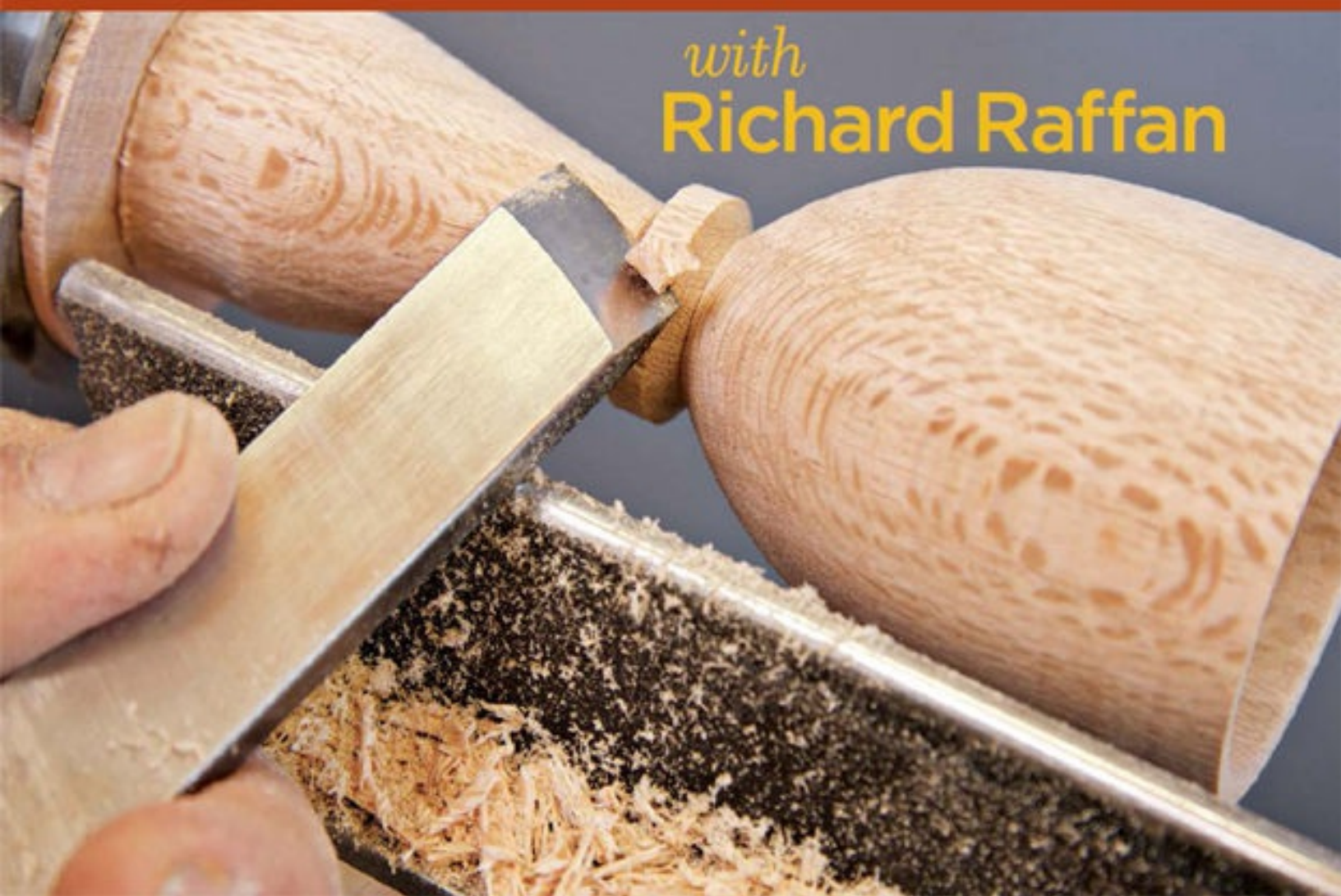




all new **Turning
Projects**

with
Richard Raffan



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The Taunton Press

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ABOUT YOUR SAFETY

Working wood is inherently dangerous. Using hand or power tools improperly or ignoring safety

practices can lead to permanent injury or even death. Don't try to perform operations you learn about here (or elsewhere) unless you're certain they are safe for you. If something about an operation doesn't feel right, don't do it. Look for another way. We want you to enjoy the craft, so please keep safety foremost in your mind whenever you're in the workshop.

Dedication

To everyone keen to improve their woodturning, particularly those I've taught who, for over 43 years, have provided me with insights into the problems we all have when learning a craft.

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Introduction

Transforming a lump of wood spinning on the lathe into a useful or decorative item in just a few minutes is one of life's more enjoyable and fulfilling experiences. Streamers of shavings arc away from the tool as shapes emerge, and in no time you have a finished piece in your hands. It's wonderful... but of course takes practice. This book provides you with projects that are designed to develop a whole range of techniques while you turn objects that are both useful and decorative.

In 1969 I was looking for a change of lifestyle and career, a sea-change that would get me out of city life in London and away to some practical and creative occupation. On a whim I chose woodturning, knowing nothing more about the craft than that it involved a lathe and tools with very long handles.

In May 1970, when I made my first sale as a professional turner, I had been turning wood for just four months in a small production workshop. During those months I was set to turning candleholders, ash trays (called pin trays to avoid a higher rate of sales tax), plates, and small bowls, and these were wholesaled to gift shops and department stores. These production lines introduced me to gouges and scrapers, but not to the skew chisel, a tool I really needed to come to terms with in order to earn a living turning wood.

When I started on my own account I needed a range of small items that would sell readily and also provide me with practice. I started with knobs for blind cords and bathroom lights: In Britain at that time all bathroom lights were switched on and off by means of a pull cord. I sold a lot of knobs, so got plenty of practice and became pretty handy with the skew chisel. I refined my use of the skew and learned to hollow endgrain by making hundreds of scoops. Constant repetition is the best way to learn anything; so many of the

projects in this book lend themselves to being repeated without heaping up in useless piles too quickly. I have mallets all over the place, so there's usually one within easy reach in my workshops. Other projects make ideal gifts, so you'll never have to go shopping for those again. If you're thinking of making your hobby pay, or even making it your profession, you can personalize most of these projects to create your own variations.

I've written up these projects as they happen in real life in the workshop. On several occasions when photographing a project I found I wasn't able to proceed as anticipated. For instance, I couldn't hollow as deep as I intended when turning the cross-grained spatula pot, so you see how to remove a lot of excess material on a nearly finished piece. It's all very well showing an idealized project where everything goes just right, but most projects throw up unexpected problems, and I reckon we learn more from overcoming those than seeing only what we "should" be doing.

Most projects help you master a particular technique and can be complicated or simplified with detail as you see fit. Techniques that are useful for turning one project will usually have applications for others, but in those other projects there will often be a reference rather than an image. Space doesn't allow for too much repetition. Consequently, ways of chucking projects at a given stage are often useful when applied elsewhere, and techniques for finishing one project between centers on the lathe can usually be applied to another job or used for re-centering roughed blanks, and so on.

When I wrote *Turning Projects* in 1989–1990, the range and quality of ancillary equipment for wood lathes and particularly chucks was not nearly as broad and enticing as it is today. For instance, self-centering 4-jaw chucks, now regarded as an essential wood-lathe accessory, were still being developed and not widely used. Today, a quarter of a century later, I am constantly amazed at how few woodturners seem to realize the potential of their chucks, so you'll see a number of ways in which chucks can help you complete projects with greater safety and efficiency.

The photos show you exactly which portion of the edge is cutting, its relation to the wood being cut, and the sort of shaving you can expect. There are tips to help you avoid catches and other mishaps, but if you'd like to know a lot more about my turning and chucking techniques, about wood, and about design, you'll find these in my other books—*Turning Wood with Richard Raffan* (3rd ed.), as well as *Taunton's Complete Illustrated Guide to*

Turning, Turning Boxes, Turning Bowls, The Art of Turned Bowls, and Turning Toys. My videos show you the tools in action and contain several projects similar to those in this book as well as many others.

My designs and turning tend to be simple and unadorned. When I do add color or carving, I still try to keep it simple. I learned a long time ago that more is not necessarily better. A sense of simple timelessness in an object is very difficult to achieve. But if you want to smother your variations of the projects in this book with beads and heaven know what else, go for it. I aim to provide you with the tools to make it all a lot easier.

Please note: All measurements are ballpark, not absolutely precise. Both imperial and metric are generally rounded to the nearest $\frac{1}{8}$ in. or 5mm, unless greater precision is needed. I was raised using feet and inches, but now I work mostly with metrics, so an object that in reality measures 100mm is converted to 4 in., not $3\frac{15}{16}$ in. or whatever it actually is.

CHAPTER

1 PULL-CORD KNOBS

When I began turning, I needed to make something that would sell readily, provided lots of practice with skew chisels and gouges, was quick to make, didn't use too much expensive material, and wasn't readily available in the small gift shops to which I sold my early work. I was then living and working in England, where bathrooms have light pulls rather than switches. The knobs on the ends of the light cords always seemed to be plastic, so discerning a possible market, I decided to make wooden versions I could turn in a few minutes and make out of scrap. I sold hundreds in my first year as a turner.



A pull-cord knob is little more than a very short spindle with the grain running the length of the piece and a hole up the center just large enough to accommodate the cord.



Blanks are best drilled off the lathe with one end countersunk to accommodate the knot at the end of the cord.

In this section I'll show you how to make your own wooden knobs for the ends of pull cords for ceiling fans, lights, or even blinds. The pulls might also be used as key tabs (or fobs) or to decorate the ends of any other cords.

My early knobs were all made using a $\frac{3}{4}$ -in. (19mm) skew chisel. Part of the problem with skew chisels is that they are prone to catches, and I kept having them, so I concentrated on grooves until I had those under control, then moved to half beads and finally to full beads. Eliminating evidence of my many catches provided me with lots of design opportunities. You can adopt much the same approach, using spindle or detail gouges and skew chisels to develop your cutting techniques.

A pull-cord knob is pretty much a short spindle with the grain running the length of the piece with a center hole for the cord. There are two approaches to turning these knobs. I used to mount blanks in a cup chuck and drill the holes by hand on the lathe. These days, long-nose or pin jaws in a scroll chuck can hold the blank, but the drill is inclined to wander off-center. It's

much easier to drill the blank off the lathe, countersink one end so the knot on the end of the cord will be hidden, and then mount the blank between conical centers for turning. There is no waste because you use the whole blank while ensuring the hole is always plumb in the middle. And you don't have to worry about terrifying catches and bits of flying wood, because if an edge does catch, the wood stops spinning. No nasty bangs! The wood will also stop spinning if you push the tool too hard into the wood, so putting a small spindle between conical centers (as opposed to spur drive and cone) is very good for your turning technique. You have to let the wood come to the tool—rather than pushing the tool into the wood. When the wood does slip on the conical drive, all you need to do is tighten the tailstock.

If you don't have a solid conical center, you can turn one. Drive a small square hardwood blank straight into a hollow spindle, then turn it to a cone. Or you can turn a Morse taper between centers and drive that in.



The predrilled blank is mounted between conical centers.

Blanks need to be at least $\frac{3}{4}$ in. (20mm) square. The length tends to be limited by the length of your drill and your ability to drill through the dead center of a long blank. If the drill wavers off course, though, that's no big deal, as the hole will end up on the lathe axis.

Turning between Cones

1 Drill the blank, then countersink the end that will be the bottom of the knob. This end will go over the drive cone so there's maximum surface contact with the drive. All the knobs shown on p. 4 were made using the $\frac{3}{4}$ -in. and $\frac{1}{2}$ -in. (19mm and 13mm) skew chisels and spindle gouge shown to the right in the photo on p. 5.

2 Mount the predrilled blank between centers. You need a solid conical center in the headstock as a drive and a conical revolving tailcenter. The countersunk end of the blank should be over the drive cone.

3 Turn the blank to a cylinder using a skew chisel. First use peeling cuts with the skew chisel flat on the rest (as in the bottom right photo below), then a planing cut to smooth the cylinder. Next use the long point of the skew chisel to cut a V-groove at the top of the knob to define the base of the bead. To avoid a catch, be sure to use just the long point, keeping the edge clear of the bit you've just cut.

4 Use the lower half of the skew chisel to shear cut into the base of the bead. Make sure to keep the bevel rubbing the wood so as to avoid a surface that is ridged or undulating.

5 Rough out the bead at the base of the knob using a peeling cut with the skew chisel flat on the rest.



True the blank to a cylinder, then define the base of the bead.



Develop the overall form using the skew chisel.



Rough out the bead at the base of the knob.

6

Complete the bead at the tailstock end using the short corner of the skew chisel. As you roll the skew into the cut, keep the skew near 90 degrees to the lathe axis as you move it along the rest. You need to cut right to the metal cone. This shortens the blank, and as a result, the tailstock will need tightening to reduce the slop.

7

Refine the taper of the body with shear cuts using the skew chisel as in the bottom left photo on p. 7, then round over the headstock end using the short corner of the skew chisel. I prefer curves, but if you like more angular designs, go for those and develop your own variations.

8

Define the top of the bead surrounding the countersunk end with a groove by pivoting the skew chisel's long point into the wood.

9

Trim the end grain using the skew chisel's long point and cut right to the cone. To avoid a catch, use only the long point, and keep the edge clear of the portion just cut. Use an underhand grip with your forefinger under the rest for the most secure grip as you pivot the long point into the wood.



Complete the bead at the top end of the knob.



Use the skew chisel's long point to define the top of the bead surrounding the countersunk end.



Refine the taper of the body, then round over the bottom using the short corner of the skew

chisel.



Clean up the end grain using the skew chisel's long point. Only touch the wood with the point and bevel edge, not the cutting edge.

10 Sand the knob. The skew chisel can cut most woods cleanly enough to barely need sanding, like this casuarina forest she-oak, which needed only a brief dose of 240 grit. If you require abrasives coarser than 120 grit, you need to ensure your skew is *slicing* the wood rather than scraping. Remember to never wrap either abrasives or polishing rags around your fingers, in case the wood grabs the other end.

11 Polishing. I prefer a simple wax finish. To apply, hold a lump of beeswax to the spinning wood to build up a sticky layer (the pale rings are wax). To melt the wax into the wood and remove the surplus, bundle up a soft cloth and squeeze it against the spinning spindle. The wood changes color as the wax enters the wood, and after about three seconds, you can stop the lathe to reveal the soft finish seen in the photo below.



With this knob I only needed to briefly sand with 240 grit.



I used beeswax and a soft cloth for the finish. Never wrap either abrasives or polishing rags around your fingers in case the wood grabs the other end.

CHAPTER

2 SPATULAS AND STIRRERS

For many inexperienced turners, turning a spatula is a daunting prospect given the shape of the blank and the obvious fact that there's a lot of space to turn at the stirring end. So start with a spurtle, which is about as simple a turning as you can get. A spurtle is a round stick like the two on the right in the photo below, traditionally used in Scotland for stirring porridge (hot oatmeal) and widely sold to tourists as useful souvenirs. Then, when you are ready, move on to the spatula, the wider version with a flat paddle. It's far more useful, and a culinary tool cooks are happy to have several of. I have been using some of my spatulas daily for over 30 years, so you're making a tool that should be a pleasure to use for decades. And the basic form can be resized for pâté knives, letter openers, clay-modelling tools, or push sticks to use when cutting wood on tablesaws, bandsaws, and planers.



After 20-plus years of daily use, the three spatulas on the left are wearing in nicely, whereas the unused newly created spatula and stirrers (spurtles) on the right have yet to earn their patina. These spatulas are 10½ in. to 12¼ in. (265mm to 310mm) long.

A plain unadorned spurtle is a very simple project that demands little accuracy—and as a last resort you can always sand your way to a smooth surface. Conversely, you can make the handle as fancy as you like, although too many deep grooves can be tedious to clean and could even become a health hazard. Beads generally look good if they sit at the start of a curve and define the handle, but those I have in use, like those on the left in the photo on p. 10, are mostly devoid of decoration other than a groove or two. I like to have my beads sit on a curve that flows beneath, but you can try them in different positions as you develop your own style of spatula. Traditional Scottish spurtles have a stylized thistle adorning the end of the handle, but remember that neither spurtles nor spatulas have to have decorative beads, so

if you're attempting beads and mess them up, go for a simpler handle adorned with just a groove or two.

Both spurtles and spatulas provide a good opportunity to concentrate on overcoming the major woodturning vice of pushing, poking, and jabbing the tool into the wood and against the axis rather than letting the wood come to the tool. The aim with gouges and skew chisels is to have the bevel resting lightly against the wood, not forced against it. You'll also need a series of grips to support the wood as the diameter slims down; you'll see a number of these on pp. 32–37.

Wood for a stirrer or spatula needs to be straight grained with the grain running parallel to the lathe axis. It need not be seasoned, but it is best to avoid material immediately adjoining the pith, as this often splits as the woods dries. Green (unseasoned) wood is generally easier and more fun to turn than dry, and as it dries it will often distort and go slightly oval, making the spurtle or spatula a more sensuous object to handle.

Cutting Blanks

Spurtle blanks need to be at least $\frac{3}{4}$ in. (20mm) square and 12 in. (305mm) long, like those in the front on the bandsaw in the top photo below. All the other blanks on the bandsaw are for spatulas. To make the best use of the material, they are cut wedge-shaped, square at one end and as a thin fan at the other. The second pair from the front was created by splitting a $1\frac{1}{2}$ -in. (40mm) square into two wedges, so each handle would end up slightly less than $\frac{3}{4}$ in. (20mm) diameter. Beyond those, the bark will be cut away along the pencil line.



Spatulas and stirrers are a wonderful way of using up thin rectangular off-cuts. The assortment of blanks for spurtles and spatulas on the bandsaw will join boxes full of others ready to go on the lathe.

The board in the rear of the photo will yield three spatulas. The initial cuts will be along splits highlighted by the red lines. The hatched area below will be cut away and might be sufficient for four small knives like those on p. 20.



Make a V-groove about $\frac{3}{8}$ in. (10mm) from the spur drive.

Turn a Spurtle

A spurtle blank should be mounted between centers. A $\frac{3}{4}$ -in. (20mm) spur drive is ideal and less intimidating than the standard 1-in. (25mm) drive. Alternatively, you can pare down one end to fit the Morse taper of a hollow drive spindle, and tap the blank in with a mallet before bringing up the tailcenter to support the other end. Never attempt to turn anything this long in a chuck without tailcenter support. The job of the tailcenter is to support the end of the blank rather than force it against the spurs of the drive. With the lathe running, you can initially wind the tailstock in tight to force the blank onto the drive, but then back the tailcenter off so it supports the blank. You'll hear the lathe "sigh" as the pressure is reduced. If you hear a rattle or the revolving center ceases to revolve, you've backed the tailcenter off too much.

Turn the whole spurtle using only a $\frac{3}{4}$ -in. (19mm) or larger skew chisel.

1 If the spur drive is a similar diameter to the blank, turn a V-groove near the end of the square blank using the skew chisel's long point. This is a good practice whenever there's the possibility of hitting the spur drive, or if the wood is in a chuck, because at the end of subsequent cuts the wood breaks away cleanly where it's cut across the grain.

2 Turn the square blank to round, using the leading/lower half of the edge to shear cut. True the tailstock end grain using the skew chisel's long point. This first cut is easy enough, but as you work back toward center with a series of scooping cuts, the wood is inclined to whip, especially if the tailstock is too tight. As you see in the photos on the bottom of the page, your hand needs to support the back of the cut while maintaining contact with the tool and the rest. Your fingers serve as a balance against the pressure of the tool on the wood, so if your fingers get hot (or if you smell burning), you're pushing too hard. Let the wood come to the tool. You'll find variations of supporting grips in Chapter 4 on pp. 32–37.



Turn the blank to a cylinder that ends at the bottom of the V-groove.



You may need to support the blank to prevent spiral chatter marks.

3 About 3 in. (75mm) from the end, block out the bead for the stylized thistle head with two V-grooves, and reduce the diameter on either side. Beads like this look better if the curve flows smoothly underneath.



Block out the bead. Where you place it will affect your overall design. Make several spurtles or spatulas and vary the position of the bead, then decide which you might prefer in the future.



You can design your spurtle handle to be as simple or as elaborate as you like. Here are a few to get you going. Regard the inevitable catches that mess up the wood as design opportunities rather

than disasters. Turn away the damaged section and see what you can do with what's left.

4

When you've established the diameter on either side of the bead, turn the bead using the short corner of the skew chisel.

5

Establish the final diameter of the top of the handle at around $\frac{7}{8}$ in. (23mm) using a peeling cut with the skew chisel flat on the rest. Clean up the end grain using the skew's long point.



Use the short corner of the skew chisel to turn the bead.



Shape the top of the handle.



Shape the business end of the spurtle. Traditionally the stirring end was straight, but I find slightly flared is aesthetically more pleasing.

6 Complete the slightly flared stirring portion of the spurtle. Support the wood to reduce any chatter. Being right-handed, I have the long point up when working to the right and the long point down when working to the left. Left-handers will do the opposite.

7 Sand and finish. I usually sand to 240 grit or 360 grit, unless the finish off the tools is good enough not to need sanding. It won't be as smooth as if finely sanded, but every time you use the spurtle you'll be able to admire the quality of your tool work. Or if you're selling them, you can price them less expensive, having saved on abrasives. If the spurtle is going straight into use, I forgo any wax or oil, but would wash the spurtle in preparation for some action.



Sand, taking care not to wrap the abrasive around either your fingers or the spindle. When the sanding is done, apply oil and wax, if desired.



Part off the spurtle using a parting tool, as shown here, or a skew chisel.



Clean up each end with abrasives.

8

Part off using a parting tool or a skew chisel's long point. Make sure to keep your thumb on the rest to keep the spurtle from banging against the rest.

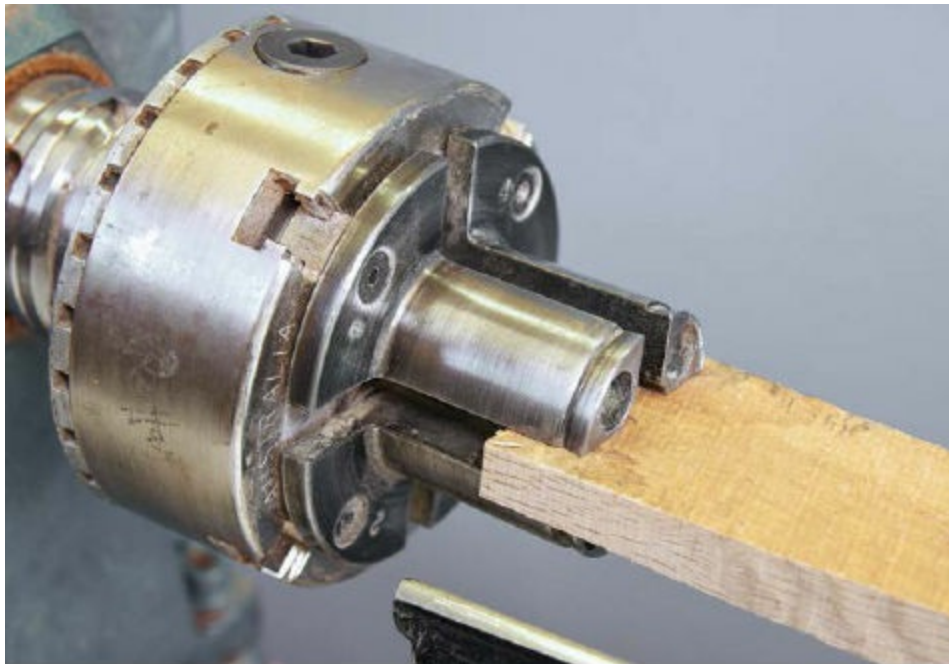
9

Finish off each end, either by hand sanding or by twirling against a disk sander. This soft pad held in the long-nose jaws of a chuck on the lathe is ideal (top right).

Turning a Spatula

You can turn the wedge-shaped blank between centers, but securing the paddle end in a chuck is much safer. When you use a chuck, *tailstock support is absolutely essential*. In the bottom right photo, the spatula is sketched on the upper surface.

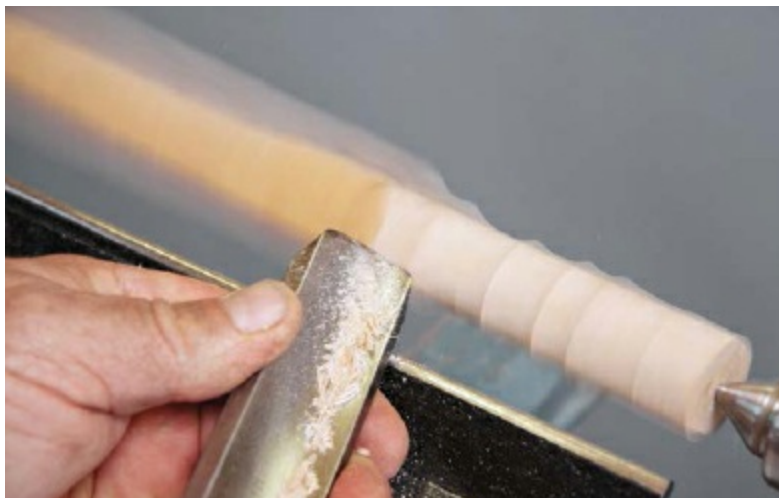
A spatula is turned in very much the same way as a spurtle, except that while the handle is pretty straightforward, the paddle end involves turning a lot of space. I'll walk you through the steps and offer a few pointers for the portions that might cause you problems.



Spatula blanks are best mounted on the lathe with the paddle end in long-nose jaws. The other end must be supported by the tailcenter.

1 Begin roughing out the shape at the handle end, and reduce the square to round for about a quarter of the length. To do so, take a series of scooping cuts using either a skew chisel or a spindle-roughing gouge. In the photo below you see a 1-in. shallow spindle-roughing gouge.

2 To shape the paddle, watch the double image on the upper horizon and work into what will be the bottom of the decorative bead where the diameter needs to be about $\frac{3}{8}$ in. (10mm). Any bead needs to be well above the part of the paddle that will be in the soup, sauce, or whatever. You can do this with a roughing gouge, but the skew chisel is more precise at the end of the cut. It's vital that you take the tool on a trajectory of your choosing rather than the wood's. If you push the edge hard against the wood it will catch in the space between the whirring sides of the paddle and likely shatter the paddle. Again, let the wood come to the tool. When the paddle is turned, complete the bead and the handle in preparation for sanding.



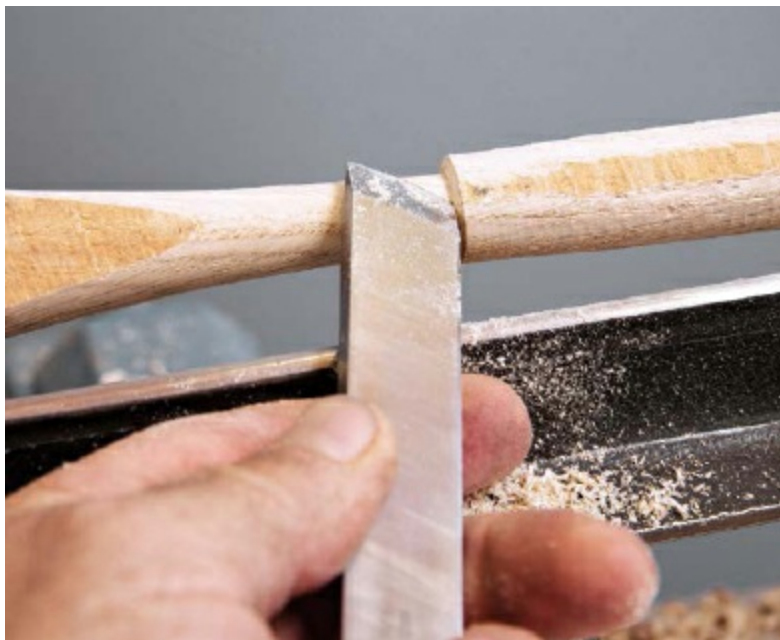
Rough down the blank, ensuring that at least 4 in. (100mm) is round for the handle.



Turn the paddle section, working to the bottom of what will be a bead.

Spatula Shapes

The flared ends need to be skewed slightly so one corner can get into the corner of a saucepan. Wok stirrers might be better off with a radiused end to fit the curve of the wok. I like a near-straight side on the longer point so I can scrape the vertical sides of my saucepans because I hate to waste anything. Plus, it's not as messy as using a finger, and I don't get burned when the pan is hot.





When sanding the paddle, do not wrap the abrasive around your fingers.

3 To sand the edge of the paddle on the lathe, hold the abrasive at either end *between* your fingers and thumb, as shown in the photo above, and pull it tight against the spinning wood. Never risk losing a finger by wrapping the abrasive around your fingers.



Slim down the paddle using a coarse sander or a handplane, or, if there's a lot to remove, on a bandsaw, as shown here.

4

Slim down the paddle. This can be done using a hand plane, on a sander fitted with a 36-grit disk or belt, or on a bandsaw, as shown in the photo at right.

The finished paddle narrows from the bead to about $\frac{1}{8}$ in. (3mm) thick on the end. *Never use a drop-saw or tablesaw to shape the paddle.*



Flatten and finish the paddle on a disk or belt sander.

5

Flatten the paddle faces and skew the end. As shown in the bottom photo, I use a disk sander for both the faces and the end, but a handplane can do a nice job.



For these 6-in.- (150mm-) long pâté knives, the blanks were set in the chuck with the blade well off-center. Don't attempt to turn either shaded area. That's all removed off the lathe on the

sander.





Similar to a spurtle and made the same way, these 10-in.- (250mm-) long bodhran tippers are for beating an Irish drum. You could also view them as double-ended stirrers.



Claret ash push-stick, 11 in. by $1\frac{1}{4}$ in. (280mm by 30mm) (top); casuarina push-stick, $9\frac{7}{8}$ in. by $\frac{3}{4}$ in. (250mm by 20mm) (above). I've used the casuarina push-stick for about fifteen years. The end has been modified several times where it caught a moving sawblade, whereas I still have all of my fingers.

CHAPTER

3 CARVER'S MALLET

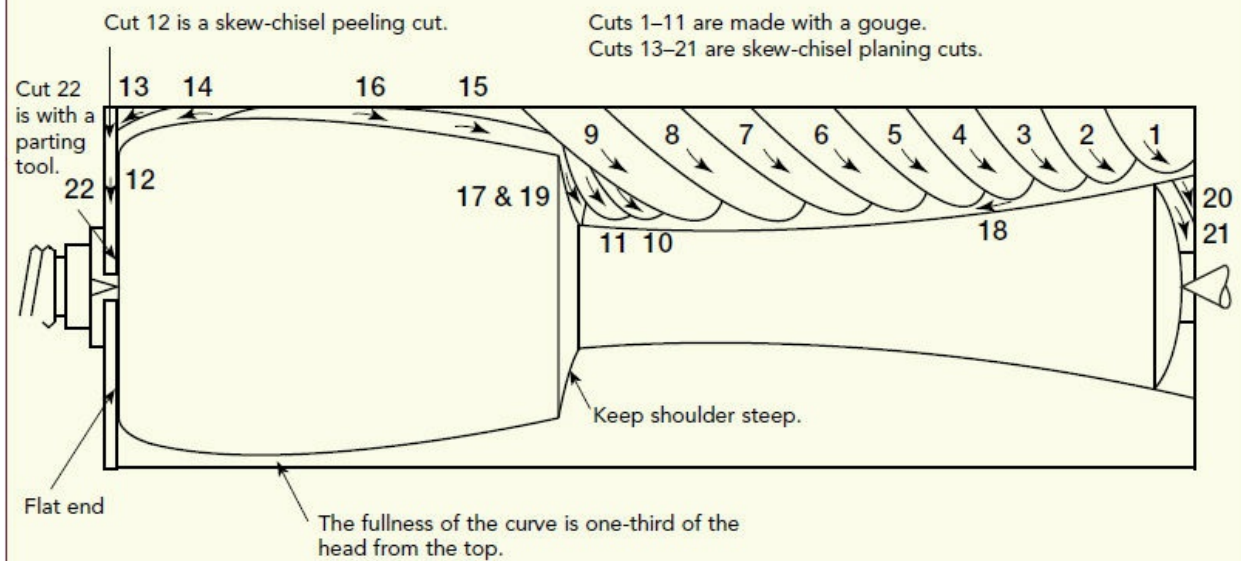
A carver's mallet is round and as such makes an ideal turning project. Commercially made mallets are turned in two parts to save material, but here you'll see how to make a mallet from a single blank. I use a gouge to rough out the shape, then a $\frac{3}{4}$ -in. (19mm) skew chisel to refine and finish the job. Ideally you'll cut the wood so cleanly that you won't need any sandpaper. Then whenever you use the mallet, you'll be reminded of what a wonderful surface you got off the tool.



These are 10-in. (250mm) carver's mallets of casuarina, ash, and Tasmanian blackwood with 3¹/₈-in.- (80mm-) diameter heads.

I have a range of mallets, each suited to a different task. The length of the handle, and the diameter to some extent, should be decided by the size of the hand that will use it. But the handle diameter will also be affected by the task it's created for; light mallets for gently tapping a small carving chisel won't need the thick handle required for the heavy head used to thump a bricklayer's bolster.

THE SEQUENCE OF CUTS TO SHAPE A MALLET



I like the fullness of the curve about one-third back from the end, as in the drawing above. I find this shape provides better contact with the object being hit. And with a flat end, each mallet can stand on end, thus taking up less bench space. The transition from handle to head is best kept plain. You don't need anything fancy like a bead to chafe your forefinger. The handle should be fatter at the end so it doesn't fly out of your hand if your grip is less than tight, and although my handles are slightly coved, I don't want too steep a curve at the end of the handle. If you want some decoration, include a couple of grooves and possibly a bead on the end of the handle around which you can tie a bit of cord to store your mallet on a hook.

Ideally the blank will be a hardwood known for its stability and resistance to splitting, such as elm, hickory, robinia, or maple. Fiddleback figure is good, being resistant to splitting as well as decorative. Go for a straight-grained blank about 3 in. (75mm) square and 10 in. (250mm) long. The blank does not need to be well seasoned, although if it's not, you might get some distortion as the wood dries. As with the spurtle and stirrers, avoid the pith.

Find Center



To find center on each end, draw the diagonals from corner to corner with a straightedge. Center is where the lines intersect.

1 True the blank to a cylinder by removing the corners using a gouge. There are several styles of roughing gouge (you can see one in the top left photo on p. 18) designed specifically for reducing square section spindle blanks to round, but they are not essential. A good alternative is a ½-in. deep-fluted bowl gouge, as shown in the left photo below, which gets the job done just as quickly but with more passes.

2 Rough out the handle to establish the overall proportions of the head to the handle (these are cuts 1 through 11 in the drawing on p. 23). Being right-handed, I rough out the handle to the right so later I can test the feel of the handle while it's still on the lathe. Now get the head turned.



True the blank to a cylinder.



Rough out the handle.



Remove the waste on the mallet head.

3

Use a peeling cut to turn back the head of the mallet (this is cut 12 in the drawing) so when you part off you are clear of the spur drive and any damage it may have caused. The resulting tenon should be about the diameter of the spur drive. Make the end flat so the mallet will stand on end.

4

Complete the cylindrical part of the head (these are cuts 13 through 16 in the drawing) using the skew chisel's long point down to the left, and then long point up to the right, or the other way around if left-handed. Make sure to keep the fullness of the curve, and therefore the weight, toward the top end of the mallet. If you have problems with twisted grain lifting out in lumps, try a low peeling cut using the skew chisel flat on the rest, as shown in the top right photo on p. 89.



Complete the cylindrical part of the head.



Complete the handle.

5 Finish turning the handle (cuts 17 and 18 in the drawing). The skew chisel held long point down does the best job.

6 Stop the lathe and test the feel of the handle. Now is also the time to check that you've eliminated anything you might not want on the finished object.

Look for flat sections and inconvenient knots and splits. A knot on the head isn't a problem, as shown in the photo at left, whereas on the handle, it might be a source of blisters unless it is filled with epoxy.



While the mallet is still on the lathe, turn off the lathe and test the fit of the handle.

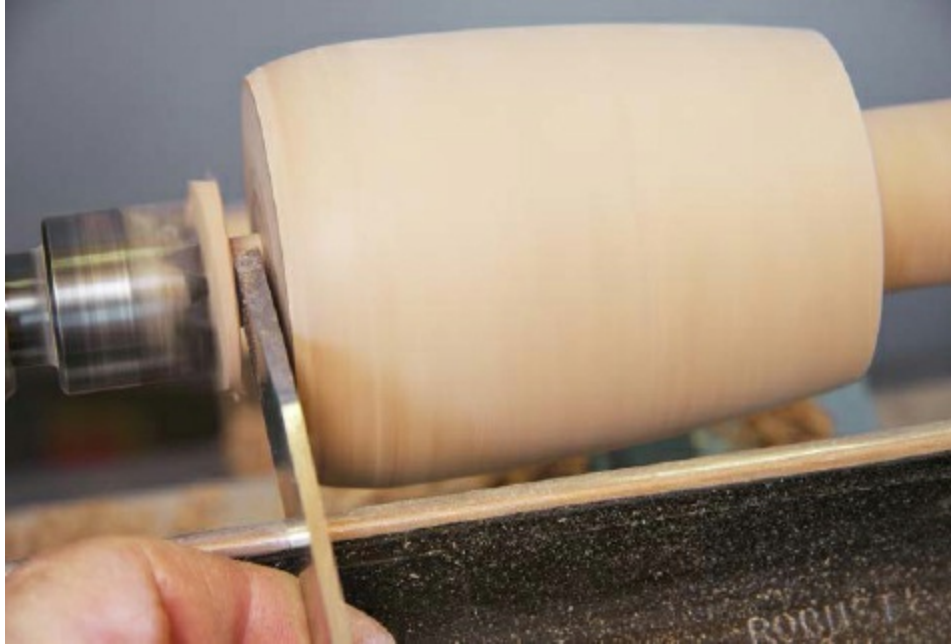


Finish turning the base of the head.



Finish turning the end of the handle.

7 With all the cylindrical surfaces turned, it's time to tackle the end grain using the long point of the skew chisel. Start by skimming the base of the head (this is cut 19 on the drawing). You won't need to do this if your cut 17 left the end grain smooth. Then turn the end of the handle (cuts 20 and 21). Last, use a parting tool (cut 22) to reduce the diameter of the tenon adjoining the drive to about ½ in. (13mm), before smoothing the end grain using a skew chisel point or ½-in. (13mm) detail gouge.



Reduce the diameter of the tenon against the spur drive.



Use a flexible ruler or batten to sand in the parting cut.

8

Sand and finish. To sand effectively in the narrow space against the spur drive, wrap the abrasive around something flat and flexible like a ruler or thin batten. If your finish off the tool is good enough, you can forget the sanding

and slap on some oil and wax. A tool finish is never as smooth as a sanded one, but with use it can look much better. Plus, every time your hand closes around the handle, you'll enjoy the inner glow that comes from knowing you didn't need to sand it.



Part off at the tailstock end.

If you need to use abrasives or prefer a smoother finish, work through the grits to what you like best. In my case that's usually 240 grit. Then on top of that I use my oil and beeswax finish described in "Finishing" on p. 177.

9 Parting off. At the headstock end, use a parting tool to cut straight in, leaving about $\frac{1}{4}$ in. (6mm) diameter. Then, at the other end, support the mallet as you use a skew chisel's long point to cut right through to center—at which time the mallet will spin off into your hand. Have your thumb against the skew and use the long point as far as you can, raising the skew's handle when you're almost at center so the edge completes the cut. To avoid a catch, keep the upper part of the edge clear of the wood.

10 Finally, clean up the ends. The end of the handle should need little more than a quick rub with 240-grit sandpaper. At the other end, saw off the stub and smooth the end grain using a sanding pad in a chuck on the lathe, as in the top right photo on p. 17.

SCHNITZEL Mallet

A squared variation of the mallet is a common kitchen weapon used to flatten schnitzels, but it could be equally useful in a workshop. Making one is a nice little exercise in cutting square shoulders. Start with a squared blank accurately mounted on the lathe and turn only the handle. To avoid a catch when turning the square-section end grain, use a skew chisel's long point with only the bevel side in contact with the wood. Angle the skew edge clear of the end grain so the point does the cutting, as in the left photo below.

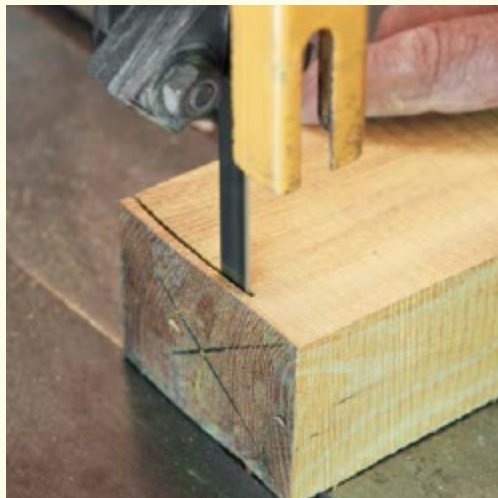
To complete the head without the risk of a catch, slice away the end grain using a bandsaw, then sand the head on a disk or belt sander.



Schnitzel mallet in osage orange. The head is 3 in. by 2 in. (75mm by 50mm).



When turning square sections, use the skew chisel's long point and keep the edge clear of the wood.



Avoid catches on the lathe by cutting away the spur-drive marks. Using a bandsaw enables me to radius the end for a less machined look.



Last, sand the head on a disk or belt sander.

CHAPTER

4 EGO STICKS

A long thin spindle is widely regarded as one of the more difficult things to turn on a wood lathe, but the inner glow of satisfaction once the spindle is complete is well worth the effort and nervous strain. The finished spindle serves no useful purpose that I've found other than to remind you that you've been there and done that, which is why I call them ego sticks. Finishing a few of these will give you the confidence to tackle all manner of fine projects: lace bobbins, pens, and just about any other spindlework. Long thin finials will be a breeze. Even inexperienced turners can usually successfully manage a 10-in.- (250mm-) long spindle less than $\frac{1}{4}$ in. (6mm) diameter if they attend to the three problems that commonly bedevil turners, particularly novices: leverage, blunt tools, and aggressive tool use.



These spindles were mostly turned in the 1980s as the last project in a day of demonstrations when I'd had enough of talking. The longest is 28½ in. (713mm). They have diameters ranging between ⅛ in. (3mm) and ½ in. (13mm) and are unsanded, retaining the surface left by the skew chisel. The spindle turned in this chapter is in the front.

To remedy the problem of leverage, move the tool rest in as close to the work as you like. To avoid blunt tools, if it even vaguely crosses your mind that a tool might need sharpening, sharpen it. The skew chisel will need a good edge with little or no burr and definitely no micro facets. The best edge comes straight off a wetstone grinder like a Tormek®, or a fine 180-grit CBN wheel. Honing should be avoided, as this creates a micro bevel that makes the tool more difficult to use. That leaves us with aggressive tool use—the scourge of fine turning. Pushing the tool into the wood, especially when the blade is at a right angle to the lathe axis, always leads to problems with chatter marks and catches, but here it is catastrophic. Push hard against a long thin spindle and it can flex or shift in the chuck, after which it is very difficult to re-center. As always, think in terms of letting the wood come to the edge rather than pushing the edge into the wood. After that, you'll need a range of

hand positions that enable you to support the back of the cut as well as the spindle itself.

Using the right speed is crucial to limiting chatter. Very high speed is not the answer, as it tends to amplify any whip or flexing; 2,000 rpm is fast enough. If flexing is still a problem, with the spindle whipping around in a flattened arc, ease the tailcenter back so it is supporting the wood rather than pressing against it. Long spindles are often supported by a steady, but if the work is as thin as this, it's better to use your hand, as a steady can create enough torque to twist the work in two. All of the spindles in the photo on the facing page were turned without the use of mechanical steadies or jigs.

For your first attempt at a thin spindle, select a blank about $\frac{3}{4}$ in. (20mm) square and 12 in. (305mm) long. The grain must be absolutely straight and aligned with the lathe axis. I prefer radiata or pitch pine, which work well and are strong enough to withstand some flexing. The blank you see here is $\frac{7}{8}$ in. (22mm) square and $15\frac{3}{4}$ in. (400mm) long. Its finished dimensions are $14\frac{1}{8}$ in. (360mm) long and about $\frac{3}{16}$ in. (5mm) diameter. The spindle is turned using only a $\frac{3}{4}$ -in. (19mm) skew chisel.

1 You can mount the blank in long-nose jaws, but I usually turn or pare down one end to fit the hollow spindle and drive it in with a mallet. If the blank is off center when you bring up the tailcenter, do not pull the blank into alignment; rather, drive it in further with a glancing blow on the end to bring it nearer to true. It is essential that you avoid pulling the blank toward the tailcenter, as that either loosens the grip at the other end or bows the blank. When the blank is centered, wind in the tailcenter tight, start the lathe, wind the tailcenter in another half turn, then back it off until the revolving center barely moves. You need the tailcenter *supporting* the wood rather than pushing against it.

2 Start to rough down the square at the drive end by cutting a small V-groove into the square edges. Use the long point of a skew chisel. Then when you make a series of small scooping cuts holding the long point down, there will be no frill of fibers up against the chuck.



Make a V-groove about $\frac{3}{8}$ in. (10mm) from the spur drive.



Reduce the square blank to a cylinder, starting at the headstock end. A groove ensures a neat termination to the long planing cuts.

3 Turn the square section to round, working in a series of scooping cuts, initially toward the headstock, and then finally toward the tailstock. As you cut back from the drive, you must use your hand to equalize the pressure of the tool against the wood to prevent the blank from flexing. The instant you have a round section you have somewhere to safely place your fingers. Heavy cuts are possible. Keep your thumb on the rest and against the tool. When you use the skew with its long point down, any tool pressure is directed more toward the headstock rather than the axis, reducing the possibility of chatter as well as the tool catching. If you are left-handed, work back from the tailcenter.



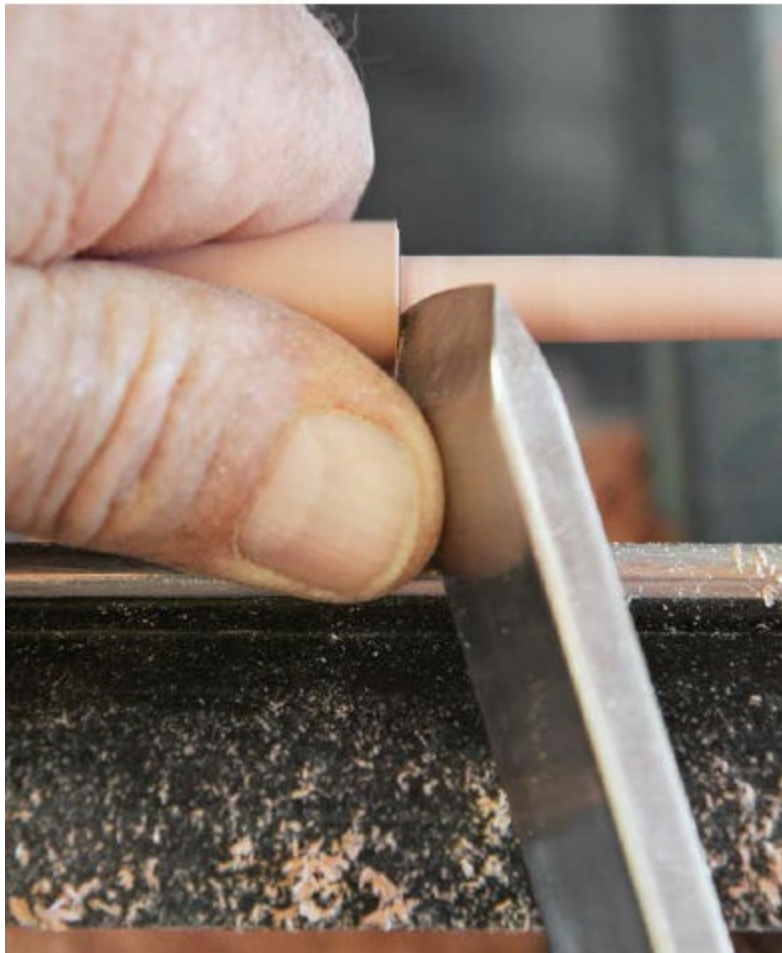
Thin cylinders need support to prevent chatter marks. Once you have created a round section, you can use your hand to balance against the pressure of the tool.

4 Now shape the spindle by turning beads and slimming the sections in between. Feel free to adorn these sections with more beads and grooves to show how clever you are. I have fewer disasters if I start near the middle and work back toward the tailstock; when it is half done, I shift the rest and work from the center bead back toward the chuck. It's all about supporting the wood as you cut so it doesn't flex. Any pressure you exert against the wood as you cut needs to be equalized by your supporting hand, so the more pain you can stand the harder you can push. Your fingers, however, should be no more than warm.

In the photos at right you can see typical grips demonstrated as I develop the right side of a central bead. In each, my right hand is pushing the skew against my thumb as it acts as a fulcrum on the rest. On sections between the beads, it helps to support the spindle on either side of the cut (below). Note that to fully control the tool, your upper hand needs to maintain contact with the chisel and the rest (bottom right).



Between beads, support the spindle on either side of the cutting edge.



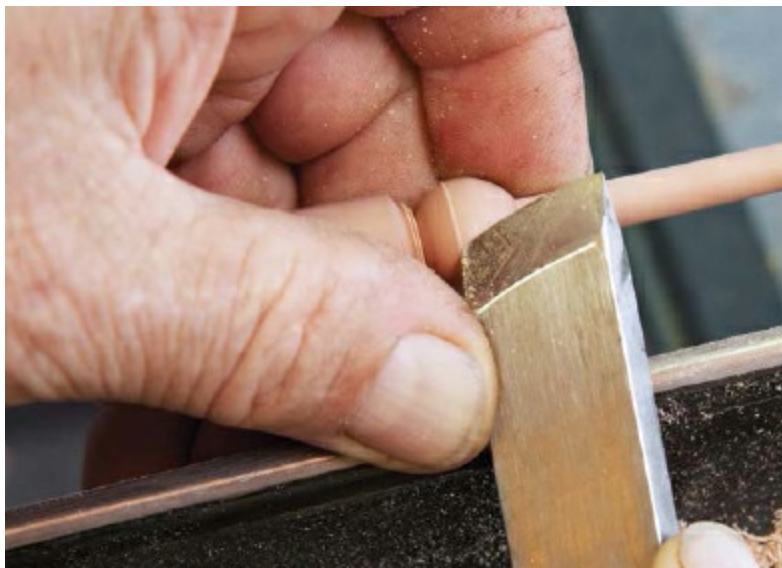
Shavings that build up as you cut in to the base of a bead vanish when you cut across the grain using the long point of the skew chisel.



When turning the middle of a thin spindle, support the tailstock half with the heel of your hand, ensuring the tool is steady on the rest.



Working around a central bead, give the spindle as much support as possible. An underhand grip allows a better view than the overhand grip that's needed if you cannot reach around the rest.



If you cannot reach around the rest, support the spindle as much as possible while you reach over the top.

Cutting back toward the base of the central bead, I steady the spindle while my hand keeps the tool firmly on the rest. I have two options to support the spindle as I turn the central bead using the short corner of the skew. When

possible, I like to reach under the rest so I have a better view of what I'm doing. I complete the bead using the skew's short corner, then slim the spindle into the base using the skew's long point up when cutting from the left.

Alternatively, you can reach over the top if the position or size of the rest prevents you from reaching from below.

For the inward journey toward the headstock you'll need variations of the grips already employed. If you're using an underhand grip, all you need to do is flip the tool over and head in the other direction with the long point down.

Coves can be turned using the skew by simultaneously rotating and lifting the handle, but be sure to use the lower part of the edge. It's best to try this on an end first: In the middle when the spindle is flexing, the spindle tries to run up the tool edge so you need to support the spindle from all sides. It's tricky.



Use a skew's long point to cut in to the base of a bead. A variation of an earlier grip keeps things steady.



It's possible to cut a cove using a skew chisel with the long point up by simultaneously rotating and lifting the handle.



Part off the tailstock end first.

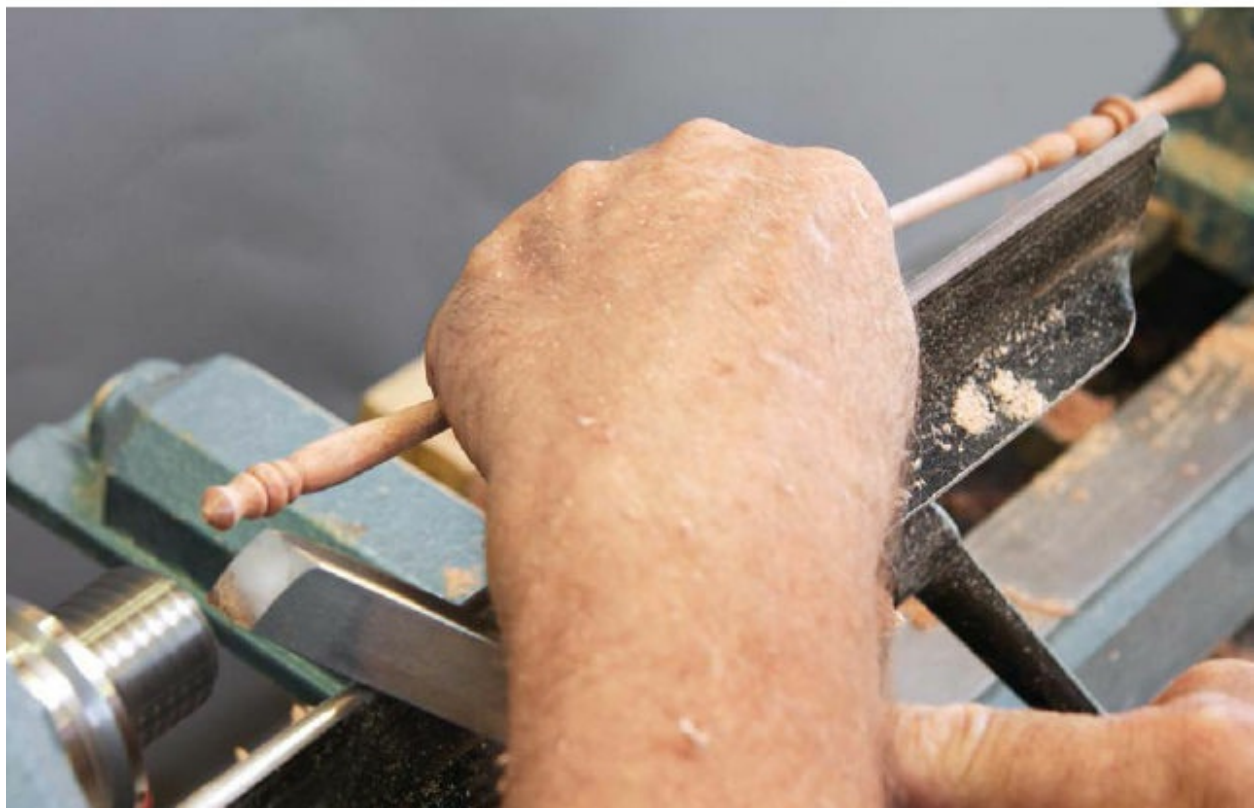
5

Parting off is much the same as usual, only with the opportunity to show off if you have an audience, particularly of woodturners, using a skew chisel with its long point down. Once you've cut through the center, you can hold the skew in position and pull the unsupported end into the edge of the tool and save sanding. Fellow turners will be impressed.

You then need to change hands and support the spindle as you move the rest and position yourself for parting the stick off at the other end. Keep the lathe running; otherwise, the torque as you restart is likely to break the stick free. As you make the parting cut, use your wrist to steady the tool on the rest.



When the stick is secured in a chuck or the drive spindle, you can pull the end onto the skew's edge to complete the end without sanding.



Last, part off at the headstock end, using your hand to support the stick and your wrist to keep the tool on the rest.

CHAPTER

5 LAMP BASE

Turning your own lamp base is pretty simple. The tricky bit is drilling two holes for the power cord with reasonable accuracy. The hole through the center needs to intersect with another parallel to the base so the cord will come out of the side, as in the photo at right. It can be difficult to get the two holes to meet, so there's a larger hole in the base that also provides space in which to feed the cord from the vertical to the horizontal hole.



This silky oak lamp is 3¼ in. by 6¼ in. (95mm by 160mm).

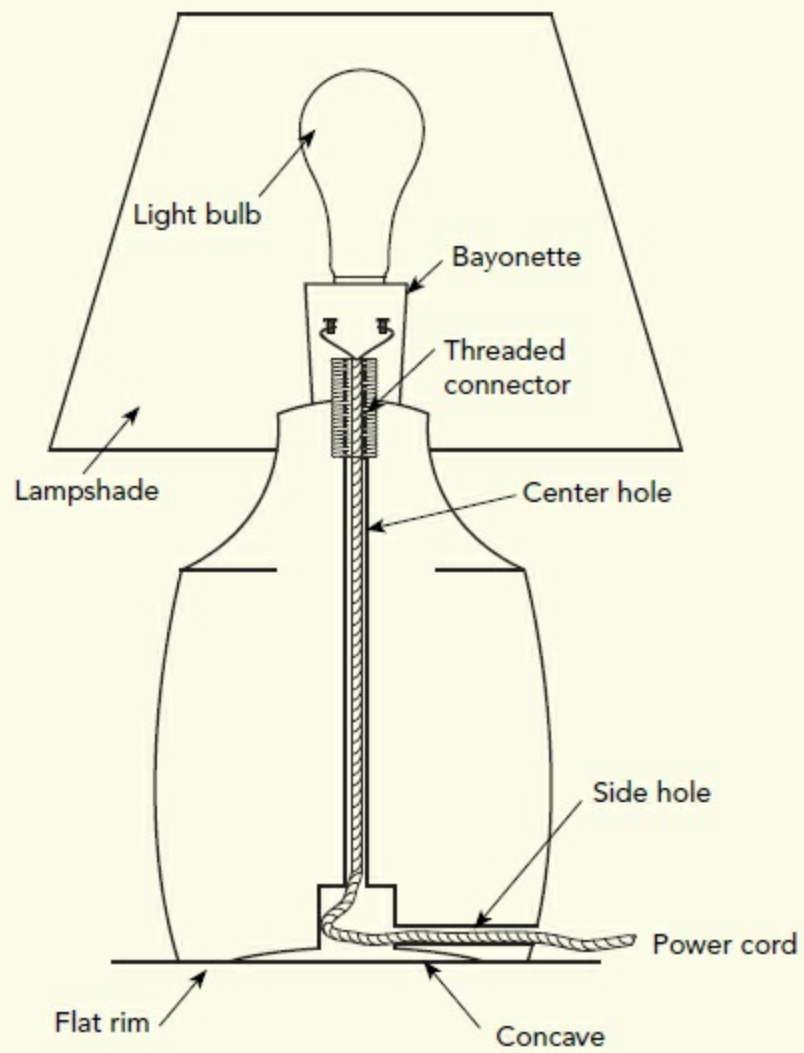
When I began turning in the early 1970s, making a couple hundred small table lamps gave me lots of practice as I came to terms with basic techniques and explored my sense of design and proportion. I suffered the usual novice's frustration of constant tool catches, which I expected at that stage of my turning career, but of more concern was the drill's unfortunate habit of wandering off course whenever I drilled a central hole for the power cord. I now know that this was in part caused by pushing the drill too fast into the

wood.

My early lamps were turned from well-seasoned hardwood cubes, which you'd be lucky to find these days. Such wood would have been air-drying for at least seven years. I tended to turn it as facework, not realizing the lamps were more likely to warp with that grain alignment. Typically, a lamp base will be taller than it is wide, so it makes sense to have the grain running vertically so the base stays flat.

Consequently, these bases are essentially very chubby spindles not too far removed from the light pulls in Chapter 1, only these are on steroids. The blanks are mounted between centers and turned with large skew chisels and/or gouges. The turning is easy enough, especially if you favor simple unadorned forms as I do, but if you want a lamp base consisting of beads and coves, go for it. Getting the hole on center can be tricky, so, as with the light pulls, the hole is drilled before the blank is turned. Because of the weight, a lamp base cannot easily be turned between conical centers, so you'll need a spur drive; more on that later. Power cords with a lamp socket and inline switch are readily available online or through electrical suppliers.

LAMP BASE CROSS-SECTION



Drilling a Lamp Base Hole

How you go about getting a hole through the middle of your lamp base depends on the drills or hole-boring augers or kits at your disposal. Drilling can be done both on and off the lathe. You can also laminate a blank, leaving a square hole at the center that can be drilled to hold the lamp fitting.

The power cord needs a hole around $\frac{1}{4}$ in. (6mm) to $\frac{3}{8}$ in. (10mm) diameter, the size of commercially available lathe augers. The threaded pipes that connect the lamp fitting to the base are usually $\frac{1}{2}$ in. (13mm), so you need a drill that size. I usually widen the central auger hole using a standard twist drill when I fit the cord, after the lamp is turned.

DRILLING A CENTER HOLE OFF THE LATHE

If you have a long enough drill, you can drill a blank off the lathe using a drill press or even freehand, or more likely a combination of both. If you are using a drill press, drill as deep as the feed will allow, then clear the kerf from the hole. Next, with the drill off, fit the blank onto the drill and support and clamp it in position before switching on the drill and again drilling as deep as the drill will allow. This gets a bit tedious, so I prefer to drill a starter hole as deep as I can on the drill press. Twist drills tend to wander, making a messy hole that's often larger than intended or required, so use a short brad-point bit for accuracy, as in the top left photo below. Then I use that hole to guide a longer auger drill powered by a hand drill to drill through to the base. Whenever you're drilling deep, back the drill out often to clear the kerf. If you don't, the drill will get jammed deep inside the blank. In the worst-case scenario, you'd need to split open the blank to reclaim your drill.

DRILLING A CENTER HOLE ON THE LATHE

Commercially available wood lathe augers are typically between 24 in. (600mm) and 30 in. (765mm) long. These very long drills are used in conjunction with a hollow tail center, seen at the top of the photo below, enabling you to drill a hole through a blank as it spins on the lathe. Below the hollow center in the photo are two commercial wood augers, but the standard drill threaded onto a 28-in. (710mm) rod is as efficient. It would be even better welded so it couldn't unscrew if the lathe was reversed. (I don't want

to deal with that again.)



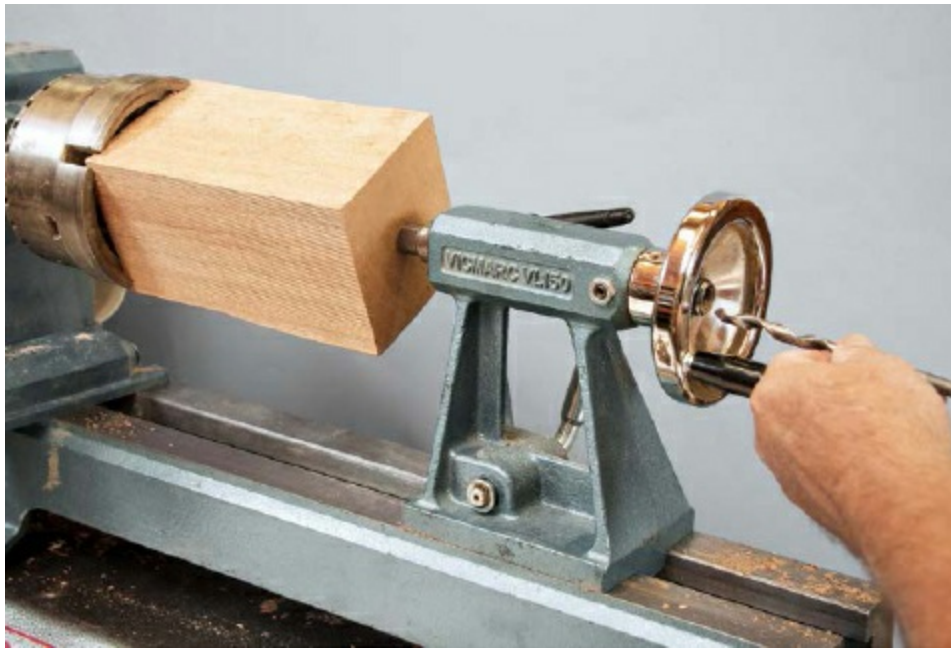
To drill a hole through the center of a blank by hand, first drill a starter hole on a drill press for accuracy.



Then use that hole to align a longer drill.



Commercially available augers are between 24 in. (600mm) and 30 in. (765mm) long and used through a hollow tailcenter. A standard twist drill welded to a rod (bottom) is as effective.



An auger can drill right through a blank mounted in a chuck. (If the blank is between centers, the drill has to stop short of the spur drive.)

You can mount a blank to be drilled between centers, but if the drilling is

dead accurate, you are likely to damage both the auger and the spur drive cone. To avoid the auger hitting the spur drive, you need to measure the depth to which you need to drill. Mark the depth to drill to on the auger shaft with a rolled-up elastic band or masking tape. The center hole needs to stop just short of the spur drive, so you need only cut away a thin slice to reveal the hole. Rounded blanks should be fixed in a cradle when being cut to prevent them from rolling into the saw.

If you mount the blank in a chuck, as in the photo above, there's little danger of damaging anything as you drill through the bottom.

If you push an auger or drill too aggressively into the wood, the buildup of shavings can force an auger off-center. In a 16-in. (400mm) blank, the center hole can be 1 in. (25mm) off the axis. The trick is to push the auger in no more than 1 in. (25mm), then withdraw it to clear the kerf. It's tedious but worth the time taken.



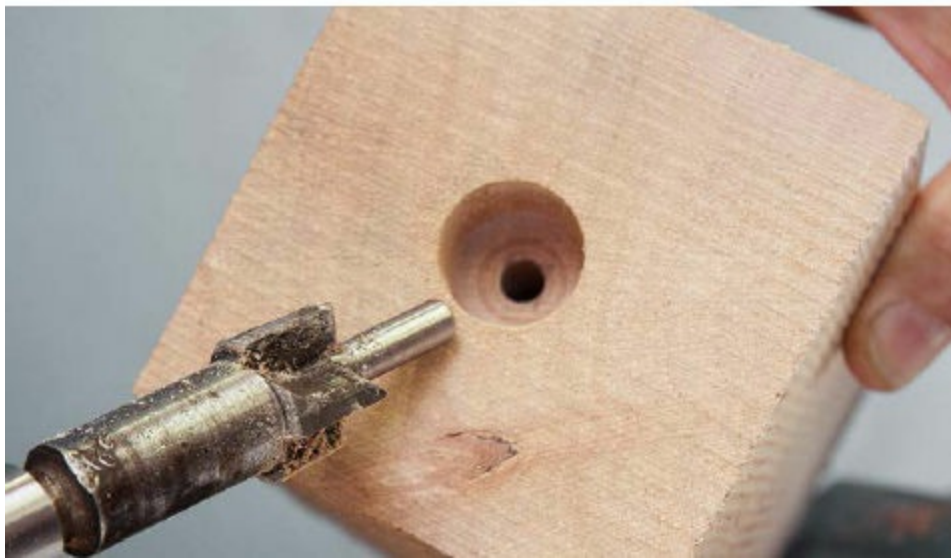
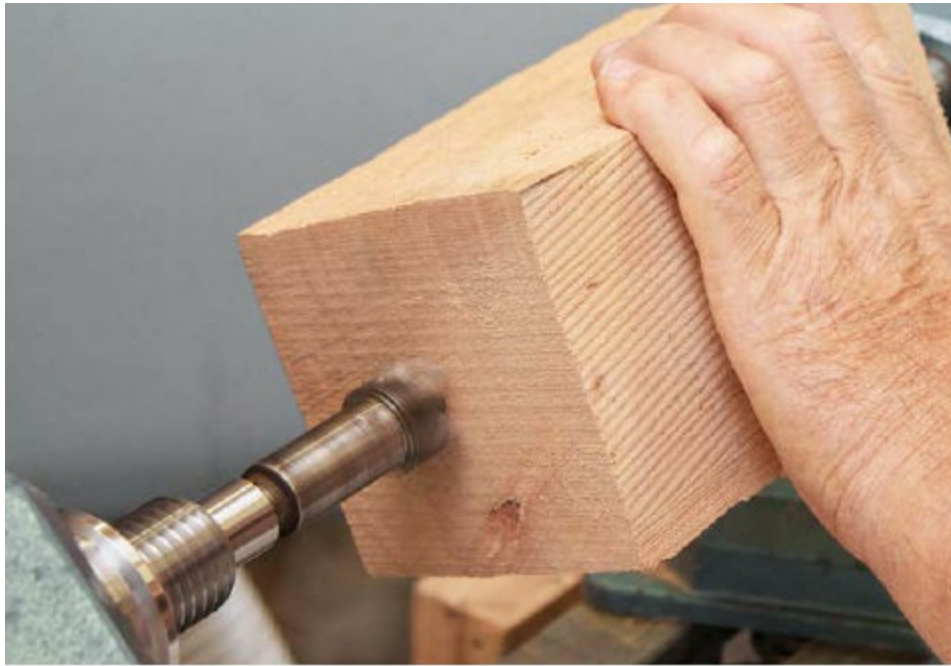
A hole bored through a blank mounted on a lathe between centers needs to stop short of the spur drive. Before you can remount the blank, remove thin slices until you reveal the center hole.



A counterbore drive center is the best tool to counterbore the base.

Counterboring a Base

The base needs to be counterbored to facilitate threading the power cord through the base hole and up the center hole. The best tool for the job is a counterbore drive center, which is a spur drive with a projecting rod that matches the center hole. These drives come in different sizes and are often sold as a kit along with an auger and a hollow tail center.



To use a counterbore, mount the blank over the guiding rod, then hold the blank still as you start the lathe and wind in the tailstock. Drill in about $\frac{3}{4}$ in. (20mm) to create a link-space for the power cord.

Mount the end of the blank where the center hole is in the middle (usually the end where the auger or drill entered the wood) over the rod with the end grain barely touching the drive spurs. The tailcenter *must* support the other end but must not be wound in tight enough to force the drive spurs into the end grain at the other end. Have your hand on the blank to prevent it from spinning as you switch on the lathe at about 300 rpm. As you wind in the tailcenter, the drive will bore into the wood. When the head of the counterbore is inside the base, take your hand off the blank and wind the tailstock in another turn so the drive spurs bite into the end grain.



If the center hole is off-center, you can drill a hole at center large enough to accommodate both the center hole and your spur drive.

If you don't have a counterbore, use a drill press to drill a hole the same diameter as your spur drive—or even do it freehand. If you want or need to have the base at the end where the center hole has wandered off-center, that's fine. Simply drill a hole large enough to accommodate your spur drive and the center hole.



With the blank remounted between centers, reduce the square to round using a gouge, then smooth the cylinder using a skew chisel.

Turning a Lamp Base

Turning the lamp base is a straightforward piece of large spindle work.

1 As always, rough the square to round, turning away all the flat sections of the original square and everything else you don't want in the final piece. In the photos at right, I'm using the right wing of a ½-in. (13mm) deep-fluted bowl gouge to remove the square corners, then a large 1⅜-in. (30mm) skew chisel to plane the cylinder.



True the end grain. To remove major amounts, use a skew chisel flat on the rest for a peeling cut. For a finishing cut, a spindle or detail gouge is less likely to catch than a skew chisel.



2 To clean up the rim of the hole in the base, use the lower wind of a gouge held on its side.

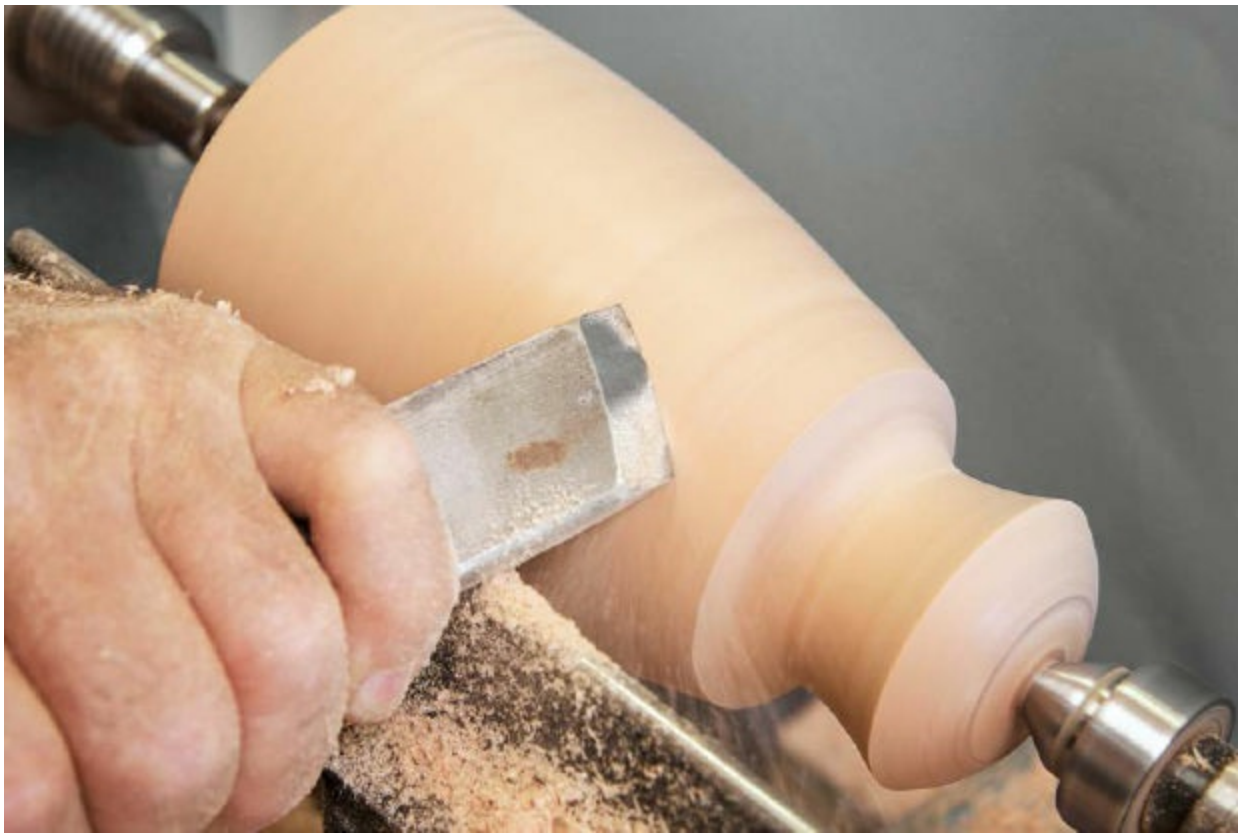
True each end. First remove any major eccentricities using a skew chisel flat on the rest for a peeling cut, and then use either a spindle or detail gouge for a finishing cut. To avoid a catch, make sure the gouge is on its side with the bevel rubbing the end grain.

At the end of the cut, the rim of the hole will likely splinter. To clean this up, roll the gouge over and squeeze the lower edge *very gently* into the rim. Then attend to the other end.

3 Shape the lamp base by slicing the wood with gouges and a skew chisel. Use gouges to cut the coves: Start each cut with the gouge on its side with the flute facing the center of the cove. Cylinders and convex curves are best planed using a skew chisel.



Coves should be cut using a gouge. Start each cut with the tool on its side and the flute facing the center of the cove.



A skew chisel will produce the cleanest surface on cylindrical and convex forms.



Drill the side hole for the power cord so it meets the center hole.

4

About ½ in. (15mm) above the base, drill a hole through to the countersunk hole that is just large enough for the power cord.

5

Sand and polish the lamp base. I sanded this to 320 grit and applied my usual boiled linseed oil beneath a layer of beeswax (see p. 177 for finishing).



Sand and polish the base.



Fitting the lampholder. First widen the center hole for the connector. Then pass the power cord through the bottom and center holes and connector before connecting the wires to the bulb

holder.

6

Widen the top of the center hole to accept the threaded pipe, then assemble the lamp. In the photo above, the cord has been threaded through the side hole, up the center hole, and through the brass connector before being connected to the lamp fitting, which now is ready to be screwed into the center hole.

Although connecting a couple of wires is a simple enough task for most people, there are jurisdictions where only qualified people are supposed to make electrical connections. You need to check your local regulations.

Turning a Lamp Base from a Log

Transforming a log into a lamp base is always an attractive prospect with contrasting sapwood and heartwood and an opportunity to retain some bark. You may want to retain the shape of the log and bark all the way to the table it sits on, but keep in mind that the rim of the base needs to be flat if the lamp is to sit firmly without wobbling. When truing the base, check that it's flat using a straightedge. Making the bottom dead flat is difficult, so mark a circle clear of the bark, then within the circle turn the bottom slightly concave so the lamp rests on the rim of the base. If the bottom is even slightly domed, the lamp will wobble.



Turn long coves with a roughing gouge. Here you see a 1-in. (25mm) shallow roughing gouge with a slightly radiused edge.



Log lamps need a flat base so they don't wobble. Check flatness using a straightedge (here a parting tool).



Mark a circle just inside the bark and make the area within the circle slightly concave while leaving the rim flat.

GENESIS OF A FORM

The original idea was to retain the bark for about the bottom two-fifths of the lamp, but a slight curve in the log, and less than satisfactory centering after the center hole wandered off, meant there was a lean to the form. In addition, the top is rather too like a mallet handle.

After a few cuts to taper the neck, the top section is looking much better, and although I chamfered the rim of the base, there's now the hint of a thrust-out chest. The bark might have stayed on, but the form is a bit of something-and-nothing.

Keeping the upper section, I went for a sort of Chianti bottle, retaining some bark but ensuring at least one view of an all-turned profile. This was an unseasoned log, and turning it was a gamble I lost—the base split within a day.



CHAPTER

6 LAMPSHADE

A wooden lampshade is little more than a very thin bowl with a hole in the bottom, which is then turned upside down and supported by a wire frame fixed into a recess surrounding the hole (see the bottom photo on p. 55). Frames can be purchased, but with wooden shades you don't need those made for home handicrafts with two rings separated by vertical struts. You need only a ring supported by struts connected to the washer that fits the lamp fitting. I found the frames I wanted on tatty old mass-produced lampshades at a local recycling operation. All I had to do was strip the stiff fabric off the frames.

Turning wood to translucent thinness is always a challenge, but if you use a pale wood felled within the past few months, a bright light and calipers to gauge thickness, and go steadily with minimal tool pressure against the wood, you might achieve well more than you anticipate. As with a bowl, you turn the outside first, then hollow out the inside. You can take your time on the profile, but when it comes to finishing off the hollowing, you can't afford to take too long because the shape will begin to distort. If at all possible, make this shade in one go. Setting the project aside for even a few hours, especially if the wood is green (unseasoned) can lead to all sorts of problems.



This deodar cedar lampshade is 9 in. by 6¾ in. (230mm by 170mm). The base is sequoia, 5¹/₈ in. by 10¼ in. (130mm by 260mm).

One advantage of turning a wooden lampshade is that you can curve the profile—which you can't do with many materials commonly used for lampshades. For a first lampshade try a slightly enclosed form around 10 in. (250mm) diameter and 6 in. (150mm) high, like the one shown here. It's more likely to retain its shape as work proceeds than the classic conical shade on p. 38.

For strength and better grain patterns, I like to have the grain run across the face of the blank, as you would in a bowl. And when you're aiming for a diaphanous wall thickness, you'll find wood felled only a few months much easier and more pleasurable to work than something well-seasoned. You'll need quality timber that works well, like ash, cherry, box elder, or oak, rather than some half-rotten, spalted relation of a ball of wool. Quality wood should cut so cleanly it'll hardly need sanding, and it'll allow you to go for a $\frac{1}{8}$ -in. (3mm) wall thickness with some confidence.



1 Cut in from the face to prevent the end grain from splitting away on the rim.

Begin to true the blank by removing as much weight as possible off the bottom corner of the blank (rather than truing to a cylinder first). Here I'm using a $\frac{9}{16}$ -in. (14mm) half-round bowl-profiling gouge with a long left wing for shear roughing cuts. The bevel doesn't contact the wood as the edge is eased into the wood in a series of arcs, working from the smaller to larger

diameter. The surface is ridged because the bevel doesn't rub the wood, but the aim at this stage is rapid waste removal rather than a clean surface.

2 True the upper part of the blank by shear-cutting in from the top face so as to prevent the end grain from splintering away. For a controlled cut, hook your forefinger under the rest and ease the tool forward with your thumb. Keep the gouge rolled in the direction you're cutting, with the bevel riding the surface you've just cut.



This cedar blank, about 10 in. by 7½ in. (250mm by 190mm), is mounted on a Vicmarc® screw chuck. With barely round blanks like this, start at a very low speed and initially reduce the eccentricity and weight on the bottom corner of the blank so you can increase the lathe speed.



3 Turn a tenon at least the size of the support frame, and flatten the base.

Turn a tenon on the base at least the diameter of the lamp support frame. The tenon could easily be a small bead that decorates the top of the shade, and if the bead is exactly the same diameter as the dovetailed jaws, the jaws won't mark the wood. If you have only smaller jaws instead of dovetail jaws, mark the diameter of the support frame, then turn a tenon for your chuck.

Alternatively, at Step 5, you could turn a wider recess in which to expand your chuck. Closing around a tenon is always more secure than expanding within a recess. There is no reason why a fixing point for a chuck cannot be retained as a decorative feature—although this tenon will be turned away so you'll see how to do that. Also, I'm not worried about the small bit you might spot missing from the tenon in the top right photo below.

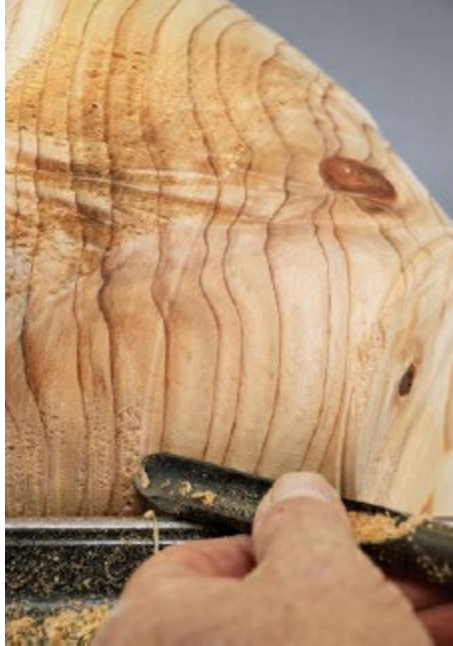
4 With the tenon established, refine the overall profile with a few more pulling shear cuts. Then use the bowl gouge for a finishing shear cut, pushing the gouge with the bevel riding the wood. In the top right photo on the facing page you can see the difference between the surfaces left by the roughing and smoothing cuts. Start a smoothing cut as near to the tenon as possible (the bevel has to be on the wood), then move with the tool around the curve to the

top. You know where you'd like to finish, so aim to get there in one pass. If you find the trajectory of the tool takes you into space, go into space, then start the cut again lower down the curve, easing in the gouge on a slightly different trajectory.

Any bumps are most accurately removed by shear scraping. My favorite tools for shear scraping are 1-in. by ¼-in. (25mm by 6mm) skewed scrapers with a rounded edge that lets them slide easily along a rest, but you can also use the wing of a gouge if the gouge is rolled on its side. When the scraper is tilted up on its side, be sure to use only the lower half of the cutting edge. At the bottom of the curve, use a skewed scraper flat on the rest to get into the corner.



Shape the shade profile using pulling shear cuts.



A final push cut with the gouge bevel rubbing the wood should leave a smooth surface.



Small bumps or ridges are most easily removed by gentle shear scraping.



At the bottom of the profile keep the scraper flat on the rest and pitched down so the edge doesn't catch.



Bore a hole into the base about 1½ in. (40mm) deep. This will help you later to gauge the thickness of the top of the shade.

5 Turn or drill a hole into what will be the top of the shade. Here I use a ¾-in. (19mm) square-end scraper to go in about 1½ in. (40mm). This will help you gauge the wall thickness when the job is almost done.

If the wood is somewhat green, when you have completed the outside you need to either get on with the hollowing or wrap the job in plastic to prevent the wood from losing moisture and splitting before you get back to it.

Save the Center



Optional! If you have a bowl-saver or slicing tool like this Sorby Slicer, you can save the inside for another project. I got the entry angle slightly wrong on this one, so failed to reach the hole I'd just drilled—a minor inconvenience.

6

Remount the shade for hollowing. This cedar was quite wet and likely to blacken on contact with steel, so I used thick plastic from a bag to separate the two. It pays to cut the corners away so there's no flapping once the lathe is running.

7

Complete the inside using a ½-in. (13mm) deep-fluted bowl gouge rather than something smaller and lighter in weight that will flex. You need the strength of a larger tool. Get the initial couple of inches in from the rim—that's 50mm—done as soon as possible. As the wall becomes thinner, the stresses within the wood alter and some warping is inevitable. So get the rim done and worry about the lower bit later. You need to support the back of the cut with your fingers. The less tool pressure there is against the wood the better; the job of your fingers is to balance out that tool pressure. Your thumb provides a fulcrum on the rest; you don't need it on top of the tool, as gravity

should keep the tool on the rest.



Remount the shade for hollowing. The steel chuck jaws—here I use Vicmarc Step Jaws—will stain green timber, so separate the two with plastic sheeting and trim this so it doesn't flap when spinning.



Complete the hollowing using a long and strong ½-in. (13mm) deep-fluted bowl gouge, and support the wood as the cut proceeds. Gauge the wall thickness with light, placing a bright lamp close to the wood where it shines through the wood but not directly into your eyes.



The wall thickness might not be as thin as you think. The amount of light passing through the wood depends on the wood species as well as its moisture content, so check with calipers as well.

If you place a strong light under and close to the bowl at four to five o'clock (as shown in the bottom right of the photo above), you'll be able to judge the wall thickness as cutting proceeds by the amount of light coming through the wall. But be aware that light has problems penetrating denser or darker wood, as you can see in the photos: It pays to use calipers as well.

8

When the wall is down to within 1½ in. (40mm) of the bottom (you can gauge from the hole at the bottom), turn a shallow recess for the shade support. Check that the support fits, then increase the depth of the recess. It's very easy to go too deep and through the side and ruin the shade, so stop frequently to measure the wall thickness in the corner of the recess and then be sure the support frame fits tightly in the bottom of the recess.



Turn a recess to fit the shade support. Take great care when deepening the recess, as it's easy to go through the side. Clear the shavings regularly, as they might obscure the light coming through the wood. It pays to use calipers to check the wall thickness in the corner of the recess.



With the recess done, reduce the wall thickness. Be sure to retain enough of the recess to secure the shade support.

9

Having established the position of the recess for the support frame and confirmed that it fits, reduce the wall thickness, retaining a minimal step for the frame. This inevitably widens the hole at the top, leaving a ragged edge, but you can complete that at the final stage.

Offset Tool Rest



Inside a taller shade, an offset tool rest lets you reach right inside the form, dramatically reducing the leverage and saving you from having to acquire longer tools.

10 Sand both inside and out, taking care to equalize any pressure exerted against the wood. Sanding will further thin the wall. This shade had no finish, as there seemed to be enough oil within the wood. I was tempted not to use abrasives either, as the wood cut so cleanly, but I soon remembered that the smoothest surface left by a tool will always catch more dust than a surface sanded to 400 grit or finer, so I took a long-term view and opted for the finish that requires the least dusting.

11 Re-chuck the shade so you can turn off the tenon and any chuck marks. This jam chuck is a rough-turned ash bowl that's nearly seasoned. It was turned true before the rim was sloped to match the inside of the shade. The slightly darker ring below the rim shows the area of contact. The fact that the cedar was damp helped it stick to the ash.



Sand the shade both inside and out. If the wood is dry, you can apply a finish at this stage.



Re-chuck the shade so you can turn off the tenon.



Support the shade as you turn away the shoulder using a spindle gouge and scrape the surface using a shear scraper.

The top of the shade was completed with a series of delicate shear cuts, using first a $\frac{3}{8}$ -in. (10mm) spindle gouge to remove the tenon for the chuck, followed by some shear scraping with a 1-in. (25mm) shear scraper. There is usually a bit of run-out with the shade running slightly off-center. Typically this is due to the shade going slightly oval as it dries. Power sanding is the best way to meld the old and new surfaces.

12 Secure the frame in the recess with a few blobs of hot glue or other flexible adhesive.

And always keep in mind that a bowl with a hole in the base is not a disaster but a potential lampshade.



Meld the old and new surfaces with a power sander.



A 12-in. by 10-in. (300mm by 250mm) cedar shade with a natural rim sits over a redgum burl

base.

CHAPTER

7 BOOKENDS

Bookends are perfect for marshaling books, DVDs, letters—anything that’s flat but when stored on edge takes up less space and is easier to get to. Bookends are also a good way of using any big lump of wood with a major defect. They present an opportunity to experiment with a range of cutting techniques on second-rate material and still end up with something useful. In the bottom photo on the facing page, the solid form has been cut in four to create two pairs of bookends. On each of the four pieces you need three flat surfaces, with each face at a right angle to the other two. This means the base of the initial turning needs to be turned flat, a useful exercise in itself. The two cut faces can be squared up on a disk sander.



These claret ash bookends can be positioned as shown in either of the two photos on this page, and either as a pair or singly.

Bookends need some weight, so the heavier the wood, the better. For two pairs of facework bookends you'll need a blank cut to a disk with a thickness less than the height of the books you intend to support and double the width.

Cross-Grained Bookends

Blanks for cross-grained bookends have the grain running across each face, like a typical bowl blank. This 10-in. by 4¾-in. (250mm by 120mm) lump of well-seasoned claret ash (right) would have been a bowl but for the multiple splits around a knot.

1 The blank is mounted on a Vicmarc 3-in-1 Screw Chuck. The tailcenter support is not essential, but it's always a good precaution at the roughing stage. As always, first turn the blank true and eliminate all flat sections, along with any defects you can't do something with. Here I'm using a ½-in. (13mm) deep-fluted bowl gouge to true the upper face to establish the usable overall dimensions of the blank. The worst of the splitting around the knot has been removed and I've established the overall form so the blank is almost ready for smoothing cuts. The small bead of a foot will be turned to fit the largest dovetailed jaw in a Vicmarc Step Jaw chuck and retained in the finished piece. The surface within this bead is slightly domed; one option is to decorate it with beads like the asymmetrical bookend on p. 67.



When truing a blank, don't forget to flatten the rim of the top face. Doing so will let you know exactly how much of the blank you can use.



A gouge can produce a surface that barely needs sanding. However, I usually find some delicate scraping improves the surface.

2 Finishing cuts begin close to the foot, starting with a shear cut with the bowl gouge. Then the surface is improved using a skewed scraper flat on the rest. Ash scrapes particularly well, but to avoid a catch you need to ensure that the angle between the top of the tool and the surface you're cutting is less than 90 degrees. The rest needs to be at about center height, and the scraper blade pitched down a few degrees to achieve the negative rake.



Delicate scraping removes the very fine groove left by a gouge.



A $\frac{3}{8}$ -in. (10mm) spindle or detail gouge is my favorite tool for cutting fine detail and getting into corners.

3 The side of the bookend, which is recessed, is mostly turned using the same techniques, but the shoulders at each end are best cut using a $\frac{3}{8}$ -in. (10mm) spindle gouge. Keep the gouge on its side and the bevel riding the shoulder as you pivot the nose of the gouge into the wood. The waste at the base of the

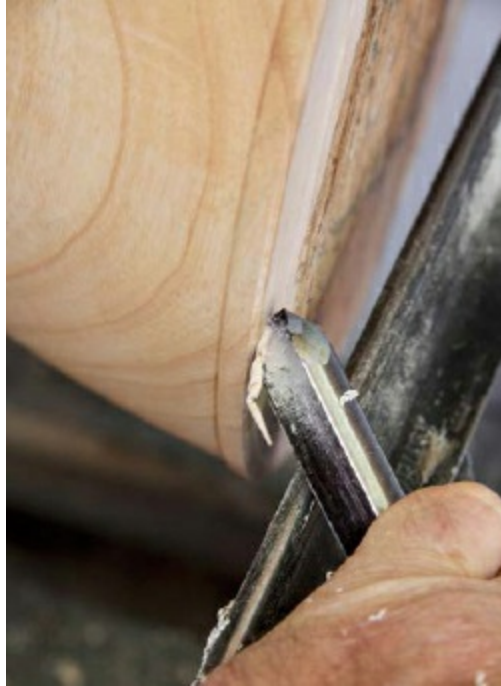
shoulders can be cleaned up using either the gouge with the bevel on the wood or the corner of the shear scraper tilted on its side.



As an alternative to using the spindle gouge in a corner, try shear scraping (with the scraper on its side). Squeeze the edge gently into the cut so you produce only dust or feathery shavings.

4

Sand the outside. Once sanding is complete you are ready to reverse the blank. If you don't have a suitable chuck, one option is to flatten or concave the face and drill a hole at center for a screw chuck, then reverse the blank onto the screw chuck. Having a hole on each face is not a problem, as you'll be cutting through the center and eliminating evidence of any screw holes.



True the bottom face first using the left wing of the edge to create a smooth surface on which to rub the bevel. The gouge must be rolled over at least 45 degrees to avoid a nasty catch.



Then roll the tool over so the flute faces out and ride the bevel on the trued rim to start a shear cut to center.



When you need a flat surface, use a straightedge to burnish the high spots. If the burnish marks are difficult to see, mark them in pencil.

5 Remount the blank so you can flatten what will be the base. First true the rim with the wing of a gouge, then flip the tool over so the bevel rubs for a shear cut in toward the center.

If you check the flatness of the base with a straightedge while the wood is spinning, the high spots should be burnished enough to see. Otherwise, mark the high spots with a pencil, then use a skewed scraper to level the surface. For maximum control, plant your palm on the rest with your fingers extended over the tool, then squeeze the tool into your palm.

Finally, sand the base using a sanding block and continue to use a straightedge to check the surface, because a hump tends to develop at center.

The knot in this blank was burned with a propane torch and later sanded back to become a feature.



Use a scraper to flatten the high spots.



Before cutting the blank, draw a guideline through center.

6 Cut the turned form in four. To ensure you cut in a straight line on the first

cut, draw a line through center and then divide each half in two. For the second-cut guideline, draw a line from center and cut each half resting on its sawn surface. If your saw won't allow you to cut each half resting on its cut side, use a square to draw a guideline at a right angle to the cut face, as shown in the photo at left.



If you aren't able to cut each half resting on its cut side because of your saw, use a square to draw a guideline at a right angle to the cut face.



To ensure that the base and the two faces are 90 degrees to each other, sand the first face with the

piece on its turned base. Then turn the piece onto the sanded first face and sand the second face.

Sand the cut faces, keeping them at 90 degrees to each other. A disk sander with a firm platform square to the sander is good for this job. On my VL300 I have a platform that fits the tool rest banjo; on p. 29 you can see an MDF variation on my small lathe.

Begin sanding with the segment resting on the turned base so the first side finishes at 90 degrees to the base. Then sit the segment on that face to sand the second face. Check your progress with a square, as it's easy to skew a face while you're sanding.

Asymmetry Creates Interest



The basic turned form need not be cut into equal quarters. By cutting a form off-center you can get a more interesting portion of the beads when the segments are on their sides.

End-Grain Bookends

As with the cross-grained bookends, you need a blank slightly shorter and double the width of the books you intend to support. This time the grain needs to run vertically from face to face. This project is essentially a short fat spindle, so on the lathe the grain is parallel to the lathe axis. The cedar blank for the bookends started out as a 9-in. (230mm) cube.



These end-grain tower bookends are 8¼ in. (210mm) high.

This is spindle turning on a grand scale, with big fat shavings and spectacular catches when you snag an edge. All the cuts and techniques are the same as for the smaller light pulls, mallets, and lamp bases. For spindles this diameter I have a 2-in.- (50mm-) wide skew chisel that is $\frac{3}{8}$ in. (10mm) thick that I ground from a scraper that was too large and heavy to be practical as a scraper. Like all my skew chisels, the edge is slightly radiused. To remove the evidence of any aforementioned catches, I use the skew flat on the rest for a low peeling cut. You need a radiused skew for these delicate peeling cuts so that no more than $\frac{3}{8}$ in. (10mm) of the edge contacts the wood at one time.



Large-diameter center work demands a large skew chisel with the rest set as high as you can get it so you can have the tool just below horizontal and at a comfortable angle.



A peeling cut is the safest (as in no catches) way to remove picked out or damaged grain. It's also good for removing a lot of material quickly.



On large-diameter end grain, a ½-in. (13mm) long and strong detail gouge is the best tool for the job. Have the rest set at about 45 degrees to the lathe axis to reduce leverage as the cut nears center.



A very gentle shear scrape can produce a glassy surface on end grain. Here I use a 1-in. (25mm) skew chisel tilted on edge.



Small shoulders and rims can be shear scraped by rolling the skew chisel bevel side into the wood.



Don't attempt to part off large pieces on the lathe. Cut in to leave a spigot that's easy to pare or sand away once the job is off the lathe.

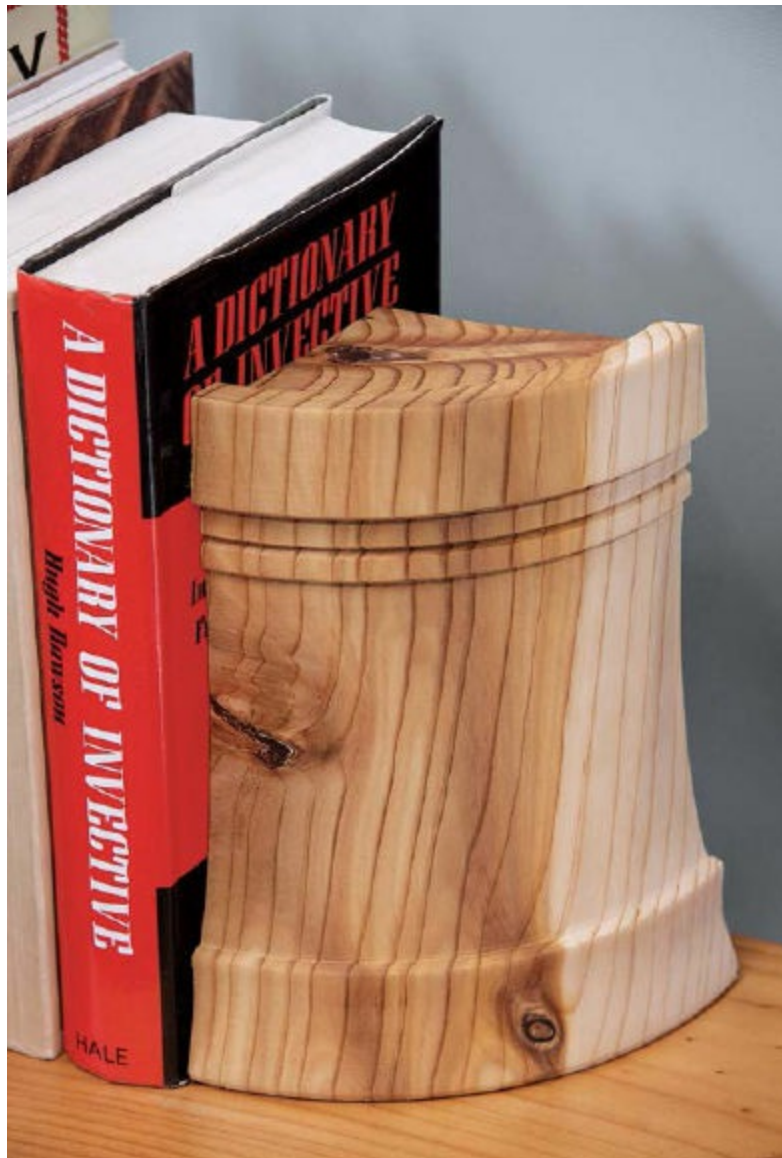


Here I'm sanding the top smooth with my angle drill.

On the end grain you need the strength of a heavy-section ½-in. (13mm) detail gouge, or even a bowl gouge, for working well over the rest. A light-in-weight gouge tends to flex enough to make life difficult. Alternatively, you can scrape end grain, provided you go very gently. A severe catch can pull fibers out of the end grain to a depth of ⅛ in. (3mm). If you stroke end grain with a honed shear scraper with a radiused edge, the surface can be like glass. You can also use a radiused skew chisel flat on the rest as a scraper.

On small chamfers and rims, I ease the bevel side of the skew against the end grain by rotating the skew slightly counter-clockwise as I drop the tool handle slightly. The bevel edge spirals into the cut to remove a feathery shaving.

When it comes to parting off a large spindle, don't even think of trying to do that on the lathe and catching it as you might a stair baluster. Use a gouge to cut close to center, then cut away the waste off the lathe. On a big lump like this I use my angle drill to sand the top smooth.



CHAPTER

8 COAT PEGS

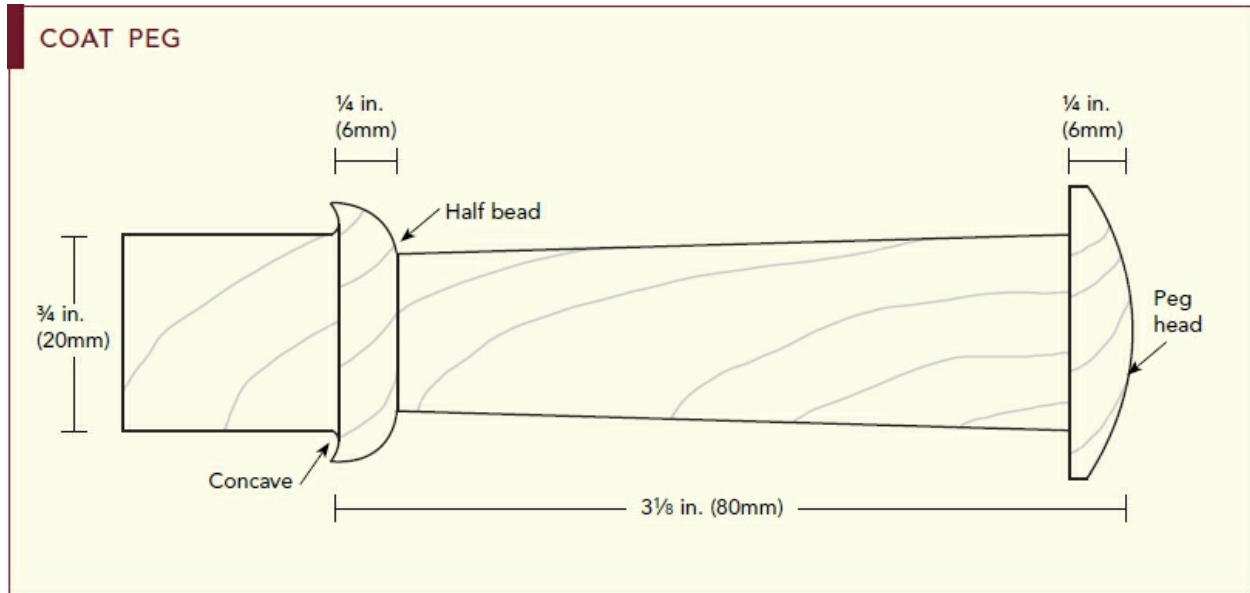
A set of pegs on which to hang coats, bags, or hats is a simple exercise in repetition turning. If you're worried about making several identical pegs, remember first that these will be fixed at a distance from each other, so close comparison is impossible without measuring tools. And then remember that absolutely identical pegs are less interesting and appealing than those that are very slightly different.



The 1-in.- (25mm-) diameter pegs project $3\frac{1}{8}$ in. (80mm) from the $22\frac{3}{4}$ -in.- (580mm-) long, 1-in.-thick board. The beads are the width of a skew chisel and the wood is Tasmanian myrtle.

As to the measuring, I find the fewer measuring tools I have in use and cluttering up space around the lathe, the better. Here I could use two or three sets of calipers to size different diameters and have three pairs of dividers to

measure lengths and widths of beads. But it's much simpler to be less exact and learn to measure more by feel and eye and only measure with tools where precision is essential. It helps if the tenon is the right size for the hole it's going to fit, but if it's slightly loose there's a bead to hide the fact, at least from the front.



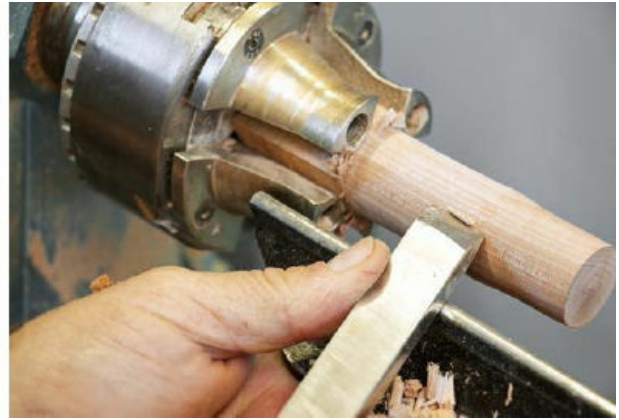
For strength, the wood grain needs to run the length of the blank, so you'll be turning a short spindle using a skew chisel. At one end you'll need a knob to keep items hanging on the pegs and at the other a tenon to fit tightly into a hole on the supporting board. The shaft between the two should taper toward the back so anything on the peg will slip to that end. It pays to have the tenon adjoining the concave base of a half bead. In part this makes for a stronger peg, but it also hides an ill-fitting tenon.

A peg can be turned entirely between centers, but I used a chuck with long-nose jaws. If you're making only a few, you might find this easier for checking as work proceeds, and there's no hand finishing off the lathe.

You'll need blanks about 1 in. (25mm) square and 5 in. (125mm) long. For a job like this, I have all the blanks squared to the same size, so when I rough the squares to round, I don't need to measure them with calipers. I can hear and feel when I have a smooth cylinder. The pegs might vary slightly in diameter, but it'll be difficult to tell at a glance when they are fixed in position nearly a foot apart.

You'll need a gauge for the tenon. Make a gauge by drilling two holes the

diameter of the peg's tenon, which is $\frac{3}{4}$ in. (20mm), in a scrap of hardwood, thick plywood, or MDF, and cut one hole in half.



True the square blank to its maximum smooth diameter using a skew chisel. Start with a shear cut, then use peeling cuts as you work toward the chuck.

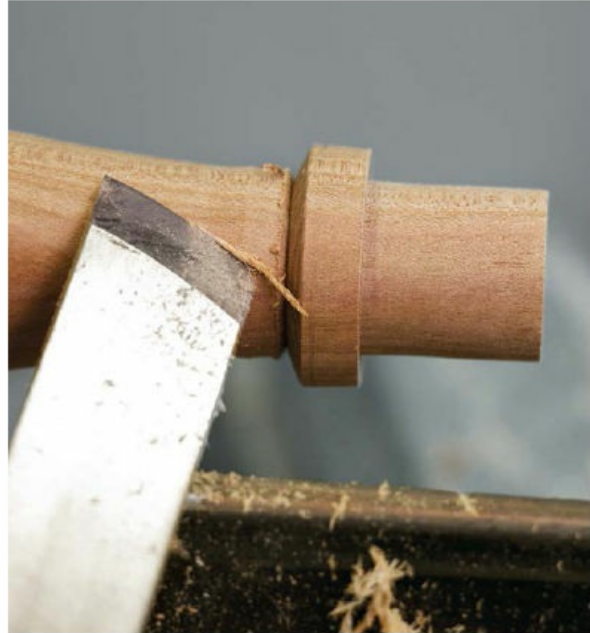
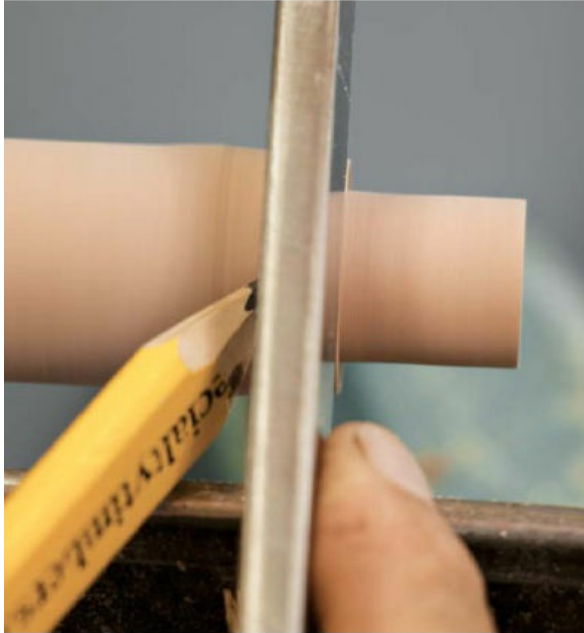


Turn the tenon to size, then stop the lathe to test the fit. The tenon should be slightly shorter than the thickness of the board.

1 Even though the blank should be secure in the long jaws, you can use the tailstock for extra support while roughing down. True the exposed end of the blank to a cylinder using a $\frac{3}{4}$ -in. skew chisel to shear cut. Then use the same skew flat on the rest to peel away the square shoulders. Keep the edge parallel to the lathe axis and tilted up into the oncoming wood. Pushing the tool straight in toward the axis on a spindle is scraping; it is slow, tears the wood, and never produces a clean surface.

2 Turn the tenon using the skew chisel to peel the wood down to size while using the gauge to keep track of the tenon's size. Stop the lathe and check

that the tenon fits the hole in the gauge. The tenon needs to be slightly shorter than the thickness of the board you'll be sticking the pegs in. Be sure that the shoulder at the end of the tenon is slightly concave so only the rim seats against the board.



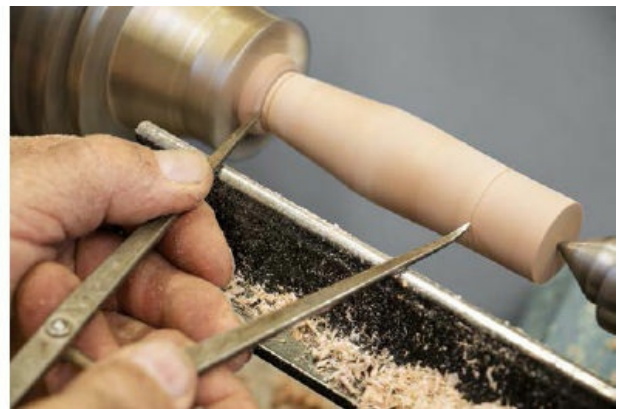
Use the skew chisel to gauge the thickness of the bead next to the tenon.

3

Lay out the bead adjoining the tenon using the thickness of the skew as a gauge, measuring from the edge of the shoulder adjoining the tenon. Then turn a half bead the width of the skew. Sand the shoulder now, because it's difficult to get at later.



Turn and finish the half-bead adjacent to the tenon.



Reverse the blank in the chuck, gripping it by the tenon.



Lay out the overall length of the peg, then part in about $\frac{1}{8}$ in. (3mm) on that line to establish the length.

4

Remount the blank with the shoulder tight against the jaws. It pays to use the tailcenter as long as possible to keep the blank in position. Then true the blank and use dividers to mark out the length of the spindle from the base of the bead. (Measuring from the chuck jaws is more accurate, but with the lathe running, the dividers can catch in the chuck jaws.) Use a parting tool to establish the length of the peg.



Lay out the head end of the peg using your skew as a gauge.



Then use the long point of the skew chisel to establish the peg head.

5

With a pencil, mark the width of the peg head on the end of the peg, again using the width of the skew as a gauge. Next, use the skew chisel's long point on your pencil mark to establish the width of the peg head.

6

Turn the shaft of the peg, first making the diameter adjacent to the peg head the same as the tenon (you can use the gauge or trust your eye), then taper the peg back toward the half bead.



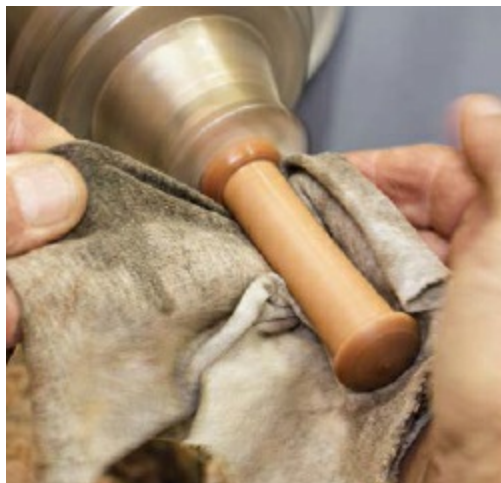
Turn the shaft, tapering it slightly from the peg head.



With a parting tool, part off the waste.



Complete the peg head with either a skew chisel or a gouge.



Sand and polish the peg.

Attaching the Board to the Wall



Once your board is complete, you are left with the decision as to which way up to attach the board to the wall. There will be screws: If the pegs are high on the board, the screws attaching the board to the wall can go immediately beneath the pegs to be hidden by the coats and other stuff hanging on the pegs. If the pegs are low so you can see the figure on the board, the screws would be better countersunk, then concealed by plugs cut from the back of the same board.

7 Part off the waste in front of the peg head using a parting tool. Then round the peg head using a skew chisel with its long point down or a $\frac{3}{8}$ -in. (10mm) gouge.

8 Sand, wax, and polish the peg. These pegs are sanded to 320 grit and finished with natural beeswax.

9 Fix the pegs to a board. Thinking of coats on hangers, I spaced the pegs a couple of inches more than a hanger width apart.

CHAPTER

9 MAUL

A big heavy hammer or maul is often just what you need for knocking posts into the ground, threatening unruly kids, or simply as what-the-hell-do-you-use-*that*-for talking point in your workshop. Refined long-handled versions might be used for croquet, and smaller versions could make their way to the kitchen for tenderizing meat. This one has a couple of steel rings inset at each end that act as ferrules that'll prevent the rim from splitting.



Weighing a tad over 7 lb. (3.2kg), this is a maul for thumping stuff. The head is 5½ in. diameter

by 6 in. (140mm by 150mm); overall length is 15 in. (380mm).

This is a two-part project, with both bits made between centers. It's all about sizing parts accurately so they fit together tightly. If you turn the head and fit the rings first, then drill a hole for the handle, you can fit the handle to the hole, rather than finding a drill to match the end of your handle.



To fit the ferrule, first lay out the diameter and then cut a tenon that tapers slightly to the diameter of the ferrule.

For the head of your maul you'll need a large lump of a heavy wood known to be difficult to split or with interlocking grain. Traditionally, elms and fruitwoods were used, particularly apple. This one is made from a lump of figured redgum that had been lying around for at least ten years, maybe twenty. The exact size of the blank will be dictated by what you can lay your hands on for ferrules. These $\frac{3}{4}$ -in.- (20mm-) wide ferrules were cut off a $5\frac{1}{2}$ -in.- (140mm-) diameter steel pipe, $\frac{1}{4}$ in. (6mm) thick. This was all I could find around that size and certainly added some beneficial weight to the end product. The ferrules needed cleaning up with a flap wheel on an angle grinder and I did most of this with them mounted on step jaws. I also drilled and countersunk three holes in each ferrule so each could be screwed in position so there is no risk of them flying off if the wood shrinks.

The blank for the head needs to be at least $\frac{1}{4}$ in. (6mm) larger in diameter than the ferrules.

1

Turn the head blank to a cylinder using first a gouge, then a skew chisel to smooth the surface. It's all much the same as roughing down the lamp base

(see p. 43), except that very twisted grain will likely present a few problems; you'll see how to get around those later. Don't forget to true the end grain.

2 Mark the diameter for the ferrules on each end of the blank. This is done most easily and accurately using dividers, lining the right point up across the diameter with the circle made by the left point. Be sure to keep the right point clear of the wood or it will catch. Then use a peeling cut with a large skew to turn the tenons. The ferrule needs to be on tight, so proceed cautiously until the ferrule just fits over the end of the tenon. Test the fit with the lathe off. The trick here is to taper the tenon so it's very slightly narrower on the end. When you can ease the ferrule on, it should bruise or burnish the wood, and that's exactly where it fits. Then turn the tenon to that diameter. Check that the tenon is cylindrical (has straight sides) using vernier calipers.



Test the fit of the ferrule with the lathe switched off. Where the ferrule rubs and leaves a burnish mark is where it fits, so turn a cylindrical tenon to the burnish mark.



Use vernier calipers to check that the tenon has straight sides.

I don't want to have to take the blank off the lathe every few seconds to fit the ferrule, so I store the ferrule on the tailstock while sizing the tenon. Because I find it easier to see what I'm doing at the tailstock end of a blank (being right handed), I reverse the blank between centers so I can fit the other ferrule at the tailstock end.

3

Drill the hole for the handle. When the tenons are done and while the blank is still on the lathe, mark a line around the cylinder midway between the tenons, then take the head to the drill press. The centerline enables you to drill the hole accurately between the ends, but the hole itself also needs to be centrally positioned between the sides so it goes through center.

To drill the hole accurately on a drill press, you need to set up a V-cradle and hold the head securely in position. In my setup, G-clamps position steadying blocks on either side, whereas tie-downs keep the head on the table. A saw-tooth drill cuts the cleanest hole. My drill press isn't large enough to drill the hole in one go, so the table had to be raised with the drill in the hole to complete the drilling. Never adjust the table with the drill running. When the cylinder is positioned correctly, the drill initially creates symmetrical hemispheres on the curved surface. This hole is $1\frac{3}{8}$ in. (35mm) diameter. Drill right through the head.



Drill the hole right through the head for the handle.



Turn the ends of the head, leaving each proud of the ferrule.



Finish turning the cylindrical part of the head, then sand and finish it.

4

Fit the ferrules but leave the end-grain faces slightly proud of the ferrules. Scraping usually produces the cleanest surface on end grain, and normally I'd use a skew chisel flat on the rest. With this project, the skew chisel edge wasn't skewed enough for me to get near enough center, so I resorted to a

skewed shear scraper that to my surprise did a much better job. You can see from the puffs of dust in the photo above that I used the tool at three different angles as I worked back and forth across the end grain.

The twisted grain between the ferrules was difficult to shear cut, so I used a 1 $\frac{3}{8}$ -in. (35mm) skew chisel to peel the sides to a slight barrel shape.



Turn the end of the handle to fit the hole through the head.



Check the diameter using a gauge made with the same drill used to make the hole.

5 Turn the handle. For the handle you need a wood known for its longitudinal strength, like hickory or ash. The grain *must* be straight and run the length of the blank. When the blank goes on the lathe, keep the grain parallel to the lathe axis. This claret ash blank was just under 2 in. (50mm) square and 15¾ in. (400mm) long, which is the maximum my VL150 can hold between centers. This is a stretched version of what you've just done on the head. Rough down with a gouge and finish with the skew. It's essential to turn the end of the handle to exactly the right size for the hole in the head. I check this with a gauge made using the same drill as was used for the hole in the head. The wider gauge helps to keep the shaft cylindrical, and you can check the fit all the way.



6 Complete the handle using a skew chisel and finish all but the portion going into the head.

Use a skew chisel to turn the rest of the handle to fit your hand. Finish all but the part of the handle going into the head.



7 Clean up each end of the head before inserting and fixing the handle.

Finish the end grain off the lathe. In the photo above, you see an angle drill

with a sanding pad. I use 80 grit to remove the bulk of the waste, then jump to 240 grit to finish. Finally, assemble the maul. To keep the handle securely in the head, cut into the end of the handle on the bandsaw and sand a wedge that's the same width as the handle and very slightly thicker than the saw cut. Then fit the handle through the head with some wood adhesive and drive the glue-covered wedge into the slot on the end of the handle. When the adhesive has set, cut away the end of the handle and wedge and sand it flush with the end of the maul.



A maul is often used with a froe to split wood.

CHAPTER

10 LITTLE BOWLS

These little bowls are about as good an introduction to hollowing end grain and parting off as you can get. Failures don't waste much material, and they allow you to practice several very useful techniques that can be applied in all manner of turning situations. There is a design aspect as well. The difference between good, adequate, and bad bowls on this scale is very fine, but you have the opportunity to experiment and pull a few apart without the capital outlay required for larger pieces. The inside should belly out slightly from the rim—aesthetically, this creates a shadow that defines the rim, but also is practical in a small utilitarian bowl used on a table for salt, sugar, plum stones, teabags, or jewelry. Even more important, having the inside wider than the rim makes the bowls easy to chuck when it comes to turning and finishing the base.



A clutch of 2-in. (50mm) diameter salt bowls awaiting scoops.



Use a skew chisel for the final roughing cut so you can easily identify any flaws on the smooth surface.

I don't normally recommend turning bowls with end grain across the base because the grain structure is so weak, especially on bowls with diameters larger than 3 in. (75mm). Thin rims are very likely to split, and thin end grain in the base is so weak that a heavy knock can push a hole through it. In addition, hollowing into end grain is much harder work than hollowing into cross-grain, but you'll have few problems with these little bowls if the bases are about $\frac{1}{8}$ in. (3mm) thick and the blanks are cut clear of the pith.

In the 1970s, I made several thousand of these little bowls to go with my mini scoops, using gouges to remove the bulk of the waste in a couple of seconds (literally), then using a scraper at least 1 in. (25mm) wide to complete the internal shaping.

As a production turner I'd make five bowls from a blank 8 in. (200mm) long and 2 in. (50mm) square, but the leverage is such that novices should start with blanks 2 in. to 2½ in. (50mm to 65mm) diameter, projecting no

more than 4 in. (100mm) from the chuck. Lathe speed should be 1,750–2,000 rpm.

1 Turn the blank to a cylinder using either a gouge or skew chisel, and don't forget to true the end grain. Now is the time to learn what nasty surprises the wood might have in store, so use a skew chisel for a final planing cut, then inspect the surface not only for splits, but also to see how the wood is working. Look for curly grain picking out and tearout where you cut into end grain.





A cone at center helps guide a depth drill as it enters the wood.

2 Position the rest across the end grain and drill a depth hole. To make it easier to start the drill, make a small cone at center using the long point of a skew chisel placed flat on the rest. If you push the drill straight in parallel to the lathe axis, it should spin true in your hand if you relax your grip. If the handle rattles around, start again with a deeper starting cone. Drilling a depth hole saves you having to stop and measure every few cuts, but it also makes starting cuts with scrapers easier and gouge catches at center less likely. A depth drill is a standard ¼-in. (6mm) twist drill set in a handle—easy to make yourself if you don't have one. In the photo at left, I've marked the depth to drill to with red tape for clarity, but I usually work to the barely discernible marks ground on the drill.



Round-nose scrapers are a slow but sure way of hollowing end grain. You'll notice my fingers are on the wood while my hand is planted on the rest; this balances against any tool pressure while dampening chatter.

3
Hollow the inside using either scrapers or a combination of gouges and scrapers—which is my preferred option because I can finish the inside so quickly. But you can do all the hollowing with scrapers, so we'll look at that first.

If you have a ½-in. (13mm) round-nose scraper, start with that, then graduate to as large a scraper as will fit in the opening. All my scrapers have the left wing ground much longer than the right, with a 45-degree bevel on the nose of the tool steepening to vertical on the side. A steep bevel on the nose can prevent the edge cutting in a narrow space. In the left photo above, I'm using a 1-in. (25mm) scraper. To complete the inner curve, I use a 1⅜-in. (32mm) scraper. My hand is planted on the rest with my fingers on the wood to equalize any tool pressure against the wood while dampening any chatter and associated noise. These scrapers are not molding tools: If you have more

than ¼ in. (6mm) of the edge in contact with the wood at one time, it's likely to grab. Completing a concave curve is much easier when the scraper has a radius slightly tighter than the curve you are cutting. Make sure you make the inside wider than the rim; otherwise, you'll have difficulties re-chucking the bowl at Step 7.

It is important to keep your scraper positioned so that the angle between the surface you are cutting and the top of the tool is less than 90 degrees. This is often called a negative rake, and it means that when cutting at center, the tool blade must be tilted below horizontal to avoid a catch (see the top left photo below). But once the cut moves on to the long side grain, as in the photos above, the handle can be dropped, as in the top right photo on the facing page. Now there's an element of shear scraping because the portion of the edge cutting is at an angle to the surface being cut.



Scrapers cutting at center need to be horizontal or pitched down slightly.



When scraping on the side of an internal curve, drop the tool handle for a shear scraping action.



You can hollow into end grain working from the rim to center.



Back-hollowing is the fastest way to hollow end grain, but it takes a lot of practice and is mostly a technique for professionals in a hurry.

The waste is removed much faster using a spindle gouge. You can hollow in from the rim as you might a bowl, as shown in the bottom left photo above, but back-hollowing with the gouge moving away from center into the upcoming wood, as in the bottom right photo above, is even faster. This is a production technique that requires a lot of practice, during which you can expect monumental catches and flying blanks, so you need to wear a faceshield.



Mark the exact internal depth on the outside.



Sand the inside before completing the outside.



Before completing the outside, part in about $\frac{1}{8}$ in. (3mm) to establish the overall height. If you marked the internal depth accurately on the outside you can easily assess the thickness of the base.

4

Before you start sanding, measure the internal depth and mark this on the outside. Take care to mark the exact depth, so you know exactly where the inside is. It's tempting to put a mark nearer the chuck to ensure plenty of wood in the base, but this is a bad idea, as you lose track of the exact internal

depth.

Whenever creating a thin wall, it pays to sand one surface before turning the other. Sanding removes a lot more material than most people imagine, so sanding both sides concurrently can make a thin wall too thin. It's also easy to sand the rim to a dangerously sharp edge that can slice you to the bone in a millisecond. My approach is to finish the inside, then set about the outside, working in relation to the inner surface.

5 Use a parting tool to establish the height of the bowl, using the depth line as a guide. The line should indicate the exact depth of the inside, so calculate the thickness you want on the base—about $\frac{1}{8}$ in. (3mm) for a bowl this size—and part in no more than $\frac{1}{8}$ in. If you part in to leave only $\frac{1}{4}$ in. (6mm) or so linking the bowl to the blank, the bowl is likely to break off when you try to turn the profile.



A skew chisel should produce the best surface whenever straight grain lies parallel to the lathe axis.



Twisted and torn grain is best turned using a low peeling cut with the skew flat on the rest.



Add any decorative grooves before sanding and finishing.



When parting off, take care not to grab the bowl: Let it spin into your hand.

6 Turn the profile (outside) using the skew chisel to shear cut. Keep the bevel rubbing the wood. If that fails to produce a surface that barely needs sanding, try a low peeling cut. Once you get the surface smooth, you can sling in a groove, pivoting the skew's long point into the wood. Then sand the outside, and polish both the inside and the outside before parting off. Don't grab the bowl—let it spin off into your hand. If you pull the bowl off, chances are it'll end up with a hole in the base.





Make a jam chuck so you can turn the base.

To re-chuck the bowl so you can finish the base (also known as reverse chucking), turn a jam chuck with a slight chamfer and ease the bowl over the end until you get the hint of a burnish mark. Go very gently! Too much pressure and friction will burn your bowl rim. The burnish mark shows exactly where the bowl fits, so use the skew flat on the rest for a low peeling cut to reduce the tenon to that diameter. Retain a very slight chamfer—think in terms of half a degree, so the base of the tenon is very slightly fatter than the end.

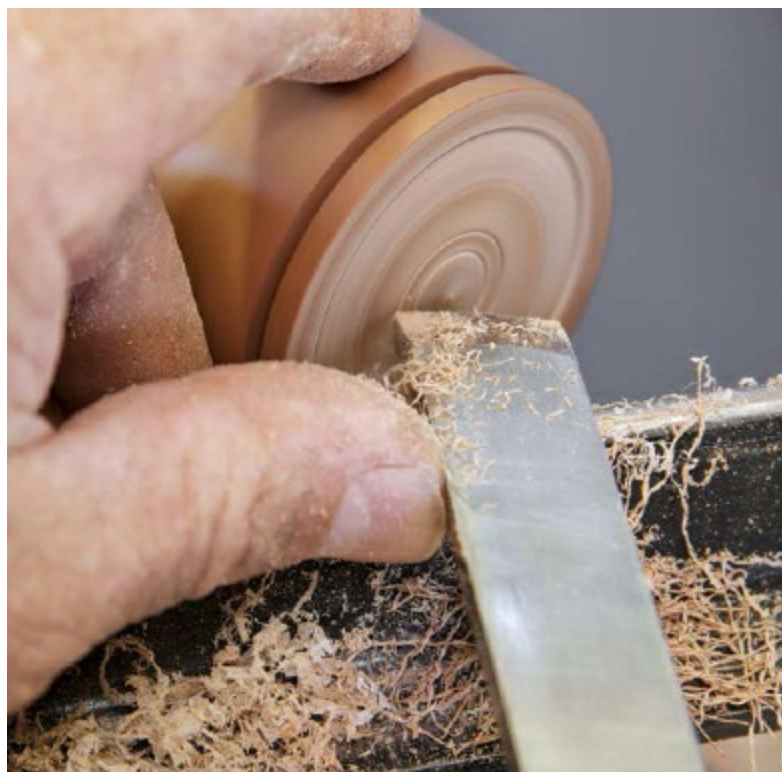


A $\frac{3}{8}$ -in. (10mm) spindle gouge is the tool least likely to catch as you turn the base.

8 Turn the base slightly concave so the bowl rests on its rim. The best tool for the job is a $\frac{3}{8}$ -in. (10mm) spindle gouge, which you can also use to check the concavity of the base. Have the gouge on its side with the bevel rubbing the wood and the flute facing out. All you need is a hint of space beneath the straightedge.



Ensure the base is slightly concave.



Add decorative grooves to the base using the skew chisel's long point with the chisel flat on the

rest.



Finally, sand and polish the base.

9

You've finished turning unless you fancy some decorative grooves on the base to show that the base was turned and not flattened on a sander. To turn grooves, raise the rest to center height and use the long point of a skew, with the chisel flat on the rest. With that done all you need to do is sand and polish the base.

CHAPTER

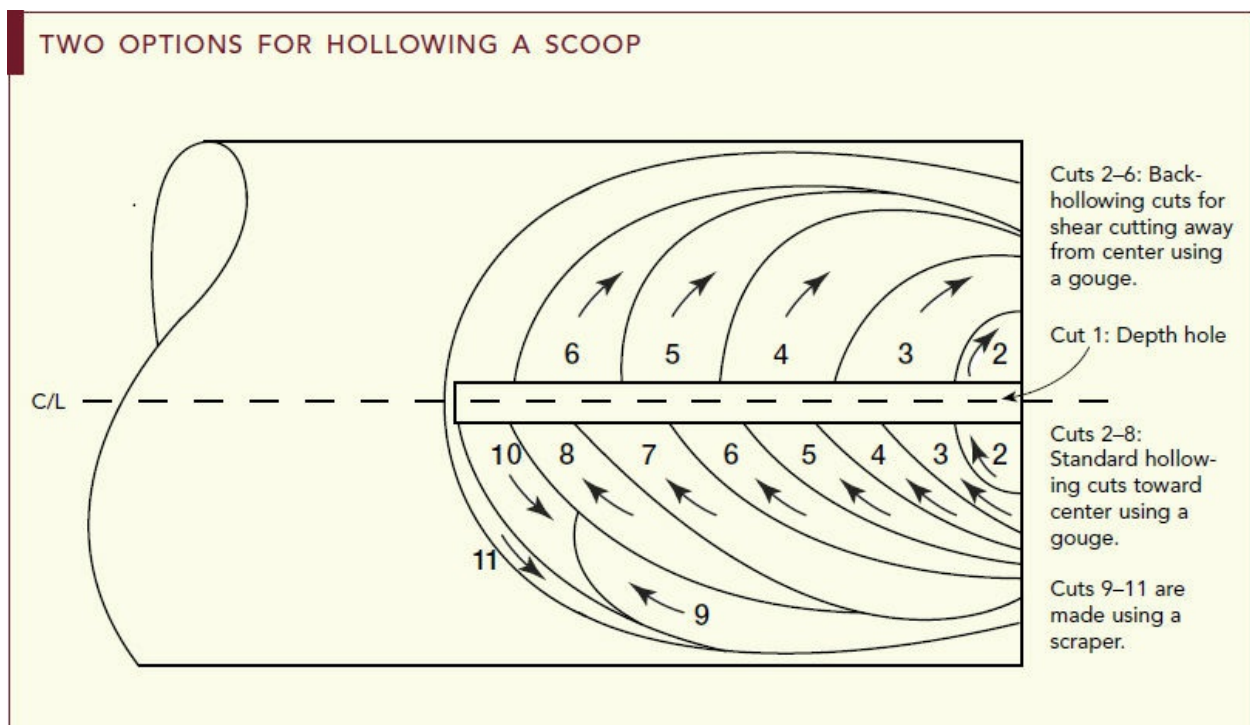
11 SCOOP

All through the 1970s I sold at least 50 scoops a week, and I reckon they paid all my basic bills while doing wonders for my turning technique. My design was based on vague recollections of an antique silver Georgian sugar scuttle, although the final product barely reflects this.



Scoops ranging from 2 in. to 4 in. (50mm to 100mm) in diameter.

The scoop starts out looking like a wine goblet without a foot, then about one-third of the goblet, or bowl, is cut away to create the scoop. The essential feature of the design is that the goblet part widens from the rim and that the curved wall is of near even thickness. The wall can vary slightly, provided both the internal and external curves are flowing and devoid of angles. If you fail to get a thin and even wall or fail to hollow deep enough, you can end up with some very clunky variations. Scoops might look simple enough, but they are not that easy to make, let alone at the rate of nine an hour needed to be commercially viable.

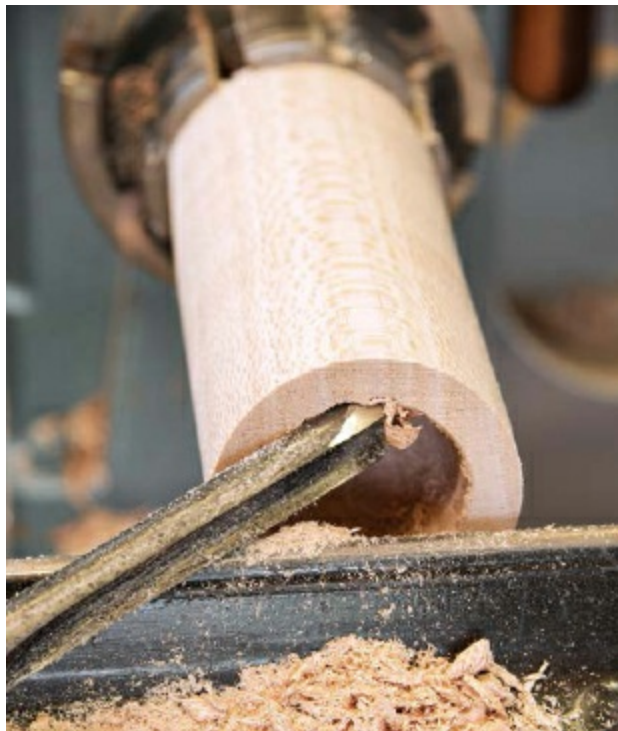


Because of the shape, this scoop has to be turned, not drilled. For strength, you need wood that is reasonably straight grained, and for stability, seasoned wood is best. The inside is turned and sanded *before* you start on the outside.

Start with a blank 2 in. to 2½ in. (50mm to 65mm) in diameter and 4½ in. to 5½ in. (115mm to 140mm) long. Larger or smaller blanks each create problems, so are best avoided initially. Turn the blank to a cylinder between centers and mount it in a chuck. Run the lathe at around 1,800 rpm.



When you've trued the blank, drill a depth hole slightly deeper than the diameter of the blank.



Complete the inside before shaping the profile.

1
2

Mount the cylindrical blank in the chuck and skim it true using a skew chisel.

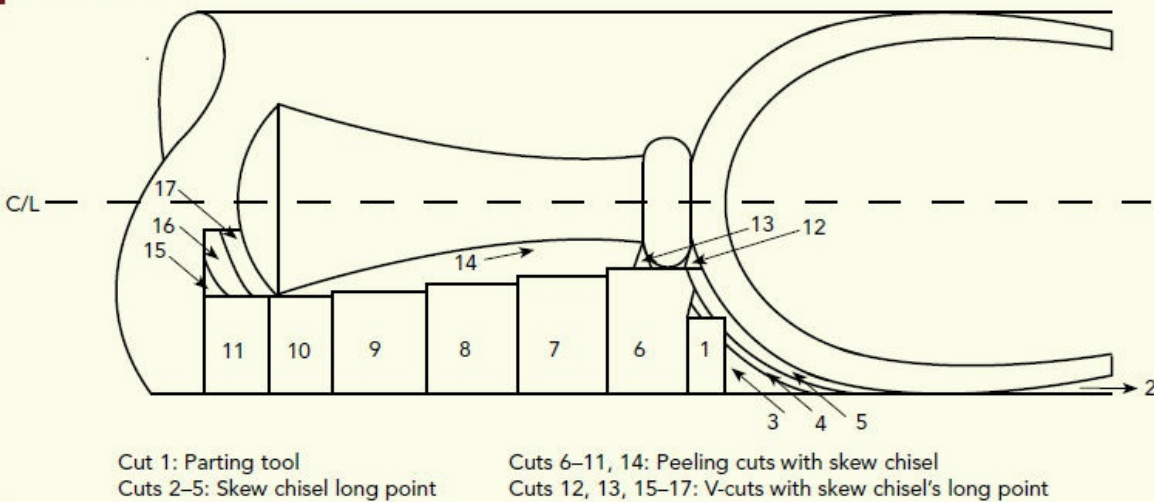
Hollow the bowl to a depth slightly more than the diameter of the blank. First use a depth drill to drill a hole very slightly deeper than the diameter of the blank. The quickest way to hog out the center is to use a gouge, shown above right back-hollowing; these are the upper cuts 2 through 6 in the drawing on p. 93. Then use asymmetric round-nose scrapers to complete the internal shaping, cuts 9 through 11. Be sure to undercut the rim. In the photo at left the spurt of dust shows where the tool is cutting, and you can discern the vague outline of the wall thickness a little way from the tool. This indicates that the tool is cutting the curve well above center as the handle is dropping. See p. 87 for how this looks from the side.



The tool is cutting the curve well above center as the handle is dropping; you can tell where the tool is cutting by the spurt of dust. Don't forget to sand the inside at this stage.

Measure and mark the internal depth on the outside of the blank and then sand the inside before shaping the outside. Small ridges or torn side grain from the turning can be sanded away in a second or two with 100 grit before moving on to 120 grit, then 180 grit and 240 grit.

SEQUENCE OF OUTSIDE CUTS FOR A SCOOP



3 Check the internal depth to ensure the mark on the outside is in the correct position. Do not add extra for safety—you need to know *exactly* where the inside is. Start the external shaping by parting in immediately to the left (the headstock side) of the depth line, as seen in the top photo at right. Use a parting tool at least $\frac{1}{8}$ in. (3mm) wide and part in about one-third of the diameter of the blank (cut 1 in the drawing above).

Obviously, if you go too far you'll end up with a curious sort of bowl with a hole in the bottom, but before that happens you'll hear the sound of the cut drop as it changes pitch. Unfortunately, you learn the finer limits by parting a few bowls off and remembering the sound of approaching severance.



Part in to the left of the line that marks the *exact* internal depth, then shape the bowl profile.

4

When you begin shaping the bowl you know that the left side of the parting cut is the width of the parting tool from the inside depth. So when you make cuts 3 through 5 in the drawing above and in the bottom photo below you do so in relation to the left side of the parting cut. It's important to retain some, if not all, of the parting cut until the bowl is completed. Continually check the wall thickness. Your fingers will become reliable calipers, though it's always safest to check mechanically. A slow but sure way to check wall thickness is to drill a hole or two through the portion you'll cut away, and then all you have to do is stop the lathe and peer through.



Rough out the handle.

5

Develop the handle. You can use a gouge, but it's faster and more satisfying to step it out using a square-section skew flat on the rest for peeling cuts; these are cuts 6 through 11 in the drawing.

6

Begin refining the handle by using the skew chisel's long point to turn a couple of grooves at the base of the bowl (cuts 12 and 13). The lump between will be a bead, but there's no need to round over the shoulders with the skew just yet, or indeed at all. It's far easier to sand them round later. This bead is structural and needed to add strength to the end grain at the bottom of the bowl. With the overall proportions of the bead established, refine the handle; this is cut 14. This usually makes the bead look too large; to slim the bead, swing the short corner of the skew through an arc into the top of the bead and hold it there for a peeling cut.

7

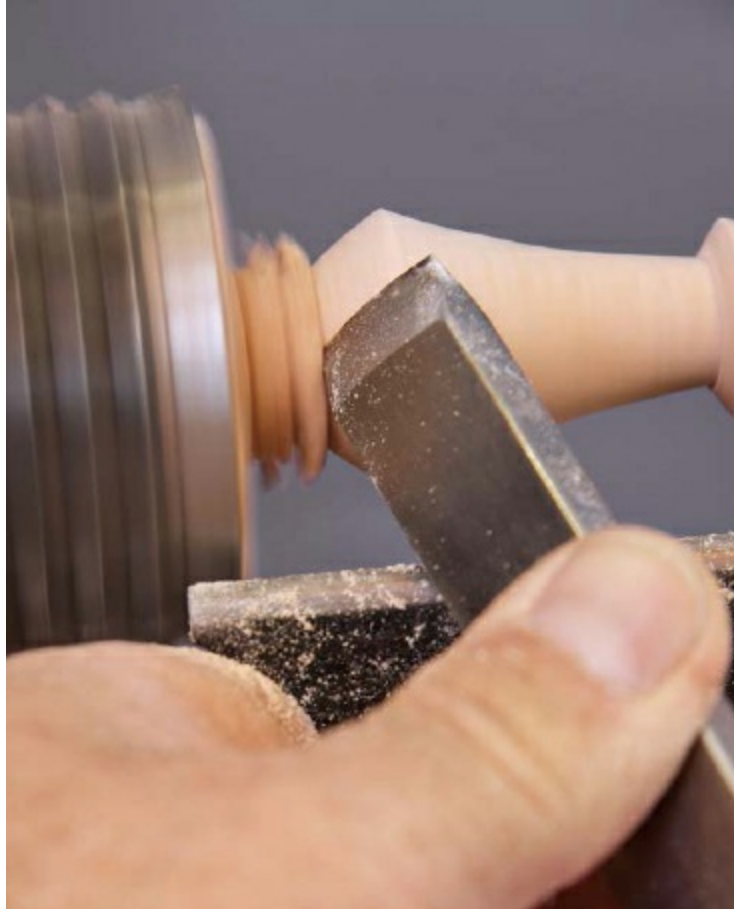
Begin to shape the end of the handle in preparation for sanding (these are cuts 15 through 17), then sand the outside (the inside should have been sanded at the end of Step 2).



Cut a pair of grooves to define the bead at the base of the bowl.



After refining the handle, modify the diameter of the bead with a peeling cut.



Use the long point of a skew chisel to turn the end of the handle, then sand the profile.



Part off your scoop.



Re-chuck the scoop on a jam chuck so you can turn the end of the handle. If this is too scary or the scoop bowl has split, hand-sand off the lathe.



Support the handle with your hand as you first cut across the end grain using the skew chisel with the long point down, then use the chisel flat on the rest to add decorative grooves.

8 Part off and finish the end. If you part off cleanly with a skew chisel's long point, a quick rub with a bit of 240 grit is probably sufficient. Or you can twirl the end against a soft disk sander, as in the top right photo on p. 17.

You can also reverse the scoop on to a jam chuck and turn the end. (See p. 90 for more on reverse chucking.) You need to support the scoop with your hand, keeping your thumb on the rest as both a fulcrum for the tool and as a pad between the scoop and the rest should the scoop come loose. The wood wants to roll up the edge, so be wary of going too fast at the wood, particularly as you near center. When the handle rolls up the skew edge, simply carry it off into space, stop the lathe, and shove it back on the chuck.

To add grooves, have the tool flat on the rest with the rest at center height, then ease the long point into the end grain.



The safest way to cut away a portion of the bowl is on a disk or belt sander.



If you choose to cut away the waste using a bandsaw, keep your fingers behind the blade and do not attempt a second cut.

9

Cut away a portion of the bowl. A belt or disk sander is the safest way to remove the waste and shape the curve, but you can use a bandsaw with a ½-in. (13mm) 4-tpi or finer blade. You need to grip the handle tightly with your hand *behind* the sawblade as you pull the scoop in to the blade. When the teeth first strike the scoop, the entry point is unsupported and if you don't

have a secure grip on the handle the scoop will roll into the blade and be shattered. Once the blade is in the wood, the back of the sawblade supports the scoop and the cut should proceed smoothly. Never attempt a second cut, as the scoop will shatter. Smooth and refine the sawn edges on a sander, as in the left photo above.

Safety



Condiment and sugar scoops, $\frac{3}{4}$ in. to $1\frac{3}{4}$ in. (20mm to 45mm) diameter.

You can cut away the waste on a scoop using a sander, a hand saw, or a bandsaw. Never attempt to remove the waste using a tablesaw or drop saw or any other sort of powered saw, or any sort of planer or routing tool.

CHAPTER

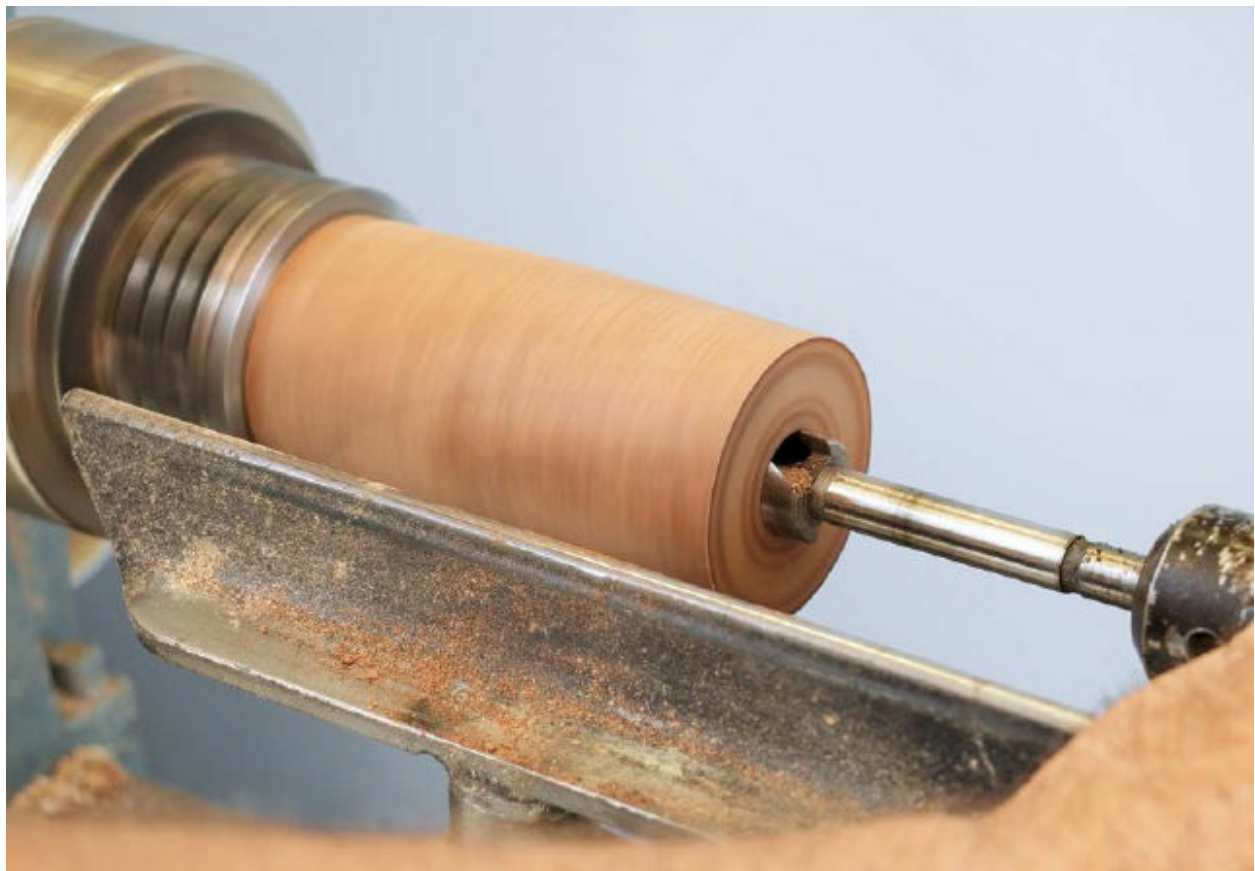
12 CONDIMENT SHAKER

This condiment shaker can be used for salt, pepper, sugar, cinnamon, chocolate, or anything else you might want to sprinkle into a pan when cooking, on food once it's on the table, or on a cup of coffee. The size of the holes in the top will depend on what you're shaking.



Condiment shakers left to right: She-oak, 2½ in. by 3³/₈ in. (65mm by 85mm) and 1¾ in. by 4 in. (45mm by 100mm); and sally wattle, 2¹/₈ in. by 3¾ in. (55mm by 95mm).

A shaker can be a very simple turning exercise in hollowing end grain if you simply drill out the center to create an accurately sized opening for a plug or bung in the base. The difficulty increases if you increase the capacity of the shaker by widening the drilled hole while maintaining the original diameter at the opening. The job can be done in one fixing with no re-chucking, because the top is finished by sculpting it on a sander.



True the blank, not forgetting the end grain, then drill a hole the size of the bung to just short of the chuck jaws.

For this salt shaker, you need a blank 2 in. to 2½ in. (50mm to 65mm) square, about 6 in. (150mm) long, with the grain running the length of the blank. And you need a plug or bung—readily available through woodturning supplies specialists, or you could use a short cork.

1

Secure a cylindrical blank in the chuck with at least 5 in. (125mm) projecting, and skim the cylinder true using a skew chisel to ascertain how the wood is working. *Do not* shape the outside before turning the inside. When hollowing end grain, you want as much wood as possible surrounding the opening as hollowing proceeds. A catch can easily split a thin wall.

2

Drill a hole for the bung and hollow the inside. The diameter of the opening is crucial, as this has to fit the bung. You could turn it, but to ensure the hole is central and the correct size, it's better to drill a hole the recommended diameter for the bung. Use a drill mounted in a drill chuck set in the tailstock. An opening larger than this $\frac{3}{4}$ -in. (20mm) hole would have made widening the inside a (whole) lot easier. Drill to a depth just short of the chuck jaws.

Ideally the inside should be widened to increase the holding capacity of the shaker without increasing the diameter of the opening that still has to fit the bung. There are lots of offset scrapers commercially available, like the Kelton hollowers and undercutters in the right photo on p. 102. Whichever tool you use, it needs to fit comfortably through the drilled entrance.



Increase the capacity of the shaker by widening the inside.



Use compressed air to clear the shavings and dust. A drinking straw might be low-tech, but it does the job.



A standard scraper can do some widening, but dedicated hollowing tools designed for hollowing through small openings are better. Shown are Kelton hollowers.

As you widen the drilled hole inside the shaker, you'll need to clear the shavings after every few seconds of cutting. Compressed air is the only way to go, and if you don't have a compressor, as I don't, go low-tech and use a drinking straw. Remember to breathe in through your nose and out through the straw. I don't sand or wax the inside, but I do clean all the dust out with the aid of a toothbrush.

3 Recess the base to accommodate the thickness and diameter of the bung. Position the rest high enough that only the top left corner of a square-end scraper contacts the wood. Don't forget to check the fit of the bung, as you'll probably need to enlarge the drilled hole a fraction. The bung needs to be tight, but not so tight that you need pliers to extract it. It's very easy to make the hole too big, so be cautious and use 120-grit abrasive to enlarge the hole rather than a scraper.



Turn a recess to accommodate the bung and test the fit.



Mark the overall height of the shaker with a parting cut, then shape the profile using a skew chisel.



The fit of the bung needs to be tight, but you shouldn't need pliers to extract it.



Shape the profile. I use a skew chisel for this.

4

Establish the height of the shaker. First mark the internal depth on the outside with a pencil, then make a parting cut, allowing for about $\frac{1}{8}$ in. (3mm) thickness in the top, as seen in the bottom left photo above. Cut in about $\frac{1}{2}$ in. (13mm) to establish where you will start the parting cut once the outside is shaped. Retain at least part of the headstock side of the parting cut so you know where to start the tool when you come to part off.

5

Turn the profile, preferably using a skew chisel so you get a nice smooth surface straight off the tool. Start at the bottom, using the edge to shear cut with the long point up, then flip the skew over and use the long point of the skew to cut toward the headstock with the long point down. To check the wall thickness, stop the lathe before using either your fingers (if any fit through the hole) or calipers.



Sand and polish the profile.



Shape the top on a disk or belt sander.



Use the left side of the original parting cut as a guide to parting off.



A couple of variations, with ash to the left, $2\frac{1}{8}$ in. by $6\frac{3}{4}$ in. (55mm by 170mm), and pin oak to the right, $2\frac{1}{8}$ in. by $5\frac{1}{8}$ in. (55mm by 130mm).

6 Sand and polish the outside of the shaker.

7 8

Use a parting tool to part off, continuing the cut started in Step 4.

Shape the top and drill the holes. The sculpted top is achieved by rolling the end against a disk or belt sander. For initial shaping I'll use a 60-grit disk, then jump to 180 grit and finer grits, usually finishing with 320 grit. Twisting the shaker as you roll it across the sander usually creates a more interesting and asymmetric top.

The size of the holes you drill will depend on the contents. For pepper, I find $\frac{1}{16}$ in. (1.5mm) large enough; for salt, between $\frac{3}{32}$ in. and $\frac{7}{64}$ in. (2.5mm); $\frac{15}{64}$ in. (6mm) is better for sugar.

CHAPTER

13 SPATULA POT

As you can see in the photo below, a spatula pot is useful for holding all those stirrers and egg flippers you might otherwise keep in a drawer. When they're stuffed in a pot near the stove they're much easier to get to, and decorative as well, especially if you made most of them. The grain can be aligned either horizontally, as at left in the photo, or vertically, as at right. With vertical you'll be hollowing into end grain, which is far too much like hard work for me, whereas cross-grain is much easier to hollow and the grain patterns are usually more interesting.



Spatula pots left to right: camphor laurel, 4 in. by 6½ in. (100mm by 165mm); cedar, 4⁷/₈ in. by 6 in. (125mm by 150mm).

Seasoned timber this thickness is nearly impossible to buy, so I like to use wood a few months felled. Although the wood is still fairly damp, it works well, with heaps of curly shavings. The pot will distort as the wood dries, lending some character to the piece, particularly if it's cross-grained. If you select a blank with evenly balanced grain, the pot will distort to an oval. If the base distorts, you can either carve away the rim to leave three feet, so the pot will always sit square, or flatten the base on a sander. If you really can't stand the thought of distortion, then you'll need to rough-turn the shape and true it

up a few months later when the wood has seasoned.



Normally you'd make each cut to within 1 in. (25mm) of the other end, but here I want you to see the size of each of the seven cuts. The seventh cut (the one being cut in the photo) is a shear cut with the bevel rubbing the wood. It is the cut that finally smooths the cylinder.

You'll need a blank about 7 in. (180mm) high by 4 in. (100mm) diameter and some big chuck jaws that can close around the pot. Any chuck marks are turned off as the job is completed.

The steps and mounting on the lathe are the same for each pot, but the tools you use depend on the grain alignment. If the grain is vertical in the pot, it will be centerwork, so the outside will be turned using a skew chisel. If the grain is across (horizontal), it will be facework, so you'll finish with gouges or shear scrapers. Both are hollowed with the same square-end scrapers.

1 Mount the blank between centers and turn a cylinder using a bowl gouge. To reduce a centerwork blank (with grain running parallel to the lathe axis) from square to round, make a series of scooping cuts *across* the grain toward the

lathe axis, as you might on a mallet (see the bottom left photo on p. 24) or lamp base (see the top right photo on p. 43). Clean up the cylinder using a skew for a shear cut, as in the bottom right photo on p. 43.

As always, true and square the ends so each will seat squarely in the chuck, as seen in the left photos on p. 44. On each grain alignment I prefer a ½-in. (13mm) long strong detail gouge to true the ends.

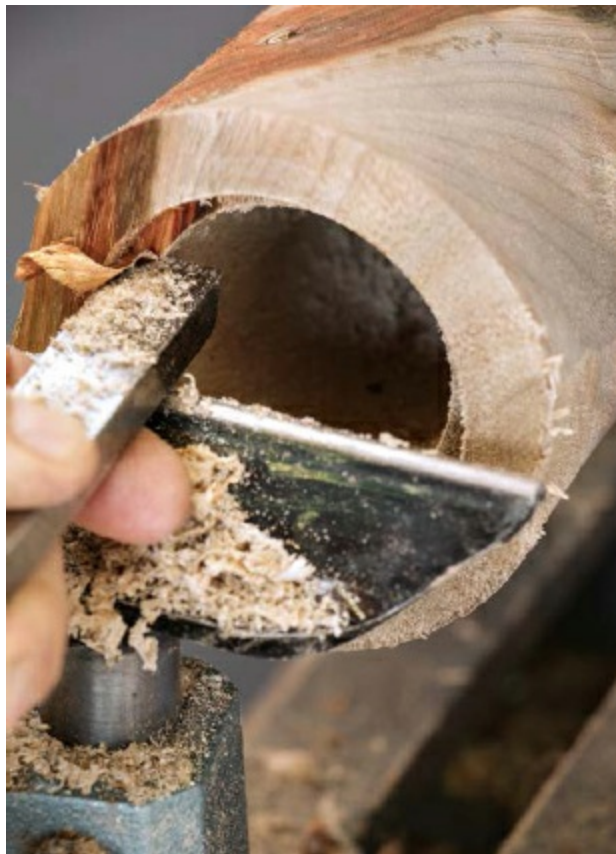
With a cross-grain blank like that in the photo above, make a series of cuts *parallel* to the lathe axis. Remember that although the blank is between centers, the grain is at right angles to the lathe axis, so you need facework tools and techniques. In the photo on the facing page, you see the seventh cut, a shear cut with the bevel rubbing the wood that finally smooths the cylinder. Normally you'd make each cut to within 1 in. (25mm) of the other end (here I want you to see the size of each cut), then step to the left and bring the gouge in from the other face so the end grain doesn't splinter away.



Work in from either end to turn a cross-grain blank to a cylinder using a ½-in. (13mm) bowl gouge.



Drill a wide depth hole to start the hollowing process, and then use a $\frac{3}{4}$ -in. (19mm) scraper, $\frac{3}{8}$ in. (10mm) thick, to remove the rest of the waste.



On facework you'll get curly shavings.

2

Mount the cylinder in a chuck for hollowing, complete with the cones left by the centers. You need both to help re-center the blank in the chuck. Invariably a re-mounted blank is very slightly off-center (because some jaws will penetrate the wood more than others), so skim the blank true. The chuck jaws will mark the wood, but these are turned away later. You could reduce the diameter of the blank accordingly at this stage, but it pays to retain as much of the blank as possible while you hollow the inside.



On end grain expect dust rather than shavings.



Use internal calipers to check that the bottom of the hollow is at least as wide as the opening.

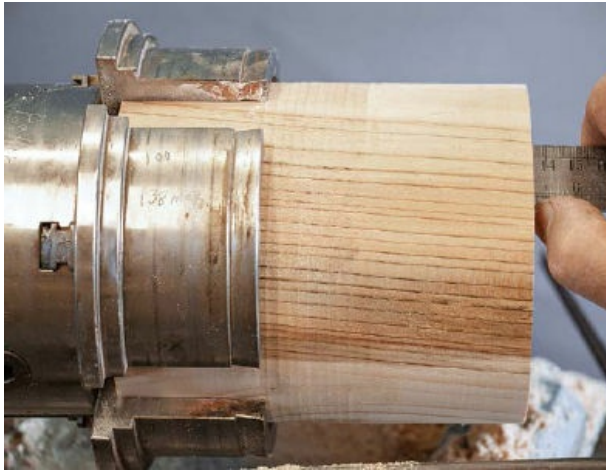


For deep hollowing the handle should be four to five times longer than the distance the cut is from the rest.

The center is removed by first drilling a depth hole, which is widened using a $\frac{3}{4}$ -in. (19mm) square-end scraper. Drill a hole at least 1 in. (25mm) diameter to within $\frac{5}{8}$ in. (16mm) of the other end of the blank. This one is $1\frac{1}{2}$ in. (40mm) diameter. When drilling the depth hole, ensure you have a scraper long enough to reach the bottom of the hole. I nearly drilled too far for my longest scraper and that raised another problem in Step 5 (see p. 111). Hollowing into cross-grain will create curly shavings (see the right photo on p. 107). Hollowing into end grain will get dust (see the top left photo above).

Whenever you're cutting well over the rest, the length of the tool handle needs to be four to five times the length of the tool blade. The cross-grained pot is $6\frac{1}{4}$ in. (160mm) deep, so my 30-in.- (760mm-) long handle is just about right. I can lean on the end of the handle to control any catches.

Turn off the lathe and use internal calipers to check that the bottom of the hollow is at least as wide as the opening. In this end-grained pot there will be little to remove, but on the cross-grained pot I could hollow no deeper than the length of my scraper, so I marked the depth of 6¼ in. (160mm) on the outside, as you see in the bottom photo on p. 112. Finally, turn and sand the rim, as you cannot get at it later. In the bottom left photo on the facing page, I'm using a ¾-in. (10mm) spindle gouge rolled over on its side to shear scrape the rim of the cross-grained pot.



Be sure to check the depth of the pot as work proceeds.



Refine the rim using the wing of a spindle gouge rolled on its side for a gentle shear scrape.



Sand the inside of a deep cylinder using a sanding stick. Putting your hand inside a spinning cylinder can lead to injury.

3 Sand the inside, the rim, and a short way down the outside. You can damage your hand sticking it inside a spinning cylinder, so use a sanding stick. Make a sanding stick by cutting a slot into a dowel—here a 1-in. (25mm) half-round. Then insert the end of the abrasive into the slot, and wrap it around the stick. If the internal surface is bumpy, inserting a thin layer of foam between the stick and abrasive makes sanding easier. You need to *turn* the end grain cleanly, as no amount of sanding can remove torn end grain.

You can apply a finish to the inside and rim at this stage, but if the wood isn't fully seasoned, let the pots dry for a couple of weeks, then finish them (off the lathe). I use boiled linseed oil.



Finish turning as much of the profile as possible before re-chucking the pot.





Re-chuck the pot so you can complete the profile and base. Non-slip cloth separates the wood from the jaws while improving the grip.

4

Turn the outside up to the chuck jaws. In the top left photo above, a skew chisel is being used to smooth the end-grain pot. A cross-grained pot would usually be refined using a bowl gouge, but this one got a bit thin, around $\frac{1}{4}$ in. (6mm) about halfway down. Because of the likelihood of some of the twisted grain picking out, I decided to do all the final shaping at the next stage.



A plywood disk spreads the impact of the tailcenter while ensuring the pot stays on the chuck as you complete the profile.



When the grain lies parallel to the lathe axis, use a skew chisel to shear cut. The supporting cone is part of the Robust Live Center system.

5 Remount the pot over the expanding chuck jaws. I wrap a length of non-slip cloth around the jaws, partly to separate the jaws from the metal that can stain or dent the wood, and partly to get a better grip without having to over-tighten the chuck. It's easy to apply enough pressure to split the wood, particularly with the end-grain version. These are long jaws, but you can also use the shoulders of standard short jaws. Either way, it pays to bring up tailcenter support. You don't want to put any pressure against the end grain for fear of punching a hole in the bottom of the pot, so spread the load using a disk or a commercial tailcenter. Cross-grain is much stronger, so using a disk is more to prevent the tailcenter from marking the wood.



If there is tearout, use a low peeling cut with the skew flat on the rest.

6 Turn away the chuck marks (in the top photo on p. 111, they're the black lines) to complete the profile of an end-grain pot, using a skew chisel for a shear cut or a low peeling cut if the grain is twisted or picking out, as some did here. An edge used for peeling cuts needs to be slightly radiused to

prevent the long point or short corner from marking the wood.



Use a gouge to shear cut cross-grain.

On the cross-grain pot I miscalculated the depth to which I could hollow, so ended up with far too thick a base. The pencil line in the photo at left marks the exact internal depth. The waste is best removed with a gouge. Start by planting your hand on the rest with your fingers extended over the tool blade. Then tighten your grip to squeeze the wing of the edge into the cut. Be sure to roll the gouge in the direction of the cut. If you use the gouge flute up, a severe catch is guaranteed. I was going to leave a bit of weight in the base, but managed to have a small catch while setting up for a photo. Fortunately it wasn't a disaster, but removed any margin for error. In this situation, mark the limits of the damage and work to that line before refining the sides.



When a damaged section has to be turned away, mark the limit of the damage, then work to that line.

During hollowing, this pot got a bit thinner than intended, so with the grain likely to pick out, shear scraping (with a skewed scraper tilted on edge) was the safest way to proceed.



If the end grain begins to pick out, shear scraping is less likely to exacerbate the problem.



Turn the base slightly concave.



Develop the habit of softening rims with abrasive.

7 Turn the base slightly concave using a spindle or detail gouge. When sanding, don't forget to soften the rim of the base, as such edges can be dangerously sharp.



These green-turned oak pots distorted after they were turned, and the bases had to be flattened on a rubbing board. The left is 4¾ in. by 7½ in. (120mm by 190mm), the right 3½ in. by 7⅞ in. (90mm by 200mm).



Elm tubes as sculptural groups. These $1\frac{3}{4}$ -in. to $2\frac{3}{8}$ -in. (45mm to 60mm) diameter cross-grained tubes were turned green, with the expectation that they would distort.

CHAPTER

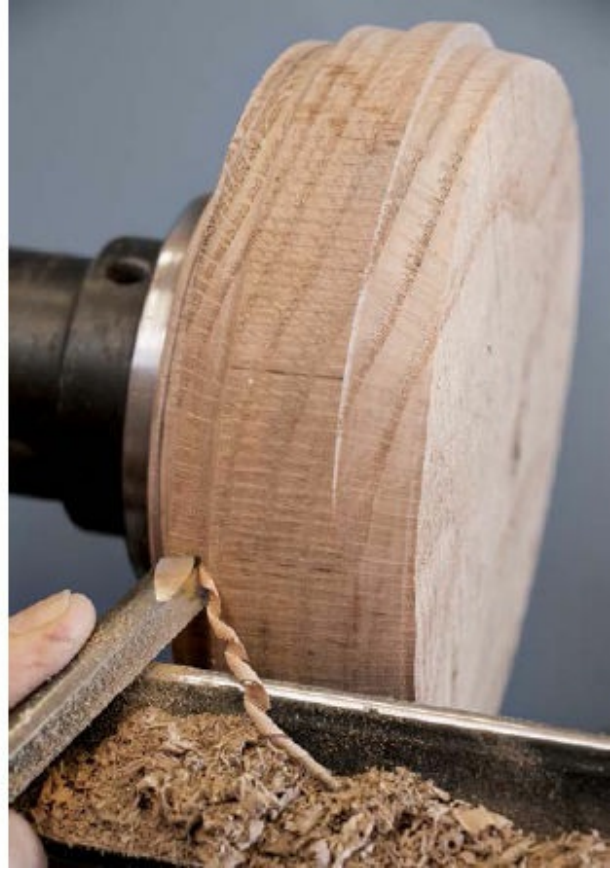
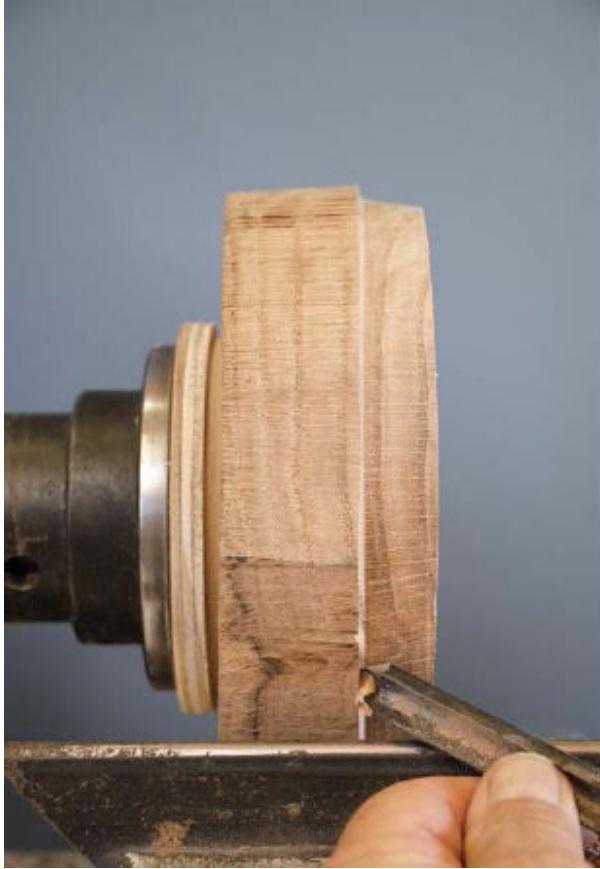
14 CANDLEHOLDERS

These days candles are rarely used as a primary source of light. Where there is no electricity, kerosene lamps do a better job. However, candles are still widely kept for emergency lighting and decorating tables on festive occasions, as well as for religious and romantic purposes.

However you choose to hold your candles, the support needs to be stable, preferably with a wide and heavy base. They must not be top heavy. The heavier the wood you use the better. Candles are still responsible for numerous house fires and consequent damage, so there are rules and regulations in some countries that require the inclusion of a metal plate or foil around the base of the candle. You'll find these in specialty woodturning stores.



These candleholders support 2¾-in.- (70mm-) diameter candles. Left to right: Red box and pin oak.



True the blank using a ½-in. (13mm) bowl gouge, working in from either face to prevent the end grain from splitting.

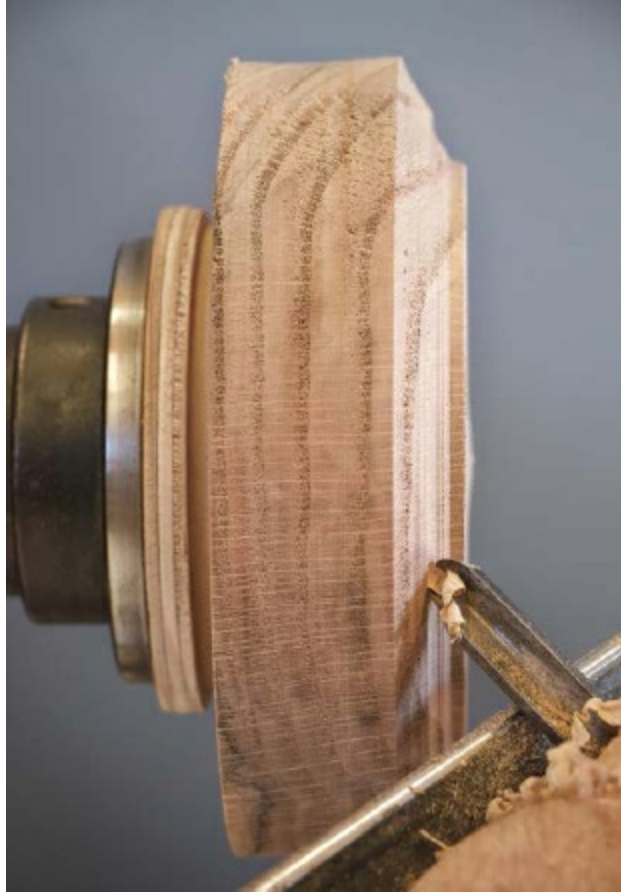
This style of candleholder is a simple one-piece turning. The one to the right in the photo on p. 115 is very easy to make, whereas the one to the left is obviously a bit more challenging, as it involves retaining the square section in the base. The key features desirable in any candlestick or holder are a wide base and a dished surface surrounding the candle where wax can pool and set, although well-made candles won't drip.

Simple Round-based Candleholder

The concept here is a low, chunky, wide, and therefore stable base for a large candle. The foot is slightly smaller than the overall diameter, so the form is lifted visually off the surface it's sitting on. The wider the diameter of the blank you can grip, the better the support for the blank as cutting proceeds. If you have jaws around the right size you can match the foot to a chuck, as I do here. Otherwise you would use expanding jaws, as I do with the square-based red-box version on pp. 120–124. Closing jaws around a foot is the better option.

A candleholder blank needs to be well seasoned so it doesn't warp and become an unstable support. This 6¼ in. by 2 in. (160mm by 50mm) pin-oak blank was cut from a board that had been air-drying for three years.

1 Mount the blank on a screw chuck and true the sides using a gouge, working in from either face. Almost any ½-in. (13mm) gouge will do the job—but never use deep-fluted roughing gouges for facework, as they are designed for roughing spindle blanks with grain parallel to the lathe axis.



Use the same gouge to roughly shape the profile.



Then make the base slightly concave.

2

Use the same gouge for a pull shear cut to rough out the curve from the top of the foot.

3

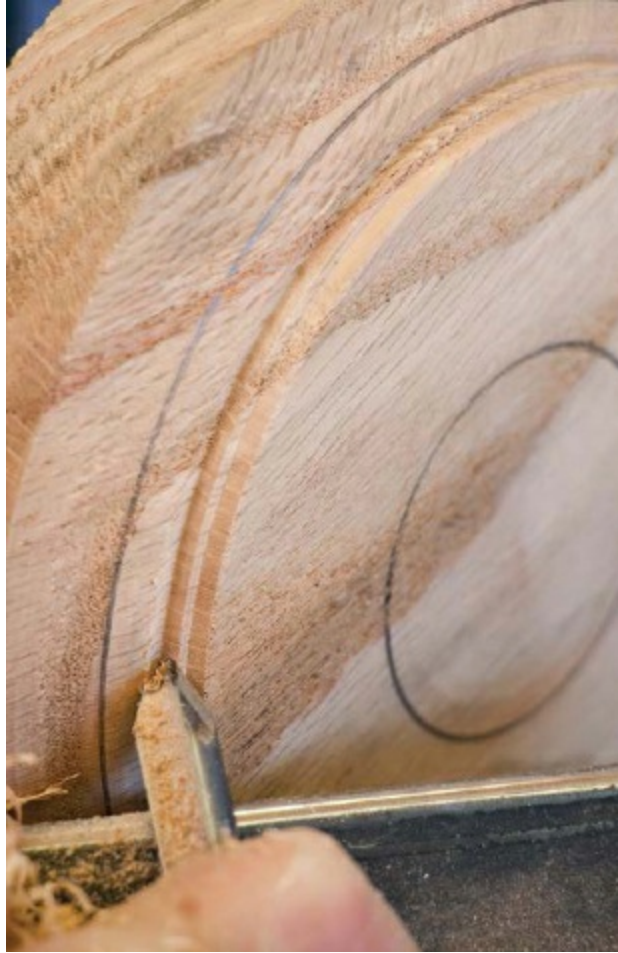
Flatten the base. It's best to true a very rough face with a gouge (as in the top right photo on p. 119). After that, on most quality hardwoods, I find I get the best finish in the shortest time using a skewed scraper flat on the rest. It can be tilted up for a shear cut if necessary. With wood that doesn't take to being stroked with a scraper, try a shear cut using a ½-in. (13mm) gouge (again as on p. 119).



The circles show the diameters for different chucks. The black Shark Jaws (rear) can expand in a recess defined by the inner circle, but the larger dovetail jaws (front) offer a far superior grip, as they contract around a larger diameter foot.

4

Lay out the diameter for a recess in the base in which to expand the chuck jaws, or for a foot to fit into the jaws. In the photo at right, the circle within the foot would be for the black Vicmarc Shark Jaws at the rear, whereas the two larger circles around the foot match multipurpose jaws on Vicmarc chucks. The support offered by the expanding jaws is not as good as jaws closing on the larger diameter. I choose the smaller of the two outer circles, because that diameter foot is nearer the original foot that was roughed out. I use a spindle gouge to cut in on that diameter.



To turn a foot for dovetail jaws, my favorite tool is a $\frac{3}{8}$ -in. (10mm) spindle gouge.

With the chuck diameter marked on the base, the original foot can be turned away, but that reduces the overall height of the candleholder. I prefer to retain the height, so I create the outflowing chamfered foot you see in the right photo above. The hint of a groove at the top of the foot is more than sufficient as a recess in which to locate smooth dovetail jaws.



The bottom section of the profile is cleaned up using a skewed scraper flat on the rest. Dovetail jaws can grip a $\frac{1}{16}$ -in.- (1.5mm-) wide groove. This groove is slightly smaller. If the foot is the correct size for the chuck, any jaw marks on the wood will be nearly impossible to find.

5 Smooth the lower portion of the profile. By far the easiest and quickest way to smooth this short curve from the foot is to use a skewed scraper flat in the rest. Stroke the surface to remove only powder.

6 Sand and polish the lower half of the candleholder.

7 Re-chuck the candleholder and turn the upper half of the profile using a gouge, either deep-fluted or spindle, $\frac{1}{2}$ in. (13mm) or $\frac{3}{8}$ in. (10mm). I prefer simple shapes, so I chamfer the upper part of the profile. If you prefer something more complicated involving beads and coves, go for it. If you don't like the result, turn them away and enjoy a slightly smaller and plainer candleholder.



Remount the blank in order to complete the profile and turn the upper half of the profile.

8

Turn the top, initially using a gouge. After that I usually smooth the face with a skewed scraper as in Step 3. It's sensible to have the top sloping inward so liquid wax congeals around the base of the candle rather than flowing onto a table or tablecloth.

9

Turn a cylindrical hole in the face to accommodate the candle. Use dividers to set the hole diameter as in the top left photo on p. 78. Drill a depth hole at center (see p. 85), then use a square-end scraper to remove the waste. Chances are the end grain on the sides will be torn, so use the nose of a fingernail-ground $\frac{3}{8}$ -in. (10mm) spindle gouge for a clean cut across the grain. Keep the gouge almost on its side, with the flute facing center.

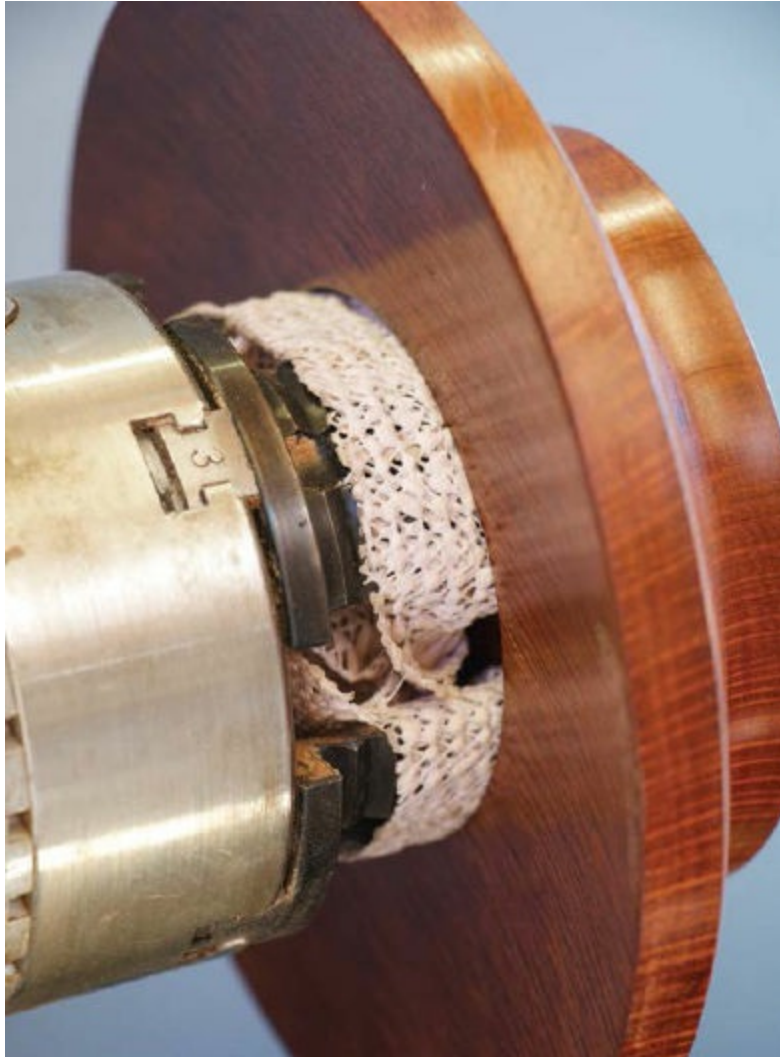


True the top face and turn it slightly concave.



Turn a recess to fit your candle. A square-end scraper is the best tool for removing the bulk of

the waste, but you'll need a fingernail-ground spindle or detail gouge to cut the vertical side cleanly. Keep the gouge on its side with the flute toward center to avoid a catch.



If you want to remove the foot, or in this case refurbish a twenty-year-old candleholder, simply expand some chuck jaws within the form. The non-slip cloth protects the wood while providing a better grip.



Turning a flat face on a square blank is tricky. On the corners, shear scraping with the scraper tilted on edge is the safest and most accurate way to go.

10 Sand and polish the remainder of the candleholder.

Square-based Candleholder

A square-based candleholder is made in much the same way as the round one, except that the corners on the bottom need to be turned flat, so when the candleholder sits on a flat surface there is no space visible beneath the sides.

For this candleholder we are using a 5½-in. (140mm) cube of red-box burl. It is set on the lathe with the grain running at right angles to the lathe axis. This is facework, so you should use bowl and spindle gouges and scrapers.

1 Mount the blank on a screw chuck and turn the base flat. This is never as easy as it sounds, particularly when it comes to the four corners. I find the most accurate and least stressful way to do this is to shear scrape with a 1-in. (25mm) skewed scraper tilted up on its side, as in the photo above. Through the spinning corners you can see that I'm using the bottom quarter of the edge (where the dust is in the top photo above).

Check that the bottom is flat using a straightedge along the length of one side.



Use a straightedge to check your progress.

2 Turn a recess in the base for an expanding chuck. There are several points to make here. First, mark as large a circle as possible within the square sides. Unless you took particular care to square up your blank, the circle will not lie centrally within the base. That's not a problem, as it gets squared up at the next stage. Second, it pays to make the base within the circle slightly concave so there is no possibility of that section contacting a flat table.



Create the recess for the expanding chuck jaws.



I use a homemade multi-straightedge (easily made from scrap plywood on a sander) to check that the recess is flat.

After the surface within the circle is turned concave, create a slightly dovetailed recess for the chuck. I use a ½-in. (13mm) skew chisel as a scraper, keeping it flat on the rest, as shown in the bottom photo on p. 121. Make sure the bottom of the recess is flat, so the jaw rim sits right in the corner (see p. 151).

You can use the same skew chisel or a small square-end scraper to make flat beads to decorate the high area inside the recess.



Scrapers are the easiest tools for decorative beads on the base.



Sand the squared face using a cork or wood sanding block.

3

Sand the base using a sanding block for the square corners. It's very easy to round over the corners, so keep checking the flatness of the edges.

4

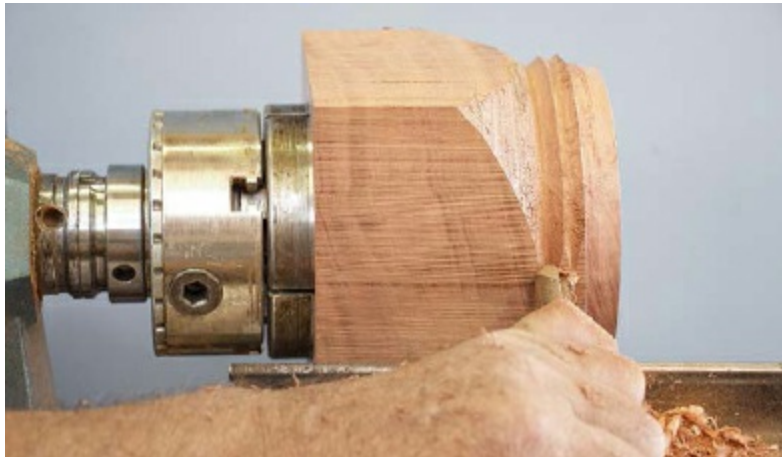
True the corners on the top face of the blank (the face against the screw chuck), and mark a circle the same size as that on the base. Then take the blank to the bandsaw and cut away any waste to true up the sides, using the circle as a guide. On this candleholder, the bandsaw marks are retained to contrast with the smoother turned sections. I'm not worried that the sides are not absolutely square to each other, as this brings more character and presence to the completed piece.



Square up the blank using a circle marked on the top face as a guide.



Rough out the profile, working from smaller to larger diameter and keeping an eye on the top horizon of the profile to see how the shape is developing.



To cut a smooth and clean curve, it's usually easier to cut slowly from larger to smaller diameter.



On this scale, add detail using a ½-in. (13mm) detail gouge.

5 Rough out the profile, working from the top back toward the base, as shown in the top left photo above, using a bowl gouge for strength. A spindle gouge can flex.

6 Dish the top and turn the hole for the candle as with the other candleholder (see p. 119). Be sure to make the top slightly concave so any candle wax collects at the base of the candle—you don't want it spilling down the side.

7 Complete the profile using a ½-in. (13mm) bowl gouge, first cutting the shoulders, and working from larger to smaller diameter. If you take the gouge steadily through an arc, you'll end up with a smooth arch over the flat sides. This is a cut against the grain (normally you'd cut from smaller to larger diameter on facework), but if you move the edge into the cut slowly and smoothly you shouldn't have to do too much sanding.

Where the profile is round, use a spindle or detail gouge to put in a bead or two, or a groove if that feels more comfortable. A ½-in. (13mm) shallow-fluted detail gouge with a long fingernail edge is the best tool for the job. Pin the gouge firmly on the rest and on its side as you pivot the nose into the

wood. If you have the flute up, the gouge will catch.

8

Sand and finish. To keep the angle between the flat sides and the curved shoulders crisp, turn the lathe off and lock the spindle so you can power sand using a soft pad in an electric drill.

CHAPTER

15 NESTING BOXES

Wherever we live there are birds and climbing animals that also need somewhere to sleep and raise their families. This project sets you on the path to creating pads for your local wildlife. The details of your design will depend on whom you are building for. For instance, some flying squirrels need a hole exactly 1½ in. (38mm) in diameter, whereas possums need a 3-in. (75mm) entrance, and different species of birds will have different requirements. You can find out the entrance and space dimensions your local furry and feathered residents prefer or require on the Internet, usually on nesting box plans. Of course your version will be round. The examples created here are generic birdhouses about 9 in. diameter.

Many birds and some other animals need a perch or some sort of ladder for access, and these present quite a few design opportunities.



The end-grain version of the nesting box is to the left, the cross-grain version is to the right.

This nesting box can be made up of two, three, or more parts, depending on the thickness of the wood and the length of the tools you have available. You need to be able to open the box for cleaning, so the sections are pinned together with short spindles that double as perches. A nesting box is made like a box with a suction-fit lid, in that you turn the top section first, and then fit that to the base, or to a central section and then the base. You could also add a frivolous string of beads to swing in the breeze.

This is not a project that demands fine finishes; occupants will prefer a

rough or textured surface they can grip, and appreciate a thick wall for their shelter, so keep the wall at least 1 in. (25mm) thick. Inside, small steps will help fledglings or small furries scramble out of the nest to the exit. Designs involving beads, grooves, or other texture are ideal. You don't need to sand anything and torn grain can actually be a good thing.

The grain in a turned nesting box can run either vertical (end grain) or across (cross-grain or facework). The advantage of end grain is that it is relatively stable compared to facework. The negative is that hollowing is hard work, especially on this scale. The advantage of cross-grain is that it's easy to work when using facework techniques, and also the grain patterns might be more appealing. You can use seasoned wood, but there's a good chance it will warp when hollowed, so rough out the two parts even if it's only a few days before you remount them to complete the project.

The steps for making each nesting box are similar, although the techniques you use depend on the grain alignment. In each case, the idea is to incorporate some detail on the profile (the outside) that will fit a chuck so you can hold the blank securely while it's being hollowed.

Blanks for cross-grain nesting boxes are similar to blanks for very deep bowls, vases, and hollow forms. In fact, a couple of large, less than perfect, roughed-out bowls can form an excellent birdhouse. Here I'm using cedar felled only a few months ago. The blanks for these boxes were all cut round on a bandsaw and all were about 9 in. (230mm) diameter and 7 in. (180mm) high.

We'll consider the end-grain version first.

End-Grain Nesting Box

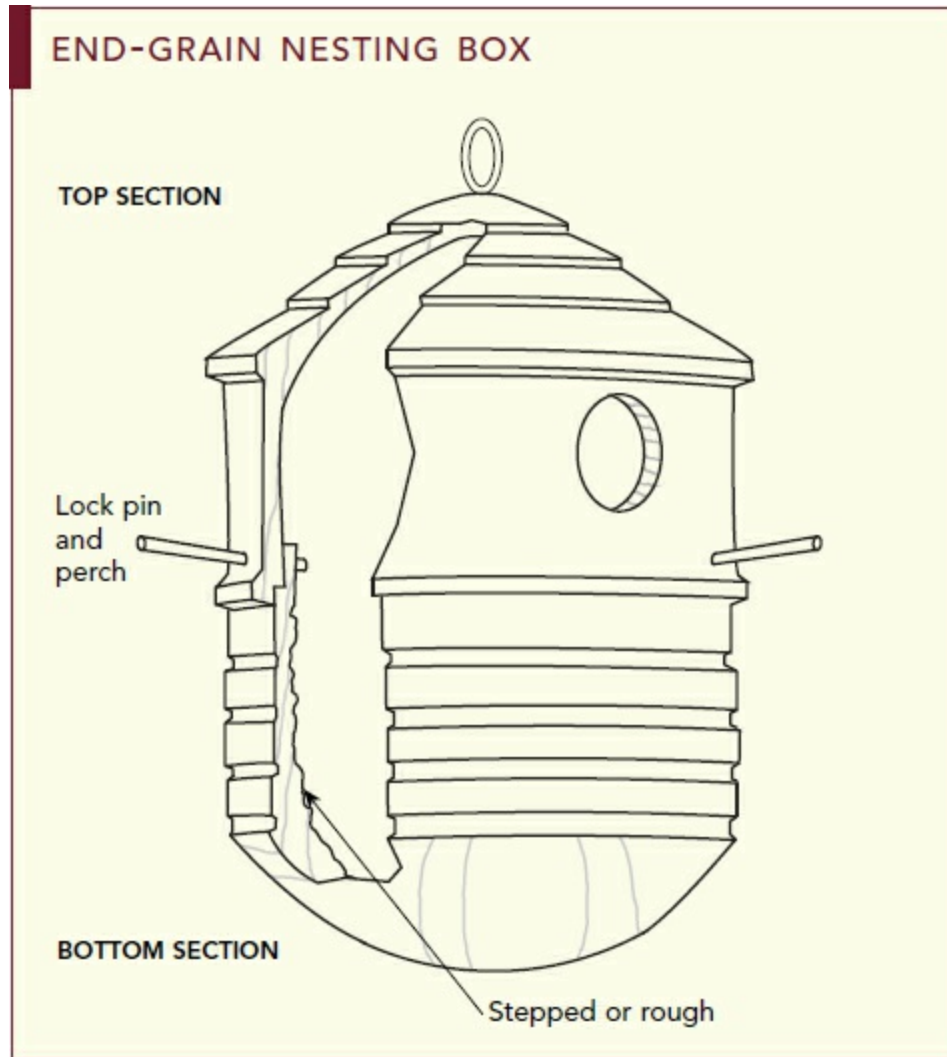
The end-grain nesting box is to the left in the photo on p. 125. End grain means this is centerwork with the grain aligned with the lathe axis. You'll be cutting from larger to smaller diameter to shear cut across the grain. On large diameters like this, I use a ½-in. (13mm) deep-fluted bowl gouge for strength when working well over the rest and a 1¼-in.-wide (32mm) skew chisel. Even better for spindles larger than this is a 2-in. (50mm) skew chisel, but you'd need to make your own, as these are not commercially available. I reground a heavy scraper.

1 Start with the top section/lid. Mount your end-grain blank between centers and true it to a cylinder. Turn the profile (outside) of the lid. Use a bowl gouge to rough out the roof of the nesting box, incorporating a shoulder detail for the chuck jaws to clamp around. Final cuts on the end grain are made with a skew.

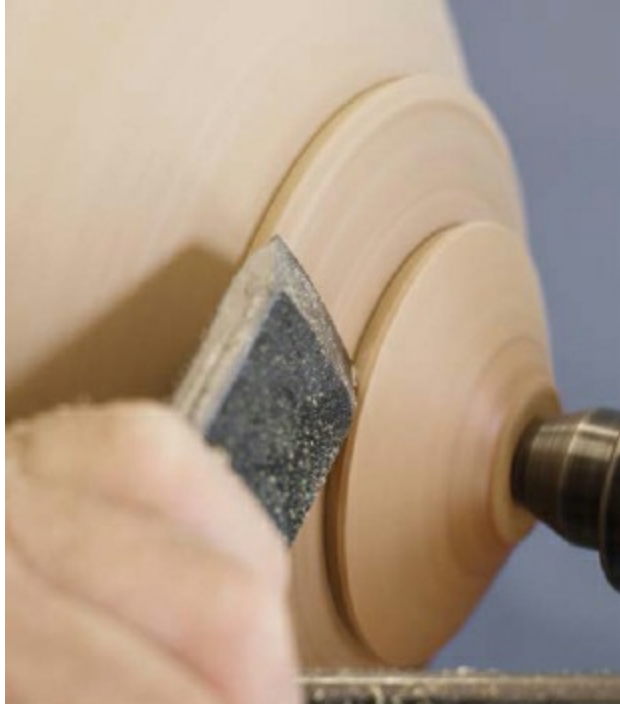


A ½-in. (13mm) bowl gouge is ideal for roughing out large centerwork. To shear cut, work from

larger to small diameter.



On the profile I want an eave overhanging the entrance hole. To achieve this, pivot the long point of the skew chisel into the wood so that the next (planing) cut finishes cleanly. To create a flat recess below the overhanging eave I use the skew flat on the rest for a low peeling cut.



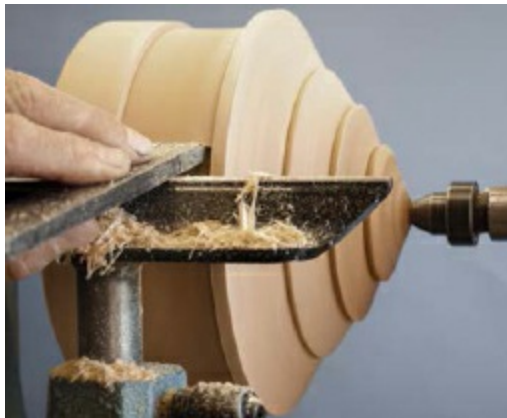
On what will be the top of the lid, use a skew chisel to turn a shoulder to fit your chuck.



To create an eave on the lid, first cut across the grain using the long point of the skew chisel.



Then when you remove the adjacent waste, the fibers will break away cleanly.



To turn a recess below the eave, use a skew chisel flat on the rest for a low peeling cut.

2 Remount the lid for hollowing. If the diameter being gripped matches the chuck jaws or is very slightly smaller, the jaws won't damage the wood.

This is end grain, so a $\frac{3}{4}$ -in. (19mm) square-end scraper is best for hollowing the inside of the lid, but drill a depth hole first. Note that the first inch (25mm) is wider than the remainder. The resulting shoulder helps align the two portions of the nesting box when you pin them together.



Remount the lid for hollowing. The wider the diameter you grip, the more secure the lid will be as it's being hollowed.



A square-end scraper is the best tool for hollowing into end grain, but drill a depth hole first.

3 Turn the profile (outside) of the bottom section. This is still centerwork, so the blank goes between centers. The nesting box will hang, so doesn't need a flat base to stand on, but you do need to grip it so you can complete the inside. Rather than use a foot that needs attention later, you can again incorporate a feature that looks decorative, but is in reality a fixing point for the chuck. This section is like a huge bead with some decoration. Use a ½-in. (13mm) detail gouge to cut the beads for the chuck to grip.



The bottom section of the nesting box need not be flat. Turn a detail for the chuck to grab, and make sure any smaller details on the base can fit into the chuck.



Remount the bottom section. Here, Step Jaws clamp around the largest bead.



It's usually possible to hollow large blanks with the tailstock support in place. Have the rest well above center.



With large blanks, use tailcenter support, and be sure to true the blank before you commence hollowing.



The inside of a nesting box needs to be stepped or ridged so small residents can climb up to the opening.

4

Remount the bottom section for sizing, and then hollowing. Here, Step Jaws clamp around a $4\frac{5}{16}$ -in.- (110mm-) diameter, $\frac{1}{8}$ -in.- (3mm-) wide bead. It's all you need. However, it's prudent to bring up the tailcenter when there's so much wood to hog out. Before you attack the inside, turn a tenon that will fit into the top/lid section. Use the skew flat on the rest to peel the cylinder down to size.

Hollowing while the tailcenter supports the wood doesn't give you much room to thin the wall in the latter stages, but at least you won't heave the job out of the chuck. When the bulk is out, use the right corner of the scraper to undercut the central column and break it free, then back the tailstock away and finish the hollowing. Using the left corner of the scraper, I step the inside so small babies can scramble out of the nest.



When the inside is hollowed, add the top so you can refine the profile. Here I turn coves with a detail gouge.

5 Jam the lid over the bottom, keeping it in place with the tailcenter; then refine the outside as necessary. The bottom seemed a bit plain, so I cut in some coves using a detail gouge (shown above). Start each cut with the gouge on its side and the flute facing the center of the cove. Then, as the cut proceeds, gradually roll the tool until the flute faces up at the bottom of the cove.

6 Drill the entrance hole using a saw-tooth or Forstner bit. Use a V-shaped carrier to keep the lid steady as you drill.

7 Assemble the nesting box and pin the parts together so the nesting box can be easily disassembled later for cleaning. Drill at least two holes, and preferably three, and insert the locking pins. Not all birds like a perch at the front door, so you might need to drill for the locking pins away from the entrance, as seen on the cross-grain box to the right in the photo on p. 125.



When drilling the entrance hole, steady the lid on a V-shaped carrier.

TURNING THE PINS

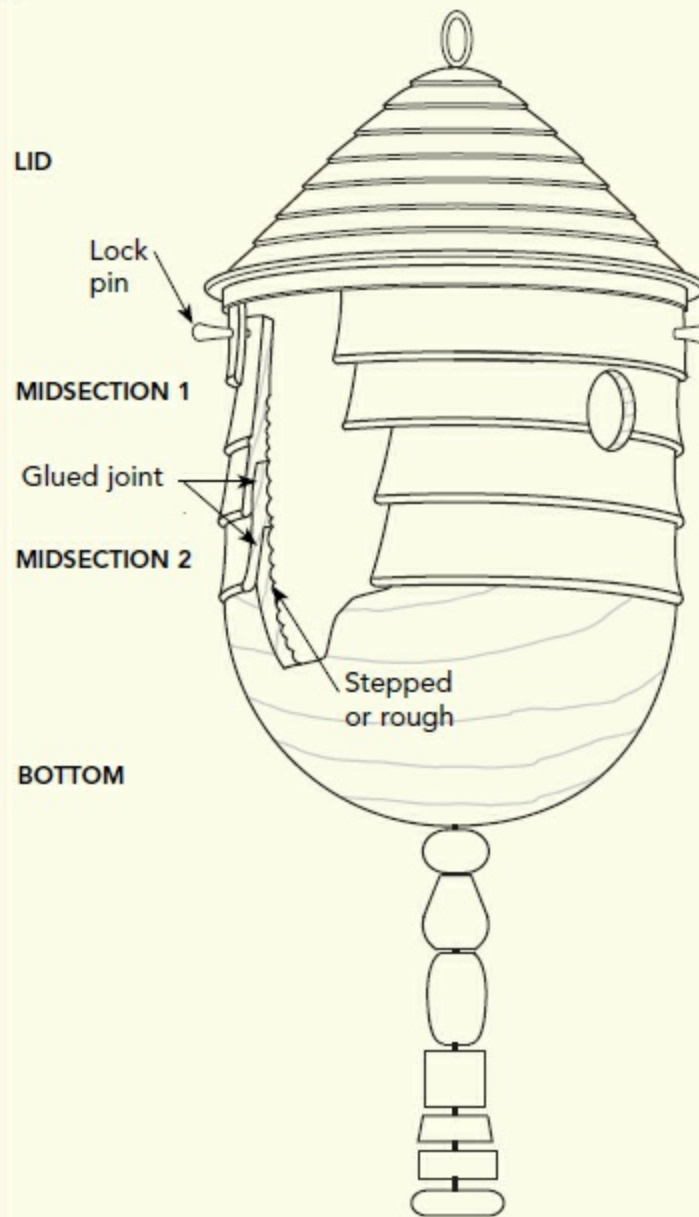
The top and bottom sections of the nesting boxes are secured to each other by pins that double as perches. The pins can be turned between centers, but the pin or long-nose jaws you see here are better when it's time to check the diameter.

Check the diameter of the pin using a gauge with a hole the same diameter as that drilled through the boxes. The burnish mark is the diameter you need. If you flare the pin, you'll have something to grab when you need to pull it out to clean the box.





CROSS-GRAIN NESTING BOX



Cross-Grain Nesting Box

The cross-grain box might be a similar shape to the end-grain version, but it's much easier to turn, particularly when it comes to hollowing. As with all facework, you shear-cut the profile by working from smaller to larger diameter using gouges and scrapers, then larger to smaller diameter when hollowing. This nesting box has three sections, but as you can see in the drawing at left, more can be turned if greater depth is required or you have only thinner boards.

1 Mount the blank for the lid on a screw chuck and shape the profile. The top half is like an outflowing bowl with a fancy foot and base. Remember you want at least one of the beads or shoulders to fit a chuck; here it needed to fit $4\frac{5}{16}$ -in. (100mm) Shark Jaws. Establish the chuck diameter, then design the final shape around it. If you have only smaller jaws, open them out to grip on the largest diameter possible. The chuck jaws will mark the wood, but you can eliminate these with some decorative carving, or disguise them with pyrography.





On a cross-grain nesting box, shear cut using a bowl gouge to cut from smaller to larger diameters and in from each face.



When hollowing into a cross-grain blank, expect curly shavings rather than dust. At the rim and for about 1 in. (25mm) down, the opening needs to be cylindrical to fit over the next section.

2 Remount the lid for hollowing. A ½-in. (13mm) deep-fluted bowl gouge is the best tool for the job, or a ¾-in. (19mm) square-end scraper is a good alternative. Leave a shoulder at least an inch (25mm) in from the rim to seat the middle section. This is also the section that will be pinned.

3 Mount the midsection on a screw chuck and turn it slightly tapered with the top sized to fit the lid. Then hollow in about halfway. Leave the inside stepped so you can grip it with an expanding chuck to complete the hollowing. These steps were turned with the bowl gouge rolled right on its side with the flute toward center.



Mount the midsection blank on a screw chuck and turn the end to fit into the lid.



When the profile fits into the lid, hollow the midsection and leave at least one step inside so you can remount the job on expanding chuck jaws for hollowing.

4

Remount the midsection to complete the hollowing. If your chuck's jaws are not big enough, you can use the ends of the jaw sliders. Failing that, make a jam chuck (much as you did for the scoop; see the top right photo on p. 98) using the blank for the next section. Shortly after you start hollowing you

break through, so what you have is a wide ring. Leave a shoulder about 1 in. (25mm) in from the bottom rim on which to seat the bottom section.

Check how the lid looks on the midsection. If you need to add more overall height to the nesting box, turn a similar ring to fit this one.



Remount the midsection to complete the hollowing.



As you start hollowing you will soon break through.



Hollow the midsection. Leave a shoulder on the bottom rim on which to seat the bottom section.

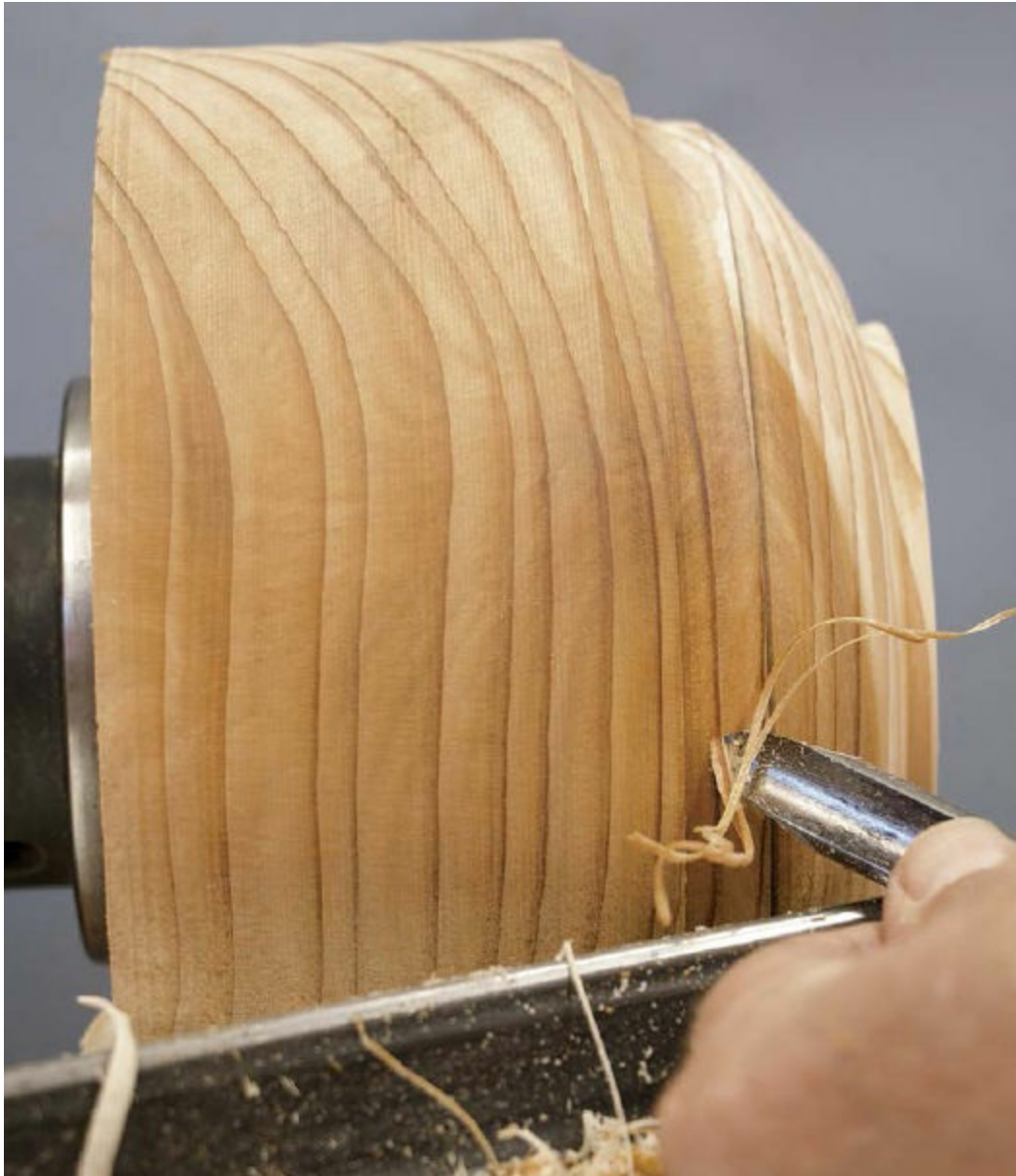


Check how the midsection looks with the lid on. If the nesting box needs to be taller, make another midsection.

5 Mount the bottom section on a screw chuck and turn the profile with a bowl gouge. As on the lid, include a shoulder detail for the chuck to close around. The base need not be flat, as the nesting box will be hanging from a branch with a string of beads swinging from the rounded base. Don't turn the base to fit the midsection now—that's easier to do when the job is reversed for hollowing.

6 Reverse the bottom section in the chuck for sizing and hollowing. First turn a tenon to fit inside the midsection. The bottom will be glued into the midsection so it can be a tight fit. A detail or spindle gouge is ideal here. You need to turn the tenon before you commence hollowing; otherwise, it's too easy to turn away the wood that should be fitting the midsection.

7 Hollow the bottom section using the bowl gouge and possibly a heavy scraper across the bottom. Rough up the steep inside a bit so fledglings can climb out of the nest. Then drill a hole in the base for the string of beads. You can use a 1/8-in. (3mm) depth drill, or use a Jacobs Chuck® as a handle for the drill unless it can be used in the tail center.



Turn the bottom section with some decoration the chuck can grip (as on the lid). Don't turn this section to fit the midsection now.



With the bottom section remounted for hollowing, first turn the rim to fit into the base of the midsection. A spindle or detail gouge does the best job.



After you've turned the tenon that fits the midsection, hollow the base using bowl gouges and scrapers. Don't forget to step the inside.



Assemble the parts and refine the profile.



When drilling the entrance hole, ensure the lid section is held firmly in place.

8

Assemble the parts and refine the overall shape.

9

Drill the entrance hole using a saw-tooth or Forstner bit. Remember to use a V-shaped carrier to prevent the top from jumping around as you drill.

10

Turn and assemble beads for a tail. These are made the same way as the pull-cord knobs on pp. 4–9.

11

Assemble the whole nesting box, gluing the lower sections together and pinning the lid so it can be removed later for cleaning.

To attach the tail to the base, start with a big knot on one end of the cord and pass the other end through the hole in the base from the inside. Then thread on the beads and knot the end of the cord.

Next attach the hanging cord to the lid. I used rings that screwed into the top. If the cord is going through the lid to be knotted inside, use silicone to seal the hole around the cord so the tenants don't complain about the leaking roof.

If you don't fancy having birdhouses, you can transform this project into a hanging lamp by piercing the walls and installing a lamp.



The swinging tail provides a chance to use any odd beads you might have, or you can turn more from scraps using the techniques in Chapter 1.

CHAPTER

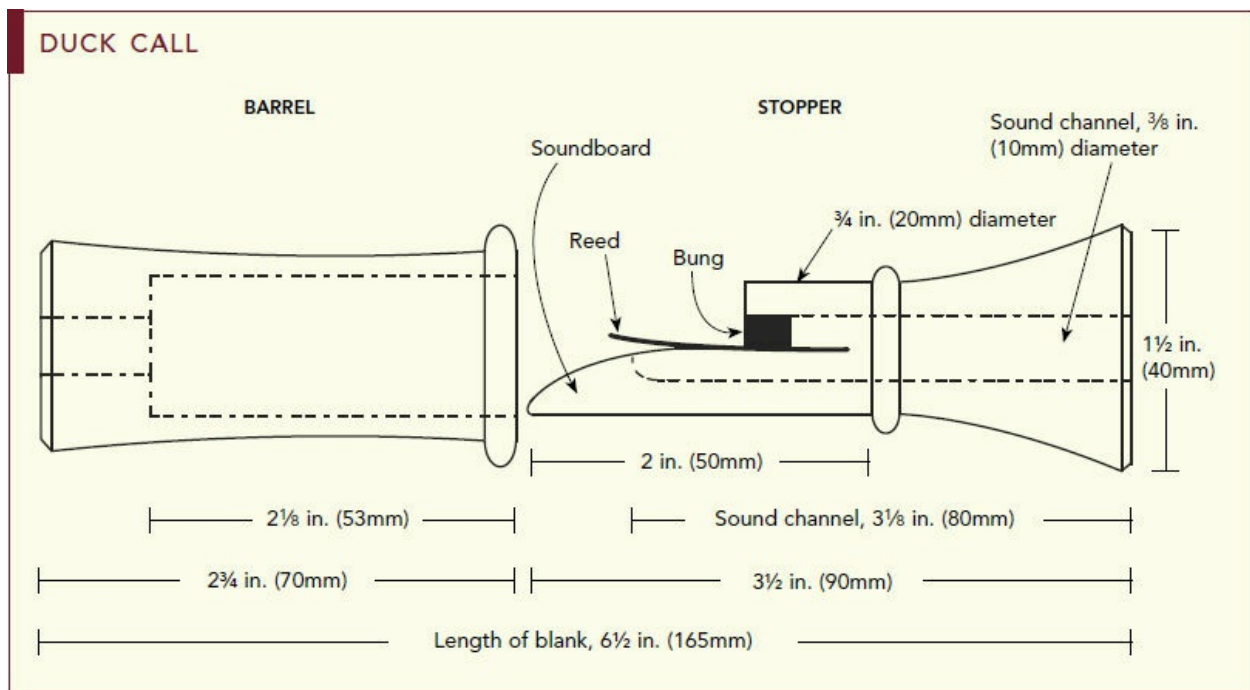
16 DUCK CALL

Duck and other game calls are quite easy to make, especially if you incorporate a commercially available duck call kit. The simplest kits, like those in the left photo on the facing page, require you to drill a hole in the blank, which is then turned on a mandrel, or between conical centers like the blind pulls on pp. 4–9. Other kits require you to turn two sections.



Duck calls left to right: pearwood, 4½ in. (115mm) long; oak, 4¼ in. (105mm) long.

As you might expect, it's much more satisfying to make every component yourself. I'll show you how to do that, but be warned that while the turning is no big challenge, getting a sound realistic enough to lure a bird or rightly nervous animal within shooting distance (I prefer to shoot with a camera) is another matter. The good news is that if your duck call can manage only a loud and irritating squawk, honk, or shriek barely related to any animal or bird call, you have an ideal gift for a child whose parents you wish to aggravate.

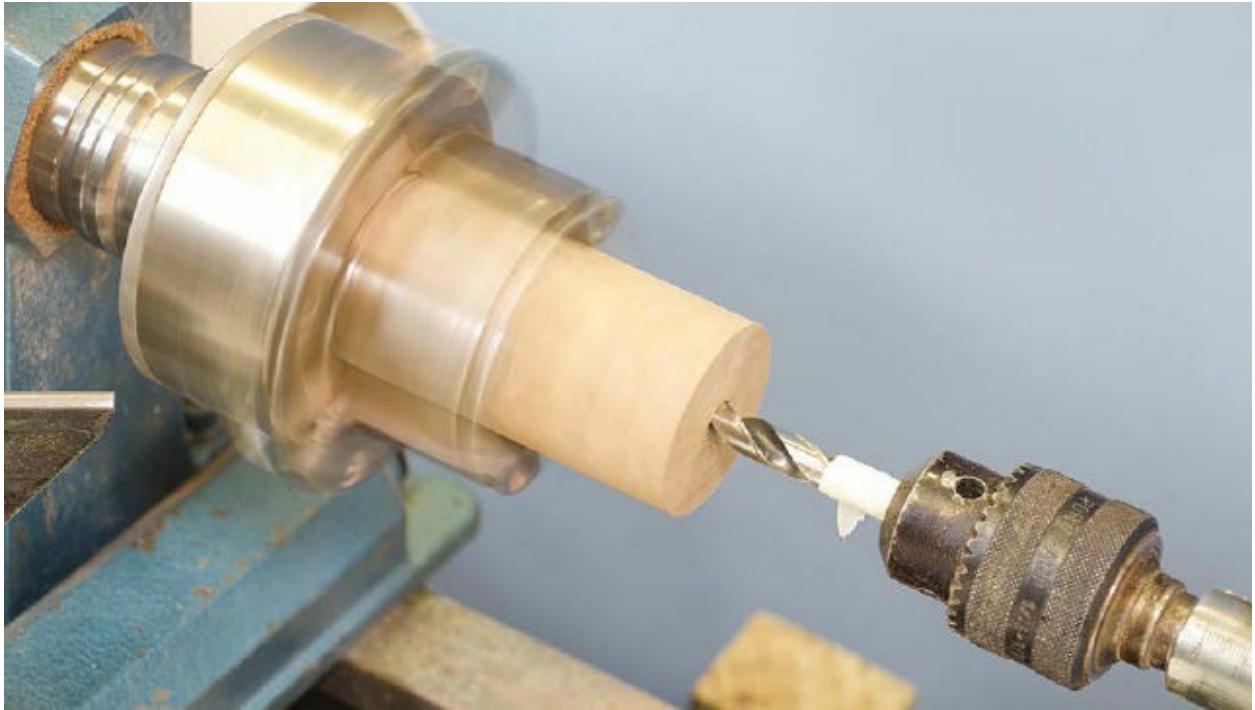




These trumpet-like calls are slightly tapered where they fit into the barrel; they are as simple a duck call as you can make.



The larger of these manufactured call inserts is a goose call, the smaller (loose) a duck call. The call is glued into the stopper, and the barrel is turned to fit over the two "O" rings.



Start with the stopper and drill a $3\frac{1}{8}$ -in.-(80mm-) deep hole for the sound channel.

A birdcall essentially has two sections. There is a *barrel* into which you blow and that fits over the *stopper* that holds the *reed*. The reed is fitted over a sound channel along which the sound is thrust out into the wide wide world. For the best results, you need a dense hardwood like maple, African blackwood, boxwood, gidgee, or cocobolo. Specialty woodturning stores will have lots to tempt you.

If you want to make the entire call yourself and want the grain to match, you'll need a blank about $1\frac{1}{2}$ in. (38mm) square and $6\frac{1}{2}$ in. (165mm) long. Cut this in two, with $3\frac{3}{4}$ in. (95mm) for the stopper and the remaining $2\frac{3}{4}$ in. (70mm) for the barrel. If you are turning a barrel to go with a commercial stopper, you'll need a blank around $1\frac{1}{2}$ in. (38mm) square and $3\frac{1}{2}$ in. (90mm) long. Either way, the wood needs to be well seasoned; otherwise, it's likely to shrink and split.

The Stopper

The stopper is the heart and lungs of any duck or other call. A manufactured stopper is probably the best option for attracting birds, but the satisfaction of extracting a primeval squawk from your very own stopper is hard to beat.

1 Turn the stopper blank to a cylinder and mount it in long-nose jaws for drilling. To keep the grain aligned in the two parts, have the end adjoining the other blank in the chuck so you will be drilling into the end where the sound comes out. Use a $\frac{3}{8}$ -in. (9mm) drill to sink a $3\frac{1}{8}$ -in.- (80mm-) deep hole at center for the sound channel. Use tape on the drill if you don't have a scale on your tailcenter. Turn and sand the end and particularly the rim of the hole, as it's difficult to get to later. Gentle scraping using a skew chisel flat on the rest, as in the bottom photo on the facing page, should produce a glassy surface on most end grain.



Smooth the end grain, as it's not easy to get at later.



Reverse the blank in the chuck and turn a cylindrical tenon 2 in. (50mm) long and $\frac{3}{4}$ in. (20mm) in diameter.

2 Reverse the blank and turn a tenon, 2 in. (50mm) long and $\frac{3}{4}$ in. (20mm) diameter. I use the skew chisel flat on the rest to peel the wood away as I wait for the wrench to ease over the cylinder. A wrench won't expand as calipers can, but the jaws must be rounded to prevent a catch. Undercut the shoulder at the end of the tenon so its rim will fit snugly against the barrel. This tenon has to fit into the barrel: It can be tapered slightly on the end, but the last 1 in. (25mm) into the shoulder needs to be cylindrical and a fraction oversize so you can adjust for a tight fit. Don't use the wrench or calipers for the final section, but gauge it by eye.



Draw a line parallel to the lathe axis, and then on the end grain extend the line through the center.



Saw through the center of the tenon to just short of the shoulder.



3 Cut away one quarter of the tenon to reveal the end of the sound channel.

Create the soundboard on which the reed sits by cutting away one-quarter of the tenon and leaving a slit through the center of what remains. First, and while the blank is on the lathe, draw a line parallel to the lathe axis using the rest as a guide. Note that on the end grain I've already marked center by easing a pencil across the end grain toward the axis to leave a pale dot at center. From the end of the line up the side, draw a line through the center as a guide for the saw.

I find the slot easiest to cut off the lathe with the blank held in a vice, but there's no reason why you shouldn't keep the blank in the chuck and take the chuck off the lathe. Cut the slit to just short of the shoulder, then cut in about halfway up the tenon (on the pencil line) to remove one-quarter and reveal the sound channel.

4 Shape the end of the soundboard so air can pass beneath the reed into the sound channel. This is most easily done on a disk sander.

5 Slot a reed blank into the slit, trim to size, and fill the hemispherical gap above the reed with plasticine. Start with the reed projecting beyond the sound channel and have a test blow with your mouth enclosing the whole of the soundboard. Typically you'll get no sound or a pathetic mewling. Snip tiny bits off the end until you get a loud quack. You might need to bend the reed up slightly. Finally, remove the corners so they don't snag on the barrel

when that's fitted.



Round over the end of the tenon from the end of the sound channel.



Fit the reed and block the gap above it with plasticine.

Making a Reed



Left to right: commercially made Mylar reed with rubber infill block, commercially made Mylar reed in place, recycled plastic reed held in place with plasticine, recycled plastic reed.

The essential part of any bird or game call is the reed that vibrates as air is forced against it. Reeds need to be very slightly narrower than the soundboard and initially the same length. The favored material is Mylar®, between 0.01 in. and 0.04 in. thick, but I've also used flat sections of plastic yogurt and takeout containers that are the same thickness as my Japanese pull saws. With the right saw/reed combination, you can jam a reed or reeds into the saw slot. Otherwise you'll need the sort of rubber infill block (shown on the left in the photo above) used on commercial reeds to fill a wider slot.



Drill a hole just deep enough to accept the soundboard tenon.



The stopper needs to fit tightly into the barrel. Sanding to refine the fit is more accurate than turning. Use a sanding stick inside the barrel.



When you can jam the stopper shoulder tight up against the barrel, the fit is right; check every few seconds until you get there.

The Barrel

The barrel blank you see here is $2\frac{3}{4}$ in. (70mm) long, $1\frac{1}{2}$ in. (40mm) diameter, and the other end of the stopper you just created. A barrel for a commercial stopper is made in the same way but likely to be slightly longer.

1 Turn the barrel blank to a cylinder and mount the blank in a chuck, with the end that adjoined the stopper projecting. Drill a hole the same diameter as the stopper soundboard tenon, here $\frac{3}{4}$ in. (20mm). It needs to be about $\frac{1}{16}$ in. (1.5mm) deeper than the length of the reed section. Be sure to chamfer the endgrain inward so it'll fit flush against the stopper.

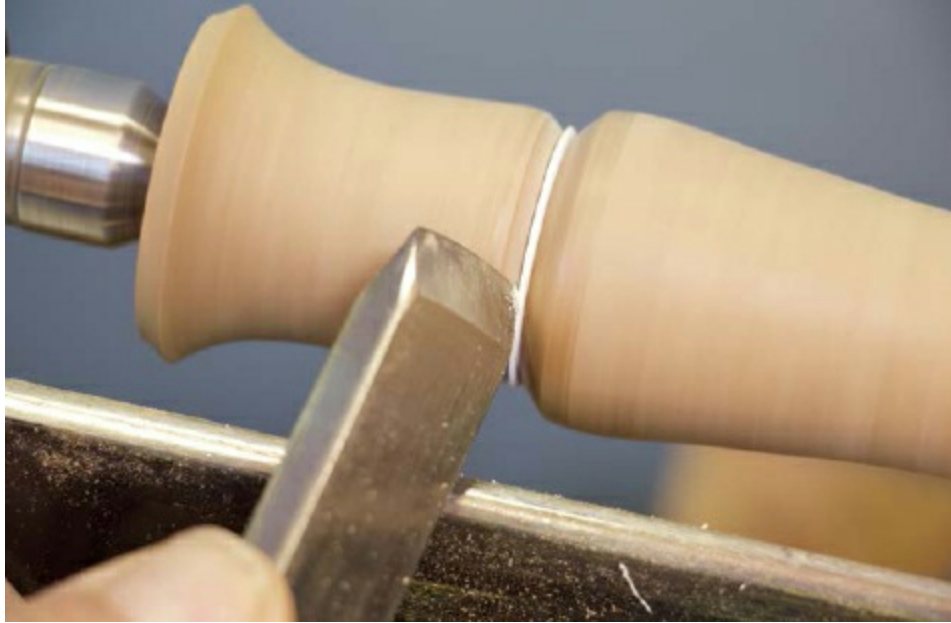
2 Check that the stopper fits tightly into the barrel. If you kept the cylindrical portion slightly fat in Step 2 in the stopper section (p. 143) it won't fit, which is what you want. Enlarge the hole using 120-grit abrasive wrapped around a dowel, and check the fit every few seconds until you can jam the stopper shoulder tight up against the barrel. Turn the lathe off to test the fit and rotate the parts against each other to create a burnish mark that will highlight any high or low spots. If you need to refine the shape of the stopper, you can pop it back in a chuck and use abrasive. When the stopper fits tightly into the barrel, reverse the barrel in the chuck.



To refine the shape of the stopper place it back in a chuck and use abrasive.

3 With the barrel reversed in the chuck, true the end and drill yet another hole. This one can be anywhere between $\frac{3}{8}$ in. and $\frac{5}{16}$ in. (10mm and 16mm). Then, because it is not easy to get to later, smooth and shape the end, bearing in mind that this is the end you'll blow into. It needs to be user-friendly.

4 Assemble the two parts, and mount them between cones so you can complete the profile. The joint is best detailed with a bead or beads, or a groove, which is essentially what you have between two beads. It's difficult to get the groove exactly where you need it as you chamfer either side, so insert a turnable washer. Then you can turn matching shoulders that look and *feel* fine once the washer is removed. This washer was cut from thick plastic in which I drilled a $\frac{3}{4}$ -in. (20mm) hole. The shape you turn is up to you. As usual, I opt for simple rather than smother this short spindle with beads and coves, but if that's your preference, do it. But remember that more is not always better.



When detailing where the two parts join, insert a turnable washer to make accurate detailing much easier.



Polish the call mounted on the lathe between conical centers.

5 Sand and apply your finish of choice. As always, I used beeswax, but you might prefer something shinier.

Turning a duck call is the easy bit. Now you have to learn to imitate your chosen duck. Luckily there are a lot of hunters on the Internet keen to show you how to do that.



Game calls are a great way to use up small blanks that are too small for most projects.

CHAPTER

17 SET OF PLATES

My first turning project was a clutch of tool handles, each turned to be slightly different so they were easier to identify among the shavings. For my second project I set out to turn myself sets of identical dinner and side plates; these varied thanks to sundry catches and my ineptitude, but they have now been in daily use for nearly 45 years.

Plate Design

Most commercially produced dinner plates, be they ceramic, plastic, glass, or metal, are around 10 in. to 12 in. (255mm to 305mm) in diameter and about 1 in. (25mm) high. A plate this size won't overwhelm a standard table, and it'll hold more food than any of us need in a day. The base, which bears the part that holds the food, will typically be half to two-thirds the diameter of the plate.



If you want to turn a set of matching plates, concentrate on repetitive actions. Don't change the way you do things mid-batch—it will probably show. Have as few measuring tools and things to measure as possible and pay particular attention to key points, like height, that can be compared side by side.



Plates are a great way to use up odd squares of flashy grain too thin for bowls or dishes. I enjoy using these plates day to day, particularly the figured claret ash (front right), which many people might not use for fear of spoiling the grain. This plate looks ever better with age and use.

You must be able to pick up a plate from a flat surface, so your fingers need to be able to get under the rim. You don't want the rim to be too thin because when the plate is dropped (an inevitability) it will eventually break.

I like a plate with a bit of weight to it. I don't want it to feel as though it was stamped or molded in plywood rather than turned from a decent bit of solid wood. Consequently, my dinner plates always felt best when the base was about $\frac{1}{2}$ in. to $\frac{5}{8}$ in. (13mm to 16mm) thick. Side plates come out of $\frac{3}{4}$ -in. (20mm) boards, so are much thinner, at around $\frac{3}{8}$ in. (10mm).

Finish

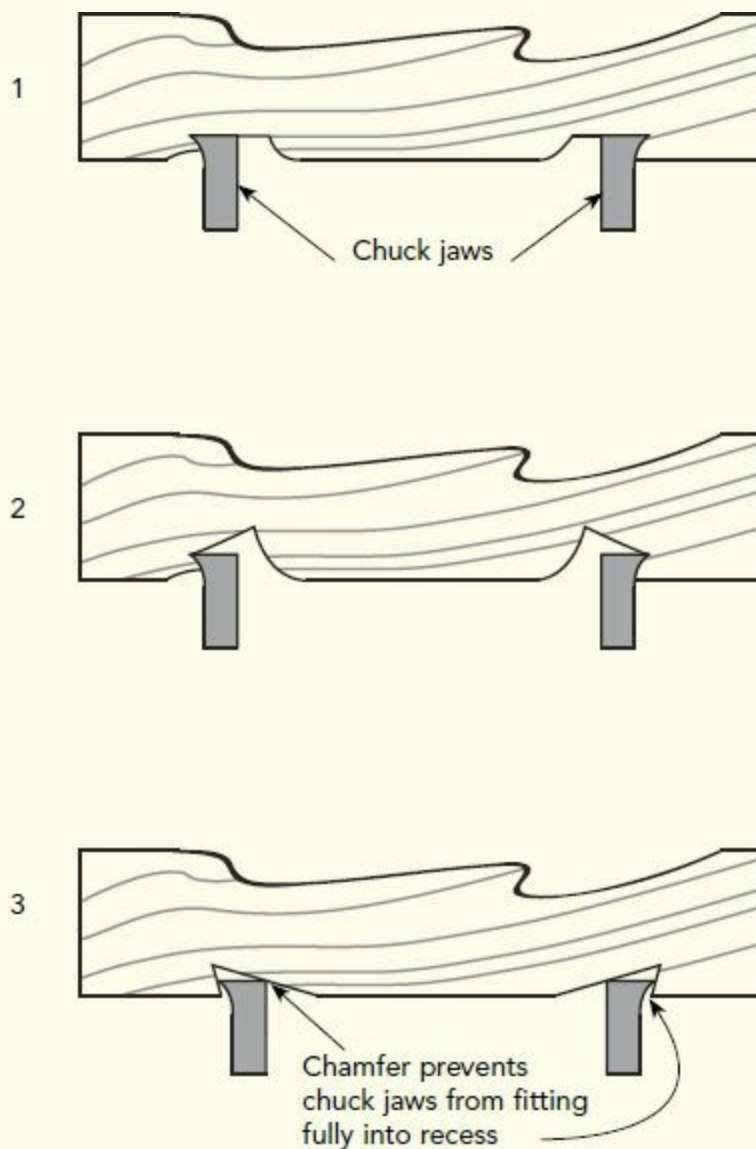
I turn bowls and plates intending them to be used, so they are finished with oil and beeswax on the lathe. I've used boiled linseed oil, walnut oil, macadamia nut oil, and orange oil, each with a layer of soft beeswax on top for retail situations. Oil is sufficient if going straight into use. It's a finish that comes off once a plate is washed. I don't put wood in the dishwasher. Plates in daily use, like those in the photo above, develop a somewhat bleached look that comes from regular washing. These plates are hand washed and left to drain as you would any cutting board. I never use a hard sealer, as these soon wear away or are broken by inevitable knife cuts and look terrible.

Cutting the Blanks

Plates need to stay flat. Imagine sawing your way through a tough steak or brick-like pastry on a plate that wobbles enough to flick peas into your host's beer, your lap, or the jaws of a slavering hound. Your blanks need to be seasoned, and of a wood known for its stability, like ash, maple, or cherry. I've had few problems with these timbers no matter how the grain was aligned within a board, but ideally the plate blanks should be from quartersawn boards to ensure they stay flat. On the end of a quartersawn board the growth rings will lie at near 90 degrees to the wide faces and parallel to the sides.

Turning a Recess for Expanding Chuck Jaws

If using expanding jaws is your only option, the recess for the jaws is best turned flat, as in Figure 1. If the recess is chamfered inward, as in Figure 2, the depth to which you can hollow the inside is compromised. If the base of the recess is chamfered outward, as in Figure 3, the chuck jaws are unable to fit fully into the recess.



Chucking Options

There are a couple of ways plates can be made. The fastest is to flatten and sand smooth one face of a board on which you lay out the plates using dividers or a compass. Dividers score a cleaner line that is better defined than any pencil in a compass can manage and the point never breaks. Drill a hole at center (marked by the compass point) for a screw chuck. Before the advent of modern woodturning chucks I made all plates this way, using a 6-in. (150mm) faceplate with a #14 wood screw projecting $\frac{1}{2}$ in. (13mm) at center. The hole was plugged with plastic wood, as was usual at that time, and that was concealed at point of sale by a maintenance or price label.

Since the advent of self-centering 4-jaw woodturning chucks I make plates in two, and occasionally three, steps. First I turn the profile (the underside) with a small beaded foot that fits a set of wide dovetail jaws. The foot lifts the form both physically and visually off the table, making it easier to pick up. Once sanded and finished, the plate is gripped by the foot for hollowing. And when hollowed and sanded, that's it—unless you want to remove the foot or adjust the proportions, in which case you'd reverse the plate in another chuck.

There are two sound reasons not to use standard jaws expanding within a recess in the base. First, by making a recess in the base the plate will be thicker than is desirable, or it will be too thin over the recess. Second, the smaller diameter of the grip makes the task of completing the inside needlessly more difficult, particularly if there is not much wood above the jaws when the hollowing is almost done.



When truing the blank, start with the top face.



Measure the height of the plate from the top face, then remove the waste with a gouge to create a flat face on the base. Here you see a $\frac{3}{8}$ -in. (10mm) deep-fluted bowl gouge, but a $\frac{1}{2}$ -in. (13mm) spindle gouge is just as effective.

Turning a Plate

1 Mount the blank on a screw chuck, with what will be the top of the plate against the screw chuck. Use disks to shorten the effective length of the screw to about $\frac{1}{2}$ in. (13mm), as in the left photo above. If you're using a screw accessory in standard jaws, it will pay to turn a ring to surround the chuck jaws, and so widen the chuck face in contact with the blank.

Begin by truing the upper rim of the blank, easing in the wing of a bowl or spindle gouge rolled over about 45 degrees. Then use the same gouge to true and shear cut the side using the nose of the tool to cut in from either face.

As you true the side, use calipers to set the required diameter. Then mark the thickness of the plate, measuring from the trued upper face, and turn a flat base on that line (still visible on the rim of the base in the right photo above); initially use the wing of the gouge, mirroring the cut in the left photo above, but finish with shear cuts (with the bevel rubbing the wood).



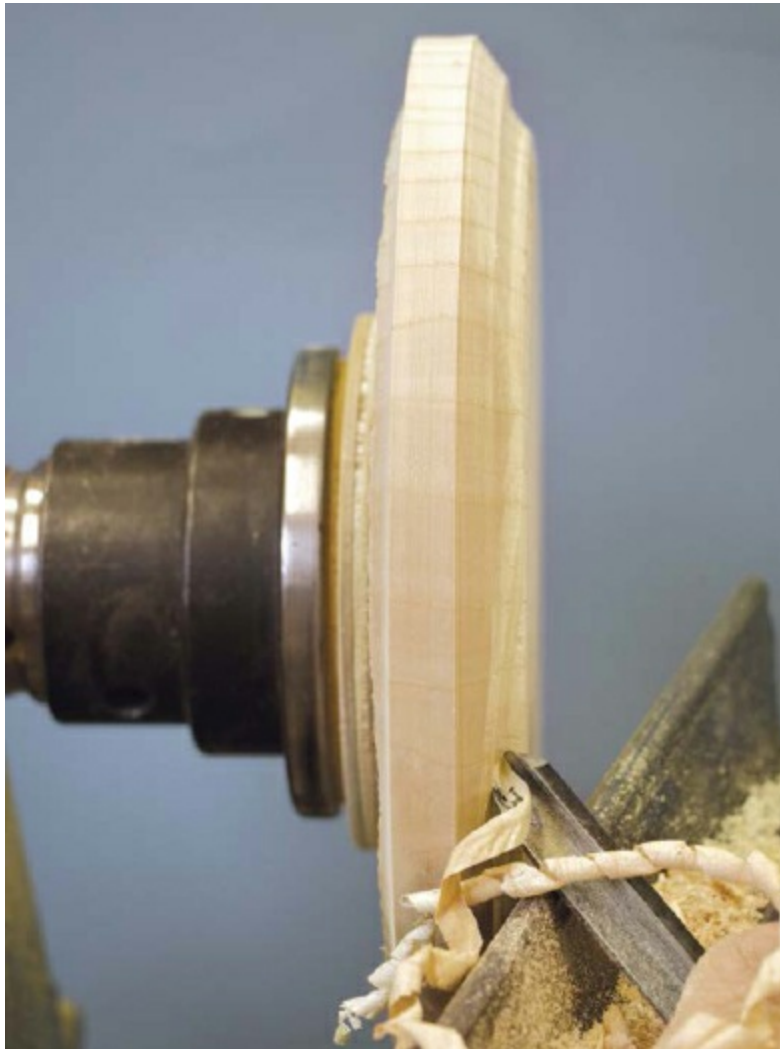
Lay out the diameter for the chuck. Gripping around a foot with the multipurpose jaws is far more secure than expanding jaws within the smaller circle.

2

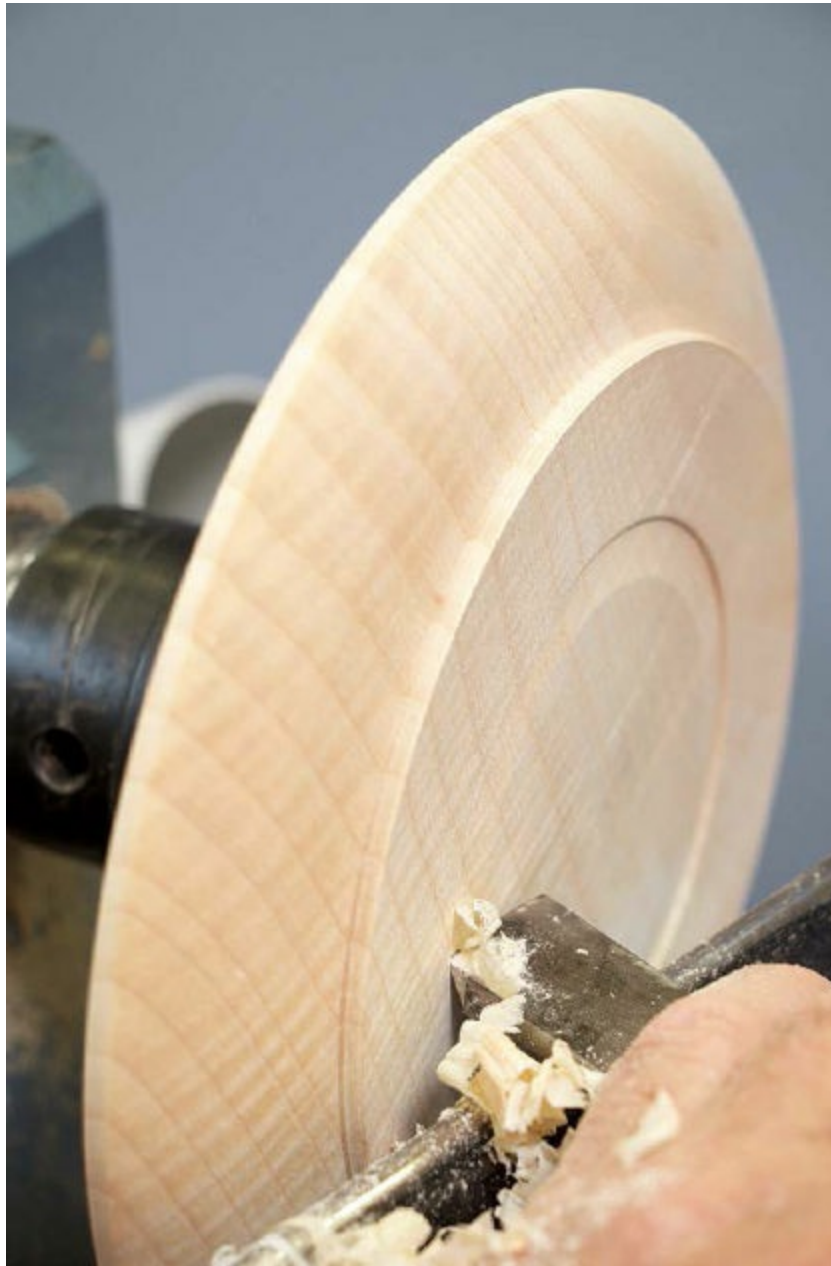
When the base is flat, lay out the diameter for the chuck. Here I'll use 6-in. (150mm) dovetail jaws to enclose the foot; this is preferable to expanding smaller jaws within a recess. If you use expanding jaws, a depth of $\frac{1}{8}$ in. is more than deep enough for dovetail jaws, but make sure the bottom is flat (using a small straightedge; see p. 122), to ensure the jaws fit snugly into the corner of the recess.

3

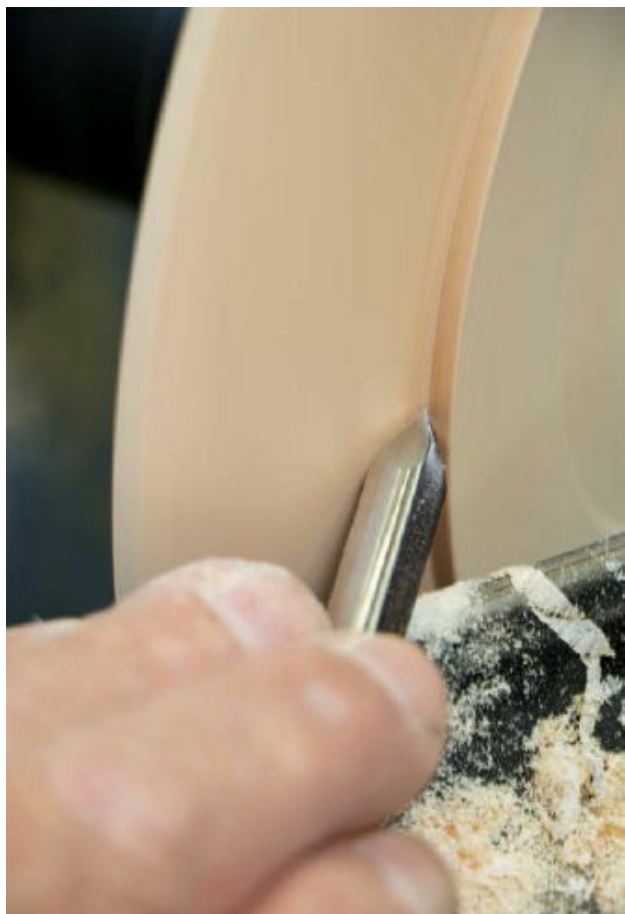
Cut straight in on the line marking the chuck diameter to establish the diameter of the foot, then turn the profile (from the top of the foot), removing the bulk of the waste with a gouge before finishing with either a skewed or square-end scraper.



Turn the plate profile before attending to the base.



Make the base slightly concave. Now is the time to add any decorative detail, but take care to keep it shallow so you don't compromise the depth to which you can hollow the other side.



Round over the foot using a $\frac{3}{8}$ -in. (10mm) detail or spindle gouge.



Sand and polish the base of the plate. I sand plates to 320 grit, finishing with a rotary sander to eliminate concentric sanding marks.

4

Use a skewed shear scraper to turn the base very slightly concave so the plate will sit flat on its rim. To add some basic detail, simply ease the corner of the scraper into the wood.

5

Complete the foot by rounding it to a bead. First ease the nose of a $\frac{3}{8}$ -in. (10mm) spindle gouge into the corner at the top of the foot. Keep the tool on its side so the right wing doesn't catch on the foot. Then round over the rim of the foot using the left wing of the same gouge for a delicate shear scrape.

6

Sand and finish the profile and base of the plate.



Using scrap that's equal in thickness to the proposed thickness of the plate, set the drill depth.



Drilling two depth holes will help you achieve a flat surface across the center of each plate.

7 Use a drill press to drill depth holes into the top of the plate so you have a guide as to how deep to hollow. The surest way not to drill too deep is to set the drill depth using some scrap that's equal in thickness to the proposed thickness of the plate. Then drill a couple of holes, one further from center than the other.

8 Hollow the plate using either bowl gouges or scrapers. I tend to rough out with a $\frac{3}{8}$ -in. bowl gouge and finish with scrapers for greater control of the shape. With silica-impregnated woods that blunt tools in seconds, I use scrapers for roughing rather than shorten my more expensive gouges.

When refining the inside shape, first turn to the bottom of the depth holes. This should produce a flat surface across the center and you can check for this with a small straightedge. On curved surfaces I tend to trust my sense of

touch to achieve smooth curves, then I check by assessing the evenness of the shadow cast by the straightedge.

Alternatively, turn the lathe off, then hold a strip of stiff plastic or paper to your curve. Mark points of contact between spaces, then hold a soft pencil to these as you spin the job by hand. Now turn away the lines, treating them like the burnish marks.

This plate has an undercut inner rim so it can be re-chucked if required, either to modify the foot or for refurbishing years down the track. To undercut the rim I use a $\frac{3}{4}$ -in. (19mm) skew chisel flat on the rest as a negative-rake scraper, making use of the bevel side to cut the inner lip of the plate rim while the edge cuts the inner curve.





Hollow the plate first with a gouge, then when the depth holes are almost gone, complete the inside using a scraper with a slightly radiused edge.



You can check flat or curved portions with a homemade straightedge.



To undercut the rim I use a skew chisel as a scraper, using both the edge and bevel side to cut the wood.

Make a Multi-Straightedge

A multi-straightedge, a useful tool for checking curves and flat recesses, is easy to make. Cut a scrap of hardwood, plywood, or MDF so each side is a different length. Sand these straight on a disk or belt sander.



I find small square plates particularly useful and they're in constant use.

9

Sand and finish. And that completes the plate unless you want to remove the foot, in which case reverse the plate on the jaws, with the jaws expanding inside and against the rim detail.



If you don't like the idea of square corners whizzing around on the lathe and the possibility of hurting yourself, gluing on waste blocks (which you remove later) makes the turning a lot safer.

Squarish Plates

A 6-in. (150mm) round plate barely accommodates a piece of toast, whereas a 6-in. square plate does so with ease. Square and parallelogram plates are made following the same procedure as for round plates.

A square blank whirring on the lathe makes for an exciting turning experience, but it's easy to catch a finger as the corners swing round. That's painful and often bloody. You soon learn to keep your fingers on your side of the tool rest, but it's safer to glue on waste blocks, so you turn the square or rectangle within a disk. When gluing up waste blocks, make sure the joined edges are straight and flat and use a good quality wood adhesive. To find the center of a squared plate within the waste blocks, draw the diagonals corner to corner on the plate blank and then drill for the screw chuck where the lines intersect. After you've glued on the waste blocks cut the blank round on a bandsaw.

Square-rimmed plates look best when the edge is an even thickness. This is easy to check if you're turning a naked square (devoid of waste blocks). If you have waste blocks, remember that any bumps on your otherwise smooth curves show up as an undulating rim and there's not much you can do about them once the waste is cut away. Check your curves carefully using the straightedge, as in the photo on p. 157, and look for an evenly curved shadow cast by the straightedge.



I find precisely squared plates rather boring, so sand them freehand. Don't worry if each side is slightly different.

When the turning and finishing is done, break or cut the waste clear and finish the edges on a sander. I consider a truly square plate more than a trifle boring, so I shape the edges so from above they appear curved. In fact they are straight off a disk sander and flat in one plane, having been presented to the sander at an angle. The edges can be chamfered with precision, but I like a bit of asymmetry, so each side of my “square” plates tend to vary slightly in length.



I had hoped to retain book-matched grain, but that vanished as the surfaces were dished. These plates are 8-in. by 6-in. (200mm by 150mm) New Guinea rosewood.



These 10-in.- (250mm-) square celery-top pine dinner plates have been in daily use for thirty years.



Plates ranging from 6 in. to 10 in. (150mm to 250mm) in diameter. Several have been used daily for 45 years, and most for over twenty years.

CHAPTER

18 LADLES

I find it handy to keep scoops or ladles in every kitchen storage jar. There are small ones in the spices, midsize ones in the tea and coffee caddies, and larger versions in the rice and flour. Hidden away and ready for use is much better than having them out on display, always in sight and rarely appreciated. Each trusty ladle lies in wait ready for me to renew my acquaintance with its curves and details as I measure out the flour, dried fruit, cereal, rice, or whatever. Why bother with an unattractive mass-produced plastic or metal equivalent?

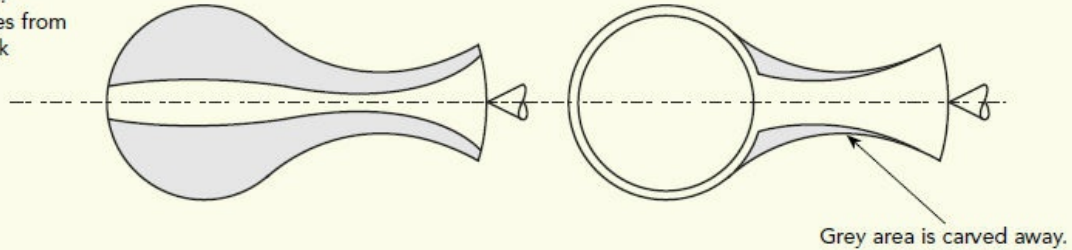


Ladles are a neat little project that starts with some centerwork, then has some facework, and finally some carving.

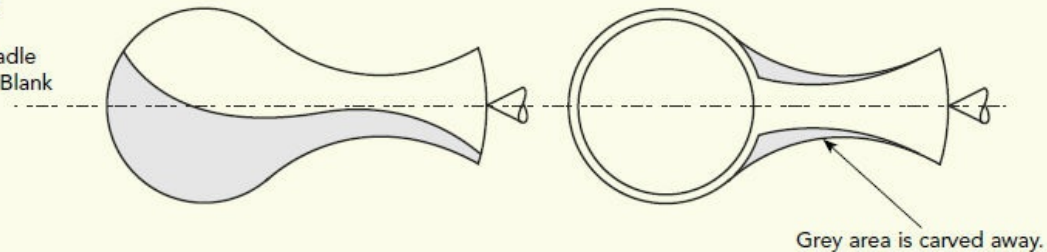
I always enjoy that these ladles look laboriously carved, when in fact they are the result of a few minutes of turning and even less time sanding. As a production item, a professional craft turner should be able to knock out at least fourteen an hour. They sell readily on their own or as part of a bowl-and-scoop set.

CUTTING LADLES

Side view:
Two Ladles from
One Blank



Side view:
A Single
Dipping Ladle
from One Blank



Start with a blank between centers, turning a sphere with a handle. This is cut in half lengthwise to make two scoop blanks, then each hemisphere is hollowed to form a ladle bowl. Or you can cut one dipping ladle (the lower ladle in the drawing above) from a blank. Finally, a bit of carving refines the handle. You can see how the ladles lie within a blank in the drawing.

The first stage can be turned faster and with less waste between centers, but here I turned the blank in a chuck so the spherical end is more apparent and easier to measure. Turners who do long runs of something like this develop the useful knack of being able to turn a pretty good sphere by eye. The rest of us use templates made by drilling a hole in a bit of scrapwood or plywood, which is then cut in half.

You can use just about any straight-grained wood for ladles. A green branch about 2 in. (50mm) in diameter is ideal, provided it isn't split. Green-turned ladle bowls tend to go oval, so the final ladle looks anything but turned. The bowl of this ladle is 1½ in. (40mm), turned to fit my Vicmarc chuck Shark Jaws, as you can see in the bottom photo on p. 164; a gauge

ensures the spheres are the right diameter for the chuck, and therefore the jaws barely mark the wood.

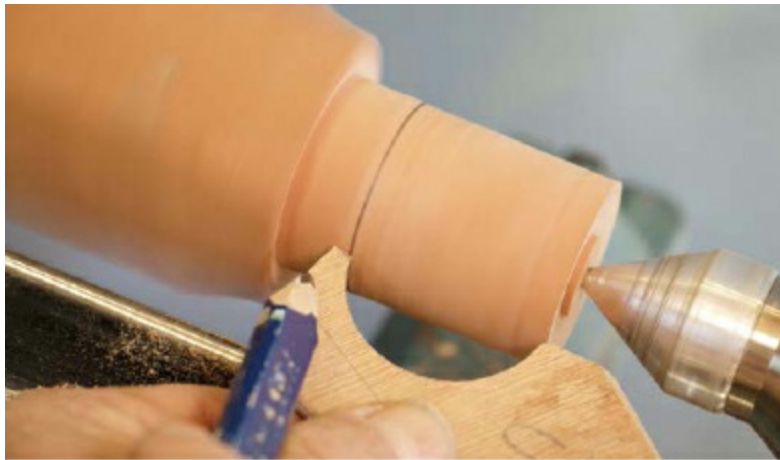


Use a gauge to turn a cylinder the same diameter as your chuck jaws.

Turn a Ladle

1 Turn the blank to size using a gouge or skew chisel and a gauge that matches the diameter of your chuck. You can run a 2-in. (50mm) blank at 1,600 to 1,800 rpm, but, as always, start slower if you have variable speed.

2 Mark the diameter as a length, measuring back from the end grain. Part in no more than one-third the diameter, then mark the center of the cylinder with a pencil.



True the end, mark off a length equal to the diameter of the blank, and part in on that line about $\frac{1}{4}$ in. (6mm).



Turn the end to a hemisphere.

3

Turn the sphere using a skew chisel or gouge. Cut away from the centerline, checking roundness as you go.

4

Develop the handle, ensuring a curve links the sphere and handle. This is essential for strength when it comes to detailing the handle. If turning between centers, retain a square portion of the blank for support when you cut the piece lengthwise on a bandsaw. Sand the spindle.



Turn the handle with a curve joining the sphere. If turning between centers, retain a square portion of the original blank.



Cut the blank lengthwise on the bandsaw.



Drill a depth hole in each hemisphere.



Remove one jaw from your chuck so you can grip the ladle bowl.



Then cut off the squared end.

5 Cut the sphere and handle in half lengthwise. You should never attempt to cut anything round using a powered circular saw (tablesaw, drop saw, skill saw, etc.), but here you can use a bandsaw fitted with a fine blade of four or more teeth per inch. You should also retain a square portion of the original blank for support, then cut this away once the spindle is split.

6 Drill a depth hole in the center of each hemisphere using a standard bit in a drill press. Set the depth stop to leave $\frac{1}{8}$ in. (3mm) of thickness in the base.

7 Remove one jaw from your chuck so you can grip the hemisphere for hollowing. Before you switch on the lathe, lock the rest in position, making sure it's clear of the ladle handle. After that, keep your fingers on the tailstock side of the rest.

An alternative is to make a jam chuck, as in the top left photo on the facing page. The gap for the handle is half a $\frac{5}{8}$ -in. (16mm) hole drilled into the center of a square blank and near its end. The square was then mounted in a chuck and turned to a cylinder before being hollowed for the ladle. You might need to carve away the inner lip of the handle opening to accommodate the scoop. The ladle is not as secure in a jam chuck as in the mechanical, but it's less likely to mark the wood. However marks are easily sanded away, so I'd go for the security of the mechanical.



As an alternative, make a wooden chuck.

It can help to mark the wall thickness before you start hollowing. The best tool for removing the bulk of the waste is a ¼-in. (6mm) deep-fluted bowl gouge with rounded wings and a steep bevel on the right wing. Start the gouge right on its side and aim for a clean cut across the end grain, which means to at least halfway down.

After that, use an asymmetric round-nose scraper, going very gently so you don't heave the scoop out of the chuck. Try not to scrape the upper half of the bowl, as this usually roughs up the end grain; it's always best to shear cut end grain with a gouge.



Mark the wall thickness, then hollow the bowl using a $\frac{1}{4}$ -in. (6mm) bowl gouge.



Next, use a round-nose scraper gently.

8 Sand the inside of the bowl with the rest lowered but still guarding your fingers from the whirring handle.

9 Refine the handle using a combination of sanding and chip carving. Begin by shaping the top of the handle and bowl, then carve the sides of the handle to narrow it where it comes into the bowl. A small carver's knife is ideal for finer detailing. For strength, remember to retain the original curve from the handle into the bowl on the underside.



Keep the rest in place while you sand the bowl. Make sure to keep your fingers behind the rest.



Refine the shape of the handle by sanding and chip carving.



Although the 2-in.-(50mm-) diameter bowl was hollowed as above, the turned handle indicates this was the only ladle from the blank.

CHAPTER

19 HANDLED BOWLS

In this project you have two bowls emerging from one turned form, not unlike the ladles in the previous chapter. The bowls could be a matching pair or they could have completely different handles. This project involves some large spindlework as you turn a spherical form with handles between centers. This is split in half lengthwise to create a pair of half-turned hemispherical bowl blanks. Each half will be remounted a couple of times before you refine the handles to complete the bowls. The largest I've made is 8 in. (200mm) wide and a foot long, but I suggest you work through this basic example before moving on to variations.



Left to right: Ash and pin oak handled bowls, both with a wingspan of about 8 in. (200mm).

The blank for this pair of bowls should be slightly over 4 in. (100mm)

square by 8 in. (200mm) long. The grain runs the length of the blank. This can be a single lump, although a better option is to glue two pieces together. This is mostly because thinner material is easier to come by, but also because it will make the initial turning easier to split accurately into two halves. So the joint is easier to spot, I have ash on one side and oak on the other. Glue the two pieces together using wood glue and enclose a sheet of newsprint or absorbent paper in the joint.



Draw a circle on each end grain to ensure the blank is mounted precisely.

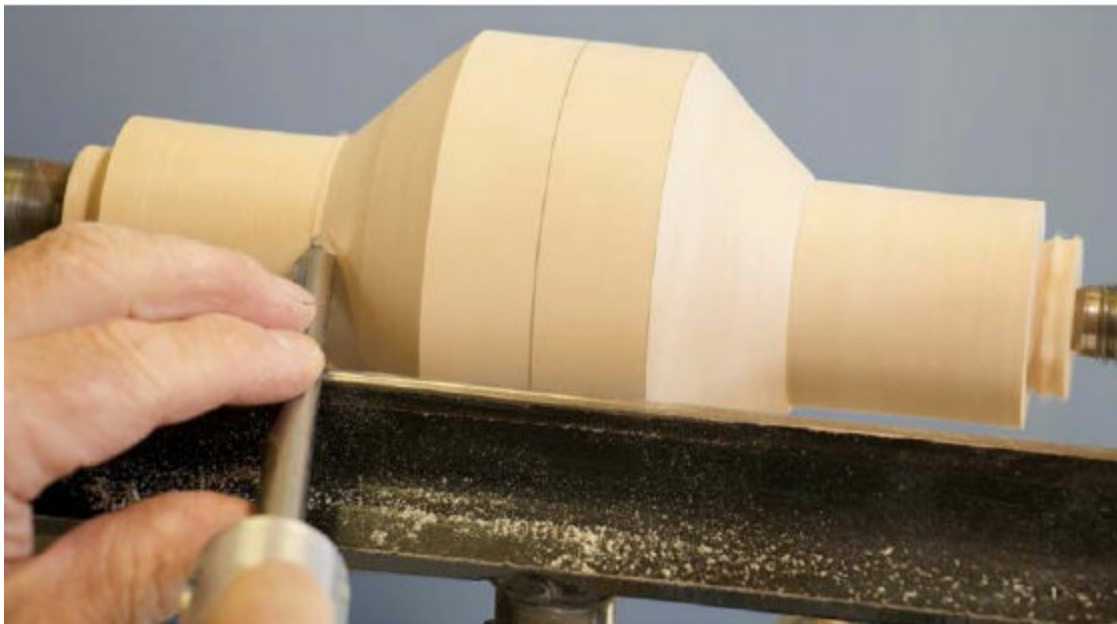


Use a skew chisel to turn an accurate cylinder.

1 Mount the blank between centers, ensuring that the drive and tail centers are in the center of the glue line. Check by holding a pencil against the end grain as you rotate the blank by hand. Turn a 4-in. (200mm) cylinder. I'm using a 4-in. (100mm) gauge to ensure an accurate cylinder.

2 Mark off an 8-in. (200mm) length in the middle of the blank and part in at right angles to the lathe axis to define that length. Next divide the 8 in. into four equal parts and reduce the diameter of each end to 2 in. (50mm). In the top photo on the facing page the handles are sized and the central portion is divided into four equal parts in preparation for turning a sphere between the handles. The spindle gouge is poised to cut the first of the facets; you can see them completed in the middle photo on the facing page.

3 Turn away the waste between the outer lines and the top corner where the handles meet the emerging sphere. Then round over the corners, working away from the centerline and checking the curve as you go. To create a spherical surface right to the handles, you'll need to increase the length of the handles. See how to turn a large sphere gauge on p. 170.



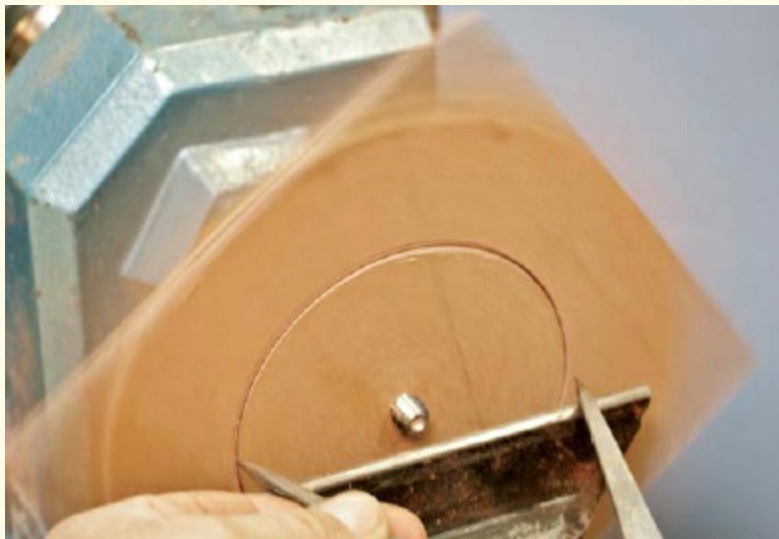
Divide the center section into four equal parts and reduce the diameter of each end.



Turn a sphere between the two handles.

Turn a Gauge for Spheres

Mount a square of scrap plywood or MDF on a screw chuck and lay out the required diameter. Then use a $\frac{3}{8}$ -in. (10mm) fingernail-ground gouge to cut through the plywood. As you cut through, the outer ring will usually end up spinning on your gouge. Cut this in half to use as a gauge. Burnish marks will indicate high points on the spheres you are working on.



Lay out the required gauge diameter on a square of scrap plywood or MDF.



A $\frac{3}{8}$ -in. (10mm) fingernail-ground gouge cuts through the plywood.



A gauge held against spinning wood will burnish high spots.

4

Check the length of the handles, and adjust as necessary. A $\frac{3}{8}$ -in. (10mm) fingernail-ground gouge is the safest tool to use across the end grain, being least likely to catch while cutting cleanly.

5

Shape matching handles. An advantage of laminating the blank is that you get a better idea of the thickness of each handle than when turning a solid blank.

6

Sand the spindle. Heavy sanding removed the slight bulge on the upper left of the sphere.



When the sphere is turned, check that the handles match.



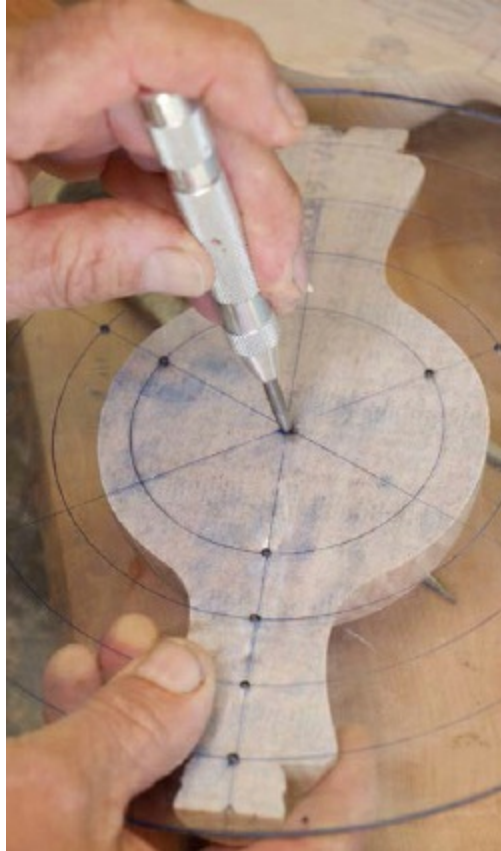
Finish shaping the handles using a gouge.



Trim the end grain as needed.



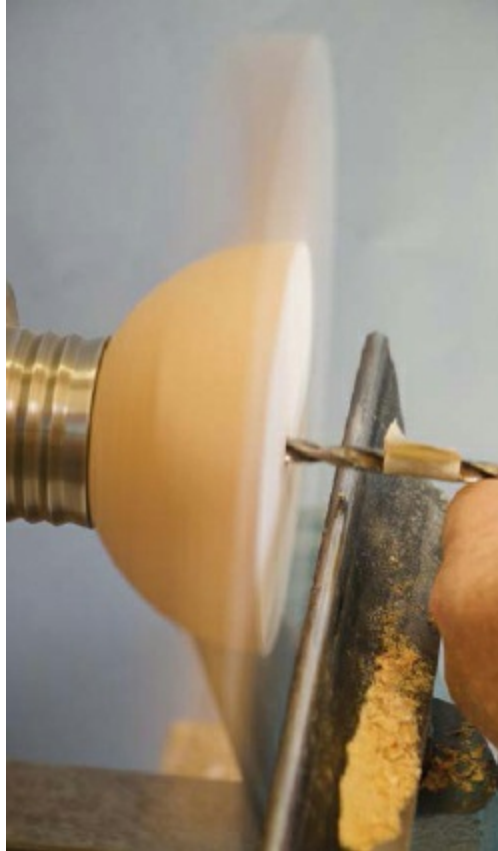
Sand the form before splitting the blank. Finish is applied later.



If you don't have a vacuum chuck (as I don't), use a template to find center and mark for drilling a hole for a screw chuck.



Mount the half bowl on a screw chuck and turn a small foot so you can remount the bowl for hollowing.



With the bowl mounted in a chuck or vacuum chuck, drill a depth hole in preparation for hollowing.

7 Split the spindle by tapping a chisel into the glueline at one end. A solid blank will need to be mounted in a carrier to be cut on a bandsaw. Never attempt to split a rounded form using any other sort of power saw. If you have a vacuum chuck, you can go straight to Step 9. The rest of us need to find the center of each half. You can do this by eye, scribing circles with dividers or a compass, but a center-finder makes life a lot easier. (You can make one by marking concentric circles on a sheet of clear plastic, drawing a line across the sheet through center, and drilling a small hole at center.) Align the centerline of the center-finder with the cones made by the lathe centers, then use a circle on the center-finder to locate the center on the blank and mark that.

8 Drill a hole at the center of the blank and mount the blank on a screw chuck so you can turn a small foot on the base. For me this is a temporary foot that enables me to grip the bowl for hollowing. I make it as small as I can get

away with, but there is no reason why you shouldn't flatten the base and turn a more refined foot to retain on the finished piece, thereby cutting out Step 12.

9

Mount the blank for hollowing. Here I'm using $1\frac{3}{8}$ -in. (35mm) Vicmarc Shark Jaws to grip the $\frac{1}{16}$ -in.- (1.5mm-) high foot. Drill a depth hole so you'll end up with a base $\frac{1}{4}$ in. (6mm) thick. The handles whirring around are an obvious hazard, so position the rest before switching on the lathe and make sure you keep your fingers on the tailstock side of the rest.



True the face using a $\frac{3}{8}$ -in. (10mm) bowl gouge, working in from about halfway up the handle.



Hollow the bowl to the line you marked, initially using a bowl gouge.



Mark the width of the rim.

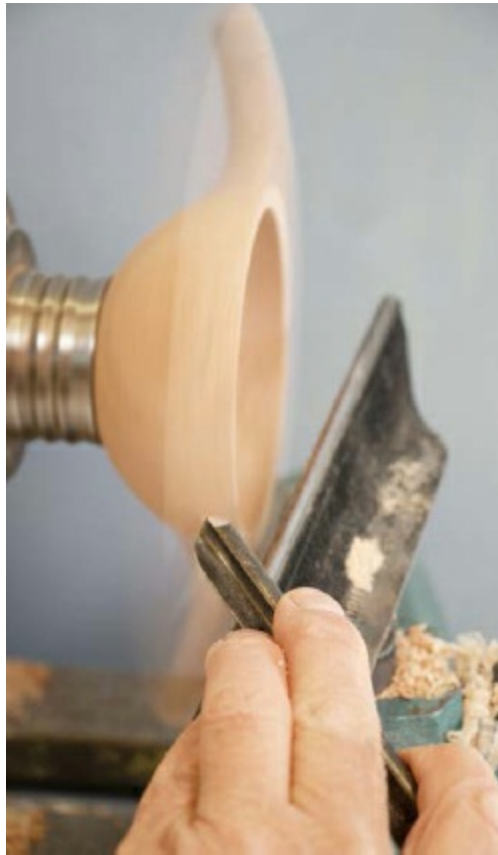


I prefer to hollow the bottom half using just a small portion of the edge of a large scraper.

Begin hollowing about halfway up the handle, to establish the bowl rim and a smooth surface on which to mark the rim width. With a pencil, mark the rim. This is a safety measure more applicable to less spherical bowls where it's easy to end up with bowl sides that are too thin. Then use a deep-fluted bowl gouge to hollow the form and cut cleanly at least two-thirds of the way down the inner wall. A $\frac{3}{8}$ -in. (10mm) gouge is ideal. Anything smaller is too flexible once you're cutting more than 1 in. (25mm) from the rest; anything larger reduces your feel for the cut as it enters the wood. It's easy to go in too hard and heave the bowl off the chuck, usually splitting away the foot.

I rarely use a gouge all the way to center, feeling I have more control of the

shape when I use as big a scraper as I can get in the space. When cutting an internal curve, I use a scraper whose radius is slightly tighter than the curve I'm cutting. I try never to use a scraper near the rim of any bowl, as catches are a constant risk, especially when the scraper is flat on the rest. You can use a scraper on its side to shear scrape, but by far the best option for the two sections of end grain is a clean shear cut using a gouge. Don't forget that, with the handles, you need to stop the lathe to check the wall thickness.



To safely turn the handles, shear scrape using the wing of a gouge (the gouge must be on its side to avoid a severe catch).



Or use a shear scraper tilted on edge (and never flat on the rest).



Sand the handles with the lathe off. Off the lathe on a sander is a much safer option than turning.

10 Turn the handles. If this looks a bit scary, that's because it is. The good news is that the handles can be sanded or carved with the lathe off (see the right photo above), or even off the lathe. To turn the tops of the handles you need a delicate touch, as there's not much wood spinning around. I remove the bulk of the waste using the left wing of a $\frac{3}{8}$ -in. (10mm) deep-fluted bowl gouge, which must be rolled over at least 45 degrees to avoid a severe catch. Refine the surface using a shear scraper on its edge. Never use a scraper flat on the rest in this situation or something similar like a natural-edge bowl rim.

11 Sand the inside and the handles. The handles are best power-sanded with the lathe turned off.

12 Mount the bowl over a jam chuck (as shown in the top right on p. 133 and in the top right photo on p. 98) so you can remove the foot and finish the base. Use the tailcenter to ensure the bowl stays on the chuck. Here

I use a flat center rather than a cone so the center doesn't penetrate the wood. This base remains rounded, but near flat at center so it won't roll over. All the turning can be done using a $\frac{3}{8}$ -in. (10mm) spindle gouge (my favorite detailing tool). Initially pull cuts remove the bulk of the waste and develop the curve, then after sanding all you can reach, take a shear cut toward center, leaving a miniscule supporting nub that can be sanded away off the lathe.

Alternatively you can use a skewed scraper flat on the rest.



To refine and finish the base, mount the bowl over a jam chuck with tailcenter support. Use a $\frac{3}{8}$ -in. (10mm) spindle or detail gouge to remove the foot.



Remove the final nub using the nose of the spindle or detail gouge. As the lathe slows to a stop, a small shove with the gouge will shear the nub off the base, leaving you with minimal hand-sanding to finish the job.



Blend any eccentricities with sanding.



You could also use a skewed scraper to remove the foot.



Any further detailing of the handles can be done off the lathe before the bowls are oiled.

13 Refine the handles and clean up the base. A small disk sander on the lathe is ideal for this task.



These bowls have a wingspan of about 8 in. (200mm). Two are redgum, the other camphor laurel.

FINISHING

I prefer a soft wax finish on my turnings to anything hard and glossy that could make the wood look like plastic. Throughout the 45 years of my turning career I've tried numerous finishes, but I always return to a variation of the simple oil and wax finish I was shown on my first day at a lathe back in January 1970. It's extremely quick and easy to apply. And it is easy to refurbish, unlike most commercial sealers, which pose major problems once they start to degrade. The oil and wax mix does not seal the wood permanently, so the only downside is that the surface requires ongoing maintenance. But it's worth the effort, for in a few months the wood develops a deep antique-like glow. Utilitarian wooden bowls, cutting boards, spatulas, and the like that are not oiled or waxed but washed regularly take on a different patina that is no less appealing.



One of my favorite ways to finish a piece is with beeswax and a soft cloth. Never wrap either abrasives or polishing rags around your fingers in case the wood grabs the other end.

Applying the Finish

Once the wood is sanded, I stop the lathe and slop boiled linseed oil onto the wood. The purpose of the oil is to fill the pores in the wood. Unfilled pores on open-grained woods like ash or oak can be seen as small white dots within the annular rings. Wipe away the surplus oil, and then run the lathe at the speed at which you were turning. Surplus oil will spray out, so be sure not to stand in line with the wood. Next, hold a block of beeswax against the spinning wood firmly enough that friction will melt a layer of wax onto the surface. Then melt the wax into the wood by holding a soft cloth against the surface. The wax will grab the cloth initially, so *never* wrap a polishing rag around your fingers in case the other end snags around the spinning wood: You could lose a finger.

As the wax melts into the wood you'll see the wood change color, and in a few seconds you'll have a smooth surface with the surplus wax gathered up by the cloth. Use a cleaner cloth to buff the surface and remove any wax remaining on the surface.

A polishing rag that is stiff with wax will be all you will need on many dense and very close-grained woods. A rag loaded with wax held against the spinning wood polishes it nicely. Cotton T-shirts make excellent polishing rags.

When finishing open burl or another surface with fissures or holes, forget the wax, as that will build up in the gaps and be nearly impossible to remove. Instead, slop oil all over the burl and let it trickle into the gaps for a minute or so. Then switch on the lathe to spin out the surplus oil and buff the wood with a cloth. Don't let boiled linseed oil sit too long before buffing, as within 30 minutes it can become sticky and difficult to handle.

Ongoing Maintenance

The finish on utilitarian bowls, plates, and other stuff that needs washing comes off in detergent and hot water. With use they develop a patina similar to the second and third spatulas from the left in the photo above. These are ash, and just a few months previously were pale and whitish. Now stained from stirring curries, jams, borscht, and sauces at one end, and by my hand at the other, they have the wonderful flat patina of use and are infinitely smoother than when they left my workshop. Use is all the attention they need.



These spatulas are ash, and they have developed the wonderful patina of regular use.

Wood that will remain dry should be polished with commercial furniture wax polish or oil, or boiled linseed oil. The old rule of thumb for polishing furniture was every day for a month, then every week for a year, and every month thereafter, but a glowing patina can emerge with a weekly polishing over five months.

Food-Safe Finishes

As a bowl turner I was always worried about toxic finishes, and for years I used only vegetable or cooking oils. With the rise in nut allergies I tend to avoid the nut oils that I've used in the past.

There are a lot of commercially available finishes marketed as food safe, despite containing volatile compounds. However, it seems that once the volatile compounds in a modern finish have evaporated, that finish is food safe. It's unlikely you'll find lead or mercury in modern finishes, but you should always check the list of contents and read any instructions. But no matter how safe a hard and glossy finish is, I'll not insult my bowls with it and will be sticking with my trusted oil and wax.

HANGING BOWLS

In my 45 years as a bowl turner, I've cut up hundreds of bowls. Cumbersome and other less-than-satisfactory bowls were sawn to bits so I wouldn't be tempted to rescue them from the recycled bags of firewood, and, of course, there were quite a few bowls obnoxious enough to split on me that had to go as well. But I also cut many very good and just-missed bowls in half so I could work out what makes one bowl more satisfying than another. Many of these have been used as teaching aids, including those in the photo below, but most ended up in someone's fireplace—which was a waste, because I could have stuck a back on them and hung them on a wall. I've had a couple on my workshop walls for many years, and they've proven to be incredibly handy to have hanging around for all sorts of stuff.



Hanging bowls around 7 in. (180mm) in diameter. The blue is acrylic paint, the black is ebonized oak.



The original ash bowl was turned with a pointy base and designed to be cut in half.



Bowls aren't the only project that can be repurposed to hang on the wall. These hollow forms also work well—the pencil pot, below, not so much.

Except for the solid wood backboard seen in the lower right of the photo on p. 179, all these bowls have backboards recycled from the veneered plywood back of a set of cheap bookshelves, now defunct.

The blue bowl in the photo on p. 179 was a demonstration bowl of insipid ash, which was never sanded, so a bit of color was a good option. The ebonized oak (top) I considered an excellent bowl, and I used it as a teaching aid for many years until it acquired a backboard for this photo. The rim of the bowl (lower right) angles down about 15 degrees from the backboard, rendering it less secretive and more user-friendly than the other two.

The ash bowl in the photos on the facing page was made to be cut in half and hung on a wall, so the bottom never needed to be flat. The bowl was turned in exactly the same way as the top and bottom sections of the nesting boxes on p. 128, with the small detail near the bottom sized for 4-in.- (100mm-) diameter Vicmarc Shark Jaws to grip.

Rounded bottoms tend to look better, as you can see in the photo above, in which the flat base of the converted pencil pot (center) doesn't look right when compared with the converted hollow forms on either side. Its place is on a bench against a wall. Regarding the bowls on either side, I amputated the narrowing top third of a hollow form and detailed the rims before attaching the two halves to their backboards.

I hope this might tempt you to revisit some of those bowls, deeper turnings, and other design opportunities that end up gathering dust in your workshop.

FURTHER READING

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(The Taunton Press, 2002)

Turning Boxes with Richard Raffan
(The Taunton Press, 2002)

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The Art of Turned Bowls
(The Taunton Press, 2008)

RICHARD RAFFAN DVDs

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(The Taunton Press, 2003)

Turning Projects with Richard Raffan
(The Taunton Press, 2003)

The New Turning Wood with Richard Raffan
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Turning Bowls
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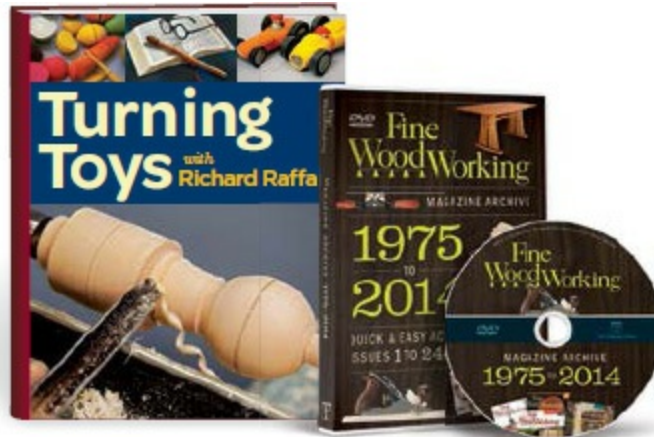


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