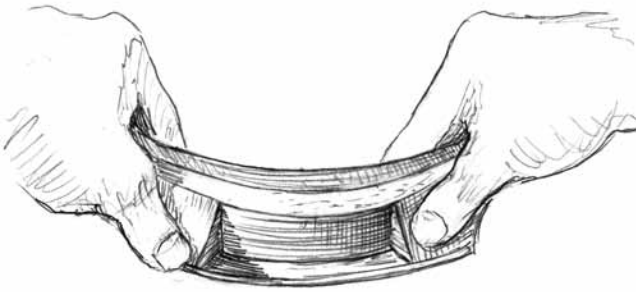
Unlike when using a carving tool, where lowering the handle actually raises the edge out of a cut (like a spoon in ice cream), these tools take a deeper cut when the handles are dropped back. To come out of the cut with control and not have the thick end of the shaving clog the throat, the tool must be rolled forward at the end of each stroke. This is a strange action and no one should expect it to feel normal at first. Practice this "stroke" without engaging the blade, just riding on the surface and exaggerating the rolling forward at the end of the stroke, jutting your wrists forward. I know it feels wrong, but it's right. To see the illustration of this motion, refer to the section on pitch-adjusted tools in Hand Tools: Sharpening & Use.

Like the inshave, I use the travisher across the fibers while skewing it in the direction that the end grain descends. This allows me to traverse the transition areas without getting hung up in the end grain of the opposing side. A subtle crisscross pattern will help create an even surface.



It's common for new users to grip the handles and hold them very tightly. This is not the best way to hold the travisher.

Hold the body of the tool lightly between your thumb and first two fingers.



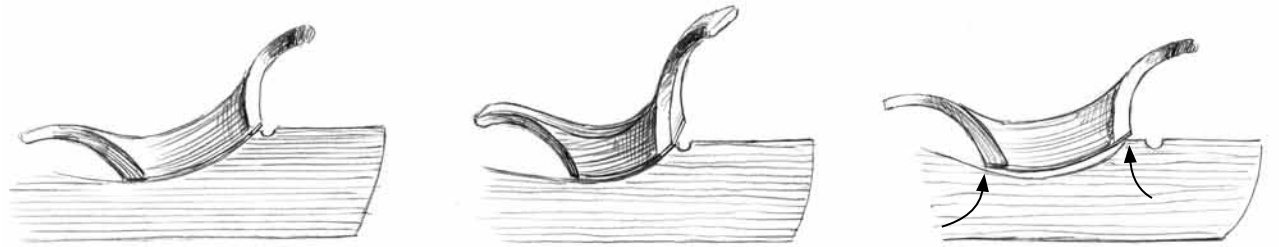
Position your thumbs low on the flats at the back of the tool for the best feedback and control.

FIG. 19.24 ***Hand position and pressure is essential to travisher technique.***

The shape of the travisher is also helpful in creating a consistent curve at the back of the seat. Cut in front of the gutter until the shape of the seat matches the shape of the travisher. If you want to make it deeper, skew the travisher. If the tool won't cut in the center of the curve any longer, check to make sure that there isn't material holding it up in the surrounding areas.

The travisher is one of my favorite tools. I use the various portions of the blade to refine the curves of the seat with a speed that allows me to "see" the seat take shape and make subtle adjustments as needed.

Rubbing your hand with its palm flat across the seat's surface can help to detect any bumps or dips. At this point, the initial depth holes should be barely visible, if at all.



The travisher can be used to form a consistent shape in the curve at the back of the seat.

Skewing the tool makes a tighter radius.

If the travisher won't cut in the middle of an area, remove material from the adjacent areas.

FIG. 19.25 ***Cutting the back of the seat to match the travisher.***

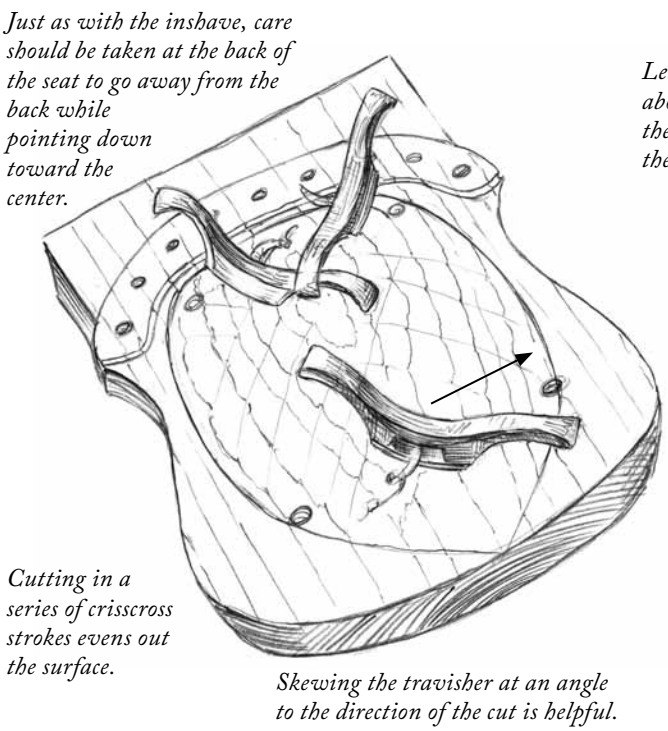


FIG. 19.26 ***Smoothing the surface with the travisher across the grain.***

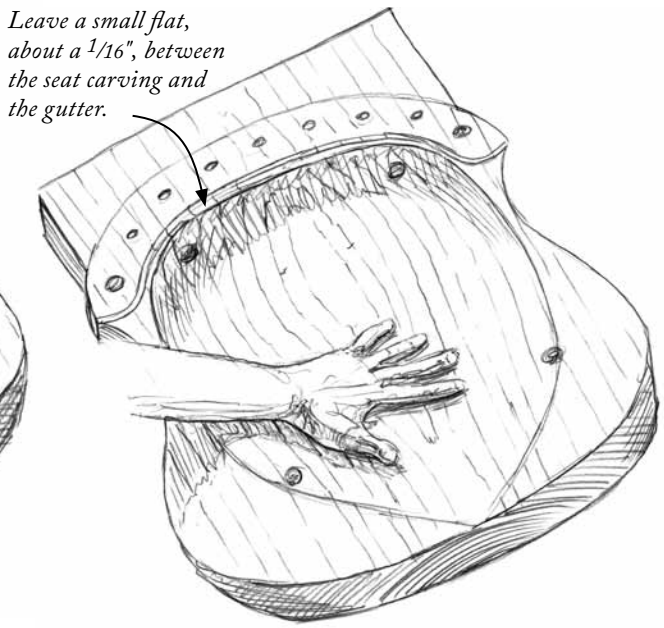
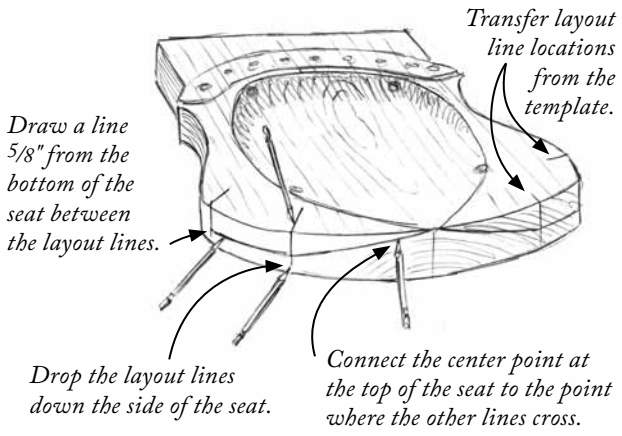
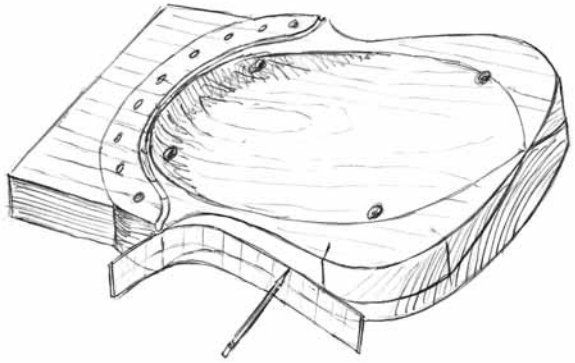


FIG. 19.27 ***Examine the surface for areas that need refining.***

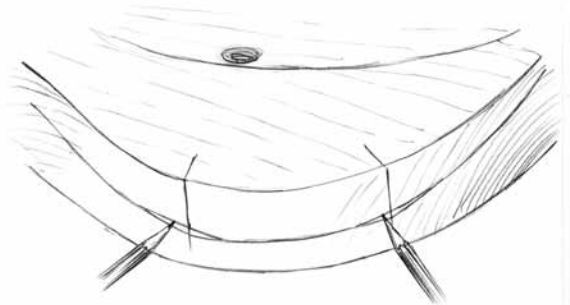
STEP 5. REMOVE MATERIAL FROM THE TOP FRONT OF THE SEAT

The next step is to remove material at the front edge of the seat. Following the layout shown, create the line on the front of the seat that separates the top from the bottom.





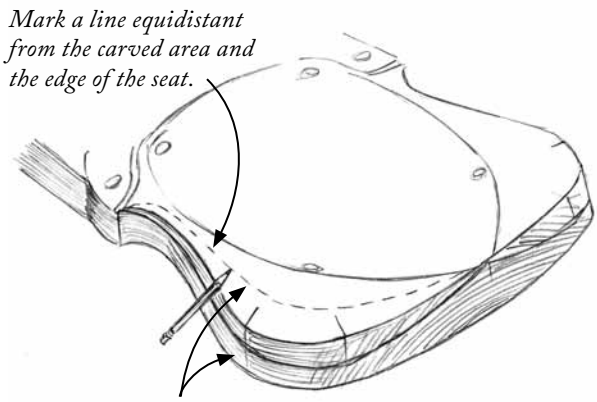
Use a flexible ruler to draw a line connecting the point where the layout lines cross to the point at the front of the gutter.



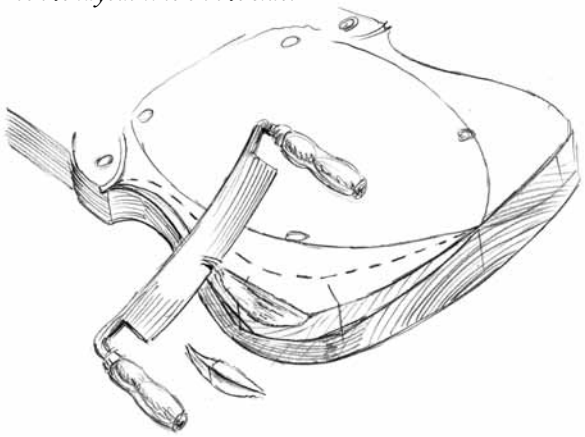
Draw a line to fair the harsh transition where the layout lines meet.

FIG. 19.28 ***Layout lines on front and side of seat.***

Next, draw a line on the top of the seat that is equidistant at any given point from the corner of the seat and carved area. By cutting the material between this line and the layout line on the front and side of the seat, you will form a bevel on the front edge of the seat. I begin by cutting the material at the widest point of the seat, finding and following the fibers. Then I know the transition point for my direction of cut. It takes a bit of nerve at first, because the shape of the shaving gets thicker and wider at is follows the fibers. This causes the material to "POP" off when you pull the first couple of times. Don't be too



The bevel to be carved will be from the layout line on the top to the layout line on the side.



Start by lopping off the corner at the widest point of the seat to find the fiber line. Once you find the fiber line, shave the fibers until you contact the layout lines. Establishing the fiber line helps locate the transition where the direction of cut changes.

FIG. 19.29 ***Completing the layout and finding the fiber line.***

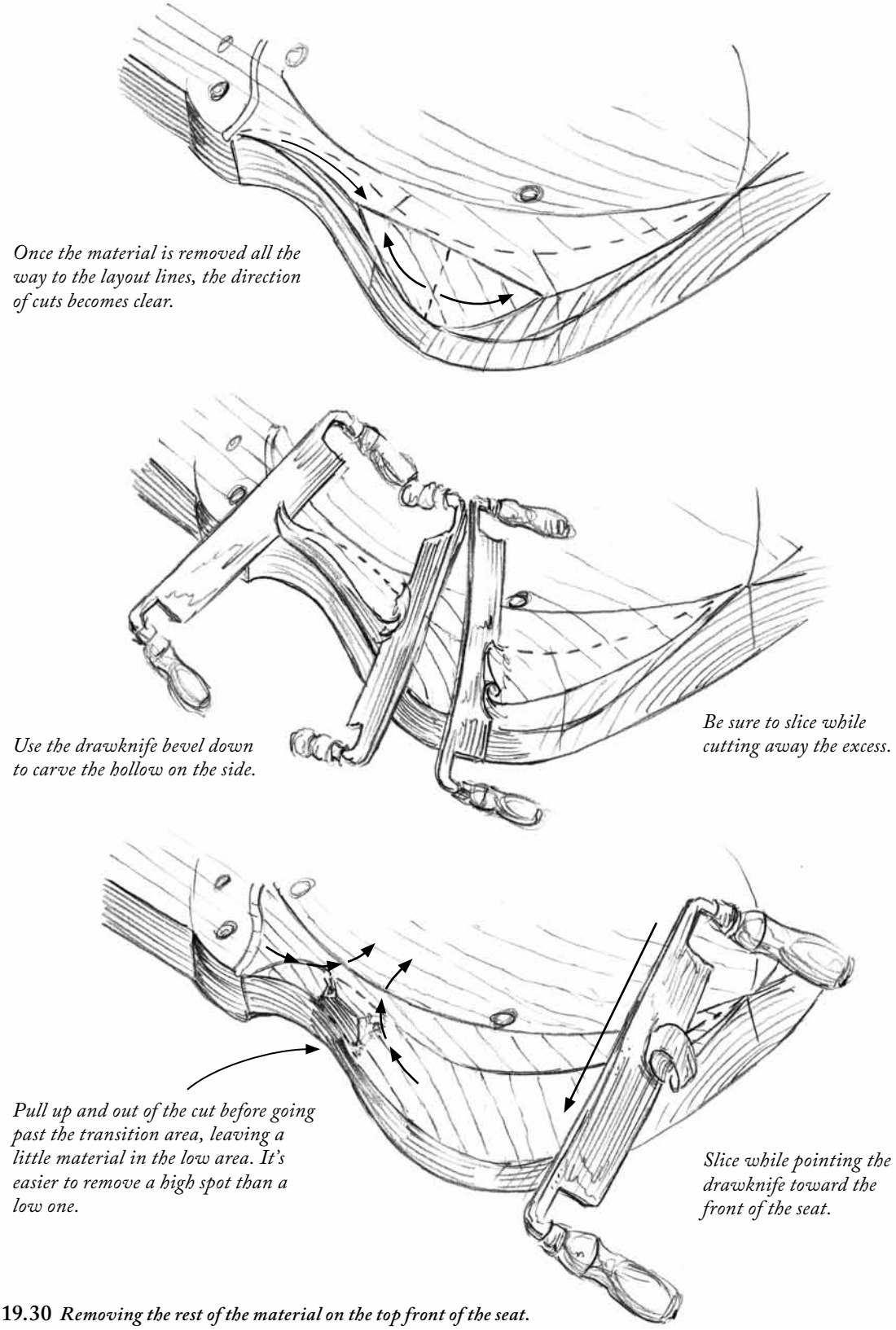


FIG. 19.30 ***Removing the rest of the material on the top front of the seat.***

concerned; soon the shavings will start curling away and give a sense of control as the depth of cut reduces and approaches the layout lines.

When cutting the material on the side of the seat, be aware of the transition where the grain direction changes. It's helpful to remove material from either side of the transition, leaving it as a high spot that is then easy to remove with a series of light slicing cuts. Don't be alarmed if the hump is a bit ragged, it's simply the result of pulling out of the cut. Using a drawknife bevel down in hollows is helpful, and often, the only way to get good results.

If you cut at a straight trajectory to the middle of the transition and attempt to emerge from the other side, you will likely create a V in the middle that makes it nearly impossible to exit the cut. This is a common mistake in a transition area, and it can be remedied by removing material from either side until the transition is a high spot, as pictured. If your drawknife technique needs a little practice, don't worry. This is not the last process that will be touching this area, so a little roughness in the transition is not a problem.

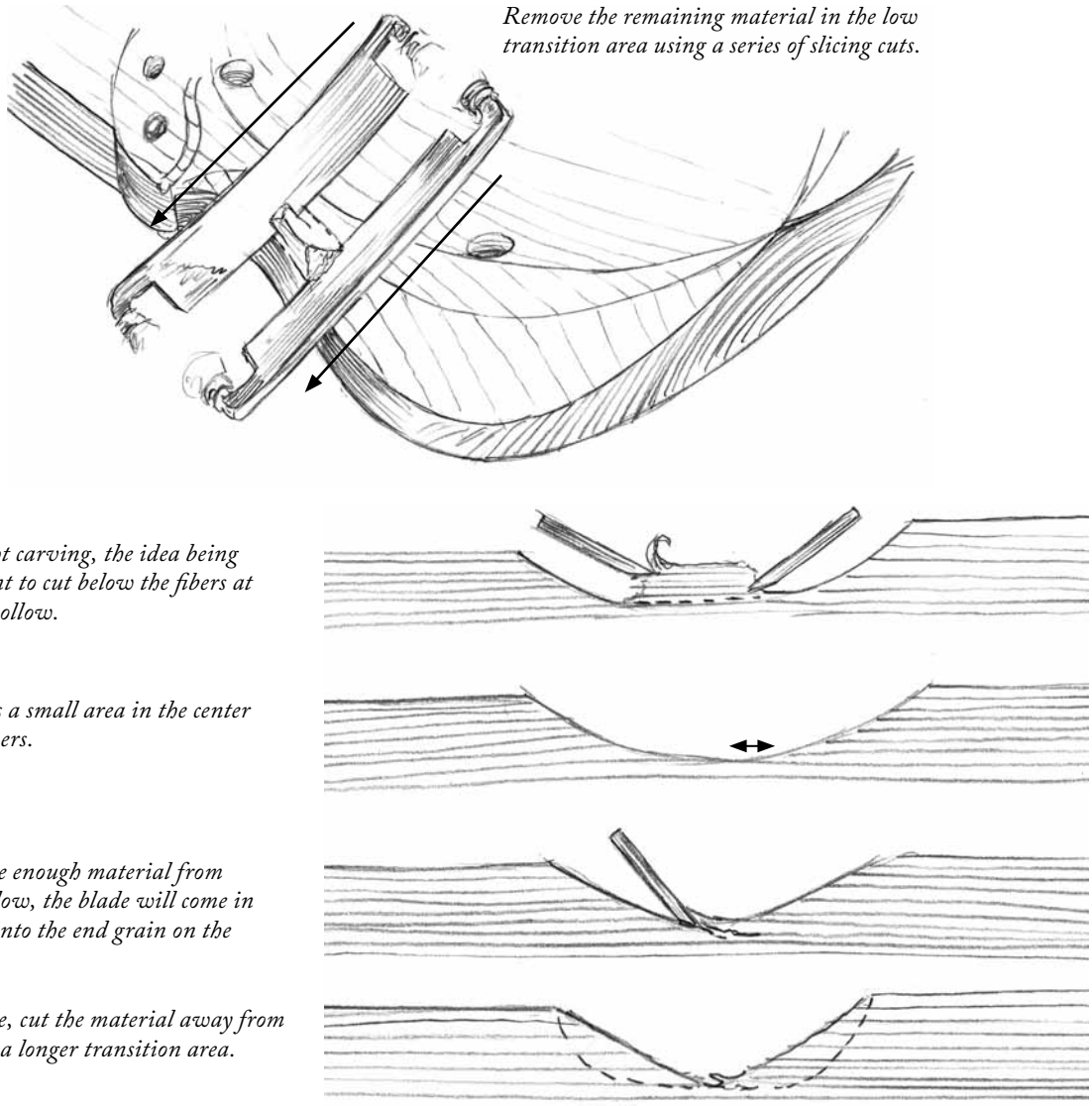


FIG. 19.31 ***Removing the remaining material.***

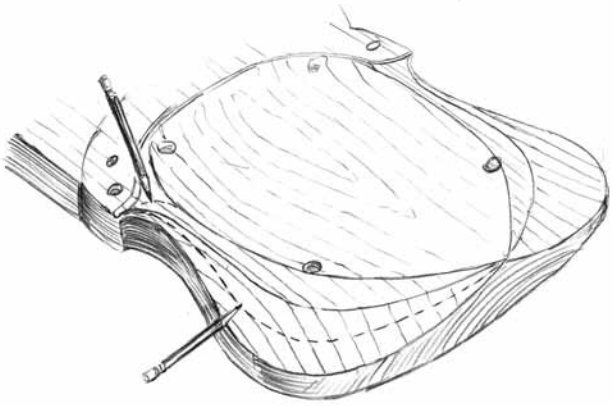
This facet should be flat in cross section. Once it's established, draw a line directly down the middle of it as shown. You will be cutting the material from this line to the line where the carving in the center of the seat ends. Depending on your drawknife, the handle might prevent you from cutting all the way to the line toward the center; don't worry about it, this can be addressed later with the inshave or travisher.

Next remove material from the sides in front of the gutter as shown below right, continuing the curve at the back of the seat around the edge of the spindle deck.

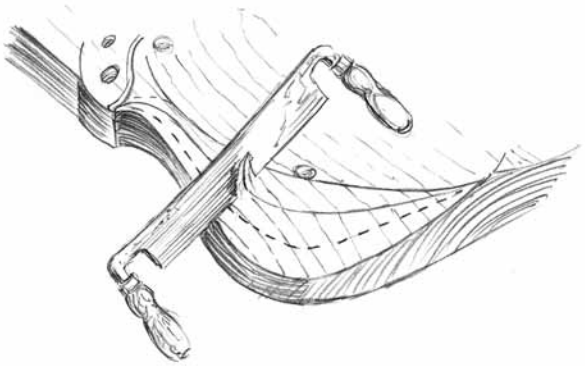
It's important for comfort to remove material where the sitter's legs will be so that circulation isn't cut off at the back of the thighs. This material is on either side of the center; when you hold a straightedge from the center point at the front to the spindle deck near the end of the gutter, it should reveal a 7/16" or so gap.

This step establishes the rough shape of the seat; the next step is to knock off the visible edges on the top surface and make all the shapes flow without any distinct transitions. I begin this process with the drawknife and inshave, and I finish with the travisher and spokeshave.

The travisher and spokeshave are complementary tools for smoothing the shapes. The convex areas of the seat are best worked with the spokeshave, and the concave ones with the travisher. This is because the surface contact of



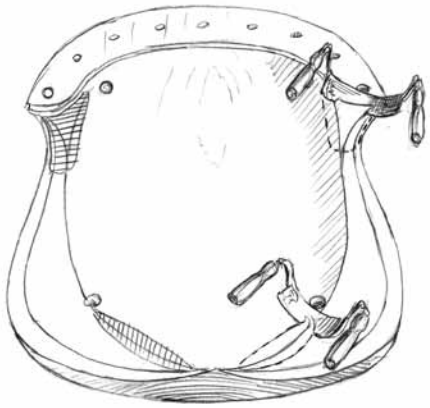
Draw a line splitting the newly formed facet in half.



Carve a new facet from the line to the perimeter of the bowl area using the same steps and cutting directions as before to remove the material.

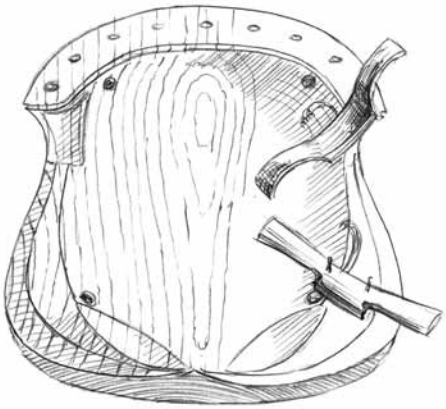
FIG. 19.32 ***Lay out and cut another facet on the top of the seat.***

Use the inshave or spokeshave to remove the material in front of the gutter at the sides of the seat and at the front of the seat where the thighs of the sitter pass.



All the edges of the facets are now small enough to be faired, making the top of the seat a fluid shape with no distinct transitions.

The travisher works well to bring the hollow at the back of the seat around in front of the gutter.



Take light cuts and be aware of the transition areas where the cutting direction reverses.

FIG. 19.33 ***Fair the top surface of the seat.***

the sole on convex parts of the chair will be greater with a flat tool and give more feedback when leveling the shape.

I leave the top of the seat alone after using the travisher and spokeshave. You will still be able to fair the surface after the legs are glued in place. I wait to scrape and sand the seat until the undercarriage is in place, otherwise the empty leg mortises make scraping difficult. I don't leave any tool marks on the top of the seat. To my eye, this obscures the shape and overstates the handmade nature of the chair. I prefer the tool marks to be "discovered" through closer examination. Details on scraping are shown in the chapter Complete the Undercarriage.

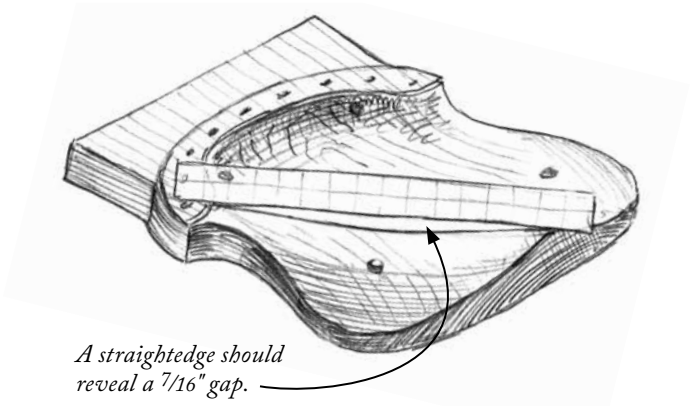


FIG. 19.34 ***Check the seat for the gap to ensure comfort.***

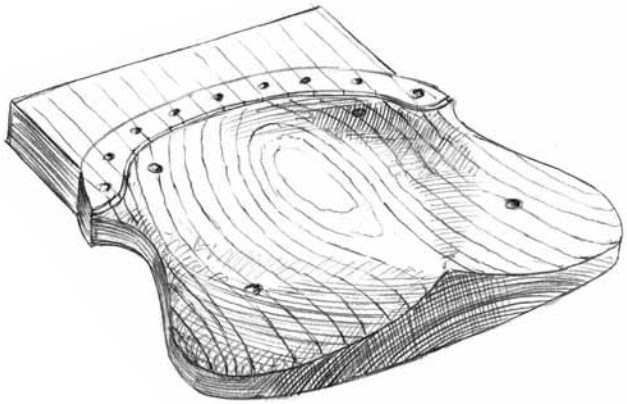


FIG. 19.35 ***The completed seat shape.***

STEP 6. CARVE THE UNDERSIDE FRONT OF THE SEAT

Shaping the underside of the front of the seat is a great job for the drawknife. It is crucial to avoid clamping the carved portion of the seat because the forces applied to

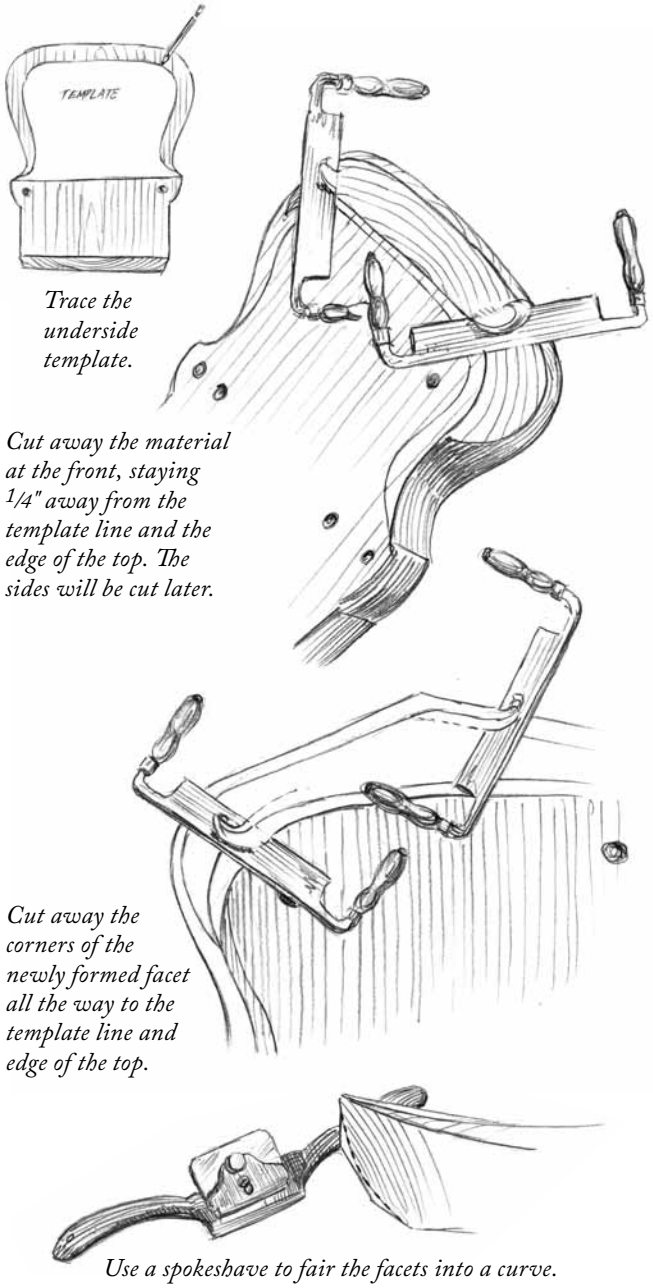


FIG. 19.36 ***Carve material from underside of the seat front.***

the high spots on the soft pine will crush the carving. To prevent this, I position the seat in my vise so that the flat underside of the seat and the spindle deck are pinched.

Begin by tracing the pattern for the underside onto the seat. Then follow the steps in the drawings to remove the material from the front of the seat.

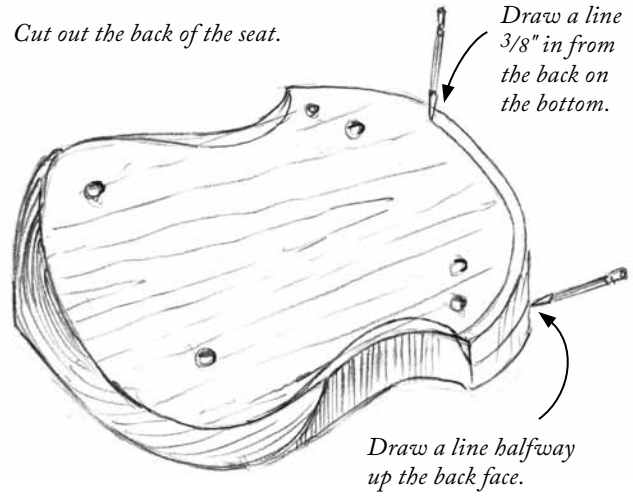
I like to start at the sides by peeling away material at the widest point of the seat along the sides, just like on the top of the seat, then pull toward the center. I always keep the drawknife edge facing away from the seat, which is the correct position for shearing without the blade grabbing the end grain.

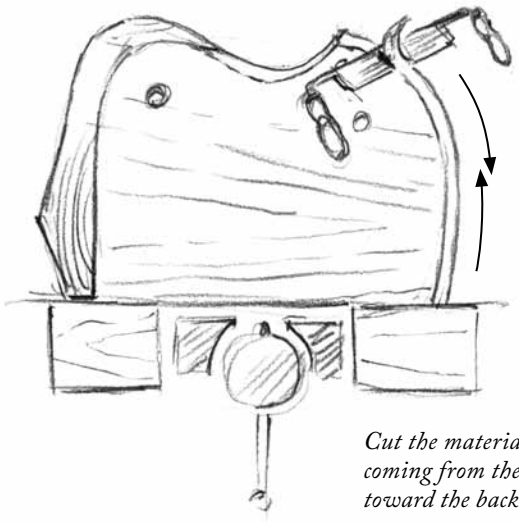
Once all the material is removed to within 1/4" of the layout line and front edge, carve away the corners of the facet as shown. This will establish the convex shape of the underside. Then use a spokeshave to fair the surface into a shape with no distinct transitions, as shown below.

STEP 7. SHAPE THE BACK OF THE SEAT

The shape of the back of the seat is similar to a quarter of an oval. I make this by drawing a line half way up the back face of the seat and a line 3/8" in from the corner on the bottom of the seat. Then I cut the material away from between these lines, heading from the sides of the seat toward the middle.

Next, I knock off the hard corner between the facet and the flat. Finally, I fair the curve with a spokeshave, leaving the tool marks as the final surface. It's important to cut from the sides toward the back. The end-grain area at the back of the curve will allow you to cut a bit beyond center – but not much without the surface quality suffering. Skewing and slicing with the spokeshave are essential to getting clean, waxy facets.





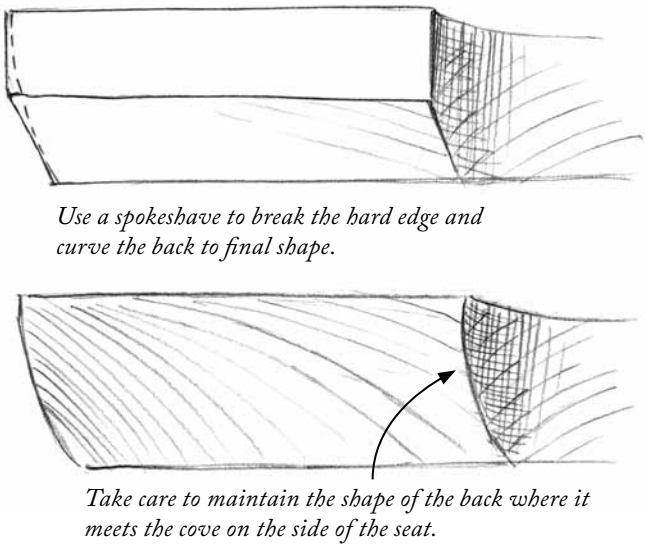


FIG. 19.37 ***Carve material from underside of the seat back.***

STEP 8. SHAPE THE RELIEFS ON THE UNDERSIDES OF THE SEAT

Next, I remove the material from the concave portion at the sides of the seat. This shape is like the inside of a doughnut, both convex and concave. The difficulty in cutting this section is that the fibers run along the shape, which makes the transition a bit trickier than on the front of the seat. You can't cut all the way from one end of the shape to the other with one motion because you will run headlong into the exposed end grain on the opposite slope.

While you could remove this material with a rasp and avoid the trouble, I like using a bevel-down drawknife for speed and clean tool marks. They are a lovely point of discovery as sitters explore the seat with their hands.

At the very least, I encourage you to remove the bulk of the material with the drawknife before turning to abrasive tools. You will find that a thin, bevel-down drawknife with a rounded bevel will perform best here because of its ability to follow the curve without getting pushed out of the cut by the bevel. If you don't have such a knife, use any bevel-down knife, but hone away any hard edge at the back of the bevel first.

The key to cutting in this area is to make sure that you always cut so there is a high spot left in the transition area. Then you can shave the high spot down safely to the level that the cuts are entering from each side. The type of cut to avoid is one that dives toward the center, which will cause the knife to dive into the end grain of the fibers on the opposite slope. Slicing is essential to controlling this cut, and once you remove the high spot in the middle, you will find that lots of slicing even lets you cut "uphill" just enough to fair the curve. Think of the drawknife as a saw, because all the pulling in the world won't give you control, while slicing will.

Another key to cutting in this deep cove is to keep the width of the cuts narrow. Wide shavings become difficult to control and cause the knife to dig. By keeping the shape convex, you ensure that the width of the shavings stays narrow.

I break the cutting in this area into three sections, and I focus first on removing the bulk of the waste.

The final cut is more for cleaning the surface than making a deep carving because removing material from this area would change that shape of the seat.

Then I return to the first area that I cut and carefully refine the shape. And then the second area.

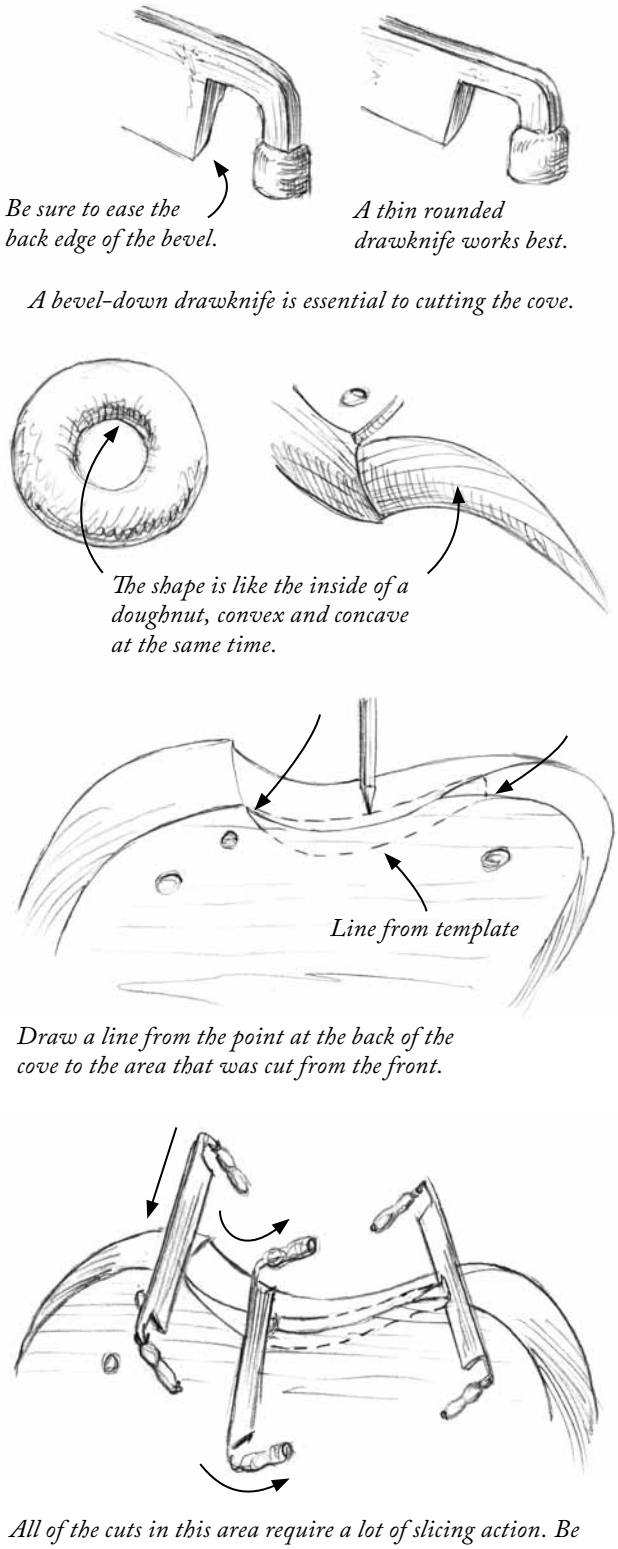
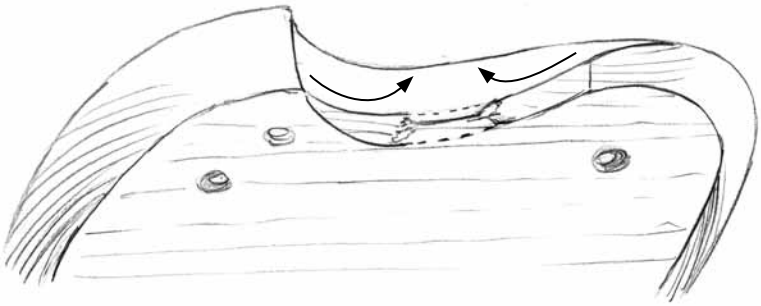


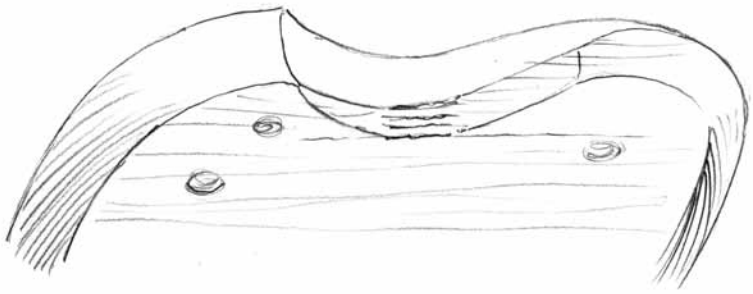
FIG. 19.38 *Carving the underside of the seat sides.*

Pull out of the cut from both directions, leaving the transition area in the bottom of the hollow.



Just as with the hollow on the top of the seat, carefully shave away the remaining material with a slicing cut.

Don't worry if the surface isn't perfect; it's more important that you don't carve into the end grain on the opposing slope.



For the layout of the next cut, split the two facets in half and repeat the process, cutting the material between the two new lines.

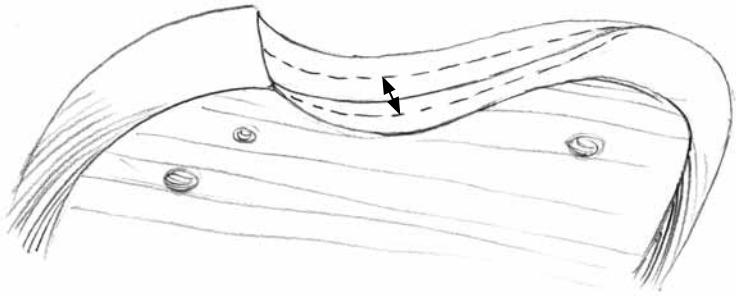


FIG. 19.39 ***Refining the underside of the seat sides.***

Finally, I knock off the hard edges between the facets, being careful to obey the same cutting technique that kept me out of trouble while removing the bulk. Leave a hard edge where the side meets the top and bottom of the seat.

This area can also be cleaned up with a curved spokeshave, such as a Millers Falls cigar shave, but note that the same trouble with the transition area can plague this tool if you aren't careful. You can also scrape and sand the area.

At this point, all of the carving on the underside of the seat should be complete because the assembled undercarriage will impede access. If there are any issues that still need addressing on the top of the seat, they can be easily taken care of once the legs are in place before the uppercarriage assembly.

Conclusion

I follow a very clear process each time I carve a seat, both to eliminate guesswork and to keep my results consistent and fast. While it might seem like lots of steps, they quickly become second nature as you understand the role each one plays.

Once the middle facet is carved, draw a line down the center of it.

Carve the material from the new line to the top edge of the side. Be careful not to remove more than a tiny bit from the top because it will change the shape of the seat.

Finish the shape by taking narrow shavings off the high spots and fair the surface with spokeshaves and, if necessary, a rasp and file.

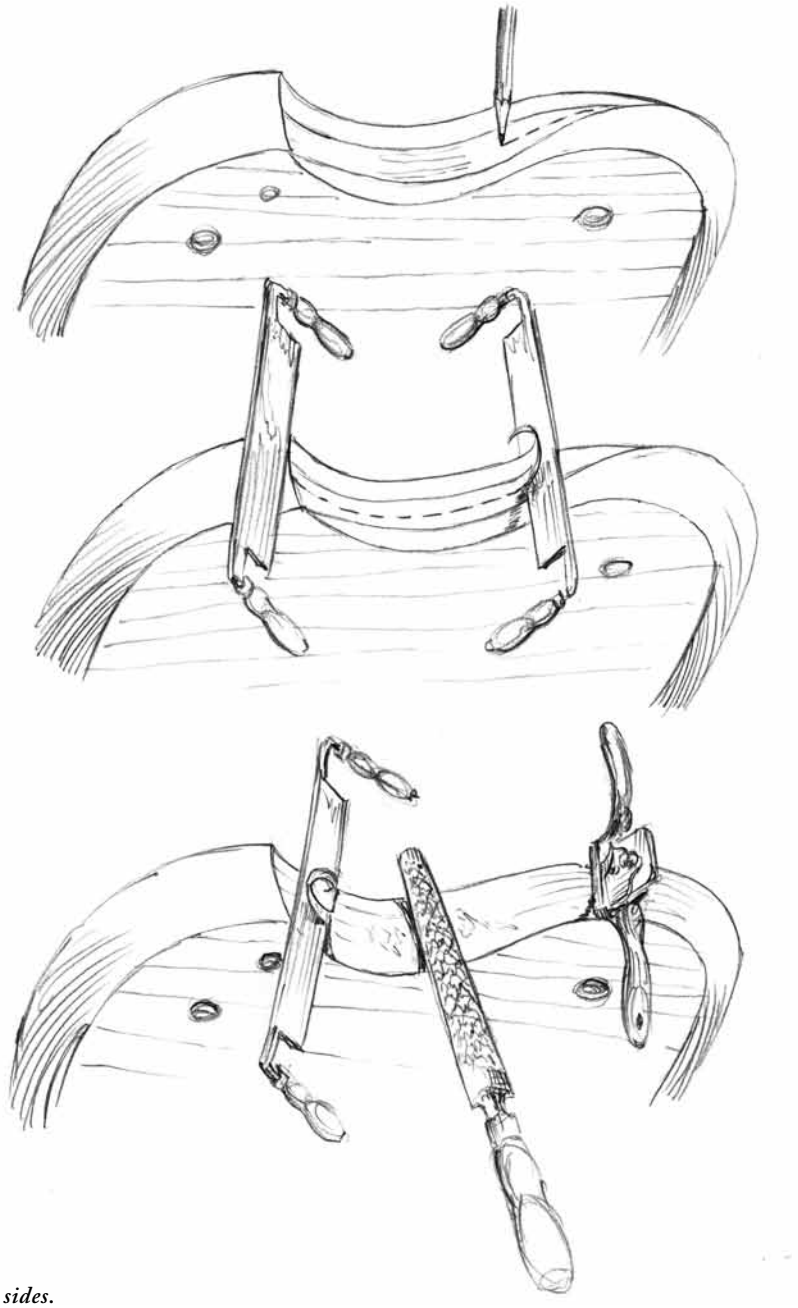


FIG. 19.40 ***Finishing the underside of the seat sides.***