SOFA SOUNDS

SOF&A
SOUTHERN OHIO FORGE & ANVIL
Artist-Blacksmiths Association of North America

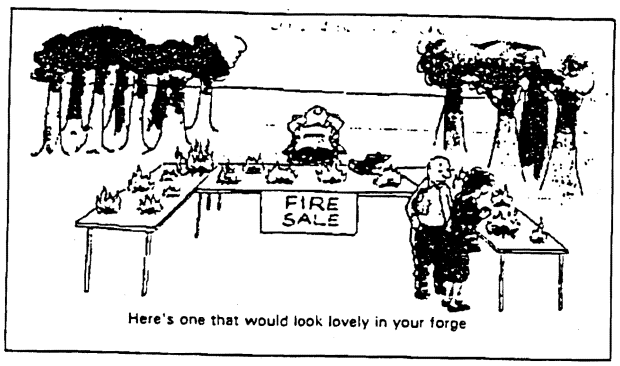
JUNE/JULY 1992

MARK YOUR CALENDAR: Unless otherwise noted, all meetings will be held at the Studebaker Frontier Homestead on Rt. 202 about four miles north of I-70 near Tipp City. Please don't park on the grass or block access to the production area. Donations of items to the newsletter support raffle are always welcome. Please bring your work or tooling for display. The public and guests are welcome. Finger food and cold drinks provided on a break-even, donation plate basis. The forges at the homestead are available before and after meetings for individual projects. PLEASE BRING AND WEAR SAFETY GLASSES!

June 6th, 1 PM	Demonstrations by Joe Abele and Steve Roth.
July 11th, 1 PM	Demonstration by Hans Peot and Bill Fleckenstein.
August 1st, 1 PM	Demonstration by Art Holz.
September 5th, 1 PM	Demonstrator needed.

SOF&A BOARD OF DIRECTORS ELECTION: The elections for vacating director's positions was delayed from the May meeting to the July meeting. If you are interested in helping to run SOF&A, please volunteer to be considered. Also consider who else you would like to see elected to the board. Once elected, the new board then appoints group officers on the recommendation of the members present.

Sorry about the more than usual 'cut and paste' look with this issue - been a busy few weeks. - ks.



Here's one that would look lovely in your forge

(From the newsletter of the Prairie Blacksmith Association.)

Chapter of ABANA

FOR SALE: Multi-purpose ornamental bending machine combo plans. 50 ton max. Easy to build, does the job on a budget. Curves up to 55" high rails to compound curves. Bends -ronze caps, stair stringers, flat, round, etc. hot or cold. Two units, air over hydraulic, large 6'x8' press and ten ton hand unit and some tooling. Costs $300 plus one hp min. compressor. Parts sources included to build. $75.00. Contact Mike DeStefano at 813-646-3055 or 1087.

FOR SALE: 50# early style Little Giant, 1914 vintage, $400. 50# 1906 Little Giant, $300. Treadle Hammer, $600. Contact Bob Haverstock, RR3, Box 103, Sullivan, IL 61951 - 217-752-6873.

SUBCONTRACTORS WANTED: Roger Scott, Custom Ironworks, P.O. Box 180, Union, KY 41091 - 606-384-4122 is looking for smiths interested in forged sub-contract work, such as scrolls, leaves and balusters.

WANTED: To buy or trade - miniature advertising anvils and statues related to blacksmithing. Contact Ron Porter, RR #1, Box 64, Bunker Hill, IN 46914.

EMPLOYMENT OPPORTUNITY: Established shop doing forged/fabrication interior and architectual metalwork seeks experience decorative ironworker. Wages are negotiable with a percentage of the business an eventual possibility. Contact Lee Badger, Glen Echo Park, Glen Echo, MD 20812 - 301-229-9593.

EMPLOYMENT OPPORTUNITY: Established architectural blacksmith business needs full-time help. Good pay and benefits. Must be proficient in basic forging skills with a clear un-erstanding of traditional joinery. Provide references and resume to Corky Storer, Heritage Forge, 19709 Maxwell Rd. SE, Maple Valley, WA 98038 - 206-432-1468.

Dover Publications (11 East 2nd St., Mineola, NY 11501 - catalog on request) has the following books available: "Decorative Antique Ironwork" by Henry R. d' Allemagne, 4,500 photographs, 420 pages, $17.95 plus $4.50 S&H and "Art Nouveau Decorative Ironwork" by Theodore Menten, 137 photographic illustrations of railings, gates, balconies, doorways, staircases, etc., 128 pages, $8.95 plus $4.50 S&H.

Art Horizons (140 Prospect Ave., Suite 16R, Hackensack, NJ 07601 - 201-487-7277 is sponsoring a major art competition with prizes totaling $6,500, with a $5,700 top prize.

If you are interested in trying the necked down - no blower required gas jet design on page 4 of the last issue, but don't want to try to neck down a 1 1/2" pipe, you can pick up a 1 1/2" to 3/4" pipe connector at plumbing supply outlets. Screw in a length of 3/4" pipe, add the gas jet and you are in business.

Received a letter from John Kosirnik noting SOF&A video tapes can be mailed at the cheaper book rate as they are considered to be educational material. He mailed a tape from Michigan back to Greenville for $1.05 postage.

Valley Forge & Welding (30-C E. San Francisco St., Willits, CA 95490) is now offering preformed shovel heads ready to incorporate into your fireplace tool set. Handmade from 18 gauge mild steel they are 6 3/8" long, 5 3/8" wide and 1" deep. Set of 5 for $23.75 or set of 10 for $45.00.

Reminder: If you are planning to donate some of your work to the auction at the June 17-21 ABANA BIENNIAL CONFERENCE, they should be sent to: Housing and Conference Service, Attn: Devon Shearer, Cal Poly-State University, San Luis Obispo, CA 93407. Please mark all packages on the outside: ABANA A. On the inside of the box, please include a label with your name, address and value of item(s) you are donating.

The Rocky Mountain Smiths will hold the Mountain Smiths Blacksmithing Conference, Autust 27-30, at the Francis Whitaker Blacksmithing School, Carbondale, CO (a short distance from Aspen). Demonstrators will include: Francis Whitaker, Frank Turley, Jon Anderson, Rob Gunter and Will Perry. For further information contact Steven Titus, 7815 Maverick Rd., Colorado Springs, CO 80908 - 719-495-4363.

WANTED: Anvil in the 100 lb range. Leave message for Gary Martens at 335-7642.

OSO Famoso, Box 654, Ben Lomond, CA 95005 - 408-336-2343 carries fossilized ivory, scrimshaw material and handmade beads. Send SASE plus $1.00 for catalog.

FOR SALE: Johnson Gas #10 to $16 crucible melting furnaces for pouring your own castings. Prices vary but are in the $300 range, some have safety features. Also combination sheet metal shear, press brake and roll - 20 guage capacity, 30" width. New - $430. Older model Pexto combination brake and bar folder - $175. Contact Ed Bond, 2695 South Arber Drive, Marietta, GA 30066 - 404-926-7177.

The first issue of Richard Kern's "The Powerhammer" magazine has been issue and it looks like a dandy. Articles include information on the Bradley Helve Hammers, fixed sow block repair, heating large areas and more. Should be of interest whatever make of powerhammer you have. For a sample copy contact The Powerhammer, P.O. Box 284, Xenia, OH 45385. Richard has also published "The Little Giant Powerhammer" book on its history, use and rebuilding. Cost is $27.95 plus $2.50 S&H at the same address.

Norm Larson Books (5426 E. Hwy 246, Lompoc, CA 93436) carries a number of reprinted books on all aspects of metalworking. Catalog on request.

The 12th annaul Indian Blacksmith Assoc. Conference will be June 12-14 at the Fairgrounds in Tipton, IN. This is a nice site with all demonstrators under cover. Demonstrators will be Jerry Darnell (18th century reproduction ironwork) and Bob Patrick (forging a gun barrel). Both have been demonstrators at past Quad-States. For further information contact Charles Hess, RR 1, Box 452A, Whitestown, IN 46075 - 317-769-3872.

WANTED: Articles for this newsletter. They need not be fancy - print on the back of a paperbag if you want to. I'll take care of rest.

BLACKSMITHING EQUIPMENT FOR SALE: The following generally have a variety of equipment, including powerhammers, for sale: Neil Brown - 219-724-7554; Russell Cashion - 615-731-3215; Benny Wilson - 615-758-7176; Fred Caylor - 317-769-6351 (he also reconditions powerhammers); David Oliver - 615-878-5712, John Kosirnik - 517-456-7881/4494. Locally try Joe Abele - 276-2977 or Steve Roth - 836-8520. For heavy-duty castiron firepots, contact Bob Zeller at 849-1771.

The SOF&A VCR Tape Library is now in operation. See Hank Steinmetz before the SOF&A meetings.

Reminder to please try to limit pickup of coal to before SOF&A meetings if at all possible. Load your own in your own containers and then pay Emmert or his representative if he is not there.

BUCKETS NEEDED: I would like to find a couple of metal 5-gallon buckets in relatively clean and good condition for quench buckets. If you have one or two you are interested in selling cheap, please give me a call at 427-2447.

Beside Norm Larson, two other sources of blacksmithing books are: Centaur Forge, 117 N. Spring St., Burlington, WI 53105 and Jim Fleming, Box 1212, Breckenridge, CO 80424.

FOR SALE: #400 Buffalo Forge, new (still in the craft) with electric blower, and coal/water container. Large forge. $700. Contact Jack Wise, 97 Old Alto Hwy., Decherd, TN 37324 - 615-967-4847 or 615-455-0903.

Hand-tied hearth brooms to fit your handle. Contact Linda Ferguson, P.O. Box 1180, Rocky Face, GA 30740 - 404-226-8020.

As far as I know, SOF&A's membership fee has been $5.00 per year since it was formed, yet newsletter printing and postage costs have continued to increase significantly. The primary reason due have been held level is that the newsletter support raffle before each meeting covers about half its cost. Lately items donated for the raffle have been a bit on the sparce side. Please consider donating a item you have made or any blacksmithing-related item or tooling to the raffle.

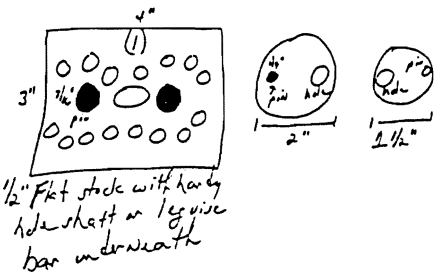
MEETING NOTES:

Prior to the April 4th demonstration, Joe Abele announced he had received severa requests from group members who farm and who were looking for someone who still repointed plowshares. He has located someone so if you need this service contact Joe at 513-276-2977. Due to the historical significance to blacksmithing, this would make a good group demonstration. Joe - hint, hint!

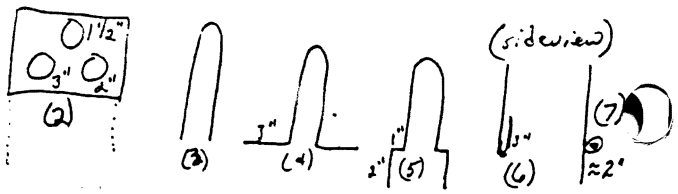
For the demonstration Don Mumford and Hank Steinmetz demonstrated using fixtures/ jigs to facilitate bending. Both are actively involved in buckskinning and thus demonstrated items relating to it.

Don started by making several tongs to lift pie plates or cake pans out of Dutch Ovens. These pots are used extensively at rendezvous and, since the plate or plan fitted closely inside the Dutch Oven, he had developed a lifter, rather ironically using a computer to do so.

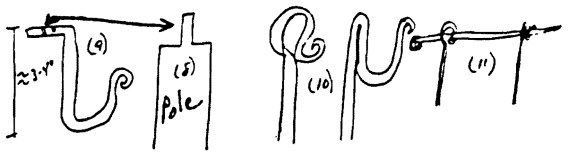
The lifter was made from two pieces of 3/16" cold rolled, 21" long. To start Don bent the two pieces around one roller of a bending jig as shown in (1). An off-centered hole had been drilled two a short length of 2" and 1 1/2" round stock with a pin placed on the opposite side. When set over pin-stock on the jig, the two could be moved to present a range of openings between them.



Once both had equal length legs, Don then used a piece of 1" square S-5 in which 7/32" inch holes had been drilled 1 1/2", 2" and 3" deep. It was noted to help prevent scale build-up in the holes,



cleanout holes could be drilled in from the side.
The first piece was bent at 3" from each end in line with the "U" and then bent a second time 2" from each end to a form (3 - 5). The second piece was bent at the 3" point back towards the side of the "U". Once placed over the first piece, the legs were brought around to form the tongs (3 and 6-7). Don noted final twerking needed to be done to fit specific pans or plates.



Following Don's demonstration, Hank Steinmetz demonstrated using the bending fixture to make a markee hole hook (8-9), a campire pot hanger (10-11) and a kitchen pot hanger for use with a 2"x4" beam. The markee hook and campfire set was made out of 7/16" or 1/2" stock and the kitchen pot hanger out of about 1/8" x 3/4" stock. The legs tapered towards the tips. He noted all three items are very popular sellers.

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I was not able to attend the May meeting, but I understand Mike Dowler did an excellent job on his demonstration of decorative corner treatments for faces and leaves.

SOF&A BEINGS SEARCH FOR A PERMANENT HOME:

For something like 15 years SOF&A has met and held Quad-State Round-ups at the Studebaker Frontier Homestead through the good graces of the Studebaker family. We have recognized we would eventually need a permanent home at another location and have been banking the net profit from Quad-States for this eventuality. Future options might include working with a park or craft learning center to co-sponsor a facility, buying and developing property on our own, monthly meetings held in members shops with Quad-State held at a fairgrounds or other similar facility, or even not holding future Quad-States which would greatly reduce demands for volunteer manpower, equipment and facility support. Ideally a future home would include almost everything available at the Studebaker facility, including a large permanent shop, registration area, display area, commerical sales area, tailgate sales area, 3-4 acres of camping space, 4-5 other demonstration areas, parking for up to 100 vehicles, retail coal sales and a secure equipment storage area.

If you know of an option for holding monthly meetings and/or Quad-States, please pass the information along to either Dick Franklin (517-233-4878), Larry Gindlesperger (517-233-6999) or Ron Thompson (517-492-2259). However, please do preliminary research on the option first on such aspects as availability, current and future support by owners/operators, ability to host monthly meetings, ability to host Quad-States with permanent or semi-permanent facilities, current or potential future restrictions (e.g., burning of coal) and potential cost implications. We need this information as soon as possible as an early October 1992 board meeting has been set as a decision point to select the most promising options for presentation to the SOF&A membership.

When considering options, bear in mind sponsorship by a small community could result in business to local restaurants, motels, camping areas and joint use of a metalworking shop, joint equipment purchases (e.g., bandsaw) and a contribution towards garage facilities for one weekend a year's use. In this situation, a long-term agreement would be essential.

Is there an attorney in the group willing to provide low-cost advice to the group as we go through this process?

Scarfing and Hammering Strategy for Forge Welding

Dick Franklin

The shape of pieces being welded is important. Scarfing is the name used for shaping pieces to be welded. The shaping process must provide enough metal that the finished weld will have the shape you want. The shaping process must also provide shapes that forces flux and scale out of the weld area when hammered. The shapes must present the surfaces to each other so that unwanted slip doesn't occur during hammering.

Generally scarf shapes are highest at the point that will be the center of the weld. When stuck on the high spot, flux and scale can move outward in all directions. Thin ends and edges will generally cause problems. They heat quickly and it is easy to burn them before the main body of the weld has reached welding temperature. They cool quickly. When it is necessary to have thin edges and ends, keep that side of the piece away from the anvil. The anvil will cool thin pieces below welding temperature almost on contact.

The hammering strategy must work with the shapes used, work with flux movement and cooling rate of the shapes. Stick the weld first by striking the high points of the scarf, forcing the two pieces together . General hammering strategies for basic welding are hammer from thin to thick and from the middle to the edge. Thin pieces drop below welding temperature faster than thick ones. Hammer the thin areas first.

The flux must flow out of the weld and carry the scale with it. Hammer from the center of the weld to the edges. Hammering thin areas should be done before hammering the center of an area. The scarf should be designed so that such a strategy will provide a path for the exiting flux.

Getting good welds and good looking finished products requires considerable judgment in both scarf design and hammering strategy. A well designed scarf that provides for flux movement and ample metal will look lousy if it is over hammered so that the weld area is considerable smaller than the adjacent areas. Small edges or ends that cool before being hammered can be the source of crack propagation as well as producing a bad appearance. Weld areas that aren't struck hard enough will fail to move the pieces together and force the flux out, thus not welding. It is best to error on the side of under hammering. If the weld isn't complete, bush it with a wire brush to remove scale, reflux it, reheat it and continue your hammering until the weld is complete.

There isn't much remedy for a piece that has been over hammered. Once the cross section is reduced below the adjacent regions it is rare that the piece can be upset to a proper dimension.

Practice. Concentrate on what is happening with each step you do. Clean metal at the correct temperature will weld. Good hammering technique is developed by repetition. First get good welds, then get well shaped welds.

Material Choices for Pattern Welding

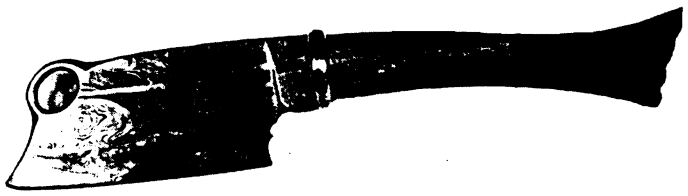
The choice of materials used in a pattern welded object will be a major factor in determining both its visual appearance and its physical characteristics. Being able to predict a material's lightness or darkness after the etch is a great help in planning a billet.

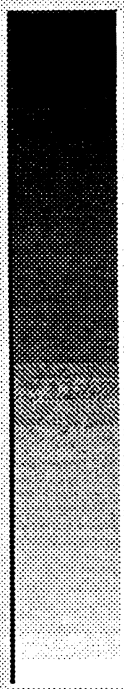
In my experience, the higher the carbon, the deeper (darker) a steel will etch. Conversely, the lower the carbon and higher the percentage of chromium or nickel the lighter an alloy will etch. The following is a list of the steels that I commonly use and their approximate place on the gray scale.

Notes:

Contrast is more important than position on the scale. The father apart on the above scale the greater will be the contrast.

I usually etch in muriatic acid or ferric chloride. Ferric chloride seems to be better when the pattern contrasts depend on carbon differences. I use the muriatic acid as it comes out of the bottle and dilute the ferric chloride with about three parts water.





1095, W-1, W-2: will etch dark because of high cabon content.

O-1: about the same carbon content as 1095, but a little lighter because of .5% chromium.

52100: high carbon, but lighter yet because of 1.5% chromium.

5160: medium carbon and .7% to .9% chromium make a medium gray.

L6 (?): I'm using sawmill band saw blades and guessing on the alloy. Probably .7% to .9% carbon and 2.% to 3.% nickel.

Mild Steels: vary a lot, but generally are lighter than the above steels and darker than wrought iron.

Wrought Iron: Light gray with nice "grain" in wide layers.

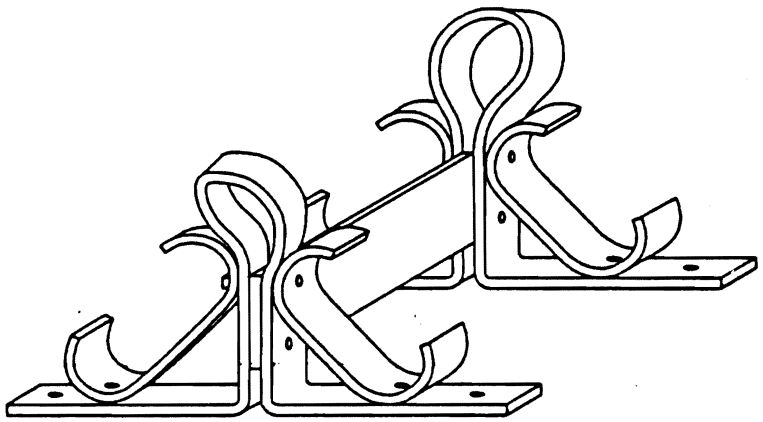
203E: low carbon and 3.% nickel make it very light

Pure Nickel: silvery white.

Building a Bootscraper

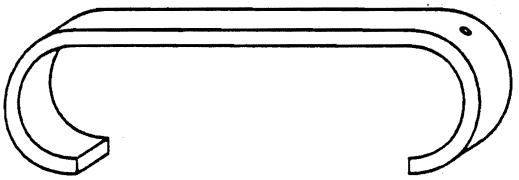
An easy project for novice blacksmiths

by Bill Curry (Originally from the newsletter of the California Blacksmith Ass'n.)

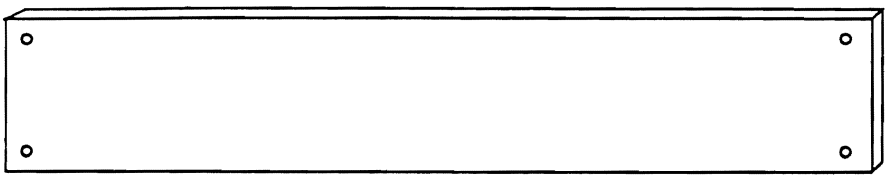


A very simple, yet attractive and useful project for the novice blacksmith

Material: mild steel.
Four pieces 1/4" X 1/2" X 7"
Two pieces 1/4" X 1/2" X 22"
One piece 1/4" X 2" X 9"

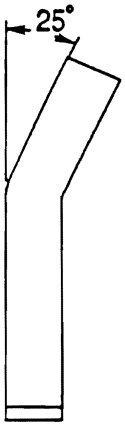


Angle Bracket (four required)
Form two inches at each end around a 1.25 inch diameter mandrel while hot. Hold up on drilling or punching rivet holes until support brackets are finished, then locate holes in Angle Bracket to fit.

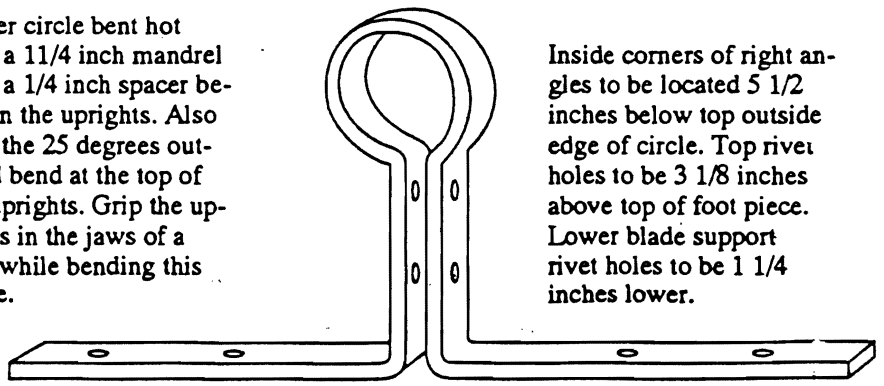


Scraper Blade (one required)
Locate rivet holes 1/4 inch from ends and 3/8 inch from top and bottom edges. All holes in this project will be 3/8 inch.

Support Bracket (two required)



Upper circle bent hot over a 11/4 inch mandrel with a 1/4 inch spacer between the uprights. Also note the 25 degrees outward bend at the top of the uprights. Grip the uprights in the jaws of a vise while bending this angle.



Inside corners of right angles to be located 5 1/2 inches below top outside edge of circle. Top rivet holes to be 3 1/8 inches above top of foot piece. Lower blade support rivet holes to be 1 1/4 inches lower.

The two rivet holes in the feet are spaced the same distance from the right angles as the top blade support rivet holes. Mounting screw holes are located one inch from the ends of the feet. Countersink holes if using flat head flat head screws

Mild steel gas welding rod (3/16 inch) makes fine rivet material if the holes are countersunk to accept the peened ends.

Weather proofing can be handled with black spray paint or a coat of beeswax applied with the metal still warm to the touch.

FINISHES

BY NANA SCHOWALTER

In early October, 1991, I took a class entitled 'Interpretive Sculpture' taught by Ed Gray, metalsmith and jeweler, of Fennville, MI. The class was held at the John C. Campbell Folk School, Brasstown, NC. My tuition was subsidized by an UMBA Scholarship and in keeping with the terms of the scholarship, this is the first of two articles to pass along some of the processes and techniques learned there.

The weekend class involved techniques for evoking creative inspiration and the subsequent designing of a sculpture. The processes used to construct the sculpture were mixed media including metals (copper, brass, and silver). I will discuss the methods of inspiration first and follow with specific techniques for copper work, namely a variety of colorful patinas and some silver brazing methods.

Ed Gray is a Native American. For most of my life the art making process has been inspired by the artifacts and philosophies of the ancient cultures of North America. To find myself in a class with just three other students in a fully equipped metal working studio, tucked away in the Smoky Mountains during peak fall color, felt like the winds had carried me to exactly where I belonged for those three days. (Actually, I enjoyed it so much that I stayed for another full week of class.)

The creative process for me has always been very subjective. I do not believe there is a formula for achieving an inspired moment or thought that can be interpreted into a work of art. Individually we are moved by varying situations that lead to different creative ideas. The instructor of the class saw the creative process much the same way as I, so my reservations were eliminated.

At the beginning of class we watched a video tape called 'Beyond Tradition'. It gave an overall survey of different Native American cultures and their hand-crafted wares, both functional and religious. It dealt with basic philosophies of the integration of all beings and the sanctity of the earth. The intent was to embrace many generations, cultural differences and Native American oral teachings. We were then given three separate paragraphs on a subject that we were to interpret into a sculpture. Throughout this inspiration time we listened to Native American flute music. We began the first hands on work by taking a slice of wood and some paint and painting the image of our first ideas. From this sketch we would interpret the ideas into a sculptural form using metal working techniques.

For the sake of this article, the actual object is almost inconsequential. For me, it was more important to try every technique demonstrated and come home with intricate notes and samples of the results than to produce a sculpture. These new techniques would be used in many sculptures to come. I have found that forged ironwork can be greatly accented by the addition of colorful copper elements.

The techniques I am about to describe are mostly done on relatively small pieces of 16 oz. copper, which is a good way to start until you get the feel of the materials. When the techniques are understood, you can move onto larger items, larger torch tips, and greater amounts of chemicals. Most of the supplies are readily available, with a minor amount of hunting. I will make a complete list of materials and some suppliers elsewhere. Between a welding supply shop and a nearby lapidary store I found just about everything required for a reasonable fee.

The instructor for the class let us know that some patinas we were to learn are commonly known and others he achieved through years of experimentation. He basically started with a disclaimer that he was no chemist and didn't recommend fooling around with chemicals unless we knew what we were doing. He said that he wasn't always sure why certain techniques worked, but that they did and he had tested them over time.

One of the most important aspects of applying hot patinas is the consideration of safety. When heat is applied to metal treated with liquified chemicals a VERY TOXIC steam is released. In order to use the information I learned in this class at home, I installed a simple ventilation system in my studio. It consists of a squirrel cage blower and some 6" stove pipe connected to a funnel-shaped hood. The fan vents out a window and has a damper to keep the cold air out. When I am ready to work I simply turn on the fan and all the gasses are drawn out of the room. This is VERY IMPORTANT. I do not recommend that you try any of these techniques until you have arranged for some type of safety situation in regard to the fumes. Remember, even if you wear a respirator during the process, the fumes will still get into your eyes, or your dog will breath them, and they will remain in the room until you have totally ventilated the area.

Generally speaking, the copper to be colored needs to be completely clean and free of grease and dirt. One of the most efficient ways to do this is to soak it in a hot pickle. We used Sparex No. 2. This is an acid that brings the copper to a bright finish in a relatively short amount of time, especially when the pickle is heated. One way to do this is to mix up an amount in a crock pot and set the temperature on medium. Crock pots are ceramic and therefore will not corrode or contaminate the acid. You'll need copper or wooden tongs to retrieve the work from the acid. Pickling acids are sold with complete safety instructions so you can read about proper use for the particular brand you select. Remember, a hot pickle lets off acid steam so don't breathe it.

It would be most convenient to have a sink with running hot and cold water to complete these processes, however, it is not required. I have cold running water in my studio, and have set up a large pan on the wood stove to heat water. Then I set up three plastic dish pans, one for a clear rinse, one with hot soapy water, and the third for a final clear rinse. I always have an emergency pan of clear water for accidental acid splashes on skin.

If you are working with brand new copper, you may only need to rub it free of grease and oils with fine steel wool before applying the chemicals. If your copper has any other contaminants on it, soak it in hot pickle for about five minutes then rinse thoroughly with water followed by soap and water. Remember that pickling acid is just that, and it will burn exposed skin and eat through your clothes. Rubber gloves and eye protection should be considered.

Now that you have a perfectly clean piece of copper, the next step is to set up a place to heat it evenly. The most effective method is to get a few pounds of pea sized pumice and spread it out evenly in a pie pan. A heavy aluminum pan works as long as you don't aim your torch directly at it. The pan is then set on some nonflammable surface, like fire bricks or a steel table. Heating the copper on a bed of pumice allows you to move the torch completely around the piece so that the heat actually comes up from underneath, as opposed to putting the flame directly on it and over heating one spot.

The first color process I will describe does not require the use of a torch.

BLACK - Black is achieved by immersing cleaned copper in liver of sulfur diluted in water. I have seen a variety of recommended ratios of liver of sulfur to water, I use 1/2 tsp. to 1/2 gal. water. The chunk form of liver of sulfur has a much longer shelf life than the liquid form. If too much liver of sulfur is added to the water, then the black will flake off of the copper. If this happens, clean the copper in Sparex and immerse in a more dilute mixture. Heating the mixture causes the copper to blacken quicker, usually in about ten seconds. Again, safety precautions are on the package so I won't go into too much detail. I mix the liver of sulfur in an enameled pan on the wood stove (you could just use very hot tap water). When it is completely dissolved immerse the copper piece using copper tongs or copper wire until the desired shade is attained. The copper is then immersed in cold water for at least 15 seconds to fix the color, then lightly rubbed in soapy water. The ranges of color vary from lightly browned to bronze and deep flat black, depending on the amount of time the work is immersed in the chemical. Liver of sulfur loses its potency after several hours of exposure to air so it either takes longer to work or lets you know that it has lost its punch.

Black serves as a base for some blues and greens, and oddly enough for WHITE as well. When the copper is blackened, rinsed, and dried, a variety of effects can be had by the application of Phillips Milk of Magnesia. No kidding. For a speckled effect, put Phillips in a spray bottle and spray from a distance. It can also be applied with a sponge or brush for a variety of textural effects. If applied thickly enough, you will get pure white. First wait for the Phillips to dry completely, at this stage it will appear grayish and dull. Next spray it with Krylon clear fixative and it will turn a

solid white. The Krylon also turns the black from a flat finish to a high gloss.

A wide range of colors from YELLOW to RED to deep PURPLE can be attained by using heat. Now you get to use your pumice and torch. Take a small amount of dry borax and slowly add water, stirring until it gets to the consistency of yogurt. Mix an equal amount of Harris silver solder flux with the liquid borax and stir thoroughly. Take your perfectly clean piece of copper and apply the mixture to both sides. A 1" brush works well for this. Make sure the entire surface on both sides is covered and place on the pumice.

Using a small tip on the torch, slowly bring the flame to the copper in a circular motion. As mentioned before, first heat from underneath via the pumice, not directly on the copper. Move the torch around the piece until the flux begins to bubble, then move the flame directly over the piece while keeping it in constant motion. Slowly heat from a distance of about 10-12", closer if you dare. As the copper is heated the flux mixture will bubble, then turn dry white. Next it will become clear and runny. At this stage the patina colors will begin to take. Heat the copper until it becomes low red and then bring the torch back just a bit to maintain that temperature for about 5 to 10 seconds.

The longer the copper is heated, the darker the finished patina color. This is a bit of a guessing game because the color of the heated copper is not the same as the color you will ultimately achieve. Again, the spectrum ranges from light yellow, to orange, to light then dark red, purple, and if you get it too hot, black speckles. These black speckles on a dark red back ground are rather nice looking, like leopard skin.

The best way to get a feel for how much heat gives what color is to take several pieces of copper and run tests. You should be careful not to overheat the copper, however, some of the more daring results come from bringing the metal up to a bright red heat. At this point you may be sure it will melt away any second, and it may, but if heated slowly and from a distance it will remain in a solid state.

When finished with the torch work, the copper pieces will have a variety of colors on the surface, most of which will come off in the wash water. The greens and blues are residual flux and borax, and after a soaking will dissolve. Immerse the copper in hot soapy water (Palmolive green) for at least ten minutes. At this point the residual flux should be dissolved and the copper can be gently washed with a sponge or non-abrasive pad. After rinsing and drying, the piece should be covered with a protective finish. This can be a clear spray or a wax. Unlike the tempered colors achieved by just applying a torch to copper, there is something in the flux and borax mixture that makes it stable. Ed Gray uses this technique on outdoor garden fountains and finds the color to be permanent.

The next newsletter will cover blues, greens, silver, and some silver brazing techniques. As part of the condition of the UMBA scholarship I will demonstrate some of these techniques at an UMBA meeting sometime in the future.

In February the UMBA board of directors voted to increase the 1992 scholarship to $500. I highly recommend applying for this generous amount of support. The class I took at the Campbell Folk School has opened up many design opportunities and made a distinct difference in my work. Application information should appear elsewhere in this or the next newsletter.

A materials list follows...

MATERIALS

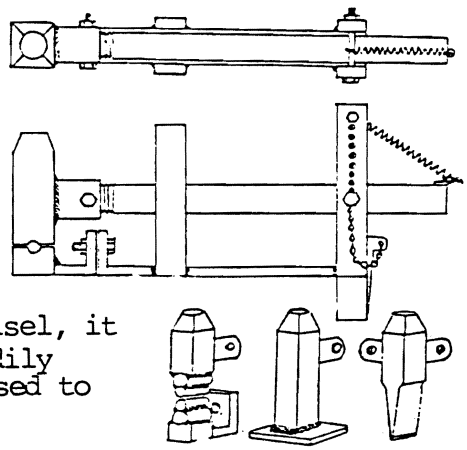
Pea sized pumice gravel
Sparex Pickling Acid No.2
Liver of sulfur (dry compound)
Phillips Milk of Magnesia
Harris Stay-Silv silver solder flux
Harris Safety Silv cadmium free silver solder
Krylon clear coat spray
Butcher's Bowling Alley Wax
Cupric Nitrate
Green patina solution from Rio Grande
Palmolive green dish soap
Dry borax

The RIO GRANDE catalogue lists small metal working tools and some patina chemicals. It also has a variety of books on processes, and is a great wish book! For more information, visit your Public Library and look under Copper work, jewelry design, and patinas. Centaur Forge also sells books on this subject.

RIO GRANDE
6901 Washington N E
Albuquerque, NM 87109
1-800-545-6566

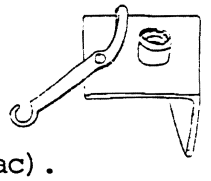
SHOP TIPS AND TECHNIQUES: The following were, for the most part, paraphrased from other ABANA Chapter newsletters. While the information presented herein, and elsewhere in this newsletter, is believed to be accurate, neither SOF&A nor ABANA assume any responsibility for the accuracy, fitness, proper design, safety or safe use of any information, technique, material, tool design, use, etc. USE IS SOLELY AT THE USER'S OWN RISK!!!

- BLACKSMITH'S HELPER: This blacksmith's helper appeared in the Dec 91 newsletter of the Ontario Artist Blacksmith Ass'n. This version is fabricated from 1 1/2" square stock for the top and bottom tools, 1 1/4"x 3/8 flat bar for the brackets and 3/4" black-iron pipe for the handle. The handle is attached to the tool head by means of a 3/4" pipe coupling welded to the tool and is spring loaded to help prevent bounce. The assembled helper would be about 15" long. Note that by putting a coupling on two sides of the chisel, it can be used in either direction. The tools can be readily changed or removed for resharpening. Note the wedge used to secure the shank in the hardy hole.

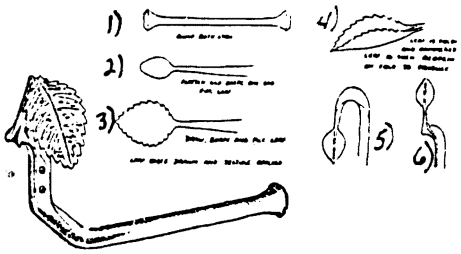


- CUTTING OIL: WD-40 seems to improve the cutting ability and life expectancy of drill bits vs standard cutting oil - considerably. (From the newsletter of the Pittsburg Area Artist Blacksmith Ass'n.)

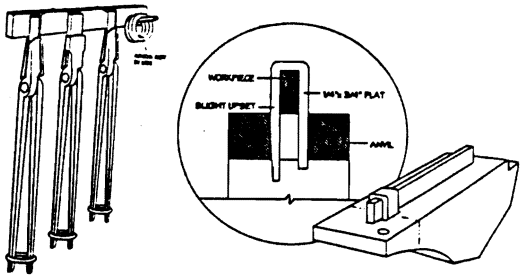
- SOCKET BENDING JIG: A versitile bending-jib can be made by using a socket set. Weld appropriate size holding shaft to hold sockets and rivet holding handle on a piece of wide angleiron. The heavier the work, the heavier the handle needed. (By George Anderton from the newsletter of the Blacksmiths' Guild of the Potomac). (These could be made for 1/4", 3/8" and 1/2" sockets. - ed).



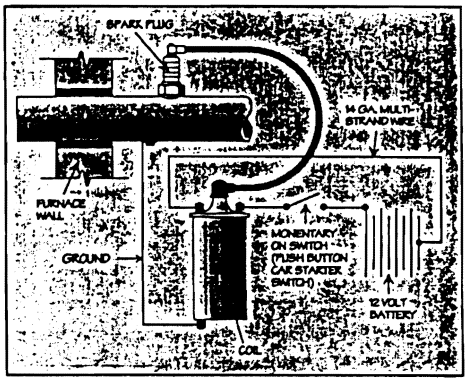
- TOWEL RACK: 1) Upset both ends of desired length of stock; 2) flatten and shape one end for leaf; 3) draw, shape, put in texture and file leaf; 4) fold and hammer leaf on fold, reopen leaf and hammer on fold to produce crease in center; 5) bend stem, hammer bend, twist stem up and bend and shape rest of road and 6) bend leaf down and apply brass finishing to it. (By R. Bloom from the newsletter of the Upper Midwest Blacksmith Ass'n).



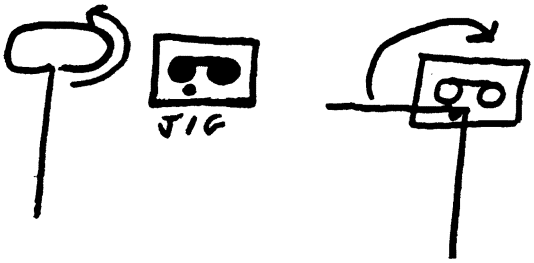
- TONG RACK and HARDY HOLE HOLDDOWN. 1. With this tong rack you always know what size stock the tong is made for since the piece welded to the rack bar exactly fits the jaw. Handle clamp rings hold tongs in place on the rack. (Tom Clark). 2. I recently needed to slot punch 1/2" flat bar the hard way. The worst part was trying to hold the bar on edge to hit it. This hardy hole hold-down really helped. (Walt Hull)- Note piece along side of stock to be slotted also. (From the newsletter of the Blacksmiths Ass'n of MO.)



- GAS FURNACE IGNITOR: This ignitor works on the principle when one pushes (closes) the momentary on switch, the coil builds up a magnetic field in the primary coil wires of the coil. After one or two seconds it is released. The collapsing magnetic field induces (creates) voltage across the secondary windings of the coil and hense the spark for the spark plug (15,000 to 40,000 volts) depending on the coil. The illustration is self-explanatory. (From the newsletter of the Blacksmiths Ass'n of Missouri.) (About a year or so ago this newsletter contained a similar item about using a ignitor off of a B-B-Q gas grill. It did not require a battery. The plug must go between the gas jet and furnace. ed.)



- MAKING D-HANDLES: I recently bid on making 100 D-handled hooks for a company in the Dayton area out of 1/2" round stock. I made up a jig based on the sample furnished. My first attempt was to heat a length of the rod, stick one end in the jig and then to bend the rod so it overlapped one side of the handle. This area was then reheated, the handle reversed in the jig and the leg bent down using arm and hammer. After thinking it over, my second one involved bending the rod at the appropriate place in the leg vise to 90°, heating the handle portion, putting it in the jig as illustrated and then bending the rest of the handle around the jig fixture. This went much easier and produced a nicer looking handle. Ken Scharabok.



- LAYOUT PATTERN: I have a piece of 3/16" sheet steel 24" x 24". It has concentric circles scribed onto it, each 1/2" greater in radius than the last. It also has three lines radiating from the center at 120° angles to each other. 3/16" steel is hardly a machinists surface plate, but it is good enough to check the flatness of door handle cusps, etc. The circles are very handy for truing up rings and hoops, and the three lines are good for checking trivets and three legged stands. I clamped a lathe bit to a piece of 1/4" by 1" to jury rig a compass which scribed the circles deep enough so they will not wear off. (By Jonathan Herz from the newsletter of the New England Blacksmiths' Ass'n).

- ANGLE IRON HELPERS: If you have a cut-off saw, it will be well worth pulling out some scraps of variously sized angle irons and cutting a couple of 1" lengths of each size. Leave them on the back of your welding table. You'll find them very handy in laying up work for welding. Vise grip them to two pieces for a guaranteed right angle weld. (From the newsletter of the New England Blacksmiths' Ass'n - by Jonathan Herz).

- HEATING BLADES FOR TEMPERING: After shaping the blade, a piece of pipe with a plug on one end was put into the forge and the blade put inside of it. This sealed off the blade from drafts and prevented contamination from the fire. (From a write-up on a demonstration by Tommy McNabb as reported in the newsletter of the North Carolina Chapter of ABANA).

- USING BOLTS FOR TENONS: For a quick and dirty round tenon for the ends of small size bars, drill and tap the end of the bar and tightly screw in a bolt of the desired tenon size. Cut off the end of the bolt to the right length and install by riveting in the usual manner. While this system may not be satisfactory in situations where the tenoned bar might unscrew, it has several benefits. Bars may be made to an exact fit between two fixed points by merely cutting to length, instead of trying to finish the shoulders of forged tenons to length by upsetting and drawing out. Angled tenons can be accurately made by cutting the end of the bar at the proper angle and drilling at a right angle to cut surface. This type of joining can also eliminate the problem of trying to get two tenons to enter matching holes simultaneously. The drilled and tapped bar can be fitted snugly into place, the bolts screwed in through the mating parts, and the tenons cut to length afterwards. (By Brad Silberberg from the newsletter of the Blacksmiths' Build of the Potomac).

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