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The Journal

of the Guild of New Hampshire Woodworkers

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features

Member Profile introduces a member of the Guild—professional or otherwise—which I hope you find inspiring—editor.

Good Work

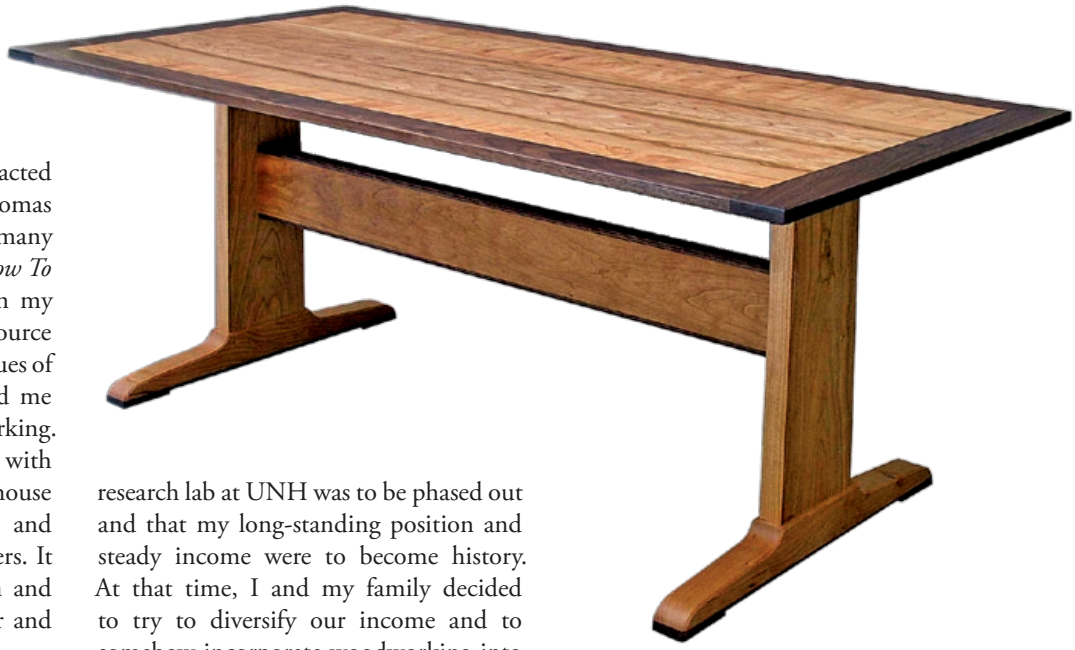
Stuart Blanchard

Some of my earliest childhood memories are of the numerous stickered stacks of pine lumber in our backyard in rural Maine. They came from my grandparents' wood lot and were used for all kinds of construction projects including some of my own. Tree houses were a favorite.

"Dad, can I have some more lumber from that stack over there?"

I'm sure I built many things as a child, but my first real piece of furniture was a frame and panel desk made with the help of my dad when I was in high school. I can still remember chopping out all of the mortises and gluing in the tenons. Had the times been more amendable to crafts when I graduated, I might have continued with some form of woodworking. But those were the days when science was deemed to be of the utmost importance and I willingly pursued my interests in chemistry, eventually working at the University of New Hampshire for nearly 30 years supervising the research lab for agricultural testing.

But I never forgot my interest in woodworking. For many years, I spent much of my spare time building furniture—first in a very small spare bedroom, then in a small shop in the backyard, followed by a roomy but dark basement in another house, and eventually in my current mid-sized shop that has lots of natural light.



During those years I was very attracted to the Shaker-style pieces that Thomas Moser was building and spent many hours pouring over his first book *How To Build Shaker Furniture*. It is still on my bookshelf today. I found another source of encouragement in the very first issues of *Fine Woodworking* which introduced me to a much wider world of woodworking. For many years I contented myself with filling my (and eventually our) house with various pieces of furniture, and occasionally building pieces for others. It was a good time of self-instruction and of accumulating tools—both power and hand, either by purchase or trade.

Around 1990 with the encouragement of my wife and friends (and also with some trepidation) I was successfully juried locally in woodworking with the League of New Hampshire Craftsman through their then Exeter, NH store (now *Exeter Fine Crafts*.) I made and sold many items through the Exeter store as I continued to gain further skills in design and technique. I also gained a growing appreciation for the work that could be done with good quality hand tools, including making a Shaker-style nightstand entirely with hand tools, starting with rough lumber. And, yes, it did take three times longer!

Our world was turned a bit upside down in 2003 when it became clear that the research lab at UNH was to be phased out and that my long-standing position and steady income were to become history. At that time, I and my family decided to try to diversify our income and to somehow incorporate woodworking into the mix, either full or part-time. We set some relatively modest goals for the first few years and, somewhat to our surprise, we were able to meet those initial goals, first with some existing clients, and then later with newer clients. But it is not easy to establish a real income-producing business later in life—not to mention that our economy was already heading to our most recent economic downturn. Eventually, the best mix proved to be part-time employment for my wife, with part-time woodworking for myself coupled with some house assessment work in the town where I live.

Interestingly, I was offered the opportunity to learn assessing by one of my first new furniture clients who needed help and thought that the relative freedom of the assessing schedule would fit well with my continuing efforts to make furniture. And it has proved to be a good combination.

Later, in 2006 I became juried at the state level with the *League of New Hampshire Craftsman* and this opened up many additional opportunities in woodworking.

Presently, due to the economy, it is difficult to generate solid income from woodworking, and it has been challenging to try to set good direction for the next few years. In the next year I intend to seek more commissioned work from previous and new clients through additional marketing and referrals, while at the same time de-emphasizing pieces built on speculation that can easily tie up both time and money. I'm also working on a series of new items intended for retail sales that will fall in a price range well below that of larger pieces of furniture, but that have the kind of originality and quality expected in the retail stores of the League.

I am by nature a somewhat reflective person, and as I have become more involved in realities of building and marketing woodworking items over the past several years, I have found myself thinking much more deeply about the process of designing good furniture as well as the best ways to build lasting pieces.

Much of my thinking about woodworking is encapsulated in a quote from well-known author Wendell Berry in his book *The Art of the Commonplace*.

"*Good work uses no thing without respect, both for what it is in itself and for its origin. It uses neither tool or material that it does not respect and that it does not love—It does not dissociate life and work, or pleasure and work, or love and work, or usefulness and beauty—To work without pleasure or affection, to make a product that is not both useful and beautiful, is to dishonor God, nature, the thing that is made, and whomever it is made for.*"

In my woodworking I have tried to work out this philosophy in the following five areas…

Good Work—In all my work I try to maintain a vision for what I call *good work*. There is a goodness and wholeness, even holiness, about the creation that surrounds us. There is a depth and beauty that permeates and resonates throughout all of creation from the smallest particle invisible to the naked eye, to the incredible plants, animals, and landscapes that surround us, and even to the grandeur of the night sky (if only we pay attention). These qualities can, and I think, must be, expressed in the things we create whether in woodworking or any other craft. Work that expresses these qualities becomes what I consider to be *good work*.

People—I value my clients, and I try to listen carefully as they express their needs and desires for a piece of furniture. I ask questions to clarify and sharpen those needs and desires until I have a good sense of what my client really wants. Whenever possible, I like to see the space in which the proposed piece will be placed. To the extent my clients desire, I wish to keep them involved in the process of creating a piece from the initial design on through the details, and to the finished piece. My workshop is always open for a client to see their work in progress. My desire is that when the piece is completed, it will actually meet the needs and desires of my client, not just for the short-term, but for many years to come. It is always a joy to have the client involved in the design process because they too can experience the slow emergence of a well-designed piece that will be just right to meet their needs.

Design—For any piece of furniture that will satisfy and last for a long time, I believe there is a process that leads from the initial thoughts to a successful design and finished piece. Initially, the design must be kept mostly in the mind to keep it sufficiently fluid and open to the many possible directions it might take. Eventually, a design (sometimes firm, sometimes very tentative) begins to flow from the mind onto paper in the form of very rough sketches that hopefully reflect my clients desires. Only after the overall shape, size, proportions (and perhaps primary species of wood) have begun to take shape, is it possible to turn to finer details such as surfaces, edges and other details that will enhance and support the overall piece. When the design is done with care over a adequate period of perhaps days or even weeks or months, it is more likely that the overall form, proportions, and details will really result in a piece that can be appreciated and valued for many years.

Workmanship—Good workmanship results when the process of construction is just as important as the end result. The process of construction begins with careful selection of quality materials and items such as wood, knobs, hinges, locks, escutcheons, etc. as required. When these quality materials are combined with time-proven joinery executed with the most appropriate tools in a well laid out shop, the final piece will surely pass the test of time. Only when I am satisfied that the piece is indeed "good" do I sign and date it.

Reflection—Finally, I believe it is important to have enough 'margin' in the work (and in life in general) that there is time to reflect on what one is doing, how well it is being done, and what is required to do it even better. In these times of reflection I readily acknowledge that I work best when I have the mind-set of an apprentice rather than that of a master. As an apprentice, I am more likely to remain open to and aware of more possibilities, and I am more willing to learn from other woodworkers, thus improving and extending my own abilities. In his book *Living The Sabbath,* Norman Wirzba notes:

"The apprentice becomes a master not by bending the world to his or her own will, but by submitting to, learning to work within, and developing an affection for the rich possibilities latent within the craft. Of course, one's apprenticeship never comes to an end because there is always more to reality than was first thought."

Although I am usually satisfied with the quality of my current work, I know there is much to learn from the many fine woodworkers whose abilities readily exceed my own. Learning is simply part of the joy of woodworking. ■

Festool Factory Tour

by Al Spitzer

Where to begin? I have been involved in woodworking of some kind since 1976. It started with a simple picture frame—I was addicted in no time flat. I am self taught and own a large library of how-to woodworking books. All of these seem to preach that you should buy the best tools you can afford. So, whenever I need to purchase a new tool, I do my research. I grab tool reviews from various magazines—*Fine Woodworking*, *Fine Home Building*, *Popular Woodworking* and many others. I also review blogs on the Internet.

Several years ago I was reading *Cabinet Maker*, a free magazine for small shops. In this particular issue there was an advertisement from Festool stating that if you participated in a survey you could purchase an random orbit sander (ETS 150/3 EQ) for the unheard of price of $50. Not to pass up an offer to purchase a new tool (even my wife couldn't argue with that kind of savings), I filled out the survey and purchased my first Festool tool.

I was extremely doubtful that a $50 dollar sander from a then-unknown (to me) brand could outperform my trusty Porter Cable or Makita sanders. However, not only did it perform as promised, but it is the fastest material-removing sander I own. As I continued my research for new tools, the Festool name kept showing up. I desperately attempted to justify their high up-front cost, but could not part with the hard-earned cash. Secretly, I was probably hoping for another *survey says* opportunity.

While planning my Christmas vacation this year, a thought came to me. I wanted to contribute an article to the Guild so why not visit the Festool factory and write about it? I would be visiting with my brother who lives just south of Stuttgart, Germany, and Festool is located just to the east. I contacted Festool's press officer and we arranged a visit.

And so I went to Germany this past December, 2009. On the day my brother, my wife and I were to visit the factory we called ahead and were told to visit the Neidlingen production factory first. There we were met by Herr Geillinger, who gave us *The Grand Tour*.

He explained how just the right amount of material and number of parts come in to the factory for an eight hour shift, so they do not have to carry huge inventories. Quality checks are done at every level, from material delivery through final assembly. Each tool that Festool sells has its own unique assembly area and a crew of 4-6 people. They have adopted an extremely efficient and compact assembly line with minimal staff. These small teams will assemble a complete tool and package it with all the necessary literature in a 'U' shaped space (roughly 10′x14′). This single factory of about 90 people is the main factory for Festool and assembles tools for the entire world. All of Festool's parts are made and assembled in Germany.

If you take the time to view the Festool website (*www.festoolusa.com*) and read the standards that the company demands of its suppliers, you will begin to see the commitment to quality that goes into their products.

After completing the tour at the factory we were directed to corporate headquarters to meet with Frau Silvia Pirro, press and public relations officer. We were served coffee and cappuccino at the public cafeteria by Frau Pirro and were given informational packets on the various tools available in the US.

Frau Pirro continued our tour at the Tanos Systainer (systems container) distribution facility and shipping center. Tanos is a subsidiary of the parent company TTS Tooltechnic Systems. At Tanos they manufacture system containers (Systainers and Sortainers), that provide a highly efficient way to store and transport tools and materials. TTS also manufactures ProTool (commercial power tools) and Schneiner (compressed air solutions tools). The tour was both a delight and extremely enlightening. Their methods gave me some ideas that might even work in my one-man shop.

Since the tour in Germany I have had the time to read and review the literature and the CD Frau Pirro gave me. I understand now why Festool tools warrant their price. They are of high quality and their efficiency saves valuable time. I was not aware of the extremely high and I mean extremely high tolerances that Festool requires of its products. As an example, Festool's literature states that they require the ball bearings that go into a tool must be no more than 0.5 millimeters out of round,

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I bought my first Festool tool for $50 as a reward for participating in a survey.

Ask The Old Saw

Grinding New Bevels—I am careful with my planes and chisels. I hone them often, but I do not grind new bevels. Should I change my sharpening practice?—Alan Saffron

Bob LaCivita replies: This depends. Some people sharpen by honing the entire bevel flat. This style of sharpening eliminates the need to grind but you have to hone a lot of metal off. Others grind and then hone a secondary angle. This method gives you a small edge to hone and over time, you will hone it back and then want to regrind as the honing surface gets larger and larger. I use the second method because I find it easier to keep my cutting edge square to the sides. The choice is yours.

Veneer Hammer Shape—What should the working edge of a veneer hammer look like?—Joe Barry

Al Breed replies: The edge of my veneer hammer is rounded over. Remember that you are really using it as a squeegee, so it should slide over the veneer and have no burrs or rough places.

Repairing Finish—How do you repair a finish where sapwood (from cherry) appears later?—Steve Colello

Dave Emerson replies: I can't imagine cherry sapwood appearing later. I don't know any way to conceal it—I've tried. I don't use it unless it works in the piece. The contrast looks good in bowls and plates. I sand/final thickness figured maple on a belt power feed sander. You must allow enough extra in planing to sand out the tearout. Unless you have the right equipment, you should take it to a shop with a special planer head that can do it.

Wood Sources—Where do you get quality wood for building furniture?—Guy Senneville

Mike Cyros replies: We are fortunate to live in an area where there are wonderful resources for wood. There are a number of quality lumber yards that carry a great supply of all common and many exotic woods for furniture making. Having tools for preparing rough lumber gives you the greatest possibilities. As I live in the seacoast area, my two favorite lumber yards are Highland Hardwoods in Brentwood, NH and Northland Forest Products in Kingston, NH. As a GNHW member, you'll be granted a 10% discount for your purchases. If there is something specific you are looking for (e.g. flame birch, curly maple, quilted cherry), call ahead and ask what they have—they're always glad to help.

Marty Milkovitz replies: Any reputable hardwood dealer, personally I deal with Highland hardwoods in Brentwood NH, Goosebay lumber in Chichester NH, for exotics Trade Winds Lumber in Grafton VT or for something unique Hearne's Hardwoods in Oxford, PA.

Bob Oswald replies: Any lumber yard that specializes in hardwoods for larger quantities. Look also for specialty yards that might not be so visible. Search the internet for the lumber type you want. In the Portland, OR area for example, Goby Walnut is an incredible source for walnut, Northwest for all forms of fabulous maple. But you have to search them out. Rockler and Woodcraft carry fine exotic lumber in many species also, but typically only available surfaced four sides and at higher prices.

Post Hole Beetles—Is it safe to cut off pines edges with post hole beetle traces until the wood is clear and burn the scraps?—Allen Everett

Marty Milkovitz replies: Fire is a very effective way to deal with post hole beetles, just don't store the scrapes in the house until your ready to burn them.

Outdoor Wood—To build a planter, what is the best most weather/water resistant wood besides cedar?—Hugh Gardner

Terry Moore replies: Teak. But it is expensive!

Alternative Outdoor Wood—With the price of teak so high, what are some alternative woods for outdoor furniture? How long will some of these last outdoors?—Kent Michaelsen

Bob Oswald replies: Besides the obvious Cedar and Redwood, harder woods for outdoor use include Cypress, Ipe and Jatoba, also known as Brazilian Cherry (for public marketing value). Cypress is a softer wood on the order of pine or fir. Ipe and Jatoba are very hard and very tough on cutting tools. These two will last as long as Teak.

Marty Milkovitz replies: Cypress, redwood, mahogany and red cedar are all good choices. I have some outdoor

After monitoring print and mailing costs and consideration by the Steering Committee, *The Journal* will be published three times per year rather than four. This will be more efficient than a quarterly allowing us to maintain the same annual page count (120) as planned. Expected publishing dates are November, March and July.

Michael Moore joins the Journal staff as copy-editor. He has also agreed to authoring the member profile articles in the futrue. Please contact Jim Seroskie if you have an interest in contributing to *The Journal*—editor. ■

furniture I made close to 20 yrs ago out of redwood and they are still holding up well. In fact I am still using a redwood picnic table I made back in the 60's. Don't abuse the stuff and it will last as long or longer than you.

UV Resistance of Water Based Finish—Are water-based finishes such as water-based polyurethane as UV resistant as the corresponding oil-based finishes?—Bob Jarratt

Jim Morris replies: The difference between water-based resins and solvent-based resins are very minute as far as UV protection go. The manufactures put UV blockers in the finishes to give them more protection from the sun, so in general they're both the same. You have to read the labels of the finish to find which ones have the UV blockers in them.

Open Time of Hide Glue—What is the open time for genuine hide glue?—Bob StLaurent

John Whiteside replies: There is not a fixed open time for hide glue. For thickly mixed hide glue applied to a cold joint, the open time is less than a minute. For thinly mixed hide glue applied to a joint that is kept at a temperature above 140 degrees, the open time is, for all practical purposes, infinite.

This means that the woodworker can extend open time by making the glue more dilute and by heating the joint. Dilution is achieved by adding water and observing how easily the glue drips off the glue brush. Heating the joint can be accomplished by using a hair dryer, a heating pad, an infrared lamp, or simply by raising the temperature in the shop.

In practice, with the right dilution and joint temperature, you can achieve open times of several minutes. Of course, if the hide glue sets prematurely, it can simply be released again with moist heat, That's the huge advantage of hide glue—it is reversible.

Al Breed replies: The 192 gram strength (maybe it's 92?) hide glue that I use sets up quickly. With this glue from the glue pot, you don't have any open time at all if the surfaces you are gluing are cold. If it gels when it hits the wood, it won't hold. I warm the surfaces up with a heat gun to give myself some time to work because warm surfaces equal longer time as a liquid for the glue, which gives it time to penetrate before it sets up. It takes some time to get used to using hot glue. Some different gram strengths do have different open times, but my advice to students is *don't take your time*.

Home Made Veneer Tape—Is the glue on veneer tape hide glue and if so, can one make large pieces of veneer tape at home?— George Lang

Jeffery Cooper replies: I once made up a compass rose for another woodworker, who in his eagerness to see the result, removed the veneer tape with a belt sander. Big mistake, and I made him another one. The veneer tape is intentionally thin with perforations and hide glue to allow it to be gently lifted when moistened. Stick with the product readily available. It's cheap and easy to use.

Wax in Shellac—How do I get wax from shellac flakes? How can I determine if shellac has wax and how important is it to get out wax from shellac?— John Watson

Al Breed replies: Buy dewaxed shellac. Supposedly varnish overcoating will adhere better.

Straightening Bandsaw Blade—If a bandsaw blade has a bend in it, can it be straightened to run true?—Claude Dupuis

Bob Oswald replies: In a word, no—not recommended for two reasons. One is that it's nearly impossible to get the kink out unless you could bend it back at exactly the spot it bent in the first place. Instead you'll get a bit of an "S" shape, possibly very small, but still not as smooth as it was originally. A weld, for example, is over-filled with steel and ground flat to make it as smooth as possible.

Two, depending on the stress created at the bend, and then re-created in straightening it, you could be weakening the metal at the point, setting it up as a future failure point. Usually, the cost of a bandsaw blade is reasonable enough to just replace it. That's relative of course. The bandsaw is capable of very fine work and a bent blade is a compromise to that.

Marty Milkovitz replies: If the blade is kinked, a machinist could cut out the kink and re-weld it but it will probably cost you more than a new blade. A bend however—how severe? Maybe it can be done with high tension. Practically speaking, toss it and buy a new one. ■

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PHOTOS BY JIM SEROSKIE

December 5, 2009 & February 6, 2010
at McLaughlin Woods in Canterbury, NH

Tom McLaughlin's year long project — Parts 2 & 3

BY AUDI PAULIUKONIS

Making a Traditional Chest of Drawers

December 5, 2009

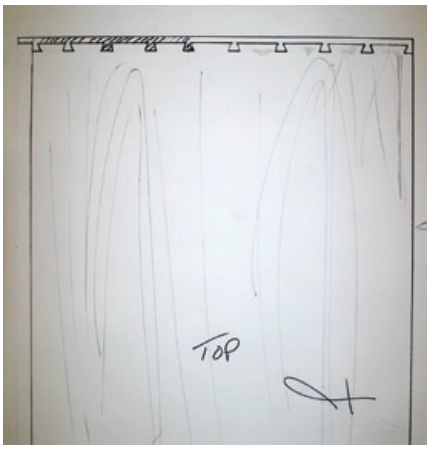
After a two month recess, Tom McLaughlin's shop was full yet again for the second installment of the BIG series *Solid Case Construction: Making a Traditional Chest of Drawers*. Many of those who were present at the first meeting were back, and there were a few new faces in the crowd as well—a good turnout for this next phase of the project. I know I was really looking forward to this meeting, having had a great time and learned much at the first one.

This meeting began with a quick review of the first session, including stock selection, stock preparation, and the process of getting flat glued-up panels from the rough lumber you started with. Once we were all brought back up to speed, it was on to the next step in the process—joinery decisions, layout tips, and the methods and techniques required to build the actual case from the panels begun during the first class.

As the title of this BIG series suggests, the case sides and top are to be dovetailed together in the traditional manner. Of course, there are several ways to go about this, and while a brief discussion ensued concerning the advantages, disadvantages, merits and costs of some of the various dovetail jigs on the market, this class will use traditional hand-cut dovetail joinery.

Few would argue that the most satisfying way to cut dovetails is by hand,

Tom cuts the tails first in the top and bottom panels



as they impart a real sense of craftsmanship as well as aesthetic beauty to the finished piece which you just cannot match with a machine-cut dovetail—the pins will forever be too clunky. And while the dovetail jig can be really useful if you need to cut large numbers of them quickly, the consensus was that it's best to learn to cut them by hand, and cut them well for a project like this. To that end, Tom asked if anyone was interested in buying his dovetail jig, long unused since it was purchased for a production job years ago.

Now Tom turned our attention to the side panels, which he had completed since the last meeting. He showed the group how to properly evaluate these panels and orient them in the finished case, always keeping the most visually pleasing side facing out. He demonstrated a few methods of marking the panels to maintain this orientation, the cabinet maker's triangle as well as the *face mark* he learned from his own mentor. The top and bottom panels of the case were also marked in this fashion, not to denote a visually pleasing face, but to keep everything consistent as we lay out the dovetails.

Special attention was called for when deciding which face of the bottom panel would be *up* in the case. This surface should be free of any imperfections that would prevent smooth movement of the bottom drawer upon which it rides. Unlike the side panels, most of the top and bottom panels will not be visible in the finished case, so they are built from a less expensive secondary wood—in this case yellow pine. As only the front edge of the top and bottom panels will be visible, these two panels are cut slightly narrow in depth, with a strip of the appropriate primary wood glued to the front edge to bring the panel to its finished width.

Now began the task of laying out the actual dovetails. The case calls for half-blind dovetails with tails cut into the top and bottom panels, with corresponding half-blind pins cut into the case sides. Tom suggested the tail length should be about ⅔ the thickness of the case side panel, making our tails ½″ long for our ¾″ thick panel.

The next step is to mark the faces and edges of these panels ½″ from the ends with the marking gauge. Before laying out the tails, some thought must be given to the angle of the tail as well as how far apart to space them. In general, a 1:5 slope works well for softwoods, while a shallower 1:8 is good for hardwoods.

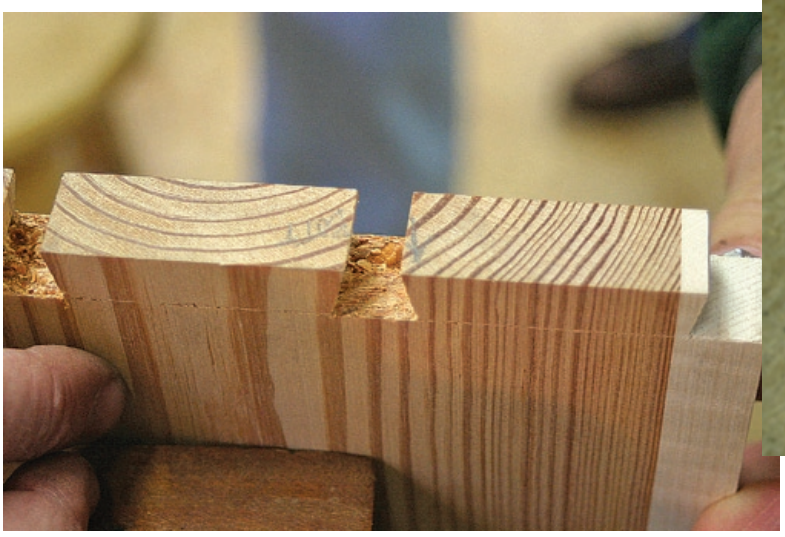
Tom chose to use 1:5 for our panels. The main consideration as far as spacing the tails goes was the ease of removing the waste between them. For this reason, we spaced them 9⁄16″ apart making it easy to slip a ½″ chisel in there.

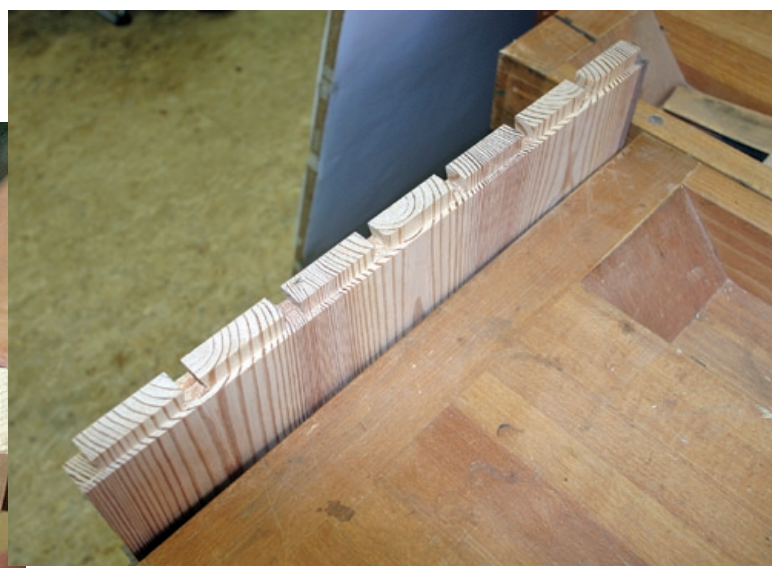
To lay out the tails, Tom suggested first locating and marking the *half-pins* on the ends of the panel. Next make a mark where the center of these half-pins would be if they were full-size pins. Lightly draw a line down from each of these points perpendicular to the long edge of the panel.

Decide on how many tails you will be using, perhaps seven in this case. Then take a ruler, place the "0" on the left line you drew, close to the edge of the board, and skew the ruler until the "6" intersects the right-side line (6 spaces makes 7 tails). Mark each inch where it falls on the panel, remove the ruler, and draw lines square up to the end of the panel from the inch marks you made. Now you have evenly spaced index marks, and you didn't have to pull out your calculator and try to divide 17 13⁄32″ by 6.

Once the tails are marked, Tom recommended cutting all of one side of the tails first, as he finds this allows you to get into a rhythm and can help keep your cuts accurate. Still, be sure to stay on the waste side of the line. Once the side cuts are done, the bulk of the waste may be removed with a coping saw. Gradually chop away the rest of the waste with an appropriately sized chisel, keeping 1⁄32″

Finished tails





away from the scribed line so you can pare down to it. You only want to go halfway through with the chisel before flipping the panel and coming at it from the other side.

Tom stressed that if there's a little undercut in the end grain between the tails, it's not a big deal as it's not a glue surface, and to just take your time and focus on getting a clean cut.

Once the tails are cut, the tail profiles must be transferred to the side panels to locate the pins. Tom demonstrated the method for doing this, clamping the side panel vertically in the front vise of the bench while lining up the corresponding top/bottom panel above it as it will be oriented in the finished case.

A sharp marking knife made short work of transferring the tail profiles to the side panel end grain. Tom advised marking the dovetail sockets so they'd be slightly deeper than the actual dovetails, in essence leaving the pins proud of the final assembly so they may be planed flush once the case is completed.

The side panel is then placed flat on the bench with the half-blind sockets up. A sharp Western-style dovetail saw, or dozuki if that's your preference, is then used to carefully begin cutting the sides of the sockets. As these cuts don't go completely across the thickness of the board, there's no way to remove most of the waste with a saw. Fortunately there's more than one way to deal with this and make the process a little more efficient too.

Tom suggested using a Forstner bit on the drill press to hog out much of the waste. He also over-cut the sockets a little into the inside face of the panel in order to get that cut line deeper into the socket. Tom mentioned the latter technique was common practice among the furniture builders of old, and the nice thing about it is no one sees the over-cut line. Whichever way you choose to do it, once the bulk of the waste is removed, carefully pare down the remaining waste wood to the scribed line.

Cutting the half dovetail pins in the side panels—half dovetails hide the joinery on the finished case

Once we got to this point, time was running short and Tom began to wind the meeting down. He stressed making sure the side panels were perfectly parallel in the finished case, else the drawers wouldn't fit well, and briefly touched on the subject of drawer dividers and a few ways of creating them, but it looks like that topic will likely kick off the next meeting, to be held February 6. See you there!

It was great to see and watch Tom go through the various procedures of setting up and executing the joinery required to build this case, step-by-step, and I couldn't think of a better way to learn the process. Even if you already know how to cut dovetails and have your own little tricks, it's always possible to learn something new, and if you've never cut a dovetail before, this one class would have had you feeling confident you could do it, and do it well. And if some of your early attempts wouldn't exactly pass for a Townsend or Goddard piece, well, listen to Tom's sage advice—*You can always give it to your neighbor!* The next one will no doubt be better.

A drill press & Forstner bit are used to waste most of the wood

February 6, 2010

Measuring the diagonal. Clamping blocks protect the project

Another two month recess brings us to the February meeting at Tom's shop in Canterbury. In theory, this class marks the mid-point of the project. Even with everything Tom has discussed and explained during the previous two meetings, there is still so much left to cover that Tom began this meeting by joking that once the five meetings are finished, he'll have to hold a follow-up session called the *Finishing the Projects I Started* class, which got a chuckle from everyone in the room. A quick show of hands indicated there were about ten people present who were following along at home with their own chest of drawers, including me, and even though it might be a tight squeeze getting all the info into the planned time frame, everyone realizes that, as Tom put it, "A project is an excuse to learn a lot of new techniques."

Tom started this meeting by going over the process of gluing the top and bottom to the sides of the case. Many woodworkers have *glue-up stress*. The best cure is to dry fit the panels prior to gluing. Tom walked us through the actual process. He recommended *white glue* for the case dovetails as it tends to have a longer open time than yellow glue especially on a warm day. Tom's application approach doesn't spread glue around needlessly—a line of glue over the tails and a glob in each socket, then brush it out over the tails. Just hit the side grain, not the end grain in the socket.

He then explained how he assembles the case. First, set the bottom panel on blocks to keep it up off the bench. Place the sides onto the bottom, then fit the top. Lay the case on its back, clamp it together using blocks to prevent the clamps from marring the case, and roughly square it. While it's possible to use specifically made clamping cauls designed to allow clamping pressure to be exerted on the dovetails themselves, it is often sufficient to have clamping blocks bearing on the panel just inside the dovetails. The goal is just to get the dovetails to seat fully, and there's nothing to be gained by wrenching down on the case.

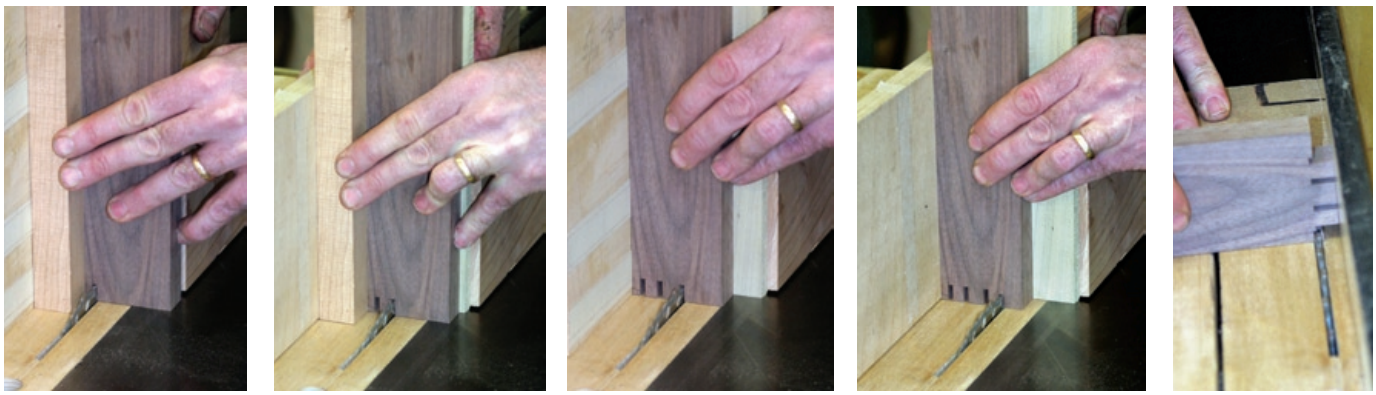
While a tape measure works well to measure diagonals in order to check the case for square, a story stick might be better as it's harder to misread. To square the case, instead of placing a clamp on the longest diagonal, Tom showed us how to *skew* the clamps slightly in order to exert pressure to bring the case back to square if it's out a bit, a neat trick I hadn't seen before.

Now that the case itself is assembled, we turned our attention to the drawer dividers. To transfer the divider locations to the case, Tom used a story stick to take the lines right off the full-size drawing developed during the first meeting. He noted that while it is important to be precise and clean in marking these lines, any slight variation won't matter too much as each drawer will be custom fit to its particular location. He also said it is easiest to lay these lines out on the side panels prior to gluing up the case. Just line up the bottom of the side panels and mark them at the same time.

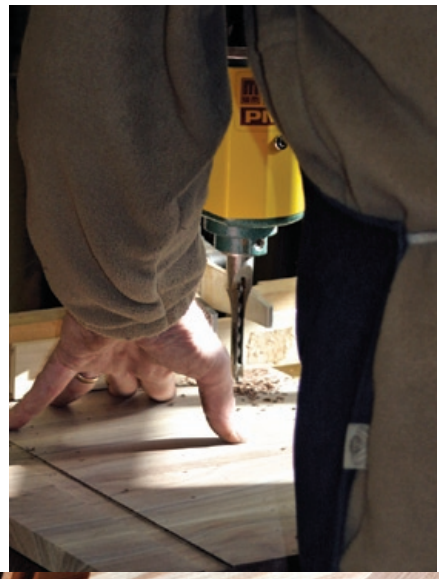
Our chest will have three dividers, and Tom specifically mentioned using really stable stock, preferable quartersawn, especially for the lower two dividers as they must span the full width of the case. In preparing the stock, the pieces are ripped roughly to width and then they must be allowed to reach a new equilibrium before final thicknessing and preparation.

The other parts we also need to make are the runners that are attached to the side of the case between the front and rear dividers. These support the drawer along the length of its travel. Typically made of ash or oak, the most important thing is that this wood be wear-resistant enough to take the repetitive sliding motion of the drawers. These will tenon into the dividers and "float" allowing for case expansion and contraction across the grain.

Of course, there's more than one way to actually join the dividers to the case sides, and Tom explained these various methods in some detail—twin tenons, half dovetails and full dovetails. Twin tenons are a popular method to join



Cutting twin tenons on a tablesaw using a shop-made jig, filler blocks and a high fence



Cutting twin mortise and tenon joints

the dividers as they are strong, provide lots of glue area and are self-squaring. One drawback however, is they can't be dropped in after the main case has been glued-up. They must be installed during the final assembly of the case which adds to the aforementioned *glue-up stress*. You now have that many more glue surfaces to line up and fit before the glue starts to set up.

When cutting a twin tenon joint, Tom cuts the mortises first, using a spacing or story stick to keep the distance between the mortises and tenons consistent which makes for a really clean, tight joint.

Tom showed us his shop-made jig for cutting a twin tenon, which is designed to ride along his tablesaw's Biesemeyer fence. After advising us to make a few test cuts should we choose to use twin tenon joints, and that divider off-cuts make good practice stock for this purpose, Tom told us to cut the mortises about 1/16″ deeper than the length of the tenons in order to keep them from bottoming out. With this bit of wisdom, the twin tenon demo was finished—on to dovetailed dividers which is the actual approach Tom chose to use for these chests.

Our project will actually utilize a dovetailed divider, as it's possible to fit these once the case has been glued together, lessening the stress on those of us who haven't done this too many times before.

The first step is to cut the dovetail on each end of the divider, using either the tablesaw or the hand cut methods Tom described in the earlier meetings. Next, transfer the dovetail profile to its location on the case front. Knife these lines, then carefully rout out most of the waste with a straight bit, in order to get a nice, flat bottom to the dovetail socket. Carefully pare out the remaining waste, including the angled side, with a chisel. There is no need to set up for a router/dovetail bit operation—hand tools only. Sneak up on the correct fit using the divider's dovetail to test the fit.

Finally, a 3/8″ wide groove needs to be cut on the inner face of both the front and rear drawer dividers to accommodate the 3/8″ thick tenon of the runner. Fit the rear dividers, install the runners, fit the front dividers and the case is well on it's way to being finished!

With the end of the third meeting, the project is starting to really look like a case piece, or at least those attending are probably feeling pretty good about proceeding on their own in the endeavor. While the meeting began with Tom joking about how the series is a bit behind schedule in terms of where he thought we'd be, this is only because he takes his time to thoroughly explain each process in detail, not just in terms of "how" but the "why" as well. Tom has also been very patient in answering questions from attendees of all experience levels, boosting the confidence of those new to the woodshop, while others with years of sawdust under their fingernails have all learned new things as well. That's what makes this BIG series such a great experience—can't wait for the next BIG installment April 3rd! ■

Dovetail divider with groove and mating runner

BY BOB OSWALD

Biscuit Alignment

Biscuits serve two basic purposes in joinery, adding strength and making alignment easier. The alignment process however, has one significant opportunity for error which would defeat the whole point of using them.

The biscuit cutter, also known as a plate joiner, can be aligned to either the top or the bottom surface. The critical procedure is to use the *good face* of each piece to register the cutter. That way if the two boards have slightly different thickness, the step at the joint will be on the unseen underside.

But here is a factor that's easy to overlook and that will destroy your alignment. If you use the plate joiner sitting on a flat surface and register it to the good face on the *bottom side* as shown in Figure 1, any warp, twist, or bend in the board will cause them not to be perfectly aligned. Unfortunately, I know from experience.

My pretty much foolproof solution is to lay the fence at ninety degrees as shown in Figure 2. Then register the cut against the good face on the top side. Any curvature is pretty much negligible.

The "pretty much foolproof" means that you must be sure the plate joiner does not hit the surface the work is resting on. The work should probably overhang the edge of the bench a half inch so the plate joiner has plenty of clearance and stays well registered against the top face. Experience again points out this little pitfall opportunity.

The photo shows the joiner being held by the handle. You must also be careful to hold the fence flat on the work. There are different ways to resolve that. I prefer to securely hold the fence flat with one hand. However, do not let it be a safety issue for you. Be sure of the positions and behavior of your hands and all moving parts. ■

FIGURE 1…BOTTOM ALIGNMENT—NOT RECOMMENDED

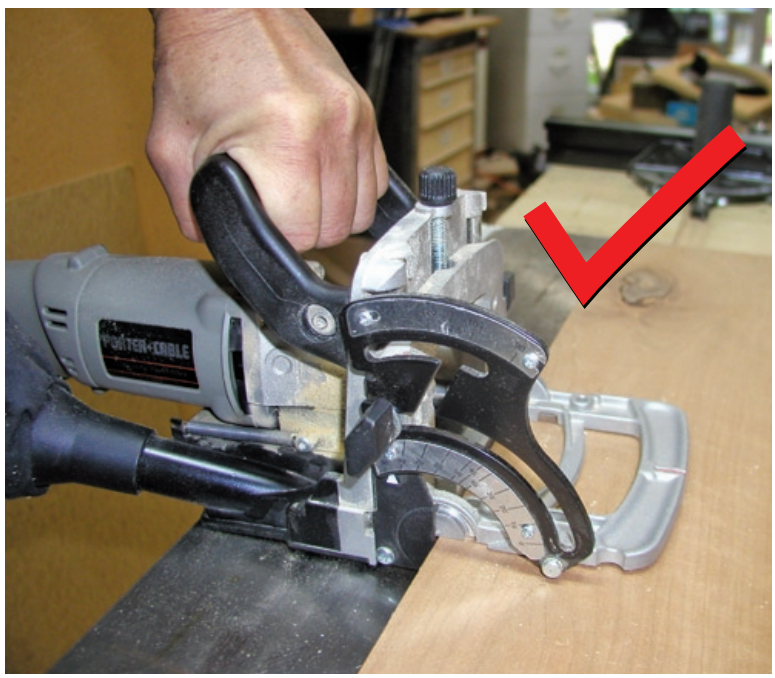


FIGURE 2…TOP ALIGNMENT—PRETTY MUCH FOOLPROOF

BY ROGER MYERS

Removing Rust with Electrolysis

Arm & Hammer Washing Soda is the key ingredient to this method

Many of us have seen that old tool in the pile of junk at a yard sale. Maybe it is an older hand plane with the rosewood knob and tote looking out of place in a mess of rusty steel. Or perhaps it is a 100-year-old adjustable wrench that seemingly has no hope of being used as the moveable parts have been fused into one solid-looking mass. Well, if the price is right, and often it is, there is still hope for these old treasures and with a minimal amount of elbow grease and a few tricks you can put those tools to good use.

At a recent meeting of the hand tools subgroup, Dave Anderson tackled some rusty hand planes. This article is derived from his demonstration and my own experience in turning rust into gold.

Sometimes all that is required is the use of a little WD-40 and some steel wool and you can clean things up fine. But when the rust has really taken hold, it is time to let science come to your aid. Commonly referred to as the electrolysis method, electrical current can be used to help you clean up some pretty rusted tools.

The materials required for this are pretty simple and you will probably already have most of them in your home or garage. The first item required is a 12V automotive battery charger. If you don't have one already, they are available at all automotive parts stores for less than $50. You will want to have a plastic tub that is large enough to completely submerge the part being cleaned. Plastic tubs used for storage work very well, and often have handles that make filling and emptying the tub a bit easier.

A scrap piece of steel will become the sacrificial anode and this can simply be a piece of iron rod or bar stock. A piece of steel 15″ or 20″ long and a couple of inches wide that can be bent to shape is a good size, but this isn't critical.

A couple of pieces of heavy gauge wire with alligator clips on them are useful as this enables you to keep the leads from the battery charger out of the solution—a good idea if you also use the battery charger for its original purpose. I picked up a very inexpensive set of jumper cables and cut them to use for this purpose, giving me four leads from the one set.

The one item you probably won't have is Arm and Hammer *washing soda*—not baking soda. This can be found in the laundry department of your local supermarket.

Begin by mixing a solution of the washing soda and water. The recipe need not be exact. I generally use one cup or so of washing soda with five gallons or so of water. Stir the solution to mix the washing soda and water completely. You really can't make the solution too strong, but a weak solution will not work as quickly. During use, the solution will get real mucky but it can be used a number of times. As I use a covered storage container, I'll just put the cover on it if I know I am going to be using it again soon, otherwise I just dump the solution after each session.

The method we'll use is easily adapted to many types of tools, but I'll use a hand plane as an example here. Begin working on the plane by removing all the components—the cap lever, iron and chip breaker, the wooden knob and tote, any brass parts and the frog assembly which can later go in the solution as well.

Brush off any surface dirt and grime from the plane. Attach the negative lead from the charger to one of the short cables which you then clip to the body of the plane. Place the plane into the bath

Plane submerged in the solution

The sacrificial anode

of water and washing soda. The solution should completely cover the plane. I will generally place the plane or other item on a couple of pieces of plastic or wood (twist off caps from soda bottles work well) to keep it off the bottom of the tub.

Take the piece of steel that is your sacrificial anode and bend it into a shape that sort of follows the outline of the plane as this makes the process a bit more efficient. Think of the process as the rust moving in a line of sight from the tool to the sacrificial anode—the more direct this path, the more efficient the process will be. Attach the positive lead from the charger to the remaining short cable and clip and attach that clip to the sacrificial anode and place this in the bath—close, but not touching, the plane.

Make sure that the sacrificial anode is not touching the plane. Plug in the charger and turn it to the regular charging mode, not the fast charging or jump-start modes—this will vary by make of charger. You will soon begin to see a number of bubbles rising in the solution, an indication that electrolysis is underway. The rust from the tool will begin to migrate to the sacrificial anode. Let this process sit for a few hours and you can check progress from time to time by turning off the charger and looking at the plane. After a few hours, your plane or tool will be ready to come out of its bath.

When you remove the plane from the bath, dry it immediately. It may begin to develop a light surface rust from the water, but this is easily wiped off in the cleaning steps. Your tool will also likely have a slight gray color to it.

After wiping it dry, you can go over all surfaces with 000 steel wool. The majority of the heavy rust should have been removed. If necessary, you can always return it to the bath for another cycle. The sacrificial anode will now look in terrible shape, but it can be used for quite a number of times. If you are not going to reuse the solution, it is safe to dump as it only contains the washing soda, water, and perhaps some very small traces of oil from the tool.

Before reassembly, examine the mating surfaces of the frog and the plane body. These should be clean and provide for a solid, well matching assembly. If there is rust, paint or japanning present, or if there are surface burrs, take the time to clean these surfaces with a smooth file.

The bed of the plane must be flat and co-planer within a reasonable degree. What is a reasonable degree depends on the plane and its intended use. A scrub plane or a fore plane does not need to be as flat as a jointer plane or a smoother. In any case, the critical areas are the very front and back of the plane, and the surfaces around the mouth of the plane.

There are a number of methods to flatten the body of the plane, but one common method is to use sandpaper attached to a flat reference surface. This can be a table saw or jointer bed, or a slab of granite or marble tile.

Surfacing the bed of the plane should be done after it has been reassembled and with the blade assembly inserted and under tension, but with the blade withdrawn.

With a little science in the workshop you can turn those pieces of yard sale junk into tool treasures. ■

Other Approaches

There are many methods available to the hobbyist woodworker to rescue and begin the tuneup of an old metallic plane.

Similar results can be obtained by removing all the loose hardware, brass, and wooden parts and dipping/soaking in a bath of citric acid. This is available from most stores which carry home canning supplies and is sometimes available in the larger supermarkets. A concentrated vinegar solution also works though it is much slower and a bit smellier. As a final offering, the commercial product *Evaporust* can be used and it will work well too.

Finally, the old elbow grease method of scraping off the loose stuff with a razor blade followed by some serious time with various grits of wet/dry sandpaper and mineral spirits or WD-40 will also get good results. This is cheap, but time and labor intensive and I only use it to touch up those areas which are too intricate or hard to clean completely with electrolysis.

— ***Dave Anderson*** ■

Wipe down immediately, then reassemble

Brush Cleaning Basics

General cleaning in the shop after a day's work might be tedious, but cleaning brushes after applying a finish can be exasperating. What seems like a straightforward task consumes a lot of time and material. There may be no short cuts, but developing an effective routine will make this job easier and preserve your valuable brushes.

First, consider your finish type. Most of us work with a few basic finishes—water-based, oil-based varnish, shellac and lacquer.

Water-based coatings include clear finishes as well as water-based paints. They will contain hard resins like polyurethane, acrylic or latex. Some may even include a little oil. Directions on most cans say to rinse immediately after use with soap and water. But, if you have let a brush sit too long or if the finish starts to cake near the ferrule, add a little stronger detergent like trisodium phosphate (TSP) to remove the partially dried finish. Follow this with mild soap and water and finally a clean water rinse.

Oil based varnish and paint can be rinsed with low grade mineral spirits (paint thinner). Two or more rinses will be needed and I usually follow with a final rinse in lacquer thinner for a complete cleaning.

The solvent for shellac is alcohol and typical, denatured alcohol works fine. *Save your more expensive solvent alcohol for thinning shellac.* About two rinses is adequate. If you want to use the brush some days later and find the bristles to be slightly stiff, just suspend the brush for a short time in alcohol or shellac until the brush softens. Do not force or bend stiff bristles. Let the solvent do the work. Long-term storage of shellac brushes may require more cleaning than the two rinse method.

Standard nitrocellulose lacquers clean in lacquer thinner the same way shellac cleans up with denatured alcohol. The exception to this can be modern catalyst type lacquers but most of these lacquers are meant for spray systems, not brushing.

Here are a few extra tips…

Most brushes can be kept in a plastic bag if wrapped tightly and used again in a day or two. Even if I know I will be using the brush soon, I still like to do one rinse before bagging a brush.

Mike Halstead, one of the experts at Phillips Fine Paint in Concord, MA, recommends spinning a brush between solvent rinses. This can be done by hand or there are special manual spinners made for this purpose. He also recommends conditioning oil-based paint and varnish brushes with a little linseed oil after cleaning. This keeps natural bristles supple.

Occasionally a brush may need to be raked with a wire brush to remove partially dried solids. Do this with care on standard brushes and perhaps not at all on delicate, artist quality brushes. Also, take care with brushes that have flagged tips, that is, bristles that have been purposely split at the ends for fineness.

Always shape and point a brush after a final rinse. Wrapping the brush in paper or plastic will further help to retain the shape.

Some experienced users may disagree, but I almost never do a final soap and water cleaning with natural bristle brushes. If they have been dedicated to a solvent type finish, it seems easiest to keep the cleaning in the same solvent family. There is the added concern about trapped moisture in the tuft of bristles.

For those who like cleaning with soap and water as a final step, I recommend spinning the brush out well and wrapping it in paper rather than plastic to allow evaporation. Write the date on the wrapper with a plan for not sticking it in varnish or other solvent based finish for about a week. If you prefer a final soap and water rinse, there is an mild paste

type cleaner called *Masters Brush Cleaner* that keeps bristles soft and conditioned for future use. It is available at art supply stores and some paint stores.

Every brush can suffer abuse from swelling if finish is allowed to cake high in the bristles near the ferrule. It only takes a few seconds to wipe excess material off the metal ferrule and another moment to clean the handle to remove sticky paint or finish.

Suspending a brush in its appropriate solvent is a gentle approach to cleaning. My favorite cleaner for overnight or longer soaking is *Solvitol*, made by Preservation Solutions. It is an extremely slow drying mineral spirits-type solvent, has very low toxicity and is not combustible. It is primarily suited for oils, oil-based paints and varnishes. You can use a detergent-based soaking solution for water-based paint and varnish brushes.

On the opposite end of a gentle soak, is the occasional need to clean a partially or fully hardened brush. Hardware and paint stores sell strong liquid brush cleaners. It is similar to paint stripper but without some of the waxes or other bodying agents used in a stripper. Although brush cleaner has strong solvents, a hardened brush can take a few days to soften, and this is best followed by gentle soaking in mild solvent, spinning and careful reshaping.

Since soaking is quite effective and not labor intensive, you may want to build a simple tool to suspend brushes—see photo. It is vertically adjusted with a wing nut to accommodate brush handles of different lengths, and it solves the problem of deforming bristles of brushes left standing on the bottom of a jar or can. Use a container just large enough to accommodate the brush. For instance, a 16 oz rectangular can, cut in half, will hold a 3″ wide brush and use a minimum of solvent.

These are just a few ideas. Each of us develops our own brush cleaning methods based upon our personal experience. Your methods might be valuable for others who are trying to do a better job of taking care of their tools. Be sure to share your ideas and suggestions at any of the Guild's workshops or seminars. ■

Since soaking is quite effective and not labor intensive, you may want to build a simple tool to suspend brushes

Factory Tour continued

"which is one fifth the diameter of a spider web filament." According to Festool, this kind of high tolerance also leads to less user fatigue. All their tools must pass a drop test from 1.2 meters without serious damage.

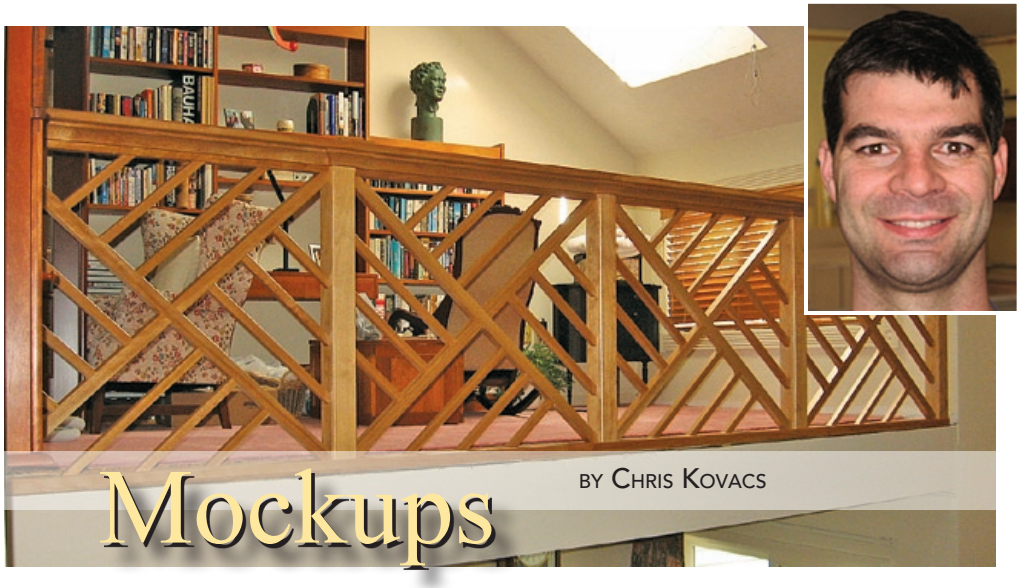
Most of their tools require no additional tools for making adjustments. Not having to search for the Allen wrenches again is a real time saver. The more information I read on Festool's quality control and the manufacturing standards they adhere to, the more I understand their motto—*Cost Effective or Worth the Cost*.

The icing on the cake is that if Festool upgrades an accessory for any given tool, they do so to allow existing tools to utilize the new accessory. Festool also gives their customers a three year warranty. They will even take back a tool when it has reached its end of life and recycle it back into raw materials to make new tools.

Before I took the tour and reviewed the literature, I had a hard time justifying the purchase of these high priced tools. Now I see that the quality and durability of a Festool tool is worth the expense. I have since come to the conclusion that manufacturing Festool tools is more like building custom furniture than I thought.

Most customers do not see the value in custom furniture. At first one must sit down with them and describe the quality and the attention to detail that goes into a piece. Only then does the customer see the value, realize that the piece will last and is worth the cost. Woodworkers and Festool build their respective products of high quality materials to perform a specific function and are built to last for years to come. The craftsmen at Festool are proud of what they build, as are the woodworkers using their tools.

I may not go out tomorrow and buy all the Festool tools I'd like to have (my accountant and my wife may still have trouble justifying that), but I will definitely replace defective old tools with the new Festool version. And who knows: maybe some of my existing tools are defective already! ■



Mockups

BY CHRIS KOVACS

Completed railing made of red birch. Using the mockup allowed the client to make significant design changes that increased the amount of open space in the design. Changes are easy to make with foam mockups.

Building a mockup can be a great way to get started on a new project if you are uncertain about how the final outcome is going to look. I have used mockups on numerous projects to help me determine size, scale, position of components, and thickness of parts. Building a mockup should be fast and made of inexpensive materials such as rigid foam, card board, tape, hot melt glue, 2x4 lumber, drywall screws or any other shop scraps. Spending the time building a mockup can be very beneficial, especially if you are building a piece for a paying client.

One reason to build a mockup is to fine-tune your two dimensional drawing as a three dimensional entity. If you have experience looking at drawings and blueprints, then you can often picture the final piece in your head. I have found that many of my clients *think* they can picture a finished product based on a two dimensional drawing, when in fact they really have very little practice in that skill. There is nothing more unsettling to a professional furniture or cabinet maker than to have a client say *Hmmm, that's not quite what I was expecting.* A nice mockup, shown to the client, is worth the time and effort to construct.

Let me tell you about an experience that I had that made me committed forever to making mockups. A very nice client commissioned me to build a fourteen foot long balcony railing. I went through numerous hand sketches until the client narrowed his focus. After that, I spent time at the computer generating several versions using CAD software. Each time the client saw the drawings, made comments and approved any changes. After half a dozen CAD drawings, I was finally given the approval to build the railing. With the drawings signed off and a check in my pocket I was ready to start building. The day before buying the lumber I realized that after so many design drafts, had I really captured every detail that the client wanted? Was there anything missing? I had spent enough time with this client to know that he was going to be extremely tough to please and that my skills as a woodworker were going to be thoroughly tested. The answer to these questions was to built a mockup and have the client approve the mockup, not the drawings.

Before I went shopping for lumber, I hit my local Home Depot and bought a few pieces of rigid foam insulation. Using hot-melt glue, double-sided tape and a short length of scrap molding, I built a full-sized four foot section of the railing. I brought this over to the client's house for him to look at, and even hold it in place where it would ultimately reside. His first reaction: *Hmmm, that's not quite what I was expecting* followed by lengthy list of things he did not like about the design. The mockup had been built to the exact dimensions of the drawing he had approved. It turned out that he was never really able to picture the final design in his head based on the CAD drawings.

I took the mockup and my bruised ego back to the shop and re-built the mockup. An hour later, I dropped the mockup off and this time the reaction was "Yes, that's exactly what I had in mind!" With a huge sigh of relief, I took measurements off the mockup, purchased materials, and several weeks later delivered and installed the railing to a very satisfied customer. In the end, the mock up cost me about $20 in foam and a few hours of time. This was priceless, as it saved me from an enormously uncomfortable situation had I built the railing based off the CAD drawings. The client really enjoyed the design process and was excited about his involvement in the preliminary stages. He recognized that the mockup helped him better understand the design, ultimately leading to a final product that he really appreciated.

In the weeks following this project my kids have used the mockups as a props in their play fort. Yet another use for the reliable and extremely useful mockup. ■

Simple foam mockup constructed after initial sketches and CAD drawings were complete. The full sized mockup was shown to client allowing them to visualize the final product at full scale and in its actual location.

BY CLAUDE DUPUIS

Pen Making

I taught my daughter Angela, on leave from the military, to make a pen—she's hooked. As I write this she is aboard the USNS Comfort and on the way to Haiti to help with medical relief. Godspeed to all those helping. My wife and I are very proud of her and I wish to dedicate this article to her. I hope to see her back in the shop soon.

Warning—one drawback to pen making is once you get started, it's hard to stop. Pen making is easy, lots of fun, interesting and maybe even profitable. I haven't experienced the latter. I did visit a booth in Vermont last year where the lowest priced pen was $70 and the most expensive was in the area of $350. Pen projects are a quick turnaround start to finish. You could get home from work, have dinner, watch the news and still have time to complete a pen, from scratch, that same night and still get to bed early.

The possibilities are endless using woods, acrylic, corian, stone, deer antler (photo 27 far right), water buffalo horn, dymondwood, colorwood, and corn cob. That's right corn cob. I have even made a couple of pens using snake skin. One was a diamondback rattlesnake skin and the other was a prairie rattlesnake (photo 27 on the right side).

Embellishments include Tagua nut (photo 27 in the center), wood, corian, pickguard and many more. The combinations are infinite. You're only limited you your imagination. I think anyone wanting to, can make a pen with some basic tools and equipment.

Like any woodworking project, you need to study up on the subject. Two good books are *Unique & Unusual Pens* and *Pens From the Lathe* both by Dick Sing. A good video is *Hand-Crafted Pens -The Basics* by Penn State Industries. A few good product sources are Penn State Industries, Craft Supplies USA and of course, Woodcraft.

What You Need

Assuming you have a lathe and a drill press, the first thing you need are some pen kits. Pick a pen style that you like— there are hundreds to choose from. Do not forget to get the bushings and the drill bits that go with the pen style you have chosen. They are very specific to each—photo 1.

Next you will need pen blanks, either store bought or made from shop scraps—photo 2. Most blanks are ¾″x5″. Some are ⅝″ for smaller diameter pens. You will need a pen mandrel, a barrel trimmer, a pen tube insertion tool, a pen drilling vise and a pen press—photo 3. My chisel of choice is a small gouge—photo 4. I haven't mastered the skew chisel yet.

You will need adhesives and abrasives—photo 5. I use gap filling CA glue and accelerator for gluing in the brass tubes. You could use epoxy. Use sandpaper starting at 150 grit. I like the multi-pack abrasive rolls ranging from 150 to 400 grit and the micro surface pen makers kit ranging from 1500 to 12000 grit—photo 6.

For a finish, I first apply *EEE-Ultra Shine* as a final sanding/polish. For the finish coat I use *Shellawax Cream* a shellac base friction polish that creates a waterproof high gloss finish in seconds—photo 7.

Getting Started

Make sure you have everything. Layout the pen parts as in photos 1 & 8. I have selected a *Jr. Gentleman's Pen*. The blank is olive wood. This pen style has two different brass tube sizes requiring a 25⁄64″ and a 15⁄32″ brad point bit. The top section bushings are 0.535″ and the lower bushings are 0.480″ and 0.460″ so proper alignment is critical.

Follow the directions carefully. When buying from a catalog you will automatically get instructions with the kit, but when buying at a store you may have to ask for the instructions.

Decide which end of the blank will be top and bottom to take advantage of a feature in the wood. With this pen top and bottom are different lengths. Cut the blank about 3⁄8″ longer than the brass tubes. Keep the blank wood grain alignment by using a reference mark—photo 8.

Cut to length on a chop saw trimming the blank from the ends with only a saw cut between them keeping the gap to a minimum so the grain alignment is as close as possible—photo 9.

Setup the drill press drilling vise. I mounted a piece of plywood to the bottom of the vice so that it was the length of my drill press table allowing me to clamp either end to the table. Center the vice by installing a drill bit, lowering it into the vise and closing the vise onto the bit. The vise is especially helpful when you are working with different size blanks. The size does not matter since it is always centered—photo 10.

The blank will heat up from drilling and it's a good idea to let them cool before gluing in the brass tubes. The heat in the blank can cause the CA adhesive to setup prematurely not allowing you to flush-up the tube with the blank. Sand the brass tubes to promote good adhesion. Clean off both the tube and blank. Hold the tube using the intersection tool. This prevents getting CA on your fingers—photo 11.

Apply gap filling CA glue to the brass tube. Insert the tube with a spinning motion to get full CA coverage. I'll flush-up the brass toward the reference mark end of the blank thus avoiding cutting off too much from the match point.

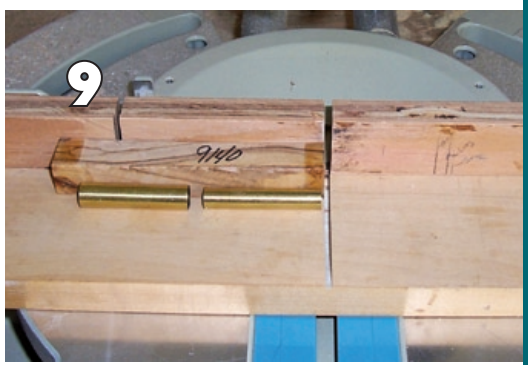
Here is a CA hint. Leave the cover off the CA container to avoid clogging up the tip. You need to cut off oxygen in order for CA to work. I store CA without a cap.

Hit the blank ends with accelerator, trim the excess wood at the chop saw leaving 1⁄16″ or so. Use the barrel trimmer in a drill to flush up the wood with the brass tubes—photo 12.

This squares the wood to the brass tube assuring a good fit with the abutting pen fittings. Check that the bushings fit easily into the brass tubes—photos 13.

Sometimes CA will get inside the tube at the end and this can easily be filed clean using a chainsaw file.

I like to keep the blank reference marks toward the top. Drill using short strokes evacuating the shavings often to avoid overheating and binding. Place scrap wood under the blank to help prevent chip-out and drilling the vise base. The blanks are purposely cut long in case of chip-out. This is why the reference marks are kept to the top.



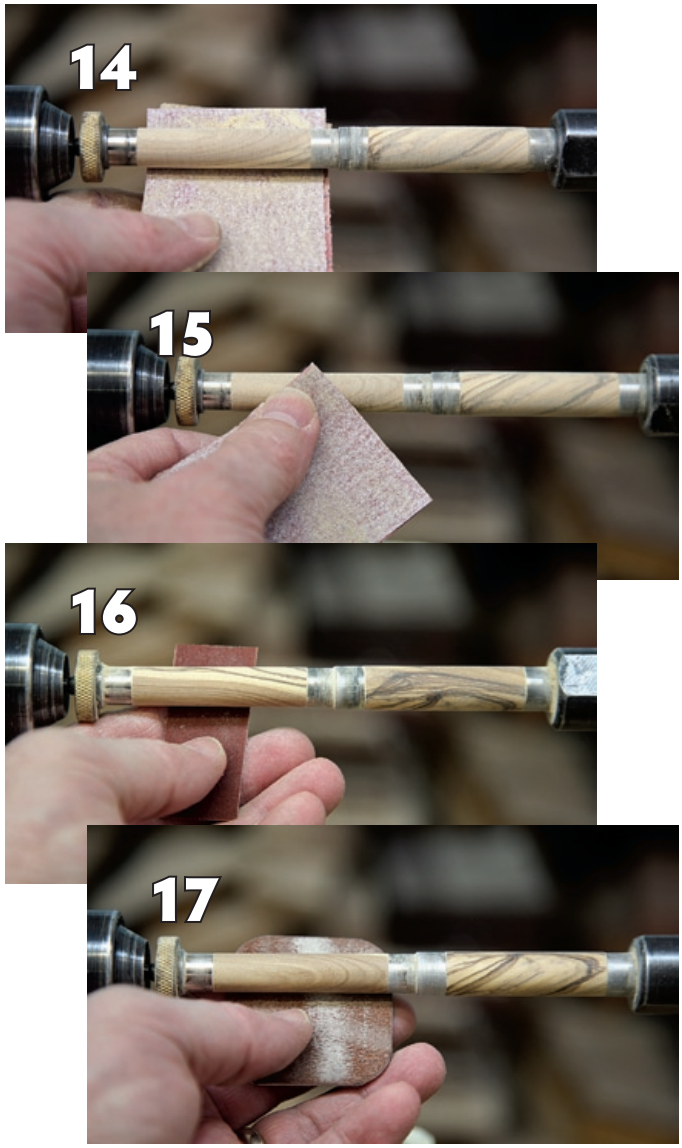
To the Lathe

Install the pen mandrel in the lathe. Adjust the mandrel length to match to pen length and tighten the lock nut. Insert the blanks with bushings being careful of proper bushing size and location. Keep the blank match line centered. Bring up the tail stock to steady the mandrel end (don't over tighten) and we're ready to turn. The lathe speed can be quite high due to the small size of the parts. Turn to a cylinder using a small gouge. Use light cuts—photo 14.

Bring the wood down to just proud of the bushings. The bushings are a guide to the finished diameter of the turning. *The difference between a well and not so well made pen is right here.* The goal is to get a perfect match to the pen fittings. Not all wood turns or sands alike so be careful. Close is not good enough. As the bushings wear from sanding, it may be necessary to use a calibrator to check for an exact pen fitting match.

Do the initial sanding with 150 grit sheet sand paper cut slightly longer than the blank and backed with a wood block—photo 14.

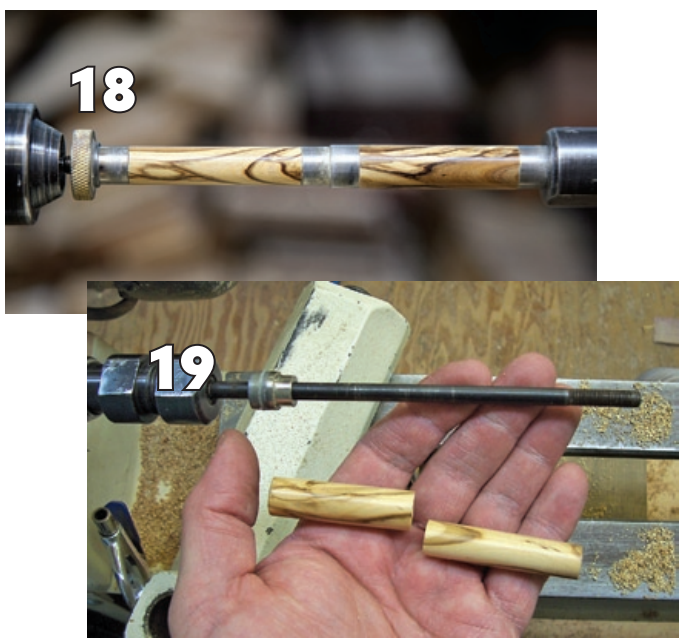
This will help flatten the blank between the bushings. Always sand with the grain (lathe off) between grits being careful to remove any defects as you go—photo 15. I will do this through 400 grit—photo 16. Using the micro pads (all defects already gone), we're just making smaller and smaller scratches. With the lathe on, using a light touch with each pad will do the trick—photo 17.



Finishing

I use *EEE-Ultra Shine* wax. It is an ideal base for a friction polish. It's not cheap but it works and will go a long way. Apply with paper tower with moderate pressure. Wipe clean.

Apply the finish coat using *Shell Wax Cream* again using a paper towel. Work from the center of the blank outward toward the bushings. Avoid picking up metal stain from the bushings onto the blank. Polish to an even shine. The blanks are now complete and ready for assembly. The nice thing about the friction finish is that there is no drying time. They are immediately ready to handle. Remove from the mandrel being careful to maintain the match line—photos 18 & 19.



Assembly

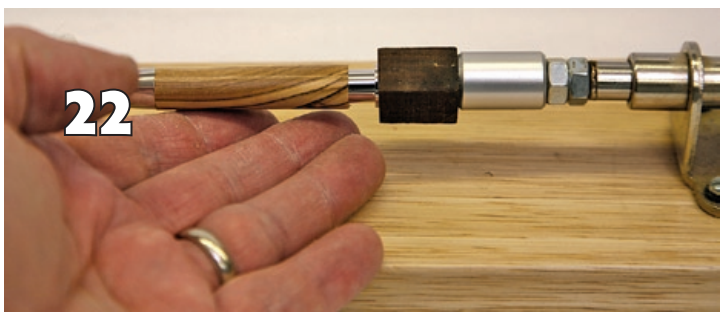
Place the blanks with the already laid out pen parts—photo 20. Using the pen press, assemble following the instructions in perfect sequence. Note the wooden press block used to protect the threaded coupler threads—photos 21, 22 & 23.

Sequence is important with some pen kits. Disassembly is difficult if not impossible—so be careful. Watch that parts are not skewed when pressing parts in place. Proceed slowly and adjust as needed. Align the clip to take advantage of a figured section or to hide a small defect. Assemble the two haves lining up the grain pattern. Presto you have a finished project—photo 24. Note the grain alignment.

Both pens in photo 25 are *Jr. Gentleman's Pens*. The one at the bottom was made from oak crotch wood salvaged from the wood pile and the other is olive wood from the holy land.

Pen parts come in several finishes. The oak one is 10K gold plated. The plating blends hard nickel and the beauty of gold together to form a brilliant plating that is durable and affordable.

The Olive pen is Rhodium. Rhodium plating is a member of the Platinum Group of precious metals. Rhodium's brilliance, hardness, and beauty has made it a favorite of fine pen makers as well as collectors.



See you in the pen isle—*Claude*. ■

24

25

Banister back chair. Maple with rush seat. Every part of this chair was made on the lathe. The back consists of split turnings with the flat side facing forward.

Turning Chair Back Legs

It may be hard to believe, but in the 1920s, in a misguided quest for modernism, most people were cleaning out grandma's attic and throwing away all the old furniture. Wallace Nutting of Framingham, Massachusetts realized what was being lost and began his mission to preserve this part of American decorative art history. In doing so he could be credited with single-handedly reawakening America's interest in its heritage of colonial furniture. Today, driving through central New Hampshire on Route 4, it's easy to see why this stretch of road is known as *antique alley*, and the popularity of *Antiques Roadshow* on TV are examples, nearly 100 years later, of the continued influence of Wallace Nutting.

Nutting started a factory in Framingham to make what we would call today *museum quality* reproductions, and feverishly collected antiques to use as models. Most importantly for woodturners and furnituremakers, he published many books about antique furniture. The best known is the *Furniture Treasury—Volumes 1 and 2* combined, published by Macmillan—ISBN 0-02-590980-0, that contains over 5,000 photographs, an amazing compilation of photographic documentation for that time (1920). When he died, much of his collection went to the Wadsworth Atheneum in Hartford, Connecticut.

In the late 80s, after deciding to devote myself exclusively to spindle turning, I entered what I call my *Wallace Nutting phase*. I made many pilgrimages to the Wadsworth Atheneum to study the collection of early Colonial furniture previously owned by him. I remember experiencing profound amazement while making close-up inspection of 300-year-old gate-leg tables and wondering what kind of lathes and tools were used to make them. As if through some magical force within this furniture, an ancient woodturner of long ago reached out across the centuries and spoke to me. *You should have been with us*, he said. *It was a great time for woodturners. All furniture design and production depended on us turners.*

I know, I know, I said. *I'm a spindle turner born in the wrong time.*

Don't worry, he said. *We built stuff to last, so some of it's still around, as you can see. Look at it, learn from it, carry on.*

I will.

Turned Chairs—*The Furniture Treasury* contains photographs of hundreds of chairs and most of them are turned chairs, meaning that all or nearly all of the parts are made on a lathe. The Carver chairs from the mid-17th century were made mostly of straight cylinders highlighted here and there with decorative turned details, especially the fancy finials. At the same time the more elaborate Brewster chairs had decorative turned spindles below

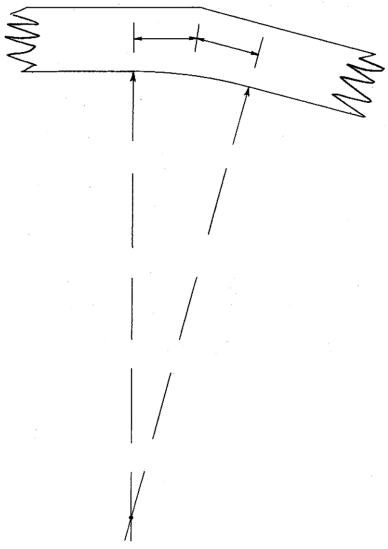


Figure 1

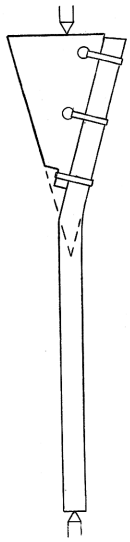
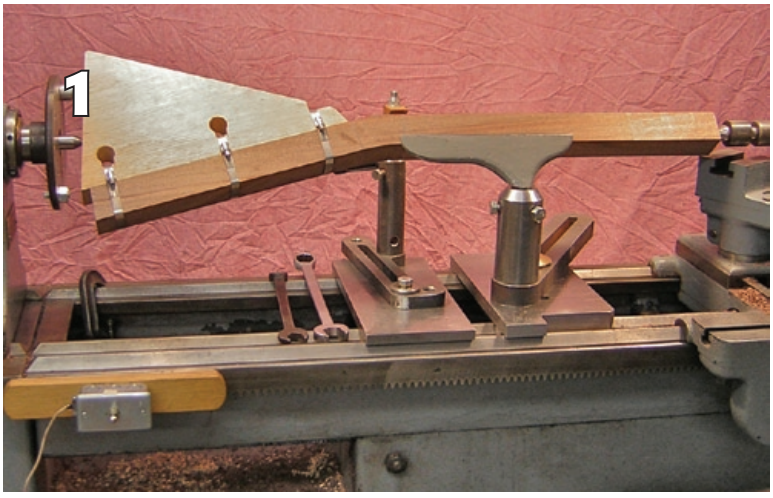
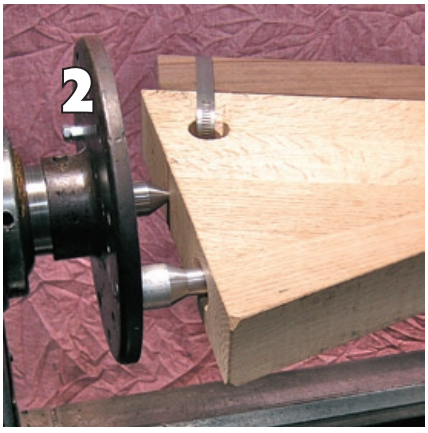


Figure 2

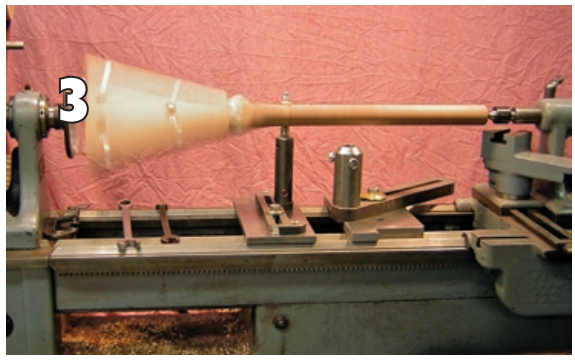


The workpiece has been attached to the jig with the hose clamps and mounted between centers on the lathe.

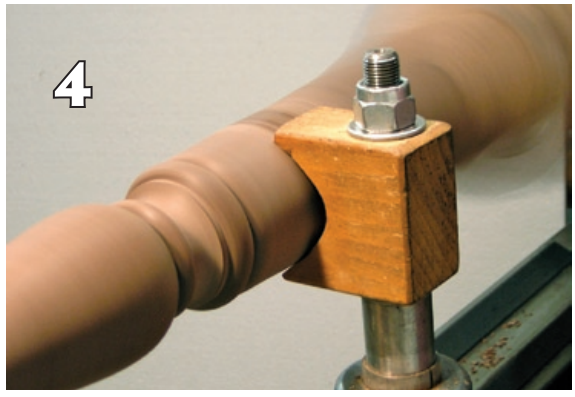


The assembly is located on the centers, and driven by a loose fitting pin.

After reducing the diameter in the middle area, the marking jig is used for a second time (jokingly referred to as "making a remark").



The work (top half) has been turned to rough size and the steady rest applied.



A view of the steady rest.

The marking jig has notches to locate the pencil, and marks are drawn while the work is rotating.

the seat. Corner chairs (now extinct?) and multitudes of slat backs are depicted in *The Treasury*. All of these chairs had back legs that were straight, and this simple but not very comfortable design persisted into the 18th century. But then chair design took a great step forward with the advent of curved or angled back legs. This feature allowed the back of the chair to recline while still giving the chair proper stance to keep it from falling backward. Woodturners responded by developing turning methods to produce multi-axis back legs for chairs. This article describes the method I use to make these legs, some of which is gleaned from old books, and some I invented.

Preparing the Stock—In this example, the angle of the bend is 16 degrees, and the angle is distributed more or less equally to the top (back of the chair) and the bottom (leg). The stock is first planed, and then cut on a band saw about ⅛″ larger than the finished size.

There is a short curved section where the turnings meet. Measure 1″ or 2″ above and below the intersection point (measure on the center line), and where these normal lines intersect is the center of curvature (Figure 1). This results in a curved section that is usually 2″ to 4″ in length, but it could be any length. Remember *not* to cut the inside bend to a sharp angle, but follow the curvature of the inside radius. Cut the bottom of the foot at the angle of the inclination of the leg. Leave about one diameter extra material at the top to cut off from the finial (Photo 11).

A spindle roughing gouge shapes the work quickly.

Construction of the Jig—The type of jig that I use (which I nicknamed the *gunstock jig*) is easy to make and easy to attach to the workpiece. It is designed on the following principles:

1. The jig should be constructed in the shape of an isosceles triangle (Figure 2) from wood that is the same thickness as the work so the assembly will be balanced automatically (Photos 1 & 12).
2. The jig should extend as far up the leg as possible to add rigidity to the work.

A series of stainless steel *hose clamps* passing through mortises in the triangular jig provide easy attachment.

After centering the assembly, I had a choice of driving the work with a spur center or mounting between centers with a dog. I chose the latter, because I wanted the minimum tailstock pressure. Of course, I did not want the tailstock pressure to cause the workpiece to slip in the jig, but also less pressure helps reduce workpiece vibration. The photo shows how the jig is dogged to the faceplate by a stud in a loose fitting hole (Photo 2).

The finial is the last part to be turned.

The Second Jig—If your leg is turned below the seat as well as above, then you need a second jig that is similar but slightly different

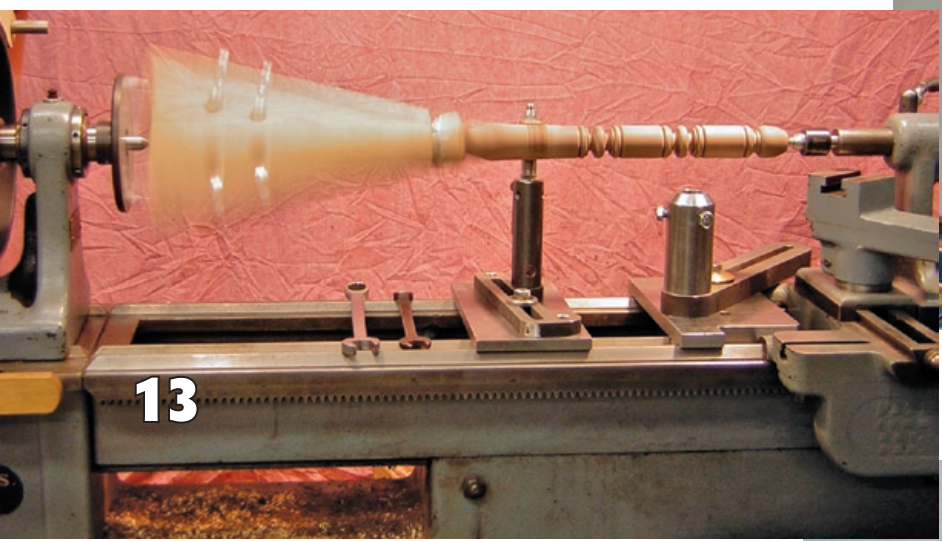
This is the appearance of the work before sanding. Sharp tools + careful work = less sanding.

This is one of the rare times you will see me scraping a spindle turning.

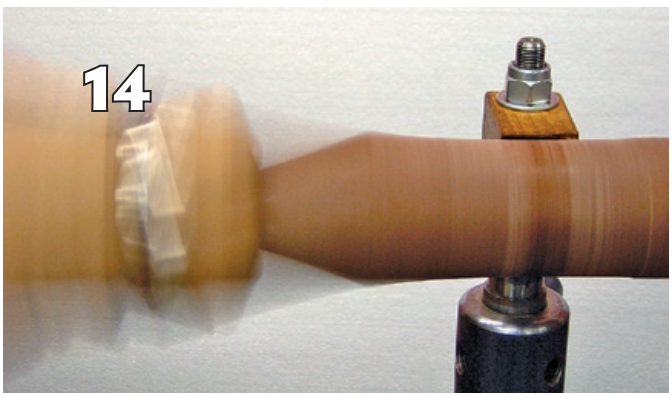
After sanding is complete, it's time to cut free.

The two turned sections merge into a ridge on the outside of the bend, while the inside is essentially finished.

Notice how the second jig is lined with leather to protect the finished part.



Lower part of workpiece has been turned and sanded.



At the transition, the turning flares into a "trumpet" shape.

A block plane works well on the outside of the bend, always planing away from the ridge line.

A spoke shave works into the curve on the inside of the bend, working toward the ridge line.

from the first one. The second jig has a vee-groove to accept the finished round upper part of the leg. This keeps things in alignment, as long as the jig and the leg are adjusted so that they lie in the same plane (Photo 12). When using the second jig, it is necessary to pad the surfaces of the groove and the clamps so that they do not damage the finished surfaces.

Making Adjustments—After the jig and the leg are assembled and placed on the lathe, the centering is tested and adjustments are made until it runs true. Adjustments are accomplished by making slight alterations in the position of the workpiece in the jig. To move the knee outward, pull the work further out of the jig. To move the piece laterally, slip the work to a slightly skewed position in the jig. With the second jig, it is not possible to skew the piece, because it rests in a groove, so the same effect is obtained by rotating it slightly. I like to put the work into the jig slightly long, because it is possible to adjust to a shorter position by loosening the clamps, and moving the work by tightening the tailstock until it slips. If it is necessary to make it longer, this requires removing the assembly from the lathe.

The Steady Rest—I always use a steady rest placed just outside of the transition area (Photo 4). The type of steady shown here consists of a soft wood shoe that has freedom to swivel on the vertical axis but has no movement up-and-down. I invented this type of steady, but it was inspired by the types shown in Frank Pain's book that utilize a wooden contact surface. The shoe touches the work at two points, and presses only from the back. This dampens the vibration and counteracts the pressure of the chisel. Because the front of the workpiece is unobstructed, this type of steady does not interfere with the tool rest, the woodturner's hands or the movement of the chisel.

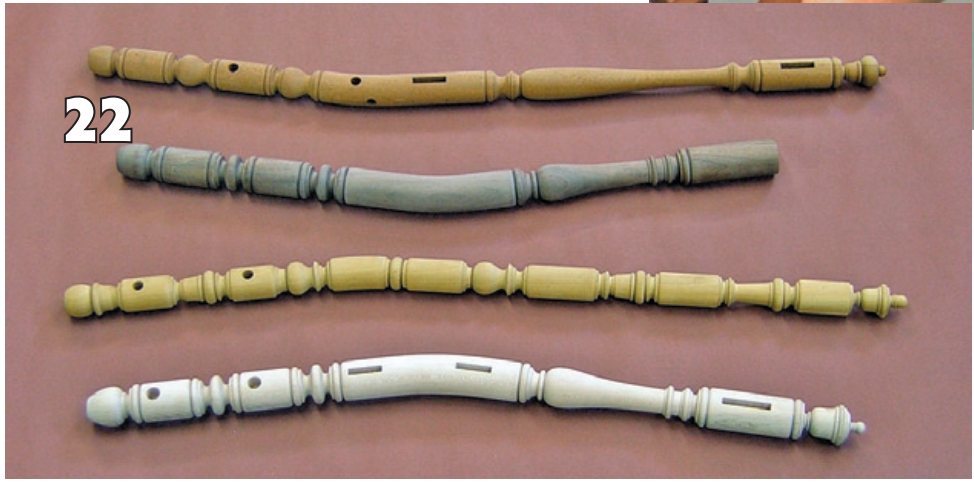
Working the Transition—It is very important that the *inside* line is sawn carefully to the circular arc, because this is the line you will follow while turning to generate a *trumpet* shape (Photo 14), and if carefully done, this will leave you with the minimum amount of hand work to do after the turning is complete (Photo 15). The outside line is simply left as a sharp ridge where the planes intersect. This serves as a reference point from which to take measurements. In theory the inside line can be finished right off the lathe, but some hand work is required with plane, spoke shave and files to smooth the outside of the transition area after the turning is done (Photos 16 - 21). ■

Frequent checking with a circular template keeps everything smooth.

A stiff sanding belt (about 150 grit) removes any remaining lumps.

Final hand sanding in the direction of the grain.

A double-cut file further refines the surface.



An assortment of back legs made for various projects over the years.

BY TOM MCLAUGHLIN

Laminated Curves

When it comes to creating curved parts, there are many methods from which to choose. The most basic is to saw the curve from solid wood, commonly used when making table or chair legs with some shape like Queen Anne or French, but not very effective for larger or stronger curves.

The best known method for making a strong curve in solid wood is steam bending, popularized in the classic bow back Windsor chairs, and the Thonet No.14 ice cream parlor style chairs. Once set up, steaming can be fast, easy and fun. But steam bending has its limitations. Not all woods respond well to steam, and *spring back*—wood not retaining its shape while drying—can make things a little unpredictable.

Other methods that share similarities and limitations of steam bending are simply applying a hot clothes iron on wet thinner stock, or the "heat pipe" method as popularized recently by frequent *Fine Woodworking* contributor Michael Fortune in his stylish contemporary curved back slat chairs.

Laminated Bending Technique—But when the project calls for creating a strong curve in a solid wood not friendly to steam methods with reliable and repeatable accuracy, *laminate bending* is the method of choice.

In a nutshell, laminate bending consists of making a curved form that is the desired shape, gluing up multiple thin layers of wood, and clamping them to the form until the glue sets and freezes the layers to their new shape, identical to the form.

A recent round table commission required just these attributes. The table top design was simple, a round solid mahogany slab. The base is where things got interesting. It would consist of twelve sweeping solid wenge curved staves encircled by two hand forged iron rings, a narrow 9½″ diameter ring appearing to cinch the waist together like a bale of wheat. There was also to be a larger 25″ iron ring around the staves at the floor level. The hand forged iron was by Garry Kalajian, owner of Ararat Forge.

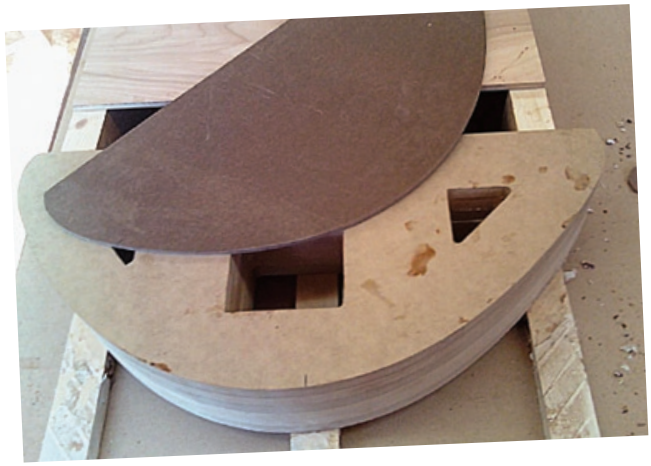
Making the Curved Pattern—The design and shape of the base begins with a full size drawing of the table profile. The table height and the diameters of the top and iron rings define the curved limitations of the staves. Once the inside arc of the curve is drawn, the shape is transferred to ¼″ thick masonite to make the pattern. Tracing paper can work well but I like to stipple directly through the drawing with a sharp pointed awl into the masonite below. Then the curve is recreated in the masonite stock by connecting the dots. Finally, the pattern is sawn out with a jigsaw or band saw and refined smooth with files.

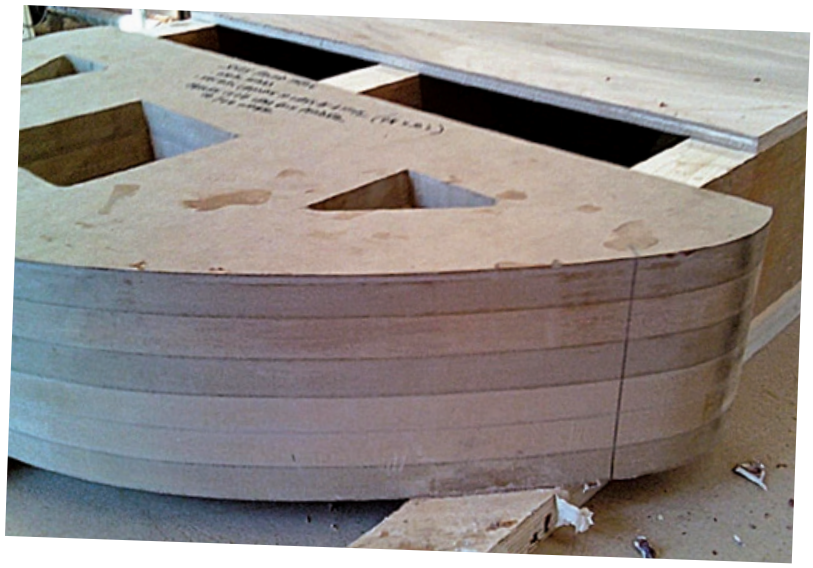
Making the Bending Form—The bending form is built up with layers of ¾″ thick

MDF high enough to fully back the width of the curved lamination. The first MDF layer is made by flush routing the shape using the masonite pattern as the guide. Be sure to make the pattern overly long to allow for some extra length of the laminated staves to be trimmed from each end. Then the rest of the form is simply made by attaching each MDF layer to the next, flush routing to the previous layer as you go. Note the various hollowed areas of the inner form to lighten up the overall weight.

With so many laminations to shape, I decided to make my form double ended to cut the actual number of glue-ups in half. It is also helpful to indicate the key points on the curve (top, bottom and center) by marking lines directly on the form. It also helps in the gluing up phase if the form is up off the table a bit to allow for the glue to drip clear, so a few cleats were added at various intervals to the bottom of the form.

Since the worse thing that can happen during glue-up is gluing your lamination to the form itself, the form needs to be protected from the normal glue squeeze-out that occurs. I have used various methods—a layer of paper or applying a good coating of paste wax to the form. But my latest favorite method is to simply cover the form and support cleats with clear plastic packing tape.





Preparing the Laminations—Wenge is a strong fibrous wood, so it took some trial and error to determine the thickness the wenge laminations needed to be to bend without breaking around tight curve of the form. You will need to resaw and dimension the laminations to thickness. A thickness sander is ideal for getting things smooth and uniform. Keep the laminations in the order they were resawn for the ultimate glue joint match.

For my table base, I discovered ten laminations, a heavy 1/16″ thick would make the bend comfortably and yield the ¾″ stave thickness I was after. The finished staves at their widest point needed to be approximately 3¾″, so I made the rough laminations 4″ wide.

The laminations are shaped and held to the form with 2″ thick strap clamps. These clamps are strong and exert a lot of pressure. So two layers of ¼″ thick hardened masonite the same as the 4″ width of the laminations, are used as cauls between the outer layer of wenge. The strap clamps distribute the pressure evenly and don't leave pressure indentations behind. In this case, the curve was too strong to bend ¼″ thick masonite without breaking, so four layers of ⅛″ masonite were used for the caul instead.

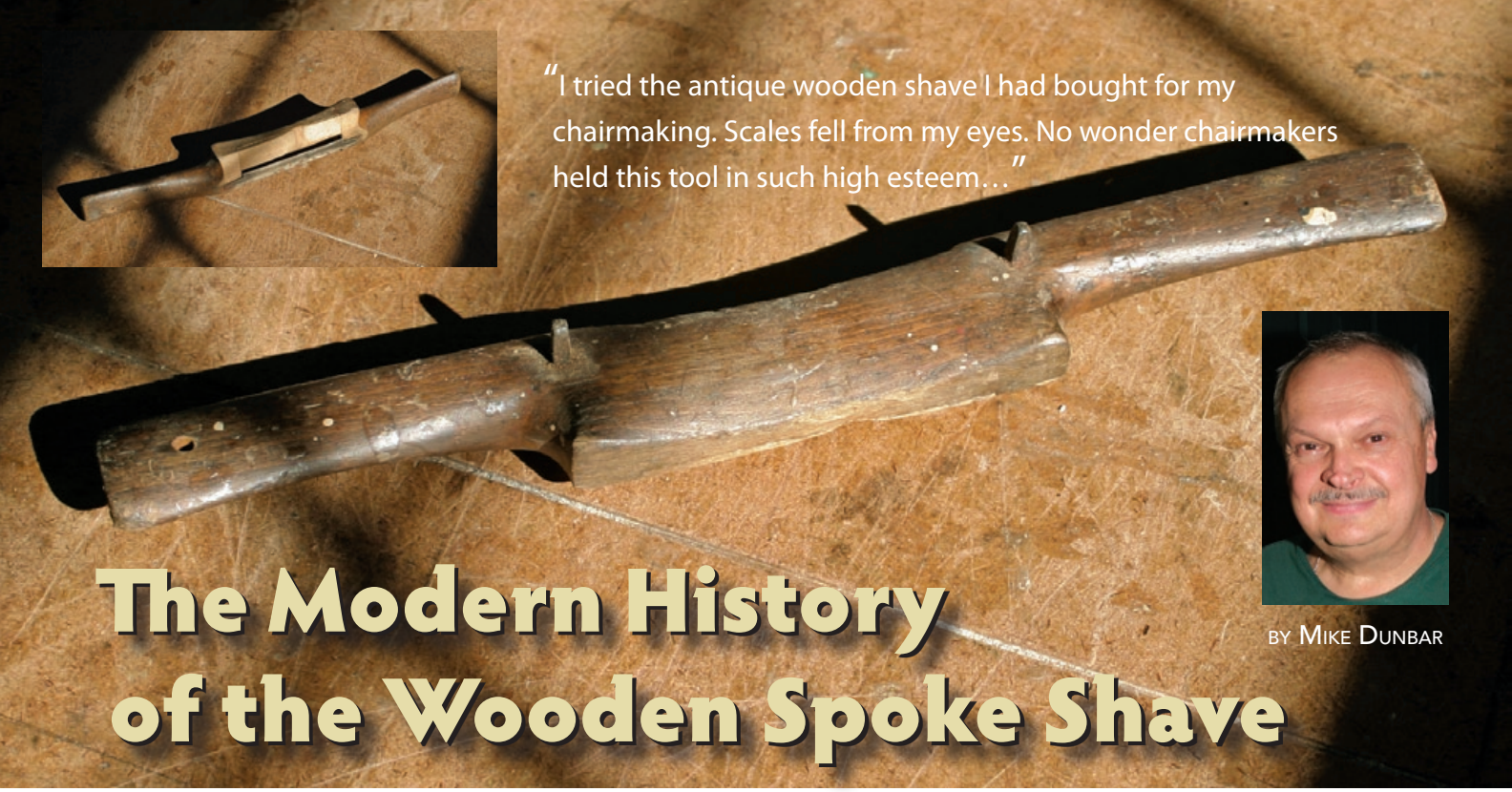
Gluing-Up—A half-length adhesive or foam roller is perfect for spreading the glue between lamination layers. But not just any glue will do. The typical white and yellow wood glues remain flexible when cured and allow laminations to *spring-back* from the desired curve.

For laminated bending, a urea formaldehyde based glue is best. These glues offer long open times, helpful to getting things covered and clamped in place with little stress. But even better is the brittle rigid nature of the glue when cured, locking the laminations to the desired shape reliably every time.

Urea formaldehyde glues are available in two brands as far as I know. The first is Unibond 800 (available from Vacuum Pressing Systems—*www.vacupress.com*). This is a two-part glue consisting of a thick liquid to which must be added a powder catalyst. The liquid portion of this type has a shelf life of about one year, so I usually prefer to buy an all powdered form—VAK-Bond 2000 available from Quality Vacuum Products—*www.qualityvak.com*. This powder mix has a long shelf-life to which you must simply add water.

Shaping the Laminations—When the laminations are set, a paint scraper makes quick work of removing the excess hardened glue from one edge. Once roughly scraped, the edge can be jointed to create a true straight edge. The true edge is then referenced against the band saw fence and the lamination is ripped to finished width.

The reference lines of the laminations top and bottom points can be transferred from those marked on the MDF form by fitting the lamination curve snuggly, back up against the form. Once they are cut to the desired lengths, the laminations can be further custom shaped to the given project design requirements. For my wenge table base, each lamination was narrowed into the waist ring area and flared out wider toward the top and bottom. ■



"I tried the antique wooden shave I had bought for my chairmaking. Scales fell from my eyes. No wonder chairmakers held this tool in such high esteem…"

The Modern History of the Wooden Spoke Shave

BY MIKE DUNBAR

People who are new to Windsor chairmaking, or have come to it in the past 15 years or so, assume various chairmaking tools have always been known—have always been available.

Not so. There was a time when many chairmaking tools were not only unavailable, but few woodworkers had ever even heard of them. After disappearing for a century or more, they are again being produced because of *The Windsor Institute*. Over the years I actively sought people with the skill to make tools. I worked with them to develop their products. Then, *The Institute* provided a ready market of customers to them. This last point is important, because without the steady pool of customers created by our students, these toolmakers would have likely failed financially.

When I first started making chairs and did not know much about tools, I used a drawknife for most work. While very dependent on the draw knife, I could not help but be intrigued by the New York City Chairmakers Society's coat of arms from 1825. I had found a copy of the banner in Thomas Ormsbee's book *Early American Furniture Makers*. It bore a bit brace crossed with a wooden bodied spoke shave.

I understood the importance of the brace to chairmakers, but the meaning of the spoke shave eluded me. I mentioned the coat of arms to a friend who restored buildings and who was rediscovering 18th century building techniques—as I was rediscovering Windsor chairmaking techniques. We both did a lot of poking around looking for and acquiring old tools. I remember his comment about shaves, "Every woodworker must have used them. What else could explain why I see them everywhere?"

He had lit a light bulb for me. As soon as possible, I went out to some of my favorite haunts and purchased a likely wooden spoke shave. I ignored the shaves with cast iron bodies, because I knew they were developed nearly a century after Windsor chairmaking had disappeared, and had never been used by chairmakers.

I tried the antique wooden shave I had bought for my chairmaking. Scales fell from my eyes. No wonder chairmakers held this tool in such high esteem that they would choose to cross it with a bit brace on their coat of arms! I immediately understood that for a chairmaker, a wooden spoke shave was a crucial tool. Also, I quickly learned that it was the nearest thing to a woodworking magic wand. With it, I could almost will away wood. My hand became an extension of my eye. I envisioned the result I wanted and it occurred. Wood disappeared effortlessly leaving behind a surface far smoother than anything I had ever achieved previously. I recognized the spoke shave's gentle track. It was the same track I saw on all the antique chairs I examined. I had found my way home.

I taught my first Windsor chairmaking class in 1980 at Brigham Young University. In doing so I taught what I belive to be the very first Windsor chairmaking class in history. The old guys didn't teach classes, and in 1980, as a Windsor chairmaker, I was working pretty much all alone. Dale Nish had invited me to be a presenter at the *Woodworking West: State of the Art* conference. He also asked if I would stay an additional week and teach. I agreed and we set a limit of 20 students. He called a couple of weeks later to tell me the class was full. He had so many others clamoring to get in on the experience, that he was inviting me to stay an additional week and teach a second class.

Dale asked me to provide a list of tools the students would need, and he would acquire them. I perused a Woodcraft Supply catalog and sent Dale a list of stock numbers for their draw knife, scorp

(inshave), etc. At the time, the catalog also carried a wooden spoke shave made by (I believe) Marple. I included it on the list, as well. Dale bought a quantity of each tool, enough for a class of 20 students.

None of the tools worked. In fact, I concluded that they were not really tools, as the nature of a tool is to accomplish work. These items performed very poorly, or not at all. Ergo, they were not tools, just bad reproductions that looked somewhat like my tools. I commented that "These items were completely useless. They would not work wood, and were not heavy enough to use as a boat anchor."

This is about wooden spoke shaves. So, let me focus on the problems with the pitiful device we were trying to use, and ignore the scorp, draw knife, etc. for another time. Remember, I had selected these items from a catalog, and had only seen pictures of them. Until this class at BYU, I had never used one, or even held one in my hands.

I showed the students how to whittle spindles using my antique shave, and they set about to do the same. Soon, I was overwhelmed by guys asking for help. Each time one tried to use a shave, it rolled toward the user and the cutter pulled loose. For the first time, I actually examined one of the "tools." The sole was round, very much like that of the compass shave Dave Wachnicki makes. The cutter's tangs were square and loosely fitted into round holes.

When a student tried to whittle with the device by pulling it, it rolled forward on the round sole. The square tangs then pulled loose from the square holes. I compared this to my shave. Mine had a flat sole. The tangs, while square, were also tapered, larger in section at the bottom, and smaller at the top. These tapered square tangs were fitted into holes that were themselves both square and tapered. This type of hole is known as "broached." Thus, the tangs of my cutter, fit securely into their broached holes with a self-locking friction fit.

One by one, I performed meatball surgery on the so-called shaves. I planed off the round sole and glued on a flat piece of wood. I stuffed shavings around the tangs to create some holding power. Multiply the time I needed for this surgery by 20 students, and you can see that these items were a disaster. I was frustrated and Dale Nish wasn't so pleased about the money he had spent to buy these useless implements.

When I returned home I contacted Dick Dabrowski, a friend of mine who was at the time vice-president of *Woodcraft Supply* in Woburn, MA. Dick now owns *Shaker Workshops* and *Cohassett Colonials*. I chided him for carrying that item in his catalog. Dick explained that the stock had a round sole because the factory had made it by turning it in a lathe! The object immediately disappeared from Woodcraft's catalog, and to the best of my knowledge Marple soon dropped it from production.

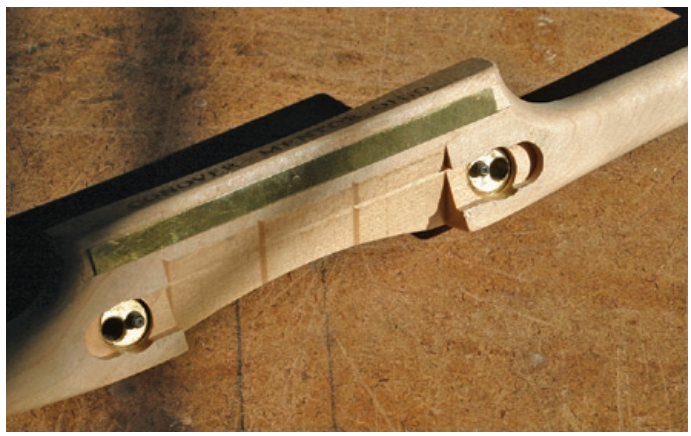
I had learned a painful, but important lesson. A lot of hand tools look good in pictures, but are really just junk. If they work at all, they only work poorly. Why? Most tools are produced by people who don't use them, and who do not seek input from people who do use them. For example, Marples did not understand why turning a spoke shave body in a lathe and obtaining a round sole was a bad idea. After all, the turned stock looked something like a spoke shave. As a result of no user input during the design, many items you see for sale just look like tools. They are not tools, because they fall outside the most important part of the definition of a tool—it must perform its intended job.

I wish I could say that 27 years later the situation had gotten better, but I can't. A lot of hand tools are still junk, and you buy them at your peril. If you do, you lose four ways. 1–You waste money. 2–You can't do good work. 3–Your self esteem is damaged. You see hand tools at work in the magazines, and assume your poor results are your deficiency. 4–You end up relying on machines to do everything, no matter how inefficiently you are working.

John Kelsey (the founding editor of Fine Woodworking) put Ernie Conover and myself together and how Ernie and I became lifelong friends. In 1981 Ernie and I also started a school, and for the first time in history, we developed a regular schedule of Windsor chairmaking classes. In doing so, we faced the same problem I had working with Dale Nish. *Where do we find a supply of tools?*

Ernie provided the solution. He would make them. Ernie ran Conover Woodcraft, a company that already manufactured tools. He would add chairmaker tools to his product line. Like Leon Robbins a decade later, Ernie did it the right way. Before going into production he found out from a tool user (me) what

An example of Ernie Conover's spoke shave with set screw adjustment and modified handle.



features each tool required to function well. This method of tool development eliminates junk. Ernie only had to tweak his prototypes to arrive at tools that were as good as the ones the old guys worked with.

Ernie sent me the first spoke shave off the production line. I adjusted it, and first pass it cut as well as my antique shave. I retired my old shave, and for many years used the very first one Ernie had produced and given to me.

Ernie's shave was made of a very hard tropical wood known as Indian teak. I'm sure that was just the wood's commercial name and it was not really teak. He reasoned that it would wear better than the traditional beech. In time, even this wood would develop a dip in the sole from whittling spindles. Ernie solved the problem in a later production run by inletting a strip of brass into the sole. He held the brass strip in place with epoxy.

However, his method of securing the cutter, and adjusting it was the true genius innovation that endures today. Ernie inserted two pieces of round brass into the stock. Each brass insert had two holes, one larger than the other. A threaded cutter tang passed through the larger hole, and an off-the-shelf brass battery nut was screwed to the top of the tang. This secured the cutter in place.

The smaller diameter hole in the brass insert was threaded and had an Allen screw fitted in it. The Allen screw could be adjusted up and down to increase or decrease its projection from the bottom of the brass insert. The brass battery nuts pulled the cutter up securely against the Allen screws. Thus, adjustment was very easy, very accurate, and secure. It was clever development and typical Ernie Conover.

Ernie and I taught lots of classes together and he provided a lot of tools (especially spoke shaves) to our students. Time passed. Ernie put much of his talent and genius into developing a wood bed lathe that itself became a classic. Eventually, Ernie sold Conover Woodcraft. Someone else was now producing the lathe, and the spoke shave.

About the same time, Susanna and I founded *The Windsor Institute*. Once again, our students needed tools. For a spoke shave, I directed them to the company who had bought out Ernie. Surprise, surprise. As in 1980, I found myself surrounded by students who could not make their brand new shaves work. Somehow, the tool had changed. Not being someone who used tools, and not knowing how a spoke shave worked, it was predictable that the new maker would botch a perfectly good design.

When students put the tool to use, it quickly choked. The cutter's bezel and the wear (the upper surface of the inlet cut out of the stock) should diverge. This creates an increasingly wider passage, which allows the shaving to find its way out of the shave. Think of the shaving passing up from the bottom of a funnel and out the wider top. On this botched shave, the two surfaces actually converged. Thus, the shaving was pushed into gap that grew increasingly narrow. Think of pushing the shaving down into a funnel.

As in 1980, I once again began each class overhauling everyone's spoke shave. At the time, Dave Wachnicki was working with me as a chairmaking instructor. He and I performed many of these surgeries each class. Fixing shaves started Dave off on a quest to understand shaves, somewhat similar to the one that sent me off to understand Windsors. Dave began to examine spoke shaves (old and new) up close and in detail. Eventually, he began to try his hand at making them.

Around 1999, Dave went off on his own and started Dave's Shaves. *The Windsor Institute* provided him with a steady flow of customers, and he provided us with a supply of very dependable spoke shaves. While I missed working with Dave, I certainly I did not miss overhauling a bunch of shaves every Monday morning. To this day, Dave's shaves are the official shave of *The Windsor Institute*.

Dave made his own wooden spoke shave bodies. However, he purchased his cutters from the guy who had bought out Ernie. Thus, like Ernie's before him, Dave relied on the same brass battery nut technique. He also used the same distance between holes that Ernie had established 10 years earlier.

Dave had replaced Ernie's brass adjustment insert with a very clever and simple system. He placed two Phillips head wood screws into the stock under the cutter. Adjustment was made by simply advancing or backing out the screws. It was as easy and sure as Ernie's method, and less work.

As a furnituremaker turned toolmaker, Dave was real fussy about his tools' appearance. Perfectly selected wood with a perfect finish became his trade mark. While *Dave's Shaves* work every bit as well as the old ones, his are also works of art.

The company that had bought out Ernie eventually went out of business. With it, went Dave's source of cutters. He sought out Ron Hock, and worked with Ron to develop a cutter patterned on the old Conovers. Dave's new source retained the threaded tang and the same distance between them. However, as Dave developed both larger and smaller shaves, he needed blades of varying sizes. He worked out these dimensions himself.

Dave's success in making shaves began to attract others who also began to produce and sell these tools. Jack Goosman was

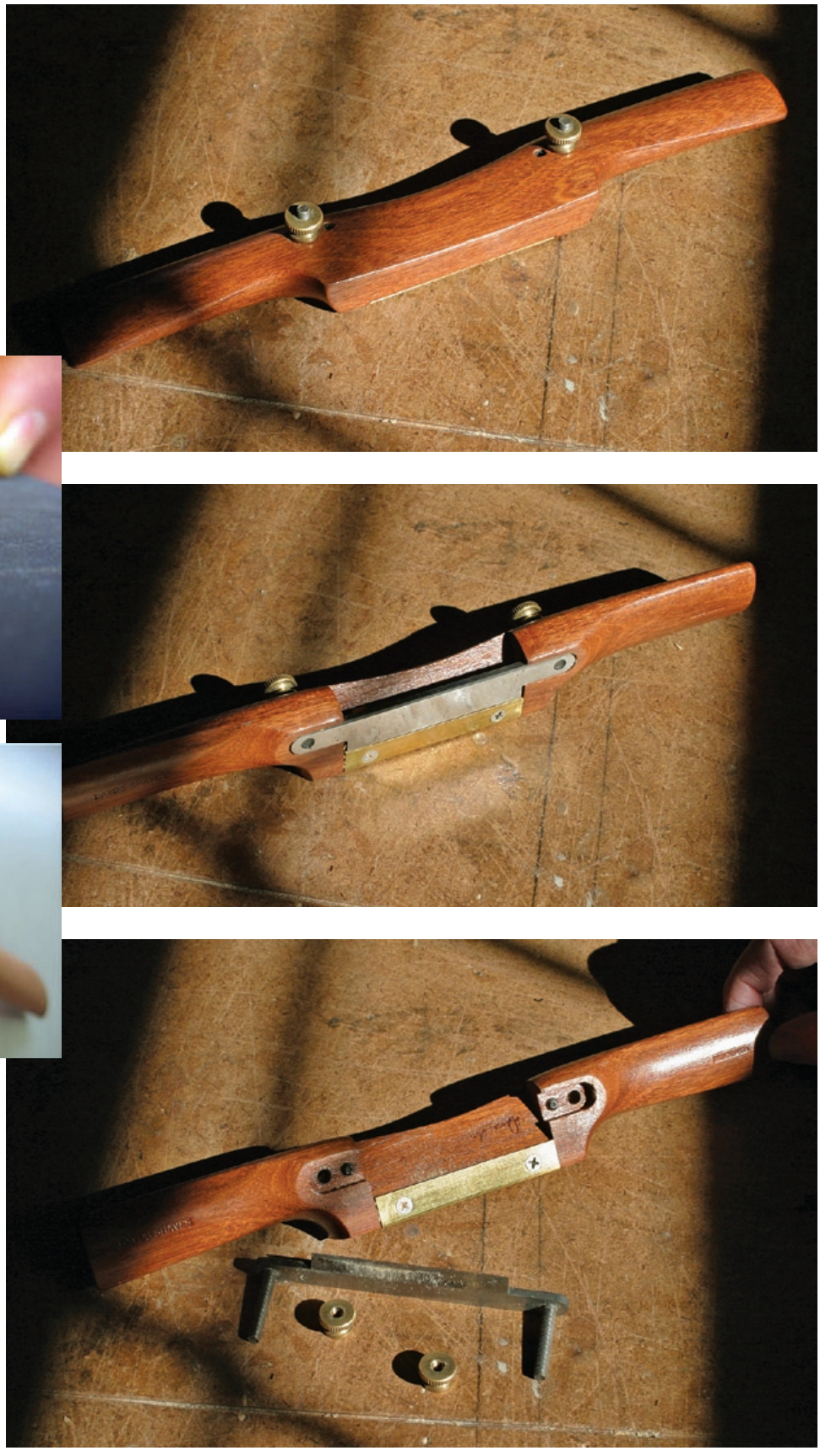
Dave's Shaves No. 1 Standard

Dave's Shaves No. 3 XL Custom

one of the first. Starting in 1996 Jack took several classes with us and saw the tools we were using. Jack tried his hand at dealing in antique tools, and brought his wares by each class to sell to students. I'll confess to having bought my share from him. Next, Jack decided to produce new tools. His first effort was a copy of a Stanley 85. As with his antique tools, he experienced some success by bringing his shaves to classes and selling them to our

continued on Page 37

Dave's Shaves—There are two ways to set up the blade or cutter relative to the sole. It may be either exposed equally side-to-side or one side may be set higher than the other—this is known as cocking the cutter. Cocking the cutter allows you to adjust the shaving thickness while you work without readjusting the blade. Simply move the shave laterally relative to the work piece to achieve a thicker or thinner setting. This is possible with a shave because it is a whittling tool, not a jointing tool like a handplane—*www.ncworkshops.com.*



Recent example of Dave's Shaves spoke shaves—wooden body, Hock Tools cutter, brass retaining nuts, brass sole plate and top-side blade allen adjusting screws.

Maple Syrup

by Ron DeWitt

The maples of the world number about 120 species and 14 of them are common to North America. The commercial value of the maples is considered to be equivalent to that of the almost 500 species of the world's oaks. Most important of the maples is the sugar maple (Acer saccharum), also called hard maple or rock maple, valuable for its furniture and bowling pin wood as well as its maple products. The range of the sugar maple extends across eastern Canada and from Maine to Minnesota and south into Indiana and West Virginia.

March is the season for maple syrup, the most notable of maple products. America's oldest agricultural commodity and the first agricultural crop of the season in the northeast is maple syrup. A few drops of sap from a broken branch over the driveway, about the same time we hear the trills of the first red-winged blackbird, is our usual signal for the beginning of maple season.

Sugaring is a rite of spring, the first respite from winter's cabin fever. About this time of year we get impatient for the big dose of fresh air and exercise that goes with the process. My operation is quite small compared to the serious maple producers. It takes about a day to set up our 2′x3′ evaporator in the sap house, a 10′ addition to the old cow barn. Small as it is, it does provide a very cozy shelter from the inevitable wind, rain, snow and sleet of early spring. It also provides easy access to the full cord of dry hardwood required to produce the 20 gallons of syrup we try for each year.

Weather is key to maple syrup making. Tapping too early results in holes drying off. Too late and we miss the best quality sap. We use a hand brace with a 7⁄16″ drill to tap an assortment of our sugar maples and an occasional black maple (Acer nigrum). A tree 10″ in diameter gets one tap while the 5′ diameter monarchs in the yard can handle about 5 taps, roughly a tap per foot of diameter. Any maple produces sugar-bearing sap but we don't bother with the soft or red maples, silver maples or the boxelders because of their low sugar content.

A few guidelines are useful when tapping. Trees with large open crowns produce best. Taps are placed low on the tree—two to three feet above the ground depending on snow cover. South and west sides of trees flow earlier and heavier—*east is least*. A tap over a large root or under a big branch does especially well.

Previous tap holes are to be avoided—by 4″ side to side and 12″ above or below. This can be quite a challenge on mature trees with dozens of old hole scars. A 3″ deep hole, drilled slightly upward should remove a couple inches of wet, creamy-white sapwood to produce good flow. If the drill produces only dry brown chips, we forget that hole and make another. On a sunny 40 degree day, sap will flow immediately, almost gushing, which helps flush the hole clear of chips. Sap pressure has been measured as high as 20 psi in fresh holes. Heaviest flow will usually occur on a sunny 40 degree day after a 25 degree night.

Generally, the longer the boil the darker and more flavorful the syrup, so the higher sugar concentrations in sap produce lighter grades (lighter color) of syrup. Syrup produced later in the season is usually darker.

During the boiling process various sap compounds precipitate out into the bottom of the pan as "sugar sand" or niter, a sludge of calcium oxylate. When the hole is washed clean of chips the tap or spout is driven lightly in, firmly enough to seal the hole but not hard enough to split the tree—surprisingly easy to do to a frozen tree.

Early Americans, who learned sugaring from Native Americans, whittled spouts of sumac sticks after pushing the pith out with a sharp probe. A 16-quart bucket is hung from the spout and a weather lid is set. An average day will yield one to three gallons of sap per tap although several of our trees may occasionally overflow their buckets. A heavily tapped tree only gives up about 20% of its available sap. We usually set out about 60 buckets on 30 trees to finish that job.

I made Judy a nice form-fitting basswood shoulder yoke so she can carry a pair of five gallon collecting pails. We collect daily, if it runs, to get the sap quickly into the cool of the storage tank in the barn. This helps avoid bacterial action that seems to begin at about 40 degrees and can spoil sap. Heavy snow and snowshoes make the job more difficult. On cold nights, water tends to separate from the sap and freeze first. Unless temperatures get very low, sugar content can be concentrated by draining

Maple Syrup continued

and removing ice from buckets before it remelts. Every little bit helps. A trickle of sap from the reservoir is set to maintain about an inch of sap in the pan on the arch, as soon as the fire gets a rolling boil in the pan.

Wood is added every five minutes. First syrup is ready to draw in an hour and thereafter we expect to draw off a quart an hour. Our best days produce nearly three gallons of liquid gold. We use a syrup hydrometer to accurately finish syrup to the final temperature on the kitchen stove. This also makes it easier to do the final filtering. Syrup goes in the cans and is sealed at about 200 degrees.

Syrup can be preserved indefinitely if kept sealed and in a cool, dark place or if refrigerated after being opened. The maple season may extend from late February into April and is wholly weather dependent. Although sap flows most of the year, sugar flavor and content is best in early spring. Syrup flavor becomes unpleasant with a "buddy" taste after a few consecutive warm days and nights cause the tree buds to begin to swell.

We're usually a bit relieved when the season is over in spite of facing a big cleanup job. We often breakfast in the sap house while boiling and the first picnic lunches of the year are there. Social life begins anew as friends and neighbors drop in. And it's great having a cabinet full of syrup packed away in the cellar.

In contrast to our little operation, commercial producers may tap with power drills and set plastic spouts piped to holding tanks with plastic tubing. Flow is encouraged by pulling a vacuum on their pipelines. They may also filter through reverse osmosis units to remove about half the water. All of this is controlled by sophisticated computers assuring correct sap and fuel flow, syrup draw and temperature in a continuous round-the-clock operation.

That doesn't seem like as much fun to us, but then our neighbor did make 2600 gallons of syrup last year, to our 21 gallons. New England is the primary source for maple syrup in the U.S. New York state, with about 210,000 gallons, is third in production behind Vermont and Maine. Total annual U.S. production is about 1.25 million gallons, or about half Canada's production. Of special note was the 1860 season when U.S. production hit a high of 4.2 million gallons—a year of record high sugar cane prices.

The production of syrup from maple trees is a fascinating process. This is the season to visit a sap house in your area for an educational afternoon of fun. Enjoy another of the wonders of trees. ■

Spoke Shaves continued

students. I still have the one he gave me.

Jack was both under capitalized and unable to make his own parts. He jobbed out all the operations. This left him with little profit, and he eventually stopped making his shave. However, he was the first in a string of people that having become aware of the market we had created for spoke shaves, sought to enter it.

One result of these new entries was an increased buzz about wooden spoke shaves among mainstream woodworkers. Awareness of this type of tool grew, as more woodworkers used it and found out effective it was. The magazines too, learned about this heretofore forgotten tool and joined the chatter. They published articles about shaves. They did tool reviews. They included woodworker-made shaves in their sections of reader work.

This increased noise about wooden spoke shaves in mainstream woodworking attracted the attention of larger, toolmaking companies. Like sharks attracted to smaller fish feeding, they moved into the market. Sensing the chance to cash in on the growing number of chairmakers being trained here, they tried their hand at developing wooden spoke shaves. One company even developed a low angle spoke shave with a metal body. The same company is now offering a kit for people who want to make their own wooden shave.

It is important when you see these shaves to remember that there was a time when this tool was forgotten and unknown. It was brought back from oblivion and reestablished to provide a source for my Windsor chairmaking students in 1981.

Ernie Conover worked out a practical design that continues to dominate. As I have noted previously, chairmakers who are new to the craft assume the tools and sources were always here. Not so. It all has its origins in the Windsor chairmaking class that I developed in 1980 and continue to teach at *The Windsor Institute*. ■

What about Metal Shaves?

As an aside, metal shaves are poor tools in comparison to their wooden counterparts. Look at the cutter in a metal shave. It is set at 45 degrees rather than at only several degrees. This high cutting angle means it is really an odd-ball plane, rather than a true shave. Because of this high angle cut, metal shaves will not pare well on end grain. They chatter and make dust.

Look too, at the sole. It is only a fraction of the width of the sole on a wooden shave. The narrow sole and high cutting angle both require more force, and make the tool harder to control. On our tool list we specifically tell students to avoid a metal shave. Some people ignore us. When they observe the difference between their results and that of their bench mates, they usually toss the metal one back into their tool box and take a wooden class shave down from the wall. ■

1—This is how the system looked before I started

BY STEVE COSTAIN

2—The cyclone disassembled, showing the start of the hole thru the wall

SOURCES:

McMaster-Carr
www.mcmaster.com

Wynn Environmental
www.wynnenv.com

3—The sound dampener fitted thru the wall

My Dust Collector Upgrade

Late in the fall of 2007 I decided to move my Torit cyclone dust collector from inside my shop to outside in an unheated portion of the attached pole barn. This opened up an area for the 20″ Rockwell band saw I had just rebuilt.

However, I quickly found that this unit sucked all of the heated air out of my shop about once every five minutes. So last year after reviewing my heating bill, I decided to move the exhaust portion back into the shop, the exhaust is a large cloth bag which doesn't do a real good job of filtering out the dust, the exhaust would be coming into an area of my shop that I try to keep clean. So I went searching the internet looking for a pleated paper filter option, the first one I found was Oneida but that was an expensive option, after more searching I found a company called Wynn Environmental. They made some recommendations and I filed it away until recently when I decided to get it done.

This involved cutting a hole thru the shop wall, disassembling the cyclone unit so that I could reposition the exhaust portion of the cyclone by 90°. Once the exhaust was inside, I had to fabricate a bracket to support the weight of the two filters and come up with a suitable dust bin below the filters. I made the bracket from some leftover ¾″ plywood and four ⅜″ threaded rods. Below that I connected the two filters to the fiber drum with 8″ sheet metal flanges and a short length of flexible hose. I put three small casters under the fiber drum to make it easier to move around. I also needed to secure the bottom of the filter assembly to the wall to make it more stable.

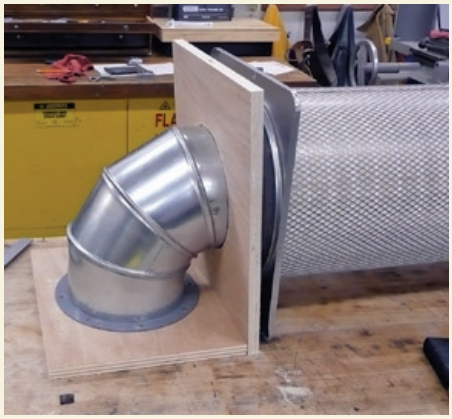
My cyclone had a sound dampener as part of the exhaust. This is a very rugged foam lined device that was able to take the weight of the two filter assembly (these are available to retrofit any dust collection system thru McMaster-Carr).

The greatest cost was $180 for the filters. The cost of threaded rod, elbows, caulking, wood, casters, flanges, hose and screws was all minimal. I also used a nice fiber drum that I got for free for the dust barrel but these are available thru McMaster-Carr. ■

4—Dampener thru the wall and the cyclone all assembled

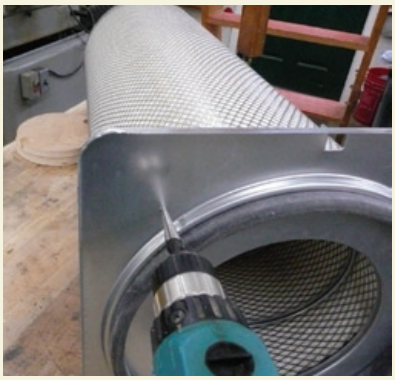
5—From the inside, showing the dampener and all trimmed out

6—Showing one filter as received from Wynn

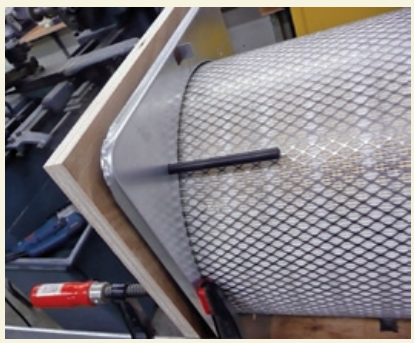


7—90 degree 8″elbow and wooden support bracket

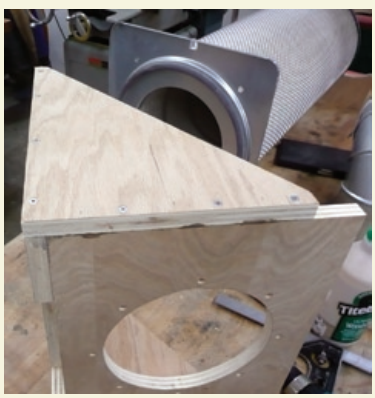
8—Fixture to drill 4 holes in the corners of the filter flange



9—Step drill clearance for ⅜″ rod



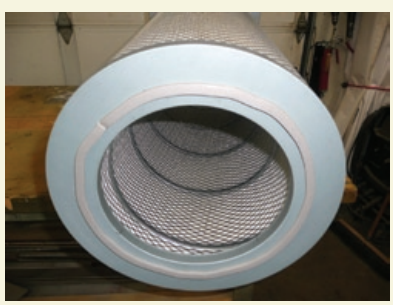
10—Transfer holes from flange to wooden support bracket



11—Wooden support bracket

12—Sealing inside of 8″ elbow with polyurethane caulk

13—Support bracket mounted to end of sound dampener



14—Closed cell foam between the two filters

15—Assembly of filters to support bracket

16—Complete filter assembly

17—Upper half of filter assembly

18—Lower half of filter assembly

19—Bracket holding filter assembly to the wall

20—Flange at bottom of filter assembly

21—Installing flange on top of dust barrel

22—Dust barrel attached to the bottom of the filter assembly

Madagascar ebony coffee table

BY BRIAN SARGENT

Thick Table Tops

There seems to be a design trend toward thicker square edge tops on some furniture. I have made commercial conference tables in the past with a thick molded edge using a corrugated cardboard product that resembles a honeycomb. I have made tops 2½″ to 3½″ thick with this system.

I purchase the product from Vacuum Pressing Systems (*www.vacupress.com*). It comes in 2′x4′ sheets and in ½″, ¾″ or 1″ thicknesses. The honeycomb sheets are very light weight and easily cut with a utility knife. These sheets are designed to be used with the Unibond 800 glue, which is sold by Vacuum Pressing Systems.

I just completed a 42″x51″x2½″ thick Madagascar ebony coffee table using this honeycomb material. So let's go through the process.

The core of the coffee table top is two sheets of ¼″ MDF forming the top and bottom of a five layer sandwich. The inner layers are constructed of ¾″ honeycomb materials with a sheet of ½″ MDF in the middle (see photo 1).

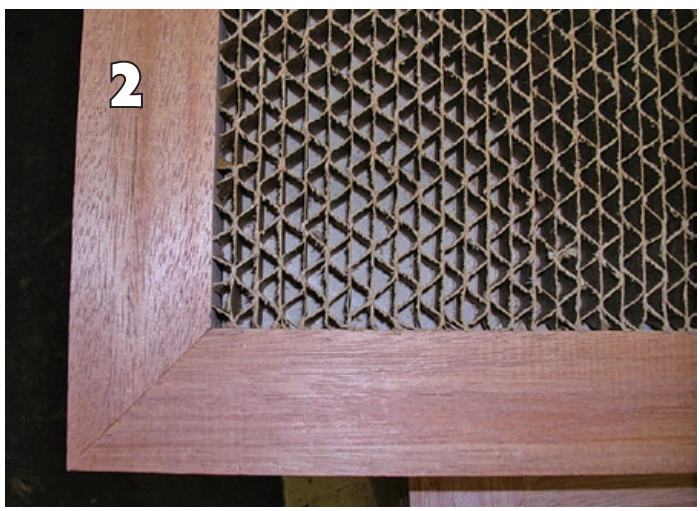
I cut my top and bottom MDF ¼″ larger than my final dimension. This is because the whole sandwich has to go into the vacuum press and things tend to move around a little.

I then made up enough mahogany edging for all four sides of the top. I use mahogany because of its stability. The edging is going to be sandwiched between the top and bottom so it must be exactly the same thickness as the honeycomb and MDF combined. My edging was 2″ thick by 1⅝″ wide.

Next I make up a mitered frame that is the size of my top and bottom MDF panels. I glue all four miters together.

I then cut my ½″ panel so that it will fit snugly inside of the frame and I do the same to the honeycomb material (see photo 2).

Now we are just about ready to put



BY JOE BARRY

Trip to Mecca

Over the Columbus Day weekend, I had a family event requiring a trip to Portland, Maine—the gateway to the Mecca of tool lovers. I drove up after work on Friday and got a hotel room giving me all day Saturday for my agenda before the family event in the evening. I was almost tempted to sleep in my car because the leaf-peeper rates for two nights were enough to buy a Lie-Nielsen #4.

I was up early on Saturday. I had to look at my watch because there is so much man-made ambient light in Portland I wasn't sure if it was early morning twilight or the middle of the night. I wanted to get an early start before all the leaf peepers crowded the roads. The big choke point on Coastal Route 1 is Wiscasset. It just doesn't look the same without the hulks of the four-masted schooners *Hesper* and *Luther Little*, that first came to Wiscasset in 1932. They eventually settled into the mud flats in the Sheepscot River right next to the town where their masts, hulls and ropes aged gracefully until 1998, when the were intentionally destroyed due to extensive rot. From Wiscasset, my plan was to get over to Maine Landmark *Moody's Diner* for breakfast. But the tourists circling the parking lot looked like vultures so I drove on.

As I came down the hill into Warren, I was amazed at how much *Lie-Nielsen* has grown. It is now a large complex of well maintained white buildings with brick red roofs. I've been in and out of there

TABLE TOPS CONTINUED

the top in the vacuum press. But we must first turn the press down to 15 HG so that we do not crush the honeycomb.

When gluing up the sandwich, only apply the glue to the MDF. We glue one side of the bottom MDF panel, set the mitered mahogany frame on top and one layer of the honeycomb. Then glue one side of the MDF and put that in the frame. Put glue on that side, put down your other layer of honeycomb, then apply glue to the bottom side of the top MDF sheet and place it on top.

I put one sheet of melamine on the top and bottom each to protect the surfaces. Put masking tape on all four corners to hold the sandwich together. Slide it into the press and press at 15 HG (see photo 3).

When the glue is set, remove the top from the press and stand it up on edge for 12 hours so that air may circulate around it. This way it will dry evenly and stay flat.

I then trim ⅛″ off all four sides so I minimize only end grain at the mahogany frame (see photo 4).

You are now ready to veneer the top as you wish at full vacuum pressure.

Have fun with your designs and this new process. ■

ever since he started. I even have a Wisner #95 edge plane that I got just before Tom bought Wisner out and started his own business. I was waiting when the showroom opened and was beckoned into the sanctum santorum of tool lovers. The showroom has also grown with the business and everything they make is not only on display but available to be pawed and even used on the scrap wood available at the workbenches. They don't even require you wear a bib to keep the drool off the tools and floor.

I have reached a point that I look at the tool catalogs when they come and say *It's nice, but I don't need it*. At Lie-Nielsen I was like a three year old at a toy store—*I want it, I want it! I waaant IT!*

Earlier in the week my girlfriend was at the weaving school she goes to in Massachusetts and mentioned my upcoming trip. Most weavers seem to have woodworkers for husbands and the group included Ernie Conover's spouse. They all groaned and said don't let him go with a credit card in his pocket. However, restraint won out and I only bought a couple of books and plane socks. Christmas is coming and my list will have a few more items circled in Tom's catalog.

About a half hour north of Warren in the Norumbega hills and off the main tourist routes is Liberty where the Liberty Tool Company's main store resides. There are a couple of other locations further north in Searsport and Hull's Cove. Field trips to those stores were a frequent outing when I was an intern at *The Apprenticeshop.* The shops are stuffed with old tools to the point where they offer you a hard hat when you enter the store. It always used to be a place where you could find treasures like a bedrock plane or a shipbuilders adze. I always lusted after the lignum vitae smoothing and jack planes made by boatbuilders for their own use and worn to a comfortable fit in the hand. But, Tom Lie-Nielsen has spoiled it for me. There isn't anything there that he doesn't make a better version of. Plus, the real jewels don't make it to the shop floor anymore but are sold on e-bay. I didn't buy a thing. An adze wanted to go home with me but I know I no longer have a need for it. Sorry, Bud!

I had also planned on a stop in Rockland at *The Apprenticeshop.* However, the Apprentices graduated that week and the 'Shop was closed on the holiday weekend. I have never been to the *Center for Furniture Craftsmanship* in Rockport and considered stopping there but I didn't want to get further north on Route 1 with all the holiday traffic.

I decided to stop in Bath at *The Maine Maritime Museum.* When I went through Wiscassett this time the Northbound traffic was backed up 2-3 miles to the town line confirming my earlier expectations. When I went to the Apprenticeshop thirty years ago, it was affiliated with the museum. A tangible difference in the philosophies that led to a parting of the ways is on the grounds of the museum. The building that had been the Apprenticeshop was floated down the river to provide display space right next to the barn that had once been the Restoration Shop and now also serves as display space.

The question was one of do you preserve the skills or the artifacts? The two view points were not compatible. The two bustling, busy and messy boat shops are now quiet, orderly display spaces. 'Nuff said.

Built on the site of the Percy & Small shipyard the museum has grown significantly since I was there last several years ago. Driving down to the museum you will see a large white structure looming over the street like one of the

cranes at the Bath Iron Works up the road. It isn't a crane but is the bowsprit of a full size sculpture of the largest wooden vessel ever built in America.

The Wyoming was a six masted, 450′ schooner built on that spot in 1909 and gives new meaning to the term *backyard boatbuilding*. The museum plans to fill in the skeleton of the full hull and six masts at a later date. It is an interesting contrast in scale when the ship loomed over the neighborhood where it was constructed as the largest built structure in sight. Launch days were in some ways equivalent to watching the local church slide down the ways into the Kennebec River.

People who have made the trip to Mecca are entitled to be addressed as hajji thereafter. I can just be considered satisfied. It was a good day! The family event that evening wasn't half bad either. ■

Compressed Air Distribution System

In my last article *(Woodshop Air Compressors – Journal…Summer 2009)*, I discussed different types of air compressors and considerations when purchasing one for your shop. Now, I'd like to go into designing and installing the compressed air distribution system.

A compressed air distribution system would ideally meet several criteria. There are four that come quickly to mind:

- Safe
- Relatively inexpensive
- Easy to install with common tools
- Efficient

Piping is the major component of the distribution system. There are two good options that are recommended for pressurized air distributions systems:

- Copper – Type L
- Black Iron Pipe

Unfortunately, I don't think there are any piping systems available that meet all four criteria. You can get three out of the four, but not the fourth.

While it would appear the plastic pipe would be the thing to use, PVC, CPVC, or PEX and all other readily available, inexpensive, easy to install plastic tubing and pipe are not rated for compressed air. OSHA expressly prohibits using plastic for pressurized air. There have been many cases where the plastic, when bumped or disturbed, explodes—sending out a wave of lethal shards of plastic.

Copper pipe comes in several grades that are normally available in local plumbing supply houses, hardware stores, and home stores. Type K is a softer, bendable pipe and very expensive—though it is rated for use with compressed air. Of the two grades that are sold in 10′ rigid lengths, only the type L is suitable for use in compressed air systems. Type M is intended only for use on hydronic (hot and cold water) heating systems. Type L is labeled with the blue printing on the pipe or it is stamped into the metal. It should be silver soldered together for maximum joint strength. Copper is easy to use, easy to reconfigure, and fittings and pipe are easy to obtain, even on a Sunday afternoon should the need arise. The downside is that copper is relatively expensive to purchase and the cost can be substantial if the runs are long. Additionally, extreme caution is required when sweating joints in a workshop with sawdust or other flammable materials nearby.

Black iron pipe is what has been traditionally used for compressed air piping. It is still what is used in most commercial and industrial applications. It is a very safe piping to use and with the proper filters will provide clean, dry air. It is inexpensive, strong, and with the right tools not too difficult to work with. However, most non-plumbers do not have the proper equipment or knowledge to do the installations themselves and must hire a professional. This will increase the cost of black iron to more than that of copper.

Galvanized iron pipe would seem to be even better than black iron because it does not rust as easily. The problem with galvanized iron is that the interior of the pipe has minimal coating and that coating is prone to come off in small flakes that can contaminate the compressed air. It is very seldom used because of the added cost and limited, if any, benefit over black iron.

Based on the qualities of plastic, copper, black iron and gallvanized pipe, copper is probably the one that most do-it-yourselfers should choose.

Please be safe, don't use plastic pipe!

The design of the system should take into consideration the fact that there will always be moisture

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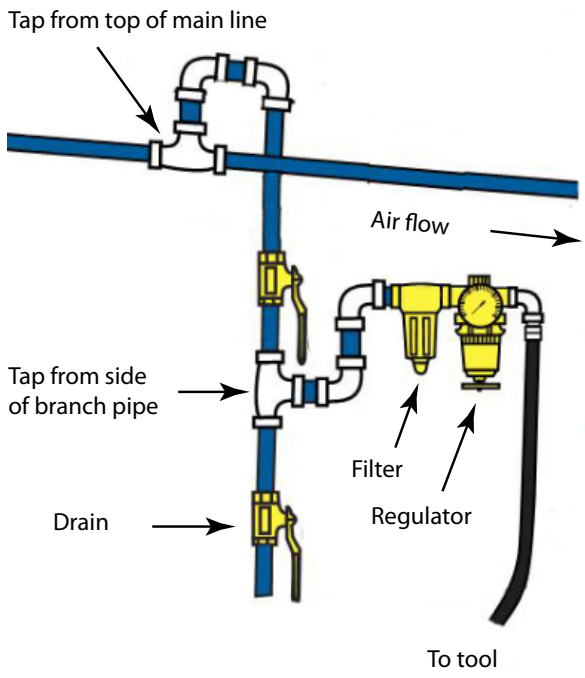

by Bruce Hamilton

Coloring Wood

Wood can be colored with pigments and dyes. The most vibrant colors are achieved with dyes. They are transparent and reflect more light. Their small molecular size permits deep saturation into the wood fibers. For many years aniline dyes where used. These are a derivative of coal tar and are toxic. Now all dyes for wood coloring are synthetically created.

Dyes come in powder and liquid form. Dye powders can be dissolved in water, alcohol and solvent but each powder is solvent specific and you must use the right solvent with the right powder. Of the powder based dyes, water dyes are the most like fast and easiest to apply. Water-based dyes can be sprayed on and the excess wiped off to achieve a fairly uniform application. When alcohol-based dyes are used, they tend to show lap marks because they dry so quickly. The drying rate of solvent based dyes can be adjusted depending on the solvent used. Mineral spirits slow drying. Naphtha or acetone are faster.

Pre-mixed liquid dyes can come diluted like Behlen's Solar-Lux or concentrated like Jeff Jewitt's Trans Tints. Solar-Lux dyes and the Trans Tint dyes are metallized solvent dyes. According to Jeff Jewitt, these dyes are the most light-fast available and more bleed resistant then the powder dyes.

When it comes to top coating over colorants like dyes, the one finish that I believe will enhance the colors the most is shellac. Shellac has the smallest molecules of all the common finishing materials and can penetrate deep in to the wood fibers. Shellac gives the surface a crystal like appearance when light hits it. It is important to use de-waxed shellac that is light in color such as Super-blond. Other formulations of shellac can be very amber and the wax they contain may cloud the appearance of the color and diminish the sheen. ■

Distribution System continued

in the compressed air. Proper layout of pipe runs and design of the points to which the tool hoses are connected can provide relatively dry air.

The pipe should be pitched down in the direction of the air flow. Drains at the end of the main line and at each drop or connection point can be used to remove the condensate from the system. The diagram shows a good way to set up the connections with a filter, regulator and drain. This arrangement allows the moisture to be collected and removed from the air stream. The filter will remove any contaminants and the regulator will maintain a constant pressure to the tool. This set up can be used no matter what type of pipe you choose.

The connection between the compressor and the piping system should have a flexible link. One of the easiest and least expensive ways to do this is with a short piece of hydraulic hose which can be obtained at an auto or tractor supply store. This hose is rated for very high pressure and is reinforced with metal braid. This link will extend the life of the system and make it quieter by reducing vibration from the compressor.

To connect the tools and hoses together a system of quick connects are used. The female ends are sealed shut when the male end is removed. This allows tools and hoses to be connected and removed without have to manually shut of the air line. There are several different fitting styles and they are not interchangeable between styles. The Milton style is the most common.

Another style is known as Lincoln Long. It is less common but is preferred by many people (the author included) because it is less prone to leakage at the connections than some of the others.

Compressed air has many uses in the wood shop. It can make many tedious jobs go faster and air tools can be lighter and easier to use than the electric counterparts. Air powered sanders are a good example of this. With some practice, the new and less expensive HVLP spray guns can do a good job of applying an even finish that rivals that done by experienced professionals.

A good compressor and a properly installed system will serve you well for a long time. Just do it right and don't be tempted to take unsafe shortcuts. If you have any safety questions, consulting a qualified expert is always recommended. ■

Craft Schools

BY TED BLACHLY

Ted Blachly assists in making Penland wagon wheels—why not?

Jere Osgood teaching a tables & chairs class at Penland

If you ever want to dig deeper into the world of craft and expand your knowledge base or perhaps open some doors to a new skill you are unfamiliar with, taking a class at one of the many craft schools around the world can be a great experience. Classes can take the form of one or two week workshops to nine month comprehensive courses and more. Class designs can vary greatly from technique specific focus to project oriented classes to classes that allow you to broaden your skills in a personal way. I think the key is an opportunity for total immersion in the school environment. You basically leave the outside world behind to take advantage of schools facilities and teachers and to interact with other students who are in pursuit of learning new things as well.

This past summer with the help of a Guild scholarship grant, I spent two weeks at *Penland School of Crafts* in North Carolina assisting Jere Osgood with a class on tables and chairs. . Then I was home for a short time before leaving for the *Center of Furniture Craftsmanship* in Rockport, Maine to teach a two week class titled *Design and Craftsmanship*. I have co-taught this class with another furnituremaker every other year since 1999. This year I was joined by John McAlevey, a founding member of the Guild. Both schools are well grounded and have their own personalities. I'll give you a description of the places and the experience of being there.

Penland School of Crafts—Penland school of crafts is in western North Carolina about an hour north of Asheville. It was founded around 1928 and is remarkably similar in its formation to the *League of NH Craftsman*. Both were the vision of singular people who wanted to promote crafts. Tucked up a long rural winding road in a beautiful mountain setting, Penland is far from the hustle of everyday life but is an incredibly active place. Accommodations are basic and spread out around the hillsides.

Penland has studios/shops to accommodate a wide variety of craft media—woodworking, iron/metal working, two glass studios, printing, papermaking, two textile studios, two clay studios, painting, photography and jewelry. All of these are in close proximity to one another so you are always rubbing elbows with people working in another media. Visiting other shops is a big part of the experience.

They do a lot to encourage a community

Prototype of chair I designed while at Penland

Penland School of crafts—*www.penland.org*

experience at Penland. Many students are there on work study arrangements or have duties outside the scope of the class. There are a lot of evening activities from gallery openings, evening slide presentations, parties or musical events, and it can't go with out mentioning THE FOOD is great! Three healthy meals a day are provided in the Pines building—a rambling old hall with sunny porches and view of the mountains. All this contributes to group interaction which happens pretty easily because people there have a common love of making things, and make they do. Most shops are humming until midnight. On my first trip to Penland in 2005, I averaged five hours of sleep a night. There just seems to be a lot of creative energy flying around.

They have a brand new wood studio there with a bench room to accommodate twelve students, a teacher and assistant. Two fully equipped machine rooms and a finishing area makes it complete. One beautiful machine I'm sure some guild members would like was an old 12″ Oliver jointer that would continue spinning for eight minutes after you shut it off! How's that for bearings? One evening Jere, a student and I took apart a horizontal slot mortiser that was having problems and put it back together—so there's an example of evening entertainment.

A typical day after breakfast in the "Pines" (and a 7 am yoga session before that if you are so inclined) might be 9 am lecture or demo in your shop for one to two hours followed by working on your project with help from the teacher. Then at noon, we stroll down to lunch for an hour or so then back to work in the shop. Dinner is at six in the evening. You can relax, catch a slide presentation around 8 pm, walk around to see what's happening in the other studios, then back to work if you want or just relax.

Center for Furniture Craftsmanship—Peter Korn has put together an amazing facility in Rockport, Maine and I'm sure anyone who has been there can attest to the quality of the workshops and the organization that makes it run. The non-profit school was founded in 1993 with a single workshop building and now has a large campus on Rt. 90 in Rockport. Unlike Penland, this school's focus is furnituremaking and it is expanding the range of classes to address the many aspects of that field—CAD drawing, drawing, refinishing, carving and turning are just some of the examples of workshops offered.

It has been said that the two week basic woodworking class there is one of the best around. I can say that walking through that class at the end of a session and seeing precision mortise and tenon joinery, crisp dovetails and sharp tools all produced by beginners is astounding. They run a variety of two week workshops, a twelve week intensive and then the nine month comprehensive which is a commitment but it covers the full range of furniture making processes.

Center for Furniture Craftsmanship

Center for Furniture Craftsmanship—*www.woodschool.org*

Teachers come from all around the world so it's a chance to learn from some of the best. In addition they have a gallery with a busy show schedule and next to that a library chock full of books related to furniture making. Also on site is a fellowship building where serious makers can apply for a bench space to develop their work over an extended period of time. There is no housing or meals served at the school but they have a list of nearby places to stay and the office staff works with the students to get them situated. There are evening slide shows and weekly pot luck dinners with hot lobsters delivered and ice cream served. Rockland and Camden are nearby.

There is a wide range of people that attend classes at both Penland and CFC—young students, hobbyists, professional craftsman and retired enthusiasts. Occasionally there will be classes that suggest a certain level of skill before signing up, but in my experience, people come with an eagerness to learn and we try to elevate there skills no matter what level. I usually get a few experienced mechanical engineers or physicists and they straighten me out on a few things. So there is a give and take and if you are open to that, then everyone benefits. Additionally each school has residency programs for longer term immersions. Penland has a core student program and CFC has a studio fellowship program. ■

Members Gallery

Jeffery Cooper Portsmouth, NH

'Dining with Vivaldi'— Mahogany with aniline dyes and hand-painted fabric. Backs 48″ high, seat 18″ high.

The designs of the seat backs portray backyard birds of New England. The chairs represent winter and spring with a downy woodpecker, owl and robin. Summer is represented by a great blue heron and fall by wild geese flying. The fabrics matching the seasons were created through a collaboration with Jane Balshaw, a well known New Hampshire textile artist.

Photos by Bill Truslow

George Lang Strafford, NH

Secretary Desk— Cherry finished with garnet shellac. This secretary desk was a commissioned piece for someone I had worked with on many other building projects. Some of the curly cherry came from lumber left from one such project we did 25 years ago. The wider boards and 12/4 cherry for the top molding came from newer cherry that I happily found at Highland Hardwoods. As a result, the slant top and door panels were one piece.

The finish was garnet shellac for the older wood. To color match the newer wood to the older, garnet shellac with added aniline dyes was used for the newer. All was buffed out to a semi-gloss finish and waxed.

The client found a picture in an antique catalog online and scaled down the piece to 34″ wide, 18″ deep and 85″ high to the top of the finial. All-in-all a very satisfying experience for it was a first project of this scope and complexity I had attempted.