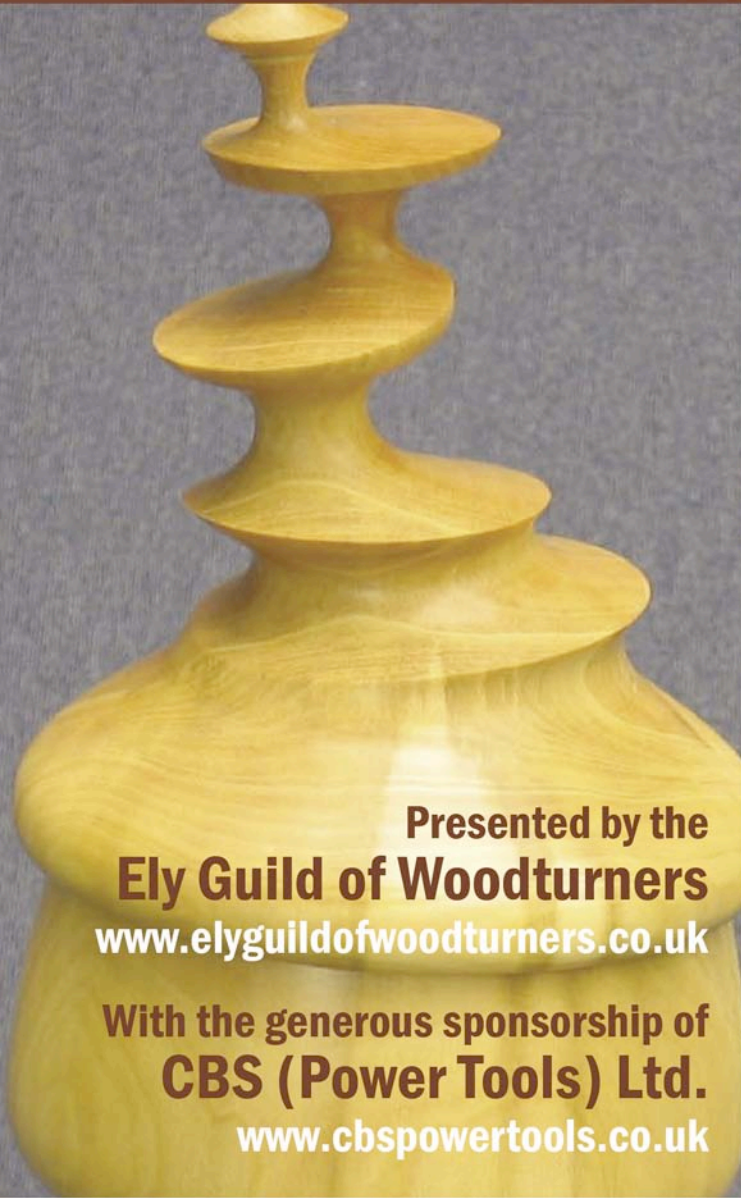


Hand Turned Wood an introduction



Presented by the
Ely Guild of Woodturners
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Hand Turned Wood an introduction

This leaflet, written by members of the Ely Guild of Woodturners, is intended to illustrate to the uninitiated, the sometimes complex processes involved in making some of the items you see on display here and at other venues. It is not a technical instruction manual, there are numerous publications of that nature already. Rather, it's purpose is to give the layperson an insight into the amount of work which can be involved in the design, and the methods of production, of a turned wooden object.

In these days of machine mass production, the demand for hand turned household items, or treen, is very small, although there are still a few discerning people who appreciate even an everyday object which has been carefully hand made.

More and more, woodturning is being regarded as an art form. Some of the items you may see on display may have no practical use whatsoever; they may be intricate or very simple, weigh many kilos or be small enough to almost sit on a pin head. Whatever form they take, they are a demonstration of the turner's skill and the natural beauty that is wood.

We hope that this leaflet will help you to understand and appreciate the work that we do. Woodturning is a very satisfying activity. A hobby for most of us, only a relatively few people find it financially rewarding. Like many other hobbies, it can be expensive, especially if you wish to purchase the best machines and tools available. However, much enjoyment can be had from a relatively modest outlay. Once equipped with a lathe and a few basic tools, and a few hours tuition, you will be raring to go. How far you go will depend on the depth of your pocket and the extent of your imagination.

Any sort of wood can be hand turned, including man-made boards, as can plastics and even metals. Indeed, there are now available 'plastic' alternatives to ivory, horn, and mother of pearl, to name but three.



In the world of woodturning, very little timber is wasted. Indeed, woodturners are able to make use of much that would otherwise be discarded. Off-cuts, small branch wood, reclaimed timber, even roots. Bark inclusions, knot holes and other 'defects' are not looked upon as such by the man behind the lathe. Instead, they are considered natural characteristics which can often be incorporated to enhance the attractiveness of the piece.

Burrs, those rounded lumps sometimes seen protruding from the trunks of trees, are much prized by turners. The grain within them runs in all directions and is often very beautiful when exposed. They are comparatively rare, and as such usually expensive, but offer a turner a burr, and his eyes will light up.

It must be remembered that all wood, being an organic material, will continue to expand and contract to a certain degree, no matter how well it has been seasoned, or what sort of finish it has had applied. It is not unusual to make a container, the lid of which fits perfectly in the workshop, but when taken into a centrally heated atmosphere, that same lid will sometimes become too loose or too tight. To get a lid which comes off with a satisfying 'plop' is often difficult to achieve.

It has been said that, as with sculpture, the item is already there within the wood. All the turner has to do is remove that which is not necessary.

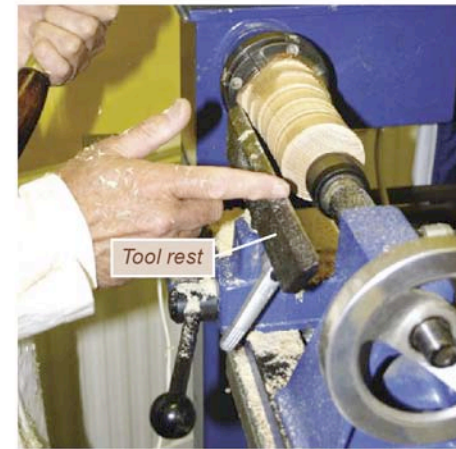


The lathe - a brief guide



Faceplate/
screw
chuck

Drive centre



Tool rest



Four-jaw chuck

Off-centre and multi-centre work

Off-centre and multi-centre work

Off-centre and multi-centre work differs only from straightforward work in the way in which it is mounted on the lathe. The tools and techniques employed in cutting and shaping the wood are exactly the same.

The work will initially be mounted, perhaps on a chuck or faceplate, on what may be called the true centre. This may be merely to bring the wood to a cylinder, or it may form part of the design.

Next, the mounting position will be moved, so that the piece is revolving eccentrically. Further tool work is carried out, blending this second section into the first. This process can be repeated as often as desired, perhaps resulting in a 'zig-zag' form, as shown below.



What the turner has to remember is that each section must be finished, that is sanded and polished, before proceeding to the next section. It is not practicable to return to a previous section later as, no matter how careful

you are, it is almost impossible to get the work-piece back in exactly the same place so that it revolves absolutely concentrically. A fraction of a millimetre out, and it will require either further tool work or much laborious sanding to achieve a good finish.

No matter how many of this type of item a turner makes, they are all likely to be different. The chances of turning a matching pair are indeed remote.

With larger multi-centre items, it is usually necessary to attach some form of counter weight to the work piece, in order for it to revolve reasonably smoothly. The amount of weight, and its position, also sometimes needs to be varied, particularly with a large off-set, as was necessary with the triple bowl shown.



Segmented Turning

Briefly, it's a way of making a woodturning out of small blocks, perhaps cut from different coloured woods, thus utilising small pieces that would otherwise be wasted.

One method is to divide 360 degrees by the number of segments you require; e.g. 360 divided by 24 =15, therefore each of the 24 wedge shaped segments must be cut with sides of 7.5 degrees. After deciding the thickness of the layers, a full size drawing of the turning is made, so that the diameter of each layer can be measured. Each layer is also drawn, and the widest part of each segment measured. Segments are cut, assembled dry and checked for fit. If all is well, the segments are all glued together using a circular clamp.



Each segmented disc must have its faces trued up to be perfectly flat so that good joints are made. They are then assembled and glued onto a solid bottom disc, mounted on the lathe and turned in the usual way.

Taking the technique a stage further, **open segmented turning** is perforated with uniform square holes. For example, using twelve-segment layers, 360 degrees divided by 12 is 30 degrees. To create the gaps, take 2/3 of 30, which is 20. Therefore each segment is 20 degrees and each gap, or hole, is 10 degrees.

Again, full size drawings must be made. Having prepared a solid base disc, using an index wheel and a positioning jig, the first layer of blocks are glued onto the base. This should result in 12 evenly spaced segments and 12 even gaps. Subsequent layers are glued on, each one straddling the gaps in the previous layer. The last layer is solid, as this will form the rim of the vessel. When the glue has thoroughly cured, turning proceeds as before.

Some examples of segmented turning comprise several hundred separate pieces.



Open segmented vase with view from above



Thread Chasing on Boxes

During your hunt for interesting turned pieces you may come across boxes with threaded lids. If you do they are likely to be expensive. Apart from the design and complexity of the piece, there are two main reasons for this. Firstly, to take a thread the wood has to be hard, boxwood and ebony being examples, and this type of wood is expensive. Secondly the process of threading is difficult and leads to a lot of very small fire logs.

I am sure you will understand the difficulties when I explain the process of *thread chasing*.

To cut the external thread and with the lathe turning very slowly the threading tool, known as a chaser, which is rather like a miniature saw, is drawn along the piece. This has to be at just the right speed. Too fast and you cut off the young threads, too slow and you end up with a series of rings. The chaser must be withdrawn at the shoulder or again the threads will be destroyed. Very slowly the threads are extended and deepened until the external thread is complete.

We now come to the internal thread, which is cut with a similar tool, but this time used simultaneously with a second tool called an arm rest. On very small work it is sometimes difficult to see what is happening, as the chaser fills most of the opening. A well-known wood turner said that thread chasing is simple, just buy a ton of boxwood and practice for five years.

Threads should be smooth to screw on and off, and clean cut. When the lid is screwed on the grain on the box and lid should line up.



Thread-chasing



*Scorched bowl (See Colouring and decorating turned wood)

Segmented turning

Colouring and decorating turned wood

The term colouring wood can be the subject of a large misconception. In woodturning it generally does not mean, with few exceptions, completely obliterating the beautiful grain that is often present in many woods with ordinary paint. Certainly, our magnificent native yew should never be treated in this way.

However, in the case of very light coloured timbers such as sycamore, ash, oak and other coarse grained woods, a somewhat bland appearance can be transformed by the application of a coloured dye or stain, together with gilt, white lime and black wax polishes, which soak into the open grain and highlight it magnificently, as is evident in the photograph.

This is skilled work, requiring great diligence in finishing the surface of the wood before any colour is applied. It is a mistake to assume that any minor defects, scratches etc, will be hidden by the colouring process. In fact, the reverse is true, they will be exaggerated.

The exception mentioned above is when the shape and form of a piece, as opposed to its surface appearance, is considered to be the major consideration. Then, a matt black finish, either all over or just on the inside, can be advantageous.

The use of coloured resins and inlays, such as brass or pewter (in liquid form made from powders), can have a striking effect when used to fill knot holes, natural splits and fissures, and man made features such as texturing in various forms.

Some timbers, oak in particular, can be 'fumed' with ammonia, which reacts with the natural tannins in the wood, in enclosed boxes. Iron filings or steel wool in vinegar will make a simple but effective stain. Sandblasting, gold leaf and marbling can be added to the list, as can scorching with a blow-torch.*(See above right) This may sound rather drastic but, skilfully done, can look quite dramatic. It just has to be remembered that care must be taken if this operation is carried out in a workshop where wood shavings are abundant!



Pyrography on turning

Pyrography is the art of producing pictures and designs with heat. Originally this was achieved with the use of shaped iron tools thrust into a fire until red hot, then applied to wood. The fiercest heat of the iron produced the darkest part of the design, then as the iron cooled the lighter tones, and finally the shading, were produced. In these early days it was known as poker work.

The Victorians invented what sounds like a lethal machine named Vulcan, rather like a large scent spray. Petrol was pumped through a fine rubber tube to be ignited inside a platinum point; as charred wood built up on the point during use, an open bottle of nitric acid was kept close at hand to clean it.

These tools and devices have long been superseded by our modern rheostat control boxes with light-weight heat insulated pens which plug into them, allowing us to safely practice our art for hours on end without distress.

Sycamore, being light in colour and without pronounced grain, is the preferred wood of many pyrography artists, but boxwood, birch and many other light coloured woods are worth attempting. Cork, leather, card and even paper can also be used.

While it is possible to do reasonable line work with just an electrician's soldering iron, the greatest flexibility of temperature and texture are only produced by the more controllable units such as those available from *Peter Child* or *Pintail*. For the woodturner, pyrographed decoration is able to lift an ordinary, bland piece of turning into something far more interesting and appealing. Do attempt this gentle craft, your efforts will be well rewarded.



Carving on turning

Most items which have been turned can be carved upon, from a simple bread board, to a complicated design on a vase or bowl.

If you have a featureless wooden bowl, carving some leaves around it will give the piece some interest. Carving can be carried out either on or off the lathe, whichever is more convenient.

Bowls and vases are not the only items which can be carved upon; the arms and legs of a chair, candle sticks, a lectern, even a totem pole, the list can go on.

When you have turned your piece, you can then decide which type of carving you want to do:-

- Chip Carving, which is a continuous pattern, and perhaps the easiest to start with
- Letter carving, incised or raised
- Flowers or Animals, again incised or raised.

There is only one way to find out which sort of carving you want to do, and that is get yourself a couple of basic chisels and have a go, it can only add to your skills.

Seasoning wood



Commercially dried wood involves a vast investment in equipment and technology, that's why timber is expensive. But the layman can obtain good results with very little equipment, by following simple rules.

Small branch wood can be dried successfully in the round. The ends should be sealed with paint or wax to help prevent cracks developing. Larger branch wood or small trees under 300mm diameter should at least be split or sawn down the pith, the ends sealed and sticks of about 20mm used to separate the two halves. The wood should be stored under cover where air can circulate through the stack, but shielded from hot sun.

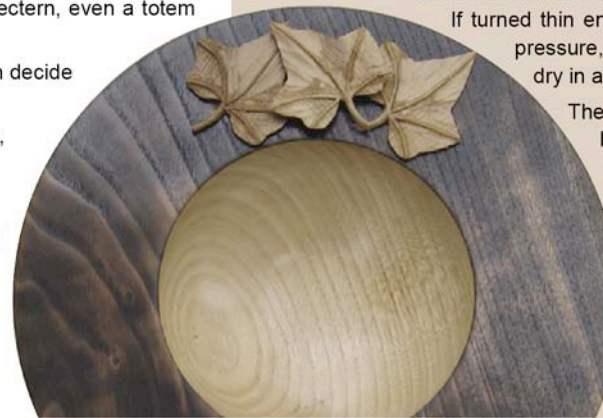
Planks should not be thicker than 100mm, as above this the internal structure of the timber may never fully dry. Even with ends sealed, cracks will develop and may extend up to 500mm from the ends. To obtain the maximum usable timber planks should be as long as possible. As a rule of thumb, air drying takes one year for each 25mm of thickness.

Turning wet wood: The term wet wood means unseasoned, freshly felled wood. Many turners like to use this as it cuts more easily, and doesn't produce the dust that dry wood does. There are two main methods, although the actual cutting techniques are the same as for any other work.

Items can be turned to a finish while still completely wet, but cannot have any polish or other finish applied until they have dried out. It will be found that, when they are dry, they will have warped and distorted, but hopefully not split. This cannot be controlled, but can be very attractive and usually adds to the appeal of the piece.

If turned thin enough to be flexible with light finger pressure, it will not usually split, and will be dry in a week.

The second method, usually adopted for bowls, is to 'rough turn' the blank to a thickness of about one tenth its diameter, wrap it in newspaper or dry wood shavings, and store it away for several weeks, by which time it should be dry enough to turn and finish in the usual way without distortion.



Platters

Essentially a large plate or shallow dish, wooden platters these days are in three classes; useful, decorative and a combination of the two, the latter however must never take away from its usefulness. It is generally accepted that a platter should have a wide, flat rim.

With a project in mind the turner may buy his wood from a specialist supplier in the form of a 'wood blank', which may be 50 or 75mm thick and 300mm or larger in diameter, correctly seasoned so as not to distort with drying as the wood is cut thinner on the lathe. Different tools are used to cut the underside first, which is usually brought to its finished state, and will incorporate a recess or spigot, so that it can be reversed and re-mounted to cut the top side.

On a large platter, unless finishing is to be carried out by hand off the lathe later, it is usually best to cut only part of the way in from the outside, and finish this area before proceeding further in as, even with well seasoned wood, there is a danger that, once the whole of the platter has been reduced in thickness, the rim can distort or flex whilst being worked, thus making it difficult to obtain a good finish.



Bowls

A dictionary definition of a bowl is 'a hemispherical container, wider than deep'. Woodturners interpretations of this description tend to vary considerably, and of course, designs and finishes are legion.

The invention of the lathe was a huge advance in the production of wooden bowls, previously they would have been carved. Most people new to woodturning make a bowl as their first prized possession.

Bowls destined for food use, especially salads, must have a 'food safe' finish, usually several coats of various oils. Others, intended more as artistic pieces, often don't look much like 'bowls' at all, having natural edges (bark left on), knot holes, splits and bark inclusions. Sometimes stitched with wire or leather, or filled with coloured resins, such features usually only enhance the appeal of the piece, and serve to illustrate that wood is, after all, a natural material.

No two bowls, or any other item hand turned from real wood, will ever be exactly the same because of this. So when you buy a hand turned item, you are always getting something which is unique.

The turner will perhaps start with a sawn circular 'blank', or maybe half a log. This will usually be held on the lathe with a faceplate or some form of chuck. The outside of the bowl is turned first, including either a recess or a spigot (a protrusion) on the bottom. This is so that the half finished bowl can be reversed and re-mounted for the inside to be cut. The outside will be brought to its final finish, except for the aforementioned recess/spigot, before anything is done to the inside. Finally, the holding point will either be removed completely, or carefully blended in.



What you need to turn wood

Woodturning uses a lathe to hold and spin the wood; hand tools like chisels, gouges and scrapers to shape the wood; safety items like goggles or a face shield, and a grinder to sharpen the tools.

The biggest item is the lathe, which has a history going back to the ancient Egyptians. Theirs were wooden pole lathes using a springy pole with a cord from the top, then wound round the work piece usually to a foot treadle. Millions of chair legs and backs have been made in the middle of English woods using these – no transport of waste wood, no electricity needed, but very hard work. Indeed, there are still a lot of these lathes in use today. The big disadvantage is that the work-piece revolves back and forth, allowing cutting for only 50% of the time. In time it was found that a flywheel and foot treadle would allow the wood to be spun continuously in one direction only, a big advantage.

Then came many sorts of lathes, but now woodturners usually use lathes driven by electric motors with gears or electronic speed control. The motor turns a chuck or other means of holding the work. There are two main types of turning but perhaps the best to begin with is spindle or between centres turning. The wood is held at both ends, so that the chair or table leg, lamp, stair spindle or candle stick can be shaped along the wood grain. In bowl turning the wood is only held at one end with a chuck or face-plate, so that the turner may hollow out the other end as well as turn the side, across the wood grain.

The tools are designed to make different cuts; gouges are best suited to make the hollows, called coves, and the bumps (beads) as well as cutting rough wood to a cylinder. Chisels turn the smooth faces and sharp edges and also cut the work free at the ends. Scrapers are used in bowls and boxes to smooth the surfaces, especially internally. Tools are ground sharp at various angles to suit the work and the turner's style. Frequent sharpening is necessary to turn well.

There are very many other tools which help but are not essential to the beginner, who can usually manage with six or eight to start with. Callipers are useful for sizing work, and different grades of abrasive papers, together with various finishing materials.

The two main safety items are a face shield or goggles to guard the face from flying wood chips, and a dust mask or dust extractor system to prevent danger to lungs, as some woods are hazardous to turn without proper protection.



The Ely Guild of Woodturners

A brief history



The Guild was founded on 17th February, 1988 by the late Reverend Alun Lloyd Davies. Meetings were held at the gift shop and tea room at Steeplegate, High Street, Ely, owned by another founder member John Ambrose, a man well known in the world of woodturning. John became President, Alun was Chairman, Ken Howard Treasurer and Adrian Flude Secretary.

The meeting place moved to Little Thetford village hall in 1990 when membership became too large to be comfortably accommodated at Steeplegate. Later, a constitution and a logo were adopted. Amongst our past and present members we can include a many times gold medal national and international winner, silver and bronze medal winners from national exhibitions, a well known professional turner in a wooden hat, at least two authors with books published, a previous editor of Woodturning magazine, and a committee member of the Association of Woodturners of Great Britain.

The Guild meets on the first Wednesday of the month, and enjoys a varied programme of demonstrations, talks and competitions, coach trips to woodworking events, and exhibitions. Membership is open to anyone, whether professional, amateur, beginner or collector.

If you would like to know more about possibly joining us, just pay us a visit at Little Thetford village hall; meetings start at 7-30 pm. Alternatively call Hon. Sec. Peter Symonds on **01638 577 462** or Treasurer Beryl Wallace on **01353 667 168**.

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