

RFS AND TATHS TECHNICAL DAY, 'THE HISTORY AND USE OF TOOLS IN FURNITURE-MAKING' 20th MAY 2000

Conversion of timber for furniture making by Damion Goodburn.

To kick off this Technical Day given jointly with the members of the Tools and Trades History Society, Damion Goodburn from the Museum of London gave us a fascinating talk on the historical methods of timber conversion for use in woodwork. Using his expertise and deduction as an archaeologist he covered these processes from Roman Britain to the late Mediaeval period prior to written records of tool use and extant furniture. Firstly Damion described those timbers which appear most commonly in archaeological finds from these periods, and how they might have been systematically 'cropped' by shredding or pollarding of the trees; wild woods generally being non-existent from c1250. Close examination of tool marks on the timber has made it possible to deduce which tools were in common use and how they were used. The most important early technique, in use certainly in Roman times, was cleaving of timber butts radially with wooden wedges. As with other techniques described Damion was able to illustrate this technique with slides of field demonstrations, which lead to his deduction that the butt was generally split in to 32nd parts, providing fairly standard dimensions in which the timber would be sold in the late Saxon and Medieval times. These boards would subsequently be hewn with axes leaving marks which enabled him to deduce their form and evolution. Wide 'T' axes were used from Roman times onwards to true up the cleft timber, and narrower axes by the Medieval carpenter; adzes only appearing in the 15th century which coincided with developments in ship-building. Many techniques endured unchanged for centuries, with major innovations introduced from France at the end of the 12th century when the family name *Carpenter* became relatively commonplace in England. The third technique for the conversion of timber, which Damion described, was that of sawing. In Roman and Medieval times the timber was squared prior to cutting, and the evidence of saw marks show that various sawing methods were used; cutting from both ends with either single support 'see-sawing' or twin trestles, and more recently, the use of pit sawing from circa 1420 right up to the early 20th century. We were shown illustrations of reconstructed conversion saws such as the large frame saw and the pit saw.

Whilst cleaving was effective with straight grained timber, sawing could utilise knotty butts. Some boards show evidence of conversion with both saw and axe. Examples of finished work from this period is obviously rare, but it was fascinating to see some of the converted timber in a Roman box crudely but effectively dovetailed, and neatly rebated door boards. This talk answered many of those nagging questions on the earli-

est conversion techniques and tools, from which later methods evolved, and the subject was brought to life by our speakers knowledge and enthusiasm for his subject.

Anthony Buxton

Saws, their history and use by Simon Barley

The talk by Simon Barley was part of an ongoing study he was carrying out on the early history and manufacture of hand saws. Parish records of 1695 for St. Giles without Cripplegate listed a number of London saw makers. Saw making then moved to the Black Country and later to Sheffield. In Birmingham towards the end 18th century about dozen sawmakers were listed, and a Sheffield Trade Directory for the period 1774-1845, indicated that the number of saw makers during this time increased from 4 to 94. In Sheffield, saw makers were self employed people working in small units. They worked on a piecework basis as subcontractors, supplying the finished handsaw to saw makers who marketed the final product. It was these saw makers or distributors whose name would appear on the blade. Simon then went on to explore the evolution of saw making in Sheffield, highlighting the main factors which assisted their development. These were water power, stone for grinding, crucible steel technology, metal rolling techniques, metal working steels and 'the Sheffield Factor'.

Principal to the success of saw making were the developments of crucible steel and metal rolling facilities. In the early days, wrought iron bar was heated over a long period mixed with charcoal, to produce a form of blister or cementation steel. This had a high carbon content on the surface (1.5%) but was not homogenous and so unsuitable for saw blades. The development of the crucible furnace changed this. Here the cementation steel was broken up and remelted with coke at a high temperature producing a much better quality steel suitable for saw blades.

Of equal importance was the development of steel rolling techniques. In 1740 Thomas Bolsover was making Sheffield plate; a sandwich of silver/copper/silver rolled out very thinly. He later developed techniques for making thin rolled steel plate so necessary for producing saw blades.

Simon then went on to discuss the many skills used in saw making, working on the steel plate received from the rolling mills. Initially the saw blade was 'pared' or cut to shape, and then cut along the edge using a fly press. The blade was hardened and tempered in hot whale oil, and tapered or thinned by about 0.005" across the blade width by grinding. Marking was an operation to stamp the makers name on the blade. Smithing and hammering removed imperfections in the blade surface. Glazing and blocking produced a fine finish to the saw blade. Next the blade teeth were set and sharpened. Lastly the blade was inspected ('looked over'), the handle was fitted and the saw packed ready for despatch.

Finally, slides were shown comparing the varied

range of saw types produced in 1817 and later in 1850. The changes in the appearance of saw blades over this period provide a useful guide to dating early hand saws.

David Bryant

Planes and edge tools for furniture making.

by **David Millett**

David spoke of these tools from the eighteenth century to the beginning of the machine age, broadly from 1700–1850 though mainly from 1770 to 1820. Key sources of information from the period are:

- 1) the Seaton Chest - a complete kit of tools purchased by the Rochester cabinet maker Joseph Seaton for his son Benjamin (1797) including an inventory and prices from the London toolmaker Christopher Gabriel. These can be seen in the Guildhall Museum, Rochester.
- 2) Gabriel's own accounts, and stock inventories of 1791 and (probably) 1800. These are immensely valuable in showing the range and quality of tools being produced.

(Note that both 1 and 2 are the subject of books published under the auspices of TATHS)

- 3) furniture and tools of a US dynasty of woodworkers and clockmakers the Dominies, now housed in the Winterthur Museum, Virginia, which covers a period prior to 1840.
- 4) an order for a kit of tools by a Philadelphia joiner (1760) known as the 'Wilson List'.

Edge tools. Chisels over this period came in a very wide variety of forms, designed for specific purposes, ranging from heavy mortice chisels, used by wheelwrights, joiners and carpenters, to delicate paring chisels for cabinet-making – light, polished, and 'certainly not to be hit'. Blade technology advanced in the mid 18th century with the introduction of crucible cast steel, but blades remained laminated or 'lined' in Sheffield parlance until early to mid 19th century. Earlier gouges and chisel blades are flared, tapered, and with fine curves. These gave way to modern, straight-sided blades with no taper. The standardised blade shape came in by about 1880.

While none of the tool-kits listed above specified carving chisels, David showed several from his collection, of very fine quality.

Planes. This is potentially an enormous field. The forms were well established by 1700, with design evolution having moved forward substantially from those to be found in the Mary Rose (16th century). However the paucity of late 16th century tools makes the development process obscure.

Commercial manufacture of planes in England started in the late 17th century, ahead of the rest of Europe. Apart from Holland industrialisation came late. Even by the mid-18th century French craftsmen were assumed to make their own planes. The difference in development probably explains why English planes are more austere than continental ones.

Planes can be classified as follows:

- 1) surface preparation
- 2) fitting for joints
- 3) moulding for embellishment

Virtually all English planes are of beech (rarely boxwood and seldom of mahogany) while continental planes are mostly of fruitwood.

The key innovation of the 18th century was the development of the double iron plane which took place around 1765. This reduced or stopped 'tear-out' on the worked surface. However the production of single iron planes continued throughout the 19th century.

Amongst specialised types of plane mentioned were the Tothing plane, to roughen surfaces before veneering (if the teeth were ground off it became a Scraper), the Compass plane with curved sole to shape curved surfaces, the Strike Block plane for trimming mitres (but used only for picture framing), Rabbet planes with moving fillister, described as 'the great workhorse of the carpenter's shop', Ploughs and Tongue-and-Groove planes. There is such variety that even in one class, the Ploughs, US experts claim 59 varieties. In reality, there is just one, with many inventive attempts to improve stability and ease adjustment. The list continued with Dado, Hollows, Rounds and the Table-Joint plane for cutting joints in drop-leaf tables. Others include planes for fitting drawer bottoms and for fitting dividers in bureaux. This last category is always quite small.

David also provided detailed technical insight into how wood was chosen and cut to ensure stable, hard-wearing tools. Interestingly for RFS members, mention was made of some regional variation. As an example, Rabbet planes generally had boxwood inserts fitted in the sole to reduce wear, whereas in Birmingham, lignum vitae was sometimes used instead (perhaps as a derivative from the use of this expensive wood in machine bearings).

David's talk was lively, informative and provided a rich introduction to a fascinating field of study. We thank him appreciatively.

John Lumsden

Pole Lathe bowl turning by Robin Wood

The reciprocating lathe is first illustrated on an Egyptian tomb of 300 BC where a spindle is being cut by a craftsman while the work is driven by a strap pulled to and fro by a colleague. Robin Wood then produced a slide taken in the 1960s somewhere in Africa of an identical set-up involving a turner and a 'driver' which suggested this was not an indigenous tradition but a colonial import. Even more recent was a picture of a Moroccan turner of candlesticks driving a bow lathe with one hand and guiding his chisel with the other, holding it steady against the tool rest with his big toe (safer than it sounds!)

Mr Wood's practical experience as a pole-lathe turner had enabled him to identify as a mandrel an artifact

previously identified by the archaeologists as a 'lathe turning tool'. This had come from an early Egyptian site and was interesting because it gripped the work with a square socket rather than by the usual pair of spikes. The early Egyptian work was of small components for furniture or little lidded boxes for ointment (or makeup) and was of the high quality that one associates with their furniture generally.

Robin Wood's earliest example was dated to around 6-800BC, a 2" diameter basal plate left after turning a bowl, found at Oak Bank, Loch Tay. A tiny fraction of wooden ware has survived, compared to pottery; a lot of it has been excavated from ancient privies which provided just the right damp conditions! An enormously important site is at Novgorod in Russia where the wet ground has preserved to a depth of 6 metres, large parts of a city founded in 996AD, and where for nearly 1000 years everything was made of wood. The quality of earliest edge tools could be seen from his slide of 10th century posts whose axe-cut points showed a mirror finish, achievable only with a blade sharpened to a mirror finish.

Hook tools had been found, very similar to the ones used by the last full-time English pole-lathe bowl turner George Lailey (died 1958). The wood ware from Novgorod was sophisticated stuff, as were 14th century examples found in a huge latrine in a Freiburg monastery.

These pictures lead neatly on to Robin Wood's recent studies of ware from the Mary Rose, especially of a collection of turned lidded canisters in the surgeon's walnut chest. All of these objects, asserts Mr Wood, demonstrate a different aesthetic, one which glories in the quality of the turner's tool marks and ignores, for example, the roughness with which the scar of a snapped-off core can be cleaned up inside a bowl. With Mr Wood to guide us, we could begin to discern the signatures of different makers in the forms they used and the patterns they made on those forms.

Robin Wood concluded his fascinating lecture with a discussion of the remarkable conservatism of traditional bowl-turners, who might spend a lifetime making bowls of the same size and shape, in the same wood and decorated in the same way. He was looking for funding to pursue this research, which seems likely to require the same kind of painstaking and perceptive enquiry as produced *The English Regional Chair*. I can think of no person better qualified to carry out the task.

Nick Abbott

past Chairman of the Association of Pole-lathe Turners

Bench-made and period tools, and their application in furniture restoration by Howard Page

For those of us who earn our livelihood from the use of tools in furniture restoration this lecture was one that was surely going to be of special interest. Howard Page is currently senior restorer at Sotheby's in Billingshurst.

We were not to be disappointed! As an apprentice he started work with a toolbox of new tools and was surprised by the lack of interest shown in them by the mas-

ter craftsmen in the workshop. He then described how he realised like 'Saint Paul on the road to Damascus' why his new colleagues favoured the 'old' traditional tools. He described how, with only a monthly salary of £24 he would search market stalls for tools, some he sold on, others he kept for himself, so he started his practical collection.

The tools that he went on to describe, often assisted with the use of the overhead projector, varied from those used every day to tools still awaiting refurbishment or completion! I felt we could all empathise with that problem. He described his own bench-made scratch stock together with the simple slotted screw for creating beading. It soon became clear that whether it was a refurbished tool, a bench-made one-off version, his attention to period detail and finish was one of perfection.

Tools from other professions which could also be pressed into use were described such as the angled forceps, useful for handling small sections of veneer and a bone chisel used as a good lever. The need for 20 paring chisels was also mentioned, and yes they are all really needed! Some detail was also given to workshop jigs such as the box used for producing reeds on chair legs.

Favoured tools were discussed such as the much used 60¹/₂ block plane. Other tools were described for uses other than intended such as small hammers with and without handles and a plane that would be used more often if it were not for a damaged mouth.

We were treated to a 'guess that object' which turned out to be a device to obtain extra purchase when using a syringe. Altogether a most interesting, informative and reassuring lecture.

Anthony Rayner Baker

Report by David Dewing on the final session of the Technical Day.

In the final session Michael Legg gave us a tantalising glimpse of what would be a fascinating autobiography. At the age of 10 he was allowed to start in his father's antique restorer's workshop in the old malthouse at the back of the Noah's Ark pub in Dorchester, where Michael was born. Also in the malthouse were his grandfather's carriage-building shop, Uncle Bert the wheelwright, Mr King the clock repairer, Pa Watson the taxidermist, Mr Cook the cabinet maker and carver, and two autocratic ladies dressed in black who dealt in herbs! Apparently, Uncle Bert used to hire out bicycles to the young ladies of Dorchester, who wheeled them up the High Street on Sundays until a suitor could pluck up the courage to ask, "May I push your bike for you, Miss?"

Michael was initiated into the mysteries of cabinet making and restoring by Mr Purseglove, as well as his father, and he explained several of the workshop techniques he had learned from them. In distinguishing inlay from marquetry, for example, inlaid work will often betray itself through tiny knife marks in the ground veneer, caused by the over-run of the inlay knife when cutting the 'grave' for the inlay and clearing

the waste; marquetry can show a 'wiggly line' if the cutter has had to saw from the edge of the panel into the pattern, a line which is almost invisible, but unmistakable when you know what to look for. Michael explained the use of a heated sandbag in applying veneer to a shaped or curved surface; the bag is laid onto the work and cramped down, moulding itself perfectly to the contours, while the heat softens the glue enough for the excess to be squeezed out, ensuring a good bond. A particular cabinet-maker's glue is used, called 'Tug', made by the Sheppey Fertiliser Firm and now called Sheppey Adhesive. This is heated not in the two-part cast-iron glue pot, a very difficult article to keep clean, dirt being the enemy of glue, but in a disposable shiny bean tin warmed in a saucepan of water. The glue is applied with a home-made rattan brush which could almost be guaranteed not to lose a hair, especially important for working quickly before the glue begins to set. Michael showed us how he was taught to cut mitres without using a mitre box, by placing the saw on the work and using the reflection in the saw blade to form a right angle with the work, at which point the cut will be at 45 degrees. He was almost in tears when he showed us the user-made veneer hammer produced by his grandfather, which he could only describe as 'perfection'. It was a moving moment for us all, and for me at least, the highlight of the day!

We ended with four short contributions 'from the floor'; the first was Arthur Kingdom asking for opinions on a tonguing plane in oak with early dating features, but which delegates thought was probably a craftsman-made mid-eighteenth-century tool; next was from John Lumsden who showed us tools from his family's mid-nineteenth-century plane-making business in Dundee; then we heard David Bryant on his research into the circular saw, prompted by claims that a Shaker sister had been responsible for its invention in 1810, but David puts it down to one Walter Taylor, working on a block-making contract for the Royal Navy in the 1780s, closely followed by Mark Isambard Brunel doing the same in 1801; and finally Chris Currie talked us through the contents of a tool chest owned by Edwin Robertson, a cabinet-maker from Grove Road, North London.

The day was organised by Chris Currie, on behalf of the Regional Furniture Society, and Fred Woodroffe, on behalf of the Tools and Trades History Society. Our thanks go to them for their meticulous planning and for making it such a success. Thanks also to Christopher Claxton Stevens and Fred Woodroffe for chairing the sessions efficiently and enthusiastically. And finally, thanks to Buckinghamshire Chilterns University College for their administrative and practical support.