FALL 2019 / VOL. 2 NO. 2

NEXT GENERATION

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Forging on the River. Sorting parts, left to right: Elizabeth Belz, Lewis Meyer, Karine Maynard. Photo: Kim Ward

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Editor Adriane Dalton.

Cover:

adalton@snagmetalsmith.org

Kate Fogarty Graphic Design

Heather White, Pixel37 Design Advertising

John Garbett, jgarbett@snagmetalsmith.org

SNAG Executive Director Gwynne Rukenbrod Smith

SNAG Board Of Directors

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• Curtis H. Arima, Heartfelt: Bleeding Heart (see p.20)

FOREWORD



There is more to a creative practice than completing a work and sending it out into the world. In this issue, we touch on ideas that might seem peripheral to making yet are integral: a support network, a grounding in history, maintaining and treasuring the tools of the trade, and pushing the boundaries of how we approach and solve the problems that inevitably arise during the making process.

In her report on the Association of Israel's Decorative Arts (AIDA), Davira S. Taragin touches on how the organization provides

key support for Israeli jewelry and metals artists, and connects them with audiences around the world. A roundtable discussion among students with jewelry and metals backgrounds enrolled in the new MA in Critical and Historical Craft Studies at Warren Wilson College highlights the dearth of metalsmithing and jewelry histories in the curricula of most art programs, and the need for their inclusion.

The importance of proper tool care and maintenance is front and center in Jeff Georgantes's *The Rolling Mill: A Jewelry Studio's "Forever Tool."* Through personal anecdotes and research into current market offerings, Georgantes provides the information necessary to select a new rolling mill or maintain the one you have. He entices readers to use them creatively, featuring images and insights from artists whose rolling mills are essential to their work. Finally, Charles Lewton-Brain inspires and challenges us to keep an open, inquisitive, inventive mind about the tools we use and the processes by which we create our work.

Tech Event is a new section featuring first-hand coverage of regional happenings relevant to the field. Whether it's a one-off symposium or an annual gathering, if there is an upcoming event in your part of the world that merits coverage, please keep us in the loop: editor@snagmetalsmith.org.

-Adriane Dalton, Editor

The mission of Metalsmith Tech is to focus on techniques, processes, educational philosophies and ideas, professional development topics, and new technology in the field of jewelry and metalsmithing. The magazine will include both contemporary and historical references, highlighting a diverse range of approaches to jewelry design and metalwork, including professional practices, creative influences, and new trends.





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Opposite: Anat Gelbard

Handbag and clutch purse from the "Metal Scale" collection, 2017 Dyed cowhide, silver-plated brass Handbag: 11% x 11 x 4 in.; Clutch purse: 11 x 7% x 11% in. Courtesy of the artist Photo: Dima Valerstein

Liat Ginzburg

Triumph, 2015 Silver, brass, Swarovski crystal, found objects, resin 5% x 5% x 4% in. Courtesy of the artist Photo: Guy Miller



HOW WE BUILT THIS

AIDA in Action

Working across countries and across cultures, AIDA fosters exchange for Israeli artists

BY DAVIRA S. TARAGIN

To some extent, the chain of events leading up to Israel's presence as the Guest Country in this year's Philadelphia Museum of Art Craft Show was typical of that of most of the Association of Israel's Decorative Arts (AIDA) projects.¹ First, Doug Anderson, AIDA's co-founder, was approached to determine feasibility. Director Aviva Ben Sira, headquartered in Israel, then approached artists whose work she has followed for years-including jewelers/metalsmiths Dana Hakim Bercovich, Nirit Dekel, Anat Gelbard, Liat Ginzburg, and Sara Shahak-to determine their availability. The artists then sent images of their works for consideration by a small jury of American curators and collectors. Then invitations to selected artists were extended, and AIDA raised the funds needed to provide booth space and hotel accommodations.

At this point, however, the similarities between this, AIDA's major effort for 2019, and its previous ventures ended.

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Throughout the remainder of the planning and implementation phases, the twenty-four participating artists, half of them jewelers or metalsmiths, worked directly with show organizers to handle all arrangements, including shipping, installation, and sales. This shift in responsibility demonstrates the level of sophistication and professionalism now characteristic of Israeli artists, in part a testament to AIDA's success under Ben Sira's leadership.

AIDA was founded in 2003 by Charles and the late Andrea Bronfman and Dale and Doug Anderson after they observed firsthand Israel's declining crafts market and the isolation in which its artists worked because of Middle East politics. Initially AIDA provided both retail opportunities in US and UK galleries and craft shows, and funding for museum exhibitions of Israeli work. Its focus has grown. In addition to giving mature Israeli artists travel grants to advance their careers at American arts institutions, AIDA organizes trips within Israel and the United States for Israeli and American arts professionals, respectively, in the hope of furthering international cooperation and collaboration.

Early on, AIDA arranged participation in such ongoing retail events as CraftBoston, in which some Israeli artists still participate. For this author, of all of AIDA's programs that address a combination of sales and education, its involvement with the contemporary jewelry exhibition/fundraiser Bijoux, held from 2012 to 2018 at West Palm Beach's Norton Museum of Art and scheduled in 2020 for that city's Armory Art Center, has had the most far-reaching effect on the artists themselves and on their contemporaries. Each year Ben Sira recommends six or seven jewelry artists, to whom AIDA then gives travel stipends. Artists develop close bonds with one another and with international colleagues. Strong friendships develop as their fellow



Sara Shahak

Sometimes Purple, 2019 Stainless steel, found objects, enamel, glass paint, velvet flocking powder 5½ x 2 x 1½ in. Courtesy of the artist and *Gioielli in Fermento*, Italy Photo: Shlomi Bernthal

Nirit Dekel

Dropping, 2018 Flameworked glass, 22k gold leaf, silver Length 23% in. Collection of Idee German Photo: Shlomi Bernthal







Dana Hakim Bercovich

The Hanging Gardens—Winter, 2018 Stainless steel, powder-coated paint, acrylic paint. Variable dimensions. Courtesy of the artist Photo: Tamuz Rachman © Dana Hakim Bercovich

artists gain an understanding, beyond what they hear in the press, of life in Israel. In addition to sales, the Israelis receive valuable feedback from customers and curators. They learn about new techniques, materials, and exhibition opportunities, and return home with inspiration to mine and to share.

Considering the fact that Israel has no arts council, Anderson feels that AIDA is filling a significant void: "We never thought of what we do as being an arts council," he noted. "But we definitely do look like one."² Artists, writers, museum curators, art educators—all of whom have benefited from AIDA's munificence—definitely concur. Renowned former gallery dealer, curatorial consultant, and educator Helen W. Drutt English recently wrote to Anderson: "I keep meeting people who are enriched by your support."³ More countries would benefit from an organization like AIDA.

Formerly curator at the Detroit Institute of Arts and the Toledo Museum of Art, and director of exhibitions and programs at the Racine Art Museum, Davira S. Taragin is an independent curator serving as an advisor to AIDA since its inception.

AUTHOR'S NOTE: This essay is based on conversations with Doug Anderson on May 29 and June 2, 2019, and with Aviva Ben Sira on May 31, 2019.

1 Israel first participated in this prestigious craft show in 2008. / 2 Doug Anderson, conversation with the author, June 2, 2019. / 3 Helen W. Drutt English, e-mail to Doug Anderson, June 6, 2019.



Kat St. Aubin, July 2018 Residency. Photo: Reggie Tidwell

NEXT GENERATION

Warren Wilson College's New MA in Critical and Historical Craft Studies

Director Namita G. Wiggers and students discuss the ups and downs of academia for those interested in jewelry and metalworking

In the fall of 2018, Warren Wilson College in Swannanoa, North Carolina, launched a new low-residency program focused on developing a field of craft studies, the first of its kind. Conversations with former *Metalsmith* Editor Emily Zilber highlighted the number of students enrolled in the program with metals training: five of the ten students in the first semester, three of whom hold MFA degrees.

We began to wonder: Why would students in this area of craft media be particularly interested in pursuing an MA in Critical and Historical Craft Studies? What can a program like this offer to makers, and what can makers reveal about opportunities for change in how we teach in academic art programs in the US?

Of the five students engaged in the following discussion with program director Namita Gupta Wiggers, one student, Kelly Malec-Kosak, could not continue with the program, as she received a promotion to Chair of the MFA program at Columbus College of Art and Design. The remaining students—Pheonix Booth, Matt Haugh, Matt Lambert, and Kat St. Aubin—will complete their master's degrees in July 2020.

Our conversation covered a number of issues, from the lack of metalsmithing histories in art history coursework, to reasons for studying theory and craftspecific histories, to connecting making to writing and voice, to the material limitations of jewelry itself if confined to specific materials, forms, and conceptual questions that reveal academia's disconnect with what students need, want, and are creating.

The conversation is condensed here; the full version is available online at *Metalsmith Extra*.

NAMITA WIGGERS: Our conversation is taking place after you've completed your first semester in the program. How might the program connect to your future work?

KAT ST. AUBIN: I've definitely gained valuable research skills and have learned different ways of applying research to broader questions—especially the importance of asking questions.

MATT LAMBERT: The program is supplying the tools to be critical. I think we lack a lot of actual criticism within metalsmithing; we're one of the fields within craft that doesn't produce really harsh criticism. We need to have some tough conversations. I think we need more people that are confident in their writing and their speaking abilities to have healthy discussions that are critical. We need to be critical of what has happened, but also what is happening now.

KELLY MALEC-KOSAK: I'm interested in looking at things in a broader way than I had before. I feel like my metalsmithing background is really insular. I was trained by people who were trained by people who were...you know, it's kind of this whole sort of incestuous family [group laughter].

I'm part of some weird, dysfunctional family that I want to look at a little bit closer now. Who is included and who is not included, and how we've decided as a field, has become interesting to me as a maker and a writer and thinker.

MATT L.: Interesting or problematic: the canonization of our field?

NAMITA: Say a little bit more about that, both of you.

MATT L.: I feel like, looking through the American lens, we have missed a lot of very important figures that the European context has held onto: Jan Yager, Marjorie Schick, or Winifred Mason—all women. Or they exist in an "art world" context, but for some

Marily Zapf, Object Collection Workshop, January 2019, Center for Craft, Asheville, North Carolina. Photo: Namita G. Wiggers reason they've been pushed to the side.

I guess I'm being critical of the historical, of why we have shaped our canon the way we have. We've had so many successful makers "make it" outside of the insular craft world, but we don't celebrate them in a way that I think is appropriate. I think we do them a disservice.

KELLY: There is a link between capitalism and our field that has left some people out. We're so invested in making a living through selling our work that our structure doesn't support risk; a lot of times it has to exist within a certain way. You don't see that in places where there's more support and more interest in breaking rules or challenging norms. It is problematic.

MATT L.: Heck, yeah! We have not celebrated conceptual makers, and so we've narrowed our field down to the sellable object—but we also don't want to be in a relationship with fashion. We want to be in this weird bubble that doesn't exist.

PHEONIX BOOTH: As a conceptual maker, I will say that I don't know a lot about the broader metalsmithing field because I've never felt like my work fit into it. In my undergraduate program we were pushed into making in a conceptual way, but there wasn't a lot of research we could do on other people, or there was a lack of a canon of people that were making in that way. There are people working in that way; I've just never heard of them for whatever reason.

NAMITA: This is an interesting question, then, about how what you learned in your metals programs set you up for the kinds of things you're thinking about now. For example, Matt Lambert, Kelly, and Matt Haugh all hold MFA degrees; they've done deep, focused study in metalsmithing and jewelrymaking specifically, in different ways. Kat and Pheonix have undergraduate degrees and were taught by jewelers who are three of the most prominent women in international contemporary jewelry right now: Kerianne Quick, Sondra Sherman, and Anya Kivarkis, all of whom are recognized for material and critical jewelry works.... I'm curious about what you recall learning. You are all saying something similar, that there is a deepdive into conceptual making but not necessarily jewelry and craft history. What craft histories were you exposed to in your academic education?

MATT L.: *Gardner's Art Through the Ages.* Where are we in art history? I think we have the Gates of Ishtar, and I think



we have the one pin in Ireland, and no one knows how it was made! We have one piece of jewelry and one piece of blacksmithing.

I think that the people we studied under have done the best that they can to provide us with contexts, but the systems that they work within don't support craft as part of art history. We cannot rely on our studio courses to also feed us conceptual and historical knowledge as well. This is a critique of the Academy and not the people we study under. The people, predominantly women in craft, have done the best that they can.

We're not in the art history canon, we're not being taught our own history in the Academy, but we still have to exist within the Academy, which somehow makes us lesser. And that's where the problem is. I think that is where this degree can fill that void.

PHEONIX: There is no craft theory class where I studied, only art history. You do the making, and then the only thing that you learn about critically is the broader art world. If it's not built into the curriculum, there is this huge disconnect.

KAT: Sondra Sherman and Kerianne Quick, my instructors, did incorporate research into the making process. Kerianne encouraged me to look into this program because I was really into intersectional feminist theory, classism, and racism and asking, "Where do those things come into craft and making?" Because those things affect people. People are the ones who are doing the making.

I don't know if it's because I went to a state school, but we had a checklist of courses you needed to fulfill your degree. Applied design isn't even its own degree; it's a subsection of art. To get your art degree you have to take art history, which is painting and sculpture, and craft is maybe a tiny little paragraph in some period where it fits. You can only learn so much about craft from those classes, and then, because we're all in technical programs, we're learning technical skills.

NAMITA: Matt Haugh, what about from a blacksmithing perspective? What does this MA in Critical and Historical Craft Studies reveal about your training in the field and the way the field is structured?

MATT HAUGH: I recognized pretty early in the course of my MFA (Southern Illinois University) that the theoretical component



Student Pecha Kucha, January 2019. From left to right: Mike Hatch, Nick Falduto, Samantha Rastetter, Matt Lambert, Kat St. Aubin, Sarah Kelly. Photo: Lydia See

was missing. There was actually a craft theory class offered as an elective that was, I think, trying to fill that void. I will say that there was not much interest in it. So there was just a difference in terms of what you were looking for out of the MFA experience. I was really interested in the theoretical concerns and an academic approach to material and making that would support my work going forward.

Blacksmithing is a much smaller field; a sub-field of metalsmithing. The Metals Museum is three hours away from SIU, and exhibits and presents blacksmithing on an academic level in a way, and with some regularity, but we weren't really doing that in our metals coursework. As a field, its practitioners have not applied critical discourse to the material.

ABANA (Artist Blacksmith's Association of North America), which is the primary organization, has thousands of members and their own publications, such as the quarterly publication *The Anvil's Ring* and the *Hammer's Blow*, which are both largely technical in focus. The work of Daniel Miller is an exception. He has really set an example for critically engaged practitioners and for smiths who make work and also write about their work. It just doesn't exist otherwise. Either the makers write about it in critical ways, or it doesn't get written about.

KAT: If I were to go into education, I would want to be able to teach a craft history course, not necessarily focused on metalsmithing, but craft in general. San

Diego State University, for some reason, cut fiber arts because they felt there wasn't a demand, even though there is, and there are plenty of students who are fiber artists who had to work in other mediums.

But looking at the way that academic institutions place value on what courses are able to be taught, I think that'll be a big challenge for me to find a school and say, "Hey, this is an important course. You have craft courses that are technical. How can I get a craft history course into the curriculum so that these students can get history that's relevant to their making instead of having to learn just about painting and sculpture and conceptual art?" It's valid to learn those things but...what use does a metalsmith have for learning two whole semesters of painting?

MATT L.: I think that raises another conundrum that we're facing right now: the intersectional use of material, and crafts being defined through singular material. Can I call myself a metalsmith? My graduating master's work is in leather, which doesn't even exist in the Academy. Where does leather fall? I can't go teach textiles with that knowledge.

Jewelry sits on this weird cusp, like Matt Haugh was saying. It's a format, it's not a material. Ceramics is jewelry, and wood is jewelry, and fiber is jewelry.

Although, Matt [Haugh], you say blacksmithing is small, but it has a very stabilized community that has its own publications, its own production of shared knowledge, its own conferences.

RECOMMENDED READING

PHEONIX BOOTH:

- Tim Ingold, Making: Anthropology, Archaeology, Art and Architecture. Routledge, 2013.
- Maurice Merleau-Ponty, Galen A. Johnson, and Michael B. Smith, *The Merleau-Ponty Aesthetics Reader: Philosophy and Painting*. Evanston, IL: Northwestern University Press, 1993.

MATT HAUGH:

Ezra Shales, The Shape of Craft. London: Reaktion Books, 2017.

MATT LAMBERT:

- Homi K. Bhabha, *The Location of Culture*. Routledge, 1994. Pekka Harni, *Object Categories: Typography of Tools*. Aalto University, School of Art and Design, 2010.
- Maureen Mercury, *Pagan Fleshworks: The Alchemy of Body Modification*. New York: Simon and Schuster, 2000.
- Diana Sorensen, *Territories and Trajectories: Cultures in Circulation*. Durham, NC: Duke University Press, 2018.

KELLY MALEC-KOSAK:

Judith K. Brown, "A Note on the Division of Labor by Sex," American Anthropologist, New Series, vol. 72, no. 5 (Oct. 1970), pp. 1073–1078.

KAT ST. AUBIN:

bell hooks, *Feminist Theory: From Margin to Center*. Boston: South End Press, 1984.

Assata Shakur, Assata: An Autobiography. Chicago: L. Hill, 1987.

Jewelers participate in SNAG, but that organization also incorporates every form of metalsmithing. But jewelry...it's a little bit homeless. It's a little bit nomadic because it's not materially defined.

NAMITA: Not only are we seeing craftbased media subsumed into sculpture in a broad way, but we also, at the same time, have people talking about textiles as a discipline, or metals or jewelry as a discipline. I'm having some issues with both of those things.

This incorporation [of craft media] into sculpture in academic training impacts aspects of how learning is structured, which Kat brought up. She expressed concern that a student may only have one or two classes in a particular area, and then seems considered qualified to go out with a degree. When craft gets subsumed into sculpture, this may become even fewer in terms of media literacy and focused training. At the same time, I would argue that a lot of contemporary jewelry is sculpture. It's not necessarily adornment and jewelry in that same way, and it crosses some boundaries that can expand sculpture.

PHEONIX: Wasn't it Marjorie Schick who called her work "body objects?" I've adopted that for my work.

MATT L.: Marjorie also had wearable paintings and wearable sculpture. But I feel like in the field that's been treated as, "Oh, you're just trying to be part of the art crew or the sculpture crew and disassociate from craft."

But my question, back to Namita: The borrowing of craft techniques, does that become appropriation? Does it become assimilation?

NAMITA: I think we have to be very cautious about using those terms. There are certain ways in which humanity has transformed materials in some way, shape, or form. The appropriation would come, I think, in taking from one culture and bringing that into a practice, or into the studio and into the making, in a way that doesn't recognize [the source]. When working with metal, for example, is it appropriation to take a blacksmithing technique from Nigeria and apply it? It's appropriation if you take the forms or the culturally signified object that has been produced and bring that into

your practice without recognizing that finished product. That, I think, is appropriating. But is it fair to take that to the level of the fabrication itself?

MATT L .: I think that gets back to a good conversation we had in a class meeting about authorship and recognizing how things are being produced. We're being taught keum-boo, shibuichi, and mokume gane...and I don't think it's a problem if you understand the historical context. Look at Dorothea Prühl's work. If you look at her work out of context, they are pieces of wood. If you look at why and when she made them, and where they come out of, that's what makes them part of the discussion. And so, that's where I'm going to differ with you, Namita. I think we have to understand the context, or it is very problematic that you're taking those techniques.

NAMITA: I'm not disagreeing with you on understanding those techniques and giving the context. I don't think it's wrong to engage techniques from multiple cultures. I really strongly object to this idea that only people in a certain area have a right to use certain techniques. It's a very complex, complicated global history that we all sit in. We're not in nice, neat categories.

I agree with you that you need to have that process, and that's why I think it's going to be problematic as processes get subsumed into broader sculptural practices. At the same time, I think that we should be looking to multiple cultural processes with that context.

This is where I would hope that the program opens up a space for all of you to start writing that language and getting that documentation out there. This ties into a question of Emily Zilber's: What does a maker bring to this kind of program?

MATT L.: There has been a lack of art historians dedicated to craft. And I know that has been changing in the last ten or fifteen years, but it makes sense to me that we would become a part of a group of makers but also craft historians.

NAMITA: It's a dialogue. There's reciprocity in what you bring into the program is as much as what we're sharing with you...and you bring an ability to manipulate materials into this program. What do you bring in that somebody else might not? **PHEONIX:** There's a foundational understanding-maybe everybody can help me expand on that—of what it is to make. Not just the concept of making, but the physicality of it, an understanding of material. And, like Matt Lambert said, you can't just organize craft by material, because we all use materials and processes from other areas. It's convoluted...it's not able to be neatly categorized in an art-historical and canonical kind of way. And so, because we understand that, we understand that there needs to be a new way of looking.

MATT L .: I think all of us have unique studies or training beyond being makers. I think we all bring in an understanding of making and certain areas of theory that haven't overlapped craft yet. And I think craft will gain from participating in dialogues with psychology, with cultural studies, with gender studies, because there's so many amazing parallels that it's a mutual relationship that can grow, that craft needs.

PHEONIX: To piggy-back on what Matt Lambert is saying, I have noticed that each of us, in our craft degrees, had a minor in something that was theoretical. Matt [Lambert] had psychology, I had a

philosophy minor, and Kat's was gender studies.

KELLY: I think we bring an intimate knowledge of what is missing, and that is probably what drove us all to this program.

NAMITA: Kelly, I think makes me think back to the '60s. We started to have more artists writing about the shifts they were making in art... in order to make sure people could understand the moves that they were making and the way they were shifting art. They had to turn to writing. They had to turn to other ways of communicating.

MATT L.: I hope that's what we take on... the way things are applied, they're all defined in these very narrow constructs that don't even imply that there is space for conceptuality or material experimentation or scale size...especially with jewelry shows. It must fit in a case that is X by X size. And if it doesn't, then you can't submit it.

PHEONIX: Except for the exhibition that you helped to make. Right?

MATT L .: I did not make it. I lovingly cochair the "Exhibition in Motion" for SNAG because it is trying to attempt to make space for alternative conceptual work, larger work. It's a way of paying back.

PHEONIX: So, exhibitions like the one that Matt Lambert's talking about become seminal in the way that new makers think about what is possible. Right? By the time I came to metalsmithing in academia, "Exhibition in Motion" was already a thing. And so, because it was already a thing, I was able to look back at those catalogs and say, "I can make big work."

MATT L.: But there wasn't a central archive for that. This is the fourth year we're doing this specific project that you're talking about, to create an archive and also to dig up, source, and properly discuss the history. Which is a practical application of this [MA] degree: to learn how to do so.

We have a huge history. You look back and see work by Don Friedlich and Susie Ganch; there is a brilliant photo of Susie wearing a headpiece in the very first "Exhibition in Motion." We have all the original photos. These are people that have entered the canons of craft. But the thing is with those images, unless we dig them up, where are they going to show up in a book?

NAMITA: Excellent. Thank you all. Is there anything that you feel we didn't cover that you wanted to mention about the program or why you're here, and how it connects to metals work or anything that we didn't touch on?

KAT: Be ready for the revolution.

NOTE: For the full transcript of this conversation, which contains additional details and context for the recommended readings, please visit Metalsmith FXTRA!

Student Matt Haugh and Core Faculty Linda Sandino, July 2018, research trip to Western North Carolina Archives. Photo: Namita G. Wiggers

For additional information on the MA in Critical and Historical Craft Studies, visit https://www.warren-wilson.edu/programs/ma-in-craft/ and follow on Instagram @macraftstudieswwc

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TECH TOOLKIT

The Rolling Mill: A Jewelry Studio's "Forever Tool"

BY JEFF GEORGANTES

AT ITS MOST BASIC LEVEL, a rolling mill is like a pasta press for metal. Its primary use is to manipulate sheet and wire into different thicknesses, but it can do much more. The rolling mill can be used as a forging tool, a texturing tool, and, perhaps most importantly, it can be a critical component in recycling silver and gold scraps into usable stock. Most rolling mills are "forever tools," and if properly maintained will last for the rest of your career.

I got my first rolling mill back in the 1980s. It was a used Cavallin square wire/ flat combo mill, made in Italy. It's built like a tank and weighs a ton. When I moved into my current studio, I didn't set up the rolling mill up right away, because I couldn't figure out a good spot. Because it is super heavy, I left it on the concrete studio floor. Big, big mistake. At some point, my new studio flooded unexpectedly because of spring snow melt, and the Cavallin rollers rusted. It was tragic. I did my best to repair the damage, which helped the rollers, but it didn't remove all of the pits. I tried to talk myself into the idea that the rust marks added texture to my work, but eventually metalsmith guilt got the best of me.

I decided to explore the question of if the rollers could be refinished. I talked to the folks at Otto Frei and received instructions on how to remove the rollers and ship them to their headquarters in Oakland, California, where a specialized machinist could refinish them. Part of the challenge is that you can only take so much off the surface of the rollers, as the steel rollers are not hardened all the way through to the center, and if you remove too much of the roller surface, the mill won't close entirely. Fortunately, my rollers were salvageable, and they came back looking perfect once again. Now I rub and clean every surface of the rollers regularly with cloth and oil, much the way my dental hygienist lectures me to brush and floss. Five years later, the rollers still look brand new. My Cavallin rolling mill is back to its "forever tool" status.

At the 2019 SNAG Conference in Chicago, I met with Steve Frei, president of Otto Frei. I've known Frei for at least thirty years, and of all the people that I know in our industry, he's the closest I've met to a jewelry tool historian. He knows the history of pretty much every jewelry tool that has come on the market in the past fifty years. I asked Frei how he has seen rolling mills evolve within his career. Jeff Georgantes Spiral Ring, 2019 Milled recycled silver, rolling mill forged taper sterling silver, 14k gold, ruby 1% x 1% x 1% in. Photo by Case Hathaway-Zepeda

He said that a lot has changed, and a lot hasn't; the core design of rolling mills is very similar to those from a hundred-plus years ago. What has changed the most are the quality of materials and the efficiency of the manufacturing process.

I talked to Sean Seo, owner of Best Built Jewelry Equipment, at his NYC storefront while attending the Manufacturing Jewelers and Suppliers of America Expo in March 2019. I asked Seo what he hoped





B

(intering)





Clockwise from top left: Durston D4 Combo Rolling Mill; Pepe 130 mm Combo Power Rolling Mill; Otto Frei Blue Economy Rolling Mill; Best Built Combo Rolling Mill.

Work made using a rolling mill

ARTIST: Curtis H. Arima

curtisharima.com Secondhand 1980s Durston Wire Sheet Combo Mill

My rolling mill allows me to recycle my metals and make different colors of gold (or any alloy) for my fabricated work. It gives me the independence to make any size wire or sheet that I need. I make my own bezel wire, ring stock, cloisonné wire; the list is endless. I often use it to help forge tapers in both jewelry and larger sculpture. I use it every day that I am in my studio.

Curtis H. Arima

Heartfelt: Bleeding Heart, 2018 Torch-fired enamel on copper, sterling silver, gold 4½ x 3¾ x ½ in. Photo courtesy of the artist





ARTIST: Jim Dailing

jimdailing.com Secondhand 1980s Cavallin Power Mill

I cast a lot of my own alloys, like 20k rose gold (gold with a little bit of copper). My mill allows me to recycle metal quickly into usable stock for nearly any project.

Jim Dailing

Galileo's Daughter—Neckpiece Rolling mill forged taper Continuum silver, diamonds, Tahitian pearls Photo courtesy of the artist

ARTIST: Jeff Georgantes

jeffgeorgantes.com Secondhand 1980s Cavallin Wire/Sheet Combination Mill; Pepe Flat Mill; Otto Frei Blue Economy Mill

My three mills all have different purposes. The Cavallin mill fits on my bench and is there for small pieces of sheet and wire. The Pepe flat mill is for wider sheet metal and the Otto Frei Economy Mill is for my hand-carved texture rollers.

Jeff Georgantes

River Rock Ring, 2019 Metal textured with hand-carved steel mill rollers Sterling silver, 14k gold, found rock, carnelian, garnet 1% x 1% x 1% in. Photo by Case Hathaway-Zepeda



to bring to the jewelry industry with his line of rolling mills. He said that one of the features he hoped jewelers would appreciate about his products was, as Steve Frei had said, the quality of materials and construction. For example, Best Built's rolling mills feature rollers that are plated with industrial rhodium to protect against rust and create an enduring shine. The rollers on a Best Built mill really are a thing of beauty.

What Best Built has done with their rollers highlights the importance of maintaining your mill. So how do you keep your mill a forever tool, and looking brand new? At JCK 2019, I asked Tony Aizenman, Founder and President of Pepe Tools in Oklahoma City, how he recommends maintaining a rolling mill. Aizenman said that the most important thing a person can do is to keep the rollers clean and to never let them get damaged in the first place. He recommends cleaning your rollers after each day of use with a cloth soaked in a light lubricating oil. I've definitely found that to be helpful. If I don't use my mill for days or weeks, I also make sure that the rollers are well coated in oil. Making sure that the rollers are separated is also crucial, because when the heavy steel rollers touch, it can create condensation and rust.

Covering the mill with either a cloth or plastic cover will also help protect it. I've heard both sides of the debate when it comes to cloth versus plastic covers. Cloth allows for moisture to escape. Many say that plastic covers are bad because they can entrap moisture. Where I live in New Hampshire, it's very humid in the summer. For me, I've found that the combination of a plastic rolling mill cover and regularly coating the rollers liberally in lubricating

The core design of rolling mills is very similar to those from a hundred-plus years ago. What has changed the most are the quality of materials and the efficiency of the manufacturing process.

ROLLING MILL TIPS AND TRICKS

BY JEFF GEORGANTES

Turning scrap metal into usable metal stock

NOTE: Some metals recycle better than others. Brass, copper, bronze, and white gold are harder to recycle into usable stock. Sterling silver, argentium, and yellow gold work well.

- Melt your scrap into an ingot mold of some kind. Make sure that the scrap is free from any solder.
- 2. Let the ingot air cool, then pickle, rinse, and dry.
- File away any flanges, pits, or imperfections, then sand to a 400-grit finish.

There are many different concepts of how to mill the ingot. Some people say you're supposed to reduce the thickness by 20 percent through forging before milling. I find that confusing. Here's what works for me: five courses of lightly forging or planishing, annealing, and then pickling before any milling at all. It accomplishes about the same thing, which is to strengthen the outer layer of the ingot.

Why do you need to forge, anneal, and pickle first? The best explanation I've ever heard is to think of the metal as water in the ocean. The wave on the water's surface moves at a different pace than the water near the ocean floor.

As the metal at the surface of the rolling mill moves more than the metal in the center of the ingot, this inconsistency can lead to surface cracks.

- 4. After you finish five hammering courses, it's time to roll. You need to roll very conservatively at first. Only reduce the thickness a little bit at a time, and anneal frequently.
- Hopefully you won't get any surface cracking, but if you do, file and sand out the cracks when they are small. Don't assume that they'll go away; they won't. They'll only get bigger.

Soon your metal will have the same consistency as metal purchased from a professional refinery, and you'll be able to mill it normally.



File the rough ingot to remove any flanges, pits or imperfections.



Sand the ingot to at least 400 grit.



Lightly forge the ingot to harden the surface. Do five courses of forge, anneal, pickle.



Anneal



Pickle

Work made using a rolling mill



ARTIST: Steve Midgett

mokume.com Multiple mills—both electric and hand crank—some with customized rollers

It would be impossible for me to make the mokume that I make without good rolling mills. Square wire rolls are essential for reducing billets into wire for ring making. Because the rollers support the metal on all four sides, there is much less chance of the billet delaminating while rolling.

Steve Midgett
Conch Pearl Brooch, 2002
18K mokume
1% x 1% x ¼ in.
Photo courtesy of the artist

ARTIST: Kris Patzlaff

arcataartisans.com/artists/kris_patzlaff/ 1988 Durston Wire/Sheet Combo Mill

My rolling mill is probably the most important piece of equipment in my studio. All of my work utilizes it in some way. I use my rolling mill primarily for rollerprinting. Rollerprinting provides me a rich embossed surface texture that utilizes my personal vocabulary of mark making.

Kris Patzlaff

Brooch, 2009 Roller-printed Silver, 24k gold, opal 1% x 1% in. Photo courtesy of the artist





ARTIST: Paulette Werger pjwerger.com

1980s Durston Wire/Sheet Combo Mill

I use my rolling mill daily side-by-side with my torch and it's my favorite tool! I predominately use it for embossing, creating patterns to be combined with Keumboo, fusion or fabrication in jewelry pieces.

Paulette Werger

Condiment set 22k gold, keumboo, roll painted, fabricated argentium silver 6 x 3 x 1½ in. Photo courtesy of the artist oil works best. In my humid environment, a plastic cover shields against humidity more than it entraps it. Any moisture that gets inside the cover is overpowered by the liberal coating of oil. Whatever you choose, plastic or cloth, it's important to keep the mill covered when not in use and the rollers well-coated with a light oil.

As I said, my Cavallin mill, which was state-of-the-art in the early '80s, is so heavy that it requires most of my strength to pick it up; yet by today's standards the rollers aren't very wide. Aizenman told me that lowering the overall weight of the steel frame in his Pepe mills, but also increasing the frame's strength, was a big goal for him. I also own a Pepe flat mill for wider sheet metal. The design looks similar to the Cavillin, but the frame is much thinner and lighter. Durston did something comparable with its Agile line of mills, redesigning the frame for strength instead of weight, so the frame doesn't have to be as massive. Both the Pepe mills and Durston's Agile mills retain high quality, yet offer a lower cost, which is a big win for metalsmiths.

How the tool steel rollers are heattreated will reflect in the mill's overall strength. Aizenman explained that the outer part of the roller is much harder than the interior, allowing for microscopic flexing under pressure and acting like a shock absorber when the metal is milled.

In my opinion, one of the biggest recent innovations in rolling mill technology comes from low-cost, imported rolling mills from India. The baseline price of these mills is currently around \$250. That is unbelievably inexpensive! While these mills do have a reduction gear, there are big limitations. With a conventional rolling mill, you can open the rollers to about 5 or 6 mm. With these low-cost imported mills, you can only open the rollers to about 2 mm or 14 ga, which is a big limitation. They also don't have a lot of torque. You could never mill out an ingot, for instance, without doing a lot of forging first.

Where these low-cost imported mills really shine though are as texture mills. The Indian mills have a large number of choices for easily replaceable texturizing rollers that cost approximately \$30 to \$130 each. Texturing doesn't require as much pressure as shaping, so these low-cost mills work well for that. The fact that you can texture entire sheets of silver or gold or bracelet and ring shank stock over and over again is unprecedented. If you're a metal texture junkie like me, this is a game changer. I even bought a \$29 plain flat replaceable roller for my imported Indian mill and carved my own texture pattern into it with diamond burs and cut-off wheels. My mind was blown with the possibilities!

For many years, Durston Tools from England has had a reputation of quality, especially with their line of rolling mills. At JCK 2019, I spoke with Matthew Durston. He talked about how important it is for him to honor his father, its founder, and his original goals. Durston said, "For me, I'd rather have a customer have one of our rolling mills for thirty years.... When someone tells me that they've had a Durston rolling mill since 1970, I love it!" Durston reinforces the idea that buying a rolling mill isn't like many other shop Most rolling mills are "forever tools," and if properly maintained will last for the rest of your career.

Forging with a rolling mill

Forging a taper, especially with thin gauge rod or wire, is really easy with a rolling mill. You still have to do a little bit of hammering, but all the hard work is done by the rolling mill.



This is easiest with square stock and square rollers. Measure and mark.

Using the square wire/ rod section of a rolling mill, create a series of decreasing steps. The angle of the taper will depend on how drastically smaller the steps are and the length between them.

In the example, I took a piece of 5 x 5 x 90 mm $(3 \frac{1}{2})$ sterling silver. I made steps roughly every 10 to 20 mm ($\frac{1}{2}$ to 1 in.). By the time I was finished, the silver rod went from 90 to 267 mm $(3\frac{1}{2}$ to $10\frac{1}{2}$).

I smoothed out the steps with light planishing. (For the finished example, check out the spiral ring on page 18, made from this piece of silver.)



Shrink the stock in a square roller to your mark. Mark and roll to a new mark.



Repeat, creating a series of steps that decrease in width until you get your desired taper and length.



investments. If you take care of it, your rolling mill will be a forever tool that you'll potentially have for the rest of your career and then be able to pass on after you retire.

There are many different models of high-quality rolling mills these days at prices that are comparatively the lowest in decades. That can make the choice of which one to purchase difficult. Virtually all current hand-crank mills now include a reduction gear, which is a huge improvement from the past. There still is the decision of whether to get flat rollers, combo rollers, or side rollers. Electric or hand-crank is another decision. Just think: right now you can get a high-quality electric mill for what you would have had to pay for a decent hand-crank mill not that long ago! Again, what Frei and I talked about summed it up: international competition has driven rolling mill manufacturers to innovate, improve quality, and lower costs. It's time to get it rolling and keep it rolling!

Jeff Georgantes has an MFA in Jewelry/ Metals from CSU-Fullerton as well as a BA in Art and a MA in Sculpture, both from CSU-Humboldt. He taught art at College of the Redwoods in Eureka, CA, for fifteen years and has taught numerous visiting artist workshops across the US. He helped develop and coordinate the Jewelry/Metals program at the Mendocino Art Center from the early 1990s until 2005 when he started his position as head of the Jewelry/Metals program at Dartmouth College, Hanover, NH. He has served on the Mendocino Art Center Board of Directors, the Metalwerx Board and currently is a SNAG Board member. www.jeffgeorgantes.com

Further Resources: Each of these companies has lots of instructional information and videos on their websites and social media channels:

Pepe Tools: www.pepetools.com

Durston Tools: www.durston.com

Best Built Jewelry Equipment: www.jdsincbb.com

Otto Frei Jewelry Tools: www.ottofrei.com

Rio Grande Jewelry Tools: www.riogrande.com

Rolling Mill Resources: www.rollingmillresources.com Hundreds of roller printing acid-free paper patterns. They will also laser-cut your own designs onto acid-free paper.



Keeping your rolling mill like new

Keep your mill covered to protect from dust and debris collecting on the rollers.

Don't roll anything that might hurt the mill. Ideally, only roll soft metals. When roller printing, it's safest to sandwich your texture material between two sheets of soft metal (like copper or brass sheet). If you use cut paper to texture, remember that many papers are made with acid and formaldehyde. Sandwich your paper unless you know that it's acid-free. (Rolling Mill Resources sells acid-free texture paper sheets: www.rollingmillresources.com.)

Matthew Durston from Durston Tools told me that light staining on steel rollers isn't a problem, but rust is. There are lots of YouTube videos out there about rolling mill maintenance. One of my favorites is by Ronda Coryell. You can do a version of Coryell's dowel trick with fine sandpaper to remove light rust.

If the worst happens and your mill gets more rust than you can remove yourself, all mills can be taken apart and the rollers refinished by a professional machinist, ideally one who specializes in roller refinishing. Contact the mill manufacturer or the jewelry tool company from which you bought the mill for specifics about how to remove the rollers, and how best to get the rollers professionally refinished.

Creating your own texture rollers

One of my favorite new tools is the low-cost Otto Frei Blue Economy Rolling Mill (currently about \$250). Steve Frei told me that at least the top rollers are interchangeable with mills made in India of a similar design, even though they are made by different manufacturers.

There is a huge selection of premade texture rollers to choose from, but making your own is extremely easy with diamond burs and cut off wheels. A polished, flat roller for one of these mills is currently just \$29. What is especially great is that unlike most other kinds of roller-printing textures, these texture makers will never wear out.



Blank rollers hand-carved with print pattern with diamond cut-off wheels and burs.

Cranbrook © Academy of Art MFA in Metalsmithing

cranbrookart.edu

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STUDIO VIEWS

Bench Tricks for Jewelers

BY CHARLES LEWTON-BRAIN

WHAT IS A BENCH TRICK? A shortcut? A faster way of doing something? A better method? A tool made for one purpose used for another? A tool or technique that saves time, effort, thought, and work?

A bench trick is a door to insight. It has to do with that emotional reaction: a reset moment, a flash of enlightenment! Pay attention when you have this reaction, and you will learn...

This article is about bench tricks and thought: the kind of problem-solving that is useful in the jewelry workshop for solving technical, tool, and procedural problems, whether a specific issue or the lack of a necessary tool. In this article we glance at the role of process and procedure in jewelrymaking. We will also look at several specific bench tricks as examples of how jewelers have problemsolved successfully.

Bench tricks are keys to understanding process, and are therefore useful to understanding the nature of metal and metalworking. Bench tricks are created by recognizing patterns around you, as well as working to invent new tricks and solutions to problems.

PROCESS VS. PROCEDURE

There is a fundamental difference between process and procedure. Process in this context may be understood as what really happens when one works in metal. A procedure, on the other hand, is just a way of executing a process; it is a formula or a technique.

If one knows only formulas and procedures, then one can be shut down by a technical problem when working. However, if one looks to the process, one can come to solve technical problems relatively easily. Engineers, doctors, and scientists are supposedly taught in terms of process so they become able to solve technical problems. But our educational system for metalworking seems to be full of procedures that are taught the "right way," rather than as being on a spectrum of technical approaches to an end result. This is, for the most part, true for both industry and art-school approaches to educating metalsmiths. There may be dozens of procedures to obtain a similar end effect, but there will be only one process or series of processes occurring.

Bench tricks are keys to understanding process, and are therefore useful to understanding the nature of metal and metalworking.

Methods of Metalworking

There are only three ways that metal is actually worked, in terms of process: chemical (including solders and alloys), heat, and mechanical interactions. Mechanical interactions can be divided into two major categories: mechanical deformation, which utilizes the metal's capacity to flow; and chip forming, or tearing chunks off of the metal in different ways.

CHEMICAL

We work with metals both as chemicals and in ways involving chemicals. Metals are dissolved chemically, becoming solutions, and may be plated back as solids from solution. Metals may also be combined with oxygen (oxidized) and other chemicals in various forms of corrosion including firescale, rust, patina, and so on. Alloys are a kind of chemical mixture, usually of metals but sometimes including other kinds of materials. Solders are in this category, as they are alloys designed to melt at lower temperatures than the parent metals to be joined.

HEAT

We treat metals with heat, which expands, contracts, and changes metals' crystal structure. We can bring alloys to a "pasty state," that is, a mixture of solid and molten particles, like a porridge. We can make metal fluid and pour it as a liquid into a mold that allows it to solidify into shapes when it cools. With the application of heat, chemical reactions happen that do not occur at room temperature. Heat accelerates chemical reactions of all kinds. We can anneal metal to realign its crystal structure, making it soft after work hardening. Alloys can be made harder by heating, migrating harder copper oxides to the grain boundaries of the crystals. Metal crystals look sort of like grapes that have packed too tightly in a crate: they have facets on them where they bumped into each other while forming.

The grain boundary is the "skin" of the grape. This 3D mesh of harder skin stiffens the metal, increasing hardness by large percentages, up to 200 times harder than annealed metal.



For example, sterling can be heat-hardened (or age-hardened) in a household oven for several hours at 450F to harden it (you might want to wrap it in copper foil to avoid firescale), and 18k gold, for example, can be significantly hardened in just an hour.

MECHANICAL DEFORMATION

Metal actually works very much like clay. Ductility is used extensively by blacksmiths, chasers, and people who roll, draw, forge, and set stones in metal. Metal is a mobile, fluid, ductile, pliable material. You can stretch it like toffee or thicken a sheet by planishing just as you would push a slab of clay around with your fingers. You mush it around, treat it as supremely plastic stuff. I once had a student with twenty years of experience as a stonesetter take a workshop with me. I saw him again several years later and asked if anything from the class had been useful. He said "Yes! The idea of metal as clay. My stonesetting improved two hundred percent!"

CHIP FORMING

Chip forming, that is, tearing chunks of metal off in a subtractive manner, comprises everything else that goldsmiths do to metal. Here is a diagram of how a wedge drives into a metal surface, raising and finally separating a "chip."



A graver or chisel is clearly a wedge. A file is a stack of single flat graver teeth (wedges); a sawblade is too; a bur is a bunch of wedges (graver teeth) wrapped around a cylinder; a drill bit is two wedges on the end of a rod and so on. All cutting and abrasive tools used by metalsmiths are based on chip forming, even polishing operations where the "wedge" is formed by sharp angles on the little jagged boulder that is a piece of abrasive grit. Pushed against the metal from different directions, different parts of the grit line up to tear chips off the metal. This goes for sandpaper, emery paper, tripoli, and other polishing compounds even rouge: all are examples of subtractive work through chip forming.





stack of wedges

sawblade

file teeth

rotary

burr

By examining the process, one is able to discover numerous procedural options. Some options will not be appropriate for one reason or another, and it is the maker's responsibility to make a good technical decision. However, by thinking of as many solutions as possible, one learns about the material quickly and more easily.

For instance, instead of "cutting with a jewelers' saw," think of the issue as "separating sheet metal." Then list all the methods available, which includes all kinds of shears, lasers, chisels, etching, bending back and forth, abrasive cutting, engraving, using a nibbler, shaped explosives, and of course, using a jewelers' saw. And you *will* probably use the jewelers' saw for your task. But down the road, one of the other procedures may be the right answer. A useful jeweler's exercise is to think of at least five different procedures for any given end result. It is good for your practice to make a habit of this kind of thinking. There is no "right" way to do things, merely variations of suitability to the technical problem at hand.

CONTRAST & COMPARISON

One principle of developing bench tricks is that if something looks like something else, it is. For instance, thinking of a sawblade as a thin file, or a file as a fat sawblade, allows you to understand more about each tool's possible uses. For example, there is a traditional goldsmithing technique called "azure sawing" (figure 1) in which the sawblade is used as a file to create sloping angular surfaces behind set gems.



what is the same and what is different about each.

There are a number of ways of finding solutions to specific problems, but here is my checklist:

PROBLEM-SOLVING CHECKLIST

- 1. Identify the problem and define it.
- 2. Examine and list alternative solutions: brainstorm.
- Define and describe alternative solution steps and requirements: iterations.
- 4. Compare solutions by listing pros and cons.
- 5. Choose solution.
- 6. Plan how to put solution into action.
- 7. Take action and complete problem resolution.

GUIDELINES FOR DEVISING BENCH TRICKS

• **Describe the problem as clearly as you can.** For instance, if you want to build a ventilation system, the problem can be distilled to "move air fast." Describe the process that is occurring. Then look for solutions that fit the problem at hand.

• Who else has your problem? Look for industrial examples of your problem and possible solutions. Take that ventilation system, for example. One can assume that ordinary household products are designed by teams of people, and have parameters such as how small of a motor can be used with the maximum effect at the lowest cost. So which household objects "move air fast"? A household fan is not fast enough, nor is a kitchen vent fan, but a vacuum cleaner is. Most vacuum cleaners have a similar form: a narrow hose (this forces a higher air speed for a given motor size); a round hose (which reduces turbulence and convection issues); and a narrow, long slit to collect air (which is the most efficient way to gather air/dust from the furthest distance into the hose). Another home appliance that moves air fast is a hair dryer: most share that pistol-like shape encasing a squirrel cage blower (that is because this shape moves air fastest for that given motor size). This blower type is used for oil furnace blowers in houses for the same reason. Blacksmiths' traditional hand blowers on forges were this type too, so the smith could use less energy when working.

Therefore, for your own ventilation system, you'll want to use a small round tube to pull the air through, have a slit vent(s) where the air is gathered, and use a squirrel cage blower in the system, probably near where the air exits. Another advantage of this type of setup is that any caustic fumes do not come in contact with the motor, which is outside the blower itself.

Another example of this principle is an enamelist's need for local ventilation to remove toxic powder while sifting. They require something to suck the excess powder away as soon as it is made, a fan strong enough to do this, and a HEPA filter so that the tiniest particles are not just boosted into the air. Who has this problem? Aestheticians create acrylic dust when buffing nails, and have units that fill all these requirements. And because there are a lot more aestheticians than enamelists, these nail dust collectors are very affordable.

• **Can you shift categories?** It is important to "shift categories," that is, to look at how you (and other people) define things and see if you can break out of those classifications. One example is

SOME FAVORITE BENCH TRICKS



A polishing machine has the machinists' spindle size (right), which forces you to buy expensive jewelers' buffs. If you get the one on the left from a machinist supply for a few dollars, you can now put cheap buffs onto it—and pricey jewelers' buffs. Trays are important in a jeweler's shop for protecting the work and isolating steps and stages.





Here a golf ball has been used as a graver handle and as a handle for stamping metal with quality marks (Axel Bernal). I have seen graver handles made with Aqua-plast and Sculpey as well.





If you don't feel like drilling all the holes to make a burr stand, look for a cribbage board at a flea market.

This is an ergonomic pusher handle made from an old pipe.



chasing tools, which sell as high as \$15 each on eBay. Meanwhile, boxes of 80–100 watchmaker's staking tools (made of the same hardened and tempered steel, the exact same thing as chasing tools, and easily altered to suit one's purpose) sell for \$45 (see figure 2). Watchmaker's tools are classed as obsolete, and only for fixing watches, but shift mental categories, and that box is worth a bundle as chasing tools. Try to categorize objects in new ways.



In the same way, driver bits of all kinds are cheap and can be used as metal stamps (see figure 3). This set of thirty-two security screwdriver bits is under \$11, and works great for stamping. Stamps have value; driver bits do not. If you are going to use them as stamps, heat the back ends up until they turn blue, and air-cool to make sure that the part you are hitting is not brittle.



Another example of a category shift is ball bearings (see figure 4), which can be easily brazed (soldered)

onto a steel rod to make dapping tools or onto a tack hammer to make a forming hammer. You use a ton of white paste flux and some scrap



✓ This is a steel boat cleat: they come in all sizes from tiny to huge and can be used as raising stakes. The small ones can be worked to create miniature raising and shaping stakes.



brass wire to join them. I grind a flat spot on the ball bearing to relieve stress and increase the strength of the join. Ball bearings are expensive, as much as \$6 each. But if you look for "Steelies," that is, kids' steel marbles, the retail category is "toy" rather than "tool" and so has a lot less value. I have bought a full set of eighteen graduated ball bearings for \$3 because they were in the "toy" category.

• What is the action taking place? Is there a smarter way of using this action? Examples include putting a chuck key in a handle and cutting off the T-bar, because its use is about rotation, not cranking. Or placing your thumb on the cogs of a #30 flex shaft chuck and gently pressing the foot pedal: this rapidly closes the jaws onto the tool. Similarly, you can mount tools onto flex shaft screw mandrels by inserting the small screw into the disc, setting it into the opening in the screw mandrel, then pressing the foot pedal which instantly self-mounts the disc onto the mandrel.

• **Can you combine elements of a job into one tool?** Examples might be where I have ground the round nub of the chuck key into a screwdriver shape (see figure 5). This does not change its width so it still works like a normal one, but now your screwdriver for mounting flex shaft tools is always at hand.

Another combination is to snap off the end of a triangular or square needle file and grind it to a fifty-five degree angle: now you have a file-graver for scoring and bending. Hold it at one



SOME FAVORITE BENCH TRICKS



Here are old leather handbags, bought for less than a dollar each at a thrift store. Fill up a plastic bag with sand, knot it, and zip it into the handbag; now you have sandbags with handles. Use them for shaping metal on and as a pitch bowl support. A hot water bottle can be used in the same way, and it will last for years.



A cast steel dumbbell (\$5 at a flea market) makes a superb sinking hammer for making bowls.

Chris Hentz developed this tool for holding things for soldering by brazing three nails together. I have added a sliding magnetic weight to this one.

thin "foot" to hold things with minimal heat sink effects and to slip under parts to hold them down

grooved to hold tubing

and wire in place

rounded end to hold with minimal heat sink effects

soldering weight

Here is another form of soldering weight that I like; with two of these you can quickly hold most things while soldering. Its weight is increased by stacking a brick or other weight onto the flat surface.

brick can be placed on soldering weight to make it heavier



When you need to blow away dust from where you are drilling materials or burring wax, make a little propeller to do so, like this.





Memorize your finger sizes for easy ring sizing estimates. I keep a map of mine.

angle and it is a file; tilt it up a bit and it is a graver for refining the scoring.

• **Simplify the procedure.** Boil it down, distill it, reduce the steps, combine steps (like using ZAM or Fabulustre instead of two polishing steps like tripoli and rouge).

• Look for someone who uses so much of something they do not value it. If you are looking for a specific material or tool, try and find out which industry uses so much of it that they consider it almost worthless. Here are some examples:

The **flint wheel** from an older-style disposable lighter is a great carbide steel burr that jewelers can otherwise pay several dollars for (see figure 6).

They are made in such quantities that they are incredibly cheap. When the lighter is empty, the top can be knocked and pried apart, and the flint wheel placed on a standard screw mandrel for the flexible shaft to obtain a carbide burr. It works like a rotary file for filing edges and coarse metal removal.



Dry pickling acid (you know the ubiquitous brand I mean) is almost the same as sodium bisulfate, which is commonly sold as "swimming pool acid," used to change the pH of swimming pools and hot tubs. It is far less expensive than at the jewelry supplier's (\$1.50 for the same amount you would normally pay \$7 for). It can also be bought very cheaply in drums as an industrial toilet bowl cleaner. It is also used in some dishwashing powders. What might this say about disposal (once the copper is stripped out of the used solution)?

Large floor polishing machines, such as those used in school or other institutions, have **giant scouring pads** on the bottom. When their pads are "worn out," they are still good for our use; but even better are the round discs that they punch out and throw away from the middles of the pad when they are mounted on

These felt floor protectors for furniture can be used as felt buffs on the flex shaft.





the machine. Stiffen up the center with a little epoxy and they are essentially the same scouring discs for the polishing machine that jewelers pay up to \$8 each for.

Pumice blocks for soldering on, or for getting a satin finish on metal by scrubbing with water, are sold at dollar stores for scrubbing your calluses (see figure 7).

You can find **vibratory tumblers** more cheaply at gun shops than at jewelry suppliery; they are generally about thirty percent cheaper.

Delrin metal forming hammers used for anticlastic raising and metalsmithing often run \$38 at jewelry suppliers but are only \$8 at discount hardware stores like Harbor Freight, where they are marketed to fix dents in cars. (There are a lot more car mechanics out there than jewelers.)

Similarly, **auto waxes and transparent paints** to protect metal surfaces, designed for expansion and contraction, extremes of temperature, acidic rain, and ultraviolet light are an ideal long-lasting finish for metal objects. In the same way, Nicholas Lacquer, beloved by people who use patinas and metal coloring, is found easily in music stores, as it is used on high-school marching band instruments as the longest lasting finish—a brutal testing ground for a product.

One can buy **cylindrical leather dog chews** in different diameters at the pet store, cut them in half, drill through them, and mount an appropriate-sized hammer handle in them to make inexpensive,

good-quality leather mallets, particularly in small sizes (see figure 8). Look for a chew that is solid, as some will have cavities in them. Three small mallets will cost just about \$2.



Master goldsmith Charles Lewton-Brain is the innovator of Fold-Forming, professor emerita of the Alberta College of Art and Design, and a founding partner of ganoskin.com. He lectures and publishes internationally on his research into rapid manipulation of metal and its surface for artistic and manufacturing purposes.

Forging on the River 2019: A Blacksmith's Riverside Reunion

April 3-6, 2019 | The Metal Museum, Memphis, TN

BY ABE PARDEE

A chain of barges churns its way around an oxbow, riding low in the current beneath mounds of coal, as swatches of mist burn off under the climbing sun. As I sit in the castiron gazebo atop a bluff, on the grounds of the Metal Museum in Memphis, this vista seems a fitting testament to the heritage of industry and the Mississippi River. Surrounded by beautiful sculpture on the lush grounds, I am waiting for the smithy doors to open on the first day of the Forging on the River (FOTR) 2019 event.

In 1993, ABANA (Artist Blacksmith Association of North America) and the River Bluff Forge Council organized the first FOTR at the Metal Museum as a showcase for excellent blacksmithing. While always focused on honoring a distinguished smith, the annual event has grown and changed. In its current format, which is no longer affiliated with ABANA, an international artist leads a three-day workshop to build a group project for the museum, followed by the general conference and the annual auction dinner. Since 2014, under the Metal Museum's Executive Director Carissa Hussong, the attendance has been capped at eight for the workshop and thirty for the conference, turning it into a more intimate gathering.

As we gather around the tool-strewn layout table for our morning briefing, I am flanked by the two current museum apprentices, along with two former apprentices (I am one myself), and three strangers. Of the three fresh faces, two are relative novices to forging and one has run her own successful blacksmithing business for years and is a recognizable name in the community. Therefore, four of us are full-time business owners of metalworking studios, which adds up to a significant accumulation of experience and talent, all directed toward the production of our instructor's design.

Alan Evans is this year's master smith who will lead this workshop and headline the conference. An established smith from England, Evans is a veteran of large-scale, site-specific forge work and is known for his techniques employing hydraulic presses. His is a direct aesthetic, bold and focused on highlighting the results of the processes employed. "I really like the way Alan has simplified all of his work ... its strong lines, simple little details, and it makes such a strong statement. It's just a nice way to work,"1 says Jim Masterson, lead designer and shop foreman in the Metal Museum's blacksmith shop. For the workshop project, Alan has designed a large freestanding structure that exemplifies his aesthetic and will be topped with a forged wind-vane.

The project is such that, over the three days of the workshop, each participant will forge one of each of the main structural elements. We will also have an opportunity to work on the large central taper, a process that requires at least three people working together to lift and maneuver the heavy two-inch bar, operate the power hammer, and employ the graduated set of "kiss-

blocks" (handled steel blocks of predetermined height held next to the work within the power hammer dies, to physically prevent forging smaller than the height of the block). This is a signature feature of the FOTR workshops. Each student

Left to right: Alan Evans, Karine Maynard, Elizabeth Belz. Photo: Kim Ward



Lewis Meyer "drawing down" on the power hammer. Photo: Kim Ward

gets the opportunity to practice all the techniques presented, as well as the chance to work alongside the demonstrator in a collaborative manner that builds rapport and working relationships, ultimately contributing to the completion of the main project in a way that grants them a sense of ownership in the process and the piece.

The days are interspersed with demonstrations and informal chats about the work at hand, metalworking in general, or whatever topic happens to come up. It's warm and casual, and, to me, it feels like the next best thing to visiting the smith in their own shop. Everyone in the class has something to offer, and it's hard not to feel a quick camaraderie. "I love just seeing all the people come together... old faces, new faces. I love the energy,"² says Carissa Hussong, director since 2008.

It is this intimacy, this sharing in a common purpose within a tight group, that seems to set FOTR apart from many other conferences. "The number-one draw is probably the family, the atmosphere of exchanging ideas, exchanging equipment, thought processes, techniques, having the ability to freely ask questions and get legitimate answers,"³ says former museum apprentice, self-employed metalsmith J.R. Lodico, who has been attending FOTR for eighteen years.

Forging on the River may be geared toward the advanced, professional blacksmith and draw a returning core group, but time and again I have seen novices and outsiders show up and get swiftly and wholeheartedly brought into the fold. This sentiment is shared by



Hussong: "I think the community itself is so welcoming that, if you're interested, you will be welcomed and embraced."⁴ There is also a sister conference to FOTR called F.I.R.E. (Foundry Invitational and River Exhibition), which has the the same format but is held in the museum foundry and focused on metal casting.

The intensity in the shop builds steadily until Friday afternoon brings the last big push to finish the project. At this point, the other conference attendees are trickling in and preparing for dinner and Alan's slide presentation. Saturday brings a program full of forging demonstrations, punctuated by a professional practices round-table discussion after lunch. This year's topic is contracts, and the museum's lawyer and exhibition curator are both there to lend their knowledge. There are only about two dozen attendees present, which makes for a lively and uninhibited conversation, ranging from personal anecdotes about shielding oneself from litigation, specifying the scope of and payment for work, and copyright protections.

The conference culminates with an exquisite catered dinner on Saturday evening, followed by a live art auction featuring metalwork by both conference attendees and renowned smiths from across the country. Trustees, board members, and various friends of the museum attend the auction each year and help to make it one of the nonprofit institution's major fundraising events.

The Metal Museum is dedicated to continuing the legacy of FOTR as a unique opportunity to work closely with renowned international blacksmiths in an intimate and nurturing environment. There are even plans to arrange for a translator to accommodate non-English-speaking demonstrators in the future.

Abraham Pardee is a full-time blacksmith and metal artist who has operated Pardee Metal LLC since 2016. An alumnus of the Appalachian Center for Craft's BFA program and the Metal Museum's Blacksmithing Apprenticeship, Pardee has taught and exhibited nationally since 2008.

1 All quotes are from in-person conversations with the author at FOTOR on 4/6/19. / 2 From in-person conversation with the author at FOTOR on 4/6/19. / 3 Ibid. / 4 Ibid.

Further Resources: Details about next year's Forging On The River, F.I.R.E. Conference, and the many other events at the Metal Museum can be found on their website at metalmuseum.org



TECH EVENT

Looking Forward: Contemporary Blacksmithing and Metal Design Symposium

June 14-16, 2019 | Bryn Athyn College, Bryn Athyn, PA

The "Looking Forward: Contemporary Blacksmithing and Metal Design Symposium," held in June at Bryn Athyn College just outside of Philadelphia, was a gathering of blacksmiths and metal artists with a shared interest in discussing the future of creative metalwork.1 The event was organized by John Rais, Warren Holzman, and Mike Rossi, three professional metalsmiths based in Philadelphia. In an online post discussing the motivation for the conference, Rossi stated, "We want to talk about what blacksmithing and metal design is in this country, and, looking forward, where it might be headed." The attendees and speakers were mostly professional metalworkers; however, the group represented a range of disciplines, specialties, and generations within the field.

The symposium began on Friday afternoon with a tour of Glencairn Museum and Bryn Athyn Cathedral, both located on the college campus. Afterwards, attendees gathered for a communal dinner and opening remarks from Holzman, followed by the first presentation of the weekend, from Maegan Crowley. Crowley, owner of Iron Maegan Ironworks in Dolores, Colorado, spoke about her career as a blacksmith and designer. She shared with the audience the unwavering courage required to take on projects, even if they were daunting due to scale, complexity, or inexperience. Crowley's talk highlighted the role of perseverance, ingenuity, and a supportive community, which has helped her produce stunning examples of modern metalwork. It was inspiring to hear her talk about the way she approached each project as a chance for discovery and growth.

On Saturday morning, Ana Lopez, a historian, metalworker, and professor at University of North Texas, spoke about the history and uses of Monel, a natural alloy made up of mostly nickel and copper that is chosen by blacksmiths for its beauty and weather-resistant properties. Most of the decorative ironwork at Bryn Athyn Cathedral and the Glencairn Museum was forged from Monel, beginning when the workshops and forge were built on site in 1915.

Lopez was followed by architect and designer Jules Dingle of the Philadelphiabased firm DIGSAU, who spoke about his experience collaborating with Holzman.² Dingle's presentation highlighted the importance of the relationship between the designer and maker in order to plan and execute large-scale building projects. For Dingle, the phrase "distribution of mass," used by Holzman to explain how

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blacksmiths move hot metal when forging, offered a better understanding of the possibilities for the material.

One of the highlights of the weekend was the Saturday afternoon panel discussion moderated by Rossi, with Vivian Beer, Michael Bondi, Rachel David, Andrew Kyte, Dan Neville, Leslie Noell, and Pat Quinn. The three-hour conversation encompassed a variety of topics such as the direction of the field, diversity, the image of the blacksmithing community, and the role attendees play in the future of creative metalwork. Attendees and panelists shared their perspectives and experiences as makers creating an impact through community outreach, education, and the production of beautiful objects.

Responding to the issue of the value of the forging process and questions of its relevance for contemporary blacksmiths, Bondi commented, "The challenge to me is how we remain relevant; how can I take the unique thing of forging and apply it where it is the correct choice." One explanation was the importance of creative design, and the development of sculptural elements that can only be created with the forging process. Stephen Yusko, a metal artist based in Cleveland, asked, "There are so many of us that are making standalone sculpture; how do we cultivate a collector base for those types of pieces?" The development and progression of this culture of making was a central topic of the event. How can we as a community create an environment to continue to develop and grow? Suggested solutions ranged from classes in higher education to personal studio practice.

Beer made a statement, which, in hindsight, echoes a common theme of the symposium: "We can't, in our work or our culture, measure ourselves on what we have done. We have to measure ourselves on what we want to do, what we want to be, what we are about to do. I think that is what to lock into to make contemporary work. That's how to drive a relevant studio practice."3 This sentiment embodied the forward-thinking conversations that took place in the panel discussions and the symposium as a whole. There was camaraderie in these discussions that felt constructive to the development of the community. The conversations on what it means to be a modern blacksmith that originated in the panel continued during the dinner that followed and late into the night.

The symposium concluded on Sunday morning with a presentation by sculptor Hoss Haley, who shared the story of his expansive career as a metal artist: from his early work and training with Tom Joyce, a blacksmith in Santa Fe and recipient of a MacArthur Foundation grant, to his current large-scale public art projects. Haley challenged the audience not to be consumed with the identity of a blacksmith. He posed the question: "Why use blacksmithing techniques when it is not the best method?" He noted that forging is not always called for. Haley's comments raised important questions, which filtered into conversations among attendees, about staying true to oneself as a maker, remaining honest about methods and materials, and finding genuine beauty in the process.



Attendees after the panel discussion. Photo: Nicholas Ireys

Opposite: View of Glencairn and Cairnwood. Courtesy of the Glencairn Museum

Monel door handles on the Glencairn Museum exterior. Photo: Nicholas Ireys



The symposium concluded with closing remarks from Rais. Afterwards I asked him for his thoughts on the event. He stated, "My hope is to build a more consistent and organized form of dialogue and camaraderie to help along our relationships in the field, and bridge new ones." He went on to express his intention to elevate the conversation, to increase thoughtfulness about the work, and to help encourage works that feel contemporary in design and style, but which are also meaningful.

"Looking Forward" was the first symposium of its kind to occur in my under-40 generation. Blacksmithing and large-scale metalwork is difficult in design and execution, and it is a hard way to make a living. This symposium created an environment of support and demonstrated ways that blacksmiths and metalworkers can further our relationships with one another to develop an inclusive future for anyone interested in the field of creative metalwork.

Nicholas Ireys is an emerging artist who recently set up shop in Baltimore after a journeyman experience in Europe and the US.

1 I use the term blacksmith/metal worker throughout this account to represent a group of professional metalworkers who use a variety of skills that are within the realm of metalwork. / 2 www.DIGSAU.com. / 3 Comments made by Vivian Beer during the panel.



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