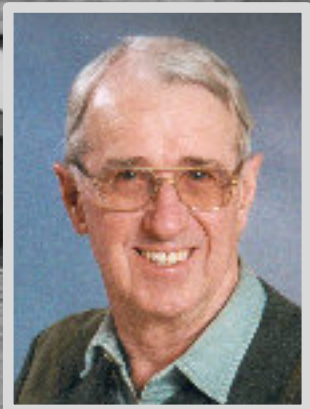




A Woodworker's Notebook

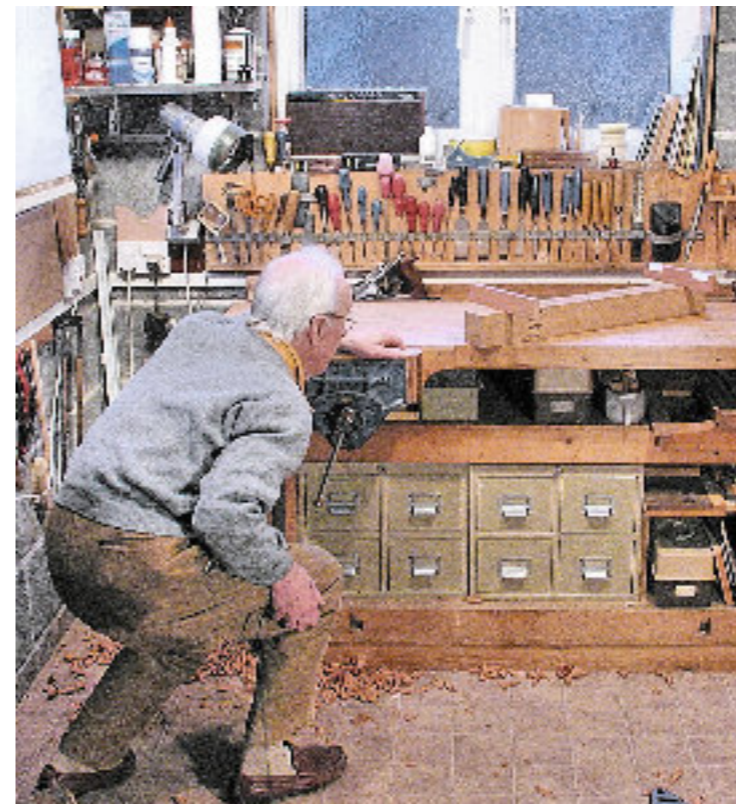


Jeff Gorman

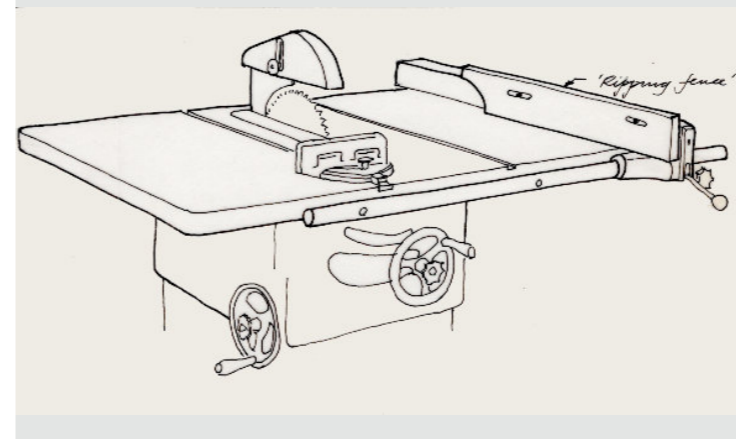


Contents

Sculpting with style2
Carve a Tawny Owl.....6
Now count my fingers10



The website 'A Woodworker's Notebook' is being continued at <https://jeffgorman.uk>



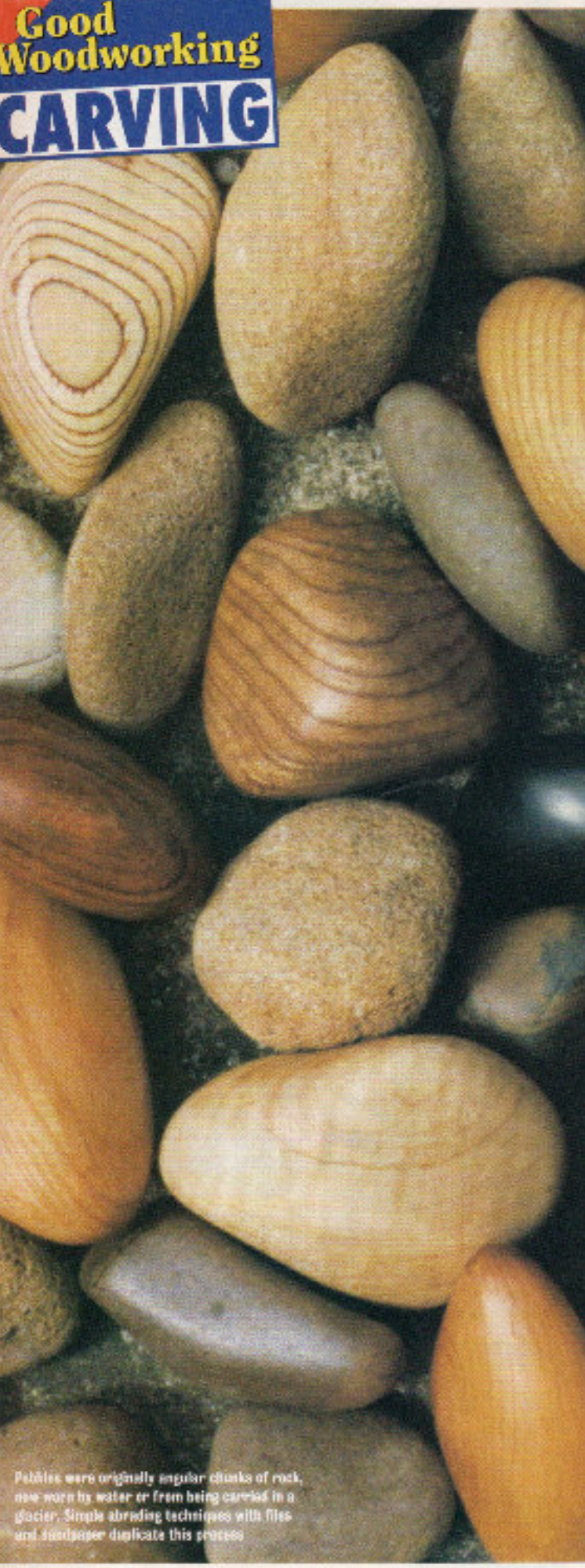
Dad's first articles were published in the 1950s in places such as The Woodworker and the Design Council Magazine. Retirement from education in 1988 coincided with the launch of Good Woodworking, an association that was to last over a quarter of a century. Contributions grew from words of wisdom on the techniques and readers' letters pages to multi-issue features including all the digital photography and draft illustrations. This was a serious matter!

Having never shown much interest in carving, a 1996 editorial meeting inspired him to carve a number of items that are now much admired by visitors to the house: the penguin, wagtail and, of course, the owl.

As these are so popular, the Good Woodworking articles are celebrated here with a bonus article on table saw safety - this was a matter of great concern throughout his professional career and into retirement.

Adam - September 2019





Sculpting with style



Free-form wood sculpting is an excellent way to learn about shape and form for carving. Jeff Gorman suggests carving wooden pebbles before progressing to simple bird shapes

Great oaks from little acorns grow, and so from little pebbles might a 'Wood Sculptor' grow. Some people collect a wide variety of woods, some collect standard sized rectangular samples, and others harvest decorative lathe-turned wooden eggs. Create a display of your own hand-sculpted pebbles and you have something very personal as the same time as learning a technique for understand their form.

Simple carving like this is a perfect use for those offcuts you couldn't bring yourself to discard, and even a suitable exercise for a partner who has been longing to have a go. Once confident with making pebbles, you will be ready to move to something more animate, perhaps in the form of stylised birds.

Get to Know your Subject

First, find your pebble. Have a good look at it. Is one end heavier than the other? If so, make this the base. Is one face flatter than the rest? Make this your face side. Visualise the longest line going through the body of the pebble. Call this your principal axis. Pencil a dot at the places where it starts and ends. For your first efforts, a coat of emulsion paint gives a surface to draw on, and covers any surface features which might throw you when judging the shape. If you want to display wood and stone together, use chalk that can be scrubbed off.

Look along the principal axis, and imagine how the stone would look if sliced at regular intervals along its length, rather like contours

on a map. Try this with the other mathematical axes, at right-angles to the one you have adopted.

Getting Started in Wood

You will need a piece of wood with the grain running along the longest dimension, about 45mm (1 3/4in) longer and a bit wider and thicker than the finished pebble. The extra length is for a temporary spigot used to hold it by. Allow a generous extra width and thickness because the light and air might have darkened the outer few millimetres, leaving irremovable patches on the finished job.

Almost any wood can be used, but avoid material like Jelutong which is too soft and characterless. Avoid, also, resinous or knotty softwoods, with very soft wood between widely spaced annual rings. Seasoned woods such as cherry or laburnum from your own garden will have an extra charm. My personal preference is to avoid mahoganies (especially with stripey grain) and the contrasty sapwood typical of



yew and laburnum. With some timbers, a small knot can add visual interest, but expect small splits radiating from the centre.

Get started by carving wooden pebble



Developing the Shape

If you have a bandsaw, saw the profile and the outline of the spigot. Use a hot-melt glue gun to temporarily stick bandsawn offcuts on again. Turn the job 90° and also draw and saw this outline. Completely remove any hot-melt glue blobs or they will gum up your files.

You know have a squared-up version of the pebble. Look along the stone's principal axis again, and observe the profile at its 'equator', and note its distance from the base. Keeping one eye on the stone and the other on the job, use the float to make a flat hand right round the job, reproducing this profile. Check your judgement with calipers or a profile gauge if you wish. Once satisfied, make a pencil line around the equator and regard it as sacrosanct for the time being.

Falling a proper carvers chop, an engineers vice is suitable for holding this kind of work. If you lack bench space or are managing with a Workmate, one can be fixed with carriage screws to a tee shaped block and gripped in a

woodworkers vice. This raises the working height for the good of your back and makes it easier to get round the job. Unfortunately vibration is a bit of a problem so a permanently mounted vice is preferable. Make wooden fittings faced with cork and leather as intermediates between the metal jaws and the job.

Start work on the final stage of curving the surfaces and forming radii. As the form develops, file with a combined forwards and twisting movement. As soon as you can, draw guidelines corresponding to the ridge lines drawn on the pebble, retouching them as you get closer to the final shape.

Talk to yourself. Say things like "A bit flatter here" or "It ought to turn quicker a third of the length from the end". Use words and phrases like shorter radius, flatter, bit of a bump, high or low places, crests and ridges, shallow or deep slope. Do not concentrate on just one part and keep turning the work. Think of the job as a volume, not an assembly of surfaces. Also, turn the work to retain a comfortable working posture. Remember which is the face side and which the face edge, since

with some shapes, it is easy to get lost and work on the wrong face.

You will find that the tool cuts more sweetly and pleasantly when filing in a certain direction. Think of wood as fibres



glued together which respond in the same way as a cat's fur when stroked. Stroke with the grain and a smooth finish will result.

Once the form is developed, change to a half-round file. If the teeth steer the file, or you get chatter marks, slightly change its direction and press less hard. Use the edge to shape more and more of the base by cutting into the spigot as far as you dare.

Refining the Shape

Much sandpaper work consists of removing the scratches left by the previous stage, so take care not to start with too coarse a grade; 60 or 80 grit is probably about right. At each stage use new paper, not

TIP Use a file cleaning card to clean floats and files during use and before putting them away. Some timbers can corrode the teeth while the files lie unused. Always fit a handle to a file or a sudden jam may embed the tang in your palm.

some holding scruffy old scrap. Use a suitably softened support. The standard cork block (cork rubber) is dimensioned to take one-sixth of a standard sized sheet of sand paper, and its length matches the width of abrasives sold in rolls.

TOOLS YOU WILL NEED

Floats have 10 to 14 deeply cut teeth to the inch right across the file. They actually plane fine shavings, rather than tearing deep grooves in the way that rasps do. A 250mm flat float will serve but, for concave forms, a half round version will be invaluable. They are sold as milled tooth files, Filemasters or Dreadnoughts. After the float, use a new 200mm half round bastard file, and keep it only for wood. There is little point in using finer ones.

I have seen Sandvik Filemaster flat and half-round floats in Homebase stores at about £10. 10in milled tooth files are obtainable by mail order from Electromail (☎ 01536 201555). File cleaning brushes are available from Tilgear (☎ 01707 873434), Electromall or APTC (☎ 01297 33656)



Copy the face-side's outline onto the wood, keeping your eye dead above the profile



A bench holdfast will hold the awkwardly shaped wood while shaping the spigot



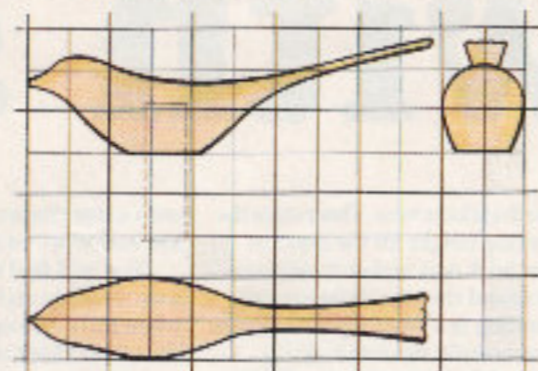
Remove most of the waste with a tenon saw, holding the wood in the carver's chops



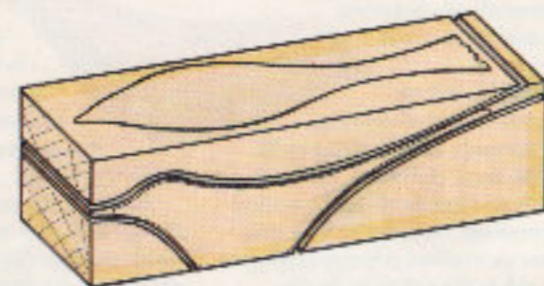
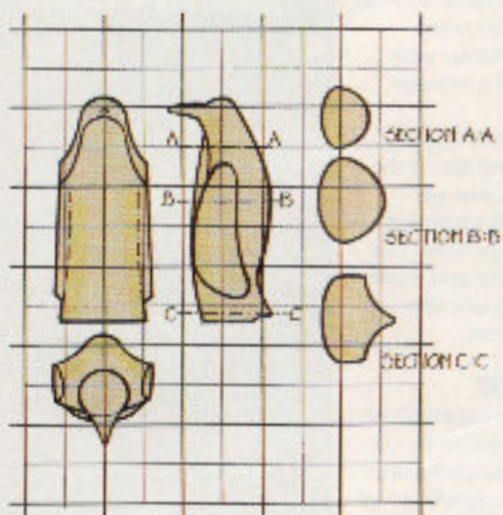
Re-draw surface turning-points as the pebble starts to take shape

Carve a Wagtail and a Penguin

Allow extra wood for a spigot on the penguin. Bandsaw the profile, or use a round Surform file. The beak will be short-grained so take care around this area.



Original grids were 20x20mm square



A stylised version of a wagtail in English oak. The tail is slender, so make sure the grain runs parallel to the tail or it will break.



Choosing a subject

Avoid subjects with fragile bits like long beaks and long spindly legs. To get the grain in its strongest direction, these need to be fitted separately. There are some ways of using metal to represent thin legs and fine claws but, in selecting your early models, avoid these challenges. Providing your work does not attempt to be too realistic, it is surprising what is acceptable. I have never heard any comment about the absence of legs and feet on the carving of the bird perched on a log.

Likewise, avoid things like squirrels' tails. These are light and airy things that, when carved in wood, tend to look solid and well, ... er, ... wooden.

Some timbers, boxwood for example, can be blackened by black silicon carbide papers.

Parting-off the Work

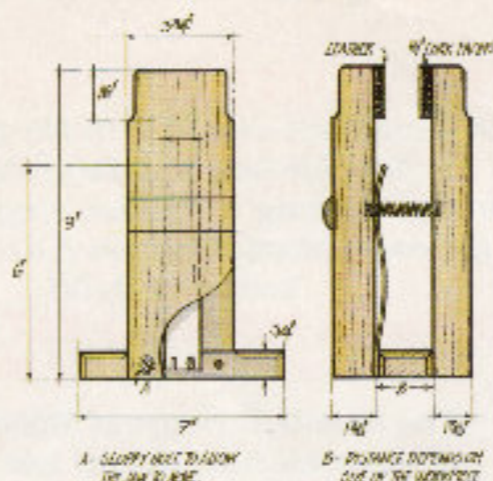
When most of the surface has been finished it is time to cut the umbilicus using a fine saw. Make sure that you do not create a flat where a curve should be.

You will now need to work freehand, when you will discover just how slippery the smoothed shape can be. Once the job has been taken out of the vice you can make smoothing a sitting-down job. An apron will keep off the dust and prevent the pebble skittling over the floor as you file and sandpaper the base. Damp hands might raise the grain, so wet, dry, and re-sand the surface a few times as a precaution.

Finish with Brasso, Duraglit or similar. Car paint-cutting compounds will serve, but check on an offcut that they do not discolour the work. You will be able to apply extra pressure if

Make a Set of Carver's Chops

Shop-made carver's chops can be made to fit a conventional workbench vice or Workmate. While not as convenient as the real thing, they are good for a woodworker's back. The main drawback is the free jaw's limited range of movement and the need to keep several spacers to accommodate jobs of differing sizes. Maybe a worn-out handpoint saw can provide the steel for the flat spring? The main plate of the saw will be half-hard steel that is best used using an abrasive cutting disc.



liquid abrasives are rubbed into the rough surface of a piece of leather mounted on the edge of a wooden block.

A wipe of linseed oil will bring out the colour. Let it soak in for a few minutes then wipe away the surplus. You now have a highly polished wooden pebble with no artificial film between you and the wood. Do not spoil it with varnish or even French polish.

Carve a Stylised Bird

Once you have become good at straightforward pebbling, you will be ready for more complex shapes, such as stylised bird forms, that avoid fine detail yet describe the main features of the subject.

Take care when sawing the Wagtail's tail since, being slender, it is not very strong. If you do not fancy your chances with a coping saw, drill a series of holes around the profile using a drill stand or a drill press and then join them together with a coping saw.

The penguin can be cut longer,

as before, to provide a gripping area, but the wagtail will need a different approach. Bore a hole in the bottom for a piece of 18mm dowel, going as deep as you dare without breaking through the upper profile; a Forstner bit is best. Cut the dowel to about 75mm long, make a sawcut down its length for the air to escape and glue in place. Hold this in a pair of carver's chops or a vice to allow all round access to the workpiece that can easily be adjusted.

Apart from forming concave surfaces, the work should be little different from pebble shaping. Using the dowel, keep re-arranging the job for the most comfortable working angle for efficient tool control. Saw off the dowel when finished, and cover the base with a piece of thin leather, furry side outwards. Alternatively, keep the dowel and show your little sculpture perched on a small log. Make sure that the dowel is completely hidden. I, for one, hate to see things, especially carved fish shapes, that appear to be perched on a stick penetrating a sensitive part of their anatomy.

Jargon Busting

Sandpaper Not used any more, and glass is becoming superseded by garnet, aluminium oxide and silicon carbide. The term has stuck as a convenient shorthand for coated abrasives.

Drate size The size of the smallest imaginary rectangular box that will contain something.

Form A word used instead of 'shape' in order to describe three dimensional qualities.

Profile gauge An assembly of small gauge metal or plastic rods that when pressed against a profile take up the shape.

Pick up a Penguin Take another step forwards in technique with the penguin, which I carved in bug oak. At the risk of breaching 'artistic correctness', one approach, from which you should wean yourself as soon as possible, might be to copy an existing carving or model. It is one way to get used to handling more complicated shapes. As a training in making artistic decisions, simplify detailed

features. Don't hesitate to measure and use calipers to copy exactly. Apart from the small radius curves under the wings, I think you should be able to work most of this with the half-round float and file. A fairly coarse round file sharpens up the wing curves.

The grain of this model will run vertically of course, so the beak will be made of rather short, and therefore weak, grain. Leave some extra wood in this area when roughing out and file gently here. In the event of a mishap, think how blessed are the glue-makers. Without a bandsaw or a bow saw, it will be less possible to saw one profile and then hot-melt glue the offcuts in place. The sideways view is the most complex so trace and cut to this outline first, then use the dimensions to roughly indicate the front view.

Working from Photographs

You progress higher in the scale of difficulty working from 'life' or an image. For a start, there is nothing to get your hands on. If you are good at drawing and have a live model, get weaving and draw and draw until you think you understand the model's shape.

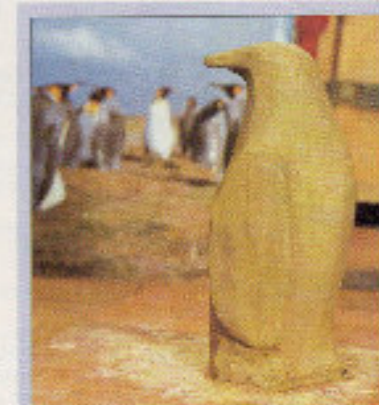
Few penguins visit my garden,

so I had to make do with pictures in a book. It had a variety of views, but bird books are written mainly to help people identify birds and generally fail to show more than conventional sideways views. Study the shadows carefully to discover their three-dimensional aspects.

If you can take your own photos, so much the better. Start with familiar things like the dog or cat in repose. What about the children's hamster or tortoise? Our long-departed guinea pig could be relied upon to do nothing at all for long periods.

Make a top and two side views. If the subject will let you, get close enough to obtain a decent sized print, but not so close that the perspective distorts. Assuming the creature will tolerate it, don't forget the value of your hands in examining a shape. Nature videos might be a useful source, especially

since the movement might let you have an all-round view of your subject.



Make a clay model

A clay or plasticine model is a great help when working from two-dimensional sources. Wood is not a suitable material for experimenting with. With clay, you can play until the form is right, then concentrate on the technical problems of translating this into wood. Use plasticine if you have enough.

The support for the penguin was simply a 3in dowel. Other subjects might need a wire 'armature' to support vulnerable parts of its anatomy. Sculptors buy aluminium wire, but almost anything should serve, including soft iron

wire (from a florist's supplier), copper wire salvaged from heavy gauge cable, or chicken wire.

Once engrained in a wooden surface, clay can be the devil to remove, so keep it in a plastic bag and pinch out the clay as needed.

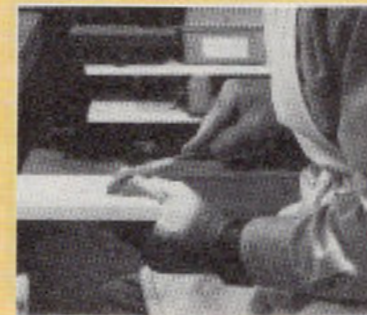
Apply egg-sized lumps to the armature until the cross-section is a little less than the wood you intend to use. Build up the height higher than necessary and pinch and tease the head into shape. Use a bit of extra pressure with a finger to displace the clay, and a lighter pressure to scrape the surface. Lolly sticks and the like work more precisely, but don't be too finicky. This is just a model to establish the basic form before carving. Don't forget that shapes made with clay tools may not be possible in wood.

Cover the model between sessions with a plastic bag, flared and weighted down to the baseboard. When you are happy, it is a matter of straightforward copying. To measure from the model, draw light vertical lines in the clay on the front and side, and measure from these points. Get the main features 'right' and you'll get along well.

Finishing the pebble shape with files and sandpaper



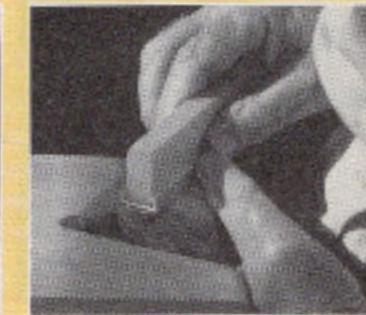
Move the work around in the chops to provide the best cutting angles.



A V-notched beard fixed in the vice or chops makes a useful rest when smoothing.



Keep one eye on the stone and imagine this. Compare both by feeling with your hands.



Finish off with sandpaper on a block. Work your way through the grits for a fine finish.

Carve a Tawny Owl



After showing how to carve simple shapes with files and abrasives last month, Jeff Gorman moves onto the use of gouges in order to add surface detail to a carving of a tawny owl

Last month, I wrote about shaping wooden pebbles as a way of learning how to understand a three-dimensional shape. Then I used examples of a wagtail and a penguin to explain some more technique and discussed ways of progressing your sculpting. Now is the time to describe how to use carving gouges to reach those parts that files cannot reach and, for those who lack freehand drawing skills, to try a novel way of making your own accurately sized drawings from a still-life model.

I have included detail drawings so that if you wish, you can copy my owl, but instead of giving instructions for chipping by numbers, I really want to tell you

how I set about it, the idea being to help people who want to break free from this kind of drawing, to fly solo and do their own thing. (Please note that the drawings are a compromise between what is observable from the model and what was carved).

Design Decisions

Rather than try to re-create the exact likeness of a bird, I have attempted to make a wooden carving based on the subject; one that celebrates the qualities of the wood yet tries to communicate the cruelty within a beautiful creature.

I used a stuffed owl as a subject. I was lucky to be able to borrow this from a local school, where it is still used as a model for the children to draw. A request to a local museum may be likely to gain permission to draw or photograph and even let you penetrate those intriguing doors marked 'Private' to use some of their reserve stock.



Several things brought me to select this subject. By perching the owl on the end of a log, the taxidermist had already solved the problem of how the carving could be supported and, as an owl's legs look thick, there are no

problems with spindly legs. Since it is easier to grip in the vice, I changed the round post to a rectangular one. Some wood is left un-carved to ensure that the carving is strongly connected to the base and, to prevent it toppling over, the height of the post is fixed with the tail feathers touching the surface. Finally, a chunk of 4x4in olive wood suited the colouring of the owl.

Proper Carving

In the last issue, I showed how to



Stuffed birds are a fine way of observing nature without it moving too much

Some might think that all this messing about with files is hardly 'proper carving'. Proper carving is done with round mallets and sharp gouges, isn't it? Well, as far as my owl is concerned, some deep hollow areas have to be excavated and features such as the wings and tail feathers have to be modelled. The time for proper carving has arrived.

I don't think that a blow-by-blow account of gouge cuts will be all that helpful, especially since I am trying to lead you to becoming your own master, but some general principles will launch you on your way.

Whatever the job in hand, just as sportsmen concentrate on the ball in a game, concentrate on the behaviour of the wood just ahead of the cutting edge at the tip of the tool. I have found that it is very easy to think I am watching what I'm doing - until a disaster reveals that I wasn't concentrating on the place that really matters, but just bashing away.

Gouge Obedience Training

If you have previously tried carving gouges, the first thing you might have learnt is that they can sometimes be damned uncooperative. They can slip and jump and, when they land, they cut just where you don't want them to.

One form of control when working up to a definite limit is to make a downwards cut across the grain very near the stopping point. You can then work gradually and watch the chip detach itself at the required point without over-running or splintering further ahead of the tool than you want. Another way

of approaching a feature where you have to stop dead is to shimmy, or use a gentle side-to-side wiggling of the handle to gently creep forwards while maintaining control.

Part of gouge control, of course, is the balance between the pushing hand and the controlling hand, (which of course is always behind the edge, isn't it?). The cutting action can be improved if, with a twist of the wrist, you use a rotary/slicing motion at the same time as you push forwards.

A further method for right-handers, to stop the gouge from going too far, is to hold it so that the fingers of the left hand lie at right-angles to, and across the underside of the shaft at such a distance that,

Translating the Shape

Experienced carvers can chop away at their block of wood and gradually rough out the basic form 'by eye'. If you are not yet at this stage, you might like to follow the way I made my five-eighths scale copy of the owl. You may find the procedure a bit elaborate but, then again, you might like to have a go.

If you have ever tried drawing the view from a window by drawing on the window pane itself with your eye kept still, you will have rendered a geometrically accurate, but smaller, perspective drawing of the view. If, on the other hand, you had moved your eye so that your marker touched the glass where a line between the object and your eye was at 90° to the pane, you would have produced an orthographic projection called an 'elevation'.

To draw a still-life model, use a light coloured Chinagraph pencil or an overhead projection pen on perspex or glass. I have not found felt tips to be very suitable. The first photo shows the set-up for making your first mark. Continue moving your head, taking your eye around the model's profile until you have a series of dots indicating the profile. The profile finished, pick out the important surface features, mark their salient lines, and join the dots. I suggest that you do try fairly hard to obtain clear Perspex sheet. Glass will serve but it is more difficult to apply pressure confidently, with there always a fear of a fracture. If you do use it, make the edges safe by slightly rounding the sharp arrises with an oilstone or diamond hone. Perspex is expensive in full sheet form, and the best bet might be to approach a signmaker for offcuts.

Trace the outline and surface detail onto a Perspex sheet. Note that a line from my eye to the pencil point is at 90° to the sheet. With your face towards the light, align the reflection of your right eye on the outline of the model, and make a mark exactly over your eye's image



Set the perspex so that the light shines into one of its edges. Mount tracing paper over the marks. Shade the paper with the free hand, but not covering the perspex edge. Light guided from the edge will cause the chinagraph marks to glow enough to be seen through the tracing paper



A shaded lamp will provide sufficient light. Notice the shade between the lamp and the paper. The edge of the Perspex is not covered. Of course, if you are really good at drawing, you can dispense with a crutch such as this



Once the carving is under way, you will need to mark some of the surface detail, perhaps on the wings. Squint through the outline traced from your scaled drawing to see where the carving has to be re-marked



Various methods of using a carving gouge



For some work you need only hold the gouge by the blade. The right hand rests on the work as do the backs of the fingers of the left hand



Most control is gained applying cutting pressure from just the hand. Resting the left arm on the work helps the wrist keep control

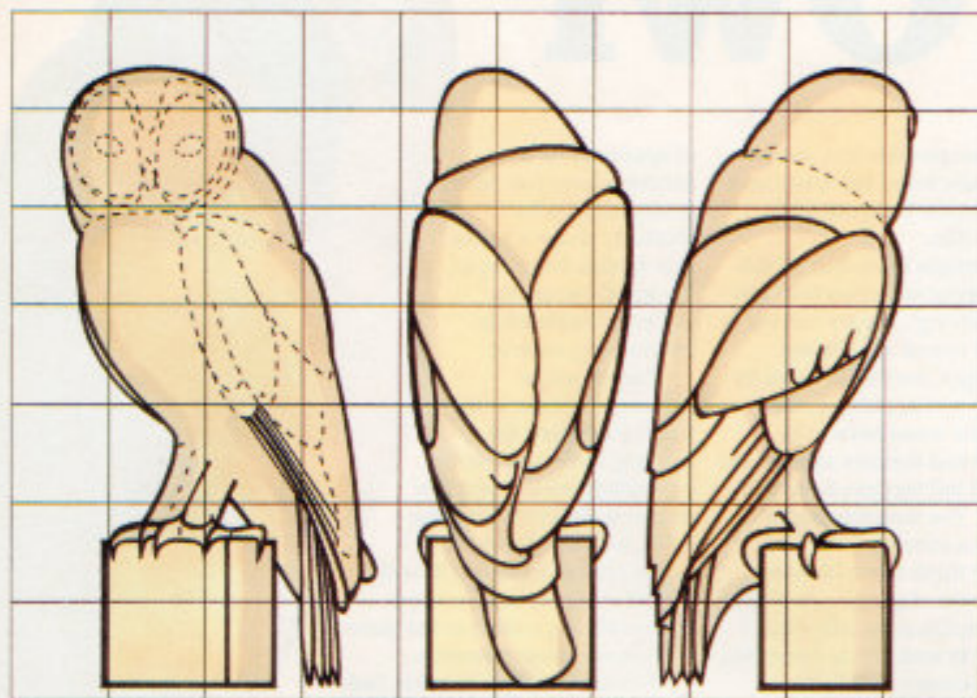


A thumb from the base of the hand suffices for some cuts. The left arm rests on the work with a firm grip on the handle acting as a brake



While an ordinary carpenter's mallet will serve, a round mallet lessens the fuss of aligning the head before striking

Elevations of the tawny owl



The elevations you achieve by my drawing method will, of course be full-size but, for a variety of reasons including the availability of material, you might need to reduce or enlarge the drawing. Mine needed to be reduced to five eighths full size to fit the piece of olive wood I discovered in the woodturner's corner of a store. Overlay

your elevation with a grid of squares of convenient size, say 20 to 25mm. Next draw on a piece of paper, the same size as your wooden block, a grid containing the same number of squares, but to a size that fits. Use the intersections of the elevational drawing to accurately re-draw the outlines

Jargon Busting

Cannel
The name given to the bevel of a gouge or chisel. This is why scribing gouges having a bevel on the inner curved surface are called in-cannel gouges.

File Card

A strong fabric on which are mounted many hard springy wires. Mount it on a wooden backing for cleaning debris from the teeth of a file.

when the fingers reach some convenient part of the job, the travel of the gouge is stopped.

Whatever you have learnt about grain from the earlier projects, will have to be applied when carving because, of course, you don't want the wood to split ahead of the gouge and leave a poor finish. Watching the grain is easier said than done, especially when it changes direction at which or when the configuration of the

subject changes frequently.

Some timbers have prominent hollow tubes (vessels) running through them. When they meet the surface the holes will be more pointed at one side, just like the end of a hypodermic needle (if you have been able to bring yourself to closely look at one). The point indicates the direction of the grain.

Sometimes it can be helpful to work across the grain, especially

when the area is eventually to be smoothed. If, part way along a cut, the gouge suddenly becomes more difficult to push, you might be about to go against the grain.

When tackling features such as the back of the owl, various feather areas will need to be defined. This is a job for the V-shaped veiner. Draw with it, as you would use a pencil, to define the areas in which you are interested. If you have a 60° tool, this will enable a bit of undercutting that throws a deeper shadow and enhances the final job. Take it gently. You can always deepen a shallow curve.

Sometimes, to get a bit of leverage, use a finger or part of the job as a fulcrum. When working on a bit that, for the time being, is not terribly critical, try reversing hands. It is useful to be a bit ambidextrous at times. You may be surprised how good you are.

One can become very engrossed in the work and be tempted to fiddle away and make do with a particular tool simply because it happens to be the one in your hand. Change tools according to the needs of each particular area. Decide how you are going to arrange your gouges on the bench. In some trades the carvers arrange their gouges with the edges pointing towards themselves but, for this kind of work, I do not find it very convenient. When feeling self-disciplined, I arrange mine in order of width, then depth of curve. Get to know your gouges by the handles. This is something of an argument against purchasing a set of ready-handled tools all from the same maker.

A Few Hints and tips

Use an adjustable lamp to light your subject, varying the position

so that the light and shade help you to see the form.

Keep all offcuts, you never know when you might need to find exact matches for repairs.

Be prepared for disappointments, for example, when the outer 'skin' was removed, my wood began to dry and fine splits appeared. However, they don't seem to spoil the finished job. For obvious reasons, put your gouge down before adjusting the vice, mopping your brow, stroking the cat or even your aching back, adjusting specs, etc.

For the safety of the job and yourself, make sure that it is securely gripped so that it cannot suddenly move while you work.

Half-round files have a smaller diameter at the tip and you can make good use of this feature.

Use a file card to clean files after use. Some woods can corrode the teeth if allowed to linger, especially if the workpiece is still green. It helps productivity if you fix the file card to the bench and work smaller files up against it.

You will make better progress by repeatedly slightly changing the direction of the stroke. The idea is to prevent the file running in its own grooves. Finish with the grain, of course. If you examine some flat files, you will find that one edge has teeth whereas the other is uncut and is therefore 'safe-edged'.

Advice about abrasives

If you find a blemish, probably revealed by the way its crevices retain sanding dust, it is no good just rubbing and rubbing over the problem spot. To reach the defect, you'll have to work on the surrounding area as well.

If you can't remove a blemish with say a maximum of twelve strokes of the paper, much as it may grieve you to do so, go back to the previous grade. If you get too hard a shine, gently cut it back with 0000 steel wool. Use a dowel under the fabric when using felt-type abrasives such as Scotchbrite. The teeth of a file can cut through the abrasive backing and damage the job - the abrasive can also damage the file teeth. Use old Stanley knife blades for cutting abrasive paper and a brass brush to clear the paper as it clogs.

How to Sharpen Gouges

Sharpening carving gouges is something of an art in itself. Gouges differ from chisels, of course, in that they are curved and have an 'in-cannel' as well as the outer cannel (bevel). The out-cannel is usually ground at 15° but its entire area is polished and slightly curved by the worker so that the angle at the cutting edge might be nearer 20°.

One reason for the in-cannel is that fine control of the depth of cut depends on holding it at a suitable operating angle to the work surface. At 20° it should be in a position such that if the handle is raised, a gentle push will make it start to cut, and cease if lowered a fraction of a degree. Unless you are excavating deeply, the higher this angle, the harder it can be to control the gouge, so a low operating angle requires an acute-angled cannel. However, such angles can lead to rapid blurring or even crumbling of the edge. By adding a narrow 10° in-cannel to the outer-cannel angle, you make a thicker and stronger edge while maintaining a low operating angle.

When preparing a new gouge or re-sharpening a badly used one, hold it vertically on an oilstone or sheet of aluminium oxide or silicon carbide paper, clench your teeth and draw the edge forwards a few times to deliberately blunt the edge until you have a distinct flat running from side to side of the edge. You may find that the centre line of the outer curve is displaced to one side, the result being that one side of the edge is thicker than the other. One of the drawings shows the usual advice offered for gouge sharpening

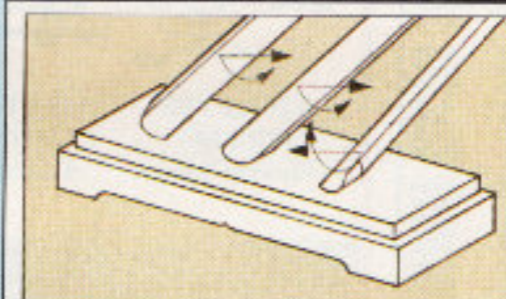
but, while I'm sure that many generations of carvers have successfully done it this way, I have come to adopt a different technique. This is partly based on the need to tune up some new, but inaccurately-ground, gouges from a very well-known maker.

I decided to use a coarse diamond hone to modify the honing bevel (an oilstone will serve, as also will suitably supported aluminium oxide or silicon carbide paper). With a watchmaker's loupe (magnifier) on my specs, I held the gouge with its edge towards me and, using a vertically mounted block as support, I slid the edge of the hone on the top of the block while at the same time swing round the curve. Yes, I know I could have re-ground the bevel on a grinder, but I don't have a water-cooled wheel and don't risk a high-speed wheel for fear of overheating the edge. Once the flat had nearly been honed away, a finer slip finished the edge ready for stropping.

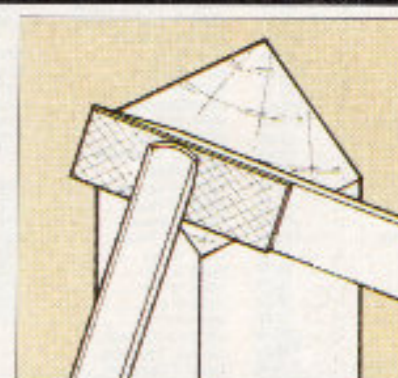
For the in-cannel, conventional oilstone slips or abrasive papers will do the job. Strop these bevels by folding hard leather over a suitable wooden support.

Many sources recommend rouge or crocus as stropping media, but my information is that these abrasives are really for the softer metals used by jewellers. Green chromium oxide is a more suitable medium. This is sold for use with power sharpening systems using stitched cotton mops or felt pads in place of strops. Once you have a decent bevel they can be quick in action and very convenient. Green chromium oxide is sold as buffing soap by Ashley Isles (☎ 01970 763 372) and John Boddys (☎ 01423 322 370).

Sharpening the carving gouge



The normal way of gouge sharpening. It can be difficult to observe the edge as you work. Make a twist as the gouge slides along the stone, but take care not to round the edge extremities



I use an abrasive paper on a firm backing, held against a block in the vice, to grind the bevel. I slide the edge of the hone on the top of the block as I sweep round the block. A finer slip finishes the edge before stropping

Rifflers on the Cheap

Although gouges played their part in the working of the owl, a great deal was still done with files, including some small fine files. The files used by diesinker's can often be picked up from the surplus dealers that trade at woodworking shows. These are made in a wide variety of shapes, some of which are very dinky.

However, one can achieve a great deal by modifying some of these sets of half-a dozen tin files available quite cheaply from most DIY stores at prices from £4 to £8, some times erroneously described as wading files and often sold in plastic wallets, maybe with plastic handles.



LEFT With the handles removed, the tips were heated to red-heat with a propane torch, and then pressed against a heat-resisting surface. There is no need to re-temper the files
RIGHT Two needle files given the body treatment and a collection of diesinker's files gleaned at various woodworking exhibitions. I polished the back of one to act as a burnisher



Rest the lower forearm on the job to help support the gouge as you make vertical downward chops



A curved file is used to shape a leg. The left hand pushes while the right applies pressure and acts as a brake.



You will need to clean the file with a file card quite frequently though perhaps in a better place than this



A sharp penknife makes a handy scraper and is even more efficient by turning the edge in the same way as a cabinetmaker's scraper

PHIL DAVY
NEXT
MONTH
STAIRWELL
STORAGE



TECHNIQUES

We take you behind the projects and explain the methods you'll use

Now count my fingers...

With table saws becoming cheaper and more easily available to the untrained amateur, the issue of safety is even more relevant than before. Jeff Gorman samples a few of the problems you're likely to encounter and offers essential advice to ensure your digits remain firmly attached to your arms...



Employers of woodworkers are required by law to ensure their staff are fully trained before they can use a circular sawbench. Individuals who buy their benches directly from a responsible dealer might be lucky and receive a few minutes practical instruction. Most just have to manage as best they can. My aim is to help you to make each cut on the table saw an informed, competent and safe operation.

Having nannied many experienced woodworkers over the years, I've seen many things done by people who don't know the inherent risks. They sometimes argue, for example, that fiddling about and making a special alternative to the

Always use a pushstick with a circular saw. The crown guard should be set no more than 12mm above the timber. But how much of the blade should actually protrude above the workpiece? Read on to find out...

crown guard is just too much hassle for a one-off job. Indeed, some say that whatever they do in their own shop is entirely their own affair. By the end of this article I hope that if people do try a few of the more dodgy operations, they do so fully knowing what can go wrong.

With any machine it's always worth asking "What will happen if it jumps?" In the case of the table saw, if it jumps the work probably will have been kicked out of your hands. Since you will already be pushing forwards, you will jump forwards on to the guard or, perish the thought, on to a whizzing blade. There would be little to write if there was just one simple rule for safe practice, but really there ain't! However, "Avoid kickbacks!" will do for starters.

Kickback and the Knife

Set in line with the sawblade, the riving knife is a rigid plate of hardened steel, with a chamfered leading edge. It should be thicker than the plate of the sawblade, but slightly thinner than the kerf. A good one will rise and fall in company with the blade. It often supports the crown guard, although its main job is to prevent the kerf from severely pinching against the upwards-running teeth and causing a violent kickback. This happens when internal stresses are released as case-hardened timber, wet or gnarly-grained wood is sawn.

The riving knife also prevents these teeth from unnecessarily scoring the kerf and guides the workpiece after the trailing end has passed the toe of the fence. Note that until the leading end of the job reaches the knife, there's always a risk of a kickback. Some very short pieces may not even reach as far as the knife.

The riving knife also acts as a form of rear guard that stops offcuts and knots from being ejected by the



The riving knife prevents binding. Maximum gap between knife and blade should be 8mm

back teeth of the saw. The leading edge should be curved so that it matches the largest sawblade you'll use. Fix its distance from the saw teeth small enough to prevent offcuts or knots from getting between its edge and the teeth. Don't make it any more than 8mm. Some knives project above the crown on the saw, so you can't use them on jobs where the work is not divided into two.

Kickback and the Blade

With the saw well and truly switched off, use the end of an offcut to try pressing the blade sideways. I think you'll find it takes a lot of effort to budge it by even a millimetre, but I've seen many a fingerplate that shows evidence of running blades being deflected by at least 10mm! When an incident causes the blade to be deflected sideways, the eventual kickback force will not only involve motor power, but also 'catapult' energy as the blade springs back.

With a rip cut, the missile from a kickback is aimed straight at the operator. Not only can the missile cause damage, but the workpiece will also be taken out of your hands.

If the blade is canted for bevel cutting, the wood should not be trapped between the fence and the saw. The job can be caught by the up-running teeth, the workpiece lifts, jams against the fence, deflects the blade and generates a hefty kickback. Move the fence to the other side of the bench, if possible.

Fences and Faces

Many of the older industrial machines will carry rip fences with a toe that only reaches an inch or so beyond the front of the blade. Since people want to use them for rebating and grooving, many machines are fitted with fences that stretch right across the table.

Some machines are now provided with a two-position fence as shown. You can slide the fence forwards and backwards to adjust the location of the toe. You can also turn its face through 90° to allow for

What Blade Height?

The 'correct' blade height can be a nice topic for a lunchtime argy-bargy, but a diplomat might say that for each job you need to consider the job in hand. There's no clear general answer but here are two considerations:

Minimum Practicable height

Cutting Efficiency: So that the gullets can properly release their charge of sawdust, the minimum height should be such that the gullet roots clear the upper surface of the workpiece. More teeth are engaged with the wood, hence there is less blunting action. The oblique angle cutting angle reduces breakout on the underside of manufactured boards.

Safety: The operator-facing thrust (and hence a kickback force) is greater. Some self-adjusting guards might raise themselves more efficiently when the blade is set low down. As the workpiece approaches the blade it sees what is more or less a curved ramp. If the wood is very hard or the blade somewhat blunt, the work will tend to climb the ramp, you will try to push down harder and probably bring a hand too near the blade. The job might even be thrown out of your hands.

Maximum Height

Cutting Efficiency: More gullets are exposed so there is better chip clearance. The cut becomes more of a chopping than a slicing action. Be sure that at least one tooth will be in contact with the wood at any time, otherwise the teeth can snatch the work if the wood is fed too far into a gullet. The teeth exert less horizontal thrust and the action presses the workpiece more firmly against the surface of the table.

Safety: If you are working on differing sizes of material there will be less need to stop to adjust the blade height. However, safety requires that the guard should be adjusted so that for each and every cut its lower edge is not greater than 12mm above the top surface of the workpiece.

Deep cutting

If you haven't got a bandsaw and need to saw stuff that is too deep to be parted in one cut, the temptation is to saw the work from one face then turn it over to part it with a second cut. Several serious snags lie ahead.

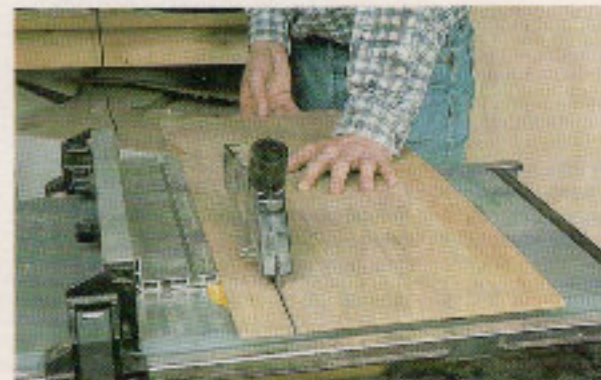
Some riving knives, especially those that support the crown guard, are taller than the crown of the blade, so such riving knives would have to be removed for this job. This means that the kerf can pinch the up running teeth and the work can be thrown out of your hands.

The teeth will not be cutting effectively because the travel of each tooth is relatively long. The gullets are therefore unlikely to effectively clear their load of chips. The wood will tend to ride up the saw. You will then need to press down very firmly and, especially likely with small workpieces, it's quite likely your hands will get too near to the blade. If control is lost, the work can leave your hands.

If the teeth are blunt or have inadequate set, things get worse. The saw overheats, loses its tension, becomes drunk and binds in the cut. The timber has to be drawn back to ease the load. As the saw regains speed the work can kick. Quite probably the wood becomes burnt. In factories this procedure is illegal. It should be avoided in the home workshop as well. Use a bandsaw.

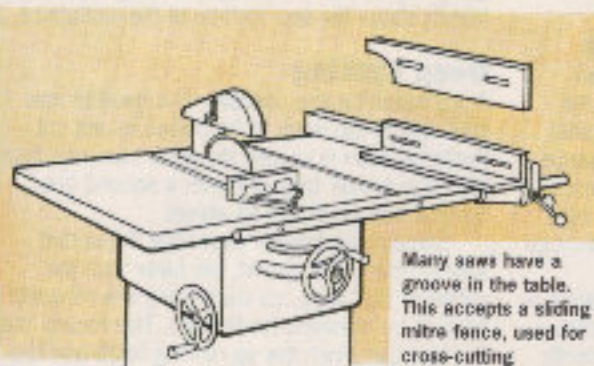


(Above) A roller stand is used for longer work, although a take-off table is better. (Right top) A two position fence can be used for ripping thin material safely (above) and ripping deep timber (below)



SAW SAFETY: Fences

Your table saw has a long rip fence, it's a good idea to make an adjustable facing from MDF. Ideally you should be able to set the rear edge of the facing to line up with the gullet of the tooth where the side comes up through the table. This will prevent deeper timber binding between blade and fence as the cut progresses.



Many saws have a groove in the table. This accepts a sliding mitre fence, used for cross-cutting.

ripping thin material or when working with a tilted blade.

When ripping, the long fence is a disadvantage. As the saw cut releases inner tensions, the wood can spread wider and the edge presses against the fence. This then forces the side of the kerf against the up-running teeth. The result can be a poor quality cut or even a kickback.

With the short fence there is space for the wood to spread and, at the very end of the cut, the operator can move the workpiece sideways before finally feeding the work forwards. Likewise, there will be adequate safe space for offcuts created by repetitive crosscutting.

The illustration above shows two wooden auxiliary fences. The upper fence will be needed to offer support in the vertical plane, whereas the lower, 'L' shaped fence will be useful when ripping most boards, especially useful for slender pieces. When an ordinary fence has to be adjusted for slender jobs, you'll find that its face may clash against the side of the crown guard. The workpiece bears against the narrow edge of this fence, creating sufficient space for the pushstick to reach between the fence and the side of the



Goggles are essential and ear defenders advisable, plus sturdy footwear.

guard and engage the end of the timber. If this still won't work, use a long, thinner stick directly to the end of the workpiece. You might well find that the L-shaped fence will serve as your general-purpose fence. To allow for the rise and fall of the saw, both fences require their fixings to be slotted.

Crown Guards

If you ask "Why guards?" the bet is that most would say they are for protecting your fingers. Guards also prevent sawdust, knot fragments, splinters and even broken teeth from being thrown towards the face. Offcuts thrown upwards by a kickback first have to hit the guard, so there's a chance that they could be deflected harmlessly out of the way.

Bear in mind that non self-adjusting guards will only be fully effective while the blade is actually cutting the wood. Remember that the teeth become exposed during the very final stages of a cut.

American OSHA regulations require that the guard will automatically adjust itself to the thickness of the material without impeding its passage. In real life, it seems that poor design of some machinery exasperates a handful of woodworkers to the point that they see them as more trouble than they're worth.

If the guard hood is discarded, very likely the diving knife also goes into the bin. A guard can get in the way when ripping narrow sections, but please note the advice under 'Fences'. The manual adjustment of some crown guards can be decidedly user-unfriendly. It makes sense to follow the UK regulations and always see that that the guard is adjusted so that its leading edge is no more than 12mm above the upper surface of the workpiece (or as closely as practicable if the surface is uneven). This can mean reaching to the back of the guard and operating a small lever or wingnut that tightens a screw.

It's decidedly risky to attempt to adjust such guards while the blade is still running. Your hands can be perilously close to the teeth and if the guard should inadvertently drop and catch the crown teeth, it can be (and has been) become damaged and the fragments propelled dangerously towards you.

This really means that such saws ought to be stopped and run down between adjustments. I think that most mortals will admit that, unless you have a guard like the one illustrated by the HSE, this requires enormous self-discipline when dimensioning components of a wide variety of sizes. What usually happens is that it remains set at too great a height.

Heaven knows why some manufacturers produce transparent guards! They soon become obscured by dust. Perhaps they do this because some people believe that they need to see the cutting action of the saw. If the wood is being guided by a fence, it is the fence that determines the line of cut, hence there is absolutely no need to see the cutting teeth. The tip given below for precision crosscutting to length is also useful when accurately ripping a component to a gauge mark.

Blade Size and Cleaning

Undersized blades cut badly because their rim speed is too low. They are more inclined to flutter, create a poor finish and deflect to one side. People subject to the UK factory regulations will know that they must not use a blade of a diameter less than 60% of the machine's specified size. (The spindle speed of a saw bench is normally designed to give a speed of 3000m/min with its intended blade).

Your saw will tend to stall if it is gummed up with resin. Cleaning implements used against the side of a running blade have been known to break. A cloth is liable to be caught up, tangle with your hands which are then drawn on to the teeth. Workshop lore offers many recipes for soaking solutions, but given time, plain water will serve to loosen the gum. Oven cleaner is frequently recommended, but it has been shown to slightly blunt carbide teeth.

Don't ever use a sawblade with two or more missing teeth.

If acquiring a machine, it's wise to check that the blade and ripping fence can be set parallel to the mitre fence grooves.

Next month

Jeff discusses cross-cutting, wane edge cutting. Show guards and taking-off tables for bench saws.



Many table saws feature a dust action outlet on crown guard, as well as an outlet in base of the saw. Here the guard is fitted to the diving knife and is secured with a bolt lever.



