

Fall 2012—Vol 5 No 1

The Journal

of the Guild of New Hampshire Woodworkers

bob oswald
gary wood
owain harris
bruce wedlock

My First Violin
Delivering the Finished Piece
Hammer Veneering Curved Work
Hand-Cut Dovetails in Jig Time

by Nate Carey & Dave Frechette

Restoring an Old Town Canoe





The Journal

Fall 2012 • Volume 5 Number 1

features

- 2** Hand Tool Journey
- 6** Q&A—Ask The Old Saw
- 8** End Table Project
- 11** My First Violin
- 18** Restoring an Old Town Canoe
- 22** Hammer Veneering Curved Work
- 27** Jon Siegel's Amazing Workshop
- 30** Hand-Cut Dovetails in Jig Time
- 36** Tea House Doors
- 38** Delivering the Finished Piece
- 40** Hitchcock Chairs
- 42** Chippendale International School of Furniture
- 43** White Mountain Breakfront
- 44** Member Gallery

Wall-o-tools, including saw and plane tills, after reorganizing the shop for an all-hand-tool focus.



Steve Branam

Hand Tool Journey

I've been a woodworking hobbyist most of my life, though more as a dreamer than a doer for most of that time. My interest started when I was nine or ten when I helped my uncle repair damage from a small fire in his house in Philadelphia. He had some basic hand and power tools.

I learned more when I took wood shop in junior high and high school using full-sized machines—no hand tools. As an adult I loved to watch Norm Abram make something from nothing on the *New Yankee Workshop*. But the thing that held me back was the belief that I couldn't work without that ideal shop full of power tools, so I never actually did much.

I became interested in hand tools when I saw Don Weber on the cover of the April, 2004 issue of *Popular Woodworking* magazine. I was fascinated by his article about building a small table entirely with hand tools using lumber riven straight from a log.



Portable toolbox with raised panel lid, sitting on portable workbench. These comprise my main travel setup for teaching and demonstrating.



It took me a few more years to get going, but I started acquiring tools and very slowly developing skills. I went through several false starts trying to learn to use a hand plane. It took me a while to have any success with sharpening and only after I got over the initial shock of *What do you mean I have to sharpen these things?* Mike Dunbar describes sharpening as the gateway skill, and he's absolutely right. Success with sharpening means success with everything else. Tools that sing are a joy to use.

I started my blog *Close Grain* at that point as a way to document my learning process and share what I've learned. I know there are others going through the same learning curve. I'm a strong proponent of the *See one, do one, teach one* philosophy. Not only does it help spread the knowledge, it improves my own learning, because it forces me to focus on details and work them out before I can explain them to someone else. I was inspired by Kari Hultman's blog *The Village Carpenter* and Tom Fidgen's blog *Working Wood*.

I'm primarily self-taught, learning from books, magazines, videos, blogs and online forums. That involves a lot of trial and error. It was frustrating at times, because it was hard to know where I was going wrong and what I should do to correct a problem. But eventually the successes built on each other. Each one encouraged me to try the next skill.

At some point I realized I could do everything by hand. Now, after another three years, I feel like an accomplished apprentice. Not a master by any means, but competent, continuing to improve. Last year I moved my power tools out of the shop, leaving only the lathe. I keep a benchtop planer handy for when I have a large amount of wood to plane down, but for most projects, I do all the planing from rough by hand.

I also feel competent enough to teach others the basic skills, helping them avoid the difficulties I had. I started teaching private classes at people's home shops. This past summer I opened

the *Close Grain School of Woodworking* in Pepperell, MA to teach small groups and private classes. I focus strictly on the basics to give people the foundation and confidence to go take more advanced classes from the various fine schools in the region.

I enjoy doing demonstrations, where my goal is to get people to put their hands on the tools and try them out. The spokeshave is a great way to engage them, because it's easy to use and produces immediate results. I've had kids stand there for 10 or 15 minutes shaving away. Adults are just as fascinated. Then I have them try out a plane, helping guide it along if necessary. People are so convinced they can't do it, but then see that they can. This fall I had the honor of helping Phil Lowe at his booth at the Topsfield Fair doing that.

It can seem overwhelming trying to learn all the hand tool



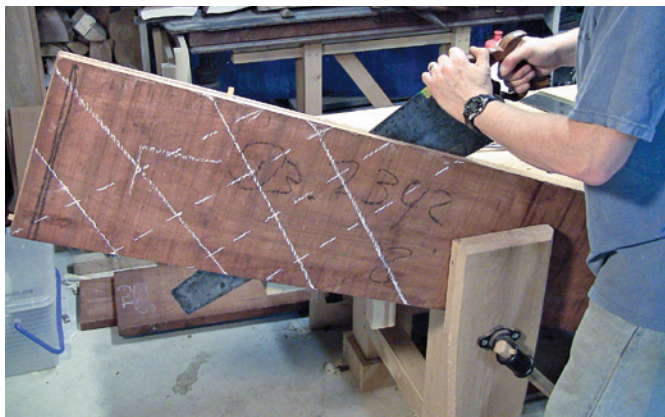
Bench-on-bench sitting on Roubo workbench. This raises work like carving and dovetailing to a comfortable height.

skills. But if you break things down, no single skill is all that difficult. The process I've found most effective is to learn about a skill from several different sources, then go into the shop and try things out a few hours at a time. I don't worry about the results, what's more important is putting in the time to develop the hand control and coordination. The first session may not appear to accomplish much, but by the second or third I'm starting to get it down. Time on task builds facility.

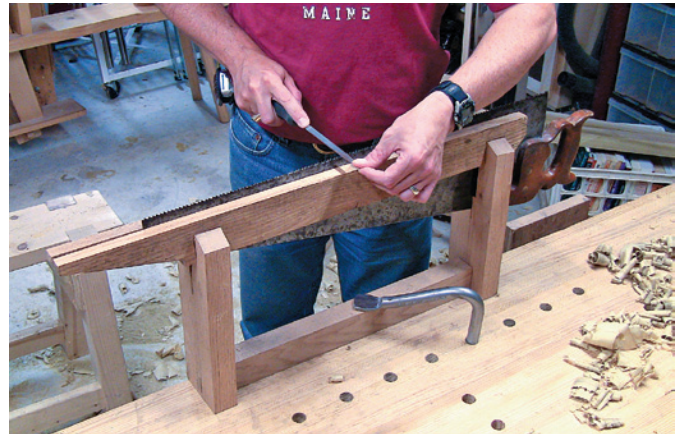
It's much like learning to play a musical instrument. You don't expect to play Mozart on the first try. You put in the time learning to find the notes and make them flow together, developing that hand control and coordination. No one wants to hear your first attempts, but with repeated practice you learn to make beautiful music.

I like to learn multiple methods so I can be more versatile. There are many ways to get each task done, with variations in tools and procedures. Knowing them means I can adapt to different situations depending on the tools at hand. I'm concerned less with knowing the *best* way and more with knowing effective ways. They all have their pros and cons. What's best in one situation isn't necessarily best in another. Any method that's backed by tradition or that someone has been using successfully for years is worth learning about, no matter how others may feel about it.

So far I've focused primarily on booting up my skills. As a hobbyist, my time in the shop varies wildly. Some weeks I get 10 or 20 hours in, some weeks none. Most of my projects have been shop-related, fairly simple. But they've made great learning opportunities. Now I've reached the point where I have the confidence to tackle more complex furniture projects. Last year I built a Queen Anne foot stool by hand as a member of the *Society of American Period Furniture Makers*. I've also been participating in Al Breed's *Townsend Document Chest* project with the Guild's *Period Furniture Group*.



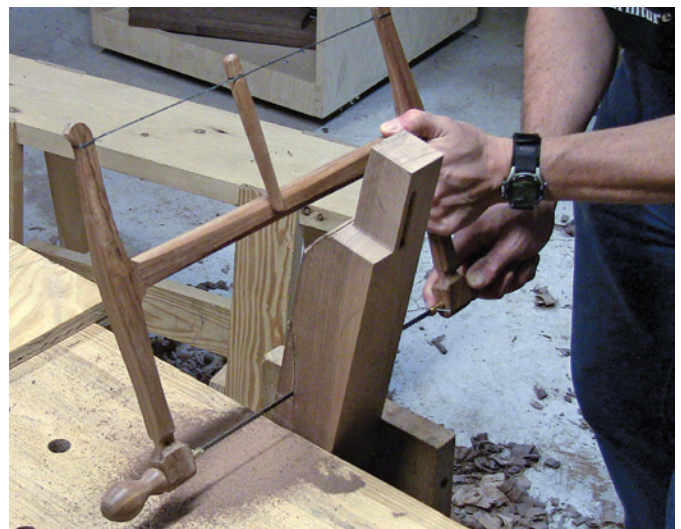
Resawing a mahogany 1x12 for Al Breed's Townsend Document Chest project. The chalk lines indicate the progress I made each time before flipping the board. I had some difficulties resawing the full-width board, so I first ripped subsequent pieces in half, resawed them, then edge-glued them back together, similar to making a guitar back.



An early and very useful project, a saw sharpening block.



Crosscutting a piece of rosewood to make a bowsaw, on a saw bench and Krenov-style sawhorse.



Sawing out a cabriole leg for a Queen Anne foot stool with my rosewood bowsaw.

Why do I like to use hand tools? Sometimes it's a mystery even to me, but I've boiled it down to four things.

First, I like the feeling of knowing that it's me, my skills doing the work, not a machine. I find that intensely satisfying.

Second, I like the history and tradition, using techniques that have been passed down over centuries. We came close to losing these skills in our quest for more power. I feel like I'm a link in the chain preserving them. I get a thrill using a tool that may have been around when Lincoln was president, or Teddy Roosevelt was riding up San Juan Hill.

Third, I find it liberating. I don't have to spend time building complex jigs or setting up machines, I just do the work directly. There are no limitations.

Finally, I like to show people who don't have access to power tools that they can still do the work. Rather than wasting years just dreaming about building things like I did, they can do it now with hand tools. Whether they don't have the space or can't have the noise and dust produced by machines, they can probably set up a hand tool workspace.

It's not that I have anything against power tools. Since I don't need to worry about how long something will take, I do every step by hand, but I think the best balance of efficiency and beauty comes from a combination of the two. Use power tools to quickly break down stock and bring it to rough dimension, then shift over to hand tools for the remainder of the work. That's the modern equivalent of the old workshop with master and apprentice. The apprentices got the rough work done so the master could focus on the fine work.

Sharing skills is important. That's one of the things that distinguishes those who were my original influences—Chris Schwarz, Roy Underhill, Don Weber, Drew Langsner, Mike Dunbar, Al Breed, and Phil Lowe. I continue to find more, like Paul Sellers and the late Jim Kingshott. These are all people with

tremendous skill and the desire and ability to pass it on to the rest of us.

I recently found out where my uncle got his interest in woodworking, when he sent me his grandfather's 1920s era Stanley #3 plane. He said he remembered how his grandfather would use it helping out neighbors with handyman tasks. My daughter, who started college this year, has shown an interest in working with hand tools. After I use the plane for a while, I'll pass it on to her, the fifth generation in our family to hold it, and the next link in the chain of tradition. ■



Portable sharpening station with oilstones and leather strop. This makes sharpening much more convenient.



Flushing down the knee blocks of the foot stool.



The completed foot stool before finishing with oil and shellac.



Ask The Old Saw



TOOL STEEL & HEAT TREATMENT—What tool steel and heat treatment is recommended for planes and chisels?—Lou Yelgin

Steve Costain replies: Some small tools made for O-1 (oil hardening tool steel) can be done in the shop, but for a plane blade A-2 steel holds an edge best. A-2 steel requires a heat treat furnace. The steel needs to be brought up to temperature, held at temperature for a certain time depending on thickness and then tempered at a lower temperature. The minimum charge for heat treatment of A-2 steel is about \$85 plus the cost of steel and fabrication. Considering that you can buy a very nice A-2 plane blade from Lee Valley for less than \$60, I wouldn't recommend making your own.

Bruce Wedlock replies: Tool steels are alloys of iron, with varying small amounts of carbon, chromium, manganese, nickel and possibly molybdenum, tungsten and vanadium. These alloy compositions result in characteristics after heat treating which enhance their particular application. For woodworking tools, two hardening methods are used—A-2 in which the steel is air hardened and O-1 where the steel is oil quenched.

A-2 steels have a balance of toughness and wear resistance. They are typically used for mortise and bench chisels where the bevel angle is 30° or higher.

O-1 steels have increased harden ability and are less likely to crack. Since they can hold a sharper edge, they are used when the bevel angle is 25° or less. So O-1 steel is preferred for paring chisels and low-angle plane blades as well as knives.

In cryogenic tempering the steel is gradually lowered in temperature to 300°F below zero and held for 24 hours. The steel is then slowly raised to +300°F and annealed for several hours. Cryogenically

treated steels have improved wear resistance and toughness. Typically the edge will last 50% longer than an oil-quenched tool.

Garrett Hack replies: I am assuming you want to make some cutting tools. The easiest steel to work with would be an oil or water hardening steel that you can either scrounge up (other tools or the like) or buy in many shapes and sizes. Once you have your new tool shaped—either by grinding or by forging—you need to harden the cutting edge. Heat it glowing red hot and then quench it rapidly into a can containing cooking oil. Plunge vertically and agitate the tool as you plunge. Oil works for both oil and water hardening steel. To make sure you really got the edge hard, file across it and the file should skate and not cut. To temper the steel, reducing its brittleness, polish up an area of the edge and heat back from the edge slowly and carefully with a torch. As soon as you see the polished spot turn a light straw color, quench immediately. If the tool proves too prone to chipping, you can always temper further, to a slightly darker straw.

SHARPENING A WOOD RASP—Is there a method to sharpen a wood rasp or file? Any comments on caring for and cleaning files?—Jeff Neil

Peter Breu replies: An acid dip works extremely well. It is a mild phosphoric acid and is very easy. I use this periodically on all my files and even very worn files end up like new. We often overlook dull files even though we sharpen everything else in the shop. I buy it from www.moonssawandtool.com for \$18.95 a quart (#1QSP). A quick tip—pour it into a 1½" PVC pipe that is capped off on an end to reach the full length of longer files. I am particularly pleased with the results on my rasps—just like new! The best tip



The Guild of NH Woodworkers

President Bob Couch

Vice President Claude Dupuis

Secretary Alan Saffron

Treasurer Marty Milkovits

Journal Editor Jim Seroskie
jseroskie@gmail.com

"The Journal" is published tri-annually

www.GNHW.org

for caring for files is careful storage—don't let them sit on top of each other!

SANDING SEALERS—Please de-mystify "sanding sealers." When is it appropriate to use them or not to use them?—Tony Immorlica

Bob Oswald replies: Sanding sealers are used to make soft woods or wood that absorb in irregular ways, more even in the way they absorb stain. Commonly soft woods like pine and poplar, and hardwoods such as Cherry and Maple, are very blotchy. They have harder and softer regions in the wood and absorb less or more stain accordingly. Burl type woods like maple and walnut also have wild variations in the rate at which they absorb stain.

Sealer's partially fill the softer areas, since, of course, they absorb more of the sealer than the harder areas. You don't want it on so heavy that it puts a 'layer' over the

wood preventing stain from penetrating. So sealers are very thin and are intended to be wiped on and off, allowing the softer sections to assume more the properties of their harder neighbors. I worried about it oversealing for a while and finally just dived in, figuring I could sand to bare wood if necessary. You don't need to worry, they work. As usual, of course, follow the can directions and test on a scrap piece of wood.

There are a number of products on the market, Zisner's SealCoat, General Finishes Seal-a-Cell and Pre-Stain Conditioner and Crystalac, to name a few. With General Finishes you typically wipe it on, wait a few seconds and wipe it off, then go right to your stain. Crystalac, a jelly like material, is best applied by brushing it on, vigorously squeegee it into the wood and removing absolutely as much as possible, then letting it dry overnight and sanding it gently at your finish level, typically 220 grit. I had a very stubborn walnut burl that was incredibly blotchy. After my third strip and try again, this product made it a perfect finish.

TURNING GREEN WOOD—In turning green wood, what is the best way to dry after turning?—John Kerr

Peter James replies: One method that I have used with good success is to dry small to medium sized items in a microwave oven. It is done in short bursts in the microwave and then the item is removed and the steam evaporates until it cools down. Then I give it another short burst and keep repeating this process. You can go from just cut down to under 6% in less than 30 minutes. This works best on bowls and hollow objects. If you are going to twice turn the item, be sure to leave it thick enough to accommodate the change in shape caused by the shrinking.!

STEAM BOX DESIGN—Where can I find a steam box design?—Joe Barry

Dave Emerson replies: Steam box design depends on what you're bending. A few requirements are that the steam must

flow through. A vent is required. The volume of steam is critical. Material to bend needs to be on a rack in the box. Also, the design of the box must not cool the steam. Lee Valley-Veritas designed jiggling for bending and supplied the best booklet on bending I've seen. It's no longer in the catalog but might still be available. It's not worth investing the considerable time and learning trial and error. Necessary, unless you're doing multiples. Instead, laminate for predictable results. Way back there's a video of my steam bending demo.

WHY HAND PLANE DIGS IN—What causes a hand plane blade to suddenly dig in deeper than it is set for?—Bob Couch

Garrett Hack replies: The most likely cause is your blade is flexing. The bed of the frog might be uneven, or the blade is sitting on some dirt or shavings so that it has less than full support. The lever cap might be too loose, allowing the blade to move around. Or there might be some twist or warp in your blade, so that it rocks on the bed. It might be simply that your edge is dull and digging in.

Joe Barry replies: The most likely cause is backlash. Backlash is a result of the clearances or slop in screw threads necessary for them to work. If there wasn't some miniscule space between the threads, you would not be able to adjust the depth of cut without a wrench. What's happening is that when the iron bites into the wood, it is being pushed back and up the inclined plane of the frog and taking out the backlash. The solution is to make your final adjust by bringing the blade down rather than up. That final turn of the adjustment screw downwards will take up the backlash.

Steve Branam replies: This happens when you plane against the grain. Think of planing like fanning out a deck of cards and running your hand over them. If you start on the top card and run your hand down the cards, it will pass smoothly over them. But if you start at the bottom card and run your hand up the deck, it will

catch on their edges, lifting them and knocking them out of place.

The layers of wood that form the grain are the same, with the edge of the plane blade like your fingers. When you plane up against the grain, the blade catches on the edge of the wood fibers and is pulled down between them. This may also tear out a chunk. Reverse the direction of planing to follow the grain.

Sometimes the grain will both rise and fall along the same direction. These spots are more challenging to plane. You have to identify where the grain reverses, then plane toward that point from opposite directions.

MACHINERY SETUP—Does seasonality affect the machinery in my shop enough for the need to go through a setup process again?—Mike Noel

Garrett Hack replies: I can't imagine any machine that would need re-tuning other than ones with large sections of wood. Do you have any? Your workbench might change a little season to season.

BUYING WOOD—When buying wood, what do you look for so when you rip it that it does not bind your saw?—Syd Lordeau

Bob Oswald replies: It's difficult to impossible to detect this side effect. Wood has stresses in it and when you cut it apart by ripping, those stresses are relieved and the wood moves. Woods with a pretty straight grain are less likely to bend and bind than those with irregular or wavy patterns, but I have had straight grain pieces bind and squirrely ones bind too. Your best protection is to use a splitter or riving knife on your saw.

Dave Emerson replies: Wood that has been dried properly, so that there are no tensions to be released in the wood from too rapid drying, rarely binds. It also helps if the wood is straight grained. Jay Legg (603-786-2319 leggslogs1@aol.com) has the best kilned wood I've ever used. ■



Matt Wadja



BY BILL MUNCH & BOB WYATT

End Table Project

Our project this season will be a Shaker style end table with shaped legs and a curved drawer face. Matt explained that if any of us choose to do a similar table, it could easily be of a more traditional design without the shaped legs or curved drawer face. However, he proposes a project that is expected to challenge us with techniques many have not been exposed to in our typical woodworking projects.

Matt spoke of how a BIG project could be thought of in terms of walking up the ladder of skill. The base project might be thought of as a Shaker table, with the more complicated elements of curved drawer fronts and shaped legs (as opposed to tapered legs) requiring more sophisticated skills. Matt explained that this project, like any project, is comprised of five primary elements. These elements are: 1) Get the design on paper, 2) choice of stock and proper surface preparation, 3) joinery, 4) sanding and 5) finishing.

As Matt begins with the design concepts of our project, he recommends the book *Practical Design* by the publisher of *Fine Woodworking*. His initial drawing is a birds eye view of the project. The sketch begins with a solid horizontal *floor* line with a perpendicular dashed *center* line. From a point on the center line just above the floor line, Matt draws the pattern of the curved face at a radius of $25\frac{3}{8}$ ". He suggests the use of a transit to assist with this step. He also recommended checking out Michael Fortune's Bent Stick in the Veritas Catalogue. At this point Matt also referenced the *Golden Rule* of rectangles, where the *golden rectangle* was proportioned at $\frac{5}{8}$ to 1. Note that a Google search provides a wealth of additional information on the subject.

The drawings most critical portion is a plan view—the birds eye view. This is necessary because the curved frame and drawers will require stock of larger dimension to accommodate the joinery. Drawings also include a front and side view, all done to actual scale. Matt follows a standard convention of drafting—that is elements hidden by structure are represented by dashed lines.

October 13, 2012

PART 1

On Saturday October 13, Matt Wadja (pronounced Way-da) welcomed BIG to his shop at Salmon Falls Mills in Rollinsford, NH for the opening session of this year's BIG project.

Matt Wajda is a graduate of the North Benet Street School (Boston). Since graduating from NBSS in 2000, Matt has been an instructor in the school's Workshop and Continuing Education Programs. Other teaching stints include assignments at the Center for Furniture Craftsmanship (Rockport, ME), the Penland School of Craft (Penland, NC) and a current assignment with the Massachusetts College of Art and Design (Boston).

Currently, Matt and a colleague have partnered in a business operating under the name *Piscataqua Design*, which specializes in custom furniture, fine cabinetry and architectural elements. Recently, Matt became a member of the NH Furniture Masters.

The session begins with Matt welcoming our group to his workshop. It is located in an old, five-story mill building portioned into several workshops and studios for talented artists and skilled craftsmen and women. It is an interesting setting for our new season of BIG workshops. One other benefit to those of us who live inland or in the north country, Rollinsford is not too far from the Newington Woodcraft store if you want to pick up a few supplies or a new tool.



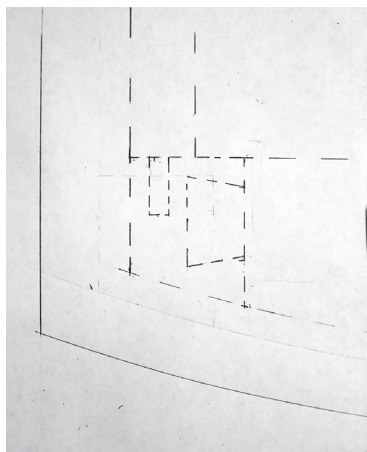
"I think the end tables with curved drawers is a cool project. We can show the plain version and the curved version with some curly maple that will work out great. I have fit 50+ people in our benchroom for other Guild talks so we should be OK"—Matt.

Next, Matt explains that the front leg stock will need to have a rectangular cross section rather than square posts to be able to extend the curved face through the legs while leaving enough material for the joinery. Matt uses *ships curves* for drafting the curved face and shaped legs of the design. These forms are used by shipwrights to lay out the compound curves found in hulls. They are generally longer, softer curves which, in his opinion, have drafting advantages over *french curves* in furniture design. Again, note that a Google search on ships curves provides numerous visual comparisons to french curves, as well as inexpensive supplier sources for these drafting design tools.

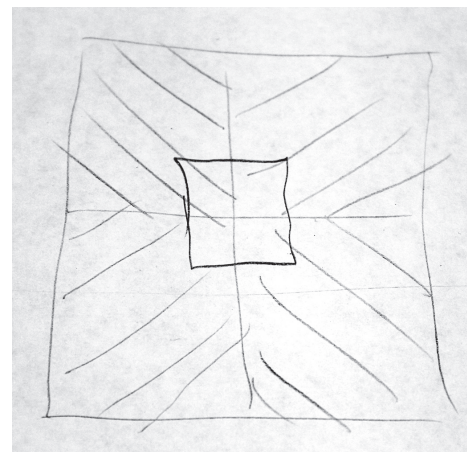
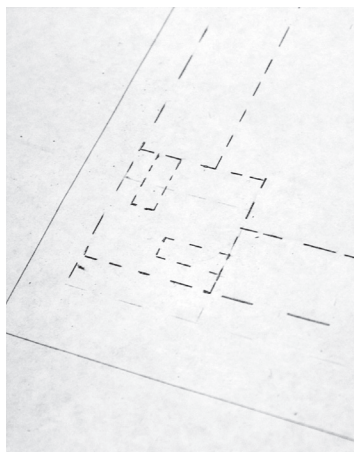
To close out the design discussion, Matt noted that drawings should also include front and side views, done to actual scale. Matt will have full scale drawings for this project available to purchase at the next BIG session.

For stock, Matt plans on using curly maple, but he notes that cherry or walnut would also work nicely. For the complex design features of this or other projects, he strongly suggests using inexpensive material, such as a 2x4 pine or spruce, to make up samples of those difficult, shaped parts. It is better to learn from your mistakes with cheap stock rather than with the quality hardwoods. He then proceeded to show us some of his *mistakes* that were hanging from a back wall in his shop. I note that one of his examples of a mistake was a shaped table leg where the rift sawn long grain did not track cleanly through the entire length of the curve. That flaw would not have been classified as a mistake for many of our own projects.

Matt had an interesting general discussion on rift sawn stock with more specific emphasis on using rift sawn blanks for the table legs. He acknowledged that rift sawn stock is not always



Front & rear joints—plan view. Full size plans will be available at the Dec. meeting.



Four legs—grain orientation.

available, but can be milled in our shops from flat sawn stock by ripping the long grain outer 25%-30% or so of each board. Then the inner wider grain portion of the board could be used for parts such as the table's side rails. Matt also demonstrated how the diagonal end grains of all four rift sawn table leg blanks should be aligned such that the lines flow to the center of the table and out to each corner. In other words, the end grains of table legs in 180° opposite corners should be aligned and flow in the same direction. This grain orientation adds structural strength and is aesthetically more appealing.

Matt then discussed joinery. Specifically, he emphasizes the importance of achieving tight, precise joinery in our woodworking projects. Matt says *open joints are no good, closed joints are good.*

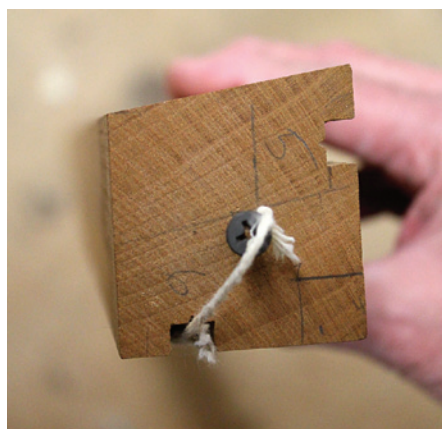
The sign of a good woodworker is one that is able to adapt, and in some cases rework pieces to overcome flaws in the materials that are being used in a project. Good execution also requires the ability to adapt, modify, and even overcome shortcomings in the plan or material. It doesn't mean throw the plan out the window if things go awry, but a good woodworker should be able to overcome the idiosyncrasies of wood and the way it doesn't always do what we want it to.

Later in the session Matt returned to the drafting table to do

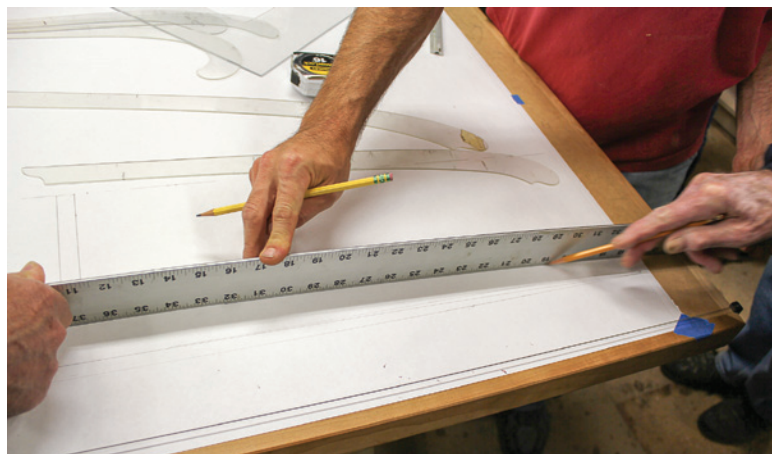
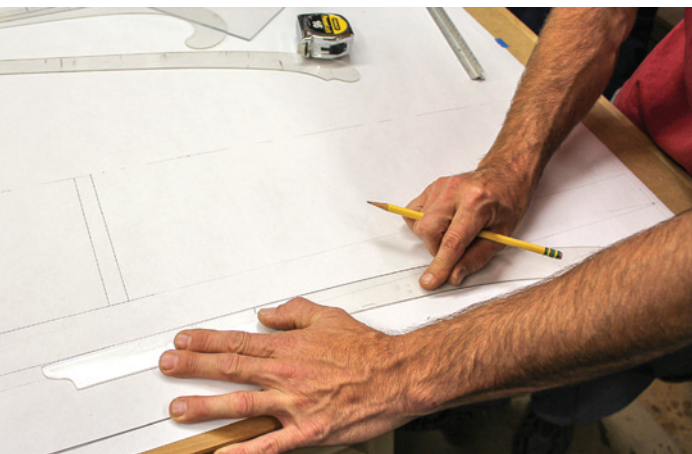
some hands on layout of the curved leg. There are many methods of laying out curves on a plan. One option is to use the ships curves mentioned earlier. However, Matt also demonstrated a simpler technique using a steel rule, bending it to get the desired curve on the leg and tracing off the rule directly onto the plan. He spoke at length on the need to select rift sawn wood with a particular grain direction for the legs. The proper grain orientation makes shaping the legs easier, provides a flow line that enhances the appearance of the face of the leg and also makes it structurally stronger.

For the remainder of the meeting Matt circulated among the attendees, answering individual's questions and clarifying any points we didn't clearly understand. He stayed after the scheduled end of the meeting and helped all comers with their questions on different projects of their own.

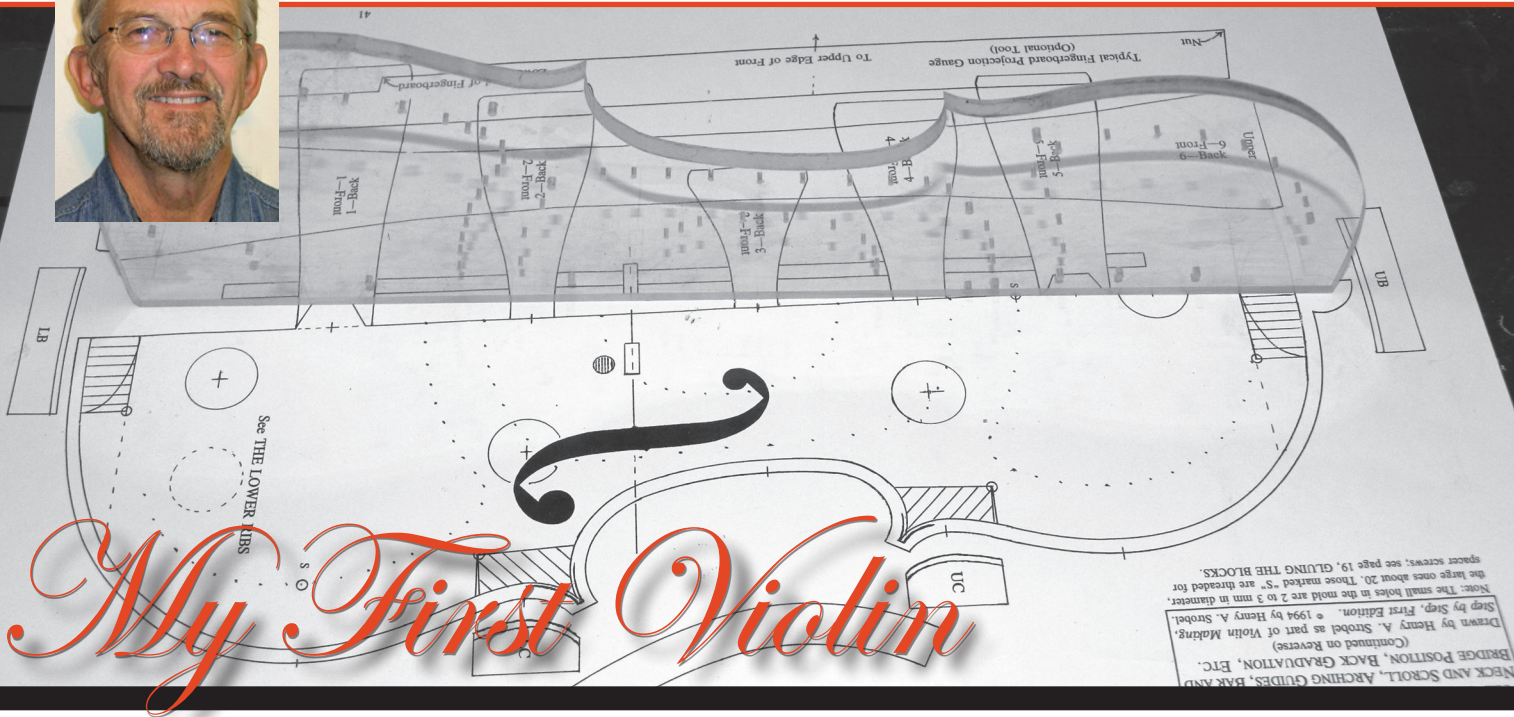
For the next meeting Matt noted that we will be out in the stationary power tool workshop and asked that we each bring our own safety equipment such as eye and ear protection. His shop does have dust collection and air filtration but suggested dust masks for those that prefer to use the additional protection. Matt anticipates having formal plans available for purchase at that meeting. ■



Examples of leg, curved drawer & front face.



Laying out the legs. First try was with a ship's curve, then a bent stick (ruler) produced just the right shape.



Part 1

Pattern & template

There is a little qualifier on this story. This is not a series of articles on how to build a violin. For that you need a good book, some wood, a bunch of new tools and a staunch commitment to do it. This is about the experiences of a guy building his first musical instrument. Hopefully it gives you a little feel for what building one involves so you just might try it yourself one day.

Most of us don't even look sideways into the field of lutherie. I never did. Last thing in the world on my mind was to build a musical instrument, despite the fact that I play five instruments (at various levels of competence) and love making music. Why did I turn my head? I started violin lessons this year, dreamed of owning more than a student model, and suddenly it dawned on me. *I'm a woodworker. I could build one.*

Lutherie is not easy, pure and simple, but it is turning out to be a very enjoyable segue from normal woodworking.

What is Lutherie?

A luthier is someone who makes or repairs lutes and other string instruments. In the United States, the term is used interchangeably with any term that refers to a specific, stringed instrument, such as violin maker, guitar maker, etc. The word luthier comes from the French word “luth”, which means “lute”. The craft of making string instruments, or lutherie,

is commonly divided into two main categories: makers of stringed instruments that are plucked or strummed and makers of stringed instruments that are bowed. Since bowed instruments require a bow, the second category includes a subtype known as a bowmaker or archetier. Which brings us to people like Ken Altman, a notable bowmaker in Oregon where I live.

I do hope you will enjoy this tour of an amateur violin factory over the next few articles. I can tell that this project will definitely generate things to talk about. And the good news is that what I've done so far has produced many lessons that will apply to other areas of woodworking.

Where Does One Start?

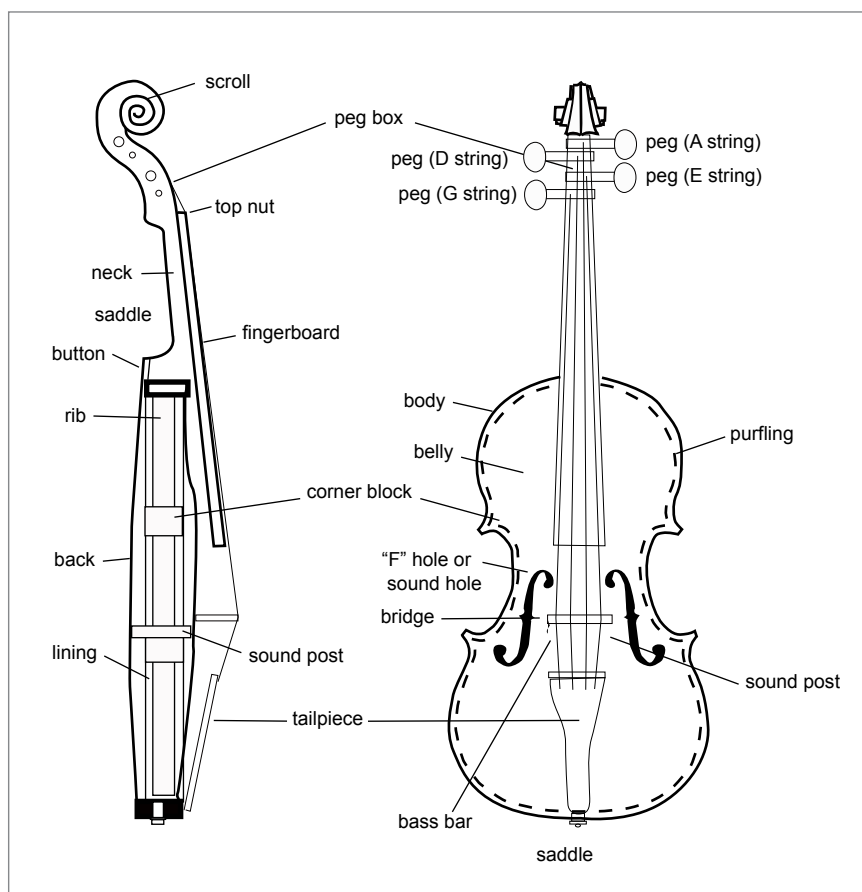
There are many books out on the subject and I was referred to one by Henry Strobel who happens to live in Aumsville, OR, a few miles Southeast of Salem. Turns out the Northwest, and Oregon in particular, is rich in luthiers. Henry's got a website and what looks like

an impressive shop where he builds violins. I must go visit. His book, *Violin Making: Step by Step*, has become a bible for me. I supplement this with *Art and Method of the Violin Maker: Principles and Practices* also by the same author. It provides bits of wisdom along with some history, both of which are helpful in the process.

As I read and internalize steps, like all woodworking projects, I see ways where I would do it differently. That's woodworking. The critical outcome here is that the instrument probably needs to be built to reasonably rigorous standards, as it has been developed and evolved by incredible craftsmen over centuries.

Parts of a Violin

The instrument is made up in general of a body, a neck and strings. The body has a back, a front, called the table or the belly and ribs which are reinforced with linings on the thin edge. The neck is a complex arrangement of parts. The scroll, pegs, peg box and nut that hold the strings at the top,



four strings, neck and fingerboard, bridge that transmits string vibrations to the belly and tailpiece that holds the strings at the bottom.

Inside are corner blocks, the bass bar and sound post. The sound post was invented to keep the belly from collapsing under the force of the strings. It's off to one side. The bass bar was added on the opposite side to balance it.

Add a few structural details such as the button, end button, saddle, "F" holes and you basically have it. You have to make all these parts (except the strings). I count twenty-seven wood parts and eight metal ones, strings and tensioners. It's not all that many. On the other hand not a one has a straight line in it.

Making a Violin

It starts with reading the book a few times while learning many new terms. Most of it doesn't mean too much at first. *The obvious is obvious, and the rest— isn't.* I will come to learn that you definitely do have to build a first one to realize how much time you'll save building another

when it makes sense and you've made the critical numerous early mistakes and gotten that out of your system.

Pattern

Step one starts out with a paper pattern. Henry's book includes a copy of a Stradivarius. If you photocopy the pattern, you must be aware of possible distortion in the copy. That's the first step towards making a poor replica. I checked my copies and found them pretty much dead on, and adjusted the template (next step) slightly to accommodate the copy error.

Template

The paper copy is attached to a piece of Plexiglas or aluminum to make a pattern, one half of the violin body. It's carefully cut and sanded and has holes drilled in precise locations for assorted features. The pattern has registration holes located on the centerline, top and bottom.

Mold

A plywood mold is then made around which the violin will be built for the early

part of its life. The pattern is aligned with the registration pins, tracing the right half in pencil and then, flipping and re-registering the pattern, the left side.

Cut out the mold very carefully and sand to the lines. The astute observer will realize that every step introduces distortion—quality of the paper, accuracy of the template, accuracy of the mold. We've barely started and already we have three opportunities for error. There will be more.

Note the odd cutouts at the top, bottom and corners. Six corner blocks will be glued into those spots. I spent days anguishing over how the mold will ever be removed when the corner blocks are glued to it. The mold is varnished, so glue does not stick to it very well, or so it says. Over the next many days, I knocked the blocks off and had to re-glue them several times. So much for that concern.

Type of Glue

Hide glue has been used for centuries, as it was invented and available long before plastics emerged from the earth. Made from by-products of animal hide tanning, it's water and heat soluble. That means you can actually dismantle an instrument or a piece of furniture with heat and/or steam. Yes, most furniture of days gone by was assembled with hide glue. It's all they had.

I've been given to worry about the quality of glues. Most recommended is mixing your own from dry powder in a double-boiler kind of device. I've vacillated between heat your own, store bought hide glue and Titebond Hide glue. The caution is always pointed at expiration life. Turns out hide glue does have expiration dates when in liquid form.

I find this glue obnoxious to say the least, but I'm sure I'll come to love it. First, in the boiler, it takes at least a half hour to get it up to temperature. It must be between 100 and 160 degrees. No grabbing the bottle and a quick squirt. Second, it sets up immediately as it cools, which is seconds after it hits the wood. That is to say, it turns from a nice thin liquid to a gooey, sticky substance very quickly. So you have to be prepared to brush hot water on the wood and on the glue to keep it soft enough to align and



The mold

clamp. And then it takes twelve hours or so to fully cure. No wonder instrument making is a challenge.

I will stick with it where I think it affects the musical properties and where you want to take it apart in the future, like edge gluing the front and back book match, and attaching the front and back. I'm to learn the eventual challenge of gluing about 30" (circumference) of wood 1/8" wide and having it aligned. Fortunately that's still a long ways down the road.

As I work ahead, attaching the linings to the ribs would be greatly speeded up by Titebond and likely not affect the sound. I could be wrong, but there are so many other factors in making the front and back that I have a feeling they will outweigh a few small indiscretions.

Let's Cut Some Wood.

I was inspired by a summary of Don Biasca's Guild meeting, one I was very sorry to have to miss. Selecting wood, and the art of tuning, are very special needs in this field of lutherie. As I write, you may sometimes hear a bit of a casual tone. Being my first experience, I'm writing about what I feel, my modifications based on my experience with furniture. I'm sure that will change into a much more humble attitude when the bow first draws across the strings. Factors like selecting simple woods at Crosscut Hardwoods instead of the hundreds of dollars version will undoubtedly surface later.

Material

Two basic materials are used, traditionally curly maple for the back and ribs and spruce (Sitka or Englemann) for the front. Pretty basic, good quality lumber was available at Crosscut Hardwoods. You can buy more exotic instrument grade wood costing much more from other places, but this is my first one. And of course you need Ebony for all the *working parts* such as the fingerboard, nut, tailpiece, keys, etc. The spruce is the most critical working part, in how it is tuned and caressed into producing great sound. I'm a long ways from that point and mildly concerned. But that's tomorrow's problem. Right now, just building the *box* is a joy. As I tell people, if it sounds terrible, it will be the most beautiful jewelry box I've ever built.

In early on shopping for tools, I chose to buy the Ebony pieces from one of several good violin supply companies on the internet. Ebony is expensive as you know. The several precut parts were

very inexpensive in comparison. I figured that there would be ample time spent building the ribs, back and belly that foregoing shaping a few little ebony pieces would not detract from the learning experience.

Tools

The artist, Henry Strobel, and all high end luthiers, I think, lean towards hand-made as much as possible, with hand tools. Henry however, allows for the use of power tools to the extent that you prefer, with the caution *be careful as you can remove too much material too fast*. I opt for using the technology available at your time in life to the extent that you enjoy what you do. Lee Johnson, great friend now deceased, loved hand tools but said the same thing. *Use what you like. Why would one not use the best tools available at the time?*

A recent observation about tools—taking up a new dimension of woodworking does have its advantages. You need a new set of tools, so for the consummate collector, there's no end. I think that's me. The downside, many are specialty tools and they tend to be expensive.

You'll need the typical furniture making tools, table saw, bandsaw, sanders. You have to think of the other specialty tools as 1) an investment in the future 2) he who dies with the most toys or 3) you'll build a whole lot of instruments and they'll pay for themselves.

Typical extra needs include:

- Thumb planes, 3 sizes, \$50-60 each
- Carving gouges, 2 or 3, around \$40-60 each
- Scrapers, set of eight, \$30
- Heat bender, \$25 home made, \$150 commercial
- Reamer for pegs, \$60
- Purfling cutter, manual or Dremel, about \$60 each
- There are other things like sound post setting tool, but that can wait.

I've got most of what I need now, currently about \$600 in four carving gouges, three tiny little planes that could be made of gold, and a number of violin specific tools. Those tiny IBEX planes, also called thumb planes, cost around \$60 each, 1" long.



Gouges, planes & scrapers

Corner Blocks

The first actual step of making a real product is cutting six corner blocks. There are six critical sharp corners and/or junction points. Small blocks made of spruce are glued to the form. They will later pop right off with the tap of a hammer. Grain direction is very important as they are so small that they will split if aligned improperly. The book tells you how.

Ribs

The thin pieces of the shell that form the sides of the instrument, are called ribs. There are six of them for three different, complex curves. Upper, middle and lower ribs, right and left. They are made of curly maple and are only 1mm thick! We've made my own veneers before so this isn't really a challenge.

Rip the material as thin as possible on the table saw or bandsaw. Mine were a little over $\frac{1}{16}$ " on the table saw. Take it to final dimension under a drum sander (for me) or a hand plane (for the enthusiast).

It's sure nice to have a digital vernier that reads in millimeters. I'm sure you know, but 1mm is close to $\frac{1}{25}$ ". A skinny sixteenth or a fat thirty-second.

Bending the Ribs

Making the ribs was easy. Bending them was a new learning opportunity. I couldn't bring myself to buy a \$150 bending iron. A little internet work located a YouTube video on how to build one for \$30 with parts from Home Depot. You can see it here (www.youtube.com/watch?v=ETUEyl_ovRA) and it works very well, although there was some education time figuring out the best technique. You don't dwell in a spot. You dip it in water, put the bending strap behind it, and smoothly draw it back and forth across the pipe. At the tighter bend sections, re-wetting and urging it tighter with a block of wood worked well. Each piece was laid against the form and corner blocks so they fit without needing any pressure to push them into final shape. Awesome! *Note: The leather bending strap behind the wood in the photo is missing.*

Glue Ribs to the Corner Blocks

The book implies that the ribs should be bent very closely to the final shape so that there's minimal stress holding them in place with the glue. I did well at that. They are glued, one section at a time with a couple of small spring clamps in the clamping holes.

The ribs are left long as each is glued on. They are then trimmed with a spindle sander (for me) or hand carved (the enthusiast) to the right length. When two adjacent ribs come together, they produce a *bee sting* look with a fine edge.

Of course we're gluing with hide glue. Heat the pot to temperature. Use hot water to wet the wood surfaces, bringing them up to temperature a little. Brush on the glue and quickly attached the rib to the corner block, keeping it aligned. The glue sets fast. The first couple of times I had to sparingly brush hot water on the joint to soften it enough to align.

Hide glue will be my nemesis.

Trimming the Ribs

Where two ribs meet in a sharp point, the easiest way to final shape them was a 1" spindle sander. Then the ribs have to be sanded on top and bottom flush with the corner blocks. This entails a full sheet of sandpaper which is not big enough to cover the whole profile. So you sand in sections, trying to keep the overall structure flat. Awkward

Linings

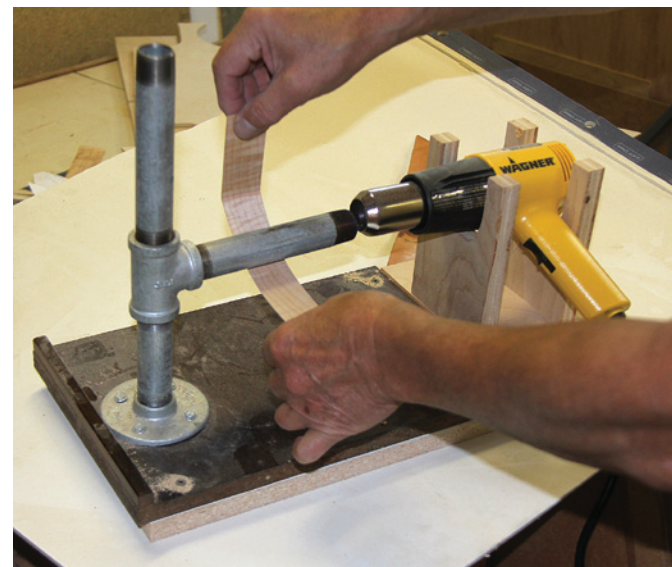
Remember that the ribs are 1mm thick, a fat $\frac{1}{32}$ ". Imagine trying to glue the back (and the front) to this thin edge. So the early makers fattened them up by attaching a 2mm thick, 6mm wide strip of spruce, the lining, giving a total gluing surface of 3mm, nearly $\frac{1}{8}$ ". It still seems minimal, but it now looks practical.

There are two assembly scenarios involving the shell and the back. One is to put the linings on both the top and bottom of the ribs. Then remove the form, wiggling it out around the linings blocking the way. This would leave the shell somewhat floppy and make gluing on the back more difficult, I would think.

I elected to only install the linings on the back side, and when the back is ready, glue it on before removing the form. Then the front linings would be installed after removing the form



Corner blocks glued to form



Heat bending jig



Rib attached



The whole shell

and before gluing on the front. In the end, it's a woodworking procedure that is likely to evolve into your own on your second and subsequent projects.

Cutting the lining was another exercise. You're told to cut several 2mm x 7mm strips with a bandsaw, about 8" long. The 7mm width is excess, allowing it to be glued with 1mm proud of the top, sanded down to where it will become 6mm tall. As a precision woodworker, I glued it barely flush with the top and had only touchup sanding to do. That leaves the lining heavier than necessary. They also have you cut it thicker than 2mm and then hand plane and sand to final thickness. All that said, I cut directly to 2mm x 6mm with a sharp combination blade on the table saw and a tight zero clearance throat plate—simple and perfectly cut without all the hassle of sanding afterwards.

The linings, of course, follow the shape of the ribs, so it's back to the heat bender to pre-form them. It seemed that it would go faster because they're only 6mm wide instead of about 30. Wrong. The 2mm thickness makes them much stiffer and I broke a couple hurrying the bending process along. Ultimately a set of six linings were bent to fit smoothly, not requiring any pressure to conform to the gluing shape.

Mortise the Linings

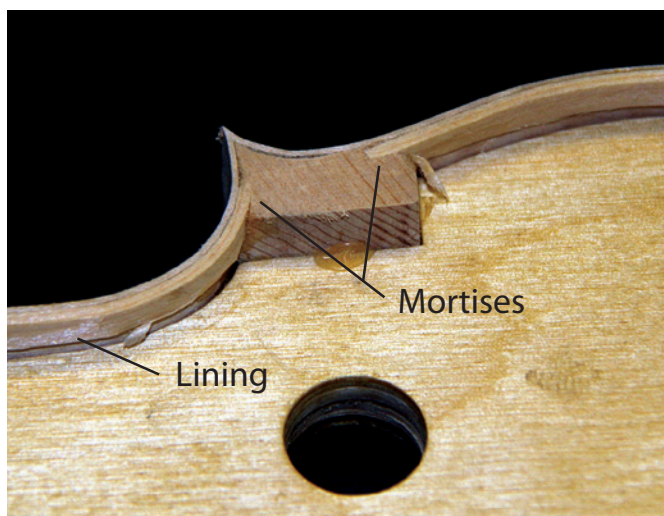
To install the linings, the book says to mortise them into the corner blocks. Now that's another learning experience. *Try to cut tiny mortises into the corner blocks without damaging the ribs.* The mortise is 2mm wide, 6mm long and 6mm deep. It would have been so much easier to cut the mortises before gluing on the ribs. Next time. Twelve places were mortised. It went better as the count went up and I stopped trying to chop square mortises. The book alludes to cutting a sloping mortise and tapering the bottom of the lining.

Trimming the Linings

I'm not currently sure of the reason other than esthetics, but the final, rectangular strips glued to the rib walls, really want to be triangular according to the book. So it's a hand carving process (a new tool, a carving knife) to hand trim the under side of the lining. Patience is a good thing, as you don't want to score the rib under the lining. I wondered about making them triangular



Glue the linings



Mortise for linings

to begin with but didn't see a predictable way to do that and get through the bending and gluing process.

That's a *lot* of words for six little sticks of wood.

The Back

Part of the beauty of this part of the project is handling, for days on end, the beautiful, book matched curly maple that will become the back of this instrument. As I read more about violin history, it seems to be irrefutable tradition that all violins are made of maple. There are allusions to other woods but they seem to be scorned, with little defense that it affects the tonal quality. If I get motivated to build a second one, I'm thinking the back and sides might be some highly figured black walnut.

Book matching

This is typically done to get that balanced look we all know about in furniture. I'd say *wrong*. I'm sure you've experience how the grain changes when you start cleaning up the bandsaw face of a book match. Highly figured wood changes very rapidly with depth and very soon the book match, isn't. It's even worse here as we're intentionally carving away a lot of wood everywhere. Another option is a solid piece. Many instruments are built this way and I'd probably do that next time. On the other hand, leaping ahead to the finished shape, it actually is turning out to look very nice.

Cutting the Outline

You draw the violin shape on this board by clamping the shell in place and tracing a pencil line around it, using a washer to space the line away from the shell about 4mm. Then bandsaw the shape a millimeter outside the line to protect the outline during rough shaping.

Arching

Now life gets interesting. We're going to take this fiddle shaped piece of wood, 1/2" thick, and turn it into a complex, domed shape. This is called arching. All you do is gently carve your way to the finished shape with a variety of gouges and thumb hand planes. I'm getting more Zen—slowly.

In buying gouges I discovered that there are hundreds of shapes, sweep angles, etc., a whole new terminology of woodworking to understand. The carved shavings are pretty. I could tell that I was going to be here a while. The book did allude to it being ok to use power tools to rough it into shape. And a professional violin maker at the Marylhurst show told me he used an angle grinder. Now we're talking.

Roughing to Shape

Before grinding away some wood, you establish a reference height around the edge, a rabbet 10mm wide, 7mm at the center. A router and rabbeting bit do that well. Go slow, less than 1/8" height change at a time, to not split out the curly maple corners. The soft spruce of the top is especially grateful for being treated gently.

With each pass of the rabbeting bit, you do the back and then the front, a great time saving economy. The setup is the same and it's way more efficient than cutting out the front a month from now and having to setup the process all over.

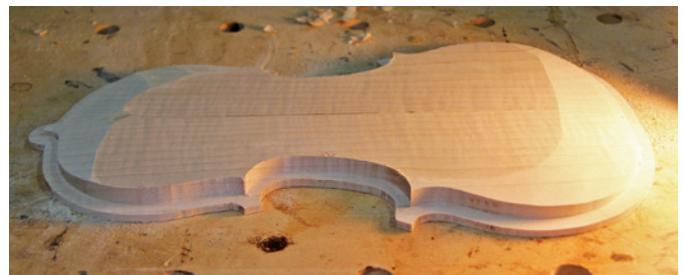
A disk sander with an 80 grit pad made the rough shaping go quickly. Just don't go too fast and definitely not too far.

Fine Tuning the Shape

Armed with \$300 worth of thumb planes and gouges, you go to work. You'll learn how to use a gouge by the time you finish. I learned over time, in carving to 1) hold the cutting end tightly, close to the end, 2) make slicing motions, not straight pushes and 3) rock the handle down cutting only short curls (gouging). I was surprised how well a sharp gouge would cut in almost any grain direction. (It will turn out later that this is only true on the hard maple. Spruce grain fights you every step of the way.)



Book matching



Roughing. Rabbet reference established



Hand carving at its best

Resources

Prices vary some and on expensive things it pays to shop. Also some companies like International Violin give a lot better detail in their catalog than on-line. Definitely order a hard copy catalog.

Suppliers/Wood Sources/Kits

- International Violin Company (MD)
www.internationalviolin.com
- Stewart MacDonald (OH)
www.stewmac.com
- NorthWind Wood (NH)
www.northwindtonewood.com
- Southwest Strings (AZ)
www.swstrings.com
- Henry Strobel & Sons Violin Shop (OR)
www.henrystrobel.com
- Cremona Tools
www.cremonatools.com
- Lemuel Violins (Canada)
www.violins.ca
- Artisan Wood to Works (Canada)
www.bowriverwoods.com
- Grizzly (Kit)
www.grizzly.com/products/Deluxe-Violin-Kit/H3099

Classes/Programs

- North Bennet St School (MA)
www.nbss.edu/education/programs/violin-making-and-repair/index.aspx
- Univ of New Hampshire (UNH summer program)
www.learn.unh.edu/violin
- Al Carruth (NH)
www.alcarruthluthier.com
- Thurmond Knight (VT)
www.violinviolacello.com

Books

- Violin Making: Step by Step by Henry Strobel
www.amazon.com
- Art and Method of the Violin Maker: Principles and Practices by Henry Strobel
www.amazon.com

Links

- David T. Van Zandt (WA)
www.vanzandtvilins.com/vn-supplies.htm

—Jeb Hooker also contributed to this list—

There must be a million little curls of maple on my workbench. They're so cute. I logged about 4 hours in 20 minute time slices spread over eight days.

These planes arrived out of the box, incredibly razor sharp and ready to use. And they have curved bottoms. How will I ever re-sharpen them? I don't know yet. I did buy a Slip Strop and I hone them every twenty minutes or so, hoping to forestall a sharpening exercise. So far, so good.

How do you know how to shape this complex profile on the back, and front?

Archiving Templates

Arriving at the final shape requires making templates of the shape. There's one full length longitudinal template and five transverse templates.

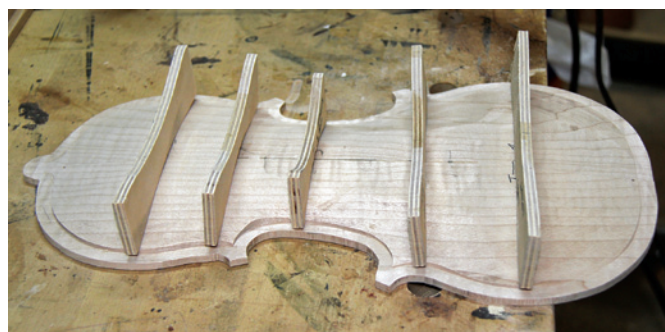
I made them out of 1/4" baltic birch, somewhat casually. As I started to use them I realized their significance. Back to the templates in the book and the sanders to profile them much more carefully and accurately. Also, every one needs to be well labeled with a big sharpie for front, back, top, bottom You'll use these templates a million times. Wasting a lot of time trying to get the right one in the right position, I finally wrote all over them in bold letters.

The final shaping is done with scrapers, oval and rounded shapes to fit the arches. They are so cute too. They arrived beautifully sharp and work extremely well.

Coming up, purfling (adding the magic), cutting the channel and hollowing, another adventure in shaping. And moving on to the front, the sound generating component with it's own set of adventures. ■



A lot of beautiful shavings



Using templates



Restoring an Old Town Canoe

BY NATE CAREY & DAVE FRECHETTE

In the woods of Henniker, New Hampshire there lives a man who knows wood and canvas canoes, how to build them and how to bring tired old canoes back from the brink. His name is Tom Seavey. When Boat Building Subgroup lead Nate Carey asked Tom to help with the restoration of a tired old canoe (generously donated by Guild member Bob LaCivita), Tom said *bring her down, we'll fix her up.*

On Saturday March 10 of this year, the restoration of the 1946 *Old Town* Model 15/50 canoe was underway at Tom's shop. Half a dozen Guild members showed up that day and the first order of business was to scrub the interior of the *Old Town*. Tom mixed up buckets of hot soapy water and doled out stiff bristle brushes to everyone, then said *go at it boys, but take care not to harm any spiders...bad luck don't ya know!*

The clean and dry boat was marched into Tom's cozy comfortable shop and inspected for parts that were sound and parts to be replaced. Hardware came off and was saved for reuse. Outwales came off, and then the old faded green canvas, without ceremony after 66 years of use, abuse and neglect, was removed in pieces.

Every Saturday (save one or two for whatever reason) our group met to restore the canoe. Some sessions five or six Guild members joined in, some sessions two or three.

We removed old ribs, then made replacements of white cedar that we steam bent and carefully clinch tacked into place using hammer and bucking iron. The bucking iron weighs about four pounds and is shaped to facilitate holding firmly against the part being clinched. The sharp end of the copper tack (or nail) is turned by the bucking iron with every hammer blow and sent back (or clinched) into the wood. The steaming is done in a wooden box about 8" square, big enough in section to hold several ribs, and about 6' long. Steam is generated and piped into the box at one end. After 30 minutes or so in the steambox, the thin cedar ribs are pliable as cooked spaghetti.

We cut out many bad pieces of planking. Replacement pieces

of cedar and oak were shaped and tested until they fit to Tom's liking. Then they were tacked in place. The wood replacement phase of the restoration was completed over several work sessions. When the hull of the canoe was determined to be sound, shaping and sanding commenced; the goal being to make the hull as *fair* as possible. Fair means no lumps, dips, or ridges in the planking; this is achieved using a *longboard*. A longboard consists of an 18" long, narrow, flexible piece of lumber or plywood (commercially available longboards are often plastic) with a handle at each end. Sandpaper is adhered to the underside of the longboard and it is drawn repeatedly and vigorously along the length of the wooden hull.

Several parts of the canoe were determined by Tom to be too far gone to be of use and these parts were copied in new wood. Outwales and inwales, the two components that make up the gunwales, were replaced, along with the stems (the curved hidden



Left to right—Cleaning interior—Barry Brunelle, Syd Lorandau, Harvey Best, Bob Katz, Dave Frechette, Tom Seavey

frame at bow and stern). The stems provide a *landing point* for the planking and determine the curved shape of each end of the canoe. Our Old Town model had three *thwarts*. Thwarts are relatively narrow pieces of solid wood (oak or ash are commonly used) about an inch thick that run from gunwale to gunwale and provide support and give shape to the boat. All three thwarts were replaced. The seats, being in good condition, were cleaned and refinished. Seats and outwales would be reinstalled after canvassing is completed.

To make the Old Town more *eye sweet*, meaning the boat looks more correct and attractive, the thwarts, seats and decks were not necessarily installed in their previous positions. Tom explained that when rebuilding an old boat, changing a few things around can often improve both appearance and performance.

The interior of the hull is clean and varnished. The exterior of the hull is faired and eye sweet. Now all Guild members present and Tom sign the hull and a coat of linseed oil was applied and rubbed out to repel moisture. New canvas is the next order of business.

It is now the Boat Builder Subgroup's sixth Saturday at Tom's canoe shop. Untreated #10 cotton duck canvas is unrolled over the canoe. The canvas is 60" wide and rolled out to 18', three feet longer than the canoe. Using devices called *grippers*, the canvas is folded lengthwise, open side up, and stretched between the walls of Tom's shop using a winch and elbow grease. The canvas is spread and the canoe is settled into the resulting hammock.

Pads are placed in the canoe to protect the bottom. A *step and go* is placed over each end. The step and gos are made of 2x6s of about 6", 12" and 18" nailed together to form a step. Then *holdy/downys* are placed between the floor joist above the canoe and the step and gos. There are *stops* attached to the floor joist with cross pieces so the holdy/downys are locked horizontally and had a support one way on the other horizontal axis. When everything was about straight, the winch was tightened again. This had the effect of lifting the canoe against the holdy/downys, which forced the canvas to stretch across its length. A hammer was used to make any adjustments necessary to the holdy/downys.

A *clothespin* was put on each end. The clothespins were actually maple boards about 36" long into which a kerf had been cut about three quarter of the way down. The clothespins brought the canvas together and were placed just about touching the stem.

Starting at the center, the canvas was tacked through the top of the planks and through the ribs to the inwale. In a new canoe, the plank to rib nails would have been on the outside edge of the ribs. The canvas tacks would have been inside them and the outwale screws would be in the center. In our case, a lot of the ribs had damage from previous nailing so that the nails might not be exactly where expected. So we used a pencil to mark where the tacks should go. Looking down on the rib, the nails were located. The pencil point (dull) was pushed on the canvas to locate the place where the tack should go. A vertical line was then drawn. This was repeated twice for each rib. A pad (a piece of wood about 1" x 6" and thin and wrapped with cloth taped in place) was placed on the inwale to protect it. The canvas was gripped with a stretching iron and pulled taught. Two tacks were lined up with the vertical lines and with the top of the planks and driven



Cleaning interior—Bob Katz, Dave, Barry, Harvey, Syd



Paul Caron removing old canvas



Clinching in new rib

slightly upward into the rib and then into the inwale. Sometimes the tack went in with no resistance suggesting it hit an old hole or crack. It was removed and tried somewhere else. Sometimes the tack hit a nail. It was removed and discarded and a new one was placed somewhere else.

Four ribs were done on one side and then four on the opposite side. This process was repeated until the decks were reached. In the deck area, special care was taken not to damage the decks and to make sure the canvas was particularly tight. Waste canvas was periodically removed always leaving a few inches to grip on to.

The clothespin was removed and the canoe cut free of the gripper. It was placed on a low sawhorse on one end and a tall one on the work end. The canoe was then flipped. The stern was done first. The area where the canvas was no longer in contact with the canoe at the stem was identified. A cut was made along the fold. It was important to keep it centered for the first few inches. After that, it did not matter because it was in waste. A stem nail (large $\frac{1}{2}$ " head) was placed just before the cut. One side of the cut edge was stretched by hand over the stem and tacked in place. The first few tacks were stem tacks but then we switched to shoe tacks because they have smaller heads. This procedure of stretching and putting in a couple of tacks was repeated the length of the stem. The tacks were about $\frac{3}{4}$ " to 1" apart. The tacks were placed on the far edge of the stem to fully cover the center of the stem. A few of the inwale tacks had to be removed to get more material as we went along. Once tacked, the excess material at the stem was removed right along the nail line.

The second side was done in the same fashion but this time the tacks were put in the near side to allow the excess canvas to be cut away over the center of the stem. These tacks were about $\frac{1}{2}$ " apart. The excess canvas was removed. There were a few wrinkles in the canvas about the stern. Back tacking was necessary. This involved removing tacks from the inwale area until there were none from the end of the boat until under the wrinkle. The canvas was pulled taught and wrinkle free using the stretcher pulled down (no levering) and new tacks put it. This progressed up to the stem. Sometimes it was necessary to backtack several times. This process was repeated on the other side. It required the operator to kneel on the floor to do it.

We then moved the tall sawhorse to the bow and repeated the process but this time we started our cut a little further out. As a result we had very few wrinkles and little time was spent backtacking.

We now had a canvas-covered boat so *we got out a blowtorch and burned it*—that is, we burned off all the loose canvas. The idea was to lightly brown all the canvas and we got to watch a lot of sparkling as loose fibers burned off. Care was taken, particularly at the bow and stern to make sure burning threads did not ignite the boat.

The boat was then thoroughly vacuumed in preparation for filling. Any burrs in the canvas (manufacturing lumps) were pounded down.

Filling is messy so the sawhorses were protected with paper and drop cloths put on the floor. The filler is oil-based paint with dryers to which silica powder and lead are added. The former does the filling and the latter prevents fungus from growing. The



Fitting and installing patch



Scrubbing interior



Bringing old wood and new wood together at the gunwale



Harvey Best tacking ribs to the inwale. Bob Katz and Dave

filler is strained through a coarse mesh screen and then applied to small sections with a roller. We donned rubber gloves and then a canvas mitten to rub the filler into the canvas. We let it tack a little and then applied circular elbow grease. As one section got done, another was rolled until the boat was covered. It took awhile and was definitely work. When it was all done, Tom took a flashlight and looked for unfilled areas. We then rubbed it down with our rubber gloves. The filler requires several weeks to dry.

On April 21, Tom transported the Old Town to the Guild meeting at William Thomas's shop in Rindge, NH. The canoe, even in its filler gray color was well received by Guild members and Tom enjoyed talking about his experiences with this and other wood and canvas canoes.

Exterior hull painting and the installation of a few pieces of hardware were the only tasks left to complete—and of course the selling of 1000 raffle tickets.

All the work that the Boat Builders accomplished, including three coats of green paint, made the 66 year old canoe look young again. The restoration was complete and now it was time to sell raffle tickets to pay for it. As soon as word circulated that tickets were available, sales among Guild members were brisk and steady. Guild members purchased about 30 percent of all tickets sold. The Boat Builders call that *generous support* and it certainly was appreciated. The canoe was shown at the *21st Annual WoodenBoat Show* at Mystic Seaport Museum in June, and then it went to the American Independence Museum's *23rd Annual Festival* in July. The restored Old Town made its farewell appearance at the Lake Sunapee Protective Association's *Love Your Lake Day* in August and June Fichter, the LSPA's Executive Director, was kind enough to pull the winning raffle ticket.

The Guild's Old Town restoration project, like the Nutshell Pram project before it, was deemed a success by all who participated. And now the Old Town, in the hands of its new owner in Texas, can be enjoyed for another 66 years. ■



Installing the new "deck", also known as the "breast hook"



Steambox in operation. About 18 inches of a spruce inwale is being steamed so that it can take a sharp bent at one end



Fitting new stem



Brendan Cahoon and Paul Caron applying filler to canvas



Hammer Veneering Curved Work

I love veneer. I love the crazy figure and defects and burls that are only available as veneer—the best logs usually get sent straight to the veneer merchants. I love getting to use exotic species in an economical way. I love that it is a green product. As stocks of certain species become increasingly diminished, veneer can quite an ecologically sound alternative to solid. Most of all, I love the design possibilities that veneer provides. Once you have started to experiment with veneer, a whole world opens up that is not possible with solid wood. From simple book-matched panels and tops, to complex layouts with grain that runs through drawer and door faces, to inlays and marquetry, you can do all kinds of things to keep people guessing. To really take your veneering up to the next level, you can start using veneer on curved moldings and surfaces while playing with grain direction and matching techniques.

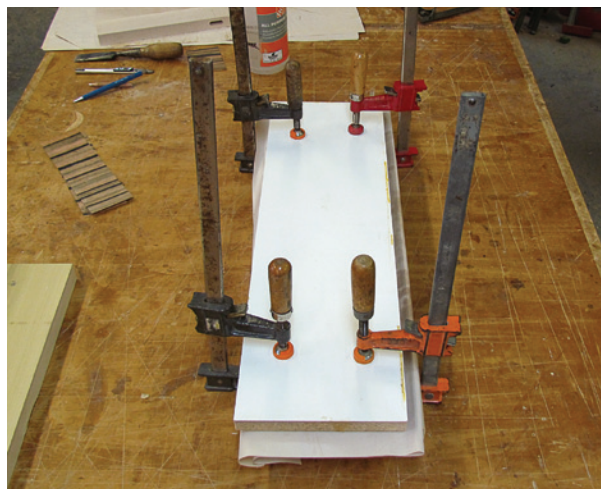
Traditionally, curved work is hammer veneered with hot hide glue, a process that is messy, smelly, time consuming and requires the investment in an expensive glue pot. I have been playing with an alternative method using a household iron and the yellow glue you are probably already using. The brilliant thing about this system besides not having to deal with hide glue is that the heat from the iron will soften the wood fibers as you work and help you with the bending. Also, any spots that do not adhere completely can be fixed simply by reactivating the glue with the tip of your iron. For the purposes of this article, I will be using an ogee molding like the one on the top of my Art Deco Hall Table, but the technique can be used for any curved surface. It works great for flat pieces too. I will often use it as a quick way to veneer up some pieces for finish samples, or even for a few small drawer faces rather than dragging out the vacuum press.



Some special tools you will need:

- An iron—nothing fancy but don't get the cheapest one at the store, it probably won't get hot enough. High, even heat is key here so spend a few extra dollars and get a mid range model. I think mine cost about \$20.
- Veneer hammer—This will be used to smooth out and apply localized pressure to the veneer once you have melted the glue. I made my own based roughly on a Tage Frid *Fine Woodworking* article. The dimensions aren't as important as the features. It should have a long enough handle so you can maneuver it comfortably, and the head needs to fit your hand so you can apply the necessary amount of downward pressure as you work the piece. It will also need to have a thin tip. For mine I used a piece of an old aluminum yard stick but a strip of stainless steel or brass would work as well. Just don't use ordinary steel as it will stain the veneer. The metal strip is fitted into a groove in the hammer head and fastened with some screws. Polish the tip with some fine sandpaper and make sure that it is slightly convex so you don't have any edges that could damage the veneer. The width of the head is also largely personal preference, mine is about 3½".

For the substrate, any stable wood will do. I personally prefer to use poplar. It is cheap, easy to find, mills great on machines and with hand tools and most importantly, it is quite stable, meaning it won't warp too much if it is handled properly. As you design the molding or curved component you will be veneering, it pays to think about how you will be doing the work and what species of veneer you will be using. Some woods take better to the bending process than others so I will usually make samples to experiment and refine the shape until it is both aesthetically pleasing and works with the veneer. In the case



of the ogee molding, I found it helpful to have a flat spot at the top that I could bond the piece of veneer to before starting to bend the curves.

Technically any PVA glue will work with this method but I wouldn't use the white stuff as it is really too flexible. Regular yellow wood glue will work just fine, but I prefer to use the cross-linking *Type II* glue made by Franklin. Regular yellow glue is made up of straight chains of polymers that remain unconnected as they cure. The polymers in the Type II glues link up as they cure allowing for a stronger bond that will be less affected by heat and water. I believe this makes it a safer choice in veneering as the glue line is ultimately so close to the surface of the piece.

Once you have figured out the size of the pieces you will be using, cut them to rough size. Since you will be butting the edges together they will need to be jointed. I clamp a stack of pieces between two straight runs of stock and rout the edges with a pattern bit running the bearing on the jig. You can also joint the edges with a sanding block or a block plane using the same jig. Whatever method you use, be sure to keep the edges relatively square to the ends so you can use them as a guide as you lay out the veneer later. If the veneer you are using is especially brittle or wavy, I find it useful to soften and flatten it with a glycerin solution. The formula I have been using with good results is 6 parts water to 3 parts denatured alcohol to 1 part glycerin. Use distilled water, as tap water can contain minerals that will stain some veneers. A good source for glycerin is your local feed store. You can buy a gallon jug (enough for many years of veneering) for about \$40. Mix it all up in a spray bottle and apply liberally to both sides of your veneer pieces. Then lay them between sheets of newsprint (buy the artists stuff rather than using your local daily paper as the dyes in the ink can bleed and ruin light colored veneers) and clamp them between cauls. I like to use $\frac{3}{4}$ " melamine for cauls. It is cheap, rigid, and the wet paper won't stick to it. Be sure to change out the paper daily until the veneer is dry, usually about a week.

In order to assure that the glue will do its work, it is worth spending a bit of time to get the surface of your molding ready. When you have the piece made, sand out any irregularities with some 100 grit paper. The rough paper will provide some scratches for the glue to get into as well as smoothing out your molding. Then glue-size the surface with a 50/50 mixture of yellow glue and water. This is basically just some extra insurance against starving the joint as a result of the substrate absorbing too much of your glue. Let the piece dry over night and then check for any bits that may have stuck to the size. You can clean it up with some more 100 grit if you need to.

With your workpiece sized, and your veneer softened, it's time



for the fun. The heart of this technique involves painting glue on both surfaces (the piece you will be veneering and the backside of the veneer), allowing it to skin over and then reactivating it with your hot iron as you apply it to the molding. Yellow glue is at its most flexible when it has dried but not cured. You will know it is ready to go when you can touch the glued surface and it feels tacky but not wet. Usually about an hour will do, but times will vary depending on temperature and ambient humidity.

Glue up the substrate first and then the veneer. When you are gluing the veneer, spritz the show side with a little distilled water to alleviate the curl produced by the water in the glue. Time is on your side with this method (another plus), but as the glue begins to cure and the polymers link, it will become much harder to reactivate with the iron so try to only pre-glue as much as you can comfortably work within a couple of hours. While the glue skins over, you can get the iron set up and make sure you have everything in place to begin. You can also start thinking about the layout of your veneer pieces. To hide all the seams, it is important to match the edges as you go. In this scenario we are working with pieces of Madagascar ebony cut from a long strip, so flipping the pieces end for end as we go will produce almost invisible joints.

Once the glue has dried sufficiently, we can begin to apply the veneer. The basic process is to put the veneer in place, heat it with the iron until the glue melts and hammer it into place with the veneer hammer. For an ogee molding such as this, I like to start at the flat spot on the top and get a good solid joint going. Put the iron on the veneer and press down. Keep it moving but don't be afraid to really put the heat to it. It will take a little experimentation to know how long you will need to reheat the glue, but once you have a good bond, set the iron down and work the area you have heated with the hammer. It is important to get a good solid foundation at the top of the molding so as you work down the curve, it doesn't let go. Now take the edge of the iron and work the veneer down the curve, melting the glue as you go. The heat will soften the wood fibers and you should find it quite easy to bend the veneer. As soon as you hit the bottom of the molding and the veneer has fully adhered, take the hammer to it again and work the piece down. After you have gone over the piece of veneer several times, check for spots that didn't adhere by tapping with your fingernail. If you find an area that sounds hollow, reheat it with the tip of the iron and work it again with the hammer. I usually will repeat this process of checking for voids and reheating several times as I am working on a long run. You will want to locate and repair any problem areas before the glue starts to cure, but if you do find a spot later that did not stick, fear not. You can



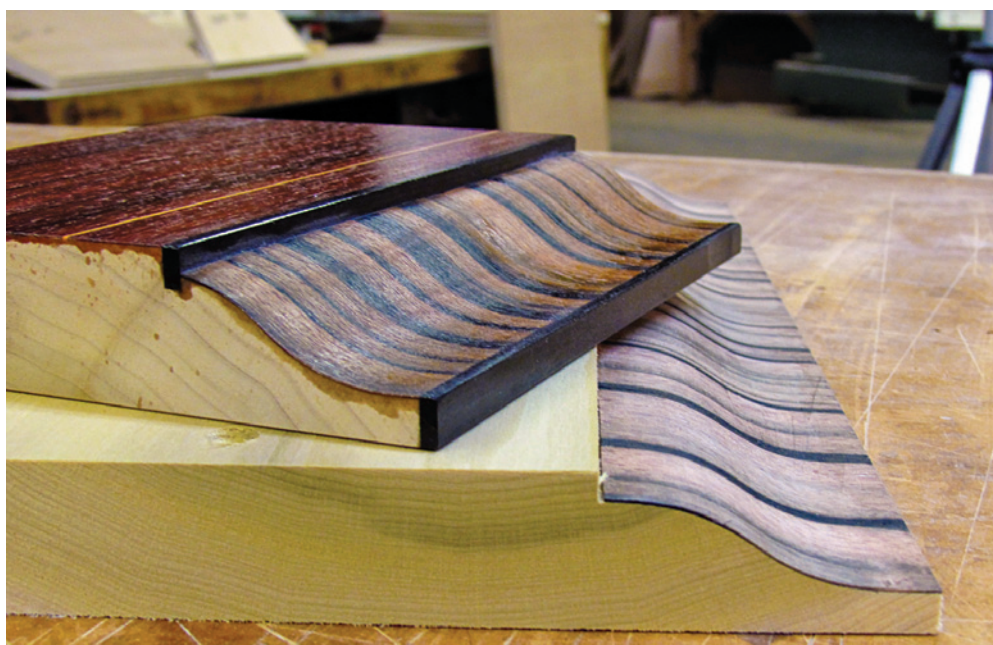
make a small incision with the tip of a utility knife and inject a small amount of glue. When the new glue has dried, repeat the process of heating and hammering as before.

The additional pieces go down in the same manner but try to work from the abutting edges out, making sure you have a tight joint. In the example of my table top ogee molding, when you get to the mitered corners, just run the veneer long over the edge and trim it back with a chisel. When the entire molding is veneered, I like to trim it flush with a pattern bit in a router but it can also be done by hand with a chisel, just be sure to work down so as not to chip out the delicate edge.

And now to the part that is no fun at all. The disadvantage to running the grain perpendicular to the top, is that clean-up can be a real drag. I use a combination of sand paper and scrapers to clean up the joints and the surface of the veneer. You will want to get it fairly flat for the finish but remember that it is very thin and if you sand through you will have to cut the piece out and replace it.

For this piece, once it was veneered, I routed a 1/16" channel at the top of the ogee and added a piece of ebony to trim out the field of the top. As you design with veneer, it is always a good idea to keep in mind how you will terminate the edges. The fewer joints you have to worry about as you work the better, otherwise it can become quite difficult to get everything perfectly tight.

Like most things in woodworking, reading about something is no replacement for doing it. Just experiment and have some fun with it and you will be veneering complex pieces in no time. Happy hammering! ■





Jon Siegel's Amazing Workshop

PHOTO BY TONY IMMORLICA



BY CLAUDE DUPUIS

Jon Siegel in his Wilmot shop

One thing that amazes me about the Guild is the enormously diverse group that we have. There are woodworkers from every profession in life. The thing that makes us unique is that we all have a common goal—Learn more about woodworking and improve our skills. The thing that keeps the Guild active and growing is the volunteers. Without them the Guild would not exist. Many woodworkers of various skill levels volunteer their time and welcome others into their home and shops to share their knowledge. A good, recent example of this was the recent Granite State Woodturners' (GSWT) meeting at Jon Siegel's shop. The Guild is fortunate to have such skilled individuals that are willing to share.

Jon resides in Wilmot, NH. It's a quaint little town with lots of space between neighbors with a combination of woods, fields and farm houses. I'll admit Jon is out there a ways in the woods. Not that that's a bad thing. It's why we live in NH. The shop is in the basement of his house and it's really two shops in one. A wood shop and a metal shop. The access is at walkout level making it easy to get things in and out. The ceilings are, I think, 9' to 10' high which makes it a comfortable place to work. Jon has a passion for vintage 100 year old machines and today's meeting was about those machines that he has restored and uses.

Jon is one of the founding members of the Guild, a past president and has been on the steering committee for 22 years. Jon is many times the voice of reason in complicated and controversial discussions regarding the Guild bylaws, Rules and

Policies. He was also the subgroup President of the GSWT for 5 years. Jon was a long time member of the NH Furniture Masters Association, has taught students in their Studio Based Learning Program and the Prison Outreach Program. Jon loves to play pool and by the way he makes his own pool sticks which is not an easy task (don't believe me—try it sometime).

Jon, besides having a passion for restoring vintage tools is well accomplished in the use of these tools. Jon owns his own business called Big Tree Tools, LLC which he and his wife Patrice started in 1996. Jon has lathes of every description so that he can produce the high quality turnings that his customers demand. A good example of that is his recent commission, selected among several submitted to the joint NH Historical Commission to design and build the *Mike Whalley Memorial Bench*—a 7' long bench that resides adjacent to one of the speaking podiums in the State Capital Building in Representatives Hall in Concord. See *The Journal*, Summer 2011—Vol 3 No 3.

Jon has been turning wood for 45 years. Turnings for furniture and architectural applications are his specialty. Jon enjoys teaching and demonstrating wood turning. Another passion, Jon will be focusing his upcoming efforts on the further development of sharpening equipment for woodturners.

The Meeting

Jon started the meeting with a little history about the inventions and progressive improvements with metal and



PHOTO BY CLAUDE DUPUIS

1900 Putnam extension-bed patternmaker's lathe (wood lathe), 50" swing inboard thru the gap

woodturning machines. Many inventions were made right here in New England like the morse taper invented in Boston 150 years ago. Jon's idol, Henry Mosley, in 1792 invented thread cutting screws and screw cutting tools. Jon had a good inventory of books about vintage tools of all types—a 1918 *Hendey Metal Turning Lathe with Change Gear Devices* by Oscar E. Perrigo; *Lathe Design, Construction, Operation with Practical Examples of Lathe Work* by Oscar E. Perrigo M.E. 1917; *English & American Tool Builders* by Joseph Wickham Roe; *The Progressive Machinist* by William Rogers; *Studies in the History of Machine Tools* by Roberts Woodbury—to name a few. The group toured the shop with Jon leading the way. One of the biggest wood turning lathes I have ever seen, a monster, the Putnam extension bed lathe will accommodate work up to 12' in length and 4' in diameter. WOW!

The Metal Turning Lathe

Today's demonstration was of a metal turning lathe that Jon restored—a 1918 Hendey. Hanging on his every word, Jon showed the group how to install the cutter head into the tool rest, how to make adjustments and a general operation of the machine. The demo was to take a metal rod and tread it to fit a nut. Jon discussed different types of steel, their hardness and which were best for this type of turning. After some careful measuring and adjustments to the cutter, Jon got a perfect fit to the nut.

The Metal Planner

Jon then turned our attention to another beautifully restored machine—an 1885 L&M metal planer. I for one had never seen one. Jon proceeded to describe the setup along with a demonstration. Once setup and dialed in, the planer with a similar cutter bit to the one used on the lathe removes a thin narrow shaving one pass at a time. The action is automated in that the table on which the metal blank is clamped to moves

1918 HENDEY METAL LATHE

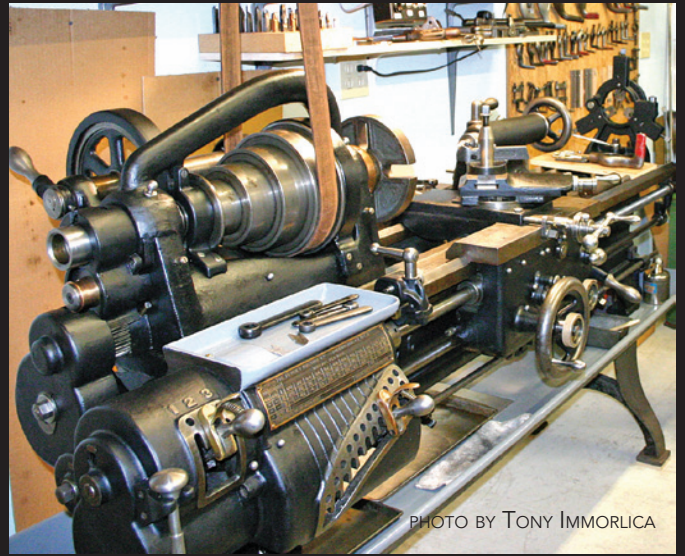


PHOTO BY TONY IMMORLICA

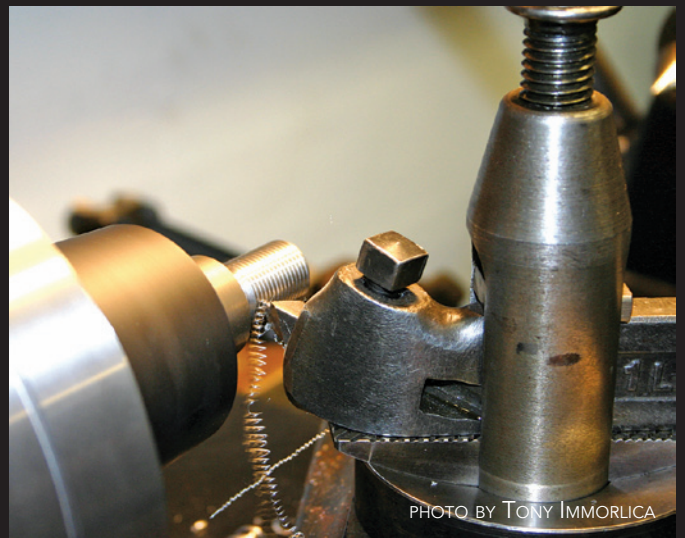
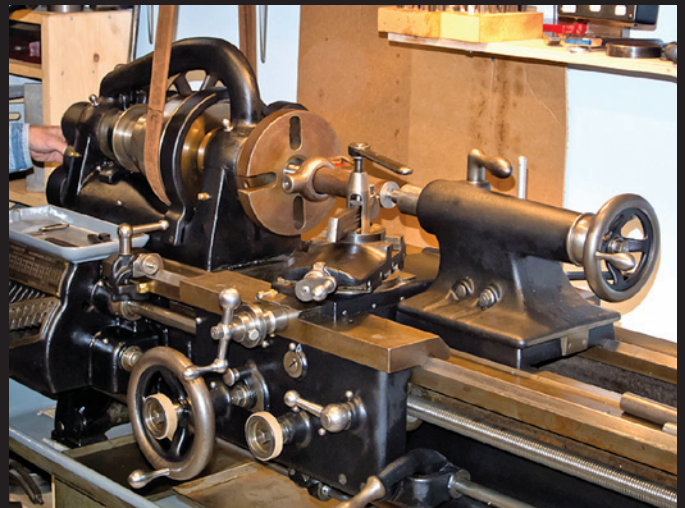


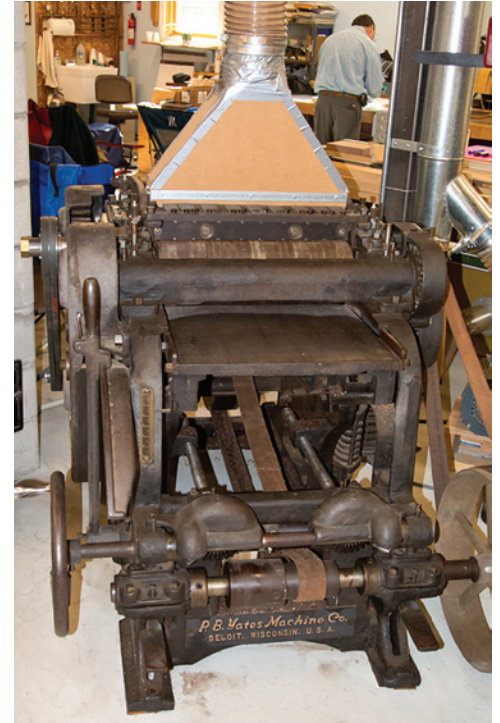
PHOTO BY TONY IMMORLICA

back and forth advancing just the right amount for each forward pass. The belt and pulley assembly which seemed to move effortlessly with little to no vibration or noise was amazing to watch. The drive pulley would move in and out while switching the drive belt from forward to reverse.

Jon also had many other restored machines some of which I had never seen the likes of. Thank you Jon for being here to share your knowledge, experience and passion for vintage machines, woodturning and metal work. It's people like you along with many other volunteers who make the Guild what it is today. ■



1880 S.A.Woods 16" jointer

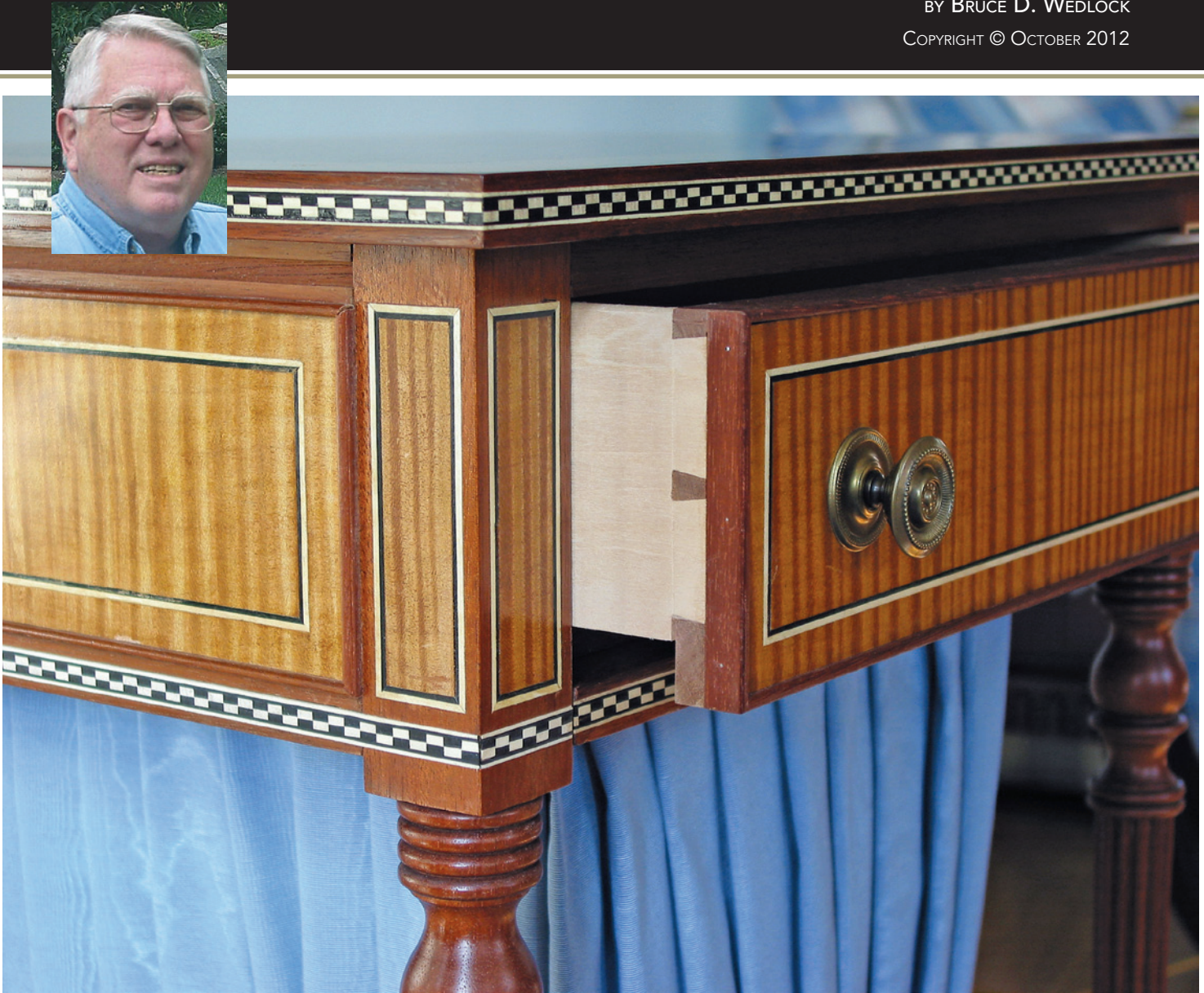


1925 P.B.Yates 20" thickness planer

1885 L&M METAL PLANER, 20' x 48"



1885 S.A.Woods 36" band saw



Hand-Cut Dovetails in Jig Time

Besides being expensive, commercial dovetail jigs have a limited capability. Even the well-known Leigh jig cannot cut half-blind 8° pins in a board less than 7/8" thick, requires a different bit for each pin depth and careful bit adjustment for a tight joint.

The shop-made jigs described here can be built in a day for less than \$20, and will cut perfect half-blind or through dovetails of any size, spacing and angle you desire. There are no fussy setups nor accurate measurements required. Just sketch out your tail pattern on one end of a tail board, and the result will be a perfectly symmetrical joint, subsequent cuts being located by matching it to a previously cut piece. The mating surfaces are finished in the traditional manner by hand. These jigs provide sufficient accuracy

that the final joints fit together perfectly every time, and they are suited for production work. The joint is directly off the jigs.

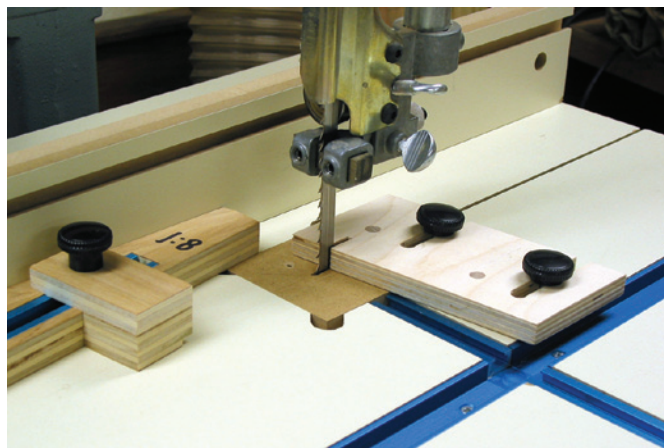
The method starts by cutting the tail pieces on the bandsaw using an angle jig and then wasting out the pin area on the bandsaw which needs no special setup. The tail sides are perfectly straight, square and symmetrical. Hand paring to the final tail baseline is done with a chisel in the traditional manner.

The pin board is then clamped in a second jig and the pins marked from the tail board. The tail socket area is then wasted using a trim router with a fence and gauge to match the pin baseline. The depth of a spiral downcut router bit is set to the tail thickness forming a perfect bottom in the tail socket. The remaining pin sides are hand pared and the joint is done. We'll first build the jigs and then demonstrate their use.

Bandsaw

A bandsaw is employed to cut the tails. If your tail boards are less than about a foot long, then a normal 14" bandsaw table will work fine. But if you plan to cut longer tail boards, you should consider adding an auxiliary table to extend the length of the table in front of the blade. You will only need about four inches past the blade, so a panel of melamine can be clamped to the normal table to extend the work surface. The bandsaw must be equipped with an adjustable fence on top of the table.

The blade should be chosen for the smoothest kerf. A 1/2" Wood Slicer cuts a very smooth 1/32" kerf. You will also need a fence adjusted to eliminate drift angle. Any drift angle will add to the tail angle on one side and subtract on the other side resulting in an asymmetrical geometry which is cosmetically distracting.



Tail Jig

The bandsaw setup with the fence, tail jig and stop block is shown here. The adjustable stop block's edge is perpendicular to the tail jig.

The basic tail jig for cutting 1:8 dovetails is made from 3/4" baltic birch plywood. The overall jig size depends to some extent on the sizes of your bandsaw table and the tail pieces for your project. The dimensions shown will work for tail stock up to about 18" long using a typical 14" bandsaw.

The actual jig needs an adjustable stop block to position the tail board for cutting. An illustration of one possibility is shown below.

This tail jig is tricked out with T-track and an adjustable stop with a dust relief rabbet. But you could do just as well with a simple square block stop screwed into the jig's edge. As you will see, the stop location isn't critical to the jig's performance but the convenience of adjustability does permit easier fine tuning of the tail cut locations.

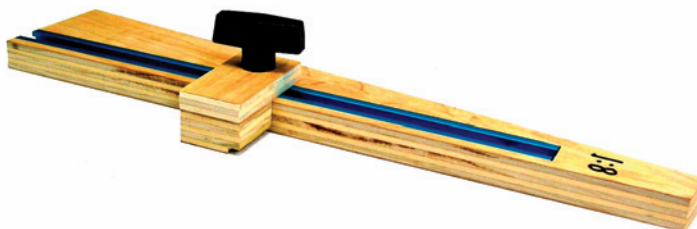
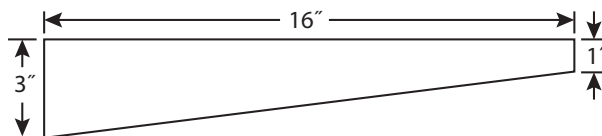
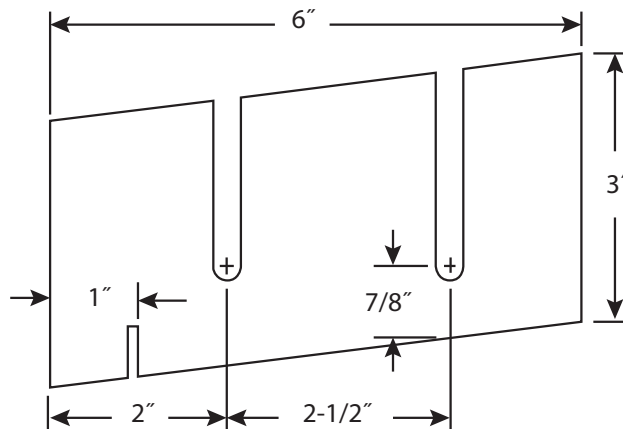


Table Stop

An accessory for the tail jig is a table stop to limit the depth of the tail cuts. A diagram of a table stop made from 1/2" plywood is shown at the right. The angle matches the angle of the tails. The two 5/16" wide slots allow the stop to be clamped to the bandsaw table. The 1/8" small notch provides relief for the blade when cutting small tails with a wide blade.

Assuming you have an auxiliary composite table, position the table stop block with the small slot surrounding the blade. Locate two holes for threaded inserts near the rear of the slots such that the table stop can be moved back from the blade to allow for setting the depth of the tail cut. If you work with a cast iron table, you can epoxy three rare-earth magnets in recess holes underneath the table stop to position it. Just don't push against it too hard.



Pin Jig

The pin jig is shown at the right. Basically it is a pair of clamps which hold the pin board in position for routing the tail sockets and provides a flat surface and adjustable fence for the trim router.

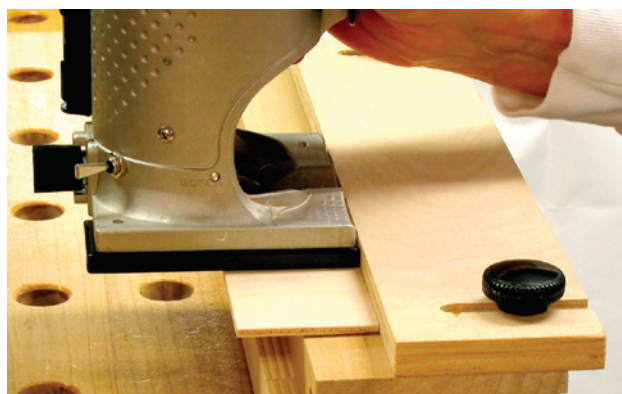
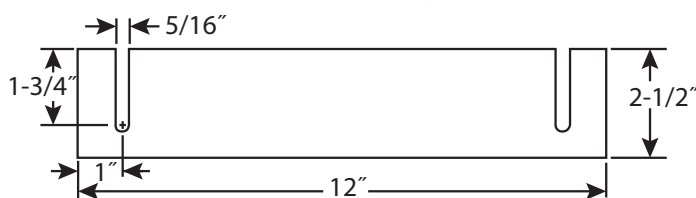
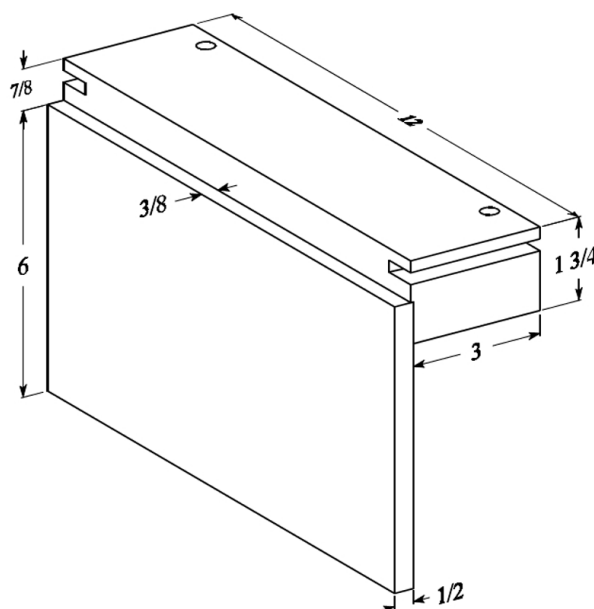
The jig is made from 8/4 poplar and 1/2" baltic birch plywood. While the dimensions are not critical, the important points include the 3/8" plywood edge which allows clearance for a 1/4" router bit. This plywood is glued in a shallow rabbet 7/8" below the top edge to permit cutting pins in stock up to 3/4" thick. The 12" inch overall length will handle a pin board up to about 10" wide. For wider joints, make the jig about 2" longer than the pin board width or the tail sockets can be cut in several passes.

The two holes shown on the jig top are 3/8" in diameter, centered 1" from each end and 3/8" from the back edge. These receive 1/4-20 threaded inserts to clamp the router fence, so should be deep enough to bury the inserts. Only the front jig needs these inserts.

The dados in each end are for alignment shims to ensure the top jig surfaces on which the router rests remain in the same plane when clamped in a vise. They also hold the jig and pin board together while clamping to the workbench. The dados are 1/4" below the top surfaces, 5/8" deep and just wide enough for a snug fit for 2" x 4" shims made from 1/4" plywood. Be sure the top of each dado is parallel to and exactly the same distance from the jig's top surface. Sand a slight taper on the long edge of the shims to ease slipping them into the dados.

The fence used to guide the router for cutting the tail sockets precisely at the pin baseline is shown at the right. It is made from 1/2" baltic birch plywood. The location of the 5/16" slots should match the hole locations for the threaded inserts installed above. The fence is attached to the jig by knobs with 1/4-20 threaded studs long enough to mate with the inserts.

An important accessory for the pin jig is a router gauge to set the fence to cut exactly at the pin baseline. This is made from 1/8" or 1/4" plywood, 2" wide by 6" long. Fasten this gauge stock against the fence and to the jig surface with double sided tape so it extends over the edge by about 1/2" as shown at the right. Next loosen the router base screws and push the base toward the rear and re-tighten. This allows the router base to be reset to a known position should it be subsequently changed for pattern work. Depending on the size of the tail sockets, a 1/4", 3/16" or 1/8" spiral downcut bit can be used. Install a bit and rout the edge of the gauge. The gauge width is now the exact distance of the router's cut from the fence for that particular bit. Make a gauge for each bit you plan to employ and mark them accordingly.



Cutting the Tails

These instructions are for half-blind dovetails. Changes for through dovetails are straightforward. The tails are cut first. Mill all stock to the final dimensions making a couple of spare pieces for test cuts. Determine the desired depth of the half-blind tails in the pin board (typically two-thirds the pin board thickness) and use a cutting gauge to score this baseline around the ends of the tail boards. Do not score this dimension on the pin board. If you are making through dovetails on the other end, you will need to adjust that baseline to the thickness of the pin board.

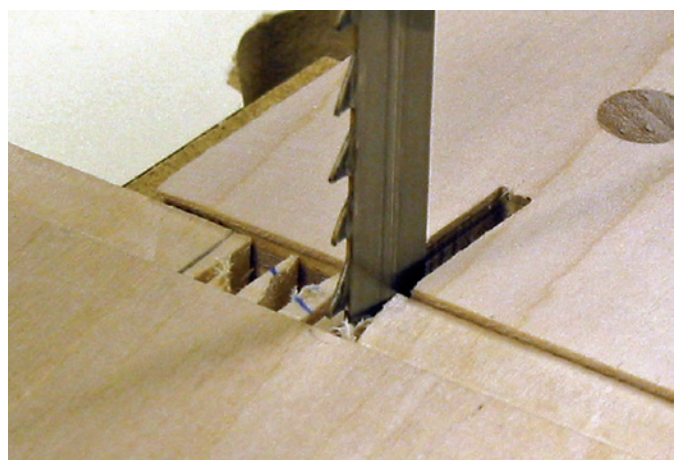
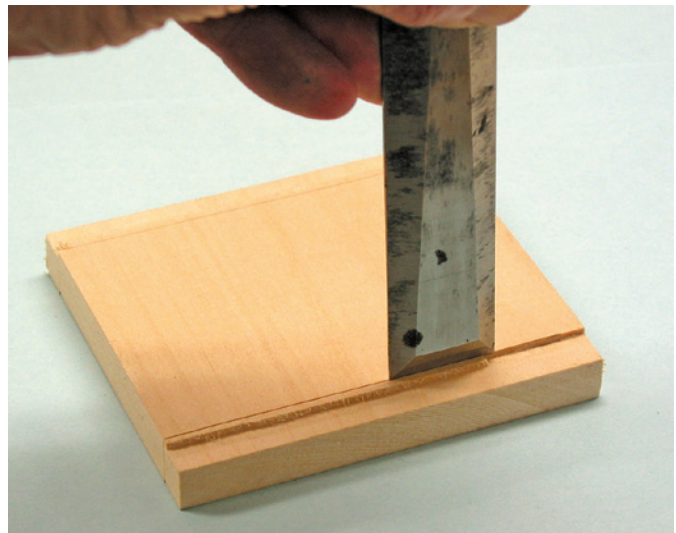
Mill a shallow rabbet no more than $\frac{1}{16}$ " deep on the ends of the inside tail board surface shy of the baselines by about $\frac{1}{16}$ ". Either a fillister plane, router table or dado blade works well for this rabbet. Hand pare this rabbet back to the baseline with a sharp chisel to form a clean shoulder. This rabbet aids in positioning the tail board for the layout of the pin board. It also cosmetically hides the dovetail pins in the inside corners of the joint.

Next lay out the tail locations on the end of one tail board. If you have several identical tail boards, this layout is only necessary on the end of one board. The layout need not be very precise as the jig will always cut exactly symmetrical tails. Install a tail board in the jig and align one of the central tail cuts with the blade by adjusting the bandsaw fence and the tail jig stop. Move the table stop back and carefully make the tail cut to about $\frac{1}{32}$ " shy of the baseline. Turn off the saw, and, without moving the tail board, align the table stop against the tail board end. Tighten the clamp knobs. The table stop will now permit you to make repeated tail cut just shy of the baseline.

Flip the tail board over and make the symmetrical tail cut. Note that one cut doesn't quite match the layout line. The error is in the layout line, not the cut, since flipping the board over produces cuts exactly the same distance from the edges.

If you are making half-blind tails at one end and through dovetails at the other, first cut all the half-blind ends and then reset the table stop for the through ends. If you are making identical joints at each end, then cut the opposite end of the tail board. Note that no layout is needed here. If you have two identical tail boards for a box or drawer, make all the cuts. You have now made eight symmetrical tail cuts in less than a couple of minutes with one setting of the bandsaw fence. If you are making several drawers, the time to make these exact depth tail cuts drops dramatically from laying them out at each end of the tail boards and cutting them with a hand saw.

Next move the bandsaw fence and tail jig to align with another tail layout line. Make these tail cuts in like manner. When all the tail cuts are made, you can quickly freehand the waste from the pin areas on the bandsaw since the table stop provides an accurately cut depth. Hand pare the pin areas back to the baseline with a sharp chisel. This now goes quickly with most of the waste already sawn away.



Cutting the Pins

The pin board is sandwiched between the two halves of the pin jig which is clamped in a vise. The fence portion of the jig and the outside of the pin board should be facing front. The best arrangement is a Moxon-style vise installed in a bench-on-bench. But because the rear of the jig rests solidly on the edge of the bench surface, the right side of a bench's face vise works as well. In this case a C-clamp might be needed to hold the right side of the plywood panels tight to the pin board.

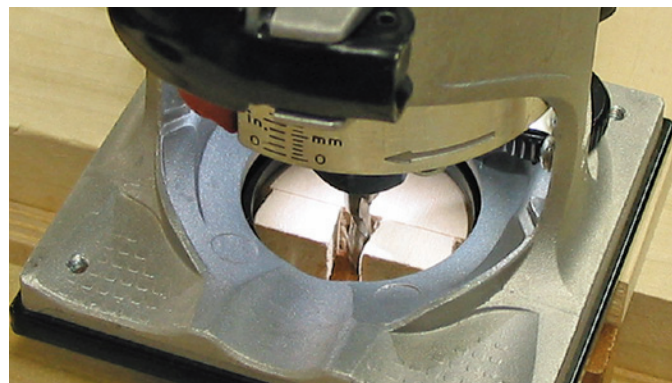
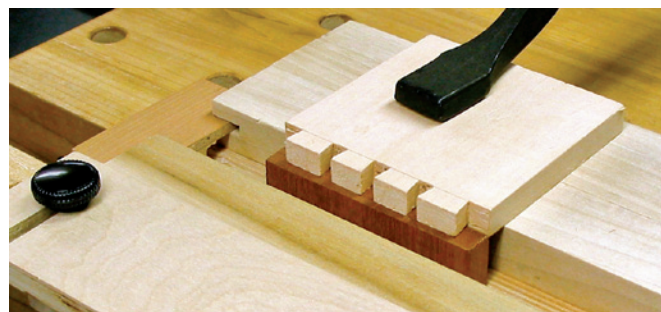
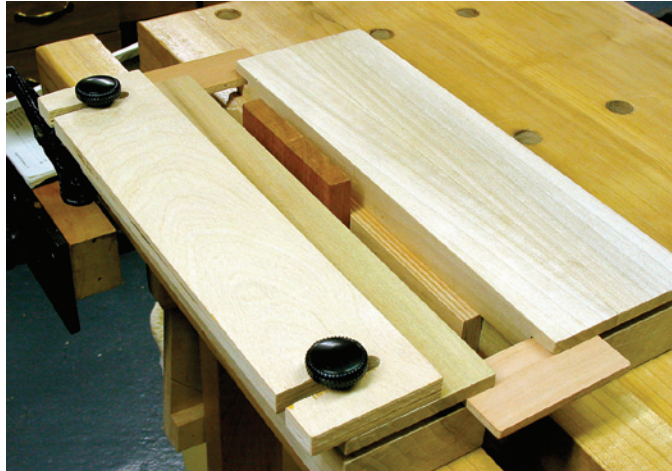
Start by lightly clamping the pin board about $\frac{1}{8}$ " proud of the jig's upper surfaces. Be sure the alignment shims are firmly in place to ensure the jig surfaces are in the same plane. Next position the matching tail board with the rabbet against the pin board and press the pin board down until the tail board is flush with the jig surface. Tighten the vise. Clamp the tail board to the jig to ensure no movement during the transfer marking.

Using a marking knife, scribe the edges of the tails on the pin board. A scalpel works very well for this. It is less cumbersome than a traditional marking knife. Do not try to make the mark deep; rather make it just visible.

Install the appropriate spiral downcut bit in the router, and set it between a pair of tails. Adjust the bit to just touch the pin board. If you want the pins to be a bit proud for finish planing, add a thin shim between the router base and the tail board. One or two thickness of manila folder or playing cards should be enough.

Place one edge of the matching router gauge exactly against the ends of the tails and clamp the fence to the other edge of the gauge. Now remove the tail board and scribe the baseline tight along the edge of the gauge to mark the location of the half-blind tails. If you are cutting through dovetails, set the router gauge to hang about $\frac{1}{8}$ " over the jig edge to prevent the router from cutting into the front jig.

Use a sharp chisel with the bevel toward the waste (tail socket area) to enhance the scribed lines of the pin sides for improved visibility. This makes a clean straight line, whereas attempts to score a deep line can wander. Mark the tail sockets to be routed with a magic marker.



Lower the pin board so its edge is exactly level with the jig surfaces. Place the router gauge against the fence and double check that it aligns with the scribed baseline. Place the router bit between the rear jig and the pin board, and carefully rout the tail areas freehand. A foot switch aids in control of the router. You should be able to easily rout to within $\frac{1}{32}$ " of the sides of the pins. The length of the tail socket cut is set by the fence, so you only need to be careful with the pin sides. Note how the router cut matches the baseline. Finish by hand paring the pin sides and corners to the scribe lines. Your joint should now fit perfectly.

Dust Collection

Routers make lots of dust, and this setup is no exception. However, most of the dust is channeled into the space above the rear plywood and jig surface. With a simple adapter 90% of the router dust can be collected with a shop vacuum. The adapter setup is shown at the right. A $\frac{1}{8}$ " steel pin and 1/4-20 insert are installed in the left end of the rear jig. An 8/4 piece of poplar is drilled to match these fasteners with the top flush with the jig surfaces. A tapered hole is then drilled and filed to position the shop vac's hose to collect from the rear plywood's surface. The plywood is then carved to make a smooth transition to the hole. The second picture shows the dust adapter in place. The left alignment shim is removed to install the collector, but with the jig already clamped in the vise, the shim is no longer needed.

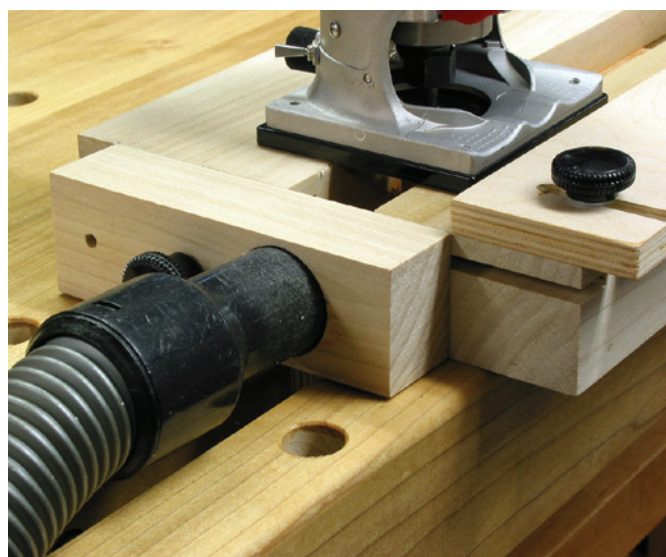


Acknowledgements

The author is indebted to Joyce Hanna for developing the initial fence concept on an early model, and to Glen Jewell for suggestions clarifying this description.

Summary

An inexpensive dovetail jig is described which provides complete flexibility in dovetail size, shape and layout with minimum setup time and production capability. Fine router adjustments for tight joints are eliminated. Waste cuts are quickly made with a bandsaw and router with final joints hand pared. Both half blind and through dovetails are easily made with production speed. ■





BY TED BLACHLY

Tea House Doors

My son Taylor had the opportunity to work with a company in California for three years that specialized in Japanese joinery and architecture. Working along side Japanese carpenters with traditional wood working backgrounds was a great experience for him. He eventually decided he preferred living in the country rather than the city and moved back to New Hampshire in 2007.

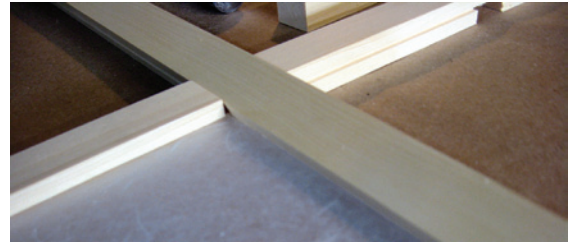
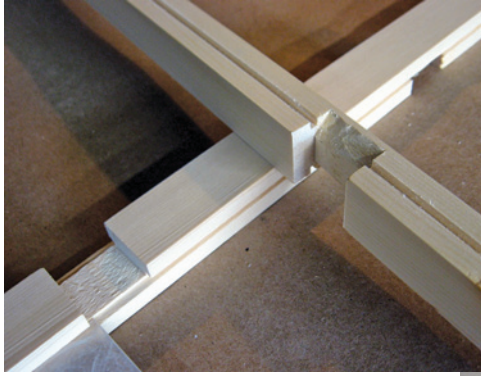
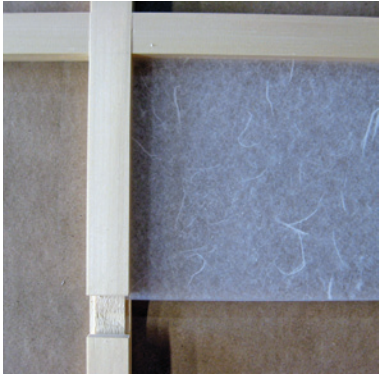
He caught wind of a Tea house project that had been in consideration for a few years and interviewed for it. His prior experience and the fact that he was young and willing appealed to the landscape designer heading the project, and also the client, so he got the job. The project went on for more than a few years and to date there are additional structures and plantings still being added.

I don't have any real background in Japanese wood working but I have always admired how developed the tradition is and of course its beauty so I started to look into it a little as his project grew. I did have a shop so naturally I wanted to help and was tapped—*hey Dad can I run a couple hundred Alaskan yellow cedar sticks through the planer tonight?*

One aspect I became involved with was the building of Yukimi Shoji doors. These doors differ from the typical horizontally sliding Shoji doors one sees in Japanese architecture in that they also have a vertical sliding sash which provides a focused view of the immediate landscape. Yukimi means snow viewing window.

Since the tea house is in New England, we had to consider the climate here. The project was based on traditional styles and techniques but there were details that respected the weather and also details that were personal in nature to the builders.

Instead of traditional rice paper for the doors a product called Warlon was brought in from Japan. This was essentially an acrylic sheet about $\frac{3}{32}$ " thick and made to resemble hand made rice paper. Rather than apply the sheet to one side of the shoji frames as in traditional work, we decided to house individual pieces in shallow grooves in the frames. This was done in part because of the vertical sliding sash detail. Alaskan yellow cedar is a wonderful wood to cut joinery in. He was very lucky and found it at a place called Uncle Hilde's in Tilton. He basically bought all of it that was in the rack. It



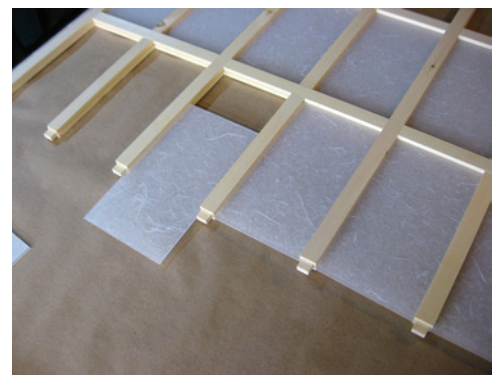
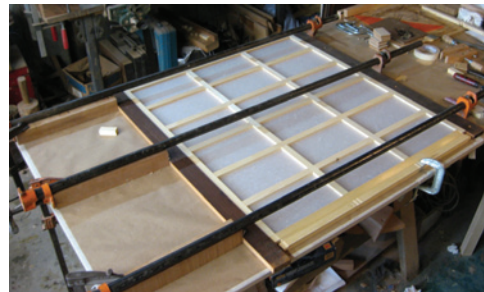
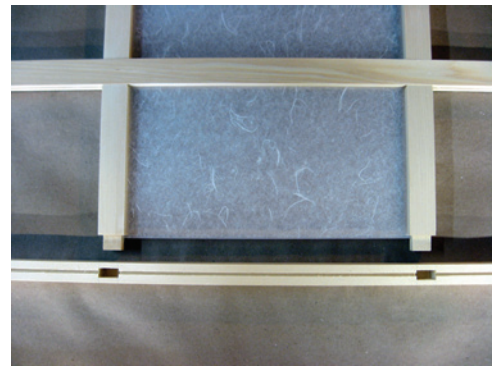
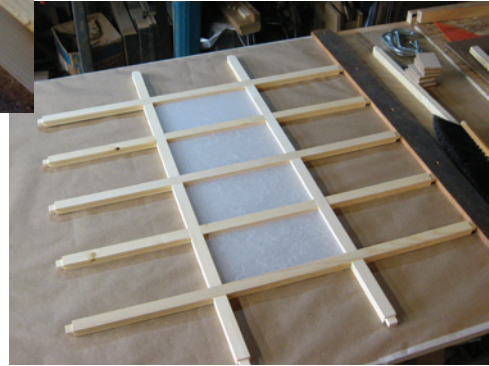
wasn't seen there again. It takes some real searching to find a wood like this. It's just not readily available.

Alaskan yellow cedar has an appealing creamy white color with fine grain structure. The spring in density has a nice, what Will Neptune would call, *mush factor* when fitting tight joints. It has good resistance to decay so that was another plus for the outdoor structure. The dust can be an irritant so proper precautions, dust masks and ventilation are important.

The doors consisted of an outer frame with a panel at the bottom and two shoji sash set into that. Each of the five doors had a hundred joints—either mortise and tenon or half lap. With that amount of joinery we wanted precise machine set ups to minimize any hand fitting, so we were uncompromising in the milling, layout and cutting of joints. Many test pieces were done before running a set of parts through an operation. There was some hand work though. I resisted buying a hollow chisel mortiser, which would have made sense, and stuck with my horizontal slot mortiser. We squared up the round ends with a mortise chisel. There were a lot of them but I consider that enjoyable bench work.

Since each sash had light panels in the middle we had to overcome the problem of how to get them in there fully housed and assemble the frame at the same time. I came up with a *roll-in half lap joint* and an assembly table which made this possible. The sliding sash used pins which rode in grooves in the main door frame and the upper sash was installed using removable splines. The doors ride in upper and lower grooved oak tracks which require periodic waxing to make them slide nice.

The doors are just a part of this involved project. It's a small structure but the level of detail in every aspect, including the traditionally designed Japanese landscape that surrounds it, was amazing to watch unfold. ■





Delivering the Finished Piece

One of the most overlooked aspects of finishing is not about special finishes or techniques, but delivery of the finished piece. In a previous article, I described the difference between drying time and curing time. A dry to the touch finish can take weeks to cure to a hard finish but we can't wait weeks before delivery. We need a delivery plan that will protect a new, delicate finish and make delivery a valuable part of the overall job.

It's useful at the estimating phase of the job to have a checklist that addresses delivery conditions, location conditions, and characteristics of the piece itself.

Delivery conditions:

- 1) Have you been to the delivery site? Is it an urban or rural location? If it is a city destination, are there road restrictions for the truck or van you have? Is there efficient unloading access? If it is a rural location, is there a bumpy road or

driveway that may cause load shifting?

- 2) Will delivery be in the winter or summer? Summer heat can cause more problems for fresh finishes than cold temperatures will in the winter.
- 3) Carrying the piece from truck to house can mean instant damage if there is rain or snow. Do you have a lightweight tarp with you?
- 4) Will delivery take one or two people?

Location conditions:

- 1) Have you seen the room where the piece will be placed?
- 2) Do you need to go up stairs or up an elevator?
- 3) Do you need to take doorway measurements and/or allow for carrying around corners?
- 4) Is the floor level? Is it a hard surface or carpeted? If there are light colored rugs, is there potential that the finish will bleed oil or stain?

The tray united with its table, unpacked and ready to take in to the customer.

- 5) Is there excessive sunlight such as from a large bay window? Is the interior light mostly incandescent, florescent or a combination of light sources?

Characteristics of the piece:

- 1) Will the piece be difficult to pack and transport because of size or weight, unusual shape, sharp edges that need protecting, delicate components such as glass, or highly polished surfaces that could show press marks?
- 2) Is it made in sections that need touch up when assembled?
- 3) Have you assessed the finished value? A restored antique or high value art piece may need extra attention when packing.
- 4) Have you assessed how the piece will relate to its surroundings, and the owners lifestyle? Is the interior highly decorated or more functionally oriented? I have placed highly polished dining tables in formal rooms that are rarely used. By contrast I have refinished and delivered country style tables that are used every day. The first table, having a decorative finish, will need table pads when used. The second table will get scratches and dents no matter how durable the finish and will require occasional waxing.

At the beginning of a job you will find out if the customer plans to pick up the piece, have it shipped, or have it delivered by you. Even if your customer is picking up the finished piece, be prepared. Ask about their vehicle and its size. You can then be ready to help them pack or have a contingency plan. Ask them to bring blankets but still be prepared to give away some extra padding material. Supply

houses like Uline have 4'x6' paper pads that are inexpensive.

Some items, especially smaller pieces, can be shipped by UPS or similar carrier. A visit to their website or a talk with their representative is a good idea. I took a UPS class once and got a number of valuable tips, including:

- 1) Invest in new boxes of at least the recommended strength. Bursting strength is noted on the bottom of the box. Used boxes have lost as much as 30% of their original strength.
- 2) Double box when you have even the slightest concern about damage and allow approximately 2" cushion between the inner and outer box.
- 3) Reinforce all edges with extra packing tape.
- 4) Do not overstate your caution labels. For instance, *This Side Up*'s almost always appropriate, but *Fragile Glass* is inappropriate if you are shipping a wooden bowl, and it will not help your claims case if shipping damage occurs.
- 5) Photograph your contents, including the packing material.

If you have chosen to deliver the finished piece yourself, customize a checklist of conditions that works for you. Then choose materials that will keep your piece secure but not so tightly wrapped that pressmarks or worn edges occur. I have found that a first layer of soft paper limits abrasion before a furniture blanket is draped. European style furniture pads are a light wool blend, making them more suitable than heavy cotton pads in some instances. Surveyors' tape makes a secure but more delicate strap than rubber stretch straps. Cotton gloves eliminate handprints, and can be used for quick buffing.

Finally, when the piece is loaded in your truck or van, don't forget a basic touch up kit. You can be prepared for on-site scratches if they occur with just a few colored markers and wax pencils. You can also make a last minute adjustment of surface sheen—the too shiny or not shiny enough complaint—with wax and fine steel wool.

Customers usually notice the care you show when you arrive with the finished



An antique lacquered tray being wrapped in a multiple layer paper blanket.



A thin walled wooden bowl placed in tissue paper and bubble pack before being placed in a double box.



A variety of packing materials, and a touch up kit.



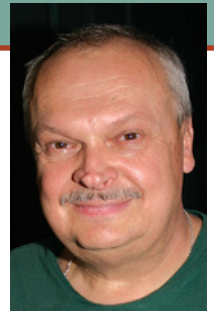
A delicate table being placed on riser blocks to avoid pressmarks.

product even if they don't know the details and conditions you have considered at the beginning of the job. A well-planned delivery can be the satisfying completion

of your work and your presence often starts a conversation with your customer about a new project. ■

Hitchcock Chairs

from the bench BY MIKE DUNBAR



Big chairs—Thomasville (left) & Gardner (right)

It has been a while since we looked at one of the country's big chairs. As you will recall, early in the 20th century Thomasville, NC and Gardner, MA each laid claim to the title *Chair City*. For decades each city sought to shore up its rights to the moniker by erecting the *World's Largest Chair*. Gardner started the competition in 1905 with a twelve foot tall monument. Thomasville countered with its own slightly taller *World's Largest*. Gardner again trumped its rival by replacing its original chair with an even bigger one. That one was dethroned in 1927 when Thomasville put up its new thirteen foot six inch champion.

With that second chair Thomasville upped the ante in a way other than just size. The first two Gardner Largest Chairs were simple, boxy Mission chairs. The 1927 Thomasville usurper was not only taller, it was an ornate dining chair, complete with turned legs and finials and with a carved medallion centered on a sunburst crest. Thus, Thomasville's big chair was not only bigger than Gardner's, it was a bigger display of craftsmanship.

In 1935 Gardner struck back by erecting the sixteen foot colossus shown above. It was displayed at the traffic circle, where it was sure to be seen by everyone. The newest *World's Largest* was produced by the Gardner-based firm of Hayward Wakefield, a major chairmaking factory with a vested interest in maintaining Gardner's reputation. Its chair not only trumped Thomasville's in height, but being an accurately made and ornamented Hitchcock pillow-back chair, was its equal in craftsmanship. By the way, the date 1785 is the year Gardner was incorporated and does not refer to the chair.

A Hitchcock chair was a curious choice for Gardner to

build and put on display, as this form is out of place in central Massachusetts. Hitchcock chairs are closely associated with their place of origin—Riverton, CT. As a chairmaker, I understand Hayward Wakefield's monument as a subtle slap across Thomasville's cheek—an insider's insult that would go over most heads. However, the southern chair factories would have understood the message loudly and clearly. Gardner was bragging about the city's prowess in chair manufacturing by associating itself with the great Lambert Hitchcock.

Lambert Hitchcock is arguably the most important name in the history of common chairs. He is the man that transformed chairmaking from a craft to an industry. Hitchcock was born in Cheshire, CT on May 28, 1795. By 1814 he was a trained journeyman working for Litchfield cabinetmaker Silas Cheney. In 1818 he stepped out on his own, renting a small building at the Benham and Doolittle sawmill located at a hamlet called Fork-of-the-Rivers. The place is in the northwest corner of Connecticut at the convergence of the east and west branches of the Farmington River. At the sawmill Hitchcock began producing chair parts, relying on water power to run his lathes. He sold large quantities of parts as far away as Charleston SC, where local chairmakers assembled them. Hitchcock prospered and was soon advertising for apprentices and journeymen of his own.

Hitchcock's world was changing fast, and he is known to us because he inserted himself into the technological revolution occurring around him. The first decades of the 19th century marked the birth of the American System, this country's response to the Industrial Revolution. The system was based on two

principles—heavy investment in machinery and interchangeable parts.

Hitchcock was a younger contemporary of Eli Whitney and Eli Terry and it is reasonable to assume they influenced him. Everyone knows Whitney's contribution to the American System. Congress awarded him a government contract after watching him assemble multiple muskets from machined and interchangeable parts. Terry revolutionized clocks in a similar way. His machined wooden gears resulted in accurate but inexpensive time pieces. A clock had always been an expensive luxury item but soon, most American households owned one. Besides being a contemporary to these innovators, Hitchcock was a neighbor. Whitney's factory was in New Haven, while Terry's was about 30 miles away in Terryville.

It is interesting that the American System was developed and perfected in New England villages, rather than cities. The new machinery being developed required water power. A spider web of streams crisscrossed rural New England hills. There was also plenty of land for expansion. This is the age that gave rise to the legendary Yankee ingenuity. Throughout the 19th century, rural New England was alive with new ideas and innovation.

After only two years at the sawmill, Hitchcock relocated to a two-story building a short distance downstream. No longer limited by cramped working space, he began to manufacture completed chairs. The first advertisement for his products appeared in the Hartford Courant in 1822. His enterprise continued to prosper and he soon built a three-story, ten room brick factory to suit his manufacturing ideas. The turning shop and rough-mill work area were on the first floor. Here, rough lumber from Benham and Doolittle's mill was processed and parts were turned. Those parts were assembled upstairs where seats were also woven, using rush harvested from the river. Finishing was done on another floor. Brick ells attached to the main building served as a kiln and a wheel house.

By 1825 Hitchcock employed 100 people and produced 15,000 chairs a year. A village with general store (half owned by Hitchcock) sprung up around his factory. The hamlet was called Hitchcocksville. Many of his chairs were stenciled on the back of the seat L. HITCHCOCK HITCHCOCKSVILLE CONN WARRANTED.

Hitchcock had transformed chairmaking. His signature chair shown in the photo was a *Fancy* chair, a type of chair produced all over the northeast United States. However, Hitchcock's approach to manufacturing contrasts with his contemporaries. Most chairmakers were still working as they had for a century or more—predominantly by hand, in small shops, and as groups of highly skilled craftsmen. Their skills were passed on through the apprentice/journeyman system. Work that could not be done in-house was jobbed out to other specialists, for example turners and decorative artists. Many sales were made directly to local customers. Hitchcock's genius was to bring all of chairmaking under one roof. Literally, raw lumber went into one end of the factory and chairs ready-for-sale came out the other. There, they were loaded on wagons and distributed to retailers all over the country. He was a wholesaler with no direct link to the chair purchaser.

Hitchcock's factory concept killed off craftsmanship. Other

chair shops advertised for trained journeymen and for *likely lads* (boys with brains) to apprentice to the craft. Hitchcock advertised differently. *Young men from 16 to 20 of industrious and correct habits, who will abstain from the use of ardent spirits, can have steady employment.* In other words, Hitchcock was only interested in your dependability. Why? He didn't want skilled chairmakers. All their training made them too expensive. He would teach an employee one operation. That guy's completed work was passed down the line to the guy who did the next operation and so on.

While Fancy chairmakers relied on highly skilled decorative artists that painted free-hand and often owned their own shops, Hitchcock chairs were stenciled in the factory by semi-skilled decorators. While traditional chairmaking was predominately an adult male occupation, Hitchcock employed lots of women and children at much lower wages. The result is illustrated in how much Hitchcock undercut contemporary chairmakers. He sold his chairs in lots of many hundreds to furniture dealers on credit. These dealers advertised that his chairs were 25 percent cheaper than usual prices. A chairmaker still working the old way didn't stand a chance.

In spite of his early success, Hitchcock experienced a major setback. In 1828 Congress passed what became known as the Tariff of Abominations and John Quincy Adams signed it. That same year Andrew Jackson was elected. Northern financiers mistrusted the new president's money policies and until it could become clear where Jackson was taking the country, they withheld payments on their obligations. In turn, Hitchcock's creditors became slow with their payments. The young factory owner found himself in a cash crunch. He had built a factory and knew how to run it, but only at full speed. He was unable to cut back on production and glutted the market. His dealers were soon awash in chairs that they had to dump at any price.

In 1829 Hitchcock was bankrupt. He assigned his factory and possessions to a trio of trustees, appointed by the court to protect his creditors' interests. Within the year it became obvious to the trustees that only Hitchcock could run the operation he had created. They established him as manager. Creditors eventually agreed to accept 50 cents on the dollar and by 1832 Hitchcock again owned his factory. He brought on board his brother-in-law Arba Alford as partner and the firm operated as Hitchcock and Alford Co.

Through these triumphs and tribulations, Hitchcock had transformed chairmaking and killed off handicraft production. Hitchcock had also given his name to the chair design used in the Gardner monument. Other factories popped up and although these competitors copied his signature chair, it was known then—as it still is—as a Hitchcock chair. ■



Thomasville's ornate 1927 dining chair at 13'6" tall



BY MATT CATALINO

Chippendale International School of Furniture

After completing the Ten Week Intensive course at The Homestead Woodworking School in Newfields, NH, I decided to pursue a career in furniture and restoration. The program at The Homestead School was very inspirational and had changed the course of my life. I was eager to learn more about design, restoration and the history of fine furniture. Where else to turn but Britain?

I attended the Chippendale International School Of Furniture at East Lothian, Scotland in the fall of 2011. This was an intensive ten-month course covering many aspects of woodworking and furniture restoration. The school consisted of 18 students from around the world and was set in an old horse stable ruin with miles of rolling hills and panoramic views. The owner of the school runs a furniture making and restoration business along side the school so we were constantly surrounded by working professionals and craftsmen. The shops are shared amongst the students and the furniture business, which really helps to gain knowledge of the commercial skills and expertise to succeed in the world of furniture.

Using only local timber within 20 miles, all of the hardwoods are milled locally and stored to air dry right at the school. Stacks of English brown oak, sycamore, elm, lime wood, walnut and yew just to name a few, surround the yard entering the school.

The course covered a wide range of furniture styles and techniques. The first two terms focused on the design and building of solid wood and veneered furniture, either traditional or contemporary. Restoration, upholstery, stained glass and gilding were also taught by visiting specialists from around Britain. Term three focused on building a traditional English Windsor chair, woodcarving and finishing methods including French polishing.

Furniture history was a big part of our lectures, always referencing



Thomas Chippendale and others from around Britain. Several trips allowed us to see original collections of Sheraton, Hepplewhite and Chippendale Furniture. I even had the pleasure of looking through a First Edition of Chippendale's Gentleman & Cabinet Makers Director from 1754. And with a month long break from school during Easter, I was able to plan a solo rail trip through twelve European countries seeing as much furniture and art as possible.

Though several pieces of furniture were made throughout the year, my favorite but most challenging piece I chose to build was a traditional piecrust birdcage tilt top tea table. I added my own taste to the piecrust carving and column design followed by a simple cabriole leg. I used local walnut for the entire table and burl walnut for the top. I glued up with hide glue and finished with shellac and a few coats of wax.

I want to thank The Guild of New Hampshire Woodworkers for their help and support with granting me the Roy Noyes Scholarship. This Grant helped me to have the best year of my life at such a unique school and forever cement my love for woodworking. It was sad to leave Scotland but it's nice to be back in Portsmouth, NH and New England with so many craftsmen still doing what they love. Thank you to everyone who keeps the wheels turning at the Guild and keeping woodworking alive for the present and future generations. ■

White Mountain Breakfront

PHOTO BY JOHN HESSION



Left to right: Tom Silvia, Shannon Chandley, James Aponovich and David Lamb shown with the White Mountain Breakfront

The latest collaboration between NH painter James Aponovich and NH Artist Laureate, Furniture Master and Guild member David Lamb is now on view at the Currier Museum of Art in Manchester, NH.

White Mountain Breakfront, also known as "Lambovich IV" was unveiled at the Currier Museum of Art on Nov. 1 and will be on view through January 6, 2013. The monumental cabinet combines the artistry (as well as the names) of David Lamb and James Aponovich. Together, Aponovich and Lamb represent the best of New Hampshire art and craftsmanship. Lamb helped found the New

Hampshire Furniture Masters Association in 1993. In early 2012 he was re-appointed as New Hampshire's Artist Laureate. Aponovich is a Lifetime Fellow of the State Arts Council and former NH Artist Laureate.

Commissioned by Shannon Chandley and Tom Silvia of Amherst, NH, the presentation of White Mountain Breakfront is accompanied by a display of sketches, drawings and models that the artists used in the planning and design of the piece. Also on view are additional paintings by Aponovich and furniture by Lamb. ■

PHOTO BY JIM SEROSKIE



PHOTO BY JIM SEROSKIE



Member Gallery

Matt Catalino York, ME

Walnut Pie Crust Tea Table—28"d x 31"h european walnut and burl walnut top. The top rests on a bird cage allowing it to turn or tilt vertically—a popular 18th century design that made so much sense to me. The table can be used for serving and tilt up out of the way for display. Finished with shellac/ wax.



PHOTO BY BILL TRUSLOW

Bill Thomas Rindge, NH

Jewelry Cabinet on Stand with Glass Inlays—19¼"d x 28"w x 60¼"h mahogany, mottled mahogany veneer, Karellian burl veneer, Gaboon ebony and white oak. This cabinet was built to house a special collection of handmade necklaces and was inspired by the satinwood cabinet I built in 2007. My patron was intrigued by the glass inlay in that piece, and approached me about a cabinet with a similar theme. Intense mottled mahogany veneer was chosen for the outside and spectacular Karellian burl for the inside. The glass inlays are by Aaron Slater Glass, Manchester, NH.



PHOTO BY LANCE PATTERSON

Kevin Ainsworth Manchester, NH

Heart Back Chair—black cherry, upholstery by Joseph Karagezian. The inspiration for this chair was found in the ten volume set of *American Antique Masterpieces*. The chair is a Philadelphia chair circa 1780-1800. I scaled the chair up from the dimensions given. For the back I made a transparency and with the use of an overhead projector I projected the image of the back on to poster board. I used this to transfer the back to my full scale drawing.

Minor changes were all worked out on the full scale drawing. On the original, the arms were attached to the front side of the back. On this chair I decided to attach the arms to the sides so as not to interrupt the flow of the moulded front. I also used spade feet to dress up the front legs. The majority of the shaping was done by hand and all moulding formed with a piece of tool steel shaped with files to match the profile that I wanted for the back.