



N.J.B.A. Newsletter

NJBA Volume 7, Issue 4 2/01/03

Editors Soapbox

Well, we had a hot, dry summer and now a cold winter. I hope you are all trying to stay warm and keep the forge fires burning.

There are a lot of events coming up for us and in our area, so I hope to see you all somewhere this year, if not this Spring.

We still are looking for some items to be donated or to purchase some items for the NJBA trailer which helps make these events such a success.

Larry Brown, Editor

Upcoming Events for 2002

Remember most of our meets have a "Iron in the Hat" drawing, be sure to bring something.

February 23, — Rich Wansor will be demonstrating on **Sunday, Feb. 23, at 10 a.m.** at Dick Gambino's shop in Garwood, Details on page 1.

March 2— Berkshire meet at Greg Phillips in Montgomery, NY. Details on page. 5.

March 15 — Post Vise Stand Workshop at Mike Erdie's, Lawrenceville, NJ, Details pages 3 & 4.

March 29 & 30 — Furnace Town Blacksmith's Guild at Snow Hill, MD. Fred Crist demonstrator and workshop leader. Details on page 6.

April 26 and 27th—Doug Learn has set up a demonstration at the Delaware Valley College A-Day for more information call Doug Learn at (215)-489-1742 <cjfdlearn@mindspring.com>

May 31, June 1—Eastern Regional Blacksmithing Conference "the Age of Iron" at Hancock Shaker Village in MA. More information to follow. Page 7.

June 14— Cold Spring Village in Cape May. Details on page 6.

July 10—13 — Caniron in Hamilton Ontario, for those who want to travel a bit. Details on page 7.

July— Monmouth Fair, to Be Announced

September 6—Pig iron festival at Peters Valley. More info to follow.

September 7— Tool sale and picnic at Red Mill Forge in Clinton NJ. Details to follow.

Feburary Meet At Dick Gambinos Shop in Garwood

Richard Wansor of Massachuttes will be our demonstrator for a meet at Dick Gambinos shop on Sunday, February 23 at 10:00. Rich will be demonstrating various architectural elements. Dick has arranged for a representative from Advanced Cutting Service, a water jet cutting company to attend the meet also.

Rich Wansor bio:

I have been a blacksmith for 17 years. Prior to that as a sculpture major at Parson's School of Design I gained a basic understanding of metals and the methods of working them. After graduating, I became interested in the more traditional methods of working iron and steel. After taking a weekend course on bladesmithing I was hooked. After reading all I could on the subject I built a forge and taught myself the rest. Over the years I worked mostly in living history museums. This gave me the time to explore and experiment with traditional forging techniques while getting A steady paycheck.

Rich Wansor

Directions on page 3:

New Jersey Blacksmiths Newsletter

Rather than use room in the newsletter,
All correspondence between
ABANA and NJBA is now being
posted

The NJBA Web Site!

The NJBA Web Site is up and running at:

<http://njba.abana-chapter.com/>

Bruce's links to the ABANA site;

<http://www.monmouth.com/~freeman/NJBA/abanawebsite.htm>

Tip from the Forge List

I have found www.carpenterdirect.com to be a great source of toolsteel for a little blacksmith shop... no minimum size or bill size. 1-877-893-2100
Brian Hall (From the Forge List)



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Howell, NJ 07731

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Marshall Bienstock, June, 2003

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freemab@pt.fdah.com

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50 Pine St., Lincroft N.J. 7738

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26 Saddle Shop rd., Ringoes N.J. 08551-1510

609-466-0349 antonholdstrom@msn.com

Adam R. Howard, June 2003

c/o HHM, P.O. Box 5005, Clinton NJ 08809

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Josh Kavett, June, 2003

471 Casino Dr., Farmingdale, NJ 07727

732-431-2152, jakavett@aol.com

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4 Patricia Ct., Howell, NJ 07731

732-206-1568, 732-949-8422

drmacauley@att.com, drmacauley@monmouth.com

Jeff Morelli, June 2003

234 Rahilly Road, Wrightstown, NJ 08562

609-723-5990, 732-494-9061x1162

Nate Pettengill, June, 2003

212 Hazel St, 2nd Floor, Rear. Delanco, NJ 08075

856-764-5639, nate.pettengill@lmco.com

Greg Phillips, June 2004,

Acorn Forge, 937 Route 17k, Montgomery, NY 12549

(845) 457-5671, suresign@frontiernet.net

Steven W. Rhoades, June, 2003

513 Harding Highway, Vineland, NJ 08360

856-697-4144, hotiron1@juno.com

Bruce Ringier, June, 2003

346 Rt.565 Wantage, NJ 07641

973-702-8475 wlkngb@yahoo.com

Tim Suter, June, 2004

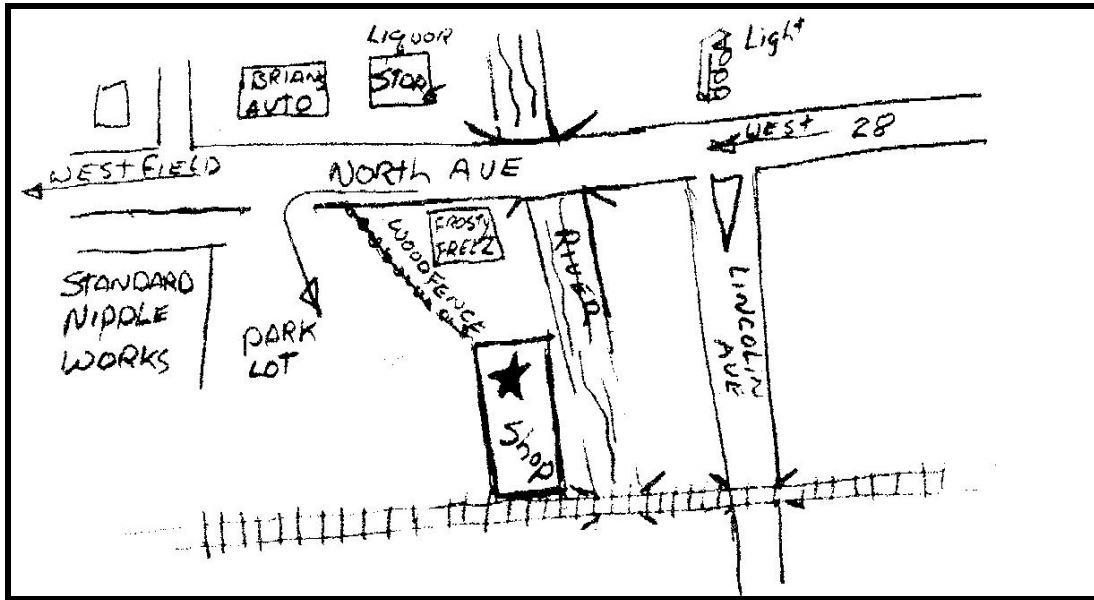
1112 Ladner Ave., Gibbstown, NJ 08027

856-423-4417

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Directions to Gambino Metal Works

Directions: Gambino Metal Works is at 7 North Avenue in Garwood, NJ (Phone# 908-789-8500) Take the Garden State Parkway to exit 137, Cranford. Go right at end of ramp onto Rt. 28 West which later becomes North Avenue. Road dog legs through town of Cranford. Go seven or eight lights. You will then see a Frosty Freeze on the left. Immediately after crossing Lincoln Ave., make a left turn into the drive way of Standard Nipple Works. Gambino Metal Works is behind the Nipple Works and not visible from the street.



NJBA Vise Stand Workshop

For all those who are interested in making a nice vise stand we are holding a vise stand workshop at Mike Erdie's shop on March 15th. This is a good opportunity to take home a nice vise stand for your leg vise. The cost is about \$40 each

Leg Vise Stand

Materials:

CRS 8" C Channel

Steel Tubing 2 1/2" O.D., .150 Thickness

The tubes for the leg of the vise are welded to the legs of the stand (A) The legs of the stand are welded to the table. The critical height of table to tube for leg #1 is determined by your vise leg length. Also a template of the bolt pattern of your vise is needed to drill holes for the mounting of the vise or bring your vise and fit it to the stand. Also an optional tong or hardie holding bar can be

welded on. See Diagram and pictures on next page. If you are interested in making a stand for your self you have to contact Mike as soon as you can to help give him time to obtain the materials for the stands and set up for the workshop. If you just want to come out to help all are welcome to come and join in. Bring your own safety equipment, items for an Iron in the Hat and tailgating.

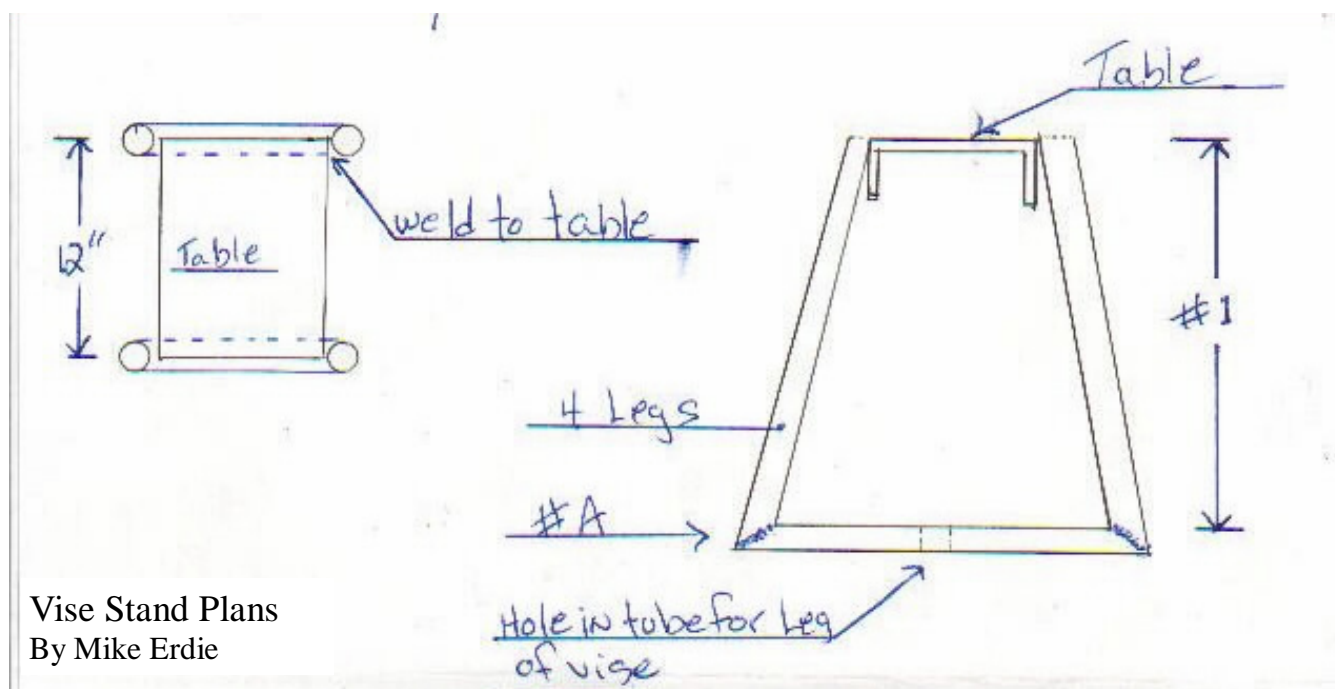
Contact:

Mike Erdie
Hollywood Garage
29 Fairfield Avenue
Lawrenceville, NJ
(609) 882-4686

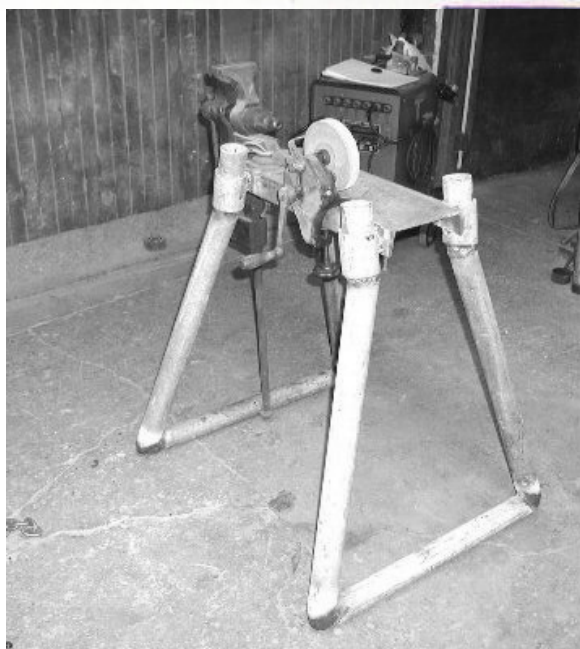
Directions:

I 95 exit 7A Rt. 206 South, go approx. 2 1/2 miles Fairfield is on left (look for orange anvil) Mike's shop is on the left last building on Fairfield.

Diagram and pictures on next page:



Vise Stand Plans
By Mike Erdie



NJBA Holiday Party

Many thanks again to Marshall and Jan for opening their home to us during the Holiday season. We had a quick board meeting during the party, but otherwise we had a nice afternoon of eating and socializing.

ABS New York Knife Expo and Hammer-in

Report by Tom Eden

Late September 2002 marked the return of the American Bladesmith Society (ABS) to New York State. Twenty years and more have passed since the early hammer-ins at the Ashokan campus. Some of

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this year's attending Mastersmiths were there back then and recalled those other times.

This year's event was held at the Camp Scho-dack retreat near small-town Nassau in upstate New York. The New Jersey Blacksmith Association had a big assisting presence with the demonstration trailer, dubbed the "Forge Wagon" by ABS Chairman Jim Batson. We provided the forges, anvils, and the necessary accouterments for the outdoor forging demos that went on all weekend. Participants, green and seasoned, were able to try forging. Every two hours a Mastersmith would rotate in to show technique and give insight and advice on the art of the forged blade. Some of the most highly rated Master bladesmiths in the world hammered on NJBA anvils!

Other seminars were held concurrently throughout the days. These included damascus patterns, mosaics, powder metals, heat treating, blade geometry, folders, grinding, finishing, cutting, and more. I heard "That class alone was worth the price of admission!" more than a few times during the weekend. Friday night had the "Cutting Contest" which was a real fun event. The contestants have to chop and slice their way through two-by-fours, rope, T-shirts, soda cans (unopened), drinking straws, paper, and other challenging stuff, all while smiling! Yours truly managed to tie for second place (yes, there were more than three of us).

Saturday afternoon had the Knife Show and other demos open to the public. Rob Hudson made one of his trademark goat's head letter openers for the audience. Evening had the Auction with Col. Tim Ryan presiding. He did a super job for the fund-raiser. You really should see him in action, great entertainment!

These hammer-ins are a great way to learn and enhance your craft. The camaraderie and spirit is inspiring. This event is likely to be held next year, maybe closer to home.

The ABS smiths, many are part of the ABANA brotherhood, showed much admiration and thanks to the NJBA for the support provided. I was glad to have a part in this and to represent the NJBA.

Thank you,
Tom Eden

Tom,

I would like to thank you and the NJ Blacksmiths for the support at the NY Expo. The Green Coal was the most attended and successful part of the NY Expo. Your forge wagon and tent set up impressed everyone. Hope we can do again. Thanks again.

James Batson, Chairman of the ABS Board

Berkshire meet at Greg Phillips Shop in Montgomery, NY

The Berkshire Blacksmithing group will be having a meet at Greg Phillips shop in Montgomery, NY on March 2nd. The demonstrators will be Meagan Crowley and Susan Madacsi. Tailgating, Iron in the hat and an open table for displaying work and portfolios will be available.

Greg Phillips, (845) 457-5671,
Acorn Forge, 937 Route 17k,
Montgomery, NY 12549
gphillips@hvc.rr.com

Directions to Greg Phillips Shop

From NJ: Take the Garden State Parkway north into New York State. Pick up the NYS Thruway (Route 87), and take it north to exit 17 (Newburgh- Stewart Airport) after exiting and the toll booth DO NOT bear right onto Route 84, continue straight to traffic light at Route 17k. Turn right (west) onto Route 17k proceed about 9 mi to 937 Rt. 17k (Greg's house) it will be on the left, there is a sign in front of the house "A Sure Sign". The building behind the house has the second floor painted with rainbow colors. (For anyone that has been to the Orange County Farmers Museum the house is less than a mile past the sign for the museum.)

Furnace town

Blacksmith Guild

March 29 & 30, 2002

Demonstrator and Workshop Leader Fred Crist will be at the Furnace Town Foundation site, Snow Hill, MD. Fred Crist worked at the Yellin shop for eleven years. While working in the Yellin studio, he is attributed with rediscovering many of the processes and techniques that were developed by Samuel Yellin.

Fred Crist's demonstration in the morning on Saturday the 29th will focus on the forging techniques used by Samuel Yellin and his great collection of smiths. Fred will demonstrate how to forge a variety of different pieces using a number of Yellin techniques.

In the afternoon Fred will forge a grille that Samuel Yellin made for the Metropolitan Museum, which was filmed when Yellin made this framed scroll in 1924. Fred will lead the workshop on Sunday which will have each participant forge their own interpretation (or copy) of the processes demonstrated on Saturday. The workshop will be limited to 12 people who will come from these supporting chapters: Blacksmith's Guild of the Potomac, Central Maryland Guild, Mid-Atlantic Smiths Association, New Jersey Blacksmith Association, and Pennsylvania Artist Blacksmith Association.

The cost for the Saturday demonstration day is \$20.00 if your registration is received by 28 February 2003; it is \$25.00 if your registration is received after the 28th.

The demonstration day includes: coffee and doughnuts in the morning, all-day demo, and lunch. Iron in the Hat (please bring a iron goodie). We will have a table of Norm Larson's books for order/sale. Representatives of Keen Welding will be demonstrating. Tailgate sales are most welcome and encouraged.

The Saturday dinner costs an additional \$17.00. Reservation for this supper must be made no later than 19 March 2002 as the caterer requires an accurate head count. The supper will be served buffet style starting at 6 pm. The evening program to be announced.

The Sunday workshop will cost \$25, which includes materials and lunch. Each of the supporting groups: BGCM, BGOP, FTBG, MASA, NJBA, and PABA have 2 slots in the workshop. Because of the limited number (12) in this workshop, those interested should contact Ray Noble as soon as possible. After the list for Sunday workshop is filled, a waiting list will be formed to fill vacant positions if they occur.

Send registration form and check to:

Mark Williams, 114 West Federal Street, Snow Hill, MD 21863

(H)410-632-0914, (W)410-651-6431

<mewilliams@mail.umes.edu>

Make checks out to Furnace Town Blacksmith's Guild. Contact Ray Noble for the Sunday Yellin Workshop: Ray Noble, 27840 Oriole Road, Princess Anne, MD 21853. (H)410-651-0987, (W)800-220-3015 <nobler511@aol.com>

Call or e-mail Ray as soon as possible so that the workshop list can be completed.

Historic Cold Spring Village

Historic Cold Spring Village will be having two events this year that include blacksmithing. May 24-25 & June 14-15, 2003. The first show is a new one for 2000, it is known as "All Hands-on Crafts" and teaches the public "How to lessons" by allowing the visitor to assist with the craft making. If possible, having someone from NJBA interpret your craft would be more than appropriate.

The second event is the good old stand-by "Tractor, Trucks and Trades." Please call for more information or email.

Sincerely, Shirley Stefanovicz, Special Events

Coordinator. 609.898.2300

shirleys@hcsv.org

NJBA will officially participate in the second event on June 14-15. This is our normal event and demonstration, the main part of which is on Saturday the 14th, with all who want to demonstrate Sunday coming back to finish the weekend. All those who want to come down to help Jerry in the shop during the first event may do so. Contact David Macauley.

CanIron IV

Announcing CanIRON IV

"Come Share Our Fire"

July 10-13 2003

McMaster University

Hamilton, Ontario, Canada

Featured Demonstrators: Elizabeth Brim, Cairn Cunnane, Lloyd Johnston, Scott Lankton, Doug Newell, Charles Orlando, Eddie Payne, Dean Piesner, Jim Wallace, Doug Wilson.

Several forge areas in continuous operation, Juried and Open galleries of fine Ironwork, Trade Show, Tailgate Area all situated on the McMaster University Campus. Accommodations, Demo sites and other venues are all within five minute walking distance. Family programs will be available.

Demonstrations will be open to registrants only, however the Trade Show, Vendors Area Galleries and Lectures will be open to the general public. There will be extensive media promotion of the public portion of the conference as we are making a serious attempt to get blacksmithing in the public eye. This will be an excellent opportunity for your work to be seen outside the blacksmithing community. For information on exhibiting in either gallery please send a #10 self-addressed stamped envelope (Canadian or US postage) to:
CANIRON IV, CanIron Gallery Curator, RR #1, 1484 Regional Road 17, Cayuga, Ontario, N0A 1E0

We are seeking donations for Iron-in-the-Hat and the Auction. Please send your donation to :

CANIRON IV, Auction Co-ordinator, RR #1, 1484 Regional Road 17, Cayuga, Ontario, N0A 1E0

Please indicate if you wish your item to be place in the auction or in Iron-in-the-Hat.

Registration and accommodation fees are being finalized at this time. To receive a registration brochure please send a #10 self-addressed stamped envelope (Canadian or US postage) to:

CANIRON IV, Registration Secretary, RR #1, 1484 Regional Road 17, Cayuga, Ontario, N0A 1E0

If you are interested in volunteering at CanIRON IV (sorry, no discounts on registrations or accommodations) please contact our volunteer co-ordinator Wolfgang Bleckert. You can e-mail Wolfgang at bleckertk@golden.net.

Ontario Artist Blacksmith Association

www.caniron.com

Eastern Regional Blacksmithing Conference

Eastern Regional Blacksmithing Conference "the Age of Iron" at Hancock Shaker Village in MA on Sat/Sun May 31-June 1.

Sponsored by:

Berkshire Blacksmiths

Connecticut Blacksmiths Guild

Northeast Blacksmiths

New England Blacksmiths

No further information at this time, more will follow in the next newsletter

Apprentice Standards

The following standards were developed by the APPALACHIAN BLACKSMITHS ASSOCIATION and registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

SKILLS EXPECTED OF AN APPRENTICE

1. Drawing out: Draw out a bar to a point or dress an edge or point tool.
2. Upsetting: Upset to at least 1 1/12 times the diameter or width of a bar on the end and in the middle.
3. Bending: Make a ring out of bar stock or flat stock; forge a square corner right angle bend in square stock.
4. Punching, slitting and decorative punch work: Show an example of decorative punch work; punch a hole in a bar the same

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size as the width of the bar.

5. Drifting: Make a drift and use it to smooth, shape or enlarge a hole.

6. Mortise and tenon: Make an assembly from at least two separate pieces using this technique.

7. Collaring: Make an assembly from at least two separate pieces using this technique.

8. Scroll work:

Make two different types of scrolls.

9. Splitting: Split a bar with a hot cut in the middle or at the end of the bar.

10. Fullering, grooving, veining, set hammering:

Show examples of each or if used as an intermediate technique, describe how and why the techniques are used.

11. Riveting: Make two assemblies from at least two separate pieces for each assembly using hot riveting and cold riveting (pop riveting not acceptable).

12. Forge welding:

Show at least three different techniques.

13. Arc welding, brazing, soldering, oxyacetylene torch welding: Show an example of each.

14. Hot rasping, filing: Hot rasp the torch cut end of a bar to reasonable straightness and evenness; show a workpiece which has been filed to a smooth, flat surface; describe the types, care, and use of files.

15. Sinking, raising, metal spinning: Make or show a hemispherical or hollow object made from flat sheet using any one technique.

16. Grinding: Know how to use a body grinder (portable grinder), pedestal grinder, belt grinder, sharpening stones and abrasive papers; know the types of abrasive and how they are graded and classified; show an edge tool that you have sharpened.

17., Drilling, tapping, diework and threads:

Drill and tap a hole; thread the end of a bar with a die; know the common thread classifications; know the common drill size classifications and the care and use of twist drills.

18. Heat treating, hardening, tempering annealing, case hardening: Know how to properly anneal, harden and temper carbon tool steel; know how to case harden mild steel; know the colors for tempering; make or show a tool you have made that has

been heat treated that will cut or forge mild steel without breaking or deformation on the working end.

19. Heading: Head two bolts, one square headed and one hex headed; head a nail; head a rivet.

20. Cutting and shearing: Know how to use the hot cut, cold cut, hacksaw, tinsnips, or bench or floor shear; know how to use the oxyacetylene torch for cutting - demonstrate each technique.

21. Swaging: Swage a tenon or make the end of a square bar round using a swage.

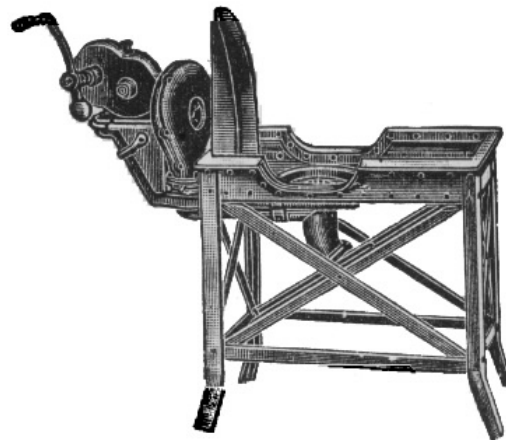
22. Twisting: Show two different twists in square bar.

23. Shop safety: Know first aid techniques for cuts, burns, abrasion and other shop related injuries; describe methods of hearing, sight and body protection and why they are necessary; know power tool and machinery safety including welding equipment safety.

25. Basic metallurgy: Know the properties and use of wrought iron, mild steel, carbon and tool steels and their classifications, cast iron, brass, copper, aluminum; know sheet and plate gauging for ferrous and non-ferrous metals.

26. Fire and fuel: Know the constituents of good shop coal; know the different types of coal fires and fire maintenance.

27. Jigs and dies: Make both a jig and a die for doing repetitive production work and show examples of work produced in them.



Blacksmithing

Workshops and Classes:

Peters Valley Craft Education Center

19 Kuhn Rd., Layton, NJ 07851 (973)948-5200
pv@warwick.net www.pvcrafts.org

Academy of Traditional Arts

Carroll County Farm Museum

500 South Center St. Westminster, MD 21157
(410)848-7775 (410)876-2667

Touchstone Center for Crafts

R.D.#1, Box 60, Farmington, PA 15437
(724)329-1370 Fax: (724)329-1371

John C Campbell Folk School

One Folk School Rd.
Brasstown, NC 28902
1-800-365-5724 www.folkschool.com

The Blacksmith of Trenton

Alex Parubchenko occasionally gives classes at his shop in Trenton. Please contact Alex or John Chobrda at the shop, Phone # (609) 396-9583.

Red Mill Forge

Contact Adam Howard about workshops and per diem use of the shop (908)735-4573

Coal

Coal is now available through Alex Parubchenko at his shop in Trenton. Please contact Alex or John Chobrda at the shop, Phone # (609) 396-9583.

Open Forges

We want to encourage
all to join us at:

Monday Night Open Forge in N.J.

Marshall Bienstock is hosting an open forge in his shop at 7 pm almost every Monday night (Please call ahead on holidays to make sure , (732)780-0871)

Business Members

We would like to thank those who joined with our new Business Membership category
Please show them our support

Ginty's Welding Service, Inc

2 Lee Mack Ave., Danbury, Conn, 06810

Timothy Miller, Artist Blacksmith,
Bayport, Long Island, NY (631)419-1185

Marshall Bienstock

663 Casino Dr., Howell, NJ 07731
(732) 938- 6577, (732) 780-0871

Lincoln Wolfe

11 Overlook Terrace, Bloomfield, NJ 7003
(973) 338-3913

John Chobrda

Pine Barrens Forge
231 Morrison Ave., Hightstown NJ 08520
609-443-3106 609-396-9583

BLACKSMITH TOOLS FOR SALE!

John Chobrda at the
Trenton Blacksmith Shop

Has a large selection of tools for sale.

Anvils – Forges - Leg Vices

Blowers – Tongs – Hammers

Will also repair and/or resurface Anvils

Call John for prices and availability

Daytime (609) 396-9583

Evening (609) 443-3106

Wanted: Donations for the NJBA Trailer

We need hand tools, files,

Tongs (Old, new and repairable),

Safety Glasses and assorted rivets.

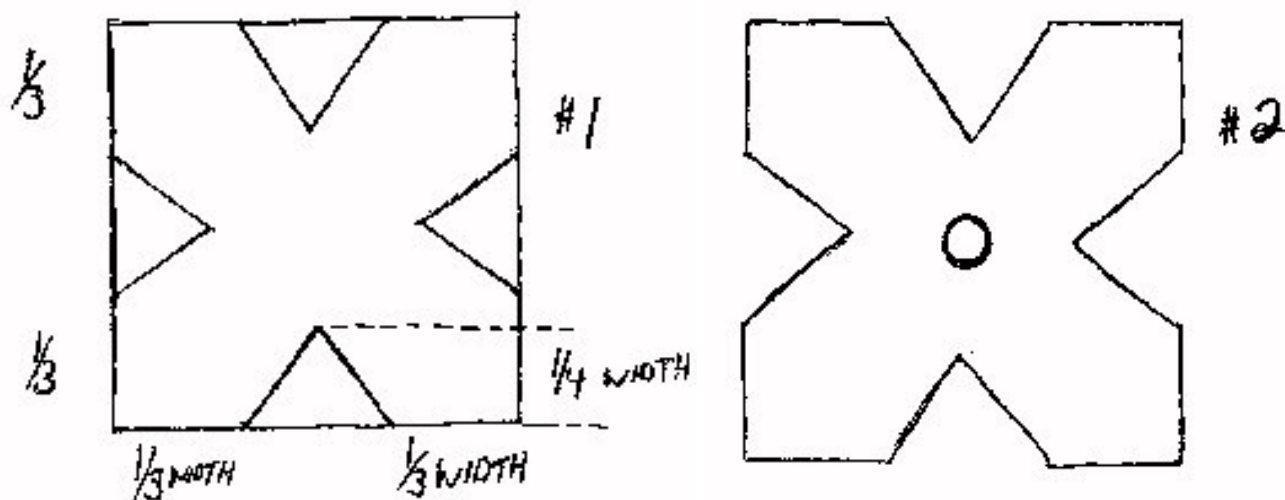
Look around and see what you
have to donate.

Contact: Dave Macauley, Directors list, Page 2

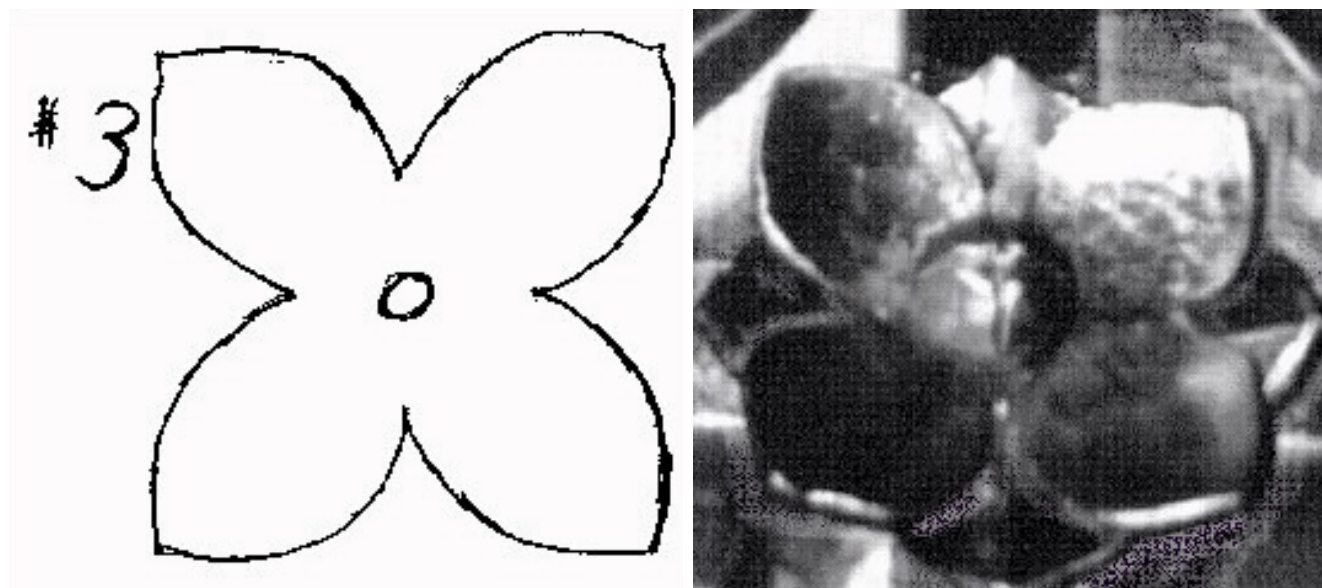
A Simple Floral Motif

By Chris Waters of the South Alberta Chapter,
Western Canadian Blacksmith Guild

Start with TWO pieces of 18 gauge mild steel squares, 3 inch by 3 inch, or size to suit. Layout as per diagram #1



Hot cut, hack saw, or other wise remove waste. Drill mounting hole on center. Forge out each petal using a rounding hammer or one with a good convex face. Take your time and shape each petal to produce nicely rounded edges; a little file work may be needed.



Slightly dishing the petal will give it more life. Descal and finish before placing the two pieces together. They are put together at 45 degrees to each other. Use a forged rivet or lag bolt. I find a ball head rivet looks good. Use for grill work, wood work accents or what ever. Enjoy, have fun

Making Chisels from S-1 Tool Steel by Armand Bussell

from a Class -- European Traditions in America by George Dixon (photos by the author)

From The Appalachian Area Chapter Blacksmiths

George Dixon was head blacksmith at the Samuel Yellin studio when it closed in 1991. He was the instructor at a class last February at J. C. Campbell Folk School, Brasstown, N.C., that I attended with the aid of a scholarship from the Appalachian Area Chapter blacksmith group. George is a very accomplished artist blacksmith and a good instructor who believes in sharing his knowledge in the art of blacksmithing. He is a former editor of "**Hammer's Blow**" and started the on-line forum "**theforge**" for ABANA.

Today he writes, illustrates, and edits a quarterly publication called the "Traditional Metalsmith" (www.traditionalmetalsmith.com), which is an excellent how-to 14-16 page quarterly publication detailing reposes' (to work or push from behind), chasing (working front side of plate steel), slitting, texturing, and other traditional metalworking techniques.

Some of the techniques George touched on in the class were; texturing sheet or plate steel with scale, forging decorative rivets or small knobs, and making hot and cold forming chisels from his favorite tool steel, S-1. Here are some of the rivets we made using his tools and methods.

George went into detail on how to forge, heat



2 9:26 AM

treat, grind and use the various chisels we made from S-1. In this article I will give a summary of making chisels from S-1, which, by the way, is an excellent shock resistant tool steel used in the making of striking tools. This was the first time I had worked with S-1 and found it a good material for these striking tools. George supplied the S-1 used in this class. At the end of this article you will find a listing of firms selling tool steels if you want to try out some S-1.

George likes to make chisels from 3.5 to 4 inches long so one can use them under a treadle hammer, which he used almost exclusively for reposes' and chasing.

To start let's make a pair of butchers from S-1 tool steel. Butchers are a blunt, sloped edge tool, justified to one side for working out lines and radii to raise a subject and give a 3-D effect.

Butchers are generally made in pairs with the



edge being 1/8 to 3/16 inch in width. The sharper one, on the left in the picture above, is used to establish a line and then the more blunt one is used to push more material away from the line to give more

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relief to the subject – thus more 3-D effect.

To make these in S-1 start with some half inch dia. material. S-1 is a chromium-tungsten tool steel that provides excellent service in both hot and cold work shock applications. This steel exhibits both good wear resistance and hot hardness value. It is made with 1.0 to 1.8 percent chrome and 1.5 to 3.0 percent tungsten along with up to 1.2 percent silicon, 0.5 percent moly and up to 0.3 percent vanadium. The actual values will depend on the proprietary mix of the supplier but all should work well for our chisels. One limitation of S-1 is short forging temperature range.

You don't want to forge above 2000 F – (light yellow), and want to stop forging at 1600 F – (dark orange). If you go above the light yellow into the white range the material will break up on you, called going "hot short" and below the dark orange you are simply beating yourself to death on a material with high hot hardness.

Start by heating the 1/2 inch round stock slowly in the forge. If a crack develops lengthwise it is because you heated it too fast. Bring it up to the light yellow heat and forge quickly into the desired shape. Use as few heats as possible. I believe one should do all the detail possible in the forging process and only finish grind for touch up. This may be left up to the individual smith since as you increase forging ability you will forge more and grind less.

After completing the forging process you should anneal the piece before doing the heat treatment. This removes stresses left in the tool from the forging and decreases problems with cracking during heat treatment. Heat the tool to about 1400 F – (bright cherry) and then cool very slowly by placing in vermiculite, or lime, or wood ashes or laying the piece beside the fire in the forge.

Now we are ready to heat treat but for this we need a brine solution for a quench. This same type of quench also works well for W-1 type of tool steel.

Why use a brine quench? It does two things, it helps prevent scaling of the surface of the tool and helps prevent the formation of a stable steam layer at the surface that acts as a good insulator and prevents a rapid even quench.

To make your quench solution add two cardboard cans (26 oz.) of table salt to 5 gallons of water. That is about 3 - 1/4 pounds of salt to 5 gallons. You can use rock salt too, and have it right if not all of the salt dissolves. Keep your mix in a closed 5-gallon container and stir before each use.

To do the heat treat -- heat slowly to a little above the non-magnetic point – for S-1 we want to get in the range of 1725 F (orange but not yet lemon). Heat your tool with the point out of the fire so as to not over heat the tip. Now quench in the brine water solution. Hold your piece vertical as you enter the brine water solution and move it rapidly up and down and around in the brine. Quench the whole shank of the tool if to be used under treadle hammer or with a striker.

Now grind and polish after final heat treat. Try tools without tempering or temper as desired. A low tempering temperature of 300 to 350 F will work well for cold use only – or if like most of us you want to use the tool for both hot and cold work you will draw the temper to at least this range the first time you use the tool on hot material.

We also made some schneckers; the word is from the Czech for claw or fingernail. Schneckers have a blade justified to one side with a slight hollow or radius for outlining radius cuts. You can never have too many of these if you want to handle a wide range of radius. Some that we made are shown in the following picture.

We also made slitters for slitting holes and these are basically a chisel with rounded corner for slitting and / or enlarging holes. Here are some of the slitters I made.

Note the rounded corners with the slitting edge continued around the corner. This means that you



cut not just on the bottom of the chisel but with the side too. It also makes it much easier to start your cut since all of the force is directed over a smaller area at the center of the tool.

There are many other tool shapes you can make and as with the chisels and schneckers shown above you



can forge them in a range of graduated sizes. Here is another view of the slitters with some of the other shapes I made.

Another thing George showed us was how to texture sheet steel – 1/16 to 1/4 inch thick using scale. Slowly heat up the steel on top of the fire until scale has formed on the top-side. To get pronounced texture, lightly hammer in the scale. The scale is harder than the hot metal and will emboss from the scale. Repeat this step 2 or 3 times to get the texture you

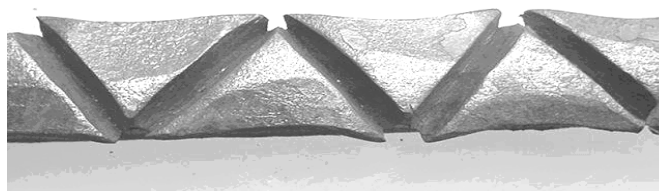


desire. Texture before cutting or working the material.

Here is a small sample of some of the effects I got using the S-1 tooling we made.

I would like to thank the Appalachian Area Blacksmith organization for providing scholarships to interested individuals for the advancement of education in the area of blacksmithing, without which some of us may not be able to expand our knowledge and education in this field.

Also, a big THANKS to all the hard working people who make this organization work.



I will be glad to answer any questions (or attempt to), about the subject material covered in this class, and I can be reached at 931-526-2101 or cell phone at 931-260-4433.

Tool Steel Suppliers

The following listing of tool steel suppliers is from ABANA's web site suppliers list put together by Dr. Mark Williams. Expect to pay \$4 to \$5 per pound for tool steel plus shipping costs. You could also make the tools shown in Armand's article from W-1 (water hardening drill rod) and 5160 spring steel. With the W-1 you should also use brine water solution for quenching. (*Dave Snider*, editor)

Burgon Tool Steel Co. - Hampton, New Hampshire
Burgon Tool Steel Co. Tide Mill Road Box 1510
Hampton, NH 03842 800-582-7223 (in NH) 800-258-7106 (elsewhere) 603-926-5704 fax 603-926-4994 A good source for small quantities of tool steel. They usually have the material and size you need in stock. Unusual orders are normally processed within 10 days. Contact Art Putnam. The sales people are quite knowledgeable about all the metals they handle. They have metallurgists that can be consulted in difficult problems. Burgon has produced a nice little book entitled "Burgon Tool and Die Manual" (FREE). It's probably one of the best practical guides for selecting tool steels and heat-treating them.

Crucible - Camillus, New York
Crucible 5639 West Genesee Street P.O. Box 991 Camillus, NY 13031-0991 800-365-1185 315-487-4028 fax 315-487-0800 outside North America <http://www.crucibleservice.com/> crucible@crucibleservice.com Complete listing tool steels. Service centers located worldwide.

Latrobe Steel Company - Latrobe, Pennsylvania
Latrobe Steel Company Latrobe, PA 15650 412-537-7711 Make a variety of tool steels. Especially of interest to smiths is their type MGR (AISI A8) shock resisting die steel. The hardness vs. temperature tempering curve is dead flat at 57Rc from 600F through 900F, and is above 55Rc at 1000F. It is a very nice hot working steel.

Linguist Steels, Inc. Linguist Steels, Inc. Stratford, CT 800-243-9637S. Plainfield, NJ 800-526-7589 W.

Columbia, SC 800-845-7052 Knoxville, TN 800-543-6258 Tool Steel Specialists. Very knowledgeable and willing to give advice. The service is efficient and personal. They go out of their way to please.

MBM Sales - Wisconsin MBM Sales Wisconsin 608-657-0721 Tool steels at good prices. They will ship UPS. Ask for Dale Steger.

Metal Supermarkets - Chicago and Atlanta Locations
Metal Supermarkets Chicago location: 1675 Tonne Road Elk Grove, IL 60007 1-888-metal01 Atlanta location: 184 Selig Drive Atlanta, GA 30336 1-888-metalnu Metal suppliers with no minimum. They have many shapes of aluminum, stainless, brass, copper, carbon steel, tool steel, bearing bronze, alloy bar. Their prices are very good.

Supplier of many metals, both ferrous and non-ferrous, including carbon, alloy, & tool steels, stainless steel, copper, brass & bronze, nickel & cobalt alloys, aluminum, titanium, and magnesium alloys in a variety of forms. Also is an on-line source for information about metals.

Teledyne Allvac - Monroe, NC Teledyne Allvac P.O. Box 5030 Monroe, NC 22810 800-537-5551 Complete listing tool steels.

Foundations!

A Resource for Beginners.

by Bud Oggier

the Anvil's Ring/ Summer 1988 Part 10

"Hi, Jean, glad to have you back. Today I'd like to teach you how to weld in the forge. It's a very useful skill and is quite important to a blacksmith.

Jean, in order to weld successfully you must have two things: clean pieces to weld, and the proper temperature. If you have these elements your welding should be successful, regardless of what steels you want to weld.

In order to have clean pieces you must have a clean deep fire. This means no clinker and a good deep supply of coke. The fire needs to be deep and of good body in order to bring the pieces to heat rapidly and not produce excessive scale. In order to remove what scale is formed out of the weld, we'll use a flux. It does two things: coats the piece with a ceramic coating that keeps oxygen from reaching the weld area (thus reducing scale formation), and reduces the melting point of the scale that is formed so it can flow out as the weld is made. There are many fluxes that can be used, certain sands, borax, and several commercial compounds.

I normally use borax, the kind you buy in the laundry section of the supermarket, but you must be sure it is only borax and contains no detergent. Some smiths like anhydrous borax, which is the same thing as regular borax with the moisture removed and the price increased ten times. If you feel you must have anhydrous borax, take some laundry borax, melt it in a ladle, pour it out on a thin sheet, and when it is cool, break it up and grind it to powder in a mortar and pestle. The only difference I've noticed between the two is that laundry borax foams up when it gets hot and the moisture boils off before it melts and covers the piece, but it works fine for me.

I have never been very successful using sand, maybe because I don't know how to recognize the ones that work well. Commercial fluxes all work well, but are more expensive.

In order to provide enough stock so that the weld can be finished down to the original size, the pieces generally need to be upset some. If you don't provide this "additional" stock the weld will end up being thinner than the original pieces. Usually one other thing that will need to be done is to scarf the ends of each piece where they will join.

Well, Jean, let's begin. We'll weld two pieces of 1/2" square using the most common type of weld. In this type of weld, two similar sized pieces are joined together to form one continuous piece. Done properly, the weld will not show in the finished piece.

First we'll need to prepare the ends of the pieces for scarfing by upsetting them. Still remember how to do that? I'll start by upsetting the ends of my pieces for a distance of about 5/8". OK, here we go get a short heat and upset. I'm trying to keep the upset in the last inch of my piece. There one more heat should do it. While my piece is cooling, why don't you upset one of yours? That looks pretty good, Jean, just keep the upset short don't let yours get too long. Now do the other piece the same way. Good, Jean. Normally I would have put the scarf on as soon as the upset was made. However, if we were making a ring and went ahead and scarfed one end, we couldn't then upset the other end easily without destroying the first scarf.

Now to make the scarf itself. From the side the scarf looks something like an "S" and is not as long as the upset. To do this, put about 3/8" — 1/2" of the piece on the edge of the anvil where the radius is. Then hit the piece with your hammer, hitting half on and half off the anvil. This will drive the edge of the anvil into the piece and produce a step. When the step is about 3/16" — 1/4" from the top surface of the stock, drop your left hand down (for those who are right-handed) and taper the end to a thin edge. Then dress up the sides back to the upset size and taper the end so it is a little narrower. OK, here we go. I place the piece on the anvil about 3/8" from the edge,

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hit the piece with the hammer, half on and half off the anvil, and drive it down. There, that's far enough; now drop my left hand and forge the end to a fine taper, dress the sides and it's done.

Now your turn good, Jean. If you had left a thick end or lip it would show in your finished weld; this way it will virtually disappear. Now we'll do the same to the other piece — OK, let's take a look. If the scarfs are made properly they will mate together. See, they do; that's good or we would have had to adjust them.

Well, I guess we're ready to weld. We'll heat the pieces to a good red heat and put on the flux. While they are heating, notice that the fire is deep, no hollow and no green coal, all good coke. I keep my borax in this wooden box; I'll put it on the edge of the forge now, bring out the first piece and sprinkle on some flux. Cover all four sides with flux, putting it on a little at a time until the piece looks wet all over. Did you notice the borax foamed up before it melted? Now it looks ready; do the same to the other piece, then bring both up to a welding heat.

When the pieces get hot enough the next several steps will happen rapidly. I'll hold one piece in my left hand with the scarf down, the other in my right with the scarf up, and tap them together to knock off any coke or loose dirt. Then I'll go to the anvil, lay the piece in my right hand down on the anvil, reach around and put the piece in my left hand on the edge of the anvil bringing it down so it matches the other scarf, and hold it in place.

Notice my hammer is sitting on the stump next to the anvil where it is handy. I'll pick up the hammer and hit both pieces in the middle of the weld; the second blow should be directly above the bottom lip, and the third on the top lip. This sequence is quite important. The first blow sticks them together, the second welds the bottom lip that is rapidly losing heat to the anvil, the third welds the top tightly. After these three blows, the sequence of the following ones doesn't matter much.

Now, how do we know when the pieces are hot enough to weld? The best trick I know for someone

trying to learn to weld is to take a piece of 1/4" round rod and forge one end out into a very sharp taper, getting it as thin as you can. While the pieces are heating up, push the tapered end of the rod firmly against one of the pieces. Do this several times and when it finally sticks, the pieces are ready to weld. If you pay attention to the color of the pieces when you bring them out of the fire, you'll soon be able to tell by looking when you have reached a welding heat. While heating your pieces, don't blow the fire too hard give the heat a chance to soak all the way through. Adding a little extra blast at the end of the heat will help.

Here, Jean, take this weld feeler and test these pieces that are heating. Does it stick? No? OK, needs more heat. Is it sticking now? OK, here we go, pieces on the anvil, hit in the middle, then over the bottom lip, then the top. Now to forge it down to size. Work all sides a little at a time. For this size stock, heavy blows are not needed. Just be sure you hit hard enough to make the pieces conform to one another.

Before I finish this to size I want to take a look and be sure the weld is closed all over. See this place right here? There is a small gap, so I'll flux again. Note where the gap is? I'll take another welding heat and close it up. There, this time everything looks fine. There's nothing wrong with taking a second heat to insure a good sound weld.

OK, Jean, your turn. Any questions about what to do when your piece comes out of the fire? Good, it takes a lot more time to tell about than it does to do it.

You'd better take the weld feeler and cold forge its end flat again. The reason it works is that the end is so thin it assumes the temperature of the piece almost immediately. Is your piece ready yet? Not quite? OK, a little more. Remember, right hand scarf up, left hand scarf down. OK? Go, that's good, now hit the middle, now the bottom lip, now the top. OK, forge it down some. Fine, let's take a look. Well, Jean, it looks to me like you've made your first weld. Congratulations!

Some smiths make a big deal of this the phase of moon has to be just right, the wind in the right direction, weather not too cloudy, etc. But it's not a reli-

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gious experience, just a very useful technique for the smith. Just remember, a clean piece and correct temperature, and all goes well.

One more thing as the carbon content in a steel goes up, the melting temperature goes down, and consequently, the welding temperature. So if we were welding two files, the proper welding temperature would be quite a bit less than with this mild steel. Sometimes you will have to weld a high carbon piece to a mild steel piece. In this case, the mild steel will be at the low side of its welding range, and the high carbon on the high side. You have to make the best compromise you can. You may want to weld a high carbon piece to a mild piece in projects such as a tomahawk blade or plane iron.

OK, Jean, now let's make a welded ring out of the same size stock. To determine how much stock it takes to make a ring of a given size, add one thickness of the metal to the desired inside round of the finished ring, then multiply that figure by 3.14. If the ring is to be welded, multiply the thickness of your stock by 2 and add this to the last figure. This will then be the finished length. So, let's make a 4" ID ring out of 1/2" square stock. Four inches plus 1/2" equals 4 1/2", times 3.14 equals 14 1/8", plus two thicknesses for the weld, equals 15 1/8".

Let's cut the stock and see how we make out. First, we have to scarf and upset. I'll start, then your turn. Upset the same as before, one end then the other. Next scarf one end, then the other—the scarfs must be on opposite sides of the stock so when the ring is formed they will mate together.

OK, here we go. I'll upset this end to about 5/8" square and 1" long, then I'll do the same to the other end. Now to make the first scarf, then the other one—one up, one down. There, that looks OK. Your turn. Keep your heats short, Jean (about 1") or you'll just have a lot more forging to do. Looks good; now the other end. Don't be afraid to get the steel to a good yellow for the upset the added heat won't hurt this mild steel, and it upsets much faster. Now for the scarfs. Be sure they will mate. OK, good.

Now to form the ring. To do this, form each end into a little less than half a circle, and be sure the bend starts from the very end or you'll have trouble matching the scarfs.

Here I go — I want to make the bends so that the weld will be made on the flat sides, not the rounded sides, because for me it is easier to finish up. Estimate the spot where the anvil horn is about 4" thick, and bend the piece around there. OK, that end looks fine, now for the other end. There, see, the bend starts right at the end, so the scarfs ought to match up well.

Now your turn. It's going well, Jean, just a little more bend and you're there. Good, now to finish the ring. Heat up the center portion, hold it there with these tongs, stand it on end, and gently tap the two sides towards one another. Stop a minute to make sure the scarfs will pass each other on the right side, then close it up. Now that the scarfs match, put the ring on the horn and make the tips of the scarfs conform to the ring. There, that looks pretty good. Now go ahead and do yours.

Well, looks like we're ready to weld, but first want to check and be sure there is no clinker in the bottom of the fire. See, Jean, I fished up a small clinker. The reason it is important to get the clinker out is that in a fire that will produce a welding heat, it will tend to melt the clinker and the blast will carry it up into the heart of the fire. If it gets on the surfaces you are trying to weld, you'll have trouble.

OK, we'll weld the same as the last time, but we'll have to finish up the inside and the outside over the horn. I'll put the piece in the fire vertically with the scarfs at the bottom. While it's heating I'll forge out the edge of the weld feeler. The piece is a good red now so I'll coat all four sides with the flux. Always try to get some in between the scarfs and pay particular attention to getting flux under the lips.

There, it looks nice and wet, so back it goes into the fire for a welding heat. Now to feel the piece — ah, the feeler sticks, so onto the anvil, hitting first the middle, then over the bottom lip, now the top lip,

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now over the horn, and closing up the seam between the two scarfs. Now I'll forge the weld area back to its original size, some on the horn and the flats on the anvil face. There, that looks pretty good.

Your turn. Good, Jean, I think you have a good weld. OK, just be careful when you forge down not to get below the original size. Don't be too concerned if your ring gets knocked out of round, we'll straighten it out after it is back to the desired thickness.

Now to round it up. It can be done either on the horn, or more easily over my cone mandrel. Let's use the cone. In order to round up the ring we have to get it hot all over, so, into the fire. I'll have to turn it around as it heats to get the heat evenly distributed through the piece.

When I use the cone I use a hammer in each hand and hit the ring on opposite sides with both hammers at once. It doesn't take very hard blows this way. When it looks quite round, tap it down on the cone just a little before taking it off. OK, in preparation I'll put a hammer on the floor on each side of the cone. There, the ring is hot enough, so onto the cone, drop the tongs, pick up the hammers and hit wherever there is space between the cone and the ring. Now, tap it lightly on the top side, not hard enough to stretch it, just enough to round it up completely. There, that looks OK.

Try yours, Jean. Say, you're doing great, you didn't distort yours as much as I did. OK, heat it up, and round it up, and we'll take a good look at it. Now that it's cool, I'll wire brush it on the power wheel and we can take a good look.

This looks great, Jean. Maybe it's time for me to take lessons from you!
See you next time!

This article was reprinted courtesy of the author Bud Ogger, The Anvil Ring and ABANA. It was originally published in the Summer Issue of the Anvil Ring 1988, Volume 16 Issue 1. Reprinting of this article must be cleared through the ABANA publishing committee.

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The Ashokan campus is located in Olivebridge, N.Y., several miles west of Kingston, N.Y. The meets are held the first weekend in May and in the first weekend in October every year. The main demonstration is in the blacksmith shop and there is a "Hands On" workshop for beginners. A main demonstrator is brought in for each meet, food and bunk-house style lodging are provided as part of the cost of the weekend long meet.

Contact : Tim Neu

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