The Newsletter of the Guild of New Hampshire Woodworkers

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Steam Bending  
half hour flowers

The Old Saw

duplication • water based finishes • articulating tambours  
surface texture • mortising jig • on becoming a woodworker  
shop apron • japanese kokeshi dolls • miter sled  
working efficiently & accurately

Tom McLaughlin

Knuckle Hinge Joint

Calendar

Nov 8    Period Furniture
Nov 15   Guild Meeting
Nov 16   Luthiers
Nov 22   GSWT
Dec 6    BIG
Dec 13   Hand Tools
Jan 10   Period Furniture
Jan 18   Luthiers
Jan 24   GSWT
Feb 7    BIG
Feb 14   Hand Tools
Feb 21   Guild Meeting
Mar 14   Period Furniture
Mar 15   Luthiers
Mar 21   Guild Small Meetings
Mar 28   GSWT
Apr 4    BIG
Apr 11   Hand Tools
Apr 18   Guild Meeting
May 9    Period Furniture
May 17   Luthiers
May 23   Turning Symposium
May 30   GSWT
Jun 6    BIG
Jun 13   Hand Tools
Jun 20   Summer Trip
Jul 25   GSWT
Scholarships and a Safety Lesson

It is a great thrill to be the new President of the Guild of New Hampshire Woodworkers. I would like to start by again thanking Dave Anderson for a great job over the last two years.

Annual Meeting – For those of you who were not at the annual meeting, we missed you and you missed a fun auction and an excellent educational session by Garrett Hack. The main business covered was a vote to raise the dues to forty dollars annually. As many of you realize, we were getting to the point where we were actually losing money on each member. The increase should hold us for a number of years.

Scholarships – It is my hope that over the next two years the Guild will continue to expand it’s educational activities particularly into the schools near our membership. I know that my first experiences where in a junior high shop class, which was mandatory and all male back then. I think things have changed a little over the years. The fact that the scholarship requests have overtaken the income to the scholarship fund is a positive change. While there is still plenty of money available, both members and nonmembers are taking advantage of the funds and we are beginning to reach out to area schools.

Just as a reminder, scholarships are not need based, are given for any woodworking related educational activity and the applications are available online from Peter Breu, chairman of the committee. We do ask that recipients pay the Guild back in some form. This may be writing an article on the experience for *The Old Saw*, making an item for the Sunapee Craft Fair Raffle or volunteering to work at the Fair or some other event is up to the individual and the committee.

Shop Safety Lesson – On another note, I recently had a reminder of the importance of shop safety. My lathe is a large One Way and the extension was on to turn a spindle from a 3½ foot 4x4. This was a sizable piece of wood and I started at a low speed. Everything went well until the lathe turned itself off. It was near full speed. I immediately hit the emergency shut off because it too turned itself off.

So I did what I was told. Unfortunately the speed control dial on the One Way is on the control box. Part of my usual routine is to check it before turning on the lathe but in this case it was upside down and out of sight and I did not follow my usual routine. Even more unfortunate for me was the fact that it had shifted when I took off the panel.

When I turned on the lathe, it was near full speed. I immediately recognized my dilemma but could not hit the emergency shut off because it too continued on Page 3

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The Guild of New Hampshire Woodworkers – Bringing together the diverse interests of the New Hampshire woodworking community. *The Old Saw* is published five times per year. To join the Guild, go to www.gnhw.org and click on “Membership” to download an application form.
November Meeting
Homestead hosts November Guild meeting in Newmarket, NH

An Introduction to Bench Planes — The common bench planes should be a part of every woodworking assortment of tools even if you do most of your work with power tools. There are just some operations that can be done better, faster and with less effort. For our November meeting at the Homestead School, Dave Anderson will provide you with an introduction to these tools, their selection, setup and uses.

For the morning session between 10:00 and 11:00, members are invited to bring in problem planes which don’t work properly or those which need setup, and we will hold a mini-clinic on problem solving for planes.

Please bring chairs and don’t forget your lunch. Please consider bringing a project to the meeting, either one you are working on or one you have completed. It is a great way to see what others are doing and to give us some inspiration.

The main afternoon session will explore how to get into these planes with your choice of new or used, inexpensive or pricey, and bevel up versus bevel down styles. Special emphasis will be directed toward picking a basic kit of three to four planes which you will never outgrow and which will meet most of your needs. While a well set up and equipped woodworkers bench is always desirable, many of us have only a basic bench. Part of the demonstration will give you strategies and show you ways to work effectively with only the most basic bench plus a few inexpensive shop made fixtures which take up little space can be put away after every use.

Directions to Homestead Woodworking School
- From Rt 125 north, turn right onto Rt 87 in Epping. After 3 miles turn left onto Bald Hill Road. The school is 1.1 miles on the left.
- From Rt 108 south, turn right onto Rt 152 in Newmarket. Go past the high school and turn left onto Grant Road. After 3.5 miles turn left onto Bald Hill Road. The school is 0.5 miles on the right.

Table Saws...
1.5 hp HP 10 inch General Cabinet Saw - extra blades etc, 220 volt. Accessories available. Direct wired. This is David Lambs saw. Also included is 1.5 hp 10 inch Delta Contractors Table Saw 30 inch – With Mobility kit installed – $625 obo.
Richard Brennan: 603-783 9493 or David Lamb: 603-783-9912

Chisel Mortiser...
Multico PM 20 Hollow Chisel Mortiser. Good condition – $750.
Dennis Capodestria: 603-968 3145 or jhighland@innevi.com

Radial Arm Saw & Planer...
Delta 10-inch Radial Arm Saw, excellent condition, one owner, light use. Includes 8-foot extension table. List price $1200. For sale, $350 or BR0.
DeWalt 12½ inch thickness planer, bench-top model. Includes extra set of new knives. Excellent condition, one owner, very little use. List price $450. For sale, $150 or BR0.
Matthew Siranian: 603-526-8029 or matthewsiranian@tds.net

Multico Mortiser & Stanley Planes...
Multico PM16 mortiser with AEG German motor in great shape with instruction and parts manual. This is the machine that all the others have copied – $160 firm.
Plus several clean Stanley user planes.
Bill Newbold 603-673-1261 before 9 pm

Sharpening System...
Woodcraft Mark II Sharpening System – $400 plus shipping. I can email photo to anyone who might be interested.
John McAlevey: 207-273-2535 or johnmcalevey@gmail.com
**Q SIZING PARTS** – When sizing the parts for a furniture project from rough sawn planks, how do you deal with the movement that can occur shortly after the plank is divided? Do you allow the plank to sit for a period after being planed? Do you size them slightly over sized and allow them to find balance before a final shape is given? *Caleb Dietrich*

**Bob LaCivita replies:*** To minimize wood movement when milling rough lumber into parts for a project, I first cut the pieces to length leaving them long by and 1” up to 6”. This way I can cut away any snipe left by the planer. I then cut all my parts to width using a band saw with a fairly wide course blade. I leave the parts ¼” – ⅜” wider than the finished dimension. If the rough board has a very bad bow to it, I will remove the bow by jointing or hand planing.

By sizing to a rough dimension, you are relieving the tension in the wood caused by the natural way it has grown or in the drying process. Most of us have experienced a wide board closing in around table saw blade. This will eliminate this for the most part and make cutting much safer. Once the parts are cut to rough size, I joint a reference face and edge and then plan the remaining face and saw the last edge.

**Bill Thomas replies:** The rule of thumb I learned in school for sizing rough stock was to cut all the parts 1” longer than finished dimension, ½” wider, and round up the thickness to the next standard quarter, ie. 4/4, 5/4, 6/4, 8/4, etc.

The next step is rough milling to an oversize dimension. It is very important to allow the wood to equilibrate to its new dimensions. Wood can be thought of as a sponge. The outside may be dry, but the inside contains moisture roughly equidistant from the outside. When the wood is cut and milled, some of that moisture is now closer to the surfaces, especially the ends, which creates an imbalance of stresses. That imbalance can cause the wood to go out of flat, sometimes dramatically.

It is critical to allow the stock to settle down to equilibrium before going further with it. How much extra to leave is a judgement call. If the pieces are milled close to their final dimensions, they will be also close to final equilibrium, but run the risk of moving beyond their final tolerance.

Conversely, if too much extra is left, the final milling may need further equalizing. How long the process takes depends on the species of wood, the thickness of the stock and the moisture content of the wood before cutting. There is no magic answer, but as much time as possible should be allowed.

**Q WAX IN SHELLAC** – What type of shellac does not have wax in it? If the shellac has wax, how do you remove it? What if any problems does the wax cause? *John Watson*

**Ted Blachley replies:** If you have Bullseye shellac from the hardware store and want to de-wax it, pour some in a jar, put the cover on and let it sit on a window sill for a few days. You will see the wax settle to the bottom. Without disturbing the jar, suck the clear liquid off the top with a turkey baster and dispense into another jar. You can let the shellac in the first jar settle again and repeat the process.

Traditional shellac in flake form is available in the woodworking catalogs – follow directions on the package. I’ve found it to be a harder finish. The wax in Bullseye may cause adhesion problems if you are using it as a sealer under varnish.

**Q WOOD VS METAL SPOKESHAVE** – What is the benefit of the blade angle in wooden spokeshaves compared to metal spokeshaves? *Joe Barry*

**Bill Thomas replies:** Without going too far into cutting geometry, a metal bodied spokeshave is designed to work like a miniature bench plane. The iron is held at a 45° angle and the bevel is on the bottom to give the clearance angle. The typical wood bodied spokeshave, however, is quite different. The iron is flat on the underside with the bevel up, like a chisel. When the iron is lowered, the nose of the spokeshave rests on the work and the cutting edge becomes angled downwards. This allows it to dig in and take a cut.

Since the clearance angle changes depending on how far the iron is lowered, a wood bodied spokeshave can be set to take very fine cuts, or if necessary, lowered more so that heavier cuts can be made.

**Q JOINTING A TABLETOP** – Are there any particular techniques to ensure a flat surface when jointing boards for a table top? *David Frechette*

**Ted Blachley replies:** When making a top, use lumber that has been acclimated to the shop for as long as possible. Flattening a single board is a basic woodworking skill but requires sharp eyes and sharp hand planes. Use straight edges and winding sticks to check for twist.

Once a side is flat you can proceed to the planer to mill the other side parallel. Re-check for twist as you approach desired thickness. Joint one edge square to the face and run it against the fence of the table saw to rip the other edge square. If you can do that, you are halfway there.

I have a set of perfectly straight long...
Water Based Finishes

“New developments repeatedly get my attention”

About thirty years ago, a small ad in a trade magazine caught my eye. It offered ‘Water Based Lacquer’ as a safer alternative to the common nitrocellulose lacquers that many of us were spraying. After receiving a sample can that had a very plain industrial label, I first noticed a trade magazine caught my eye. It about thirty years ago, a small ad in a trade magazine caught my eye. It offered ‘Water Based Lacquer’ as a safer alternative to the common nitrocellulose lacquers that many of us were spraying. After receiving a sample can that had a very plain industrial label, I first noticed that it said, ‘Combustible’. The sniff test confirmed that it had plenty of solvent, maybe alcohol, and I took their word that it would burn or at least smolder over a flame. The critical test came from brush and spray application, as I looked for leveling, hardness, and most of all, appearance. The results? Not bad.

I can’t say that I have tried every water based finish since then, but new developments repeatedly get my attention, and my finishing shelf has been full of experiments with various brands. The try outs have mostly led to frustration because I can never overcome the blanched color and melted Saran Wrap look. After all, when you have carefully chosen woods for a special project, you want a coating that will accentuate, not compromise, the beauty of the wood.

In spite of its shortcomings, there is no doubt that water based finish is here to stay and I have found several uses for it in my shop. For your own study, if you do a pros and cons list, you may be surprised that the positive qualities of water base will at least equal the negatives. After doing this exercise, you might look at the use of water in finishing with a new perspective.

Take a typical finish schedule of staining, sealing, filling and top coating. A water based finish can be the most appropriate choice for some or all of these steps. Application of water stains, especially the dyes, provide excellent depth of color and light fastness. Water based sealer coats easily accept dyes and pigments to help build color. One note of caution is that the first coat of water based sealer is often the culprit for blanching the wood, and many professionals prefer a thin coat of dewaxed shellac to seal and retain natural color.

Water based grain fillers can be used before or after sealer coats with good adhesion, and they have the advantage of quick and predictable dry time that solvent based fillers can’t match.

Topcoats in most water based formulas are designed for ease of application and are quite durable. Many rubbing compounds used to finish off top coats contain water. The traditional rubbing agent, pumice, works well in a water slurry. Apart from clear finishing, it should be noted that solid colors such as found in acrylic paints can be used full strength or thinned with water to make glazes, and genuine milk paint relies on water for full bodied color or thin washes.

Here is a list of typical uses for water based finish:

- Exteriors – The list is endless from your outdoor deck to your snowshoes. Be sure to pick a water based finish that is specifically labeled for exterior use.
- Cabinet Faces – Use water base when you want low odor, especially on a job site.
- Cabinet Interiors – Water based finish is ideal on interior surfaces when:
  1) You want to avoid strong solvent odors. Caution: water based finishes need proper ventilation too. They are not hazard free. 2) A lower sheen and flatter look is desirable such as the interior of drawers. 3) Speed and predictable drying time is needed.
- Decorative Pieces – Many projects go quicker with water versus oil colors. Consider a reproduction blanket chest that calls for one or two base colors and several highlights. You could wait days for oil paints to dry or just hours for water paints.
- Utility Pieces – A production run of tool handles or anything similar could be dipped or sprayed with water base finish.

Manufacturers have made many claims about water based finishes, often characterizing them as the equal of traditional finishes. I think it is an unnecessary and unhelpful comparison. Water based finish is just different and should be used for its unique qualities rather than seen as a replacement for solvent based varnishes and lacquers.

No single finish suits every need. When you have a variety of finishes on your shelf, and when you take advantage of their versatility as tools to reach a desired look on specific projects, water based finish will be one of your valued tools.

If there could be one plea from many of us who are small shop professionals or avid woodworkers, it might be that manufacturers would keep working to combine as much appropriate solvent with water as possible, keeping it under the threshold of required VOC levels. Some brands already contain some amount of solvent. A second request would be for the addition of more natural resins and less acrylic and urethane that are common in water based finishes. It would create a better appearance that many of us would pay for.

Relying on memory is risky when it comes to details, but the water based lacquer that I tried 30 years ago seemed to have a good portion of a natural resin and it certainly had a solvent to help it penetrate and flow. Today’s technology emphasizes user friendly, green and low odor qualities but the products still need to provide great, not just good, appearance. Having said that, I use water based finish to advantage for specific purposes and always will in my shop.
Tambours bring to mind the classic roll top desk. The small slats of wood that are the tambours create a curtain that can be drawn over the mess of a desk and secure the contents within. They can also provide a visual consistency or massing for a piece of furniture. Plus, they appeal to our inherent sense of play (Peek-a-boo!). Admit it. They’re kinda neat!

The most common form of tambour is wooden slats glued to a backing of 10 or 12 oz. artist’s canvas. There are also reports of silk or leather being used. To help conceal the canvas if it is exposed between the slats, it is helpful to dye the canvas black. Hide, white and yellow glues have been used to secure the canvas to the underside of the tambours. In one case, the manufacturer made a sandwich of the canvas by placing thin slats of veneer on the inside of the canvas. One of the best resources and how to make a curtain is the Guild video of Jere Osgood’s demo. Borrow it and all will be made clear!

Tambour History – The tambour resolved a design problem inherent in the cylinder desk of Thomas Sheraton. The solid quarter cylinder was a large awkward shape to accommodate within a piece of furniture and took up a lot of interior space. It limited the size and depth of the pigeonholes within the desk. By making the cylinder out of slats, it could be bent around a gallery of pigeonholes to drop in behind for storage. A further refinement is to bevel or shape the outside edges of the slat allowing them to turn around an exterior radius. This led to the “S”, double curve, or “waterfall” curtain that is associated with the classic roll top desk. Typically the tambour is shaped with a bullnose or a 30° bevel on each outside edge.

Tambours can also be made in other shapes. The Bureau du Roi, arguably the first roll top desk, was made for King Louis XV in the 1760s (ordered in 1760 – delivered in 1769!) had flat tambours for the marquetry surface decoration. John and Thomas Seymour used tambours shaped with a scratch stock and inlaid with bellflowers for the galleries of their lady’s desks. Hoosier cabinets had relatively flat tambours. Danish Modern used a flat square edged tambour so that the veneered face of the sideboard presented what appeared to be a solid piece of unbroken teak. Tambours have also been made in a variety of shapes and even been carved in bas relief. A more ambitious shaping into a sawn tambour can give the curtain a swelling belly like a Bombe bureau.

During the reign of the roll top desk in the late 19th century, the major drawback to a canvas backing became readily apparent. In an age when every man carried a pocket knife, it was relatively easy to insert a knife between the tambours and slice the canvas bypassing any locks. The 19th century was in many ways the age of the patent gadget. In a very competitive marketplace, furniture manufacturers were always ready to market a newer and better widget. The answer to the security problem was to replace the canvas with a couple of wire cables threading the tambours together. A different approach was to make the...
tambours interlock so that there was no space for a knife to get between them.

Making articulating tambours could be a very complicated process requiring multiple steps to form the tambour. Fortunately, we now have choices in router bit sets made especially for this task. If you have ever considered building a strip canoe, you are familiar with the cove and bead bits used to make the strips. In early strip canoes, each strip had to be beveled to match the changing bevel of the previous strip. Or you relied upon the “crap in the gap” technique when applying the fiberglass coating. Then someone had the bright idea to mill a cove on one edge of the strip and a matching radius along the other edge. This allowed the pieces to mate smoothly without any gaps as the strips wrapped around the turn of the boat. The same idea has been applied to making tambours.

**Eagle America Bit Set** – Eagle America ([www.eagleamerica.com](http://www.eagleamerica.com)) makes a set of two bits for use in stock either 5/8” thick or 3/8” thick (180-8015 for 3/8” $89.95 & 180-8005 for 5/8” stock $99.95). The thinner stock would be used for smaller items such as an appliance garage and the thicker stock for larger uses such as a desk.

They also sell a cable kit. There is no need to go overboard and buy a Nicopress tool to secure the end of the cable. Squeezing on a sleeve with a pair of vice grips or driving in a screw alongside is enough to secure the cable. Rockler ([www.rockler.com](http://www.rockler.com)) can do all the work if you want to buy the pre-cut tambours and assemble them yourself.

**Amana Bit Set** – Amana ([www.amanatool.com](http://www.amanatool.com)) has brought out a bit set in association with Lonnie Bird. This three piece set (#54314 for $189.95) will make the ball and socket style. No additional canvas or wire is needed to assemble. The tambours interlock.

This style of tambour has been like the Loch Ness monster. It occasionally pops up in the woodworking magazines to tantalize briefly and disappears only to briefly show up again later. I first sighted it briefly as a letter in *Fine Woodworking* #15 (1986) and then later in #79 (1989) it re-appeared in an article on building a roll top desk. It also briefly surfaced as a how-to in the British publication *The Woodworker* (Volume 102, issue 8 – 1998). But building this monster required a lot of steps and custom tooling before these bits were made by Amana. Now it is a relatively straightforward process.

To make the Amana style tambour there is one step that is not readily apparent on first viewing. You rip your material wide enough to make two tambours plus 1/8” for a saw kerf to separate them after forming. The large bit cuts the face profile and half of the ball. After running all four edges across this bit, you have two tambours almost fully formed and needing only a rip pass between the two balls to separate them.

Before ripping them apart, a groove is made in the two outside edges to provide relief for the ball cutter. The ball cutter makes a pass inside the groove to shape the spherical recess. The third bit is a round over bit to relieve the sharp corners around the groove and provide clearance for articulation. Now you can rip them apart! The ball slides into the spherical socket and you have the tambour without the canvas or wires. One criticism of this style is that the neck below the ball might be fragile in ring porous woods such as oak. I’ve experimented with this bit and believe that not to be an issue with good stock selection.

In this day of the internet we now have some great support materials. Both manufacturers have additional technical information linked to their catalog pages for these items. You can even watch Lonnie Bird make tambours live on YouTube!

**One Last Point** – These bits are made for use in a router table. They are not designed for freehand use and you shouldn’t be trying to shape small stick like tambours freehand.

Also if you really can’t be bothered, you can buy pre-made tambours from Rockler or Van Dyke’s Restorers ([www.vandykes.com](http://www.vandykes.com)). Van Dykes also stocks tambour cloth for the traditional approach. Enjoy!
I built myself a house many years ago. When I finally made the cabinets and a few pieces of furniture, I discovered that I liked woodworking much better than carpentry but hesitated to pursue it seriously because I was not very skilled. The doors on those rustic kitchen cabinets still won’t close in the summer, and my first coffee table has fallen apart and been reglued countless times. The only joint I knew was the mortise and tenon, which I hacked out with chisels that I took to the hardware store for sharpening when they were too nicked to use.

A couple of years ago, while contemplating a jelly cupboard with an ill-fitting door which I had just completed, I thought with chagrin, “I don’t know what the heck I’m doing!” Suddenly a light bulb went on in my head – my incompetence as a furnituremaker was not due to stupidity or some inherent lack of ability. It was simply due to not knowing how! The solution was obvious – education.

I bought Woodworking Basics: Mastering the Essentials of Craftsmanship by Peter Korn and read it cover to cover. I almost laughed out loud upon discovering the techniques that would solve my problems – using razor-sharp tools, starting with perfectly flat and square stock, and accurately measuring and marking cuts. It was clear, however, that learning these skills would take more than just a good book. With the blessings of my very supportive husband, I signed up for a two-week Basic Woodworking class at the Center for Furniture Craftsmanship in Rockport, Maine, taught by Peter Korn.

I arrived in Rockport on a rainy July day in 2007 and unpacked my bags at the home of a local family who rents rooms in their sprawling historic home near the waterfront. Over the next two weeks, I hardly saw my hosts since virtually all my time was spent either at the school or on forays to Lie Nielson Toolworks or Liberty Tool.

There were eleven other students from a wide variety of backgrounds in the class. Two teenage brothers were hoping to become professional woodworkers. A retired college professor was starting a new hobby. A stained-glass artist wanted to incorporate wood into his work. In the next classroom woodcarvers were expanding their skills. In the other buildings on campus students in the nine-month comprehensive course and fellowships were working on a variety of projects. Each of the three workshop
The Guild of New Hampshire Woodworkers

Machines I have in the shop —

• 6˝ Delta jointer
• 15˝ Makita planer (found this through Brad Purmort)
• 16˝ Walker Turner bandsaw (found this through The Old Saw)
• Delta table saw (contractor saw)
• Delta hollow chisel mortiser (found this through Brad Purmort)
• Delta bench top drill press
• Baldor slow speed grinder (found this through Brad Purmort)
• Several routers
• Dewalt mitre saw
• I hope someday to replace the table saw, drill press, and jointer with better quality machines.

— Brad Purmort Woodworking Company in Newport, NH

buildings has a machine shop with state-of-the-art equipment, maple workbenches, and every hand tool a woodworker needs. The only thing I had to supply was a good set of chisels.

Peter Korn is a consummate teacher and teaches with compassion and humor. I learned how to flatten and sharpen my chisels, mill stock flat and square, hand cut mortise and tenon joints, hand cut dovetails including half-blind dovetails, hand plane a board flat, and glue up a piece. I also attended lectures about wood movement and finishing. I had expected to learn all of these things and was not disappointed. What I did not expect was to engage in discussions about art, creativity, and even philosophy. Peter talked about the day he realized that the qualities he aimed for in his furniture - grace and simplicity - were actually qualities he wished to develop in himself. I spoke about my goal of developing patience and concentration through working with wood. Laura Mays, our Irish co-teacher and a superior woodworker, questioned the fairness of charging people money for pursuing one’s own personal development. The conclusion of this very interesting discussion was the idea that if woodworking is in part an exercise in personal development, then it is worthwhile because it makes the woodworker a better person and thereby a better citizen of the world.

In addition to philosophizing and attending lectures, every day we worked on our projects - a variation of a simple bench with dovetails and mortise and tenon joints. It was a joy to see each student develop his or her vision and put it into action. Some people sailed through their practice dovetails while others struggled along. Everyone got close attention from the teachers and improved their skills immensely, and all finished with a beautiful bench or stool to take home.

I am the kind of person who is always rushing and always thinking of the next task or the next adventure. I have trouble staying in the present moment. But for those two weeks in woodworking school, sitting at my workbench with a razor-sharp chisel in my hand seeing a cherry footstool take shape, I thought “there is no place I’d rather be right now.” Leaving was sad, but arriving home was very exciting, as the very next week we broke ground on a new workshop.

When my husband, Todd, and I bought a house in Alexandria, NH we decided we needed an outbuilding to serve as a woodworking shop for me and someday a boat-building shop for him, as well as a space for storing bicycles and skis. After getting an estimate from a local builder for a 24’ x 36 one and one half story building that was so expensive it made our jaws drop, we scaled the project down to about half that size and decided to build it ourselves. This also required us to narrow it down from an all-purpose building to a dedicated woodworking shop. Todd was a bit unhappy about this, but when I promised he could use the shop to build a boat and we incorporated an attached shed for a small boat, he became more enthusiastic. I feel incredibly lucky to be able to design and build my own shop and deeply appreciate my husband’s support.

The problem I faced was that, as a beginning woodworker, I knew nothing about how to design and set up a shop. I read Sandor Nagyszalanczy’s book Setting Up Shop, which was extremely helpful. But I still felt unsure about where to put machines and benches and where to plan storage for sheet goods and lumber. I needed to plan these things in order to determine the placement of doors and windows as well as wiring. Peter Korn of the Center for Furniture Craftsmanship advised me to visit some local woodworkers’ shops and get their advice.

I went online and found the NH Furniture Masters Association. I was
pleased to find biographies and addresses of the members. I emailed Terry Moore and David Lamb, asking if I could visit them. Both immediately agreed.

When I arrived at Terry Moore’s shop, his puppy ran out to greet me with barking and tail-wagging. Inside, Terry welcomed me just as warmly, albeit with a bit more reserve. I was impressed with how much he had in his medium-sized shop. I furiously took notes as he showed me around, advised me about tools, and gave me resources to track down. Soaking in as much as I could, I did not feel at all looked down upon as a beginner. Terry seemed to genuinely want to help me get started and even said “you need to get good fast because we need more women in the Furniture Masters.” Although I doubt I will ever be good enough to join this distinguished group of artists, his comment made me feel welcomed into the community of woodworkers. Terry’s most ardent piece of advice was to join the Guild of NH Woodworkers. He said that it would be the best $30 I would ever spend. I have since discovered he was correct. He also offered to help me get tools from a local woodshop program.

While I was at Terry’s shop, Brad Purmort, another local woodworker, stopped by, and he invited me to see his shop which was closer in size to the one I was building. We went to Brad’s shop, and there I was impressed by how he fits all his tools and a small workbench into a very small space. I began to realize that the size of my shop, though small, was perfectly acceptable.

A few weeks later I visited David Lamb in his shop in Canterbury. He and his wife, Janet, took time out of their busy day to patiently show me their shop and answer all of my questions. David echoed Terry’s comments regarding joining the Guild. He gave me excellent advice about the business aspects of making furniture, such as to record the time it takes me to make each component of a piece in order to begin estimating prices, and to have professional photographs taken of each completed piece in creating my portfolio. I also tremendously enjoyed seeing his shop, in particular the row of antique bandsaws powered by a common driveshaft, which David has lovingly restored and uses in his work.

Since meeting Terry, Brad, and David, all three have helped me by either hooking me up with folks who were selling used tools or answering questions that arise from time to time. And of course, I immediately joined the Guild, which has allowed me to meet many other folks who have been equally generous with their time and advice.

Regarding my shop design, I finally realized that every space and every woodworker is so different that there is no cookie-cutter approach. All I could do was take all the advice and ideas I’d read and received and do my best to come up with a plan. Inevitably there will be mistakes and regrets, but that’s part of the process of becoming a woodworker.

My husband Todd, our good friend Mike McGraw, my father-in-law Don Smith, and I spent ten days in August, 2007 framing and roofing the workshop. Although the days were long and the work challenging, the camaraderie was great and we had a fantastic time. I spent the year since then installing the windows, siding, wiring, insulation, heating, flooring, and inside walls. The shop has a 16’ x 20’ main room and 10’ x 10’ finishing room. It is 90% finished, but I simply cannot wait any longer to start making furniture! I am starting to design the first piece I will build in the new shop – a cherry blanket chest which will be a gift for Mike McGraw.

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**Ask This Old Saw** – continued

and heavy maple cauls that I use for big tops. I attach them to my horses and make sure they are parallel by shimming the feet of the horses – check in the same way you would use winding sticks. I wax the edges of the cauls to avoid glue sticking and lay my top boards on perpendicular to the cauls. Check the joints. If the edges are square and the set can be drawn up dry with light clamp pressure, I’m ready to glue.

When placing the clamps, I work “west to east” alternating one on top and one on bottom. I try to center the bar clamp screw in the center of the edge rather than put the bar right on the boards. Excessive clamp pressure can cause distortion in the top. If the top is laying flat on the cauls when I’m done tightening the clamps, then it is flat.

Another thing I do routinely when building a project that has a substantial top is after I’m done making the top (and it is flat) I’ll screw some temporary heavy cauls to the bottom to maintain “flat” while I work on other parts of the project.
Most Windsor chairs require bent wood parts. It is safe to say that if you want to make these chairs, you have to master this skill. However, steam bending is an art, not a science. No matter how much experience you have, some bendings are going to break. Like a military planner, the chairmaker’s goal is to keep the casualties as low as possible. That means you need to have every contingency leaning in your favor, and you cannot take short cuts. If you do, you may accomplish some successful bends, but your failure rate will be unacceptably high.

Choose Your Log Carefully

Begin with wood selection and use the woods most suitable for bending. About ten years ago, it was popular for woodworkers to make everything out of walnut. Right now, the “in” wood is cherry. I regularly get calls (as I did then) from people who are suffering very high failure rates. When I ask what they are bending, I am told they are trying to make an all-cherry chair (just as it used to be an all-walnut chair). This is folly, as these woods do not bend well.

Windsor chairmakers traditionally used locally available oak, ash, or hickory for bendings. These are all ring porous woods with long tough fibers. Today, as in the past, these remain the best woods for this job.

You need to obtain your wood directly from the log. Wood that has been sawn into boards or planks usually does not have straight enough grain to result in a high success rate. Do not buy wood at Home Depot and try to bend it. Do not try to bend wood that has been kiln dried, as wood that has been heated does not bend well. I have had bad luck bending wood that has been heated when it was left leaning against a wall too near a stove.

You have to be finicky and down right fussy when selecting your logs. When trying to describe to people what to look for I say, “Think telephone poles.” That is just what you want, trees that look like telephone poles, perfectly straight. The wood inside such a tree will generally look like the tree did on the outside. For that reason, the trunk must be straight, with no curve or twist. If there is, the wood will be bowed or twisted.

There must be no obvious blemishes on the log’s surface. A blemish in the log will cause the layers of annual growth to deflect around it, and the stock you obtain will not be straight. Reject out of hand logs with freshly trimmed limbs. It does not matter whether these limbs were live or dead.

Refuse any logs with bumps or burls. Next to the shape of the log, the bark is the best indicator to what is inside. Oaks, ashes, and hickories have coarse bark with striations in it. These should all be straight and parallel.

A knot or defect inside the log is said to be “encased.” Encased defects will usually disturb the pattern of the striations in the bark and often create “cats faces.” These telltale swirls are a
The Guild of New Hampshire Woodworkers

The wood that was once the sapling. This wood usually has too many small defects, and should be rejected.

Be on the look out for folds in the bark. These appear as long (often dark) lines, like a scar on human skin. These folds cover an injury the tree has sustained. Look out also for dark stains in the bark. This can indicate an injury that is still open to water, which can cause rot in the log.

No matter how choosy you are, there is no guarantee that even the best looking logs will not have flaws. You cannot be sure what the wood looks like until you split it open.

If you are buying the log at a mill, you obviously incur all the risk. The sawmill owner is not going to let you return a log that you split open. Avoid logs that are too big or too small. We do not like them to be less than 14 inches in diameter, nor greater than about 24 inches. Small logs have a greater percentage of juvenile wood – the wood that was once the sapling. This wood usually has too many small encased knots to be good for bending. Logs that are too big cannot be easily handled. Splitting them requires more wedges and back breaking work. In a big log, the splits made by the wedges frequently miss each other rather than running together, and a lot of wood will be wasted.

Here at The Institute, we use forest grown trees. We are a big enough business to be able to buy our logs wholesale from a concentration yard that sells veneer logs to buyers from China and Germany. The logs are delivered here by a big logging truck and a cherry picker. If you want just one log, try a local sawmill or a logger. They also have forest grown trees.

I have successfully used oaks that grew on someone’s lawn. However, landscapers and tree services usually have urban grown trees and I would recommend avoiding these. We tried to use an urban tree in a class I taught in Atlanta many years ago. The log was beautiful, but we had almost 100% failures. I do not know whether the problem was environmental, but I never wanted to take that chance again.

**Freshness**

Finally, determine when the tree was felled. If it has been down too long, it may have begun to decay. Decayed or decaying wood will not bend. If you are buying from a saw mill, the operator may not know this information, but if your are buying from the logger who cut it, he should.

Otherwise, your best bet is to examine the sapwood. This is the band of annual rings about an inch thick and closest to the bark. On oaks, the sapwood is usually a lighter color. The sapwood contains nutrients that attract fungi. These will usually appear as bluish or blackish spots about the size of a pencil point.

In red oak, you can cut away the speckled sapwood and still use the reddish heart wood. I suspect the tannic acid in red oak protects it. However, after enough time even heart wood will be affected by decay.

Trees that are cut in the summer or late spring are more likely to decay quickly. At that time of the year the tree is in its growth cycle and the sap is up. The weather is also much warmer. A tree dropped in July when temperatures are in the 90s can begin to decay in a week. A tree dropped in October when the tree is dormant and the weather cool, will remain fresh much longer. In fact, we like to put in a large supply of logs in the late fall, as they remain frozen from December through March. In the warm weather we buy small numbers of logs, and more frequently.

The problem is that other than in the sapwood, you cannot always see the early stages of decay, a break down of the wood that makes it brittle and incapable of bending. Although over the phone or via email, I cannot diagnose why wood will not bend, I suspect that decay is most often the culprit. Your best protection is to know a tree’s history – when it was dropped and where it has been in the meanwhile.

**Storing Wood**

No matter how fresh your log, it will not remain that way. This means you need to get to work on it right away. There is no difference between wood taken from a log that has been at the mill for six months and one that has been lying in your back yard for the same amount of time.

This is the analogy I use when describing wood selection during a class. Think of yourself as a farmer putting down a cow for meat. You will not take the cow out into the field, drop it, walk away, and return three months later to cut off a steak. The meat needs to be processed right away. Once it is cut up you have two choices – freeze it or dry it into jerky.

Treat a tree the same. Split it up right away. Then, you have two options, freeze it or dry it. Here at The Institute, we have a large 6 foot chest freezer which we fill with riven wood for our classes and for sale.

Unfortunately, back in the 1970s working wood that has been split from the log was been dubbed “green woodworking”. As a result many people think the wood needs to be kept wet. This is wrong, and results in a lot of ruined wood. Some people try keeping the billets submerged in water. This is unnecessary. Others wrap it in plastic.

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Still others wax the ends. These steps only promote decay. If you cannot freeze your wood, allow the billets to air dry. Although successful steam bending requires the wood to be wet, the steam box will take care of that. Treat the billets like you would any other wood you buy. Keep it dry and off the ground.

I remember one fellow who called because his bends were breaking. It turned out he had stored his billets on the ground under his back porch. Of course, the wood began to rot just as would a board stored on the ground. The best place to store billets is in a garage or other unheated building. Unless you live in a desert, it will not air dry much below 10% - 14%. Wood stored this way will be good for years. I have successfully bent air dried wood I split into billets a decade earlier.

**Making Billets**

Here at The Institute, we split our logs with a log splitter. Every couple of months we have what we call a “spilling party.” Fred, Don, and I, along with a farmer who lives down the road, split enough wood for our upcoming classes and for sales. The farmer Kevin, drives his tractor down here with a four-foot splitter mounted on the rear. Splitting the logs this way saves us a great deal of back breaking labor.

If you are a chairmaker working on a smaller scale, you will most likely split your logs by hand. Using a maul and splitting wedges, split the log into halves. This is called riving. Use a hatchet to snip any wood that is tearing from the two halves and holding them together. Otherwise, these tears may lengthen and waste good wood. Next, split the halves into quarters and then, the quarters into eighths. These eighths – called billets – have a cross section that looks like a slice of pie.

With a maul and wedge split away the pointed piece of the pie. This is the tree’s juvenile wood, and it is seldom useful. Next, use a drawknife to peel the bark off each billet. Remember, the tree’s living growth layer is right under the bark. It is wet and rich with nutrients. If left this way, boring insects will quickly make your riven billets their home. After our splitting parties we take these billets and carefully following the grain, cut them on our Hitachi band resaw into arm and bow blanks. We use this big saw because we are cutting enough stock for as many as six classes at a time. You are not likely to place these demands on your equipment and so, can use your shop band saw. To make the stock more manageable, you might want to split your billets one more time, into sixteenths.

**Preparing the Stock**

Once the oak has been sawn into bending stock it is ready to be worked. In our experience, stock that has been set aside for even a couple of days and has lost a bit of water will bend better than wood that is dead fresh. The use of the term “green woodworking” leads many people to think that wetter is better. However, as long as wood is not heated by kiln drying, being placed near a stove, or stored in a hot attic, moisture content is largely irrelevant. The steam box will provide the necessary moisture.

The type of chair you are making determines the stock’s shape and dimensions. When sawing, the goal is to keep the blade in one layer of growth as much as possible, as doing this perfectly results in stock with no grain direction. Following one layer of growth may result in stock that is not perfectly straight and that has a slight bow. This is not a problem, as the part is going to be bent anyway.

Like most other human endeavors sawing bending stock is not always possible to do perfectly. As a result, when shaping the wood into chair backs there will sometimes be places in the stock where you will be cutting with the grain and other times, against it.

When a tool begins to dive or choke, it is necessary to cut in the opposite direction. The greatest risk occurs when using the draw knife. This tool’s open blade can dive as it follows the stock’s grain and ruin the part. A light test cut is always best.

Do not be concerned by the light colored sapwood. In our experience it bends well. However, it does best when in compression. Therefore, when it is present, we plan our work so that it will be on the inside of the bend. In other words, so it will be placed against the bending form.

Pin knots are a real hazard, as they create weak spots. It is best to plan your work so they are removed while shaping the part. If this is not possible, we again prefer to place them on the inside of the bend so they are in compression.

When either sapwood, pin knots, or some other risk is present, our habit is to mark the area with large, dark Xs made with a Sharpie permanent marker. When the part comes out of the steam box, this reminds us that when making the Xs we had determined a preferred placement on the form.

**Mark Your Parts**

Since Windsor chair parts are bent from the middle, it is necessary to locate and mark the center. You have about 45 seconds to bend a part. While, this is more than enough time, you do not want to be delayed by problems that could have been avoided.

We also mark the centers of our bendings with a Sharpie, as it leaves a dark, easy to find mark. Do not skimp on this important step by making a faint or incomplete mark. Make the center mark all the way around a round part and on all four sides of one that is rectangular. When you take the hot, wet part out of the steam box, you do not want to waste precious time looking for your mark.

Do not use a mechanical pencil or a ball point. Steaming gives the wood a slight gray cast, and the faint mark made by a mechanical pencil can be hard to find. Steaming will bleed ink out of the wood and the mark will disappear.

Remember steaming wood is an art, not a science. Some parts will break, even when you are doing everything right. The goal is to keep these failures at an acceptable level. This means you want to have as much in your favor as possible. The process we use at The Institute does just that. An average of 2 parts out of 34 will break in a sack back class. In some classes, there are no breaks at all. In others, there are more than two.
The Steam Box

To successfully bend wood it has to be both hot and wet. The temperature should be at least 185 degrees F with 25% moisture content. With both these properties, the wood is said to be plasticized, which means capable of being bent.

The steam box we use is the one we developed and perfected here at The Institute. We call it The Ultimate Steam Box, because it is so efficient and because it solves the problems associated with other ways of making these devices.

To make the box we use Schedule 80 PVC pipe – Schedule 40 will not take the heat and will crinkle up like a pretzel. Wood steam boxes require a lot of steaming time just to become saturated and tight. Unless insulated, metal boxes radiate off a lot of the heat that should be plasticizing the wood. If you touch an exposed part of a metal tube you can get a good burn. PVC is both impervious and a good insulator. I demonstrate this to a class by holding my hand on the PVC tube. Only 1/4” away from my skin is live steam.

We boil water on a 160,000 BTU burner originally designed for cooking lobsters and crawdads. This burner creates a rolling boil and lots of steam. Electric hot plates and the camp stoves that I used early in my career, make the water simmer and do not provide the volume of steam created by these new burners.

We boil our water in five gallon steel utility cans. Needless to say, we buy these brand new and never put gasoline in them. Five gallon capacity is more water than most chairmakers will need. However, in a sack back class we bend 34 arms and bows in about 2½ hours, and having to continually fill the boilers is a nuisance. For most chairmakers a two gallon can is sufficient.

The steam box and boiler are connected by tight fittings. This ensures that all the steam that is generated in the boiler is conveyed to the steam box. Because the PVC is impervious and a good insulator, the steam goes right to work doing its intended job of plasticizing the chair parts.

When Should I Bend

In our experience, bending goes better some days than on others. Over the years I had observed this and began to look for the cause. The following may seem like folk lore, but it is quite true and accurate. The best bending days are those that are bone dry and crystal clear. These are the days that make you feel like you have boundless energy. Wood taken from the steam box on these days feels dry and not very hot.

The least favorable bending days are wet, gloomy, and dreary. These are the days when there is not enough coffee in the world to wake you up. Wood out of the steam box feels wet, and is so hot we end up juggling it from hand to hand as we carry it to the bending form.

This observation runs counter to what one would assume. Since wood needs to be hot and wet to bend, it seems a wet day would be our favor. However, it is not.

We found an indicator that would tell us when bending conditions were good. We found it in a very unlikely place – a piece of wood called a weather stick. These are specially cut twigs from Maine that are sold by some of the country living type catalogs for about $8. Please, Google “weather stick” rather than calling me for a phone number.

When the weather is dry and providing a good bending day, the stick points upward. When the weather turns dreary and overcast, the stick turns down. Obviously, the wood in the twig is responding to the relative humidity of the surrounding air, and the particular way it was cut makes it go up and down.

The weather stick further underscores how much successful steam bending is art and skill. I would never recommend becoming a slave to the weather stick. However, if you are not in a hurry and have the flexibility to wait for a better day, I would. At home, you have an advantage in that you can wait for a good bending day. We have to bend on the first day of each class so our parts are dry and ready to use later in the week. Regardless of the weather, we fire up the boxes and go to work.
If the steam box did not have some relief, the test caps on either end would be blown off as pressure developed in the tube. We make a ½” relief hole in the bottom of each end of the tube. The steam enters the tube in the middle and travels in both directions, escaping out the vent holes. This ensures an even distribution in the box. When our boxes are running at full steam, a plume of water vapor blows down from the ends of the tubes to the ground. We can look out the classroom window and tell how things are going in the bending area.

Because heat rises, the parts do not sit on the bottom of the box. There, they would also be bathed in cooler condensed water. Instead, they rest on a rack made of stainless steel bolts that pierce the tube. Regular steel bolts would leave dark purple stains on the parts.

**Plasticizing**

As little as 15 minutes is all that is required to plasticize red oak chair parts. This time can vary somewhat according to the circumstances. The wood we use is freshly cut before each class. That means our bendings already have 25% moisture content and that all we need to do is heat them. If your wood has been stored for a while and allowed to air dry, it may be around 14%. You should steam a bit longer, perhaps 20-25 minutes.

Chairmakers who live in the Rocky Mountain states or at other high elevations have another problem. Water boils at a lower temperature the higher you are. I ran into this problem in 1980 and 1981 when I taught chairmaking classes at BYU in Provo, Utah. We managed to bend successfully by steaming our parts even longer than usual. We left them in the box 40 - 45 minutes. Because the wood was noticeably cooler than at lower elevations, we worked even more quickly.

Adding fabric softener to the water in the boiler has been suggested in some woodworking magazines as a way to soften the wood’s fibers and make it bend more easily. I have tried that trick and have not found that it makes any difference.

**The Moment of Truth**

Before removing a piece of wood from the steam box, be sure that every thing else is prepared and ready. You only have about 45 seconds to complete the bends before the wood becomes too cool, and you do not want to waste any of that time fumbling. Always check the form to make sure it is securely clamped to the bench. Be sure that the bending strap is easily accessible. Check that you have the required number of wedges and pins, as well as a hammer. I always go through this mental checklist. For beginners, I recommend refreshing the bending process in their minds by first pantomiming it.

Remove the part from the box and moving quickly, place it in the bending strap and secure it to the bending form. While you want to move quickly when setting up the bend, remember that as you bend, speed is your enemy. You must give the wood time to compress. If you move too quickly, you shift the outside edge of the bend from compression into tension. While wood compresses very well, it has a very limited ability to stretch. Tension will cause failures. Avoid it by bending slowly and deliberately.

“Do you wear gloves?” is a common question asked by students. I advise against them. As you gain experience bending you will discover that you can sometimes feel problems in time to correct them. We will sometimes feel a piece beginning to weaken and turning the part around, bend it successfully in the other direction. Roll up too, can be felt by a pair of experienced hands. You will never develop this “feel” for the wood if you wear gloves.

While steamed wood is quite hot, you can juggle it back and forth while carrying it to the form, and can switch hands while bending. The wood needs to be this hot and if it is not, you will experience more failures. I always tell students, “If you’re not swearing, it’s not hot enough.”

**Failures**

You cannot tell if the wood has been sufficiently heated when wearing gloves. Furthermore, bending requires dexterity. Gloves make your hands too clumsy. While we have few bending failures at The Institute, they do occur. Failures are a fact of life that a chairmaker has to accept, as bending wood is an art, not a science. Four types of failure can occur when bending. They are: delamination, tension shear, compression failure, and roll up.

Delamination is by far the most common failure. In this case, a layer of wood peels off the outside edge of the bending. A tension shear occurs when the wood fibers rupture, tearing like cloth across their width. In a compression failure, the wood on the inside of the bend fails to compress evenly, and kinks up like ribbon candy.
Roll up occurs most commonly in pieces with a rectangular section, such as the sack back arm rail. In this case, the part does not remain in a plane as it is bent. Instead, the rear edge rolls upward.

A failure is not necessarily catastrophic and can frequently be fixed. The difference between it going into the scrap pile or into a chair is usually a matter of degree. If it is not too large, a delamination can be tacked back into place with glue. It is best to wait a day or two for the wood to dry a bit.

A small tension shear can be consolidated with cyanoacrylate glue, which with a sufficient number of applications will actually fill the void. We saturate small compression failures with cyanoacrylate and when it is dry, smooth the crinkled, ribbon candy effect with a plane or spoke shave. We remove roll up by clamping the bending flat between two boards and setting it aside to dry.

Delamination, tension shear, and compression failures can frequently be prevented by bending in a slow, steady motion. As I said above, speed is the enemy.

Roll up results from one of two causes. If the part's edge against the bending block was not made at a right angle to the upper and lower surfaces, the part's section is a parallelogram rather than a rectangle. In this case, the rear edge will lift as the front edge is pulled tight. Second, when bending, it is common for students pulling a part, towards themselves to actually twist the part forward. We suggest students be conscious of this and counter it by purposefully twisting the part away from themselves. If in spite of these efforts a roll up begins, we can minimize it by allowing the bend to ramp up the side of the block. When it is cool we drive it back flat against the back board.

Drying

Once a part has been bent, it has to dry before it can be used in a chair. For single plane bends such as sack back and bow back side chair, we wait until the part is cool. We then tie the bending with a string and remove it from the form. The c-arm is bent in two planes and has to dry on its form. Crests are bent in a press and have to stay clamped in this device until dry.

At The Institute we dry bendings in the furnace room, which we use as a kiln. During the heating season the furnace keeps the temperature around 100 degrees. Because humidity is very low in the winter, the warm room will dry bendings in several days. In the summer we maintain the same temperature with a heat lamp. We lower the summer humidity with a dehumidifier.

At home, you can allow a part to dry on its own if you have the time to wait. In the winter you can speed it up by placing a bending on a heating duct, or above a radiator. In the summer, a part will dry in about a week if left in the sun. When I taught on the road, we would dry summer bendings by placing them in the backs of pick up trucks with black bed liners.

If you want to dry your parts more quickly, build a small kiln out of foam core board. In a pinch you can also use the kitchen oven. Set it to its lowest possible temperature and crack the door to allow the moisture to escape.

Spring Back?

Anyone who has ever read an article on steam bending knows that it is necessary to over bend to allow for spring back. While everyone knows this, it is flat wrong. It seems to be one of those things that having made its way into print, just keeps getting repeated. When wood is sufficiently dry it compresses further. We can tell with a glance whether or not a bending is dry. As it comes off the form, the string is taut. Once the part is dry, the string droops. Obviously, the part did not spring back, but moved in exactly the opposite direction. When it dries, a c-arm will compress so that the wedges that hold it on its form will loosen and fall away. A fully-dried crest will fall out of its press.

In fact, this extra compression presents problems for a chairmaker who bends a long time before being ready to put the part in the chair. The compression set makes the amount of curve too extreme for the chair. We have had good luck correcting over compression by filling the sink with hot water and soaking one side of the bend. Once it has become wet, we can force the bend back open. We then repeat the process on the other side. Once you have restored the part to the desired shape, use it in a chair immediately. Otherwise, it will compress again as it dries.

Steam Box Lesson

As I said earlier, most of the problems people have bending chair backs is caused by decay. However, other things can go wrong and result in repeated breaks. This is an example of a problem with the equipment. During a class a couple of summers ago, one of the other instructors called me out to the bending area. On the ground were four or five broken arm and bows. Over a little less than half its length, each part was a strange purple-brown color, and each had broken within this discolored area. However, the other end of each part had bent well.

First, we examined the broken parts then, the steam box. I discovered that instead of being level, one end of the box was significantly lower than the other. The landscapers had recently replenished the crushed stone in the bending area, and one end of the saw buck that supports the steam box had sunk into the fresh stone. The steam boxes have vent holes on both ends. These are drilled through the lower surface, just before the end caps. Since
these vents are the only escape, the steam flows evenly through the tube in both directions. This two-way flow plasticizes the entire chair back uniformly.

Because the box was at an angle with one end lower than the other, the steam entering the tube in the middle rose and exited only out the higher end. None was flowing down through the lower end. However, the jet of steam entering the middle of the tube and rising did heat the air in the lower part of the tube without wetting it. This hot dry air not only failed to plasticize the wood, it began to toast it. That explained the discoloration we had observed. The parts on the ground had all broken in the end that was lowest in the tube.

As I described earlier, in order to bend wood it has to be both hot and wet. This wood was only hot and wet on one end, and hot and dry on the other. In fact, it was so dry and so hot, it had begun to char. We leveled the steam box and every part after that bent as it should.

We quickly made replacements for the students whose parts had broken, and these bent without trouble. I saved one of the discolored parts and hung it on the shop wall. I tell this story to each class and use it to illustrate my tale.

**Boiler Lesson**

During a writing arm class one year we also experienced a series of breaks. I went out to the bending area to watch and help. As I assisted a student bending his arm I commented that the wood seemed too cool. Sure enough, it broke. Polling the staff and students, I learned that all the breaks were coming from one box. Those from the other box were bending properly. This ruled out bad wood. As I studied the box, I observed that very little steam was coming out the vent holes. Ordinarily, plumes of water vapor blow down to the ground from each end of the tube. Assuming the boiler was running dry, I took it by its handle to shake it. I expected it to be nearly empty and thus, light in weight.

All I remember is a moment of surprise at how heavy the boiler was, because as I began to agitate the boiler a geyser of hot water and steam erupted out the filler spout. Fortunately, my face was not directly over the hole. Most of the hot spray passed by with only some of it landing on my right cheek and neck. For several days I looked like I had a very oddly shaped sunburn. However, I healed quickly.

All I remember is a moment of surprise at how heavy the boiler was, because as I began to agitate the boiler a geyser of hot water and steam erupted out the filler spout. Next, I was running across the lawn with the skin of my face stinging. After lots of cold water and aloe I was sufficiently recovered to look for the cause of the accident. We use utility cans as our boilers. About six months earlier the old boiler on the problem steam box had rusted through its bottom. Unable to immediately find a replacement boiler of the type we prefer, we had bought another brand. This brand of utility can had a fine mesh screen at the base of the spout, which was intended to act as a filter.

Over time, the steel screen began to rust and the tiny holes became more and more constricted. Eventually, this constriction cut down the flow of steam up the spout, creating back pressure in the boiler.

In the filler spout we have a wooden plug with a funnel though its center. This allows us to maintain the water level in the boiler without shutting down. As the water begins to boil the wooden plug becomes wet and tightens. When I agitated the can the plug let go. The water and steam trapped in the boiler by the constricted mesh filter erupted out the filler spout.

Fortunately, my face was not directly over the hole. Most of the hot spray passed by with only some of it landing on my right cheek and neck. For several days I looked like I had a very oddly shaped sunburn. However, I healed quickly.

Like most accidents, this one could have been avoided if I had exercised plain old common sense safety. The lesson – always shut down a steam box before working on it.
Most any carving is really an exploration of what you can convince your tools to do for you. Carving small flowers is an easy way to get more familiar with grain and tool techniques. Given the small scale, amount of material and time spent, think of these as quick sketches that you need not get too attached to, that way you can be brave with your cuts and not worry about the perfection of each one. It’s OK to throw them out until you get one you like. After gluing down a bunch of basswood or pine blanks about a half inch thick by two inches in diameter with very weak hide glue and brown paper, proceed as follows.

Draw a small circle in the center of your blank and cut around it with a 12-6 V-tool (photo 1).

Round the center with a 7-15 (photo 2) and then the outside with a 7-20 (photo 3).

Divide the circle into five petals and separate them with spiraling cuts using a 7-20 (photo 4).

With a 12-6 V-tool again, make a notch in the edge of each petal (photo 5) and then form the overlap of the petals with a 7-20 (photo 6).

Using a 5-35, hollow the petals (photo 7). Be brave and try to span the entire width of the petal with your cut. This will leave a single smooth surface with fewer tool marks than if you’d made several cuts. I use a mallet and try to keep forward pressure on the tool to keep it from rippling.

Before you round the outside edges of the petals, cut notches with a 22-6 or 12-6 and then connect the notches with a 7-10 or another appropriate size. Your notches don’t need to be regular (photo 8).

Draw in the veins and cut them with an 11-3, or another small veiner or V-tool (photo 9). You can clean up around the center with a 7-20 beforehand. Use your fingers like a compass to enable you to make smooth curving veins. One fingertip will be the center of the circle while the others hold the tool in orbit around it. Always have your hands on the inside of the arc of the cut so that you’ll naturally describe the curve. Never try to steer the tool from the outside of the arc, its way too hard to get a good line that way. If you run into oncoming grain (you’ll hear the telltale snapping sound) turn around and come from the other direction and meet the first part of the cut.

This is the basic flower that I start with – common on Rococo architectural carving. There are many variations on this theme that you can play with once you feel relaxed about carving the basic form. You can cut notches in the petals (photo 10), vein the whole petal (photo 11) or point the flower in a direction by shaping some petals with high outside edges and some with low ones. The treatment of the centers can vary also (photo 12).

The best thing to do is find examples to look at when you’re carving. Ince and Mayhews has a few examples, and is available from Dover Books. Many Rococo carved mirrors or mantels contain flowers that will give you ideas you can use. Anything by Grinling Gibbons will either inspire you to greatness or scare you out of carving altogether. Most importantly, just be brave and don’t count on keeping everything you do. Glue down twelve blanks and plan on getting warmed up at about number eight! Repetition may be the devil to cabinetmakers, but it’s the mother of all carvers.
I met Matthew Burak twenty years ago. He was making custom furniture in Vermont and was frustrated by the fact that the turned legs offered in catalogs were poorly designed.

After we started making legs from his designs, he got the idea that there was room in the marketplace for a company that could supply well designed legs in small quantities for furniture makers who did not have the ability to turn their own. For a few years, I made a variety of legs for Matt, usually in quantities of 40 or more. Inevitably, Matt moved on to more mechanized production, and today Classic Designs by Matthew Burak has 30 employees and sells millions of dollars of legs each year. For me it was a period when I honed my skills at duplication, and what I learned has served me well in my spindle turning career.

In my classes, by far the most frequently asked question is, “How do I make four legs that look alike?” And the short answer is, “Make more than four, and use the four that look the most alike.” This is good advice for a beginner who needs the practice. A set of legs is definitely a milestone in the beginner’s repertoire, especially anyone interested in furniture, yet none of the woodturning books in my library have a section on duplication.

Before the turning can start, there are some marking jigs you can set up on your bench that speed things along and help avoid mistakes. These jigs take time to set up, but pay off on jobs of a dozen or more pieces.

The centering jig is shown in photo 1. Slide the work along the bench and fence and into the pin four times, rotating the work a quarter turn each time. A wedge under the pin block makes it easy to adjust for different stock sizes. The pin is actually a wood screw with its head sawn off and filed or ground to a point.

Mark the location of transition cuts with another bench mounted jig — photo 2. The handscrews themselves become the marking guide. Use a soft pencil, but sharpen it regularly to avoid the error caused by a rounded point.

After the pieces are centered and marked they are still not ready for the lathe. Now is the time to put the final finish on the square parts (pommels), because it is difficult to plane, scrape, or sand these surfaces later without damaging the turning. The transition marks show us where to work. After this step, the transition marks are all but gone. No problem, we have our jig to mark them again. This system may seem inefficient because it requires marking twice, but after much experimentation, I have found it is still the best way.

There are methods you may use for repetition work that you would not use for a short run, and mostly this involves setting up jigs. Perhaps more importantly, there is a momentum and
muscle memory that kicks in after about six or eight pieces, and you may never experience this if you are only making four. In any event, success depends on a combination of taking measurements in a few critical places, then depending on your powers of observation.

Learning how to visualize curves was covered in a previous article on the “S-curve”, and if you recall it involves paying attention to inflection point locations and end point angles. The inflection point is where the curve changes from convex to concave and the end point angle is simply the angle of a line tangent to the curve at its end point.

Work in Short Steps

If there is one single piece of advice I can give you for successful duplication, it is to break up the job into many short operations. Do the first step, remove the workpiece and replace it with the next one. Working in this way there are fewer operations to memorize, fewer chisels out at one time, fewer calipers to use (reducing the chance of taking the wrong one and making an error), fewer changes of the tool rest and/or steady rest (one time for each step) and quicker development of “muscle memory”.

I see many people who hesitate to remove the workpiece in progress from the lathe, because they fear that they will never get it back in the center again. This causes them to attempt to turn the entire piece from start to finish in one step, which is definitely the hard way. This procedural error is brought about by faulty lathe centers.

Repeatability

When machinists speak of repeatability, they mean the ability to remove a workpiece or tool from a chuck, vise, collet, or jig, and replace it, or an identical part, in exactly the same location again. This concept is of the utmost importance in the machine shop where making precision multiple parts is so often at hand. We can learn from these principles even for our wood lathe projects when we embark on the production of multiples. In this case the workholding jig is simply the pair of opposing lathe centers.

While working in short steps, it may be necessary to remove and replace the workpiece five or more times in the process. Of course this requires that your centers be well tuned. It should be possible to remove, replace, or turn end-for-end an infinite number of times and have the workpiece return to the exact center every time without fuss and without fail. With a spring center point, it is possible to do this without stopping the spindle. But whatever kind of centers you have, you must be able to get “repeatability” or relocation of concentricity every time the work is removed and replaced. If you do not have this, then you are operating at a great disadvantage, and you should fix your centers.

The only exceptions to the “working in steps” method is with very heavy workpieces, such as porch posts, or hollow columns where a single set of end plugs are used.

Planning Steps to Minimize Vibration

Working in steps does not mean you should start at one end and work toward the other. Very often you need to start in the middle. In most furniture work, workpiece vibration is a problem. A steady rest is frequently necessary, and this will be covered in the next article. Regardless of the steady rest, if there are details near the middle, start there, because this is where the amplitude of workpiece vibration will be the greatest. Leave the foot for last, because you will not experience much vibration in that area.

If you only have four legs to make you can mark out directly from the drawing as shown in my last article (Drafting for Woodturning). If you have a dozen or more, I suggest you use a marking stick. This has notches in the edge to locate the pencil for quick and accurate marking of the work in motion – photo 3. Make the notches with a triangular file.

You should decide how many steps the job requires. Here are some guidelines. It is practical to make transition cuts, rough out and marking in a single step. This step requires two chisels (skew and spindle roughing gouge), a pencil and marking stick. Next proceed to the groups of details, and these require two or three steps on average. During each of these steps you would commonly have two or three lines to make starting cuts. Simply cut in on
these lines with a parting tool, or make a vee cut with a skew chisel, and the axial measurements are thus established. Usually these are made with a parting tool, because you can slide the caliper in the parting tool slot while the cut is being made. This is an essential skill to have. It requires holding the parting tool in one hand, and the caliper in the other – photo 4. It is much harder to measure the diameter of a vee cut, and should not be attempted while the work is rotating, as the calipers may catch. Calipers for measuring the diameter of a vee have the tips ground to a narrow edge, but not quite to a sharp point – photo 5.

Duplication requires the establishment of certain points in the correct measured location. After that, you simply “connect the dots”. There are many variations of this method, but in general I think you will find that you do not need very many measured points to achieve consistency. The most important diameter is at the bottom of the coves, because variations here are noticeable even at a distance.

Another FAQ is, “Do you use templates?” I only use templates in two situations: straight lines (for cylinders and cones) and circles (for balls). I think it’s pretty simple to use a straight edge, usually wood, to assist in making a straight line. I find this method works well on every scale, from porch columns to pool cues. Making and using ball templates is worthy of a separate article.

After the turning is complete, sanding is the final step. Remove the tool rest with its base, and the steady rest completely off the lathe bed, so they will not interfere with your hands, nor do you want sanding grit in any of that mechanism.
Great joinery can mean the difference between a piece of furniture lasting for hundreds of years or just a few. Some is internal, completely concealed or “blind”, its integrity known only to the maker. While other exposed joinery types, break through to the surface in some way. At its best, exposed joinery is the fingerprint of fine craftsmanship. It moves beyond its structural intent, adding a decorative effect and reassuring beauty.

My favorite kind of joinery is not the showiest, but the type you happen to discover using a piece of furniture, or when crawling around the floor looking underneath. One of the best examples of this category is the knuckle hinge joint.

The knuckle hinge joint is most often used on small to medium sized tables to hinge a support, or swing leg, under a drop leaf. It can be made with flat square intersecting ends, like a moving finger joint. Or, as in the example we show here, it can be made more refined with a rounded barrel.

The recent commission of a Pembroke style table presented an opportunity to revisit this clever mechanical wood joint. The process of making one breaks down into a simplified step by step process. For a Pembroke table like this one, the side rails, usually justified to the outside surface of the leg, are instead set to the inside of the leg. This leaves the necessary cavity into which the swing support will be held.

making the
Knuckle Hinge Joint

by Tom McLaughlin
and Levi Lucks – demonstrating craftsman
be fit. For a table like this, it is good to plan for the swing support material to be approximately 1” thick, and not less than 7/8”.

The first step is to prepare and size the material to be hinged, leaving the pieces an inch or two long, to be cut to fit into the recessed sides after the hinged joint is made. Then you will need to accurately square both ends to be joined (1).

The next step is to mark on the top and bottom of both pieces intersecting ends, 45 degree, crossing lines. Then using a compass at the intersection draw a circle of diameter equal to the material thickness (2). Marking well is key. Remember, there is no mystery to executing superb joinery. You can learn rather quickly how to cut cleanly to a line. But if your lines are bad, it doesn’t matter if you are the Samurai master of sawing and paring, the joint will never fit. Great joinery begins with accurate marking.

Next, using the table saw tilted to 45 degrees, make a small notch cut precisely to the diagonal line on the inside of the marked cylindrical barrel. Don’t worry about getting the depth perfect. It is best to be a little bit shy, or short. You can quickly clean it up with hand tools later (3). This cut defines where the swing support will stop when extended. In this way, the two 45 degree cuts will mate to stop the swing out at 90 degrees to the drop leaf it supports.

Note, to insure accuracy without risking screwing up the cut on your good pieces, always prepare and use an identically sized and marked scrap piece to set-up and pre-test your cuts. This is something you never see Norm Abrams do, but trust me, when setting up, he and his assistants are using test pieces.

With the saw still tilted at 45 degrees, cut the waste on the outer end of the cylinder to create an octagonal form. Now the rounded barrel can be shaped using a well-tuned hand plane, taking care to use the guidelines and planing in from the ends (4). The inside of the barrel can be more easily shaped using a shoulder plane (5). Once planed to shape, the cylinder is fine tuned by sanding, using a coved sanding block with the matching concave radius (6).

Dividing the cylinder into five equal parts, a marking gauge is used to crisply mark the division points of the knuckles on both ends (7). Then using a pencil or pen, scribble on the sections to be removed on each of the mating end (8). Note that the hinged end to be fixed to the table will have three full knuckles, while the swing support will have the corresponding three spaces removed.

If you are confident with a dovetail saw, saw right to the marking gauge knife line, taking care to saw on the waste, or scribbled side of the line (9). However if you prefer, you can saw just shy of the line and use a sharp chisel to pare right to it. Use the actual marking gauge line to set the chisel to insure the
greatest accuracy. Rough out the rest of the material between the knuckles using the band saw or other means, and then chisel between the knuckles to allow the outer radius of the corresponding knob to seat fully (10). The radius on the ends will also need to be cleaned out using a gouge chisel with the conforming curve or sweep (11).

Once fitted up so that the ends seat fully and firmly, you are ready to drill for the hinge pin. Be sure your drill press is set up accurately to bore a true 90 degree hole centered in the thickness of the stock. Here again, a scrap test piece is your best friend. Test your drill press by boring, using a spur bit, a little more than half way in from both ends, and then try fitting the hinge pin.

A 3/16” diameter brass, steel, or welding rod makes a good hinge pin. An auxiliary fence attached to your drill press, the same height as the hinge parts, adds greater stability and precision. Adjust the drill press as needed until the hinge pin fits firmly without much force, indicating the hole is properly aligned. Now clamp the assembled ends against the auxiliary fence and drill on your center marks, a little more than halfway from each side (12).

After the hinge pin is fit, a little tweaking may be necessary to get the joint to operate properly without binding. Look for the burnished areas on the knuckles. These indicate where you may need to adjust by chiseling or filing. It is a good idea to cut the hinge pins about an inch longer than necessary so that it is easy to tap out and remove during the fitting stage. When ready for final assembly, you can then cut the pin to the final length and hammer flare the top end slightly to keep the pin from falling through over time.

All that remains is cutting the fixed pieces to length, fitting and gluing into the recessed areas on the sides of the table. Then comes the creative phase where you will shape and sculpt the swing support, and complimentary fixed piece on the apron. Do as much of this custom shaping before you glue in the fixed portion. You will want to shape both parts in such a way that offers a comfortable and attractive finger pull recess (13).

The last step is to sit back and enjoy, and wait for someone to discover your fingerprints.
Here is a question for you to mull over – how long does it take you to route, chisel and install butt hinges in a cabinet door? If the answer to this question or the thought of this type of operation puts you in a sour mood, please read on.

I have been using a very simple system to make routing mortises for butt hinges very fast and incredibly accurate. As with most woodworking projects, a jig is the key to my system. On a kitchen I did last year, I had to mortise in about thirty pairs of butt hinges. Just the other week I did four pairs and it took under an hour to completely install the hinges in the doors and cabinet frames.

Once you have your hinges, you can build your jig. To start, rip a couple of 3” wide strips of half inch MDF. I prefer to use Merit brass hinges (www.meritmetal.com). They are extremely nice components with machined pins and your choice of tips on the ends.

Cross-cut the MDF to fit exactly into the door opening of your cabinet, not just close, but a snug fit. At the table saw, use the miter fence, dado set and stop blocks to cut out the slots in the MDF that match your hinges. In the case of the jig shown, the hinge leaves were ¾” x 2½”.

The blade was raised to ¾” and stop blocks were set up so the hinge would be 3” from the top and 3” from the bottom of the cabinet opening.

In this example, the stop block is set such that the first cut is 3” plus the hinge length. Flip the board end for end and make the same cut on the other end of the MDF. Do this for both pieces of MDF. Once you have made all four first cuts, move the stop block away from the blade and make cut 2 as shown. I usually aim for being about ¼” less than the length of my hinge. Now just nibble away the material between the cuts. Do this on both end of each piece of MDF. Make sure the cut-out is nice and smooth because a pattern routing bit is going to be following your cut.

Before gluing the two pieces of MDF together, clamp one of them to a scrap piece and set up your router with a 1/2” diameter top bearing pattern bit. This same procedure can be done using your router's bushing set with a straight cutting bit and adjusting the length and width of your cutout to accommodate the bushing. I prefer a flush trim router bit.

Set the depth of the bit. In this case it is going to...
be about ⅜” (¼” for MDF plus ¼” thick hinge leaf). Make a test cut and check the depth. Get the depth right and make another test cut clearing all of the material away. You should be left with a nice clean mortise that has rounded corner. Break out your nicely sharpened chisel and square these corners.

Check the fit. If anything, it should be too snug. If it is too loose, you can add tape or veneer to your notches to make them slightly smaller. In the case of being a bit snug, nudge the stop block ever so slightly and widen the cutout and go back to the scrap and make another test mortise. If still too tight, nudge some more and test again. If you nudge too much and make the test mortise too loose, have no fear, remember, we have two pieces of MDF and only one needs to be perfect.

Once you get the perfect fit, make the cuts on the second piece of MDF and label it as the good piece. The router is going to ride on this piece. Glue and staple the two MDF pieces together at right angles. Once the glue has set, clamp the MDF template to your cabinet side. It should fit perfectly.

Route the two mortises, remove the jig and chisel them square. With that operation complete, fit the door to the opening with whatever gap you choose. Fitting the door now is critical because once the mortises are cut in the door, there is going to be no play up or down.

To make the matching mortises in the door, clamp it into a vise and clamp the jig to the hinge side of the door. Use your fingers or a ruler, to center the jig along the door edge. It should overhang the door equally on both ends. Route and chisel clean the corners of the mortises. At this point, the hinges will fit perfectly in the door and match perfectly to the ones in the cabinet. The same jig can be used for both left and right doors by simply flipping it over.

As a last word, when driving in the screws, use a self-centering pilot bit. Skipping this part will lead to screws being off center and the hinge being pulled out of position. Also, if you are using nice solid brass screws, make sure to drive a similar sized steel screw first to pre-thread the hole. Drive the brass screw in after dabbing the tip in a little wax and using a screwdriver and not a drill. This last bit of advise will keep you from stripping screws of damaging the coatings the soft brass screws.

Although my methods for building the jig requires a different jig for different door heights, it can be modified to work on different door heights. By using short lengths of MDF (about 10”) and making only one notch in each set, pairs of MDF jigs can be attached together with a length of scrap wood. This would allow you to lengthen or shorten the jig depending on the door opening height.
Sometimes the object speaks for itself but sometimes a little decoration is in order. There are several ways to decorate a bowl or other wooden object. This article deals with texturing the surface. Among the many ways to texture surfaces are carving and branding.

**Branding**

To brand an object, you need a brand and a heat source. Let’s start with the heat source. There are a number of commercial products out there and they do a good job but are fairly light weight. You can make your own source from a battery charger but please remember that you are playing with electricity and do so at your own risk. If you would like to proceed, you will need a battery charger (inexpensive and without any circuit boards) or that old one lying around the garage, a standard single pole dimmer switch, and a few wire nuts. You will also need a screwdriver to remove the case, wire cutters/stripers and something to alter the case to accept the dimmer switch. You need the dimmer switch to reduce the amperage and therefore the amount of heat produced by the charger. At full power it will melt your brand.

**Power Source**

First remove the cover and find the place you are going to put the dimmer. Either install it now or after you do the wiring.

Find the power wire (black) coming in from the plug. Cut it and run the plug side into the dimmer switch and the other side out of the on/off switch.

There also should be a heat controller module. This keeps the charger from overheating and burning down your house if left unattended. Disable this as shown in the photos. Obviously if this is disabled and you leave the unit unattended, it can now burn down the house. Take appropriate precautions when using it. If you have a metal case, you will need to ground the switch.

Replace the charger cover. Cut off the charging clips. I would leave a little wire on them so you can reattach them in the future if you would like to. Set the clips aside.

You now have a controllable source of electricity to heat your branding iron but no iron (or in this case – nickel).

**Branding Wand**

To make the wand you will need an 8” piece of PVC pipe (22 mm diameter) usually used as a conduit for electrical wire, a piece of wood about 3 to 4 inches long and a half inch square in section, four electrical connectors (Radio shack #274-667, barrier strip, European style) from which two have the plastic removed, two pieces of copper wire (10-12 gauge) each about an inch and a half long, a bolt and nut to attach one set of connectors to the wood and a brand made of nickle chromium wire (18 gauge or possibly 20 – MSC 73226342). You will need a saw to cut the wood and pipe and a wire cutter/stripper to prepare the copper wire. Tools required, after the wood and pipe are cut include needle nose pliers and a small screw driver.

Drill a hole about ¼” away from the end of the wood. Bolt on the plastic enclosed connectors. Slide the pipe over the wires of the charger and strip the
ends or the wires. Attach the wire to the connectors on the long side of the wood. Attach a piece of copper wire to each side of the connectors. Attach a non-plasticised piece of connector to each end of the wires. Attach the brand to the connectors. Shove the pipe onto the wood. You have a completed brander.

**Make a Brand**

To make a brand, cut a piece of nickle chromium wire to length and using your pliers, shape it. Remember electricity flows like water and tries to flow back to the source by the shortest route. If you have a complicated design and the wires touch, the electricity will flow through the touch and not heat the entire brand. You can fine tune the shape of the brand when it is heated.

**Using the Brand**

You will not need full power. When you turn up the dimmer switch, the brand should get red hot at about 8-12 amps. That is all you need and if you keep going, you will melt the brand. Try the brand on scrap wood until you are comfortable with it. If you brand everywhere on a surface, you will not need to sand around it. If you are making a bowl, you can keep the pattern in a circular area and then do your sanding of the edges on the lathe.

**Painting**

When you are done with the branding, lightly sand off any fuzz you may have created. Using a black acrylic paint (available in art stores) and a tooth brush, work the color into all the crevices. After the paint is dry, sand anything that went over the side. Finish the article as you normally would.

**Rotary Carving – Another Approach**

Obviously, there are many ways to carve. This article will deal with rotary carving. Again, there are a number of commercial tools available. I have been using a pneumatic pencil grinder (Sioux – $135 from MSC) and have been pleased with it.

The only problem I had was that it came with a ⅛” collet and when I called
Because I seem to like round shapes, I got some round burrs and some cups. I use the burrs to make round holes (valleys) and the cups to leave round raised centers (hills).

Again the key to success is to use all the area you have mapped out and then to paint it and sand the surrounding wood before applying the final finish.

**Hammer Gun**
You can also use a hammer gun with a blunt tool in it to dimple a surface. If you are going to do this, apply the finish first to make it less likely for the hammer to break the wood fibers.

**Final Steps**
When turning and decorating a bowl, I will turn the outside and, if I am not going to decorate it, I will sand it. I then chuck up the bowl and turn the inside. I often will put a “V” edge around areas that I am going to decorate to make finish sanding easier.

The bowl is then removed from the lathe and branded or carved and then painted. The bowl then goes back on the lathe for sanding if needed. The bowl is reversed and the tenon removed. If I am going to decorate the bottom, this is done next followed by painting and returning the bowl to the lathe for any finish sanding. The entire bowl is then finished.

October 11th, 2008

**Hand Tools**

On Saturday October 11, the new Hand Tools Group held its first meeting at Dave Anderson’s shop in Chester, NH. Thirteen members showed up for the inaugural meeting. The group has decided to meet five times per year on the second Saturday of the even numbered months. The exception will be August when the guild is occupied with the Sunapee Fair.

Members decided that the most logical way to proceed for the future was to center each meeting around a particular tool or category of tools. Meetings will cover such things as the choice between new and used, how to restore and tune the tool, maintenance, and sharpening, and techniques for using the tool. Members will be encouraged to bring problems, questions, tools which they need identified, or those which are giving them problems.

At Saturday’s meeting, John Whiteside brought a box of assorted hand tools from the mid to latter part of the 19th century for identification. Included were both factory and user made tools such as an old woman’s tooth router, calipers, hollows and rounds, a side escapement rabbit plane, beading planes, and some complex molding planes.

For our December 13 meeting the topic will be scrapers, scraper planes, and the accessories and tools needed to sharpen and maintain them. Included will be a demonstration of several techniques for sharpening and rolling a burr and time for members to try their hand at preparing and testing their own tools. There will also be a discussion of what is available in the marketplace.

The time and location of the meeting will be listed on the guild website and further information will be available from Dave Anderson.
Some of you may remember this sled from the picture frame article a while back. A later issue talked about a jig on a jig. Well this jig has been evolving and improving. And now it’s a jig on a jig on a jig. The intent of this article is to entice you to evolve your jigs. If you find a shortcoming, as I had with this one, fix it. I used it joyfully for over a year but each time struggled with the stops for the pieces to be mitered. Clamping on other boards, temporary solutions, but good enough for now.

Well, frustration and belief in a better life won out. It has morphed into a new state that, so far, has no need for further improvement. So a quick explanation of the details in case you want to upgrade, or build your first one, or just see what evolutionary thoughts can do for you.

The first incarnation doesn’t exist any more. There was a ¾” setback to manually clamp on a stop bar. That worked but was consistently inconvenient. By moving the face out flush and adding a T-track, the external clamps were eliminated. Back then, a T-track was clamped on. It’s permanently mounted in this one.

Second problem was that the T-tracks stuck way out, four feet into the room on each side. A real challenge to store and difficult to keep from bending something. It was also grossly inconvenient for short frame pieces. So the upgrade that finally emerged through a lot of trial and error was an extension track riding on the track. In hindsight it seemed so obvious. But it took months for a solution to evolve. Holes were drilled in this rigid extension every three inches for adjustability options. This extension allows frame lengths over six feet. And yet it collapses to about a 24” x 24” jig – much easier to store.

And a final tip. This long extension would dangle unceremoniously when the locking knob was adjusted, tending to swivel itself to the floor at the unsupported end. So the extension slide was actually made with a raised center section that fits in the T-track groove and holds it aligned.

Do I do that many picture frames that all of this was necessary? Quite honestly, no. Although I did a custom eye glass frame set recently, three large structures that were basically picture frames. It really paid off to have the right tools in place. And the need arises often enough that frustration eventually wins out.

Even at a few uses a year, it was such a hassle to wrestle with the pieces that the time spent was worth it. Of course some part of this current solution was simply to make the point that sometimes it’s worth an evening to “just do the job right”. And after numerous

continued on Page 38
The Granite State Woodturners met on September 27, 2008, at Franklin High School in Franklin, NH. There were several business related items discussed, then a presentation on Japanese Kokeshi dolls.

The first item was the upcoming turning symposium, which will be held at Pinkerton Academy on Saturday, May 23, 2009. There will also be youth turning symposium at Pinkerton the day before, Friday, May 22, 2009.

Peter Breu led the discussion. This included issues concerning the number of presenters, rotation coordination, and the trade show. Peter also raised several issues concerning the video taping of the different presentations. Guild library records indicate that these tapes are immensely popular with the membership, representing one-quarter of the tapes borrowed from the collection each year. Taping this event is an area where assistance is certainly needed. Anyone willing to help out with video taping should contact Peter Breu.

Jon Siegel addressed the idea of hands-on workshops that would focus on various woodturning techniques. This would give members an opportunity to practice these techniques first hand. Jon is looking for input from members with regard to topics.

With business matters out of the way, I gave a presentation on Japanese Kokeshi dolls, which are limbless wooden dolls turned on the lathe and then hand-painted. Before I describe the details of the Kokeshi dolls, however, let me first explain how it was that I came to be in Japan and discover these cultural artifacts.

Shortly after World War II, the United States government established the Fulbright Foundation, a program designed to promote educational and cultural exchange between the United States and other countries. One country that has participated enthusiastically in the Fulbright program is Japan, sending hundreds of its citizens to the United States to study in our educational system and learn about our culture.

About twelve years ago the Government of Japan decided to reciprocate and developed a program that would allow citizens of the United States to go to Japan and learn about its educational system, manufacturing and business sectors, and its culture. This was linked together with the Fulbright program here in the US, and thus the Japan Fulbright Memorial Foundation was created. Although it is linked with, and coordinated through the Fulbright Foundation, it is a separate entity and fully funded by the Government of Japan. It is offered to teachers and school administrators only.

Each spring and fall, 160 teachers and administrators are selected to travel to Japan for three weeks. During that time, participants attend classes, lectures, and symposiums where they learn about the Japanese educational system, the economy, manufacturing, industry, social issues, history, health care, political issues, arts, and culture. These sessions take place over a week in Tokyo.
After this first week, the 160 participants are broken up into 10 groups of 16 people each. Each small group then travels to a different part of Japan and for the next 10 days lives in a smaller Japanese city and visits local government, universities, public schools, businesses and industries, local areas of interest, and finally, each person spends 2 days living with a Japanese host family. This is a total-immersion program in the life and ways of the Japanese.

As a high-school industrial arts teacher, I went to Japan last spring, and after a week in Tokyo I traveled north to the Osaki prefecture, a county-type area located in one of the most seismic areas of Japan. The Osaki prefecture has a number of volcanic hot springs, where people go to soak in hot, mineral-rich baths that are naturally heated by the earth. It was in this area of volcanic hot springs that I discovered the Kokeshi doll.

The Kokeshi doll was first made sometime during the Edo period, 1603-1867. There are several stories about how it originated. One story says that it was created as an inexpensive toy for children, a less-expensive alternative to porcelain dolls. Another story indicates that they were made as a means of remembering children who died or were sold away during periods of famine. The word Kokeshi, as I learned, is made up of two words – ko, meaning child; and keshi, meaning erasing, or absent. The Kokeshi doll served to memorialize the lost child, and to appease the spirits.

Nevertheless, the dolls were eventually seen by tourists who had traveled to the region to bathe in the volcanic hot springs, and were purchased as souvenirs. They became very popular and demand for them increased. Artisans would make them during the winter months when other types of work were scarce, stockpiling them for sale to tourists in the spring and fall, when visiting the hot springs was most popular.

Whereas this was a regional artifact, the original dolls were similar in the way they were turned and decorated, yet there are some noticeable differences. As I was told, there were eleven original varieties, based on the area within the prefecture where it was made and the artisans who lived there. I visited a Kokeshi museum while I was in northern Japan, and although the antique dolls were similar, certain turning and painting techniques became apparent and the dolls definitely fell into their own sub groups. These antique dolls are now coveted by collectors and are quite valuable.

The dolls range in size from very small (less than 1 inch) to quite large (over 3 feet). They are made from dogwood, Japanese maple, cherry, and pear, with the last two being the most expensive.

The dolls are turned on small – or what we would consider mid-sized – lathes, with an unusual cone-shaped jamb chuck that the material is driven on to. The chuck is hollow, and sharpened to cut in to the material and hold it. It reminded me of the very end of an apple corer. There is no tailstock. The entire piece is turned without any support or pressure on the tailing end. The lathes do not have a traditional tools rest, but rather, a sliding wooden rest that supports the turner’s arm. There does not appear to be any speed adjustment. The turning tools are hand-made and do not resemble our turning tools at all.

The dolls are usually turned in two
pieces, with the head being made first. The head is turned with a small tenon, or ball protruding from the end. Once this tenon is sized the head is parted off.

Then the body of the doll is turned. Most are rather simplistic, although there are some modern variations. Again, the doll is turned without a tailstock, and as it is finished, a small mortise, or socket, is turned in to the end; this mortise is ball-shaped, growing larger as it goes deeper, to accommodate the tenon, or ball, protruding from the head. While the body is still spinning the turner tries to fit the ball on the head into the socket in the body. If it's too tight, the turner opens the mortise slightly, then fits the head again. This may take several attempts, but when all seems right the turner holds the ball-shaped tip on the head firmly—and at an angle—against the socket-shaped mortise on the body until it begins to smoke, and in a second or two it actually pops in to the body with a remarkably tight fit. The head will turn, but it doesn't wobble or teeter. It's almost as if it were made from one piece.

The dolls come off the lathe as smooth as glass. The turner uses a scraper and therefore there is very little sanding. The dolls are then painted with Japanese ink. There are several different styles of painting, again, reflecting the eleven original styles of dolls, although there are more modern approaches that reflect the anime genre.

We are now making Kokeshi dolls in my wood working classes at Franklin High School, although at this point we're making them in one piece. We are still trying to perfect the ball-and-socket joint. It's not as easy as the wood turner in Japan made it look. We are working with the art teacher on the painting end of the project; that's taking some practice, too. The Kokeshi doll is beguiling in its simplicity: There is much more craft, technique, and history behind this simplistic little artifact than seems apparent.

In closing I need to thank the Japanese Fulbright Memorial Foundation and the Government of Japan for the opportunity to travel to Japan, learn about the country, and meet many wonderful people. I need to also thank the Franklin School District for its support, and finally, the Guild of New Hampshire Woodworkers for helping me share my great fortune with others.
Beginner & Intermediate Group

meetings held at the Salmon Falls Mill in Rollingsford, NH

The Beginner & Intermediate Group met October 4 at Bob LaCivita’s shop in Rollinsford. The group was honored to have a GNHW member from upstate New York. Being a local member of the Northeast Woodworkers guild, The Old Saw impressed him enough to attend his first BIG meeting.

Hanging the apple cabinet doors and finally closing the cabinet as the group’s topic was the only thing on the agenda. The doors curve gently across the front of the cabinet. To match the curve on the inside of the doors, Bob used both old and new technology. He planed some of the curve out using a 1746 wooden cove plane. Needing a more aggressive solution, he used a hand power plane to plane a shallow flat top to bottom, then used sanding discs to round the edges of the flat, and finished with a power sander to refine the curve.

The doors were checked for fit, and uniform space around the edges. The group nodded approvingly as only the edge of one door needed a little work – after all Bob made them. To accommodate expansion, he planed the center edges at a complimentary angle so they overlap and not show a space.

We all watched very closely as Bob worked on the hinges. For good design, the hinges were spaced having the top hinge a bit closer to the top then the bottom hinge to the bottom, four and six inches respectively.

Layout was done with a marking knife followed by penciling for accuracy and visibility and with two marking gauges to transfer marks from the doors to the cabinet.

The key measurement was to allow for one half the thickness of the hinge barrel on the door and cabinet mortises. The mortises were cut using the marking knife and a sharp chisel, first on the doors, then the cabinet.

To accurately drill the screw holes, Bob used a Vix bit, which does a nice job of centering the drill in the hinge screw holes. Final fit was done with a block plane. Lastly, Bob raised a small dent in the edge of one of the doors by wetting it, and heating it with a household iron. The dent did come out. Having that household iron in his shop, makes you wonder just how often Bob dings and dents his stock.

At the next meeting on December 6, the group is going to start a cabinet with multiple drawers, each having a different design and mounting. Bob will demonstrate the processes so that the group can make their own versions in their shops as we go. Just like being in school, you can ask the teacher for help on the problems you had doing your homework. The meeting will be in Rollinsford. Contact Bob at rlacivita@metrocast.net or 603-942-1240 before 9:00 PM.

Shop Apron

Do you wear an apron around the shop? Why not?

I was thinking I would write a blurb on my apron since it is my most used tool. I can’t get on with my work without it. If I do attempt to work without it, I’m liable to drop tools on the floor trying to holster them, or feel around my chest for a pencil that is not there. I take a little heat for it on job sites where framers ask me if I’m gonna bake them a cake. I either go with it, or send one back at them. Around the shop, I joke that I’m Clark Kent until I put it on.

It keeps my clothes clean and keeps my most used tools at hand. I keep a 12’ tape measure in the right pocket. You could go with a 16’, but I think the 12’ Stanley is made better. It’s smaller and a 25’ is never far away. I keep a 6” combination square in the left pocket, and a pencil, a 6” rule, and a permanent marker in the chest pockets. A crayon could replace the marker, but I use the marker for plywood edges.

Most of the tools are self explanatory, but you might not have a full grasp on what you can accomplish with a 6” rule. It is a utility knife for opening packages, a glue scraper for clearing half dried glue, and useful inside a rag for wiping stain or glue out of corners.

So if you haven’t thought about the usefulness, I hope this helps. I just recommend that you get one with Xing shoulder straps. I’m on my second one. My first was modified to have Xing straps before Lee Valley came out with the second generation. It was sadly thrown away about a month after the hole in the pocket became bigger than my tape measure. I’m warming up to its replacement.
Hi to all. This is for all of you that did not make the Annual Meeting. We had a great place, a great time and great weather. Well a lot of us wished we had another sweater, but at least the sun was out.

The turnout was a little lacking as we had 58 bidders vs 60 last year. But the real action was on the bidding. There are three people laughing all the way to the bank as they got items at $1, then we had a high bid of $60 for a morse taper chuck which he or she is going to the lathe thinking of the money they saved.

We led off with the annual auction. Jon Siegel did not have to carry the whole load this year as Gary Bashian stepped it to finish up part we through. After the accountants totaled the auction, we made $889 which is a huge help to the scholarship fund. I do not want to be a beggar but just think how much good that stuff you do not use can help those that can not afford. All in all, the auction was another success.

Next came the business meeting with more than a full agenda of items to discuss. The topic that took most of the time was discussion concerning raising the dues to $40 next membership year. There were many points of view about The Old Saw and other expenses but in the end it came down to a vote and next year the dues will be $40 – not this year but the 2008/2009 membership year beginning next September.

Election of officers took place. Incoming officers are Dave Frechette (President), Mike Noel (Vice President), Peter James (returning Treasurer) and Caleb Dietrich (returning Secretary).

Our outgoing president Dave Anderson was presented with a Lie-Nielson plane very nicely engraved with the symbol of the Guild. One more “Thank you” Dave Anderson for a job well done.

We broke for lunch right on schedule and was served a super meal that was quite outstanding, as a matter of fact I am trying to find out when Camp Lincoln is serving again as I plan to go back.

Garrett Hack gave his presentation in the afternoon. You can read about on the back cover.

We received a number of dues as they are now due, if you have forgotten please send them in.
Discounted Woodworking Books – Last Chance

The November Guild meeting will be the last opportunity to order discounted woodworking books until next Fall. If you would like to take advantage of a 40% or higher discount through group sales, email your order to me or take a look at the catalogs from Taunton Press and Fox Chapel that I will bring to the November meeting.

I will have catalogs and take orders at Guild meetings, or you can view titles on the publishers’ web sites (www.taunton.com & www.foxchapelpublishing.com) and email your order to me.

If you email your order, you must include the following in addition to your name and telephone number:

• For Taunton: The exact title, author, type of item (hard or soft cover book, video or DVD), the list price and the Taunton Product Code (NOT the ISBN #).
• For Fox Chapel: The exact title, author, type of item (hard or soft cover book, video or DVD), list price and the ISBN #.

Books should be available in early December for pick up at my home in Mont Vernon, NH, or at a future guild meeting. Note that we do not mail books to member homes.

All email orders will be acknowledged within one week. So if you do not get a response, please call me – I have vigorous anti-spam software.

I’ll email you with the net cost when the books arrive. Payment is due immediately and the books are not returnable. This gives us a premium discount. Happy hunting for some really good woodworking books.

Discounted magazine subscriptions, also an annual event, takes place in the February time frame – watch for the next Old Saw for details.

Tony Immorlica - Book Coordinator
603-6763-9629 (evenings) or aaijr@comcast.net

Beginner & Intermediate Group

The next two BIG meetings will be held December 6, 2008 and February 7, 2009 at 9:30 in my shop. The shop is located at The Salmon Falls Mill in Rollingsford, NH, studios 215 & 217. For directions go to www.millartists.com. Please let me know if you plan to attend.

Robert LaCivita: rlacivita@metrocast.net or 603-942-1240 please call before 9:00 pm

Granite State Woodturners

The Granite State Woodturners is both a subgroup of the Guild, and a chapter of the American Association of Woodturners. The group covers all aspects of turning, from the conventional spindle and bowl turning to segmented, ornamental, and other types of turning.

Meetings typically include a presentation or demonstration, and a short business meeting. Once a year there is a design critique, and occasionally other meeting formats are used, like field trips or open shops. GSWT also puts on the New England Turning Symposium every three years.

Meetings are the fourth Saturday of odd numbered months, typically from 9:00am to 1:00pm, and are open to the guild membership, AAW membership and the general public. Contact DJ Delorie to be added to the e-mail notification list.

DJ Delorie: dj@delorie.com

Granite State Woodcarvers

This small group of dedicated woodcarvers meets Thursday nights at Rundlett Middle School in Concord, NH. Meetings are 6:00pm-9:00pm during the school year. For info or directions contact:

Lou Barchey: 603-753-2708 or barchey@comcast.net

Period Furniture

The next Period Furniture Group meeting will be at Dave MacRae’s shop in Weare NH. The special guest speaker demonstrator will be NH Furniture Master Jere Osgood. Jere will be doing a presentation on furniture design, presenting a slide show that he has put together and also do a dry run demo on one of the joints he has used in his furniture making.

After Jere is done with his presentation we would like to see what you the members are working on. If you are currently working on a project or have a finished item, bring it with you for a show and tell.

We have to limit attendance to 25. If you would like to attend you need to email me and I will send you a confirmation email. I will also send you the directions in that email. We also need a person to bring a slide projector as Jere’s is broken. Let me know if you have one to bring. If you would like to attend the meetings, please contact John Faro or Mike Noel to be added to the list.

John Faro: 603-968-9800 or Jff960@metrocast.net
Mike Noel: 603-744-3821 or mnlwoods@netzero.net

Luthiers

The Guild Luthiers is a special interest group focused on the making of stringed instruments. People of all levels of expertise are welcome to join. Ordinarily we meet on the 3rd Sunday of September, November, January, March, and June.

We also have started an annual table at the Sunapee Craftsman’s Fair, which has been very successful. In addition, we are affiliated with the New England Luthiers, a sister organization based in Massachusetts. Several times a year our meetings are held jointly with them.

To receive meeting notifications, contact John Whiteside.

John Whiteside: 603-679-5443 or johninremont@comcast.net

Hand Tools

The Guild Hand Tools subgroup will meet five times per year on the second Saturday of the even numbered months. The exception will be August. Meetings are held at Dave Anderson’s shop in Chester, NH.

Contact Dave for more information.

Dave Anderson: 603-887-6267 or dsachester@gsinet.net
MITERED SLED – continued

days trying to visualize the solution, the actual construction time for a complete new jig was about an hour. Hopefully this will give you some ideas for that jig you have been struggling with or haven’t even made yet.

The latest and final incarceration is not show. It adds slots where the miter bars are attached. They are then secured with bolts from the top so they can be easily adjusted, especially to fit different table saws.
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Those who attended The Guild’s Annual Meeting were privileged to see a lecture and demonstration given by a very prolific and well regarded member of the woodworking community. Garrett Hack, whose credentials are too many to be listed, may be best known by his furniture and articles which are often published in Fine Woodworking. He divides his professional life as an author, teacher and woodworker. On that afternoon he gave a talk on the importance of working efficiently and accurately in the shop, an ability that helps allow time for his other ventures.

Garrett began his talk by warning about the high cost of mental mistakes. Errors that create extra shop time, wasted materials, and/or an inferior final product can generally be avoided. He emphasized the importance of careful planning, and taking steps that might initially seem to extend the length of the process.

**Develop a Full-sized Drawing:** Craft or even butcher paper were recommended as options for sheets large enough to handle the task. A top, front and side view will help you visualize the project and carefully consider the proportion and grain direction of its parts. Garrett also makes detailed drawings of the joinery, and uses this phase to create curves and dimensions he can refer to and work from throughout the building process.

While in the design and drawing phase, Garrett will also make critical wasted decisions that affect the time and effort that will be put into the piece. He gave the example of using a “country cock bead” on the top and bottom of a drawer rather that extending it up and down the sides where the end grain can be difficult to deal with.

As he talked about designing a piece of furniture, I could relate it to a poet working until each word has been individually chosen. Though he did admit that he is open to the design evolving later in the process, it is clear that he is very thorough and meticulous as he goes through the revisions.

**Create a Pattern:** Although I have made this into a separate step, it is more of a natural progression when Garrett talks about it. I can imagine him drawing with pencil and paper then jumping up to quickly shape something out of a wood scrap to help him visualize.

He talked about the usefulness of wooden patterns for finalizing the design. He then focused on their purpose in shaping the parts of the project. Garrett uses the patterns to lay out tapers, joinery, curves and other aspects of a piece.

He demonstrated the usefulness of a ¼” template of a tapered leg. He first used it to visually decide if he would like to splay the legs. He then set it on rough stock to choose grain direction. Afterwards, he used it as a tapering jig to pass the stock through the band saw. Finally, he used it as a story pole to layout the joinery.

**Work Efficiently and Accurately in the Shop:** Beginning where most projects do, Garrett talked about surfaced stock, developing a marking system that labels grain direction, reference faces for joinery, and orientation of the parts. Specifically, he talked about orientating the pattern on the stock to choose the grain direction of your piece rather than simply jointing an edge and working off it. He also addressed the luxury of having extra parts.

From the machines, Garrett moves on to do much of his work with hand tools. And no one attending thought Garrett would make it through a presentation without talking about the importance of hand planes. He demonstrated the accuracy and efficiency of edge jointing, surfacing, and shaping with hand planes, all together eliminating the step of sanding while creating an unmatched surface.

Throughout the talk he emphasized knowing what is of critical importance, and not getting carried away with some trivial aspect being perfect. As an example he asked, “Who has ever noticed that the underside of a table apron was slightly out of square?” His point being that, in woodworking, “square” and “flat” often only need to be visually acceptable.

In fact, as he performed many specific demonstrations of working efficiently and accurately, it seemed clear he was also hinting toward a woodworking mind-set or consciousness that would have to be adopted in order to cover the expansive topic of his lecture. It is what I enjoyed most about the talk. I walked away feeling I could better understand how Garrett approaches his work. – Caleb Dietrich