TUNING UP A BENCH GRINDER • BLAST-CARVING • PUT SOME SPRING IN YOUR TOYS

AMERICAN WOODTURNER

Journal of the American Association of Woodturners
December 2016 vol 31, no 6 • woodturner.org

THE BLOSSOMING OF DIXIE BIGGS

AN ARTIST'S PROGRESS

A BEGINNER'S SHOPPING LIST

CUSTOM LATHE ACCESSORIES FROM A 3D PRINTER

Jennifer Shirley Indiana


Photo: Clay Foster

The objects I make are reflections of things I encounter in daily life. Patterns, textures, forms, people I meet, places I've been, and even music I am attracted to seem to appear in and inform my work. Using narrative to tell stories through my pieces is becoming increasingly important to me. The stories of our lives are what connect us all, and the narrative side of my work is a never-ending world of things waiting to be made. The wood and the lathe are just the vehicles I use to give this narrative form. Exploration and the adventure of finding new and interesting techniques to deliver my work keep it exciting and new.

For more, visit jennifer-shirley.com.

Off on Their Own, 2013, Maple, pyrography, stone, 8" × 9" (20cm × 23cm)
Photo: Clay Foster

Flame Container, 2008, Cherry, pyrography, copper, 5" × 3½" (13cm × 9cm)

The Man at the Lathe, 2009, Cherry, pyrography, stone, 7" × 5" (18cm × 13cm)

Precarious Balance, 2007, Cherry, maple, leather dye, 13" × 10" (33cm × 25cm)

Black Flame, 2014, Huon pine, pyrography, leather dye, copper, 4" × 2½" (10cm × 6cm)

Fiesta Platter, 2006, Maple, pyrography, black gesso, copper BBs, 16" (41cm) diameter

AAW | AMERICAN ASSOCIATION OF WOODTURNERS

Dedicated to providing education, information, and organization to those interested in woodturning

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A NOTE ABOUT SAFETY

An accident at the lathe can happen with blinding suddenness; respiratory and other problems can build over years.

Take appropriate precautions when you turn. Safety guidelines are published online at tiny.cc/turnsafe*. Following them will help you continue to enjoy woodturning.

*Web address is case sensitive.

Editor's Note

Forward-thinking designers don't limit themselves by strictly adhering to tradition. They consider all available tools. We woodturners love our lathes, don't we? But are we limiting ourselves with this affection? Instead of asking, "I have a lathe—what can I make?" designers are saying, "This is what I want to make—how will I do it?"

I'm inspired by turners willing to go beyond the lathe. This issue of *AW* reveals examples of how new technologies are affecting the way we work and create. Look at Henry Doolittle and Luke Ferland (pages 44 and 46, respectively), who are finding ways to merge 3D printing with the lathe; Al Hockenbery (page 32), who is forming blast resist shapes with a computer-driven cutter; and Moyu Zhang (back cover), who acknowledges a CNC machine may be a better option for a particular need. So begins a crucial conversation—How might we expand our thinking, while honoring the tradition of our beloved craft?

—Joshua Friend

From the President

This is a unique time of year. It's the holiday season and a time for giving. It's the end of the year and a time for reflection. It's the beginning of a new year and a time for planning. For most of us, it's probably all of the above.

When I was a child, my family felt the best gift was "handmade," especially for the recipient. You can't believe how excited I was opening my grandma's hand-knitted socks five years in a row! In spite of my experience, I hope you'll all keep turning pens, ornaments, boxes, and other pieces for your friends and relatives. The best and most personal gift you can give is yourself and your woodturning ability.

Mentoring

Mentoring is the most obvious method of sharing your knowledge. Before you say you aren't good enough or don't have the experience, look at the progress you've made, emphasize safety, and show your enthusiasm for turning. The best way to improve your turning skills is to teach. Help your local chapter develop classes, not only for new turners, but also for longer-term members who might need assistance on specific skills. The AAW, through its Educational Opportunity Grant (EOG) program, will be awarding lathes and tools in 2017, thanks to JET/Powermatic and Nova Teknatool; have your club send in an application.

By the way, teaching is not only giving. I teach and mentor a lot, and nothing is more satisfying than seeing the excited face of a student holding a piece he or she just finished. Remember, nothing is learned in a day; follow up, see if there are questions, and maybe offer a second session. Don't forget to mention the benefits of belonging to your local chapter and joining the AAW.

Finally, make those new turners feel welcome. Don't let them sit alone at your chapter meeting. Tell them to call when they need advice. Invite them to your shop. Don't make an issue of age, gender, or background; woodturning is your common interest. You can even lend them a few back issues of *American Woodturner*; better yet, help them sign up as an AAW member or for a trial Guest membership.

In the upcoming year, set a woodturning goal for yourself. Make your first pen, platter, or multiaxis turning. Collaborate with another club member. Demonstrate woodturning at a senior center, or for a scouting group, community service club, or veterans organization. Volunteer to teach woodturning at your local middle school or high school (for those fortunate enough to have a shop program in your area). Step outside your comfort zone and stretch your skills. You might again experience the feeling you had when you turned your first piece!

Other skillsets

Mentoring and teaching are not the only ways to share your skills. Members are an essential source of expertise for help with special AAW initiatives. For example, long-time member John Kelsey, who has an extensive publishing background, is doing some very important work on our archived articles: he has been applying keywords so you'll be able to search our library of woodturning information more intuitively on the AAW website. Another AAW member, Dave Mueller, is contributing his software programming expertise in ways that will allow John's keywording to be truly useful. What a great collaboration of skillsets! For more on this new offering, see page 6. Like John and Dave, you might be able to contribute your expertise on special projects to help the AAW fulfill its mission. Contact our staff, who can connect you with the right team leaders.

Over the course of the keywording project, John Kelsey took note of topic areas in our archives where more information is needed, such as carbide tools, coring tools, and multiaxis turning, to name a few. AAW's editorial team will be working to close those gaps with high-quality journal articles and videos. If you would like to suggest topic areas to be covered or would like to author materials yourself, send an email query to our journal editor, Josh Friend. I know he would welcome all suggestions.

Thank you

As this is the last *AW* issue of the year, on behalf of your Board of Directors, I'd like to thank our staff in Saint Paul for all they do so professionally, and our many volunteers who continually strive to make this the best woodturning organization in the world. Our thanks also go to the manufacturers and vendors who step up to help whenever asked. Most importantly, thanks go out to our members and local chapters; without you, we would not exist.

Looking forward,

Greg Schramek

Apply for an AAW Educational Opportunity Grant

AAW's Educational Opportunity Grant (EOG) program offers grant funding to selected applicants for woodturning education. The EOG fund continues to be strong, thanks to the wonderful generosity of donors and buyers at our Annual Symposium auction. Funds are available for worthy proposals and the AAW Board encourages you to take advantage of this educational benefit. ***To be eligible for a 2017 grant, applications must be received by December 31, 2016.***

Lathes

This year, in addition to monetary EOG awards, we will also accept grant applications for wood lathes that are intended to introduce woodturning to individuals and/or groups who otherwise may not have an opportunity to learn woodturning. Thanks to the generosity of JET (JPW Industries), Nova (Teknatool), and others, there will be up to nineteen lathes available for awards. There are nine Nova 46300C Comet II Variable Speed Midi Lathes, each with a lathe stand and a Nova chuck. The Nova lathes will be available for delivery during the first and second quarters of 2017. Additionally, up to ten JET JWL-1015 lathes, each with a lathe stand, Nova chuck, set of basic tools, and a faceshield, will be available for delivery in June 2017.

Symposium

The committee will award ten certificates for registration to the AAW's 2017 International Symposium.

Application information

You can complete the application form and review the guidelines at tiny.cc/GrantEOG (case sensitive). The committee will not consider applications that are incomplete or vague, so please take care when applying. The following tips may help with your application:

- Complete the application online at tiny.cc/GrantEOG. Only online applications will be accepted. Submit well before the deadline!
- Provide sufficient information so EOG committee members can clearly understand what you are requesting and how you intend to use the funds. Be concise; make your points directly and clearly. Samples of successful past proposals can be found online on the application form site.
- Include details of how you will use the funds. Specific needs should be itemized. Funds will not be granted for miscellaneous, incidental, or unspecified expenses.
- Explain your educational goal or experience you wish to obtain. Keep in mind these grants are intended for educational purposes. Explain how others will benefit as well.

Limits

Grant amounts are limited: up to $1,000 for individuals and students; and up to $1,500 for local chapters, schools, and nonprofit organizations. Your total budget may exceed these amounts; however, your grant request should not exceed EOG limits. For special situations, at the discretion of the EOG committee and the AAW Board, grants of larger amounts are occasionally available.

Questions

If you have questions, contact Denis Delehanty, EOG Committee Chair, at denis@woodturner.org or the AAW office.

AAW Board of Directors Election Results

Congratulations to Greg Schramek, Molly Winton, and David Heim for being elected to the AAW Board of Directors. Each person will serve a three-year term, beginning in January 2017. Serving as a volunteer on the board requires a significant commitment of time, and we appreciate the willingness of all six candidates to put their names forward for the election. Thank you.

—Greg Schramek, AAW Board President

Prize Drawing for AAW Members

One of the many benefits of membership in the AAW is our monthly prize and year-end grand prize drawings. Thank you to the vendors who donated this year's prizes, which include tuition scholarships, $100 certificates, sanding supplies, DVDs, chucks, grinding jigs, symposium registration, and lathes! Contact Linda Ferber if you would like to contribute a prize, linda@woodturner.org.

When you patronize our vendors, please thank them for their support of the AAW. To see a listing of each month's prizes and winners, as well as hyperlinks to the vendors' websites, visit tiny.cc/AAWDrawings.

At the end of 2016, we will draw another name from our membership roster to give away a Powermatic 3520B lathe. That winner will name a local chapter to win either a JET 1642 or five JET mini-lathes. The Powermatic and JET lathes are donated by Powermatic/JET. Included is free shipping in the continental USA, or up to a $500 allowance for international winners.

2016 Donors

(Others may be added during the year.)
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Easy Wood Tools
Hunter Tool Systems
John C. Campbell Folk School
JET/Powermatic
Mike Mahoney
North Woods LLC
Tennessee Assn of Woodturners
Thompson Lathe Tools
Totally Turning Symposium
Trent Bosch

AAW Board of Directors

Call for Nominees

The AAW offers much to its members and we are looking for a few good people who can contribute something in return. Do you have the time, energy, and ideas to be a part of the AAW operations, as well as a willingness to help make it a better organization? Be a part of moving the AAW forward—run for a position on the AAW Board of Directors.

The AAW elects a volunteer nine-member board to represent the membership and move the organization forward. If you have been a member in good standing for the past three years, you are eligible. The nominating committee will select the six best candidates. From these six, members will elect three candidates to serve a three-year term, beginning in January 2018.

For information on the duties of board members, call any current board member or visit the AAW website at tiny.cc/Board for details.

If you are interested in serving on the board, please email the following to the executive director (phil@woodturner.org), no later than April 15, 2017:

1. A statement of intent, including qualifications and reasons for applying
2. Letters of recommendation from two individuals who can attest to your organizational and leadership abilities
3. A high-resolution photograph of yourself

The nominating committee will review application materials and conduct phone interviews. Candidates will be presented in the August issue of the journal, ballots will be sent out in the fall, and election results will be announced in late 2017.

CWA Leadership Change

The Collectors of Wood Art (CWA) has named professional woodturning artist/instructor John Beaver its new president. Of the prior president, Judy Chernoff, Beaver noted, "In her three years as president, she has done an incredible job of growing and improving the CWA. She has assembled a strong board and overseen fabulous events that have successfully promoted the wood art field."

John Beaver, CWA's new president.

He continued, "As president, I hope to sustain and improve on the great work Judy has done. I would like to continue putting on events where collectors and artists can interact and learn more about the field, but my primary goal is to find new ways to get wood art in front of the public and improve its status as a viable art medium."

The CWA has a growing membership and a website featuring artist portfolios and information about wood art. Visit collectorsofwoodart.org.

Introducing AAW Explore – Projects, Articles, Tips, and More!

Members said they wanted it—and now it's here! AAW Explore has just made searching all thirty years of the *American Woodturner* journal and the cumulative collection of AAW publications, including *Woodturning FUNdamentals*, quick and easy.

In as few as three mouse clicks, you're able to find nearly everything you've wanted to know about woodturning. Whether you'd like to solve a problem, research a new technique, or start a new woodturning project, you're only seconds away from exploring the most extensive online woodturning library in the world and getting exactly what you want.

Easy to use

Access AAW Explore under the "Publications" tab after logging into AAW's website at woodturner.org or at tiny.cc/AAWExplore. (Members must sign in to the AAW website for access.)

AAW Explore complements AAW VideoSource and enables members to:

- Locate articles on a specific topic with as few as three mouse clicks—one to select a *Category*, a second to refine the category by *Keyword*, and a third to click the *Search* button and produce a list of article hyperlinks that meet your search criteria
- Locate articles using *Quick Search* to search by any word included in the author's name, article title, or publication section (gallery, back cover, etc.)
- Sort results by title, author, publication date, or type of media (article, booklet, video, etc.)
- Select an option to find only articles suitable for beginners

A VISION 2020 initiative

AAW Explore is part of AAW's VISION 2020 strategy to continue being the go-to source for all things woodturning. This new online tool provides easy access to woodturning information in a user-customizable way, and creates a platform for other, upcoming VISION 2020 initiatives. More to come on the rollout of these member benefits!

AAW Explore was designed by woodturners for woodturners, and it would not have been developed so soon without the dedication, generosity, and expertise of AAW members Dave Mueller and John Kelsey. Dave's software development skills, combined with John's ability to deconstruct and tag thirty years of member publications, have made AAW Explore an exciting reality.

CALL FOR STUDENT SUBMISSIONS
2017 Turning to the Future Competition

The AAW is pleased to announce the third-annual Turning to the Future competition, an opportunity for woodturning students and schools to show off their best work. The exhibition will be held in conjunction with FreshWood, one of North America's largest student furniture-making and woodworking competitions.

The competition is intended to encourage and support students in reaching for and attaining the highest levels of skill in the use of the lathe. The contest is open to students in North America, and there is no entry fee.

Prizes include $500 first-place and $100 second-place awards in each division and category, and two lathes for the Best in Show piece in each division.

There are two divisions, High School and Post-Secondary, with three categories each: Functional, Small Turnings, and Open. Five finalists in each division category will be chosen to have their work displayed at the 2017 AWFS® Fair in Las Vegas, Nevada. Work will be evaluated on craftsmanship, aesthetic appeal, creativity and/or utility, and process documentation. Application period opens March 1, 2017. Deadline for submissions is May 1, 2017.

If you know a student woodturner, encourage him or her to apply! Submission details can be found at tiny.cc/Calls. ■

Call for Entries: 2017 Member Exhibition—*Waves of Grain*

Waves of Grain is the theme for the 2017 AAW member exhibition, which will premiere at the AAW Symposium in Kansas City, Missouri. Although the title theme was selected to honor the rich agricultural history of the region, it was also chosen to provide a catalyst for other interpretations. From ancient grain goddesses to the amber waves of wood grain, it is a theme rich in possibilities.

All AAW members are eligible and encouraged to apply: We are looking for both traditional and innovative work. Entries will be evaluated in the following areas: overall appeal, technical execution, originality, and relationship to theme. Each piece will be considered individually and by how well it fits with the overall composition of the exhibition.

Two artist awards will be given during the 2017 AAW International Symposium: a Masters' Choice Award of $300 and a People's Choice Award of $200.

Entry Dates and Fees

Entries will be accepted online from November 1, 2016, through February 1, 2017. All applicants will receive email notification by March 31, 2016. The entry fee of $30 covers up to three submissions.

Guidelines

Work must be made at least in part on the lathe and have been created between February 1, 2015, and January 31, 2017. A statement (100 words maximum) of how your piece fits the exhibition theme is required. Please review the full guidelines at tiny.cc/Calls before planning your project.

Questions? Email tib@woodturner.org. ■

Call for Videographers—AAW Symposium 2017

The AAW seeks videographers for its 31st International Symposium in Kansas City, Missouri, June 22–25, 2017. Applicants should have experience with video camera equipment, possess technical competence, and be able to make decisions regarding lighting, shooting angle, placement of microphone, etc. Applications will be accepted until January 15, 2017. Videographers selected for six rotations will receive a free Symposium registration. Selected videographers will be notified in February 2017. To apply, visit tiny.cc/CallVideo.

Call for Entries: 2017 POP Exhibition
The Sphere — Second Round

The theme for the 2017 Professional Outreach Program (POP) exhibition is *The Sphere—Second Round*, an encore of the 2008 theme. There are a limited number of juried spots available for this annual international exhibition and auction.

Entries will be accepted online from November 1, 2016, to January 1, 2017. All applicants will receive email notification by January 15, 2017. The application fee is $30 for up to three entries. New this year: Students in woodworking, design, art, and manufacturing degree programs are eligible to have their fees waived. Works will be selected based on aesthetic appeal, originality, execution, and relationship to theme.

POP exhibitions feature small-scale works, and for 2017 the finished piece, as displayed, must fit into a 6" (15cm) cube. Please review the full guidelines on the AAW Calls for Entry webpage before planning your project. Visit tiny.cc/Calls.

Questions? Contact Tib Shaw at tib@woodturner.org. ■

JOIN US IN KANSAS CITY, MISSOURI, FOR AAW'S 31ST INTERNATIONAL SYMPOSIUM

KANSAS CITY CONVENTION CENTER • JUNE 22–25, 2017

The AAW International Symposium is an excellent opportunity to watch world-class demonstrators share their techniques, to find out about the latest innovations in tools and materials, and to be inspired by the instant gallery and other woodturning exhibits. Join us to experience in person the creative passion of woodturning while enjoying the company of others who share your interests.

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Learn more at tiny.cc/AAW2017KC

INVITED DEMONSTRATORS

Dixie Biggs, Florida

- Simple Surface Treatments
- Need Some Relief?
- Adding Detail to Relief with Woodburning and Color


A Break in the Pattern, 2016, Cherry, brass rod, 8" × 8" × 2" (20cm × 20cm × 5cm)

Photo: Randy Batista

Trent Bosch, Colorado

- Revelations in Hollowing
- Vessels of Illusion
- Sunburst Platter


Facets Series (green), 2015, Maple, 6" × 6" (15cm × 15cm)

Jimmy Clewes, Nevada

- Drinking Flask
- Colored Lidded Bowl
- Tri-Cornered Box with Lid


Drinking Flask, 2016, Maple, 7" × 5" (18cm × 13cm)

Kurt Hertzog, New York

- Penturning Tips and Tricks
- Afterturning Opportunities for Pen Makers
- Presentation Is Everything


Various designs, 2015 and 2016

Michael Hosaluk, Canada

- Endgrain Bowl with Decoration and Carved Feet
- Having Fun with Spindles
- Surface Design


Various bowls, 2015 and 2016, Maple, birch, milk paint, largest is 7" × 5" (18cm × 13cm)

Photo: Trent Watts

Rudolph Lopez, Florida

- Natural Edge Wing Bowl from a Crotch
- Square to Round Bowls, Vases, and Hollow Forms
- Thin Stem Natural Edge Goblet


Bent Stem Goblets, 2015, Sycamore, ambrosia maple, taller is 13" (33cm)

Glenn Lucas, Ireland

- Dublin Viking Thin Wall Bowl
- Traditional Irish Platter
- The Utility Bowl

Photo: Rory Moore

Bowls, 2015, Ash, beech, largest is 6" × 15" (15cm × 38cm)

Andrew Potocnik, Australia

- Organic Forms Bent Beyond the Straight and Narrow
- Cheat's Guide to Creating a Hollow Form

Pod X, 2014, Pin oak, 21½" × 7" × 4" (55cm × 18cm × 10cm)

Tania Radda, Arizona

- The Traveling Woodturner
- Tea Time in Wonderland

Tea in Ipanema, 2016, Basswood, compressed ash, acrylics, 7" × 8" × 5" (18cm × 20cm × 13cm)

Richard Raffan, Australia

- Centerwork and Endgrain Hollowing
- Lidded Bowl
- Endgrain Box with Suction-Fit Lid

Rusty Verdigris Pot, 2015, Unknown wood, rust and verdigris faux finishes, acrylic, 8" (20cm) diameter

Mark Sanger, England

- Lidded Form with Carved Finial
- Textured and Colored Sculptural Form
- Offset Lidded Form with Carved Finial

Balance, 2010, Sycamore, acrylics, 7½" × 7" (19cm × 18cm)

Merryll Saylan, California

- Working with Milk Paint
- Multiples and Series—Or Is it Production Turning?

Tower of Bowls, 2001, Various polychromed woods, 77" × 17" × 15" (196cm × 43cm × 38cm)

Betty Scarpino, Indiana

- Turn! Cut! Carve!
- Embellished Wood Design
- A Journey from Bowls to Sculpture

Be Seeded, 2016, Cherry, Acrylic paint, 3" × 19" × 3" (8cm × 48cm × 8cm)

Photo: Wilbur Montgomery

Alan Stirt, Vermont

- Open Bowl Turning
- Sgraffito Platter
- Turned, Carved, and Painted Square Platter

Waves, 2015, Cherry, milk paint, 15" × 11" × 2¼" (38cm × 28cm × 6cm)

Derek Weidman, Pennsylvania

- Drawing with the Lathe
- Musings of a Wood Sculptor
- Life Moves (lathe-based sculptural performance)

Woodpecker, 2015, Holly, pigments, 12" × 12" × 4" (30cm × 30cm × 10cm)

John Wessels, South Africa

- Embellishing Woodturnings with Sheet Pewter
- Embellishing Woodturnings with Pewter Casting
- Embellishing Woodturnings with Solder, Wire, and Rod

Jewelry, boxes, and bowl, 2011, Red and pink ivory wood, cast and sheet pewter, silver, silver rod, square box is 4¼" × 4¾" × 4¾" (11cm × 12cm × 12cm)

Photo: Tib Shaw

Interactive Remote Demos

USING LIVE VIDEO

Woodturning clubs are often challenged to find willing, qualified demonstrators. Wouldn't it be great if woodturning presenters could conduct demonstrations from their own shops, with their own tools, and have live, interactive audience participation in a faraway chapter location? The advantages are obvious: no travel time, no equipment packing, increased availability of presenters from all over the world, and greater affordability for chapters.

Remote demonstrations, conducted in the turner's own shop and transmitted over the Internet to a viewing/listening audience, are becoming a reality. Presented here is a case study of how a Michigan demonstrator shared his expertise with an AAW chapter in Hawai'i without leaving his shop.

A REMOTE BUT RESOURCEFUL CHAPTER

Emiliano Achaval, Maui Woodturners Association

I have been a woodturner for about twenty years, right here on the magical Hawaiian island of Maui. When I started turning, I had a few mentors who showed me the way, sharing their knowledge. I wanted to pass on what I had learned, so at the end of 2015, I contacted the AAW and inquired about a chapter on Maui. There wasn't one, and the AAW staff encouraged me to start a new chapter, and that is just what I did (see mauiturners.com).

The AAW had great resources on its website to help me start the new chapter. Each time I had a question or doubt, the answer was right there. The best idea was to send a notice to the local newspaper. When the notice was published, my phone was ringing off the hook! Twenty-four woodturners showed up at the first organizational meeting. The club now has twenty-eight members.

Since it is impractical and not cost-effective for us to bring in woodturning demonstrators from afar, we were easily sold on the idea of receiving a remote demo. Even at an in-person demo, most audience members are looking at the screen anyway. So why not have a remote demo by a world-class master woodturner at a fraction of what it would cost to bring him or her to our location? We coordinated with Lyle Jamieson for our first remote demo.

Getting set up

When preparing to receive a remote demo, the most important thing is to have a wired Internet connection. Our Wi-Fi connection provided video that was inconsistent and "jerky." Not surprisingly, when we went to a direct, wired connection, the download speed improved dramatically, and Lyle's video and audio quality was received in smooth fashion.

We connected a laptop directly to a cable modem for Internet. A projector connected to the laptop via HDMI cable displayed Lyle's video feed onto a sheet we had hung as a

Members of the Maui Woodturners Association enjoy a live, interactive, remote demonstration by Lyle Jamieson, of Traverse City, Michigan.

makeshift screen. The studio where we had the remote demo had a built-in surround-sound system, which we connected to the laptop with a standard audio jack. But you could also connect a more basic external speaker. A few days prior to the demo, we tested the setup to ensure everything was working correctly.

Lyle did a great job with the remote demo, providing more than three hours of instruction. We appreciated that he could easily switch between his three cameras, all with different, clear views. He could even zoom in on the project for a closer look, or zoom out for a broader view. At any moment, we could stop him for questions, as he could hear us well even when turning. And we could hear him too, even with his faceshield on.

A DEMONSTRATOR'S PERSPECTIVE

Lyle Jamieson, Traverse City, Michigan

My experience with the Hawai'i group was successful on all fronts. I covered a lot of ground and, based on their good questions, was prompted to cover a number of ancillary topics related to the hollow form demonstration.

Why remote?

When I do a demonstration in person, the participants cannot all get up and stand behind me and look over my shoulder to see my techniques—they look at the monitor (if there is one). Very few are sitting in the front row with a good view—most are looking at the monitor. The people on one side of the room can see the inside of the bowl or vessel, and the people on the other side of the room can see the outside of the project. They can't see both, so they look at the monitor. The idea of remote demonstrations acknowledges and embraces this limitation by making use of multiple cameras for good quality, live audio and video. All viewers can see the workpiece, zoomed in close from multiple angles, as well as the turner when he or she addresses the audience. The demonstrator and viewers can see and hear each other, and ask and answer live questions.

When the demonstration is completed, club members don't have to sweep up the shavings. In fact, they don't need a shop at all—no lathe, no grinding wheel, no compressor, no whiteboard. You can have a meeting in a school, church basement, or someone's living room—wherever there is an Internet connection.

Not having to travel is a huge advantage for demonstrators—and ultimately for audience members, too. Demonstrators can actually put on a better demo in their own shop with their own tools and audio/video equipment than they could at a club location. We can eliminate the kinds of variables I have experienced while demonstrating on the road: rickety lathes on wheels, faceplates that do not shoulder on the spindle, poor live centers and drive centers, missing knock-out bars, cameras with short wires or stationary cameras that would not reach the positions needed to show the turning action, no amplified speaker system so participants can't hear, grinders not attached to their stand, etc.

Lyle Jamieson conducting a demonstration from his Michigan workshop for members of the Maui Woodturners. Note three small cameras providing coverage: on a microphone boom looking over Lyle's shoulder, above the lathe facing down, and in the open laptop lid facing Lyle.

It's doable

Demonstrators should know that I had no prior camera or computer experience. I accepted mentoring help from AAW member Alan Zenreich, an expert in this area. Those close to me will confirm, all I know how to do on the computer is answer email. So I am living proof: if I can do this, anyone can.

Of course, remote demos will never replace face-to-face, hands-on workshops, which are invaluable for gaining practical experience, but they can complement local club efforts to educate members by exposing them to demonstrators they would not otherwise be able to access. A remote demo can be part of the programming for a club's regular meeting (as it was in my experience with the Maui group), but it can also be a full-day workshop at club locations or woodworking supply stores. Audience members can arrange to have the demonstrator follow up with a shorter session a month or two after the presentation so they can ask questions that arose since the demo.

I encourage other demonstrators to jump on board with this trend. There are turners and clubs out there starving for quality demonstrators, so the opportunity is upon us. ▸

Resources

Alan Zenreich, Oradell, New Jersey

At the AAW Symposium in Atlanta this year, I presented a Special Interest Night (SIN) session introducing the concept of remote demonstrations. The video recording of the session notes the benefits of remote demos, then highlights some of the equipment used in my own shop for this purpose. Demonstrators and local clubs have varying equipment and budgets, but the topics discussed should be applicable to just about anyone, with a little tweaking.

The session covers:

- How presenters can use the Internet, low-cost computers, webcams, audio, software, and free video feeds to present real-time, multi-camera demonstrations.
- Typical chapter set-ups to make remote demonstrations interactive, seeing and taking questions from the audience.

Items needed

During the Symposium session, I demonstrated a wide variety of equipment because I wanted to show a range of possible configurations. A resource sheet that lists the equipment I used or mentioned in the video is available at tiny.cc/AWResources. Following is a condensed version of the resource sheet to give you an idea of the minimum, or baseline, configurations for demonstrators and clubs.

Basic demonstrator equipment

- A laptop computer (with built-in web camera)
- Two hi-definition USB webcams (for a total of three cameras)
- A microphone
- An Internet connection with an upload speed of at least 3Mbps (the faster, the better)
- A free video-conferencing program (e.g., Zoom.us or Skype)
- A low-cost video-switching program (like vMix or ManyCam) is highly recommended but not essential. These programs let you switch between cameras, do picture in picture, display photographs and recorded videos, etc.

There are many items that can be added to this list for more capabilities and features. In my video, I show several of these options, including a handheld remote keyboard to easily switch between cameras.

Basic club equipment

- A device that can accept a video call (typically a computer, tablet, or mobile phone)
- A monitor or projector to display the presenter's video
- Speakers for the presenter's audio
- An Internet connection with a download speed of at least 3Mbps (the faster, the better)
- A free video-conferencing program (e.g., Zoom.us or Skype)

Optionally, to let the presenter see and hear the club members, add

- A webcam
- A microphone, preferably wireless, that can be passed around the audience

You can do this!

None of this is rocket science. Grandmothers regularly have video calls with their grandchildren—this is not much different. It may be unfamiliar to many woodturners, but demonstrators and clubs can get up to speed quickly with a relatively small investment and a little mentoring. Remote demonstrations have the potential to dramatically increase the ability to teach woodturning in a new, effective way—and reach a truly global audience.

Alan Zenreich adjusting one of the webcams used for remote presentations and recordings in his New Jersey workshop.

Remote Demonstration Video

Alan Zenreich made an informative video recording of his 2016 Symposium presentation on the possibilities of remote demonstrations. View the video at tiny.cc/RemoteDemo or by scanning the QR code.

Coming Soon! AAW Demonstrator Scheduling Tool

One of the VISION 2020 service improvements underway for AAW members is an online demonstrator resource. This will include a searchable databank to help chapters easily identify and schedule demonstrators for chapter events, as well as useful demonstrator information such as contact information, schedule, fees, project types, ability to do remote demos, and sample demonstrator contracts.

Professional turner and demonstrator Mike Mahoney is among those offering remote demos. Mike is shown here in his well-lit, production-ready California shop addressing a camera.

AWA Extends Community Outreach

The Alaska Woodturners Association (AWA), now in its twelfth year, continues to grow its member base through community involvement and exposing the public to woodturning activities. These have included a woodturning booth at the Alaska State Fair and Anchorage's Artistry in Wood event.

Our demonstration booths were staffed by accomplished turners during all available public-attendance periods, when questions were invited and professionally answered. Onlookers who watched for an extended period were likely to be rewarded, to their delight, with a piece turned during the demonstration. We also had AWA information available for event attendees interested in our club. To meet the needs of new members, the AWA followed up with two four-week, ten-student beginner classes.


Photo: Richard Acuff

Photo: Bob Congdon

Part of the community outreach of the Alaska Woodturners Association has included adding turned wooden bowls to ceramic ones in a local Empty Bowls fundraiser, as well as turning tops for a children's event.

Empty Bowls fundraiser

Community involvement has been rewarding for both local organizations and AWA members. Last year, AWA was asked to contribute to a local soup kitchen's Empty Bowls fundraiser, which had in previous years relied solely on the city's ceramic throwers for a supply of bowls. In 2015, AWA members contributed 300 wood bowls to the event. This effort created a collector base for wooden bowls that brought a passionate plea for AWA's continued involvement. Our members rallied and completed in excess of 300 bowls for the 2016 event.

Charity representatives attended our April 2016 club meeting and announced that they had lost count at around 365 turned bowls and wanted to make our club the highlight of next year's fundraiser. They requested works other than bowls for their silent auction portion of the event.

A club effort

A concerted member effort was required to harvest a sufficient supply of turning blanks. And considerable thanks must be given to member Don Bladow, who furnished ninety-two bowls himself. Many bowls were turned by individuals in their shops, but we also rough-turned bowls at our two-lathe demonstration booth at the Alaska State Fair and at the Artistry in Wood event. Judging by the enthusiastic reactions and questions from onlookers, our involvement at both events was well received.

AWA members also turned more than 400 spinning tops on just a couple weeks' notice for a children's Easter event at a local mall. We feel blessed to have a talent that can be shared with our community. ■

—Rudy Berus

For more, visit akwoodturners.org.

A Boom for the Ages

Free Plans and Instructions Available

AAW member Rick Baker of Pennsylvania has designed a video-camera boom that's easy to make and easy to use. It's constructed from readily available aluminum stock, with an inexpensive tripod, dolly, and HDTV monitor. All told, the parts will cost about $400.

Baker designed the boom so the audience at a turning demonstration can have a better view of the action. The boom operator can easily tilt the camera, pan it left and right, and zoom in or out. The boom can be moved quickly and easily, for example, from a shot over the demonstrator's shoulder to one looking into a vessel on the lathe.

Baker had a prototype of the boom in use at the 2016 AAW Symposium but has since refined the design. The project plans available on the AAW website include complete measured drawings and detailed assembly instructions. AAW members can access the plans at tiny.cc/boom (case sensitive). ■

—David Heim

Thanks to this inexpensively built video-camera boom, audience members enjoyed a clear view of Cindy Drozda's demonstrations at the Mid Atlantic Woodturning Symposium in Lancaster, Pennsylvania, 2016.

Photos: Joshua Friend

TIPS

Tips

Mat board disk templates

I made a collection of disk templates for bandsawing round blanks out of half logs, like Wes Jones showed in his Tip in the June 2015 issue of *AW* (vol 30, no 3). I asked a local picture framer for scraps of mat board and made disks in half-inch increments, giving me more sizes to work with in about the same storage space.

I cut each disk on the bandsaw a little proud, then used my stationary belt sander to smooth the curves. All have a center hole so I can use a nail or fine-tipped sharpie to mark the center of the turning blank.

These discs were made about eight years ago, and they've held up fine. I even use some of the larger ones tacked to a half log when I want to chainsaw off the corners. I haven't had to replace any yet.

—Robin Dustin, New Hampshire

Share your turning ideas!

If we publish your tip, we'll pay you $35. Email your tips along with relevant photos or illustrations to editor@woodturner.org.

—Joshua Friend, Editor

Sanding inside vessels

Sanding inside a vessel with a small opening is challenging. The tool I came up with is a slotted wooden mandrel on a drill extension for holding abrasives, which flap against the inside of the vessel. The mandrel size can vary according to your needs. I cut the slot with a handsaw, as this provides a tight fit for the abrasive, whose grit helps keep it in place.

My drill extensions accept a ¼" (6mm) shaft, so I used a ¼" hex-head bolt screwed into a dowel for the wood mandrels. I then sawed off the bolt head and filed a slight flat on the bolt to give the extension set screws a surface to lock onto.

In use, the drill spins the abrasive clockwise, while the lathe turns the vessel counterclockwise. Make sure you position the abrasive in the correct direction so the grit is hitting the inside wood surface. As the end of the abrasive wears, just cut it back for a fresh surface.

—Dennis Ciesielski, Wisconsin

Gauges for your gouges

I use various gouges, and it can be a challenge to set up my sharpening jig to get the desired grinding angles for each one consistently. I sharpen these five gouges on a CBN wheel and set my Wolverine jig's V-arm in the exact same position each time using foolproof, shopmade gauges, as shown in *Photo 1*.

After establishing the correct distance from the front edge of the V-arm on my Wolverine jig to the jig base to get the desired angle on a particular gouge, I cut a strip of wood that length and labeled it for future use with that gouge. When resetting the jig, I simply sandwich the wood strip between the V-arm and the base to accurately position the V-arm *(Photo 2)*.

For all my gouges, I leave the Vari-Grind jig at 60 degrees, which works for me. Another gauge on the grinder is used to consistently set the distance from the Vari-Grind to the tip of the tool—1¾" (44mm). So those two variables are also made consistent each time. *Photo 2* shows my setup for grinding the Thompson ½" (13mm) bowl gouge to the recommended 60 degrees.

Note that this type of gauge is for use with an 8" (20cm) diamond or CBN grinding wheel, as those wheels maintain their diameter. Aluminum oxide wheels wear away with use, so their diameter will diminish over time. If you are using one of those wheels, base your set-up gauges on the distance from the V-arm to the wheel, instead of to the jig base. ■

—Jim Brinkman, Texas

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2

Calendar of Events

February issue deadline: December 15

Send information to editor@woodturner.org. For a more complete listing, see the AAW's Woodturning Calendar online at tiny.cc/AAWCalendar.

California

March 21-26, 2017, World Wood Day annual meeting and celebration, Long Beach Convention & Entertainment Center, Long Beach. A cultural event drawing participants from more than 100 countries and regions, celebrated annually to highlight wood as an eco-friendly and renewable biomaterial. For more, visit worldwoodday.org/2017.

Florida

January 13, 14, 2017, 28th Annual Florida Winter National Wood Art Exposition and Competition, Charlotte Harbor Event and Convention Center, Punta Gorda. An exhibition and professionally judged competition of carved and turned wood art. Woodcarving and woodturning demonstrations daily. For additional information or to obtain entry forms, visit flwoodartexpo.com.

January 27–29, 2017, Florida Woodturning Symposium, Lake Yale Baptist Conference Center, Leesburg. Demonstrators to include Clay Foster, Dale Larson, Avelino Samuel, Kimberly Winkle, Dave Barriger, Don Geiger, Barry Reiter, and Tim Rowe. For more, visit floridawoodturningsymposium.com.

Georgia

January 20, 2017–February 17, 2017, Wood Works: A Regional Exhibition, Oconee Cultural Arts Foundation (OCAF), Watkinsville. Featuring work from more than thirty-five furniture makers, woodturners, and fine artists. For more, visit ocaf.com.

March 10–12, 2017, Southern States Woodturning Symposium, Clarence Brown Conference Center, Cartersville. Demonstrators to include Stuart Mortimer, Dixie Biggs, Dennis Pallus, Greg Pennington, Peggy Schmid, Robert Lyon, Steve Cook, and Nick Cook. Instant gallery, tradeshow, and auction. For more, visit southernstatessymposium.org or call Nick Cook at 770-421-1212.

September 15–17, 2017, Turning Southern Style Symposium, hosted by the Georgia Association of Woodturners, Dalton Convention Center, Dalton. Event to include top-notch demonstrators, a large group of vendors, and a great facility. More details to follow.

Idaho

February 25, 26, 2017, Idaho Artistry in Wood Show, Wyndham Garden Boise Airport Hotel, Boise. Competitors from all skill levels submit their wood carving, turning, scroll work, fine woodworking, gourd art, and pyrography for public display and judging. Demonstrations, vendors, raffles, auction, and banquet.

For full information, entry forms, and discount admission coupons, visit idahoartistryinwood.com. For specific questions, contact Doug Rose at 208-856-8856 or roseboise@yahoo.com.

Minnesota

September 4–December 29, 2016, "Turning 30," AAW's Annual Member Exhibition, AAW Gallery of Wood Art, Saint Paul. An exhibition celebrating AAW's 30th anniversary, showcasing the wide range of approaches and techniques used in woodturning today. Humor, nostalgia, craftsmanship, and innovation mark this show as something special to see. The AAW Gallery of Wood Art features four to six exhibitions per year; ongoing exhibitions include works from the AAW Permanent Collection and the "Touch This!" family-friendly education room. For more, visit galleryofwoodart.org or email Tib Shaw at tib@woodturner.org.

New York

April 1, 2, 2017, 14th Annual Totally Turning Symposium, hosted by the Adirondack Woodturners Association, Saratoga Springs City Center, Saratoga Springs. Featured demonstrators will include Jimmy Clewes, Curt Theobald, David Ellsworth, Trent Bosch, Chris Pytlik, Kurt Hertzog, Rick Angus, Lynda Zibbideo, Willie Simmons, Ralph Mosher, and more. For more, visit totallyturning.com.

North Carolina

July 16, 2016–January 16, 2017, *Shaping the Vessel: Mascoll + Samuel,* The Harvey B. Gantt Center for African-American Arts + Culture, Charlotte. An exhibition of turned work by John Mascoll and Avelino Samuel. For more, visit ganttcenter.org.

Oregon

March 17–19, 2017, Oregon Woodturning Symposium, Linn County Expo Center, Albany. Demonstrators to include Al Stirt, Binh Pho, Christian Burchard, Dixie Biggs, Don Ward, Jon Magill, Michael Blankenship, Nick Cook, Stuart Batty, and Stuart Mortimer. Also featuring a vendor show, banquet, and lunches. For more, visit oregonwoodturningsymposium.com.

Pennsylvania

August 22, 2016–August 20, 2017, At the Center: Masters of American Craft, an installation of twenty works by David Ellsworth paired with works by the late ceramist Rudolf Staffel, Philadelphia Art Museum, Philadelphia. Curated by Elisabeth Agro, Curator of Decorative Arts. For more, visit philamuseum.org/visit.

December 2, 2016–January 28, 2017, Wayne Art Center's 22nd annual *Craft Forms* and *Making Marks Exhibitions*, Wayne Art Center, Wayne. *Craft Forms 2016*, in the Davenport Gallery, is an international, juried exhibition of fine contemporary craft, including turned work. *Making Marks*, a companion show in the Ethel Sergeant Clark Smith Gallery, will feature work by fifteen fiber and textile artists. For more, visit craftforms.org.

Tennessee

January 27, 28, 2017, Tennessee Association of Woodturners' 29th Annual Woodturning Symposium, Marriott Hotel, Franklin. Demonstrators to include Nick Agar, Cynthia Carden Gibson, Stephen Hatcher, and Frank Penta. Tradeshow, instant gallery, banquet, and auction. For more, visit tnwoodturners.org. For vendor booth information, contact voldad18@comcast.net.

Washington

March 25, 2017, Northwest Washington Woodturners' 8th annual All Day Demo, A Day with Trent Bosch, Anacortes First Baptist Church, Anacortes. Trent Bosch will demonstrate decorative utility bowls, hollowing techniques, vessels, surface enhancement, and more. Visit nwwwt.org/BoschDemo.pdf, email info@nwwwt.org, or call Rick Anderson at 360-319-7600.

Craft School Scholarships

The AAW is pleased to continuing offering financial assistance for quality woodturning instruction. Scholarships will be awarded to selected AAW chapter members to attend woodturning-related classes at one of three craft schools. The AAW Endowment Trust Fund (ETF), in combination with the three schools, provides funds for these scholarships.

Arrowmont

Fourteen scholarships will be awarded to Arrowmont School of Arts and Crafts, Gatlinburg, Tennessee. Tuition only; room and board and travel expenses are the responsibility of the recipient.

John C. Campbell

Ten scholarships will be awarded to John C. Campbell Folk School, Brasstown, North Carolina. Tuition only; room and board and travel expenses are the responsibility of the recipient.

Anderson Ranch

Four scholarships will be awarded to Anderson Ranch Arts Center, Snowmass Village, Colorado. Covers tuition and room and board. Travel is the responsibility of the recipient.

Chapter-based nominations

- Nominees must be current AAW members and be chosen through a process authorized by their AAW chapter officers. AAW guest members and those with lapsed or expired memberships are not eligible.
- Star chapters will be allotted two nominations for the first fifty members and one additional nominee for each additional fifty members. All other chapters will be allotted one nomination for the first fifty AAW members in the chapter. After that, each additional fifty AAW members will allow another nomination.

If more members are nominated than the total number of available scholarships, a drawing will determine the winners. All awards will be for courses in 2017. Chapters must provide the names of nominees, the number of chapter members, and the number of AAW members in the chapter using the online application (tiny.cc/ChapterScholarship) **no later than December 15, 2016**. Winners will be notified by December 31, 2016.

Turn a **Pencil-Stub Holder**

Michael Hamilton-Clark

The idea for a turned pencil-stub holder started simply enough: my wife asked me to make something to hold her eyebrow pencil, which had several inches of core left but had become too short to hold. There was the added aspect that a handy eyebrow brush can be fitted over the pencil. A turned wooden holder would provide for the right grasp and length, so she could continue using the pencil until it was truly depleted. I found the holder works great with short writing pencils, such as golf pencils, too. It not only provides additional length to make writing easier, but you also can reverse the pencil in the holder when not in use, so the point is protected.

This is a good small project you can use to practice spindle-turning skills. A drilled hole in the end of the holder accepts the pencil. Here's how to make one.

Woods and shapes

1

This is a good project for using scrap wood and practicing spindle-turning skills.

Wood selection

Any scrap wood of sufficient length and width would be fine for this project; I have used a store-bought ¾"- (19mm-) square by 5"- (13cm-) long pen blank. You can use any wood species you like for this project, but a close-grain variety is less likely to split around the outer edge of the insertion hole when writing pressure is applied. A nice grain pattern adds considerably to the appearance, and the wood's ability to be polished and hold a shine is also an asset. Some woods I have used are yew, zebrawood, olive, ebony, walnut, and poplar, as shown in *Photo 1*.

You can customize the holder's shape and turned features any way you like, with only one main design consideration: the outside diameter of the holder at the end with the hole to receive the pencil should be no less than 7/16" (11mm). Otherwise, you risk splitting the wood during use.

Whatever stock you have chosen, find and mark the center on each end with a center punch.

Work-holding options

For holding a small piece like this, a chuck with pin jaws is very practical (*Photo 2*). But if you do not have pin jaws, you could create a simple jam chuck. To do this, mount the stock between centers and turn a tapered section at least ⅜" (10mm) long at one end, starting with a diameter just under ⅝" (16mm) at the end and tapering up to about ¾". Remove the pencil holder blank and turn a disk to fit whatever chuck you do have so you can drill a ⅝" hole in it. Press the tapered spindle end into this hole for a tight-fitting jam chuck (*Photos 3, 4*).

Whichever holding method you use, align the work by registering the center-punched hole on its end with a live center in the tailstock.

Drill a hole

I have found it is best to drill the hole for receiving/retaining the pencil stub prior to turning the holder. To do this, remove the live center from the tailstock and insert a drill chuck. Choose a drill bit that is as close as possible in diameter to your pencil stub. I have found that for most

Work-holding options

2

Pin, or spigot, jaws are quick and practical.

3

4

(3, 4) A custom jam chuck serves as a good alternative holding method. Turn a short tapered section on the workpiece (spindle) with the piece mounted between centers, then fit the taper tightly into a hole in a mounted disk. Use the tailstock for either method.

pencils, lead and colored, 19⁄64" (7.5mm) works well. While a firm push-fit is ideal, it is better to be a bit too loose than too tight. If the fit is loose, you can wrap some tape around the pencil to improve the fit. Too tight, and you risk splitting the end of the holder.

It is best to drill a smaller hole as a starter, say 3⁄16" (5mm) diameter. For both drill bits, a length of masking tape should be wrapped around the bit to mark a depth of 1¼", or 32mm (*Photo 5*). This depth will accommodate the stub point when the pencil is reversed for safe carrying. Drilling is best done at slow speed, around 300 rpm.

Turn the holder

Once the pencil hole is drilled, remove the drill chuck from the tailstock and replace it with a cone-shaped live center. Advance the cone center into the drilled hole with light pressure—too much pressure could split the wood, and too loose will allow the stock to flex during shaping.

While a profile template is not strictly necessary, it is handy to have a gauge for quickly laying out key transition points, as shown in *Photo 6*, especially if you are making several pencil holders of the same shape. On the same cardstock, you can also make cutouts that indicate the diameters of the two ends and the central girth (*Photo 7*). I have found that a practical diameter at the end for receiving the pencil stub is 7⁄16". Going smaller than that increases the likelihood of splitting the wood during use. As to the central girth, I suggest ½" (13mm) to ⅝" diameter, and for the top, at least ⅝".

The actual shape of the turning is up to you. The upper end can be flared out or finished with a sphere, or bead. Whatever shape you choose, a set of burned V-grooves makes a nice definition (*Photo 8*). As a final touch, the edge of the pencil end can be given a very slight chamfer (*Photo 9*). Make a parting cut at the headstock end of the piece, leaving around ¼" (6mm) diameter for sufficient support while sanding and polishing (*Photo 10*).

Sand and polish

Sand the piece and apply a finish according to your preference. I generally use a rag and turn the lathe by hand to apply thinned lacquer to seal the wood, then one or two applications of a friction polish at a higher lathe speed. A helpful hint: if your lathe has the capability to spin in reverse, use that option while applying a finish at the lathe. That way, if you've been a bit generous, the spray will go away from you, rather than onto you.

Once the sanding and polishing are completed, the finished pencil holder can be parted off the lathe by gently cutting through the remaining ¼" of material at the chuck end. Sand off any stub that remains at the top, using a circular motion against a sheet of abrasive, then apply a dab of color if so desired, sealer, and polish.

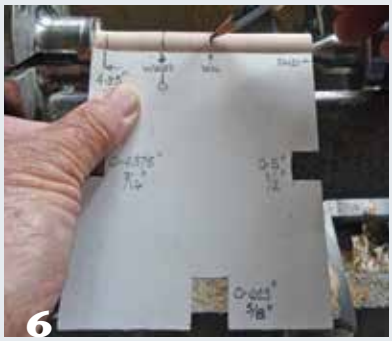
The pencil holder is ready to be put to use. I have found that in addition to being handy around the house and in the workshop, these items make good gifts and create interest at craft fairs. I hope that if you care to make some, you'll find this article a useful guide. ■

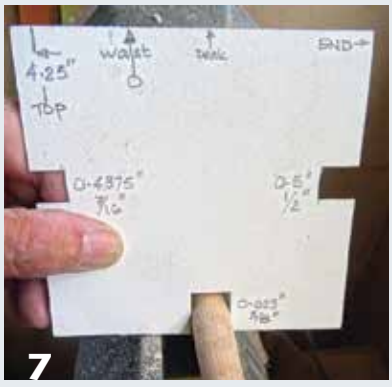
Michael Hamilton-Clark, a retired civil engineer, has been turning wood for ten years. He lives in the Fraser Valley, British Columbia, and uses mostly locally available woods from felled trees, branch trimmings, and mill offcuts to produce a variety of items. He is a member of the Fraser Valley Woodturners Guild as well as the AAW. His website is alberystudiowoodturnings.com.

Drill the pencil hole

Drill a hole sized for the pencil stub you will be holding—a diameter of 19⁄64" works well.

A handy template





Make a simple template out of cardstock showing key transition points and diameters.

Turn the holder

Burn lines add a nice touch at the upper end of the holder.

Form a subtle chamfer at the hole end.

Reduce a small area at the headstock end prior to sanding and polishing the piece, then part off.

INSIDE-OUT TURNING *Made Easy*

James L. Pruitt

Inside-out turning involves shaping a workpiece made of segmented spindle stock. Matched spindle stock is bundled and traditionally glued into a single piece of stock using a temporary glue joint. The piece is turned, the glue joints separated, and each element rotated 180 degrees relative to its first position. The collective elements are glued back together and remounted for additional turning. The result is a form with no visible clue to reveal how the inside was hollowed. Carefully matched grain and tight glue joints assure the turner's trick all but vanishes.

That traditional approach to inside-out turning requires a delay while the adhesive cures and introduces a step that puts the stock at risk of damage. As an alternative, my approach relies on turning disks that do not require the stock to be glued and easily allows the individual segments to be repositioned any number of times.

Making the reversing disks

The disks are simple to make and are real time-savers, especially when I need to make multiple turnings using the same size stock. I make the disks with good quality ½" to ¾"- (13mm to 19mm-) thick plywood. The diameter of the disks should be about two-and-a-half times the cross section of the turning stock. For example, a bundle of four ¾" turning squares would measure 1½" (38mm) across, requiring 3¾"- (10cm-) diameter reversing disks. The turning is completed between centers using the disks to hold the stock.

Continuing with the example above, I begin with two pieces of 3¾" plywood, using a bandsaw to establish rough circles and with 1/16" (1.6mm) holes drilled through their

Turn holding disks and assemble stock

Shape the two disks from good quality plywood. Mark their centers and cut them to shape with a bandsaw or remove corners with a handsaw prior to mounting between centers for final shaping.

Prepare the stock to be turned. Sanding a corner of each segment provides a centering point to locate the bundled stock on the disks.

Secure stock between disks

Small pieces of dimensioned lumber affixed to the disks with tape and fasteners trap the bundled turning stock in place. The protruding ends are turned away to prevent injuring the turner.

centers. Using a drill press ensures perpendicular holes. I mount the disks on the lathe using a safety center in the headstock and a revolving cup center with a point in the tailstock. I round the blanks with a ½" bowl or spindle gouge and round over and sand the edges with 100-grit abrasive (*Photo 1*).

I remove the disks from the lathe and insert snug-fitting finish nails in the 1/16" holes. The nails extend through each disk about ⅛" (3mm).

Mounting and turning

Position the disks with the captured turning stock between lathe centers and begin turning. A ½" spindle gouge is my tool of choice for a form of this size.

Preparing the turning stock

I cut four pieces of ¾" spindle stock 4½" (11cm) long. I select the interior edge of each piece and lightly sand the corner of both ends (*Photo 2*). Marking one end of each of the four pieces of turning stock helps keep them properly oriented during the various phases of turning. I secure the four pieces together using a rubber band with the sanded corners meeting in the center. This forms a recess for the nail point (*Photo 3*).

To secure the turning stock on the disk, I cut eight pieces of scrap lumber to ¾" thick by ½" wide and 2¼" (6cm) long. While holding the rubber-banded stock centered on the nail point, I apply strips of double-faced tape to the disk and around the turning stock (*Photo 4*). I affix the four pieces of wood on the tape and snugly around the turning stock (*Photo 5*). I then secure these pieces to the disk using small nails or screws, and repeat the procedure on the second disk. These four retaining pieces are positioned so that their ends point clockwise on the headstock disk and counter-clockwise on the tailstock disk (*Photo 6*). Removing the centering nails, I mount each disk on the lathe and round the corners of the holding pieces to prevent injury (*Photo 7*).

Using the disks for turning

The disks hold the four pieces of stock together in both the inside and outside turning positions (*Photo 8*). The ease of this system allows quick repositioning to turn both profiles, then refine each profile as necessary without committing to gluing until the form is satisfactory.

With the form mounted on the lathe, I begin turning, keeping in mind that at this stage I am actually ▸

Preparing to turn the outer form

Once satisfied with the inside form, glue the elements in place using the turning disks to assist with alignment.

Turn the outside

Turn the outside of the form. Before removing the form from the disks, re-mark the centers using the finish nail and the previously drilled center holes in each disk.

Completing the form

The turning is remounted between centers without the disks and prepared for mounting in a scroll chuck. The scroll chuck provides greater access to complete the ends of the turning and part it from the lathe.

JOURNAL ARCHIVE CONNECTION

For more ideas on inside-out turning, see Dean Andrus's 2001 *AW* article, "Christmas Ornaments: Inside-out woodturning for the holidays" (vol 16, no 4, page 18). AAW members can access all past journal articles online at woodturner.org.

shaping the inside of the finished form (*Photo 9*). A simple template made from stiff paper can be helpful for creating the proper profile. When I am satisfied with the inside profile, I sand and apply a finish, avoiding the surfaces that are to be glued. Next, I remove the piece from the lathe, rotate each element 180 degrees (thus the "outside" becomes the "inside") and glue the elements together using yellow wood glue sparingly to avoid squeeze-out (*Photo 10*). I clamp the pieces together until the adhesive sets, using one or both turning disks to help align the pieces (*Photo 11*).

After the glue sets, I remount the form between the turning disks and complete the outside profile. I use moderate tailstock pressure to avoid breaking the form as its wall thickness is reduced. I also leave material on either end to support the piece as I move to the final chucking procedure (*Photo 12*). I sand the completed area before removing the form from the lathe.

Once off the lathe, I re-insert the small centering nail through the end of each disk and tap the nail with a hammer to re-mark the centers of the turning (*Photo 13*). I remove the turning from between the disks and remount it between lathe centers, turning one end round to make a tenon for a scroll chuck (*Photo 14*). With the support of the revolving cup center to steady the piece, I complete the outside of the form, including sanding and finishing (*Photo 15*).

Finally, after parting the piece from the lathe, I add a finial and top feature to complete this inside-out tree ornament. ■

Photos by Tom Sharp.

James Pruitt retired from the USAF in 1980 and from the aerospace industry in 1995. He began turning pens as a hobby in 1993. He is a member of the AAW, and a twelve-year member of the Ozark Woodturners, serving as president for seven years.

A Beginner's Shopping List

TURNING TOOLS AND SHARPENING GEAR

Walt Wager

After I purchased my first lathe, I started shopping for turning tools. I bought a set of high-speed steel (HSS) tools from a mail-order store. The set included a ¾" (19mm) spindle roughing gouge, a ½" (13mm) bowl gouge, a ⅜" (10mm) spindle gouge, a diamond-shaped parting tool, a round-nose scraper, and a 1" (25mm) skew. Since I didn't know much about turning, these were what I used to get started. After joining the AAW, I read many articles about tools and how to use them. If I had to do it all over today, I would purchase individual tools (instead of a set) to get more flexibility and choice for the money. This article describes the various tools I would recommend for a new turner.

Traditionally, turning tools were made of carbon steel, and it is not uncommon to find these tools in garage sales, auctions, and as giveaways with used lathes. Turning tools sold today are almost all HSS, which is tougher than carbon steel and holds an edge longer. However, not all HSS steel is the same: there are differences in quality among the various manufacturers and vendors. These differences are discussed in Alan Lacer's 2008 *AW* article, "Testing the Steel in Turning Tools." Most turning tools today are made in England or China. Look for tools designated as M2 steel. M2 HSS contains tungsten and molybdenum, which give it toughness and wearability. Lacer implies in his article it is better to stick with established vendors and manufacturers, as opposed to buying cheaper tools often available on online auction sites. But he also notes that some of the tools from discount vendors meet the quality standards of the more expensive versions.

Turning tools

What turning tools do you need? It depends on what you plan to turn. If you are only going to turn pens, then get a set of tools made for penturning. However, for general use for everything from spindles to bowls, I'll give you my opinion and why I'd choose these tools, preferably in M2 HSS.

1" Spindle roughing gouge

The spindle roughing gouge is used for roughing the corners off square spindle blanks to bring them into round, forming cylinders and tapers, and making smooth planing cuts. This tool is relatively easy to learn with practice.

Safety Note: As the name implies, the spindle roughing gouge should be used only for spindle work—when the piece is mounted between centers with the grain running parallel to the ways of the lathe. It should never be used on a bowl or other workpiece mounted with the grain running perpendicular to the lathe bed. While this tool has a relatively large cutting edge, it also has a short, weak tang (the part inserted into the tool handle). Crossgrain work such as bowls present endgrain to the cutting edge, and the spindle roughing gouge is not made to withstand the associated forces. The tang could break, resulting in serious injury.

⅜" Spindle gouge

This is a highly versatile tool for spindle work. The tool's shallow flute aids in forming beads, coves, and V-groove cuts with crisp corners and transitions. ▸

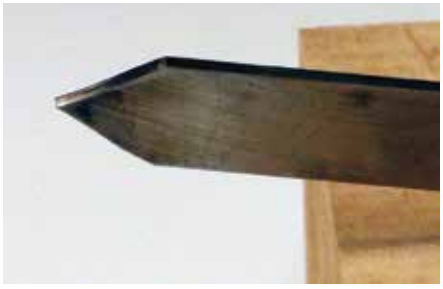
⅜" Bowl gouge

An all-around tool used mostly for facegrain work (with the grain running perpendicular to the lathe bed) but also suitable for some spindle-turning tasks. As its name implies, the bowl gouge is typically used to shape the outside of a bowl and to hollow a bowl's interior. Its deep flute and longer, swept-back wings (a grind option commonly found on bowl gouges) allow you to remove a lot of wood in one pass. If you plan to turn many bowls, you might also want to purchase a ½" bowl gouge for larger work.

¾" Square and round-nose scrapers

Scrapers are useful mostly for smoothing out tool marks and for hollowing endgrain. The traditional grind is flat across the top surface, with a 40° to 45° bevel (*top photo*). I sharpen my scrapers with a "negative rake," meaning a secondary bevel is ground on the top surface downward to meet the primary bevel (*bottom photo*). Many turners are now opting for negative-rake scrapers, citing a better quality of cut with less tearout. Stuart Batty discusses the advantages of the negative-rake scraper in a Spring 2006 *AW* article, "Negative-Rake Scraper" (vol 21, no 1, page 24).

Parting tool



A versatile tool used not only for parting work off the lathe, but also for making fillets and forming tenons for holding work in a scroll chuck. There are many types, shapes, and thicknesses of parting tools, but a flat-sided, ⅛"- (3mm-) wide by ¾"-high tool is the one I use most.

⅜" Bedan

Not commonly sold as part of a set of tools, the bedan is nonetheless effective for roughing spindles and hollowing small boxes. The tool's shaft is ground to a trapezoidal shape, with the top surface wider than the bottom, giving it relief as it enters a straight-in cut. It can be used like a skew for planing cuts, like a parting tool for forming tenons, and as a shearing tool or scraper. This versatile tool works much like a square-tip carbide tool (*see sidebar*).

Skew chisels

The skew is a traditional spindle-turning tool useful for many of the same purposes as a spindle gouge. It is especially useful for planing cuts and forming cylinders and tapers, but can also be used for roughing and removing a lot of material quickly with a peeling cut. This tool has the reputation of being difficult to master but is well worth your practice time.

Skews come in various sizes and configurations, but a ¾" skew is a versatile choice. Two April 2015 *AW* articles stand out as good references: "Build Your Skills by Understanding the Skew," by Jim Scarsella, and "Skew Chisel Primer: Learn the Basic Cuts," by Keith Tompkins.

Sharpening equipment

Turning tools do not always come preshaped or presharpened when you buy them. Some vendors offer to sharpen them for an extra fee. If you are a new turner, this is a good idea, as you will get a tool ready to use and you will know what it is supposed to look like. Even so, you are going to have to sharpen your tools at some time and will need a system for sharpening.

Bench grinder with sharpening jig

The most common means of sharpening turning tools is with a bench grinder. You can sharpen your new tools by hand, using the toolrest that came with the grinder, but this requires a practiced hand, and it isn't a simple matter to replicate an existing grind (bevel shape and size). To help with this task, an adjustable sharpening jig, either shopmade or commercially available, holds the tool in the appropriate position to duplicate the tool's shape consistently.

For new turners buying traditional HSS turning tools, I recommend a slow-speed (1725 rpm), 8" (20cm) grinder with aluminum oxide wheels. High-speed (3450 rpm) grinders with silicon carbide wheels are not recommended for sharpening HSS tools. Carbon boron nitride (CBN) wheels are especially well suited for sharpening HSS, with very little heat buildup, but are expensive and unnecessary for the new turner getting started. For a full discussion of grinder wheels, read Bill Neddow's April 2011 *AW* article, "Grinder Wheels" (vol 26, no 2, page 23).

If you get a bench grinder with aluminum oxide wheels, you will need an inexpensive wheel dresser, which is used periodically to clean the wheel's cutting surface.

Diamond hones

I recommend you acquire a set of diamond paddles or a diamond honing card. Diamond hones are used to refresh an edge on an HSS tool quickly and without going back to the grinder. Just a couple of strokes with a hone makes a big difference in how well the tool cuts. Hones can also be used to refresh the edge on carbide tools.

Note that when it comes to sharpening scrapers, preferences vary widely among turners. Many prefer not to hone at all, but to use the small burr created by the grinding wheel.

Tools with Carbide Inserts

Sharpening turning tools can be a frustrating and difficult task for many new turners. Some vendors have responded by offering tools with presharpened, replaceable carbide cutter inserts. Many experienced turners would not recommend carbide tools because traditional tools generally provide a better cut surface on the wood, more flexibility with types of cuts, and a lower cost over the long run.

But for the new turner, carbide tools may be a good choice for getting started. I teach a lot of new turners, and I like the idea that by using carbide tools, they can learn to turn and finish a project the very first time they turn. I show them the difference between the cuts you can make with carbide tools and traditional tools. Traditional tools almost always result in a better cut surface, so many of my students move from carbide to conventional tools over a series of classes.

Ask for help

Choosing turning tools and learning to use and sharpen them properly are necessary steps in becoming a woodturner. Getting help from an experienced woodturner will certainly speed up the learning process. Local AAW chapters are filled with turners who are glad to help you along. You will find a variety of opinions and methods, so listen to a number of different turners and consider what might be best for you. ■

Walt Wager lives in Monticello, Florida, and has been an AAW member for fourteen years. He teaches woodturning workshops at Camelot's Woodworking Studio at King Arthur's Tools in Tallahassee. His website is waltwager.com.

TUNING UP A BENCH GRINDER

Don Geiger

The calm surface of the wine in this glass, placed on the toolrest of a running grinder, demonstrates how a properly tuned grinder should operate.

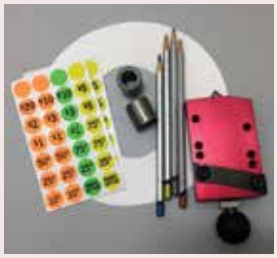
JOURNAL ARCHIVE CONNECTION

For more ideas on improving your grinder's performance, see Bob Vaughan's 1999 *AW* article, "Fine Tuning a Grinder" (vol 14, no 1, page 22). AAW members can access all past journal articles online at woodturner.org.

Most woodturners use a bench grinder to sharpen their turning tools. Quite some time ago, I recognized that many people were unhappy with the performance of their grinder. If yours produces significant vibration and your tools bounce on the surface of the wheels, there is a problem. Tools bouncing on the surface vibrate at a harmonic frequency, like a chatter tool on spinning wood. This type of vibration is easily recognized because it leaves evenly spaced dark spots on the surface of the wheel—solid evidence that the wheel is not concentric to the grinder's axle.

I developed a process for tuning up a bench grinder at minimal cost and only about forty minutes of your time. I have performed this tune-up on numerous grinders myself and have instructed others, who have reported good results. A well-tuned grinder will produce a better edge on your turning tools.

What You'll Need



Tools and supplies you will need to tune up a grinder as described in this article are as follows:

- Two ring-shaped card stock disks with an outside diameter about ¼" (6mm) smaller than your wheel and an inside diameter about ½" (13mm) larger than the cup washers on your grinder
- Spray adhesive (re-positionable photo mount works well)
- Several ¾"- (19mm-) diameter adhesive paper dots (price-marking dots work well)
- Two steel bushings (headless drill bushings work well)
- Two or three pencils of contrasting colors
- A wheel truing/dressing device with a mechanically guided single diamond that is micro-adjustable
- A wrench to fit the axle nut on your grinder (not shown)

Wheels and bushings

Most woodturning tools (except carbide) can be effectively sharpened with an aluminum oxide wheel with 30% to 60% ceramic content. The correct hardness of the wheel is important. Wheel hardness is rated on a scale from A to Z, with A being the softest. A "K" hardness wheel is ideal for sharpening most woodturning tools. The identification code printed on the wheel manufacturer's label should include the hardness rating (*Photo 1*). An 80- to 120-grit wheel is a good choice for sharpening most woodturning tools, and a 46-grit wheel is good for producing a burr on scrapers and for rough shaping tools. A properly dressed 80-grit wheel can produce excellent results on most woodturning tools.

I recommend using wheels that have an outside diameter made for the size of your grinder, with a 1" (25mm) width and 1"-diameter hole in the center (arbor hole). Most 8" (20cm) bench grinders have a ⅝" (16mm) shaft diameter (some have a ¾" shaft). Wheels with a 1" hole are usually supplied with three or four

Ring Test

Prior to mounting a grinder wheel, inspect it visually for any cracks or chips. The Occupational Safety and Health Administration (OSHA), which regulates worker safety in commercial and educational facilities, recommends testing the integrity of a grinding wheel by performing a ring test prior to mounting. Details about this test can be found at osha.gov.

Support the wheel in a horizontal position on your finger tips and tap the wheel using the plastic handle of a screwdriver about 1" from the edge in each of the wheel's four quadrants. The sound of an undamaged wheel will give a clear ringing tone. If cracked, there will be a dead sound, and the wheel should not be used. Make sure the wheel is dry and clean before applying this test. After you test one side, turn the wheel over and repeat on the other side.

tapered plastic bushings of different diameters to fit various shaft diameters. The plastic bushings are usually loose fitting, which allows the mass of the wheel to be mounted off center—a major source of vibration. I recommend discarding the plastic bushings and replacing them with precision-made steel bushings (*Photo 2*). Steel bushings provide a solid foundation, center the mass of the wheel on the axle, and improve the perpendicular position of the wheel in relation to the axle. Steel bushings are readily available in a variety of useful sizes.

Note that when installing a steel bushing, do not force it into the wheel's hole. Never attempt to adjust the size of the hole in the wheel; if the bushing does not fit, try another bushing and/or wheel.

Mount the wheels

Remove the nuts, wheels, and cup washers from the axle. Note that the nuts on either end of the axle have opposing threads. The right side has a right-hand thread, and the left side, a left-hand thread. This is a safety feature designed to allow the nuts to loosen, thus stopping the wheels, if an object inadvertently jams a wheel.

Visually inspect the shoulders on the axle where the diameter changes. Remove any rust and debris. Test fit the steel bushings to ensure they slide over the shaft and fit well. If you have difficulty sliding the steel bushing over the shaft, use sandpaper to remove obstructions such as burrs, rust, or paint.

Unevenness in some grinders' stamped metal cup washers can be a source of side-to-side wheel wobble. If you suspect your wheels do not run true, consider replacing the washers with machined circular saw blade stabilizers. These are available from several sources to fit perfectly over a ⅝" diameter axle (though I am not aware of any sources for stabilizers designed to fit a ¾" shaft). For each wheel, mount the inboard washer, wheel with new bushing, outboard washer, and nut.

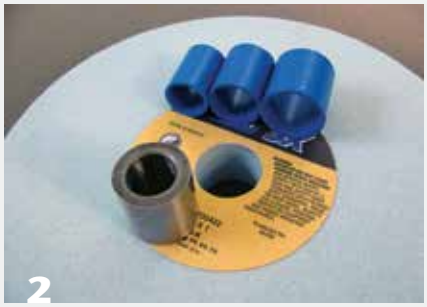
Most wheel manufacturers recommend tightening the nuts to 8 to 10 foot-pounds of torque. Determine the specified torque for your wheels. Never use a tool to hold the axle or wheel stationary while tightening an axle nut; use your hand to avoid damaging the wheel (*Photo 3*). Excessive tightening could result in breaking the wheel. Once the wheel is secured, stand safely off to the side of the grinder and turn the grinder on. Let it run for five to ten minutes to ensure the wheel remains intact and spins without excessive vibration.

Correct wheel wobble

Never attempt to correct side-to-side wheel wobble by dressing, or truing, the sides of the wheel—a very dangerous practice. Side-to-side wheel wobble is usually the result of the wheel being poorly mounted, not an inconsistency ▸

Wheel hardness and bushings

1 A wheel hardness of "K" is ideal for sharpening most woodturning tools.



2 Steel bushings perform better than the plastic variety.

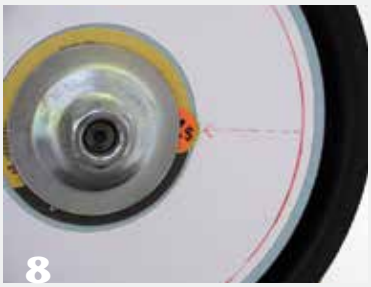
Wheel mounting

3 Never hold a grinding wheel or axle with a tool while tightening the nut; your hand will do the job without damaging the wheel. Determine the recommended torque for tightening the nut.

Eliminate wobble: find the apex

A paper disk adhered to the side of the wheel provides a surface for marking the apex, or high spot, of the wheel's side-to-side wobble.

Eliminate wobble: install shims



Adhesive tag sale price markers make excellent shims. Install them to the inboard side first, then outboard. Retest to find the new apex using a different colored pencil.

in the wheel itself. In rare cases, the axle may not be running true. The accurate placement of paper shims between the edge of the cup washers and the wheels can minimize wobble. Keep in mind only so much adjustment is available. Here's how to determine where to position the shims and how to install them.

Identify the apex of the wobble

1. Adhere paper disks to the outboard side of each wheel (*Photo 4*) to provide a smooth surface for marking the apex of the wobble.
2. Position the grinder's toolrest about ⅛" (3mm) from the wheel and secure it in place. Rotate the wheel by hand to verify it clears the toolrest. Wearing a faceshield, turn on the grinder.
3. Use the toolrest to support a colored pencil, and lightly touch the paper disk about ¼" from the outer edge (*Photo 5*). Since you are trying to identify "high spots," do not use much inward force on the pencil; simply touch it to the side of the spinning wheel.
4. Stop the grinder and inspect the mark you've made. The center of the length of the pencil mark indicates the apex of the wheel wobble on the outboard side of the wheel and where shims should be installed to correct the problem. The length of the mark indicates the severity of the wobble. If the pencil mark is very short (2" to 3", or 5cm to 8cm), the wobble is pretty severe. The longer the mark, the less severe the problem is.

Install shims and retest

Note: Use only paper shims; hard shims such as metal, wood, or plastic can concentrate too much pressure, possibly cracking the wheel, and could become a safety hazard if they fly out while the grinder is running. I recommend using adhesive paper price marking dots, available inexpensively from numerous sources.

1. Rotate the wheel so the pencil mark you made is toward the rear of the grinder, and mark a line or arrow from the center of the test mark to the edge of the cup washer (*Photo 6*). This line indicates where shims need to be installed on the outboard side of the wheel. Shims also need to be installed on the inboard side, 180° from the outboard location.
2. Install the shims on the inboard side first. Loosen the axle nut about ¼" away from the outboard washer. Slide the wheel and the outboard cup washer in the outboard direction against the loosened nut. This provides space between the inboard cup washer and the wheel to allow the insertion of adhesive paper shims between the cup washer and the wheel. Install a stack of about five dots for severe cases and fewer for less severe wobble. Adhering the stack of adhesive shims to the tip of a straight blade screwdriver facilitates easier positioning on the inboard side (*Photo 7*).
3. Install an equal number of shims between the outboard cup washer and

the wheel precisely at the center of the pencil line marked earlier (*Photo 8*). Push the outboard washer and wheel toward the grinder and tighten the nut.
4. Re-test the apex of the wobble using the pencil marking method as before. It may take a few tries, so be sure to use a different colored pencil each time so you can distinguish the current mark from previous ones. Add or remove paper shims as needed until you are satisfied with the results. A mark that runs ≥75% of the way around the wheel is acceptable (*Photo 9*).

Once both wheels have been corrected for wobble, ensure the nuts are tightened to the recommend torque and replace the safety guards.

True the wheels

To minimize vibration and prevent tool bounce, the circumference of each wheel needs to be made concentric to the axle. A wheel-truing device will do this more effectively than a handheld wheel dresser. Wheel truing systems feature a single diamond, whose position, relative to the wheel, is controlled and micro-adjustable. By mechanically controlling the diamond, it is possible to remove high spots from the surface of the wheel. Sharpening tools on the resulting smooth surface significantly improves the appearance of bevels and sharpness of edges.

Wheel-truing systems with a single-point diamond dresser are available commercially (*Photo 10*) or can be shopmade (*Photo 11*). If you are inclined to build your own truing system, there are several sources for inexpensive single-point diamond dressers, including McMaster-Carr (mcmaster.com); MSC, formerly Enco (mscdirect.com/enco); ebay.com, and Amazon.com. A 0.50-carat diamond mounted to a ½"-diameter, 6"- (15cm-) long shaft will serve you well in most cases—for wheels up to 10" (25cm) diameter—though a 0.33-carat diamond can be used for smaller wheels (up to 6" diameter).

Step by step

1. If your wheel-truing device utilizes a toolrest for support, position the toolrest within ⅛" of the wheel. The top surface of the toolrest needs to be pointing at the axle of the grinder or slightly downward. Do not position the toolrest in an upward position.
2. Use a file to remove any nicks or bumps from the edge of the toolrest facing you. It is advisable to chamfer this edge as well. Tighten the toolrest securely. Rotate the wheel by hand to ensure it clears the toolrest.
3. Position the diamond so it barely touches the face of the wheel (*Photo 12*). Once the position of the diamond is set, put on a dust mask and faceshield. Move the diamond away from the wheel and start the grinder.
4. Traverse the truing device left and right across the face of the wheel five or six times, then very slightly advance the position of the diamond toward the wheel. Repeat this procedure a few times, stopping the grinder to inspect the wheel. Repeat as necessary until the diamond has contacted the entire circumference and width of the wheel.
5. Repeat the same procedure on the other wheel.

Maintenance and use

Continue to use the truing device exclusively to maintain concentricity of the wheels and smooth and de-glaze the outer surfaces of the wheels. (De-glazing is the removal of clogged metal particles.) Using the wheel-truing device routinely will prevent re-developing vibration and will keep your wheels in top-notch condition.

Once the tune-up procedure is complete, your grinder should perform with optimal results. The vibration of the grinder will be minimized and tools will not bounce on the surface of the wheels. ■

Don Geiger is a professional woodturner who enjoys leading workshops, teaching, and demonstrating at symposiums and clubs. He has been active in the woodturning community since 1999. Don markets several of his own inventions and is a dealer for Robust Tools, LLC. He lives in Newberry, Florida. For more, visit geigerssolutions.com.

True the wheels


10


11


12

(10) Commercially available wheel truing systems, all of which make use of a diamond to cut, or dress, the wheel.

(11) A shopmade truing system, comprising a single-point diamond dresser mounted firmly in a grooved block with an integral edge guide on the bottom.

(12) Steady side-to-side movement of the diamond will remove high spots around the wheel's circumference, making it concentric with the grinder's axle. Be sure to wear an appropriate dust mask and faceshield.

PUT SOME Spring IN YOUR Toys

Richard Dlugo

I'm a grandfather, now retired after spending many years as a music teacher, band and choir director, and computer teacher. Back in the 1970s and '80s, I also made wooden toy trains, cars, trucks, and puzzles. After a long period of inactivity, I rekindled my interest in the lathe when I saw a local chapter's demonstration.

Now, I make each of my grandchildren a special toy for all their birthdays, beginning with an animated pull toy. The earliest toy was a simple wobbling duck with only the wheels turned on the lathe. But as more grandchildren came into the world, subsequent toys had new features and more turning. I learned how make and use cams, springs, and wooden gears to add animation.

I'll show you how to make the wobbling penguins pictured above. The penguin family rides together on three separate but connected wheeled platforms. Offset axles and springs give the birds a cute wobble as the child pulls the toy around. The icy blue color and silver highlights go well with the penguins' attire.

Roosts and birds

Cut three bases, each 3" (8cm) square and ⅞" (22mm) thick (*Figure 1*). I prefer to use maple for wood toys because of its strength and smooth grain. Kids give these toys a workout, and maple stands up to their play. The smooth grain also works well when it comes to painting.

Drill through the sides for the axles and in the top to mount the penguins. Also drill the holes for the coupler dowels and locking pins, as shown in the drawing. Round over all the corners with a 3/16" (5mm) roundover router bit.

Cut blanks about 2" (5cm) longer than the height of the penguins (*Figures 2–4*). After truing up a blank between centers, turn a tenon at both ends and use one to hold the blank in a scroll chuck. This will be the top of the penguin.

Mark layout lines on the blank for the hat, head, scarf, and feet. The diagrams and photos show the size and shape of the penguins. Of course, feel free to modify the design as you see fit.

Drill a 7/16" (11mm) hole ¾" (19mm) deep (measured from the bottom of the penguin) for the spring that helps the penguin wobble (*Photo 1*).

Reverse the blank in the chuck, so that the penguin's head is at the tailstock end. To keep things aligned and secure, advance the tailstock and create a small nub at the end. You'll remove the nub with light cuts before you part off the toy.

Begin turning the penguin. You can rough-turn at first and then go back and clean it up when you've finished the rough layout. When placing the layout lines, leave enough room between the chuck and the bottom of the penguin so you can part off the figure and give the bottom a slight domed shape (*Photos 2, 3*). I use a sharp parting tool for this cut. If you use a detail gouge, make this part of the turning wider to accommodate the gouge.

Drill holes in the completed figure for the wings and beak (*Photo 4*). ▸

Penguin bases

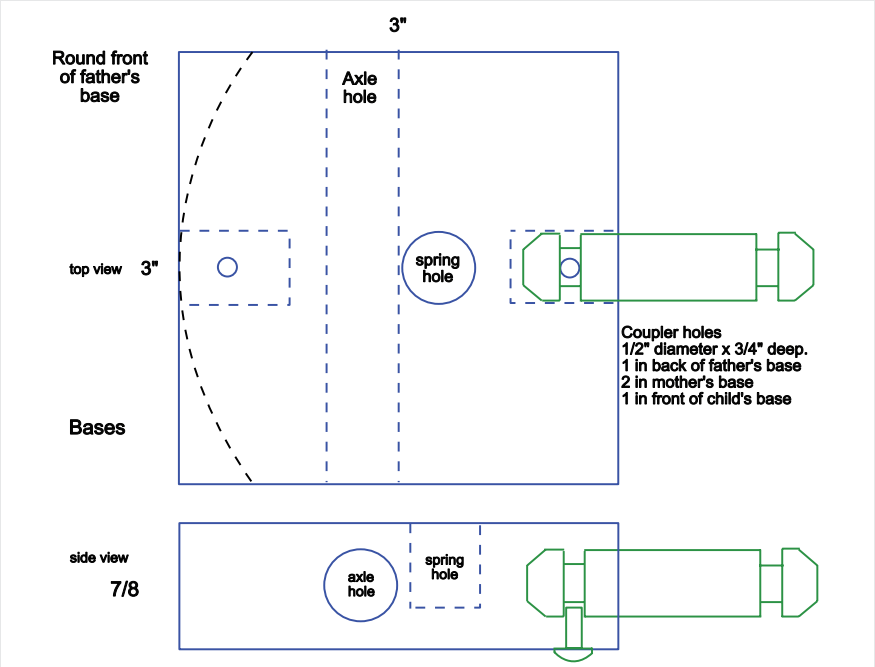


Figure 1. The plan for the penguin bases.

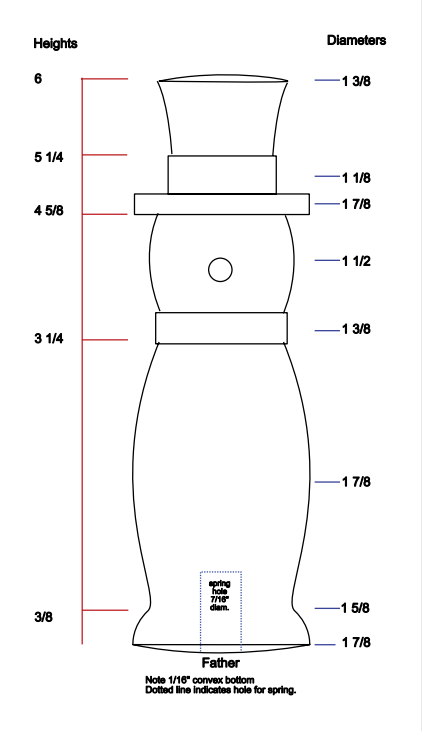
Turn the penguins

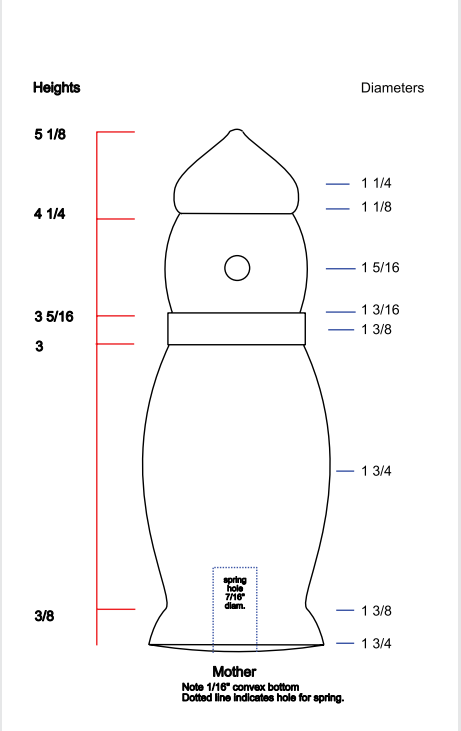
Mark the blank with key diameters and drill a hole in the bottom end for the animating spring.

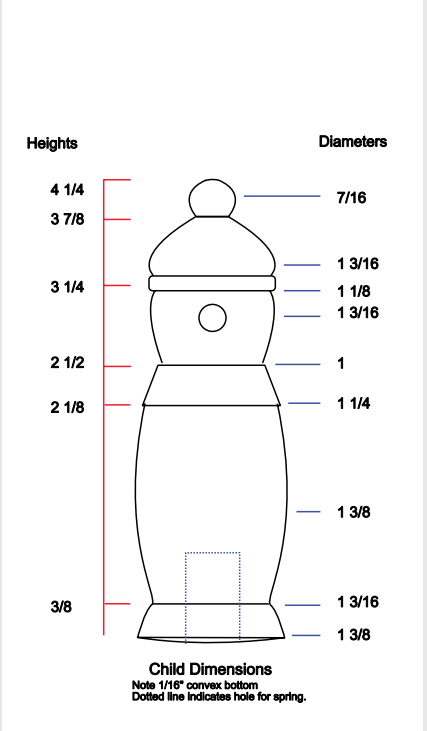
Reverse the blank and begin shaping the penguin, head first.

When parting off the figure, make the base slightly convex, or dome-shaped. The bottom need not be flat since the penguin will be mounted on a spring.

All in the family







Figures 2–4. The basic measurements for turning a family of penguins.

Drill for beak and wings

Drill the turned penguin with holes for the beak and wings.

Add color

Paint the figures with airbrush or hobby paint before assembling the toy. Apply a nontoxic finish.

Wobbly wheels

Mount the wheel blank on a screw chuck to turn it to size and shape the outside.

Plug the screw-chuck hole with a dowel and drill the axle hole off center.

Keep the offset axle holes 180 degrees apart, so the toy will wobble when rolled.

A couple of couplers

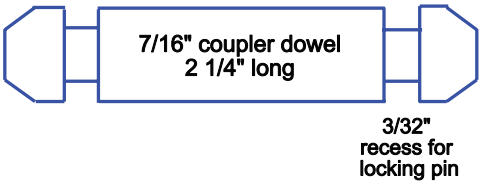


Figure 5. Two wooden couplers connect the three bases, and the locking pins hold the couplers in place.

Springs animate the penguins

Attach a restraining cord inside the springs with a dab of cyanoacrylate glue.

Mask off the base of a penguin and attach the spring with epoxy.

When attaching the spring to the base, leave a ⅛" gap so the bird can wobble.

I highly recommend painting everything before assembly. If you have not used an airbrush, this is a perfect project to try one. If you're not into airbrushing, you can use brushes and nontoxic hobby paint to create your penguin personalities (*Photo 5*). After airbrushing, I finish the piece with three to five coats of low VOC lacquer.

Wheels, axles, couplers

Cut the wheels from maple stock 1" (25mm) thick. The wheels are 2⅜" (6cm) in diameter. I hold the blank with a screw chuck (*Photo 6*). Once I've finished the wheel, I plug the hole with a piece of dowel.

In order to make the penguins wobble when the toy is pulled, drill the axle hole in the wheels ⅛" (3mm) off center (*Photo 7*). Make the hole about ¾" deep. When you attach the wheels to the base, make sure the offsets are 180 degrees from each other (*Photo 8*). That way, as the wheels turn, the platform will rock from side to side and the

spring action under the penguins will facilitate the wobble.

You can turn the axles yourself from oak, maple, or other strong wood. The dowels are 4½" (11cm) long and cut from 7/16" (11mm) stock. Or, you can buy hardwood dowels. Avoid the softwood dowels found at some hardware and big-box stores because they just won't stand up to the punishment these toys may take.

The couplers are simple 7/16" hardwood dowels with a recess turned in each end for a locking pin (or a plain dowel) glued in from the underside of the base (*Figure 5*). The recess in the coupler pins is 3/32" (2.5mm) deep and a bit over ⅛" (3mm) wide. I use dowels so the bases can freely rock left and right. A small amount of play between the hole diameter and the diameter of the coupler dowel allows the bases to turn a bit left and right as the toy is pulled.

Animate the birds

Use springs to animate the penguins' natural wobble. A 7/16"-diameter spring inserted in the holes in the birds lets them stand upright when at rest but able to wobble as the base rocks. To prevent the spring from being damaged by an aggressive pull from a child, insert a piece of nylon cord and hold it in place with an epoxied plug at each end of the springs.

Cut three lengths of spring about 1½" (38mm) long. Cover the penguins and bases with blue tape to protect them from glue drips. To hold the cord in place so it doesn't move around while you apply the epoxy, use a small dab of cyanoacrylate (CA) adhesive to attach it to the ends of the spring (*Photo 9*). Leave a smidgen of slack on the cord within the spring. The cord limits the action of the spring: you should not be able to pull the spring apart more than ⅛". Be sure not to close the opening in the end of the spring so the epoxy can enter the spring.

Mix a bit of five-minute epoxy. Hold the penguin upside down and fill the hole about halfway deep with epoxy. Insert the spring and set the penguin upside down until the adhesive hardens (*Photo 10*). Repeat the procedure to glue the other end of the spring into the base. Do a dry fit first to be sure there isn't a lot of excess spring showing. The penguin's bottom should sit just ⅛" above the base (*Photo 11*). Leave a gap between the epoxy plugs inside the spring and the hole opening; otherwise, the bird won't animate. Don't fill the holes too deep.

Details on the spring installation are further illustrated in the video that accompanies this article (*see link at right*).

I cut the wings on a jigsaw from ¼"-(6mm-) thick maple stock (*Figure 6*). They were shaped as in the diagram and slightly sculpted with my rotary sander. Turn six small pegs to hold the wings on the penguin bodies.

Turn the beaks about ¼" in diameter and about 1½" long. You can do a little shaping by sanding. Color them with a marker and glue the beaks and wings in place (*Photo 12*).

Assemble the toy

For the most part, assembly is pretty straightforward. However, the key to successful wobbling is to glue the springs into the bases before you attach the wheels.

Choose a colorful pull cord that won't unravel with pulling and twisting. Tie a knot in the pulling end for a grip and tie the other end to a brass eye screw in the base. Drip a few drops of white glue on the knots to keep them from unraveling.

I hope you enjoy making one of these toys and see the delight as a child plays with it. Don't be worried if the kids scratch it up. That means they love what you made them. ■

Richard Dlugo began turning in the 1970s to fulfill a need for wooden toy parts. In the last ten years, he has become very active as an artistic turner. You can view his other toys at richarddlugo.com/toys. He is most grateful for the sharing of ideas, inspirations, and techniques between woodturners at all levels. This article is meant to give back some of that sharing. You can reach Richard at richard@richarddlugo.com.

Finishing touches

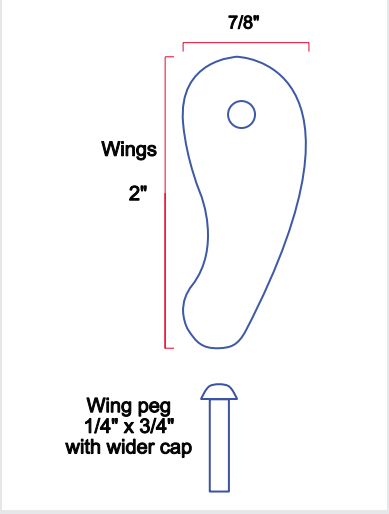


Figure 6. Shape the wings from thin hardwood stock and turn small pegs to hold them in place.

The wings and beak add the finishing touches.

You read the article—now see the video!

This article has an accompanying online video in which Richard Dlugo further explains and demonstrates this project. To view the video, visit tiny.cc/PullToys or scan the QR code with your mobile device.

Blast-Carving

Al Hockenbery

I use sand-carved images to capture ideas and lend expression to my work. Renowned professional woodturner and instructor Trent Bosch introduced me to the concept of sand-carving geometric figures when I assisted him at Arrowmont in 2010, but I didn't try the technique right away. At the time, I was making wooden globes, using a knife-edge woodburning tip to trace land borders onto turned spheres. Then, in 2013, I began sand-carving the globes. This resulted in detail superior to my pyrography, along with a relief and texture that I began using to render all sorts of realistic images onto wood.

To do sand-carving, I partially mask the surface of the turning with images cut from a vinyl material called sandblast resist. An abrasive blast medium is then sprayed on the surface from inside a protective blast cabinet. This creates a texture on the unmasked wood. The process is called "sand-carving" because it makes use of a sandblast cabinet and equipment, but the abrasive I use isn't actually sand. I primarily use coarse ground glass, which has a good aggressiveness for most woods.

The blast cabinet is fitted with protective gloves, so I can stand outside, hold the work, and operate the blast gun. I watch the progress through a window in the top of the cabinet and stop blasting when the surface looks good. Finally, I remove the resist to reveal the images on the surface.

Using the Internet, I found a wealth of information from glass artists and artistic sign makers. This led me to find an affordable desktop vinyl cutter that connects to a computer, like a printer. The vinyl cutter is quick, accurate, and does not cut the resist's backing. Although a computer-driven vinyl cutter makes life

Wood selection

1

Sand-carving on a soft wood like this camphor accentuates the grain lines.

2

On a harder wood like this red gum eucalyptus, the sand-carving produces a pebbly texture.

easier, the resist is easy to cut by hand. If you have an air compressor, you can begin sand-carving with an inexpensive cabinet, a craft knife, and a couple sheets of resist and get pleasing results.

How blasting affects wood

When I plan a sand-carving, I consider how the sandblasting will change the wood surface. I think of woods as being hard, soft, or hard/soft. The hard woods I use—such as citrus, live oak, and red gum eucalyptus—will blast into sort of a pebbly surface with a wonderful texture. Softer woods like camphor tend to show subtle grain lines (*Photos 1, 2*). Cherry is sort of in between, showing a pebbly look on endgrain and facegrain but accentuated grain lines on sidegrain. Rays in wood are hard; sycamore gets a sort of faceted look on the ray flecks in the sidegrain. Hard/soft woods such as chinaberry and Douglas fir have a marked difference between early and late wood of the growth rings. Half the ring erodes quickly and the harder half stands proud.

Use dry wood that is free of punky areas. Most sand carving is going to remove about 1/16" (2mm) of wood, and most of my sand-carving is on hollow forms with walls 3/16" (5mm) thick. Any punky wood will erode quickly.

Begin with the turning

I start my sand-carvings with an idea for a turned form that has images carved on it. In this article, I'll explain how to sandblast a design onto a small hardwood disk that could be an ornament, an inlay on a box lid, or a pendant.

Bandsaw a disk 2" to 3" (5cm to 8cm) in diameter and ½" to ¾" (12mm to 19mm) thick. If needed, drill a 3/32" (2mm) hanger hole ¼" (6mm) from one edge. Turn a convex face on each side so the middle is about ¼" thick and the edge is about ⅛" (3mm) thick, like a mini-discus.

One way to make this turning is to use the tailstock to press the blank against the closed jaws of a scroll chuck as you true up the edge and turn a tenon. Leave the center hole from the live center. Reverse the blank and grip it in the chuck. Turn and sand one face.

Mount a scrap blank and turn a mounting jig that has a shallow concave face and is 1½" (38mm) in diameter. Put two strips of double-sided tape on the sanded surface of the disk and press it onto the mounting jig; use the center hole to align the work. Turn away most of the tenon with the tailstock in place. Retract the tailstock, finish turning, and sand the face and edge. The edge can get razor sharp, so round it over. ▸

How to Sand-Carve on Spheres

Resists of flat images are easy to transfer to cylindrical and flat surfaces. The challenge for woodturners is applying resists to the compound-curved surfaces of bowls and vessels. Small or long, thin images will keep their shape when transferred, as a material like Blastlite™ will stretch and compress. But no matter what, a large, wide image like a butterfly with spread wings will buckle on a compound-curved surface. You could remove slices from the image, like darts in clothing, to make the shape lie smoothly, but that would distort the shape and remove part of the image. A technique developed by map-makers in the 1500s, the use of gore strips, lets you fit large pieces of resist on a sphere or other surface with a compound curve.

An image of the earth is a good example. Map-makers divide the image into strips 30 degrees of longitude wide. For sand-carving, resist cut like gore strips will fold smoothly around a sphere, so the curved edges of the strips meet and form a straight line on the sphere, as shown in *Photo a*. The rectangular size of the gores must be proportionate to the sphere they will cover. Their dimensions can be determined as follows:

Width = π× sphere diameter
Height = π× sphere radius

The full versions of Photoshop or Corel Paint Shop can automatically convert images to gores with the Flexify plugin. This plugin has numerous settings, but setting the input to *equirectangular* and output to *gores 12* will get you started. But making a resist for a globe does not require you to make the maps and determine the gore dimensions. You can find suitable, copyright-free images on the Internet (*Figure 1*). Size one to your turned sphere with photo-editing software. A tiny error in size won't be noticed, nor will a sphere that's not quite round.

Vinyl resist cut along longitudinal gore strips fits seamlessly over a globe, now ready for blasting.

I use vinyl cutter software to trace the image and cut out the continents and major islands. The resist can also be cut by a laser engraver/cutter that is compatible with the resist or with a sharp craft knife if you have patience and a steady hand.

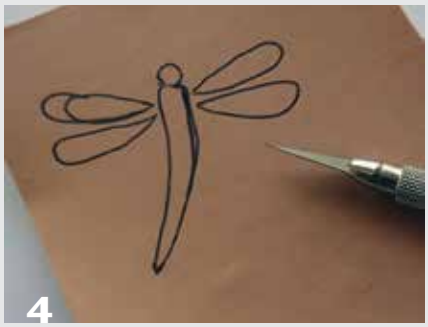
I draw longitudinal lines every 30 degrees on a wooden sphere, using the lathe's index wheel and an erasable marker that comes off with a wet cloth. Test the marker on scrap wood to be sure it can be removed. The marker lines match the borders of the gore strips. Once I have cut and weeded a continent, I lift it from the backing and align the gores' cut lines with two of the marker lines. I press this part down lightly and check the edges of other gore cut lines to be sure they match the marker lines. If necessary, lift or slide the part to nudge it into position. Press it in place, pushing the seams together with your thumbs. Squeegee it in place, select the next major continent, and line it up with the appropriate marker lines. Cover any questionable seams with a strip of resist; a tiny gap in the resist can leave a faint line if some of the blast medium gets through.

Figure 1. An example of a world map laid out in gore strips.

Adding color

The Mayan frieze on this maple bowl was airbrushed dark gray, resist applied, blasted, and airbrushed black before removing the resist.

Cut and "weed" resist



Draw the design on the sandblast resist, then cut along the lines, being careful not to cut through the resist's backing.

"Weed" the design with dental picks or tweezers, carefully pulling away stray parts that aren't part of the design.

Masking and carving choices

It is possible to either mask the main image and sand-carve the background or mask the background and sand-carve the main image.

Apply resist

Press the resist down firmly onto the woodturning, using the edge of a piece of plastic. Protect the resist with a spare piece of backing. With the resist in place, the piece is ready for blasting.

A steady pull from an endgrain side of the disk usually releases the workpiece. If not, a knife or thin chisel worked between the tape and jig will release it. Remove the adhesive residue with a solvent (naphtha works for me) and apply any color or finish you want. With experience, you can start with thinner wood and hold it with a vacuum chuck instead of tape.

Plan the finish, cut the images

When I prepare my woodturning, I pay special attention to the surface under the resist that won't be blasted. I almost always give those areas a final sanding to 320 grit for native hardwoods. Then I may apply color and/or finish. I just sand if I intend to finish the entire surface with spray lacquer, Waterlox, burnished milk paint, or a black-on-black dye (*Photo 3*). Burnishing milk paint highlights the high spots in the blasted background and the edges of the images. For black-on-black, I use black leather dye and one coat of Waterlox. This produces a slight sheen on the images that stands out subtly from the textured background of the same color. The effect is similar to that of black-on-black pottery.

I want the image I choose to be meaningful and one that I can cut. Dragonflies, butterflies, birds, fish, flowers, leaves, vines, petroglyphs, and mosaics are just some of the images that can be successfully sand-carved. The dragonfly shown in *Photo 4* is readily recognizable—four wings attached to a body with a head.

The resist I use, Anchor Blastlite™ #T226 (available at uscutter.com), is designed for use on wood. It has some elasticity and adheres well to curved surfaces. Resists designed for stone and glass are stiffer and work better on flat and cylindrical surfaces than on spherical forms. In my work, I put images cut from resist on

the wood so that the sandblasting renders the image in relief on the roughened surface.

Sketch the dragonfly on the resist, then cut along the lines or close to them with a sharp craft knife. Making the dragonfly in five pieces simplifies the cutting. Try not to cut into the backing. My vinyl cutter allows me to cut multiples of the same image and even cut the same image in a different size.

Attach the resist

"Weed" the resist by removing all the cut parts you do not want to transfer to the turned form (*Photo 5*). I use dental picks and tweezers to pull the waste parts free. Weeding gives you the option to use the solid image resist and carve the background, or carve the image and leave the background smooth. I usually carve the background, or negative space. *Photos 6 and 7* illustrate the difference.

Transfer the weeded mask to the turning without touching the adhesive, which would weaken its hold. I press the body of the dragonfly on first, then put the wings where I think they should go. I pick up each piece with a dental pick, position it on the wood, and press it in place. When all the pieces are attached, I press the resist down with a flat piece of plastic, using an old credit card like a squeegee. It helps to cover the resist with a piece of its backing to prevent the plastic squeegee from catching on an edge of the resist. *Photo 8* shows the image firmly pressed onto the turning and ready for blasting.

Blast away

When sandblasting, wear a respirator rated N100 or P100. The blast cabinet will contain most of the dust, and you can keep it out of the air by hooking the cabinet up to a shop vacuum or dust-collection system. The respirator will keep you from inhaling any stray dust, which can go deep into your lungs. Wear the respirator when opening the blast cabinet and when working with blast media.

For the blast medium, I use and recommend coarse ground glass. It has a nice aggressiveness and doesn't contain free silica, which causes silicosis, or known carcinogens. I have also tried extra-fine glass beads. This medium works slowly, just barely removes airbrush paint, and leaves a less-stressed surface. Be aware that using the same equipment to spray different media increases your downtime, since you have to clean the equipment well between changeovers. ▸

Sand-Carving Gear at a Glance

The essentials

If you have a compressor with at least a 27-gallon (102-liter) capacity, you can start sand-carving with only a small cash outlay, as follows:

Blast Cabinet

At the time of this publication, prices start at about $90 for a cabinet with a siphon-feed gun. In a siphon-feed blast gun, compressed air moves through the gun, creating a vacuum that pulls the blast medium through the siphon tube. The air and medium mix as they come out of the nozzle.

Coarse ground-glass blast medium

Expect to pay around $55 for a 50 lb (23kg) container.

Resist

Resist is used for masking areas you don't want blasted. I recommend #T226 resist, 22mm. I recently paid $60 for a roll 15" (38cm) wide and 10 yards (9m) long.

A simple blast cabinet. You reach through the round openings to don attached protective gloves so you can safely hold the blast gun and the workpiece.

A siphon-feed blast gun.

Additional equipment

As I began doing more sand-carving, some additional equipment became essential to me:

Transfer Tape

Transfer tape sticks to the top of the resist and holds it while you peel off the backing. I use transfer tape when I have thin parts, mosaics, or text parts in a resist. The tape lets me maintain the shape and position of those pieces until they are pressed in place and squeegeed. I recently paid $22 for a roll of transfer tape 6½" (17cm) wide and 100 yards (91m) long.

Vinyl Cutter

I have a computer-driven vinyl cutter that works like a printer. Its software tools allow me to trace digital images, make and refine cut lines, change the size of objects being cut, and send the commands to the cutter to cut the images in the vinyl resist. The depth of cut can be set to cut through the vinyl but not the backing.

Large-capacity compressor

My 60-gallon (227-liter) compressor lets me blast continuously. With a 27-gallon compressor, I can blast for about 90 seconds, but then must wait for the air tank to refill.

Pressure pot

I added a pressure pot to my air/spray system to provide additional control of the airflow and medium. The pressure pot replaces the siphon feed gun and injects the medium into the airstream hose, where it mixes before coming out of the nozzle.

The blast gun will have a trigger to control the flow of air and a nozzle. I use "off" and "full on" for the trigger. Wide nozzles use more air and narrow ones clog more. A ⅛" nozzle works well as a starting point with the coarse ground glass.

To prepare for blasting, I put on my dust mask, put the piece in the cabinet, latch the door, put my hands in the protective gloves, hold the piece in one hand, and hold the blast gun in the other hand. Point the gun straight at the piece and move it side to side and from top to bottom, as if you were spray-painting, and at the same time move and turn the workpiece (*Photo 9*). Keep the blast stream moving or you will dig a hole. Avoid hitting the resist from a low angle, which will allow the medium to get under the resist and either erode the crispness of the edge or lift it up, allowing the media to hit the unprotected surface.

To get more relief, work around the edge of the resist to remove more wood. I work along the edge of each resist the same number of times, with an extra time or two for endgrain. Then I blast the space between the pieces of resist to make the space look uniform. Take the piece out of the cabinet and check the depth of the edges under the resist as well as the overall surface. I use a permanent marker to indicate the resist edges that need more blasting.

Creativity

My philosophy in turning is that each step takes as long as it takes, so I never time myself, except for the purpose of demos. But to give you an idea, with no surprises, it takes me one-and-a-half to two hours to put twenty images on a 10"- (25cm-) diameter hollow form.

Part of the attraction of sand-carving for me is that I can use my computer expertise to find and create digital images for the vinyl cutter to cut. I use photo-editing and vinyl-cutter software to convert the images to a vector graphic format, which the vinyl cutter uses. Once I have a collection of vector graphic images, I can reuse them on future projects. This enables me to make a series of pieces with similar images by just sending the ones I want to the vinyl cutter. I spend a lot of hours finding and making images, some of which I may never apply to a turning.

With anything in woodturning, removing the last layer can be a surprise. When I remove the resist after sand-carving, I almost always see what I expect because I know the surface under the resist, I know the spatial relationship of the resist images, and I know the results of the blasting as I work (*Photo 10*).

Sand-carving has become the means for me to incorporate emotions and ideas in my woodturning. It is hard for me to make anything without wanting to sand-carve on it. The acceptance of the work and interest in the process has been doubly rewarding. ■

Al Hockenbery got his first lathe in 1975 and has been learning to turn ever since. He has been an AAW member for twenty-five years and volunteers to help plan the Annual Symposium and its rotation schedule. He can be reached at Al@woodturner.org.

Blast away

Ready to blast, holding the workpiece in one hand and the blast gun in the other.

The completed piece, with the sand-carving complete and the resist removed.

Endless possibilities

You can use computer-generated images and text for sand-carving, as well as uniquely created shapes to convey your artistic intent.

An Artist's Progress

ADVICE FROM A MASTER

Frank Sudol, *Plate,* Undated early piece, Cocobolo, suede laces, 1½" × 12" (4cm × 30cm)

AAW Permanent Collection, donated by Lois Laycraft

With their recent gift of a Frank Sudol ribbon vessel to the AAW Permanent Collection, collectors Jane and Arthur Mason not only donated a beautiful artwork, they supplied the missing piece for what will become an AAW Gallery of Wood Art display on creative development.

After Sudol's death in 2006, his partner Lois Laycraft donated many pieces he'd acquired from fellow artists and students, as well as two of his own works—a delicate pierced goblet from 1994 and an earlier sturdy cocobolo plate with eye-popping turquoise suede lacing. Piercing the plate and adding laces may not have panned out aesthetically, but seen with the goblet, and now the ribbon vessel, it illustrates an early exploratory step in the journey that led to the painted, thin-walled, pierced work for which he would become known.

Sudol had already achieved recognition and success with his pierced goblets when a question from Michael Hosaluk changed his course: "Frank, have you ever made anything for yourself? Just for yourself, not for somebody else, nor for sale, just for you? That makes you happy?" As Sudol related the story in the insightful DVD *Starting Your Creative Engine* (Turningwood Productions, 2005), he was ready to run down to the workshop and get started, when Hosaluk said, "And by the way, Frank, it should have color." Unsure in his own abilities and lacking formal training, Sudol had only tentatively worked with color. Freed from pleasing others, he set to work and emerged from the shop with his first boldly colorful ribbon vessel.

In his later years, Frank Sudol dedicated himself to encouraging others to find their own voices and creative courage. Artist Binh Pho was one of his students. After seeing one of Sudol's pierced goblets, Pho says, "I immediately knew that I needed to meet him, as I was looking for ways to incorporate negative space in my work. The two most important things that I learned from Frank were being true to myself as an artist, and opening up the work through piercing. It brought a whole new direction to my work."

In the creative process, not all ideas lead to success, but there are few truly dead ends: each piece is a start and may hold the seed of better work to come. "No matter how good we are, it is always a start," said Sudol. "As I learned more, I did better. And so will you." ■

Photos by Tib Shaw/AAW.

—Tib Shaw, AAW's curator and arts administrator

Frank Sudol, *Goblet,* 1994, Birch, paint, 6½" × 3½" (17cm × 9cm)

Frank gave away the first pierced goblet he made; on the bottom of this one he wrote MINE to remind himself to keep it.

AAW Permanent Collection, donated by Lois Laycraft

Frank Sudol, *Ribbon Vessel,* 1999, Birch, dye, fabric paint, 11½" × 5½" diameter (29cm × 14cm)

The wall thickness is less than 1/16" (2mm).

AAW Permanent Collection, donated by Jane and Arthur Mason

> "The message for my students is, you will never be remembered for what you copied, but you will be remembered for what you created.... Once you reach inside, you will have original work.
> — Frank Sudol

HALF 'N' HALF

Split-Turned Forms that Fit Together

David Springett

Illustrations by Robin Springett.

The black-and-white form separates into two identical pieces, called streptohedrons, that fit perfectly together. This project builds your skills with layout, chucking, and accurate turning.

JOURNAL ARCHIVE CONNECTION

For another take on streptohedrons, see Bob Rollings' 2013 *AW* article, "Behold, the Streptohedron; Precise Turning Yields an Alluring Form" (vol 28, no 4, page 42). AAW members can access all past journal articles online at woodturner.org.

The forms described in this article are generally called streptohedrons, which means "twisted polyhedron." Interesting forms like these are surprisingly easy to turn. Each one is made up of two identical halves that fit together along a curve, like the seam on a baseball. Each black-white pair, in turn, is assembled from three simple split turnings: two identical cones, plus a cylinder with cone-shaped hollows turned into both ends.

The forms need to be geometrically and dimensionally accurate, as shown in *Figures 1–4*, and as you will see, each of the identical cones has a right angle at its apex, which means the height exactly equals the radius. The cylinder has the same radius as the cones but is twice their height. Use these ratios if you decide to change the project dimensions given here. And note, the metric dimensions were converted from U.S./Imperial measure, so if you prefer to work in metric, begin by making an accurate, full-sized

Dimensions and Details

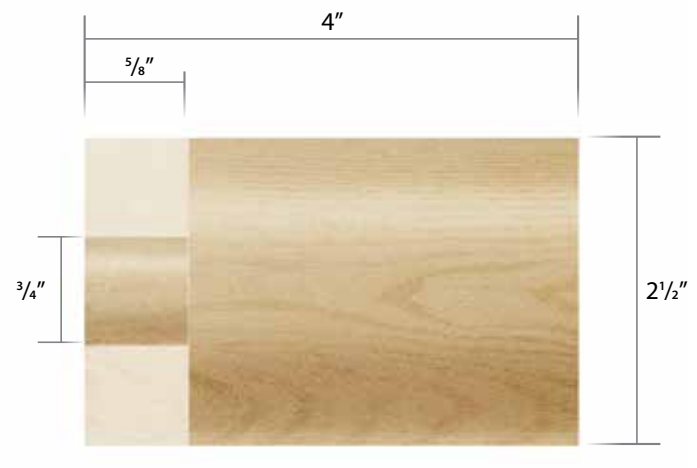


Figure 1. Blank 1—laminated with newspaper glue joint, for turning the split cylinder.

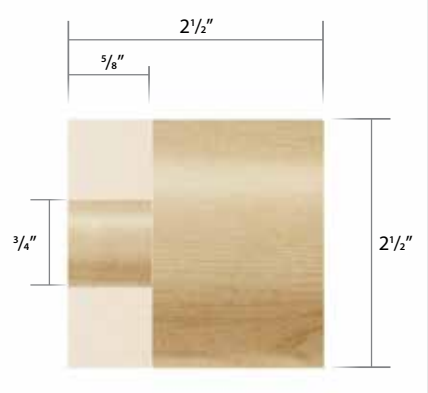


Figure 2. Blanks 2 and 3—laminated with newspaper glue joint, for turning two identical split cones.

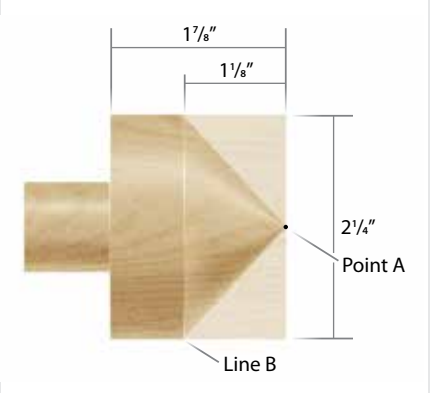


Figure 3. Finished cone dimensions.

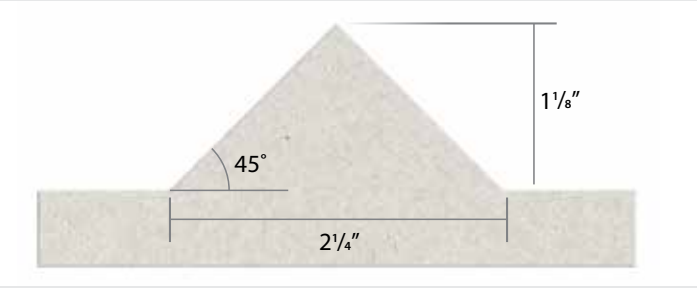


Figure 4. Card template for gauging accuracy during turning.

Materials & Tools

Blank 1 (cylinder): Formed by gluing two pieces of maple or similar hardwood 4" (10cm) long by 2½" (6cm) wide by 1¼" (3cm) thick, both planed on one side.

Blanks 2 and 3 (identical cones): Each formed by gluing two pieces of maple or similar hardwood 2½" long by 2½" wide by 1¼" thick, all planed on one side.

Drive: Steb (spur) center for the headstock, revolving cup center for the tailstock.

Chucks: Three-jaw machinist chuck for greatest accuracy, if available; otherwise use a standard four-jaw scroll chuck. You'll also need a regular 4" or 6" (10cm or 15cm) faceplate.

Jam chuck: From softwood, cut a 4"-diameter by 1⅜"- (3cm-) thick piece for the jam fitting, and a 5"- (13cm-) diameter piece 1" (25mm) thick for a base, or faceplate piece.

Tool for turning conical hollows: Specially ground scraper from ½"- (13mm-) wide by 3/16"- (5mm-) thick high-speed steel.

Shelf toolrest: Optional, can be shop-made, as shown in *Photo 7.*

Supplies:
Four 2" (5cm) No. 8 screws
Hot-melt glue gun and glue
Newspaper and white PVA glue
Clamps
Calipers
Card for template

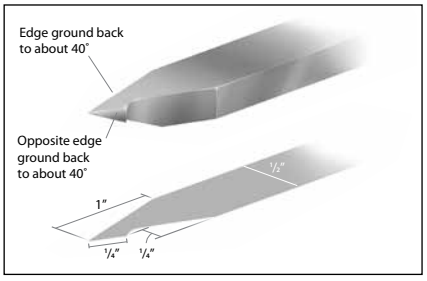


Figure 5. Custom tool, ground from high-speed steel.

drawing, trace it, and cut it apart to be certain of the dimensions.

Tackling this project will introduce you to newspaper-gluing two halves of a split-turning blank, a technique that enables easy splitting without any loss to saw kerf. You'll also learn how to use a cardboard template to turn a precise cone, how to excavate a matching cavity using a shop-made tool on a platform toolrest, and how to use a jam chuck to hold securely while leaving no marks. These skills will serve you well for many more turning adventures.

Glue up and rough out

Precise shapes like these can't be made by sawing turnings apart, as you'd lose too much wood in the saw kerf. Blanks planed or sanded flat and smooth, then glued with newspaper in between, can be split exactly in half with no loss of wood. For blank 1, which becomes the cylinder, laminate two pieces as described in the *Materials & Tools Sidebar.* Apply white PVA glue to the planed faces and, with newspaper between, glue up ▸

into a 4" by 2½" blank. Clamp firmly and leave overnight for the glue to dry (*Photo 1*).

For blanks 2 and 3, which become the two split cones, newspaper-glue as above, and clamp the parts together to make two 2½" cubes with the grain aligned. Leave to dry overnight.

Make sure the glue joint is perfectly centered when fixing Blank 1, for the cylinder, between centers. Use a Steb center at the headstock and a cup center without a center point at the tailstock because these will straddle the glue line rather than splitting it. If you are at all nervous when turning newspaper-glued blanks, you can temporarily bind the blank with cable ties and do the turning between those ties. And always wear a faceshield.

Turn Blank 1 fully round to about 2½" diameter. At the headstock end, turn a ¾"- (19mm-) diameter tenon, ⅝" (16mm) long (*Photo 2*).

Next take blanks 2 and 3, for the two cones, and set each, in turn, between Steb and cup centers so that the joint line is central, as before. Rough them both down to 2½" diameter. At the headstock end turn a ¾" tenon ⅝" long. Set aside both blanks.

Glue up and rough out


1


2

To make blanks that split with no loss of wood, glue them up with a single layer of newspaper in between. Rough out the blanks using a Steb (spur) center, with a cup center for tailstock support. This is blank 1, the cylinder.

Turn two cones


3

Turn cone blank to diameter, face off the end, and mark the center as point A. Measure over 1⅛" to draw line B.


4

With a small gouge, join point A to line B to create a 45° face.


5


6

Part off the cone exactly on the headstock side of line B. Keep the cone's base flat and smooth.

Two cones

Remove the Steb center from the headstock and for greatest precision, replace with a machinist's three-jaw chuck if you have one, or a regular four-jaw scroll chuck. Take each of the two cone blanks in turn and grip the tenon. Make sure the blank runs true. Turn down to an accurate 2¼" (6cm) diameter. Turn the exposed face flat and true.

Mark the center point of the end face. This will be point A. From the end face, measure 1⅛" (29mm) toward the headstock and mark a line, which will be line B. Using a gouge, join line B to point A to produce a 45-degree angled face *(Photos 3, 4)*. Carefully part off the conical end by cutting, precisely, on the headstock side of line B *(Photos 5, 6)*.

Mount the second cone blank and repeat the process.

Conical hollow

Now for blank, the cylinder. Hold the turned tenon in the chuck, center the blank accurately, and bring up the tailstock with the cup center still in place. Turn down to a precise 2¼" diameter and face off the end. The cup center supporting the work helps to reduce chatter.

The cone-shaped hollow in each end of the blank will need to exactly match the two cones you just turned, so prepare a card template as shown in *Figure 4*. To excavate the hollow, I prefer to use a shelf toolrest to support the specially shaped tool described in *Figure 5*. A regular toolrest can act like a fulcrum and the tool can be grabbed and drawn into the work. A temporary wooden shelf toolrest is easy to make *(Photo 7)*.

Withdraw the tailstock and bring the shelf toolrest across the face of the work so the specially ground tool *(Figure 5)* cuts precisely at center height. As a depth guide, set the tool against the card template and mark the depth of cut with typist correction fluid *(Photo 8)*. This tool will make fine slicing cuts. Do not take heavy cuts; be patient *(Photos 9, 10)*.

Use the card template frequently to check the shape of the conical hollow. When you are satisfied with the finished hollow, check the fit of the conical turnings, and make adjustments if necessary *(Photos 11, 12)*.

Accurately measure 2¼" from the hollow end of the blank toward the headstock. Part off, precisely, on the headstock side of that line (*Photos 13, 14*).

Jam chuck

At this point, the cylinder has a cone-shaped hollow in one end. To form the cone-shaped hollow in the other end without marring its surface, make a jam chuck. Take the 4"-diameter by 1⅜"-thick softwood block and screw it to the 5"-diameter softwood faceplate, as described in the *Materials & Tools Sidebar*. Be sure to locate the screws toward the outer edge.

Turn a 2¼" hollow to the full depth of the softwood block. Check regularly that the cylinder blank has a tight fit (*Photos 15, 16*).

Second conical hollow

When you are satisfied with the jam fit, press the cylinder into the jam chuck with the parted face to the front. Hold the blank in place with pressure from the tailstock cup center. Make sure that it runs on center, then add a hot-melt weld to fix it firmly in the jam chuck. Make a datum mark to help re-set accurately if necessary.

Withdraw the tailstock and bring the shelf toolrest across the face of the workpiece. Set it so that the tool cuts at center height and cut the second ▶

Conical hollow

A shopmade shelf toolrest helps hold a sharp scraper exactly on center, so it won't grab and dig in.

The shopmade tool described in *Figure 5* can excavate a precise cone-shaped hollow in the end of the cylinder. The white band marks the depth of cut.

A shelf toolrest holds the scraping tool on center. Check your progress with the cardboard template.

Verify the hollow with a turned cone. It should fit exactly.

Mark the length of the cylinder and part it off.

Jam chuck


15


16

Screw the softwood block onto the faceplate and turn a hollow as a jam chuck for holding the cylinder. Make a snug fit the full depth of the block.

Second conical hollow

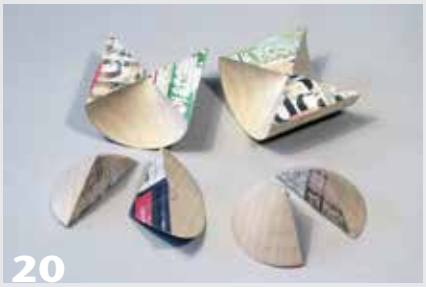

17


18

Bring up the tailstock to press the cylinder into the jam chuck for hot-melt gluing, and mark a datum to ensure alignment. Turn the second conical hollow as you did the first.

Split and re-glue


19


20

To split the turnings, carefully tap a thin and sharp knife into the newspaper glue line. Hand-sand on a flat sheet of abrasive to remove any residual glue and newspaper.


21


22

Fit the cone halves point-to-point on the cylinder halves. Tape and glue them together. Rasp and hand-sand to clean up the glue joints, then apply a coat of primer-filler before spray-painting black and white.

conical hollow as before. Check regularly with the card template, and adjust as necessary (*Photos 17, 18*).

Finally, check the fit of the two turned cones in the conical hollow and when you are satisfied, unscrew the jam chuck with the cylindrical blank still attached. To remove the cylinder from the jam chuck, take the whole assembly to a microwave oven and heat on full power for twenty seconds to soften the hot-melt glue.

Split and re-glue

Using a craft knife and hammer, carefully split all three blanks. Rub each glued surface on a flat sheet of abrasive to remove any newspaper still adhered (*Photos 19, 20*).

The parts may now be tried in place and, if necessary, alterations can be made for a good fit. When the fit and alignment seem right, tape them together temporarily with masking tape. Number the parts and their positions and, when you are satisfied, glue the numbered parts in their correct order. Use masking tape to hold the parts in place while the glue dries. To ensure a good fit without gluing the whole mass together, wrap one half in plastic food wrap then push the two halves together.

When the glue has dried, separate the two halves and use files, rasps, and abrasives to bring each half to a good surface. I used automotive spray paint as a finish. For the first coat use a primer-filler. I then sprayed one half matte white and the other, matte black (*Photos 21, 22*).

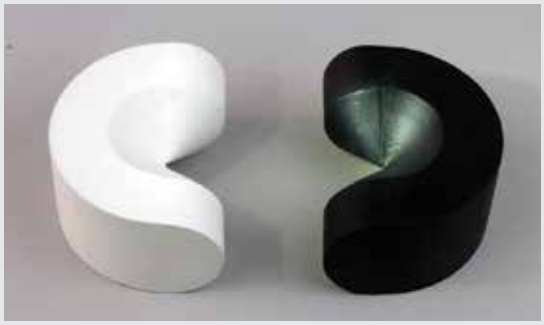
For examples of interlocking streptohedrons, see my Gallery of Surprises on page 43. I hope I've inspired you to try your hand at these forms. ■

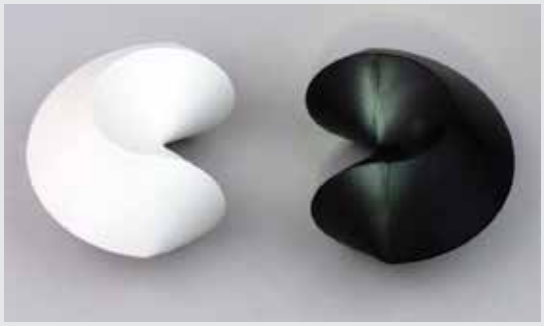
David Springett is a British woodturner known for his inventive creations. He is the author of Woodturning Wizardry, Woodturning Full Circle, Woodturning Magic, *and, with Nick Agar,* Woodturning Evolution.

Gallery

David Springett's STREPTOHEDRON SURPRISES

The piece shown here looks like the project I've just described, but they are not the same. When this two-part form is opened, it contains a reduced-size replica of itself. This 3D fractal could go on forever.





These black-and-white pairs also come apart into identical halves and were made using the logic and techniques demonstrated in the "Half 'n' Half" project beginning on page 38.

Here's a two-piece hexagonal streptohedron whose pieces fit together, but in a puzzling way. It appears to be an easy fit, but no amount of twisting, pushing, or shoving will do it. To assemble the form (center), one of the four half-cones needs to be removed and replaced.

CUSTOM LATHE ACCESSORIES FROM A 3D PRINTER

Henry Doolittle

Custom 3D-printed soft jaws hold a sphere for turning.

Have you ever had a workpiece you needed to mount on the lathe in a chuck but could not grab it using any of your existing chuck jaws? Need a jig to allow you to drill precise holes? How would you like to have a jig, jaws, or vacuum chuck that would fit the piece you are working on exactly? You may want to look at 3D printing.

About a month after I purchased a 3D printer, our club president gave a presentation on how to turn small hollow forms with carved feet. To reverse-turn and carve the feet, he used a chuck made from PVC pipe and a hose clamp. This makeshift chuck worked, but the hose clamp was a potential knuckle buster. I thought I could do better, so I printed a chuck with threads for my lathe (*Photos 1, 2*). It still makes use of a hose clamp, but the clamp is concealed so it is not a hazard. I used nylon filament to print the chuck to provide greater strength and toughness, combined with the necessary flexibility. The nylon gives a soft surface with which to grab the wood. My new chuck worked well and cost about $4.00 to make.

User-friendly software

After printing that first chuck, I thought about the design and decided I could print custom soft jaws to fit on my Nova chuck. Using computer-aided design (CAD) software called Fusion 360™ (autodesk.com/fusion360), I designed two different sets of chuck jaws—a long set that followed the lines of the hollow form I had turned and a shorter set to grab a turned sphere. For a 3D CAD program, Fusion 360™ proved easy to use yet very powerful. Other free programs that are easy to use include SketchUp, Autodesk 123D, Meshmixer, Blender, and 3D Builder. With the current market for 3D printers, there is competition for low-end 3D CAD software that does not require you to be a professional draftsperson to generate 3D models.

You don't need a 3D printer to create 3D prints. Your design files can be printed by other printer owners.

Threaded collet chuck

A hose clamp enclosed in a shroud is used to tighten this 3D-printed collet chuck.

Long jaws

Chuck jaws can be printed to any specified design, here customized for a small vase.

Organizations like 3D Hubs can identify local owners who provide printing services. And some companies can provide more professional printing services, including metal sintering.

Custom jaws

The long jaws I printed (*Photo 3*) work well for hollowing and finishing cone-shaped turnings. I have found that if I hold a workpiece in the jaws without tightening all the way and turn the lathe on at low speed, I can center the piece easily by applying a little pressure with the back of a gouge. Once the piece is centered, I can tighten the jaws and start turning.

I have also printed shorter jaws, which work well for holding spheres, as shown in the *opening image*. With the jaws being made from thermal plastic, I can adjust them on the lathe using normal turning tools. Because the jaws are attached to a chuck body, I have room for about ¾" (19mm) of adjustment for grabbing the workpiece. If I need to grab a smaller, or larger sphere, or some other-shaped turning, I can make the necessary adjustments in the CAD software and print out new jaws in about four hours.

Vacuum chuck

I have been using my lathe for metal spinning, making cups out of pewter. Finishing the outside is easy but finishing the inside requires a lot of hand sanding. As each cup is the same shape, I printed a simple vacuum chuck that requires a small amount of suction (vacuum) to hold a pewter cup for finishing the inside (*Photo 4*). The 3D printer gives me the ability to customize the chuck to the workpiece, rather than trying to modify the workpiece to the chuck.

3D printing in orbit

With the time and weight constraints placed on ordering parts for the International Space Station, NASA recently sent up a 3D printer with filament. If a tool is needed on board, NASA engineers design it using software and send the file up to be printed by the astronauts.

3D printing gives you the ability to try different ideas for tools and jigs in the workshop. ■

Henry Doolittle worked as a mechanical engineer in the nuclear industry for forty-four years. He started turning in the late 1990s, joined the AAW to attend the Portland Symposium, and has been a regular attendee since. He recently retired from engineering to become a full-time woodturner.

How 3D Printers Work

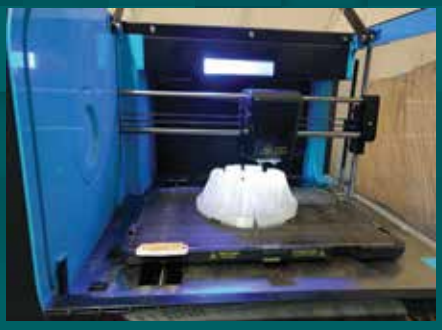
While woodturning is a form of subtractive machining, taking away material to produce an object, 3D printing is additive machining. Additive machining involves the accumulation of successive layers of material to produce an object. Think of how a segmented turning blank is created, by adding layers, one ring at a time. 3D printing works in a similar way—by building layers of material to produce the desired object, as it is defined using design software.

Although there are many methods used in 3D printing, most printers for home use employ a fused filament fabrication (FFF) process. Just as a dot matrix printer creates an image by placing ink on paper in a defined pattern, a 3D printer melts and places thermal plastic on a build plate in a defined pattern. The difference is a 3D printer can add depth and shape to the print by adding more layers, one at a time, until the print is completed. The thermal plastic comes out of the print head at a temperature that allows the layers to bond to each other.

New 3D printers are entering the market all the time, with some available for as low as $200.

Some of the types of plastics, or filaments, used in 3D printing include the following, each with its own characteristics:

- **ABS** (acrylonitrile butadiene styrene) is the most commonly used filament for 3D printing. It is strong, flexible, and can withstand high temperatures. ABS does not produce as fine a finish as PLA.



Inside the author's 3D printer. Here, a custom set of soft jaws is being printed for use on a scroll chuck.

- **PLA** (polylactic acid) is a plastic made from plant-based starches. It prints at a lower temperature than ABS and provides a "cleaner" print, but tends to be more brittle.
- **Nylon** comes in a wide variety of compositions that provide different printing temperatures, strength, and flexibility.
- **Polycarbonate** is a high-strength thermal plastic with high resistance to impact. Polycarbonate is very temperature-resistant and can be bent without cracking.
- **Composite** filaments are a mixture of plastic (usually PLA) and a fine powder, such as steel, brass, copper, graphite, or wood. This combination allows you to print objects in materials other than just straight plastic. For example, an object printed in composite brass can be sanded and polished, and will look like solid brass.

Vacuum chucking

4

The author's 3D-printed vacuum chuck fixture, sized to hold lathe-spun pewter bowls for sanding the inside surface.

Tech Ed Project
LINKS OLD AND NEW

Luke Ferland

The technology classroom, or "shop," as it was affectionately called by previous generations, has been evolving rapidly. Each high school is different, with curricula often being dictated by the local area in which it resides. My school district is on the eastern end of Long Island in New York, where high-tech industry prevails, despite the ongoing claim of agriculture on local land masses.

A number of years ago, I began thinking about our technology curriculum and the direction I saw many schools taking. I thought about the skills my students would likely need in college or in the workforce and how I could create a diverse and rewarding learning experience that would satisfy those needs. Out of this reflection sprouted what I have dubbed the Precision Engineered Pen Project. Because we live in a time when "old school" meets "new school" and "new school" is increasingly the norm, I decided to find ways to integrate technologies in meaningful ways. The Precision Engineered Pen Project successfully integrates computer technology (3D design software), modern technology (the 3D printer), and industrial technology (the lathe).

Technology eduction teacher Luke Ferland pictured in his high school workshop with a 3D printer and wood lathe.

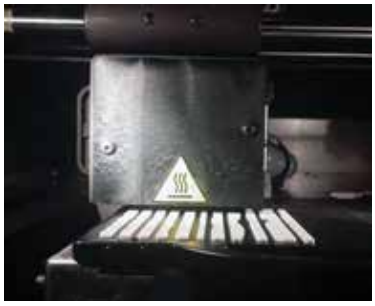
Bridging the gap

I thought about the lathe and the enjoyment students get using it. The lathe has the ability to blur the line between old and new applications. It certainly can be used for traditional turning projects, but that use does not meet my expectations for what's needed in a modern technology or engineering program. Luckily, the lathe is also a machine worthy of being incorporated in a foundational technology class that teaches students skills they'll need in a high school technology or engineering program.

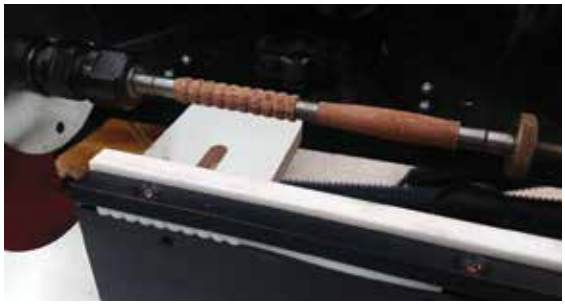
My high school's technology program has two 3D printers available. The Precision Engineered Pen

I decided to find ways to integrate technologies in meaningful ways. The Precision Engineered Pen Project successfully integrates computer technology (3D design software), modern technology (the 3D printer), and industrial technology (the lathe).

Project starts with students completely designing pens in a 3D design software program. There, they can map out their own unique pen design, making adjustments as they wish. From those 3D software models, students then create the pen's edge profile in plastic on a 3D printer. The pen profile is the key to this project, as it bridges the gap between the 3D printer and the lathe. Once students have the 3D-printed pen profile, they place it in the duplicator on the lathe and turn their pen barrels. This allows students to create the pen of their own specific design.



Newly printed, or modeled, pen profiles, shown here still inside the 3D printer.



The 3D-printed profile is mounted in a lathe duplicator, which, during turning, transfers the pattern to the pen barrels.

Two examples of the process, showing the computer-generated pen design (top), the 3D-printed edge profile (bottom), and the resulting pen (middle).

Happy students

The part of the process I enjoy most is watching students polish the pen barrels. Their faces say it all when they see the shine appear on their creation. When the students complete their pens, I ask them if they look like the pens they designed on the computer. They are so happy with the results, and offer comments like, "That was so cool! I can't wait to show my friends!"

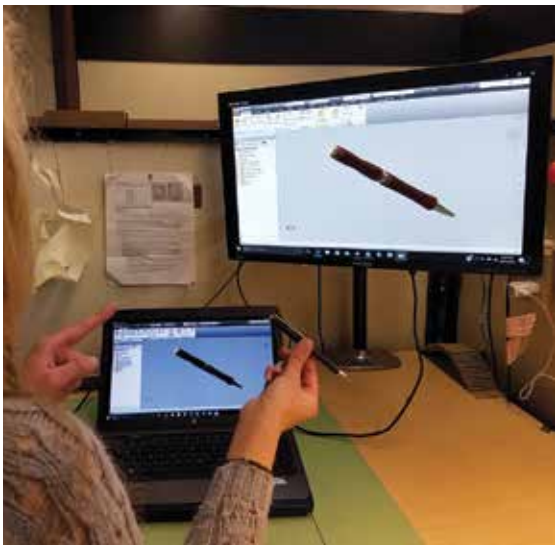
The students take enormous pride in their pens. Students often lose store-bought pens and pencils, but I have students who created their pens years ago and still manage to tote them around day after day. I even get the occasional students dropping by for more ink because they use them so much.

The Precision Engineered Pen Project served as my culminating project for my Design and Drawing for Production classes last year. It was successful because it integrates much of what students learned throughout the year in the course, along with an experience in woodturning. As a teacher, having students enjoy such a multifaceted project that teaches many things across many disciplines is truly satisfying. One of my former students said, "This project was an awesome way to end the year, combining all we had learned from the year to create something we would be able to use for a long time."

Merging computer design, modern-day 3D printing technology, and industrial machinery created a student experience worthy of a high school technology or engineering program. The project has possibilities for expansion, too. For example, other high-tech processes, such as custom laser engraving, could be incorporated. This would add to the students' learning and would allow them to create custom pens for fundraisers, school functions, or other events.

At this time, this project is definitely my favorite and most satisfying to run in the technology classroom. ■

Luke Ferland, a high school technology teacher and adjunct college professor, has a diverse background that includes education, energy engineering and analysis, fabrication, and structural wood repair. Luke is an enthusiast of early technology but also enjoys working with modern technology, specifically robotics and mechatronics. He earned a BA degree in technology education and an MS degree in energy management, both from New York Institute of Technology.



One of Luke Ferland's former students, Megan Carrick, proudly compares the pen she made in the Precision Engineered Pen Project with her computer-generated design of that pen. Students get an introduction to the lathe, along with the opportunity to realize their own designs.

NURTURE VIA NATURE

The Blossoming of Dixie Biggs

Michael McMillan

Dixie Biggs on her tractor, spreading mulch in the garden.

INVITED SYMPOSIUM DEMONSTRATOR

Dixie Biggs will be featured as one of the invited demonstrators at AAW's 2017 International Symposium in Kansas City, Missouri. For more, visit woodturner.org.

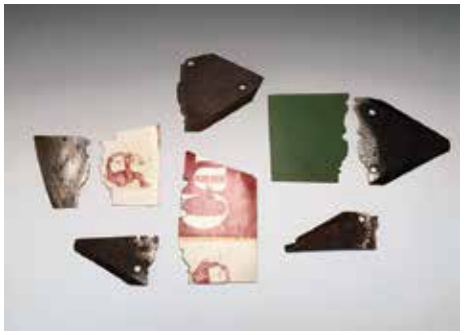
The life and art of Florida's Dixie Biggs are best defined by her fascination and respect for Mother Nature. Her appreciation for the natural world is upheld by a fluid and constantly imaginative frame of mind, paired with steadfast perseverance. Biggs's recognition of the joy and beauty of the great outdoors spans from her days gardening as a teenager in the 1970s to her current artistic practice. Her transformation from young DIY woodworker to exhibition and symposium namestay was as much nurtured by the treasures that emerge from the soil as by the artists and personalities who have provided Biggs with inspiration and encouragement.

Beloved by today's close-knit community of woodturners, Biggs carries her heart on her sleeve, has a never-ending willingness to teach and mentor, and wears a humble disposition regarding her success.

Early days in Florida

Raised in the wooded suburbs of Gainesville, Florida, Dixie's mother Becky was a stay-at-home mother, while her father Hilton was a professor of plant physiology at the University of Florida. Her adolescence was filled with opportunities to work with her hands, whether carving in various woods with a pocketknife, trekking through the vegetation of the forest, or spending a summer's day in the family garden.

"I spent a lot of time alone in the woods," reflects Biggs on her early life as a self-confessed tomboy. Living up to the title, young Dixie was the only girl allowed in the boys' forts in the woods, since she had the tools and skills to construct or repair them. Some of this handy(wo) man sensibility and dexterity with tools had been genetically acquired. Biggs's mother was a carver, and her grandfather Harris would showcase his whittling projects to the family at his Smithville, North Carolina, home. With an early edition of *Ben Hunt's Whittling Book* at her side, Biggs found many occasions during her adolescence for woodworking and nurturing her creative spark.



An early learning project for Biggs was a set of chess pieces. Her unconventional process involved making profile cutters out of sickle bar mower blades. She traced the profiles from templates her grandfather had cut from Camel cigarette cartons.

After buying property in 1980 and fencing off the cows that had grazed there, Biggs began building her studio.

Dixie Biggs during a weekend workshop with Rude Osolnik in Berea, Kentucky, 1992.

Concurrently, Georgia bird carver Jim White befriended the Biggs family and often stayed at their home while exhibiting at a local art show. While White sold his creations in his booth, Dixie observed and whittled birds of her own.

Despite the abundant opportunities for cultivating all things handmade, the Biggs house was not full of canvasses, paintbrushes, clay, or any obvious external incentives to pursue artistic endeavors. "It was definitely not an arts household," states Biggs, and the vision of becoming a full-time artist was not on her radar early in life. As a result, her subsequent journey to a career in woodturning was self-generated, with an exploratory, do-it-yourself trajectory.

Her tendency toward experimentation and a hands-on mentality started early. By the final year of her agriculture degree at the University of Florida in 1979, she had completed her first turning project: the duplication of her grandfather's chess set. Dixie's eccentric and instructionally deficient grandfather told her to simply use the patterns he originally made out of Camel cigarette cartons. After tracing the shapes onto sickle bar mower blades, she ground the chess piece profiles into the metal with Dremel tools and a jeweler's file. Upon applying the first profile with her bare hands to wood spinning on a 1970s Dremel lathe, the machine stopped immediately due to its lack of torque. Lucky to avoid injury, she was able to complete the project safely using other tools.

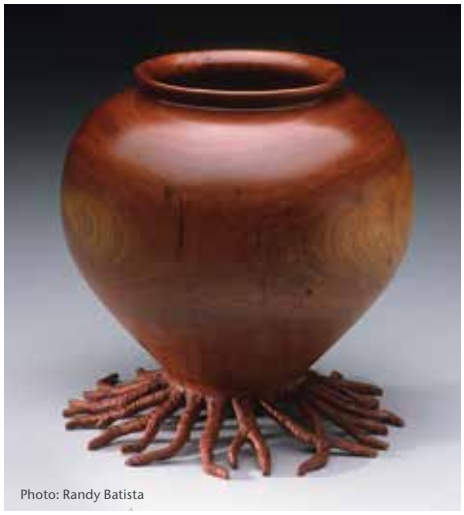
During her studies, Biggs worked a side job assisting a researcher in his agricultural variety trials at the University of Florida's IFAS (Institute for Food and Agricultural Sciences), which involved planting, harvesting, and hoeing vegetables such as peppers and tomatoes. Later, she was given the task of grinding the peppers to a fine powder as part of an investigation into its use as red dye. After graduation, Biggs worked at the University as a biological technician and, in 1981, purchased six acres of land west of Gainesville. It was there Dixie built a small living space, while turning wood in a nearby shed. Over the next three-and-a-half years, she constructed a two-story post-and-beam home on the property with the help of friends and volunteers. Upon moving in, her former living space became her studio—and home to a new 500-pound lathe. As Biggs explains, "I was a child of the 70s, so there was a big movement to live off the land," and this period of construction, land-ownership, and ambition would become her own action-oriented love letter to the gods of sustainable living. More than twenty-five years later, Dixie and her longtime partner Delaine continue to use the resources provided by their surroundings.

Square one

Biggs's earliest turning years involved the creation of utilitarian items. The only instructional manual she had to assist in her self-guided ambition was Dale Nish's 1975 book, *Creative Woodturning*. Fresh out of college, she began exhibiting her bird carvings at a local show and eventually displayed carvings, turnings, and stained glass at numerous Florida-area events. A fellow exhibitor, Larry Hasiak, would later introduce her to the AAW.

Biggs's first exposure to a woodturning demonstration was at a woodworking show in Tampa in 1990, where she saw a presentation by Georgia's Nick Cook. A friend of renowned turner Rude Osolnik, Cook convinced Dixie to put her name on the waiting list for one of Osolnik's workshops. She eventually got the call to attend and participated in one of Rude's weekend classes in Berea, Kentucky, in 1992. Around this time, Biggs's focus began to shift toward the vessel form, and she has not looked back since. ▸

Maple burl vessels, 1992, each is 4" × 6" (10cm × 15cm)



Rooted Vessel, 1994, Cherry, 9" × 7" (23cm × 18cm)

After seeing uprooted trees, Biggs was inspired to play with the contrast of the textured roots and smooth vessel surface.

Stylistic roots

Dixie's early vessel forms were deeply inspired by turning greats David Ellsworth and John Jordan, as well as by Pennsylvania potter David Greenbaum, who had previously exhibited with Biggs in Florida. A 1992 set of three maple burl vessels evidences some of these influences, created while she was building expertise in hollow forms. The years between 1994 and 2000 were a period of great experimentation—a process of diversity and trial-and-error in craftsmanship, often a rite of passage for many turners. Examples of works from this period include natural edge forms, negative space vessels, and pieces with great textured surfaces.

Then, in an effort to differentiate herself from the larger body of woodturners and articulate a more distinctive signature, Biggs began infusing her work in small and gradual doses with the botanical-themed elements for which she is celebrated today. Very early examples of nature-based motifs can be seen in the depicted root system of a cherry vessel from 1993 and a jarrah burl form from 1995. This root motif can also be seen in more elaborate works later in her career, such as in 2001's *Origins*.

Dixie's repertoire continued to evolve in complexity during the early 2000s, marked by the inclusion of more ambitious, leaf-covered vessels, which catapulted her to professional acclaim. Some of this decorative, design-based change can be credited to the work of fiber artist and close friend Candace McCaffery, who has shown with Dixie at the Gainesville Artisan's Guild Gallery. Biggs initially depicted leaves on her vessels with surface incisions, such as in the 2002 *Summer Memories*, *Autumn*, and *Bracken*. During the prior year, a juror at an art festival in New Smyrna suggested she submit her work for inclusion at the upcoming (and larger) Winter Park festival. She did, and one of the pieces submitted, *Autumn*, was awarded first prize in the category of three-dimensional art. This experience was to be a precursor to her work being included in the American Craft Expo,

Autumn, 2002, Florida mahogany, cocobolo, brass wire, 9½" × 10" (24cm × 25cm)
Photo: Randy Batista

Collection of Highland Park Hospital, Highland Park, Illinois

Before carving, Biggs used foam stamps as a means of laying out the leaves on this vessel, similar to how fiber artist friend Candace McCaffery incorporates them in her quilts and wall hangings. This was the first of Biggs's pieces with carved leaves totally encompassing the form.

> "[BIGGS'S WORK] CALLS US TO BE MORE ATTENTIVE TO BEAUTY IN THE NATURAL WORLD.
> —TIB SHAW

as well as the annual craft shows of the Smithsonian, Philadelphia Museum of Art, and American Craft Council.

A 2003 piece, *Windswept*, was the first instance of leaves illustrated on Biggs's vessels in relief. Over the next two years, Biggs created a body of work in this vein, including *Shades of Home* and *Down Home*. Stark colors also show up during this technical transition, such as in the African blackwood and holly *Winter's Blush*, and the forest green flood of color in 2004's *Beneath the Arbor*, a work of ziricote, grapevine tendrils, and brass completed after a workshop with Jacques Vesery. Vesery's manipulation of a carving bit through grinding (to illustrate surface carving possibilities) would prove to be a small but important step in the progression of Biggs's work. With her technical skills continuing to advance, she was able to accomplish her design goals with greater proficiency. Wonderful relief carving pieces of the period include *Seasonal* and *Petals and Thorns*, as well as *New Beginnings*, a chrysalis form that was on view in the 2004 exhibition *From Sea to Odyssey* at the Orlando AAW Symposium.

As time passed, Biggs's work became more diminutive. "As my carving got more intense, my pieces got smaller," she explains. But the less-is-more route has proven advantageous for the success of her visually compelling forms. An example is 2011's *Sweet Spot*, in which the viewer is witness to a tour-de-force of visual depth, accomplished through the illusion of dark negative space, visual gaps, and the contrast of light and dark colors. Other examples of Biggs's sophisticated carving mastery include *After Midnight*, *Twilight*, and *On the Fence*.

Despite the intricate talent on display, Biggs's nature-influenced vessels never come off as virtuosity for its own sake, but rather properly composed forms that come together as peaceful, unified statements of natural marvel. As observed by Tib Shaw, AAW's curator and arts administrator: "There is a beautiful poise to Dixie's art: she holds the ephemeral still, drawing us in to see nature through her own sense of wonder. The overlapping patterns and gracefully balanced vessel forms are beautiful in and of themselves, but her work also calls us to be more attentive to beauty in the natural world."

Much of her more recent work has seen a further refinement of this beauty, as well as a journey into ▸


Photo: Randy Batista


Photo: Randy Batista


Photo: Randy Batista

(Clockwise from top left)
Windswept, 2003, Maple, cocobolo, 12" × 9" (30cm × 23cm)

This piece began Biggs's transition to relief carving. *Windswept* was featured on the catalog cover of the AAW's *Put a Lid On It* exhibit in 2004.

On the Fence, 2009, Cherry, 25" × 10" (64cm × 25cm)
Collection of Randy Pi

Beneath the Arbor, 2004, Cherry, ziricote, grapevine tendrils, acrylic paint, 7¾" × 5½" (20cm × 14cm)
Collection of David Forney

Beneath the Arbor represents Biggs's first foray into the use of color.

Lip Service, 2010, Cherry, acrylic paint, 5½" × 5" × 7" (14cm × 13cm × 18cm)

Photo: Randy Batista

Collection of Sonny Kamm

new territory. Biggs's often-cited *Lip Service* (a teapot developed from the motif of 2006's *Sweeter than Wine*) is a technically exquisite work in the vein of the realism motifs of her *HOT Tea* and *Green Tea*, and is infused with political commentary. Works of the last few years, including *A Break in the Pattern, Moon*, and the trompe l'oeil *Day is Done*, demonstrate the narrative qualities of her creations.

Nurturing others

Despite her abundance of talent and focused ambition, Biggs maintains her sense of humility. With a reserved personality, she has always been the type who finds compliments and flattery too attention-grabbing. Recalls former *American Woodturner* editor Betty Scarpino, "I distinctly remember meeting Dixie about seventeen years ago in Florida at a regional woodturning symposium. I had not seen Dixie's artwork before, nor had I met her, so I asked a friend to introduce us. As I gushed at Dixie with appreciation for her artwork, she seemed literally to retreat into herself."

Her tendency toward shyness—and away from self-promotion—challenged Dixie on her path to becoming the in-demand national demonstrator she is today. Dixie's bright and energetic personality has often been a smokescreen that masks her own nervousness when instructing in public. "It's been a long learning process to get me out in front of people," explains Biggs. Back in the 1990s, it took the prodding of friends Nick Cook, Mike Mahoney, and John Mascoll to get Biggs to demonstrate her skill set. Mahoney's invitation for Dixie to demonstrate at a Utah symposium was initially met with hesitation and fear. "They wanted me out at Provo and I nearly melted into a puddle," Biggs confesses. She humorously recalls her negotiations with Mahoney: "He said, 'All right, I'm going to give you a year to get ready. And then I'm going to have Kip Christensen call you, and you don't tell Kip no.'" In Mahoney's own words, "She agreed and the rest is history. Dixie is a natural artist and her personality fits in perfectly with the camaraderie and sharing of the woodturning community."

Biggs's demo at the 2006 Florida Woodturning Symposium, only her second public demonstration, fell on her fiftieth birthday. But since then, she has been a prolific artist, demonstrating her practice to beginners and decades-seasoned turners alike. "Most of the students I have

A Break in the Pattern, 2016, Cherry, brass, 8" × 8" × 2" (20cm × 20cm × 5cm)

Collection of Gene Colley

Photo: Randy Batista

Dixie Biggs and Ray Jones, *Arca Botanicum,* 2013, Walnut, cherry, boxwood, closed dimensions 15" × 14" × 7½" (38cm × 36cm × 19cm)

Collection of Fleur Bresler


Photo: Randy Batista

Benoît's and Dixie's Wild Ride, 2012, Bleached ash, 12" × 4" (30cm × 10cm)

Collection of Dave Long

have never used a carver before," she explains. "So they have no concept other than maybe they found the on/off switch. So we have to start from really basic [concepts]."

Collaborations

Biggs has collaborated successfully with artist contemporaries such as Harvey Fein, Bonnie Klein, Steve Loar, and numerous others. A recent collaboration of note is *Arca Botanicum*, created with North Carolina's Ray Jones for the *Bartram's Boxes Remix* traveling exhibition of The Center for Art in Wood. This show, which makes stops at venues through 2017, highlights reinterpretations of seed boxes by 19th century Philadelphia botanist and explorer John Bartram, with exhibiting artists utilizing wood from Bartram's Garden in their creations. This was obviously a fitting project for the botanical leanings of Biggs, and a work that sold even before going on display.

Another notable collaborative effort is the work *Benoît's and Dixie's Wild Ride*, created with French turner Benoît Averly after participating in an Australian wood symposium in 2010. Part of the itinerary for the artists was a two-week bus tour of the Australian outback. During a day-trip on a catamaran to an island near the Great Barrier Reef, Biggs was witness to the extreme seasickness of Averly: "I had never seen anyone actually turn green, but he was green." This eventually led to the coral-covered box construction, with Averly creating the form and Dixie fashioning the coral textures based on one of Averly's photographs from the trip. The final effect of the work is a surface texture that speaks more to carved porcelain than wood. Averly explains: "I turned the box in 2011 and sent it to Dixie. No need to say how stunned I was when I discovered the fantastic job Dixie had done on it. I love it. Looking for a title, we wanted something that mentioned that 'fun' moment we shared on the ocean."

Biggs has also found ways to cross over into collaboration with non-turners. In addition to creating work with Candace McCaffery, she has completed several pieces with Polish-born fiber artist Malgorzata Deyrup. With a fascinating spectrum of hues, the woven centers of two of their small vessel forms are reminiscent of the famed Star Gate color sequence scene from the film *2001: A Space Odyssey*.

Community efforts

Dixie Biggs has spent much of her career actively avoiding the spotlight but recently has become more involved in the turning community. In the last two years, she has helped carry out the initiatives of the AAW's newest committee, Women in Turning (WIT). In the predominantly male field of contemporary woodturning, WIT seeks opportunities for women to get education and experience with the lathe. As an extension of this goal, Biggs organized the formation of *Fruits of Our Labor*, a collaborative work of more than fifty pieces by more than fifty women turners. The work was auctioned this year during AAW's International Symposium in Atlanta to benefit both the Educational Opportunity Grant (EOG) program and WIT. Biggs's efforts with the committee will continue through next year's 2017 AAW Symposium in Kansas City, where she will also be a featured demonstrator.

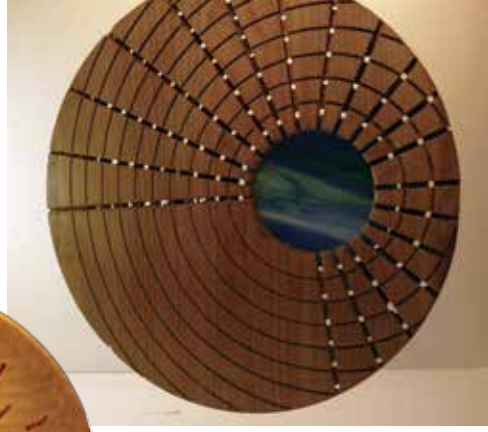
As woodturners, both experienced and new, work their way through the joys and discoveries of the lathe, they can feel confident knowing that artists such as Dixie Biggs have been down a similar path and will be there alongside the next generation to impart direction, confidence, and an overall nurturing presence. ■

Michael McMillan, Associate Curator at the Fuller Craft Museum in Brockton, Massachusetts, can be reached at mmcmillan@fullercraft.org.


Photo: Randy Batista

Dixie Biggs and Malgorzata Deyrup, Untitled works, 2003, Maple, cherry, walnut, fused glass, reed, cotton yarn

Members' Gallery



Labyrinth 3, 2016, Cherry, stained glass, 11" (28cm) diameter

Sun Catcher, 2016, Ash, stained glass, 10" (25cm) diameter

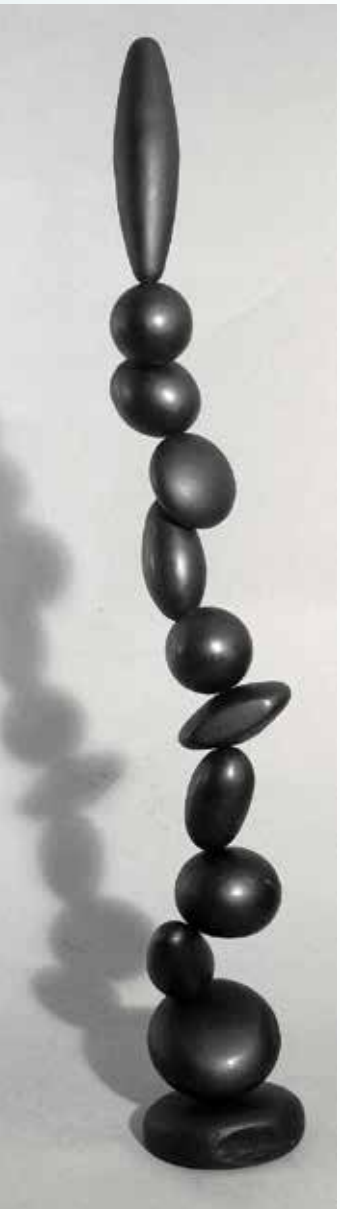
Blue Portals, 2016, Cherry, stained glass, 5½" × 7" (14cm × 18 cm)

Rolland Stratton, New York

This year for Father's Day, my son gave me a box of stained glass offcuts from his designs, a few tools, and a quick lesson. He challenged me to include stained glass in my woodturning.

My first playful steps included creating stack laminated feature rings that would hold the pieces of glass. These were glued with other rings and then turned with the glass in the wood, as you see in *Blue Portals*. Next, I made a series of *Labyrinth* pieces, which show the influence of Hans Weissflog's "broken through" style and the routed incising techniques I learned from Harvey Fein.

I am thankful for the gift and challenge to turn stained glass.



Getting There from Here, 2016, Shiro plum, dowel screws, 39" (99cm) tall

I built this piece *at left* one element at a time so it would have a sense of randomness. Since I joined the pieces with "dowel screws" and colored the wood to remove the effect of varying grain direction, the individual elements can be rotated to present new forms. Or I can unscrew the pieces and reassemble them to make a quite different assembly. The dowel screws, which I discovered only recently, have changed my life! Being able to compose assemblies in this way is inspiring to me.

Peter Rand, Canada

Putting woodturned elements together provides immense artistic possibilities. Assemblies of single turned pieces, or even parts of pieces, can range from jewelry to sculptures to totems. It provides opportunities to scale up to sizes far larger than any single lathe-turned piece.

Before scaling up, I experiment on a small scale, exploring assemblies of many kinds. The curved plum multiaxis pieces of *Assembling*, each about 2" (5cm) cubed, have curvatures in many combinations—positive, negative, and compound. They provide an opportunity to make different assemblies: a compact sculpture, a wall sculpture, a necklace. These same seven pieces also form a tall block sculpture, or totem. ■

For more, visit peterrand.ca.

Assembling, 2014, Plum, each element 2" (5cm) cubed

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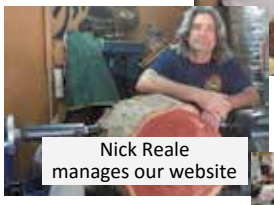

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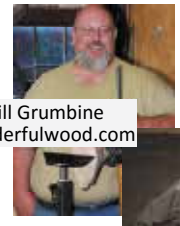

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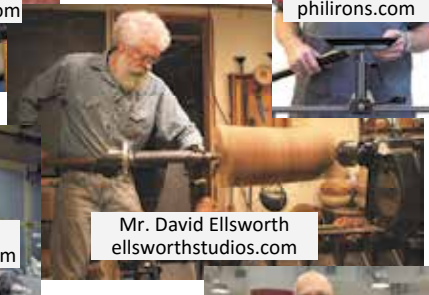

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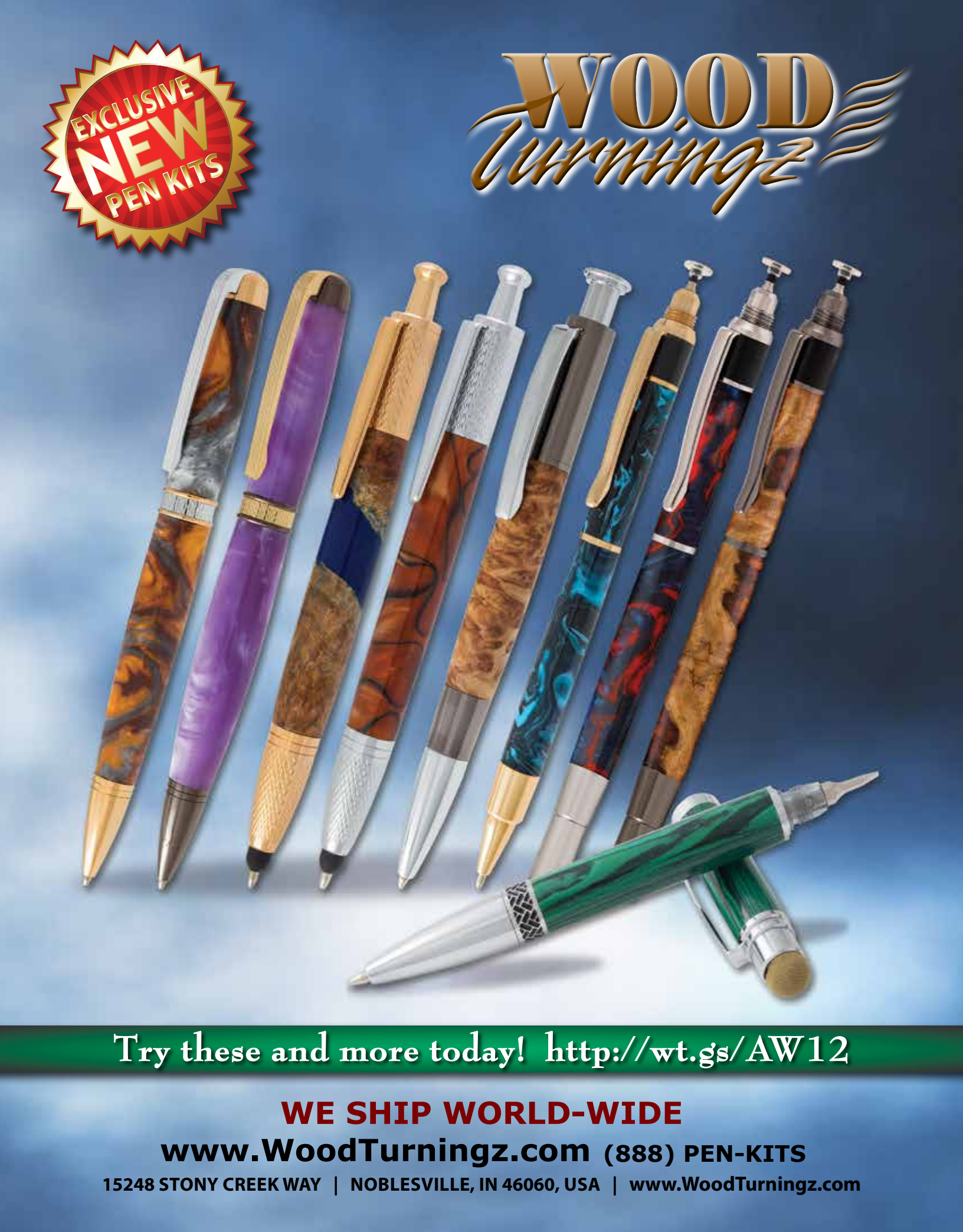
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Except where noted, photos by Elizabeth Torgerson-Lamark.

For more, visit moyuzhang.com.

Dance No. 1, 2014, Ash, acrylic, dye, 36¾" × 8½" × 5¾" (93cm × 22cm × 15cm)

Photo: Bowen Liu

The colorful inner pieces of *Dance No. 1* are extra-thick veneer, glued together with paper between them, turned, and split. Turning the veneer allowed me to achieve the smooth edges I wanted, but it was very time-consuming and wasted a lot of material. I'm still considering alternative methods, including CNC (computer numerical control).

Dance No. 2, 2015, Ash, walnut, acrylic, 16½" × 13½" × 13½" (42cm × 34cm × 34cm)

Dance No. 3, 2015, Walnut, acrylic, 17" × 66" × 9" (43cm × 168cm × 23cm)