



Bench-Chisel Techniques

Used correctly, a simple set of chisels covers all of your chopping and paring needs

BY GARRETT HACK

A few thousand years ago someone clever hammered out a hunk of bronze into a narrow blade, fitted a handle to one end, sharpened the other against a stone and produced a chisel. Generations of craftsmen since have tweaked the design: Tough steel replaced soft bronze, the shape and length of the blade were modified to suit various tasks, but in essence, chisels have not changed much. They are still simple in form and, when used effectively, one of the most useful tools in the shop.

Every week catalogs arrive, full of a dizzying array of different chisels: long, fine-bladed paring chisels; stout mortise chisels; heavy and wide framing chisels; stubby butt chisels; intriguing Japanese chisels; and many sets of bench chisels. Few other classic hand tools are still available in such variety. Unless you work entirely by hand, all you really need is a good set of what I call bench chisels or, as some prefer, firmer chisels. These are chisels with blades about 4 in. to 6 in. long, in a wide range of widths from about ⅛ in. to 2 in. and with a wooden or plastic handle.

The only substantial differences between sets of bench chisels

The most versatile tool in your shop

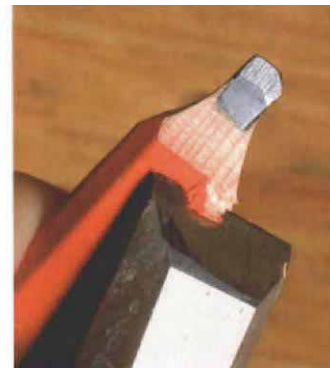
No bench is complete without a chisel. Generations of woodworkers have come up with multiple uses for the chisel far beyond its original purpose. The five photos to the right show a chisel replacing tweezers, a hollow-chisel mortiser, a pencil sharpener, a scraper and a handplane.



Better than tweezers. Perhaps best not done in front of children, removing a splinter with a chisel works faster than tweezers.



Squaring up mortises. When squaring up a machine-made mortise, a block of wood clamped to the workpiece can act as a guide.



Handy pencil sharpener. A test of a chisel's edge is how fine a point you can put on a pencil.

are the quality of the steel (*FWW#139*, pp. 52-57) and the shapes of the blades. The blades on my everyday set of Swedish bench chisels are slightly tapered in length and beveled along the long sides. Tapering the blade yields a tool stout enough for the hard work of chopping a mortise yet light enough to pare one-handed. A blade with flat sides is stronger than one with beveled sides and is less expensive to manufacture. But a beveled blade can reach into tighter places, such as for cutting small dovetails.

Prepare the chisel

As with many other tools, the performance of a chisel is determined by how well it is tuned. The back of the chisel—the un-beveled side—must be dead flat for at least $\frac{3}{4}$ in., and preferably 1 in. to 2 in., behind the cutting edge. This flat plane guides and controls the cut: A curved back will rock and provide little control.

Another common problem is a slight rounding of the cutting edge on the back side. The back might still be flat except for this tiny back-bevel. Sloppy technique, not keeping the back absolutely flat on a sharpening stone while honing, creates this sort of rounding. The result is a chisel that will not cut while resting on its back because the rounded edge is in the air. A chisel with a rounded edge must be angled forward slightly, thus losing the back as a source of control. Flattening the back of a bench chisel right to the cutting edge is tedious but important. Work through the range of grits until you get a bright polish on your finest stone.

Once you have flattened the back, choose a cutting bevel angle based on the type of work you do. The finer the bevel, the more easily the tool slices through wood fibers. A fine bevel, 15° to 20° , is a little delicate, but it works for a chisel reserved for light paring cuts in softwoods. To chop tough end grain, a stouter 30° to 35° bevel would hold up better. For everyday bench work I aim for a 25° bevel whose width is about twice the thickness of the chisel. This is a compromise between ease of cutting and the durability of the edge.

Lightly hollow-grinding the bevel every three to four sharpenings speeds the honing process by reducing the area of steel in contact with the stone. I use a grooved block of wood that holds the chisel handle, set at a distance from the wheel to achieve the desired bevel angle. I then hone the edge on a medium India stone and a fine black Arkansas stone using kerosene as a lubricant. I try



Clean up glue squeeze-out.

A scraper works best for large areas, but for small areas a chisel offers more control.



Paring pegs. A chisel with a flat back offers more control than a plane and is neater than a sander when leveling a pin.

HONING A CHISEL



First flatten the tool's back. At least the first $\frac{3}{4}$ in., and preferably the first 1 in. to 2 in., of the chisel's back should be perfectly flat. The back guides and controls the cut and ensures a fine edge.



Grind and hone. After hollow-grinding a 25° bevel on the grinder, the author hones the bevel on a medium and then a fine oilstone. The author guides the chisel freehand, but a honing guide can help until you master the technique.



Ready to cut. The tuned chisel should be flat on the back and have a narrow band of honed steel along the cutting edge, with a slightly concave ground surface just behind. If you can leave a clean cut on pine end grain, your chisel is ready for action.

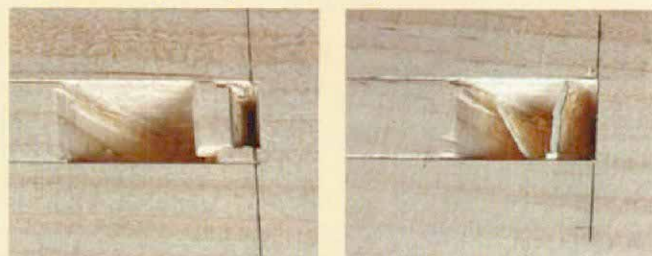


VERTICAL CHOPPING AND PARING



The right angle for chopping. With experience you will be able to hold the chisel at the correct angle merely by sighting across and down it (left). A square set on end acts as a guide when squaring up the end of a mortise (right).

Lighten up as you near your mark



Particularly in softwood, chopping too much waste at once makes the bevel push the chisel back over the line (left). It is better to take small cuts (right) and sneak up to the line.

to hone at a consistent 25° bevel with little or no microbevel along the cutting edge. The only exception is when I need a slightly tougher cutting edge for an extremely hard wood, such as rosewood, where I raise the tool handle to hone a microbevel of 30°. For a final strop I use some 0- to 2-micron diamond paste smeared on a piece of Baltic birch plywood. I prefer this to a leather strop, which being softer and more uneven, increases the risk of rounding over the bevel.

How to tell if your chisel is sharp

It's worth repeating that a chisel must be very sharp to work well. A dull edge takes far more power to drive through the fibers and, more importantly, is harder to control. Everyone has a special way to test the sharpness of an edge: dragging it against a fingernail, shaving arm hair or plucking the edge with a finger. The problem is that these tests are all a bit subjective.

I test the sharpness of a chisel by paring a block of end-grain white pine and then looking at both the shaving and the cut surface. Because softwood fibers are weak and easily torn from the surface, only a really sharp edge will cut a thin and whole shaving. Looking at the end grain, ideally it should be uniformly polished. But more likely there will be light flecks in the surface where fibers were torn away, or it will exhibit fine tracks where tiny nicks in the chisel's cutting edge scraped across the wood.

Next lay the chisel with the back flat on one of the long-grain sides of your block. If you can pare a shaving without lifting the chisel, the back and cutting edge are flat. If you have to lift the chisel to get it to cut, the back or cutting edge is rounded.

Proper technique ensures good results

For most of us, the days of working with hand tools alone are long gone. Whereas chisels would once have been our primary tools for cutting all manner of joints, today we typically use them more often to adjust joints cut on a machine.

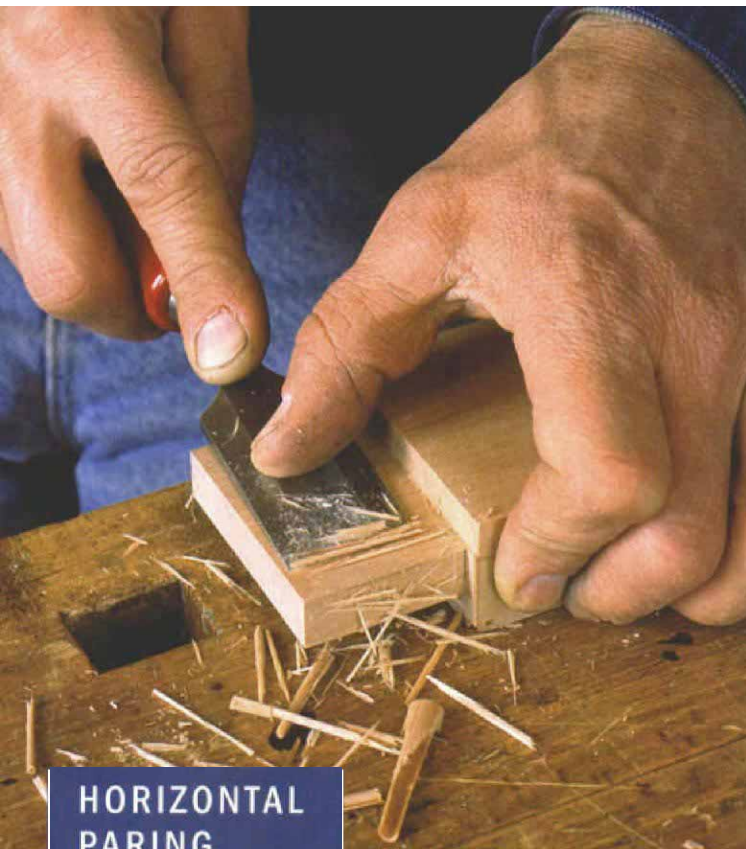
Chiseling tasks can be simplified to chopping, paring or some combination of the two. Cutting end grain, such as excavating a mortise, is chopping. A mallet usually delivers the driving force, so everything works best when you chop vertically, down against your bench, preferably directly over a leg. Paring is often a hand-powered operation, using the chisel horizontally or vertically to slice away a thin shaving. This can be against the end grain or along the grain. I also pare with the chisel in one hand and use my thumb as a lever, much the same way you would use a knife.

Chopping to a line vertically—

Cutting with a chisel held plumb is an acquired skill. Finding the right angle is easiest when you are only slightly above the work and looking across the chisel. Sighting against a square set on end helps, as does good light shining toward the work and you. Holding the chisel plumb



Chop, then pare. Lightly chopping all the way around defines the shoulder of a tenon (left) before a final paring with hand power (above).



HORIZONTAL PARING

When cutting horizontally, the smoothest cuts are made with a slight shearing action, cutting both forward and sideways. The need for a perfectly flat chisel back is apparent when fitting a tenon.

greatly speeds any chopping task. If this is hard for you, or if you have to cut an angled mortise, saw a waste block to this angle and clamp it in place to guide your chisel. For heavy chopping, driving a chisel with a mallet allows you to concentrate all of your efforts on directing the tool.

Light cuts yield more accurate results. Think about the cutting edge

sinking into the wood. The back is trying to guide the chisel plumb while the beveled side of the cutting edge presses the chisel against the back. With a light cut this pressure breaks out the chip and holds the back right to the line. Try to chop too large a chip, especially in softwood, and the pressure will push your chisel beyond your line. Take little bites, waste up to your line, and then take a final light cut right on the line. Because I have a good selection of chisel sizes, I waste as much wood as I can with a chisel narrower than the mortise. The final cut is with a chisel snug in the mortise and right on the line.

Paring to a line vertically—Paring end grain gives you a whole new appreciation for the toughness of wood. Good paring takes both muscle and a feel for controlling the cut. A sharp chisel and a light cut give you the best chance for doing accurate work.

After you have removed the bulk of the waste using a mallet, switch to a light paring cut right on the line. This provides greater accuracy and control and allows you to undercut slightly. Also, it's just plain quicker than reaching for the mallet each time after moving the work. Work around all four sides of a tenon to establish the shoulder line and to give you something to sight against when paring. Position your body above the work for paring the final shav-

ing or two, using the weight of your upper body to drive the chisel and both hands to guide it.

Paring to a line horizontally—Given a choice, I prefer the control of a plane to shave a surface. But there are plenty of times when I don't have the right plane close at hand or when it's simply quicker to pare a few shavings with a chisel. Long and thin-bladed (for flexibility) paring chisels are the tools of choice here, but a well-tuned bench chisel will work almost as well.

For maximum control when paring, I find it's best to have one hand on the chisel handle and the other as close to the work, or cutting edge, as practical. This way you can raise or lower the handle slightly to control the depth of cut, while the hand close to the cutting edge holds the chisel steady and helps guide the cut. This hand also acts as a brake, smoothing out the pressure delivered by the hand on the handle. The smoothest and easiest cuts are made with a slight shearing action, slicing both forward and sideways.

Paring while using the thumb as a lever—Holding the chisel like a penknife or a potato peeler, with the blade cutting toward you, takes some getting used to. Once mastered, this technique allows for fine controlled cuts, even in end grain. I use it to pare the end of a table leg, to shorten a tenon and to chamfer its ends.

Cutting bevel-side down—When paring the bottom of a groove, the flat back of a chisel can no longer be used as a guide, and the natural inclination of the chisel is to dig in. Turn the chisel upside down and use the bevel to guide the cut, raising or lowering the handle to adjust the depth of the cut. This method is useful to deepen a mortise or dado (or shape a curved one) or to smooth the bottom of a recess for an inlay.

As with all tools, there are many paths to accurate and satisfying results. Sharpen a few chisels and practice these basic techniques. Some of them might not feel comfortable at first, but everyday use at your bench is the surest way to master them. □

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DELICATE CUTS

Using the chisel as you would a penknife allows you to make delicate cuts such as slicing end grain or beveling a tenon.