SOFA SOUNDS

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

DECEMBER 1986/JANUARY 1987

MARK YOUR CALENDAR: Unless otherwise indicated, all meetings will be held at the Studebaker Family Homestead on Rt. 202, four miles north of I-70. Guests and the public are welcome. Bring items and tools you have made for display. Donation of items for the newsletter support raffle are always welcome. Please don't park on the grass, there is ample parking around the production buildings, but please don't block driveways or interfere with plant operations.

December 6th, 1 PM	BUSINESS MEETING followed by a demonstration on making candelabras by Paul Kuenle.
January 3rd, 1 PM	BUSINESS MEETING followed by a demonstration by Hans Peot on decorative twists.
Feburary 7th, 1 PM	BUSINESS MEETING followed by a demonstration by Larry Gindlesperger.
March 7th, 1 PM	BUSINESS MEETING followed by a demonstration to be announced.

MEETING NOTES:

Due to the Quad-State Round-Up being the previous weekend, no meeting we held in October.

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At the November 1st business meeting, two items were discussed, nominations for the A.B.A.N.A. Board of Directors and the results of the Round-Up. On the first, Hans Peot and Ken Scharabok were nominated by the group for the board. The results of the Round-Up are elsewhere in the newsletter.

The raffle brought in an additional $43.00 to support the newsletter. Wapakoneta member Scott Murray won some type of mixer left over from the Quad-State auction. Al Lorenz won a fireplace poker made and donated by Dayton member Phil Sturr. Covington member Ben Wunder won one of the beautiful little knives made and donated by Miamisburg member Scott Shoemaker. Beavercreek member Gene Schulz won a fireplace shovel donated by Rushsylvania member Ralph Van Buskirk and hand soap donated by Cleveland Heights member Al Wolfe. Either Waynesville member Dennis Hoffer was very lucky or we didn't mix the tickets well enough. Out of four tickets bought, he won four times, winning one of the pair of tongs made during the tongs competition at the Round-Up, muffler clamps donated by Al Wolfe, an orange hunting cap donated by

the Editor and a tap size chart also donated by Al Wolfe. Huber Heights member Larry Gindlesperger won four of the blacksmithing-theme Christmas cards donated by Findley-ville, PA member Bob Morris (Dayton member Art Holz also won four cards) and an eye protection sign donated by Bunker Hill, IN member Ron Porter. Dayton member Owen Vance won back a cold drink holder he had previously donated, Greenville member Robert Cruikshank won a scroll made at the Round-Up, new member John Dupps (Germantown) won a can of springs donated by Spring Valley member Bill Fleckenstein and Ham Hammond won the last of the magnets also donated by Bill Fleckenstein. Thanks goes to all the member who donated items for the raffle.

Following the business meeting, our Vice President, Duane Wegley, demonstrated three items (which will be raffled off at the next meeting):

The first was an iron belt buckle. Duane used 3/8" round stock with the formula of 4" per inch width of belt. Since he was planning for a 2" leather belt, he started with 8" of stock. The first stage was to make a chain link shape. When welded, the stock was flattened with the crosspean. For the cross piece, he used 3/16" stock, forge welded on both sides. This piece was held on one side for welding with a pair of tongs and then the sides reversed. The final operations were making a tongue using 1/8" stock bent around the cross piece and contouring the buckle since he noted most blacksmiths don't have a flat belly.

The second demonstration was a brass ladle bowl. He tried to duplicate one he made prior to the meeting but it got too hot to where it broke. To start the bowl he used the open end of an oxygen bottle valve cover. He tried to not get the brass hotter than a dullish red.

The third demonstration was a "squirrel cooker" used at buckskinning rendezvous out of 3/8" square stock. The top piece was about 18" long and shaped with a fork on one end and a coffee pot hanging hook on the other. A decorative twist was put in the middle. The upright stake was about 24" long with the top circle being canted at about a 45^{o} angle. When pounded in the ground, the angle turned away from the fire held the operating end over the campfire. To work on the tines, Duane bent the shaft in a gooseneck-shape so he could readily rotate one tine. To work on the other, he bent the gooseneck 180^{o} in the opposite direction, then straightened the shaft.

After the meeting Rushsylvania member John Jacobs showed off some of his projects and they were impressive for the time he has been working at the forge. He made a ram's head poker (based on the directions in the April/May 85 newsletter), a dragon's head (based on the directions in the June/July 86 newsletter), several basket handles and forks and probably the nicest square hole in 1/2" square stock I have seen. He had also made a nice door knocker out of two railroad spikes. For the knocker itself, he split one of the spikes, rounded the legs and then bent them into an oval shape. To keep the knocker from sliding in the holder, he drilled into the sides only about 1/3rd way. The nail head beak was pointed towards the holder. To attach the holder he drilled two screw holes and countersunk the head area. I am pleased to see John developing his blacksmithing skills and encourage him to demonstrate at one of the meetings.

ABANA REGIONAL EDITOR/COORDINATOR:

While I have many of the misgivings concerning The Anvil's Ring as have been expressed to me in the past two years, I have agreed to become a regional editor/coordinator for the publication. Basically, within my territory (Ohio and adjoining states), my job is to be on the lookout for possible articles/story ideas and encourage sending them into the publication. The Anvil's Ring, like SOFA SOUNDS, cannot publish what it doesn't receive. Either the editor does it him/herself or copies from other publications. The Anvil's Ring would like to avoid the latter by publishing original, general interest articles from members. Don't worry if your

grammer, spelling, etc. aren't all that great; I will provide editing assistance as desired. Articles could range from a major project (e.g., gate commission providing how the commission was obtained, any interesting steps involved, and the end product) to a tip or techniques on how you solved a particular problem. The Anvil's Ring deadlines are the first of February, May, August, and November. No lengthy "Voodoo Blacksmith" articles please.

CHANGE OF ADDRESS:

After some six years of trying, I am in the process of finalizing the sale of my apartments. As a result, the SOFA mailing address will change to my post office box as follows: P.O. Box 33399, Dayton, OH 45433-0399. Telephone number (513-252-3001) will remain the same for the present time (i.e., the phone company should tell you my new number when a move occurs). My plans for the future are uncertain at the moment and do not exclude transferring out of the area.

GAS VERSUS COAL FORGE:

On my trip out West following the 1986 National Convention I stopped off at Fire Mountain Forge in Eatonville, WA, stomping grounds of Terry Carson and Darryl Nelson. They now do almost all of their forging using a homemade LP gas forge, commenting that at one time they were probably the biggest users of blacksmithing coal in the Pacific Northwest. Based on my discussions with them at that time, and during the last Quad-State, some of the comparisons of a gas over coal forge are:

- CLEANER: It is far cleaner than a coal forge. No coal pile, no coal dust, no fly ash, no clinkers, way less scale buildup, no smoke inside the shop, and probably the fumes are not as potentially harmful as coal (no black boogers). Both said their clothes and the shop stay far cleaner.

- LIMITED VENTING: In fact, their forge is not even vented, making a gas forge practical for a garage or basement if adequate cross ventilation can be provided. Also, no coal smoke or soot to disturb the neighbors. If venting is required, an old range hood should work.

- FUEL SOURCE: LP gas is readily available. While they now have a bulk tank installed, they started using camp trailer size (5 lb) bottles. These were unsatisfactory in that they had to be filled often and tended to freeze when a large volume was drawn out quickly (actually, to handle this, they sat the tank in a tub of water which also kept a few beverage bottles cold). The fuel is also available in small quantities. Previously they had to buy coal by the boxcar load with the associated problems of tying up capital, transportation to the shop and resale effort. Now their fuel is delivered to them on a regular basis.

- EASE OF STARTING: To start the forge they merely lit a small piece of paper, put it in the fire chamber, turned on the gas slightly to ignition, started the blower and turned the gas about half open. The chamber took about 15 minutes to get to a good forging temperature.. No fussing with the fire or coking required. If the forge was turned off for a period, relighting was easy (no cleaning out the firepot). The forge would self-start is sufficient heat was still in the chamber. Gas volume was judged by watching the color of flame shooting out of cracks. A blue colored flame indicated excess gas flow.

- CONSTANT, CONTROLLED HEAT: Like a coal fire, the forge temperature is a combination of fuel (gas) and oxygen. However, unlike a coal fire, the gas forge maintained a fairly constant temperature since the air volume did not fluctuate (buildup of ash or clinkers) or the limited supply of coal get expended. Heat retained by the firebricks was also beneficial in stabilizing the temperature.

- VERSITILITY: Both work out of the same forge, one front and one back. Try that with a coal forge! During the beaver trap workshop someone commented, I assume

in jest, they would share their wife with someone before their forge. It appeared three or more people could use the same forge as long as the work pieces didn't interfere with each other. At one point Terry was doing a forge weld while Darryl was doing a forging operation, neither getting in the other's way.

- TIME SAVINGS: While probably not a major savings, some time is gained in not having to tend a coal fire (or in my case, starting over or trying to salvage a burnt piece).

- BURNING OF MATERIAL: Due to the constant temperature pieces could be left in without fear of them burning. Thus, they could work on two or more pieces at one time without having to keep one eye on the piece(s) in the fire. I suspect you could estimate temperature at various shut off value settings by judging the color of the metal after a sustained heat.

- HEAT TREATING: The gas forge would make extended heat treating practical (e.g., bring a piece of metal near a certain temperature and then gradually lowering the heat). This would be very difficult with a coal forge.

- FINISHING HEATS: The gas forge works much like an oven when the gas is turned off as the bricks retain heat. Work put into the chamber to come to heat prior to application of a finish receives an even heating without further scale or soot being applied - as can happen with a coal fire. With the gas turned off, it makes a terrific cheese sandwich.

- FORGE WELDING: I had heard it was extremely difficult to forge weld using a gas forge. To forge weld they merely turned up the gas a little and increased the air volume. Terry said they could do a series of welds (such as the baskets in a railing they were working on) several times faster than with a coal forge (no playing with the fire to keep it "hot and clean" and the welds were easier (less contamination from the fire). It appeared the gas forge controlled many of the variables involved in forge welding. However, I will note that apparently their homemade forge puts out more heat than the manufactured models. At the national conference one site was set up for heavy forging with four forges (Mankel gas, diesel, coal and theirs). Theirs was the only one which put out sufficient heat to work the large pieces properly. Remember that the gas forges manufactured by Mankel and Centaur were designed for farriers, not blacksmiths forge welding.

- CHAMBER SIZE: This represents a significant disadvantage for a gas forge as the chamber size would make it difficult to handle long, large or odd-shaped pieces, such as scrolls or chandelabras. You need as small of an opening as possible to retain heat in the chamber.

- COST: I cannot give an exact cost comparison as the price of coal and LP gas varies. Buying gas in bulk is far cheaper than refilling portable bottles. At the corner "U-Haul", filling a 30 lb bottle (6 gallons) costs about $9.50 and the bottle will last about four hours. Assuming you would use 50 lbs of coal at 8¢ per pound for this period, the gas works out to about $2.38 per hour versus $1.00 per hour for coal. If bulk purchase and use reduced the gas cost by one-half, or the coal cost doubled, then the cost comparison would be roughly equal. I estimate set-up cost using a 30 lb bottle at $125.00, less if you can tap into an existing bulk tank.

Their forge consisted of the following: LP gas source (30 lb bottle would work for limited operations), standard appliance regulator, 3/8" tubing and connectors, shut off valve, length of 2" pipe 18" to 24" long, about 28 firebricks (obtain at a builders supply outlet), about 12 insulated firebricks (obtain at a foundry supply outlet), two or more speed hair dryer which fits the pipe, and a place to set it on. Darryl commented that setting it on a coal forge was about the best use he could now think of for it.

About 8" from one end of the pipe drill a hole large enough for the tubing to go through with room to spare (angle drill bit after the initial drill through one side or drill two holes side by side). One end of the tubing is crimped down to a nozzle slot opening about 1/2" wide and 1/8" high. This end is inserted into the pipe so the nozzle is flush and centered in the longer end of the pipe. The hair dryer goes in the end closest to the hole for the air source (Darryl said he thought the pre-heated air helped combustion, however, a small squirrel cage blower might work as well. It might also be possible to install some type of afterburner system to increase the temperature in the chamber. Further refinements (e.g., multiple burners or a pilot light) are also possible).

The forge chamber starts with one layer of 12 bricks (4 x 3) for the base with at least the two inner ones being insulated bricks. Stack three insulated bricks on their side at both sides of the inner bricks, 1/2" inside both sides of the bottom bricks. The inside opening of the pipe should be recessed about 1" into (not out of) the sidewall. Put two insulated bricks across the top and fill in around the sides with the regular firebricks. Now fill in the front and back with regular firebricks. Remaining firebricks should be pyramided on top. The final chamber size should be 1" less than one firebrick lengthwise, two deep and three high (stacked sideways). Without the insulated bricks, your chamber may not come up to forge welding temperature. Work is put into the chamber by sliding the bricks in front and back aside as required to make an opening just wide enough for the work to be inserted. Simplicity itself!

CONCLUSION: With all of these advantages over a coal forge, would I recommend going to a gas forge? Probably not for the majority of smiths. It seems best suited to Terry and Darryl's situation. They run theirs about eight hours a day so their usage justifies a large bulk tank. They do few jobs which don't fit into the gas forge openings (e.g., they do a lot of animal heads or straight gate pieces). Both operate out of the same gas forge, so they have avoided two coal forges. Also, good coal is both difficult to obtain and expensive for them. The size restrictions would mean the typical smith would still require a coal forge set-up, although they would largely compliment each other (i.e., using a coal forge for what the gas one wouldn't handle). For the part-time or hobby smith, having to buy a bottle of gas for each four hours of forging would seem a definite constraint, both in logistics and cost, unless they already had an existing LP tank to tap into.

CAUTION: EXTREME CARE MUST BE TAKEN WITH A GAS FORGE TO PREVENT EXPLOSIONS OR ASPHYXIATION. Made sure all connections are tight (brush with soapy water to check), don't flood the chamber with unignited gas, don't set it on a flamable surface and provide adequate cross-ventilation. The gas should be shut off at the tank when not in use or, if tied into an existing bulk tank, double shut-off valves used. Use essentially the same safety precautions as with a gas stove without pilot light.

EDITOR'S NOTE: I have tried to duplicate Terry and Darryl's gas forge but have not been able to get it to forge welding temperature - am about 100° to 200° low. Is there an "gas engineer" among the membership who can give me some assistance?

REPORT ON THE 1986 QUAD-STATE BLACKSMITHING ROUND-UP:

The 1986 Round-Up was another in our continuing series of successful conferences. What started out as a small gathering of blacksmiths from Ohio, Kentucky, Indiana and Michigan has grown into a "Mid-West Regional Blacksmithing Conference". It was not unusual to see license plates from Tennessee, Georgia, Illinois, Pennsylvania, Wisconsin or even one from Canada.

Friday evening activities were hindered by rain storms but, fortunately, they came after most of the site had been set-up. Just put a damper somewhat on the usual Friday night camaraderie around the U-Forge area. Except for brief and light showers on Saturday, the weather for the rest of the event cooperated with Sunday being a pleasant day.

The demonstrators did an excellent job:

Dick Franklin's basic blacksmithing sessions drew praise from those attending - which was anticipated by those who have seen Dick demonstrate at local meetings or at Carriage Hill where he heads up the blacksmith shop. Dick started with the basic "This is a cross-pein hammer..." and progressed through forge welding and other more advanced processes.

Beau Hickory (Chino Valley, AZ) concentrated on basic ornamental ironwork usually using smaller stock to illustrate his techniques. He demonstrated several different techniques for making scrolls. We were delighted to have an impromptu demonstration of rope tricks by Beau and his wife Tennell. They are active in the national rope trick association and impressed the spectators.

Terry Carson and Darryl Nelson (Eatonville, WA) kept their spectators attention with various animal heads and the three-hour gate on Saturday afternoon. The gate turned out to be a ram's head garden gate which your Editor purchased at the auction. Now I just need to start a garden and build a fence to incorporate it into. The homemade gas forge didn't work as well as expected for reasons unknown. It used more gas than anticipated (but that may have been due to leakage - at one point we made a gas nipple by drilling a hole in an iron bolt and cutting the head off - high tech. blacksmithing!). The gas lines also became heavily frosted, something they had not experienced before. However, they did demonstrate the practicality of a homemade gas forge for blacksmithing.

Al Pendray (Williston, FL) kept his standing-room-only crowd entertained with his casual "southern" style of presentation as he worked his way through a finished damascus-pattern knife blade while discussing his wootz casting process.

Last but not least, our own Ron Thompson (or was it Ron Thomas, or Don Thompson or nospmohT noR?) demonstrated how not to do various castings using the forge as a foundry. Murphy was apparently in attendance at Ron's demonstration.

The Ladies Rolling Pin Throwing Contest kept everyone "heads-up" as some negative scores were recorded. The ABANA Executive Secretary, Ruth Cook, even managed to throw one in the coal bin on the other side of the U-Forge area. The event was won by Heidi Sommer, receiving a very nice rug donated by Ruth Studebaker. Second place went to Ginny Higgens and Ruth Cook took third place (once she got her aim straightened out).

The auction on Saturday evening didn't contain as much material as last year nor was the biding as active. Still, It provided additional funds for the SOFA building fund. Ask the auctioneer, Ham Hammon, about the practical joke pulled on him at the Round-Up.

The Saturday evening entertainment was a tongs making contest with a team representing Indiana (Tom Sanders and his apprentice Mike Shultz from Conners Prairie), Kentucky (Danny O'Brien and Mark Amick - from Indiana but representing Kentucky), Michigan (Scott Lankton and Tim Armentrout) and Ohio (our Vice President Duane Wegley and Ron Porter (from Indiana also)). The winning tongs were by Tom and Mike, beating out Scott and Tim by the equivalent of two minutes. Tom and Mike did theirs in 30 minutes, which tied the time of Danny and Mark. Michigan took second (best pair/longest time), Kentucky took third, and pride prevents me from disclosing the last place team - oh well, we were good hosts. Everyone seemed to have a good time cheering on their team and we expect to do this type of thing in the future again.

Following the tongs contest, Mark Bokenkamp, Joe Bonifas, Jack Brubaker, Terry Carson, Steve Wooldridge, Clifton Ralph, Ron Porter, Dave MacDonald and Larry Wood got together in the Wagon Shed to make a group project sculpture, for some reason titled "Mass Consumption". It was presented to SOFA for next year's auction.

I am told the Southwest Ohio Speakers Bureau did two excellent Saturday presentations for the spouses on Family and Small Business Financial Planning and Self-

Improvement. The Sunday morning speaker on Child and Teen Development and Mental Retardation developed car trouble in Indianapolis on Saturday and had to cancel out. The spouses went to craft and hobby sharing on their own.

Our host, Emmert Studebaker, was presented on Sunday morning with a copy of the Arrowsmith Plaque featured on the cover of the Spring 1984 Anvil's Ring and in the 1985 ABANA calendar. The plaque was presented in appreciation for the support he provides to SOFA. To our knowledge, no other blacksmithing group in the country has anywhere near the quality of facilities which Emmert makes available to us.

Attendance was down from last year, dispite a sizeable number of walk-ins on Saturday and Sunday. Whether this can be attributed to being in the same year as the national conference or the fact we didn't send out an advance notice several months prior to the registration forms is not known. Still, we consider it to have been well attended.

With the 1986 event being history, we are already starting to think about next year. If you would like to see a particular demonstrator or demonstration, please let one of the group's officers know and we will see what can be worked out. Likewise, any suggestions for improvement or changes in our basic format would be appreciated.

THOUGHTS FROM A BLACKSMITH'S WIFE:

It is not often I get a chance to attend your monthly meetings. I work hard at my own profession, and have my own thousand and one projects to complete. Luckily, I also love metals and have a feel for quality workmanship.

Being married to a blacksmith has helped me develop a critical eye, and an appreciation for what it takes to give steel and iron its final form. For me, it is fun. I love spending hours at the shop, watching Dave work, and maybe contributing an idea here and there.

At the last Quad-State meeting, I saw a lot of familar, friendly faces, and many new artists which I had heard Dave talk about, but had never met before. As usual, in the short time I was there, I felt I had learned a lot.

I just want to say I'm always impressed by the wonderful work which you gentlemen - and ladies - create. Please keep it up.

Signed: Mona MacDonald

HEAR YE! HEAR YE! HEAR YE!:

Smiths interested in building their own forge may be interested in a seven page article on forge building from the newsletter of the Mid-Atlantic Smith's Ass'n. Covers forge set-ups and exhaust systems. On one exhaust system the builder noted, "I have an 8" chimney on the forge. Most people will recommend a 10". On a good day though, I can suck dogs and small children right out of the shop". Reminds me of the brag a fellow smith made that his chimney drew so well he tied a safety rope around one ankle. For a copy of the article, send me 39¢ in postage. In a similar vein, Walt Hull in the newsletter of the Blacksmith's Ass'n of Missouri gave plans for a stack-scrubber which runs the exhaust through a chemical solution. He said it doesn't work as well as he had hoped but the article may give others ideas. For a copy send me a 22¢ stamp.

In the reader's tips section of a recent issue of Handyman magazine, one reader recommended using building bricks with holes in them as tool holders. Glue a piece of

cardboard on one side to keep chisel, large drill bits, etc. from falling through when it is moved. Weight keeps it from being knocked over easily. One brick will hold eight items in the holes.

As editor, I receive copies of the other ABANA chapter (and some non-affiliated blacksmithing groups) newsletters. They contain a wealth of information, only a fraction of which I can pass on in this newsletter. I will loan these newsletters to active smiths on the following basis; 1) loan period will be one week, 2) pick up and return to my residence (about a computer paper box of material), 3) newsletters must be returned to proper sequence if any material is reproduced, and 4) copyrighting is respected. If you are interested, contact me at 513-252-3001 most weekday evenings after 5PM and weekends. We also send a copy of our newsletter to these other groups and some have reproduced items originating in it in their newsletters. Thus, material submitted for publication receives attention beyond SOFA members.

The TV interview (with Beau Hickory and Dick Franklin) taped at the start of the Quad-State will be aired on December 13th. Area, station and times are: Akron, WAKR, Ch 23, 7AM; Cincinnati, WLWT, Ch 5, 7AM; Columbus, WBNS, Ch 10, 7:30AM; Dayton, WHIO, Ch 7, 7AM; Fort Wayne, WKJG, Ch 33, 7 AM; Lima, WLIO, Ch 35, 7:30AM; Toledo, WTOL, Ch 11, 7:30AM and Zanesville, WHIZ, Ch 18, 7AM. The program is called "Agri-Country" and is sponsored by Marathon Distributors.

BLACKSMITH WANTED for agricultural museum shop in 1920's circa setting. Contact Patrick T. Winstead, Personnel Director, P.O. Box 1609, Jackson, MS 39215.

BLACKSMITH WANTED to operate his/her own shop in established retail tourist market. Shop is in ideal location. Contact: Tommy Wipf, Old Town Square, P.O. Box 688, Silverton, CO 81433 - 303-387-5705.

BLACKSMITH WANTED. Immediate opening for full-time (40 hour week, 50 weeks a year) blacksmith in contemporary production shop. Beginner and advanced men and women smiths will be considered. Send resume and salary needs to: Jack Brubaker Blacksmith, RR #2, Box 102A, Nashville, IN 47448; or for more details phone Susan at 812-988-7830 (Mon.-Sat., 9 AM - 6 PM).

BLACKSMITH WANTED. The Yellin Metalsworks is looking for a full-time blacksmith/metalworker. Contact: Jack Andrews at 5520-24 Arch St., Philadelphia, PA 19139 - 215-472-3122 (Thursdays and Fridays). Some experience required.

Received a request from a member that the following be demonstrated at one of the monthly SOFA meetings: forging muzzleloading rifle parts, demonstrations showing items such as Peter Ross demonstrated at the 1985 Round-Up and the making of anvil tools and other related smithing tools. If you would like to volunteer, please contact one of the SOFA officers.

ARROWCRAFT: Regional handcrafts - traditional and contemporary, Gatlingburg, TN has a position available as shop manager. Art/craft & business/merchandising background and experience required. Contact: Kay Pirrong, 8 Carol Road, Westfield, NJ 07090 - 201-654-6715 or send me a 22¢ stamp for the job description.

I received a phone call from Findlay member Dave MacDonald. He has received a very large commission for a set of gates and says he is now backlogged with work for at least a year and a half (and may have to take on help). Dave started as a farrier but has now transitioned almost entirely into blacksmithing, mostly obtaining business on a word-of-mouth, reputation basis. Dave says he is heavily influenced by Albert Paley so the gates should be rather interesting (including using square tubing to reduce the weight).

In a recent issue of the newsletter of the North Carolina Chapter - ABANA, one member related how he had picked up business making armor for the local chapter of the Society for Creative Anachronism, an organization dedicated to reliving life in the

the Middle Ages. The newsletter also contain a sketch for making a suit of armor using 16 gauge metal. For a copy send me a 22¢ stamp. There is a chapter in Dayton, centered out of WSU, I believe.

The deadline for submitting an application to run for one of the vacant ABANA Board of Directors seats is midnight, November 29th. For an application, contact Hans Peot at 845-9934.

Christmas cards featuring blacksmithing scenes (three) are available for $6.00 per dozen from Bob Morris, Box 85-A, Mingo Church Rd., Finleyville, PA 15332. The inside inscription is also blacksmithing-oriented. These are nice cards.

Reminder that the National Building Museum exhibition "Samuel Yellin: Metalworker" will be at the Allen Memorial Art Museum, in Oberlin, January 19 - March 2, 1987. Let the editor know if you would be interested in carpooling up on a Saturday.

Member Bob Morris sent in a newspaper clipping titled "Briton turning rust to iron". It says scientist Ian Ashdown has devised a way to electrically bombard a metal object in a vacuum with hydrogen molecules which interact with the ferrous oxide or rust converting it into hard iron. The object resumes its original shape and size (so it says). For a copy of the article, send me a 22¢ stamp.

Emmert Studebaker would like to sell the 50 - 60 lb Williams-White power hammer (by the main shop door) for $1,850. He will also sell the wheelwright floor mandrel (outside the main shop door) for $200. Phone 513-223-3102.

Foot hammers based on the plans offered by A.B.A.N.A. are available from Bob Wozniak (P.O. Box 3501, East Chicago, IN 46312- 219-397-5218) for $450.00 F.O.B. Allow for about six weeks assembly time.

SHOP TIPS AND TECHNIQUES: (When a shop tip or technique from one newsletter has been repeated in another newsletter (and I picked it up from there), the original newsletter is cited as the source. In most cases, these tips and techniques have been paraphrased from the original write-up or illustrations for consistency of format. While the information presented in this section (and elsewhere in the newsletter) is believed to be accurate, S.O.F.A. and A.B.A.N.A. bear no responsibility for injuries or other adverse actions which may result).

- REPOUSSE TIP: Rather than work your repousse over a sheet of lead (which is expensive and often difficult to acquire), take a large pan about 2" deep and fill it with scrap lead. Level the pan and then level the lead with a torch. Hammer all you want over the lead filled pan. When it becomes deformed, simply level it with the torch and resume hammering. In the repousse department of Kenneth Lynch and Sons, the "pans" are old tank heads about four feet in diameter. (By Kenneth Lynch, Sr. from the newsletter of the Rocky Mountain Smiths).

- I wanted to mention a couple of new products I clamped onto. "Tuf-Oil" is a new product which is an oil with sub-micron particles of teflon held in suspension by an additive which also serves as a cleaning agent. The teflon particles fill porosity in any metal-to-metal surfaces. My pneumatic die grinder has never run so fast and smooth as it did after three drops. My 50-lb Little Giant also seems to perform much better after a few drops of Tuf-Oil. It is available from Flouramics Inc., 103 Pleasant Avenue, Upper Saddle Ridge, NJ 07458. It's about $2.00 per ounce, perhaps too high priced, but sure seems to be worth it. ... Another product seems to be the trick for loose hammer handles. It is called "Chair-Loc" and is available for $1.98 from Paxton Lumber Co. in Albuquerque and surely elsewhere. It's guaranteed to permanently swell wood. A few tiny holes drilled down into the handle from the eye and the "Chair-Loc" worked into them with a broom straw seems to have solved my rattling hammer-head problems. (By Robb Gunter from the newsletter of the Southwest Artist-Blacksmith Ass'n).

BASIC METALLURGY

CHEMICAL TESTS

Many smiths do not use chemical tests thinking they are too complex. Actually many are simple and exceedingly accurate and require only keeping some small bottles of test chemicals on hand for use when needed. Every maintenance department should have a "test kit" on hand ready for use.

1. **TO DISTINGUISH MONEL FROM INCONEL.**

One drop of nitric acid applied will turn blue-green in one minute on monel, but will show no reaction on inconel.

2. **TO DISTINGUISH STAINLESS STEEL FROM OTHER STEELS.**

Mix a solution of 94 per cent wood alcohol and 6 per cent nitric acid. Apply a drop and in one minute time unalloyed steels will discolour, but stainless steels will show no discolouration. A 10 per cent nitric acid solution will also etch carbon and mild steels almost immediately but not stainless steels.

3. **TO DISTINGUISH MAGNESIUM FROM ALUMINIUM.**

A zinc chloride and water solution (such as most acid type soldering fluxes) or muriatic acid and water will immediately blacken magnesium and will show no reaction in contact with aluminium. A drop of silver nitrate will turn magnesium dark but not aluminium.

4. **TEST FOR SILVER**

Sulphuric acid (or egg yolk) will turn high silver bearing materials green.

5. **TO DISTINGUISH BETWEEN NICKEL-CHROMIUM STAINLESS STEEL AND STRAIGHT LOW CHROMIUM STAINLESS STEEL.**

A few drops of 45 per cent phosphoric acid will bubble on low chromium stainless steel.

6. **TESTS FOR MOLYBDENUM IN STEEL**

One drop of concentrated hydrochloric acid is left on the polished surface for three to five minutes and then absorbed on filter paper. One drop of 10 per cent stannous chloride is placed on the paper. A few drops of 10 per cent potassium thiocyanate solution are placed on a second paper and the 2 **PAPERS HELD TOGETHER.** If Molybdenum is present a pink or light red occurs with a 0.2 to 0.5 per cent and brownish red with higher content.

7. **To distinguish high molybdenum stainless steel (such as types A1S1 316 or A1S1 317) from non-molybdenum bearing stainless steels.**

Immerse the stainless steel in a 10 per cent solution of nitric acid which has been heated to approximately 160 deg.F. If bubbles occur, the stainless steel does not contain molybdenum.

8. **TO TEST STEEL TO DETERMINE IF IT CONTAINS NICKEL.**

One drop of nitric acid (concentrated acid plus 50 per cent water) is left on the polished surface for afew seconds and then absorbed on to filter paper. A solution made with 1 gram dimelhylglyoxime, 60 cc 80 per cent acetic acid with 30 cc concentrated ammonia is dropped on to the paper. The acid stain will go to a reddish brown colour.

If the colouration can be removed on washing in running water, the steel is nickel free. A permanent clear red stain indicates the presence of nickel. A faint discolouration could be only a trace element due to the sensitivity of this test so only strong colouration should be considered.

SPARK TESTS

The spark test can be a reliable method of classifying metals since any deviation in composition changes the spark characteristics. When a metal is held against a grinding wheel small fragments are torn away. These are removed with such friction that they become incandescent. The difference in the pattern of the spark stream can identify the metal.

WHITE CAST IRON: Sparks will show a very small amount of red at the wheel turning to a straw colour with an average stream of 18 in. The sprigs are small and repeating.

MALLEABLE IRON: Sparks are straw yellow with shafts about 30 in. in length ending in sprigs.

GREY CAST IRON: Sparks are red turning to straw colour with a stream length of 25 in. The volume is small with many sprigs.

CAST STEEL: White sparks about 70 in. in length with a large volume. The shafts are short with forks and appendages. The higher the carbon content the more numerous the forks.

MILD STEEL: Sparks are in single straigt lines without branching and are yellow.

HIGH SPEED STEEL: Small intermitted linear sparks of red to dark red colour. A little branching near the ends.

High carbon steel.

.2 per cent C: simple branching.

.75 per cent C: White with much branching and some secondary branching.

1.25 per cent C: Secondary branching throughout entire length — white.

1.5 per cent MN: Manganese content causes branches to shoot out at right angles.

TUNGSTEN CARBIDE: Extremely small stream 10 in. in length. Light orange colour.

NICKEL: Very small orange stream 10 in. in length.

STAINLESS STEEL: Moderate stream 50 in. in length straw colour near wheel and white away from wheel. Forked.

CHIP TESTS

A small piece of metal can be removed with a chisel. The characteristics of the chip can tell much about a metal.

GREY CAST IRON: Chips are smooth, brittle and about 3/8 in. in size.

CAST STEEL: Easily chipped and the chips can be continuous if desired.

ALUMINIUM: Chips are continuous but leave a saw edge where chipped.

WHITE CAST IRON: This metal is so brittle that the chips are small broken fragments.

MALLEABLE IRON: Rough tough chips of about 1/4 in. to 3/8 in. in size.

HIGH CARBON STEEL: Chip has lighter colour at edges than mild steel. Chip can be contiuous.

RING TEST OR SOUND TEST

This test in general is limited to hardness. For example it can aid in distinguishing a hardened or heat treated steel from a soft or annealed steel. Heat treated or hardened steels have a clear ring, while soft steels have a dull sound.

MAGNETIC TEST

One of the best and easiest to use methods for quick determination of metals is by the use of a common magnet. Some of the magnetic qualities of metals follow:

MAGNETIC: Nickel, Steel, Carbon Steel, Cast Iron, Malleable Iron, Straignt Chromium Stainless Steel and Low Alloy Steel.

SLIGHTLY MAGNETIC: Monel, Work hardened Manganese Steel, Work hardened Austenitic Stainless Steel and Stainless Steel with large amounts of Ferrite.

NON MAGNETIC: Manganese Steel, Bronze, Nickel Silver, Austenitic, Stainless Steel, Brass, Aluminium Brass, Pewter, Zinc Alloys, Aluminium Alloys, Magnesium Alloys, Lead, Silver and Tin.

WEIGHT TEST

The weight test is often of great value in distinguishing between metals. For example, zinc die castings and aluminium die castings often look alike.

However, zinc is substantially heavier than aluminium, thus weight will quickly distinguish. Tungsten carbide tools that are used to machine steels will sink in mercury but those used to machine cast iron have a lower specific gravity than mercury and thus will float in mercury.

The following chart shows the pounds per cubic inch of many metals.

Aluminium	0.09751
Brass	0.310
Copper	0.0324
Steel	0.2844
Stainless Steel	0.2829
Cast Iron	0.258
Lead	0.4097
Zinc	0.2577
Nickel	0.3216
Monel	0.319
Tin	0.2637
Magnesium	0.0628
Nickel Silver	0.320
Sintered Carbides	0.5510

CONCLUSION:

The author hopes that the information contained in this paper will assist workshops in identifying metals when necessary. An accurate analysis of metals can often prevent failures and errors.

It is suggested that shop mechanics make some practice runs using these methods since the time spent will be well justified by more accurate metal identification.

Reprinted from the Australasian Manufacturer, November 29, 1969

- WELDING HELP: If you are learning to arc weld, find someone near you who is a good welder and ask for a few pointers and techniques. Most are more than willing to help if you just ask. (By Ron Porter from the newsletter of the Indiana Blacksmith's Ass'n).

- POST DRILL AS TAP DRILL: For all you with post drills but were never really sure just what to do with them, I have come up with a super use which is very practical and very useful. Not only is it good for drilling but for thread tapping also. Insert a tap like a drill bit and tighten firmly. You may want to shop around for a drill chuck if yours is not already equipped with one for they give you much more versatility. Lay piece to be tapped on table or in vice and align into hole. Clamp piece tightly. (Note: Do not use automatic feed, your tap will self feed). Use Tap Magic or oil as a lubricant. When through, your threaded hole will be straight. This is a great time saver if you have a production run or if you just need accurate threaded holes. (By Bob Wozniak from the newsletter of the Indiana Blacksmith's Ass'n).

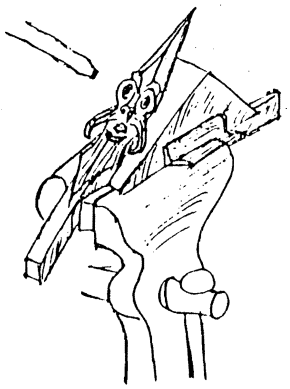
- ROUND VS SQUARE VOLUME: To estimate volume of iron for forging you can figure that for a given length of iron, round stock only has 80% of the volume contained in square stock. (By Cliffton Ralph from the newsletter of the Indiana Blacksmith's Ass'n). (This should also mean that square stock will be 20% heavier than the same length and thickness of round stock. - ks).

- CRAFT SHOP CIRCUIT: Earl McCarthy of Transit Line Forge, Belfast, NY spoke at the annual family picnic about his experiences on the craft show circuit over the past six years. Earl brought examples of the items he sells at these shows and many are reproductions of pieces found in various museums around the country. The price tags identify the origin and therefore make it more saleable. If a person reads that the toaster they are looking at is a reproduction of one found in Sturbridge Village, MA, made by a blacksmith in 1890, then the item automatically becomes more valuable and the price goes higher. The same item without the reference to being a reproduction is not as saleable to the general public. Earl commented that he did very little public demonstrating because of the liability problem facing professional people, businesses, corporations, and conceivably even blacksmiths if someone gets hurt by us or our products. Something for all of us to think about in this day and age of massive lawsuits. Earl stays with relatively simple designs to reduce production time. He is depending on quantity sales of a simple item of high quality as opposed to commission pieces which are usually one of a kind and require infinitely more time to create. He still does hot forging as opposed to cold fabrication as some are wont to do who travel the craft circuit. (From the newsletter of the New York State Designer Blacksmiths).

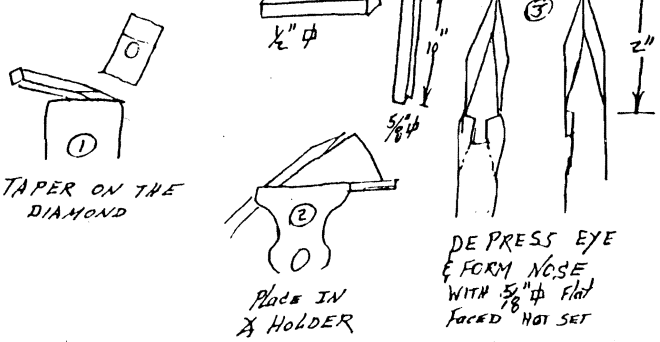
- I recently needed to drill a 1/4" hole in the tang of a large, stainless steel knife. I found the tang had been hardened along with the blade. Standard twist drills only chattered and squealed, even at very low rpms. I tried heating up the spot to be drilled with a torch in an effort to spot anneal the area to be drilled. This only seemed to make the problem worse. I realized that only carefully controlled, complete annealing of the tang would soften it (maybe) and I did not want to go to that extreme for two holes. I thought a harder than usual drill bit might do the trick, so I tried a carbide tipped masonry drill. Using low rpms and cutting oil with a new masonry bit, I was able to quickly drill my two holes. Great care must be taken, however, not to overheat the carbide tip. It is very fragile and merely blazed to the drill shank. Excess turning speed or pressure can make the carbide tip come loose or even crumble. (By Brad Silberberg from the newsletter of the Blacksmiths' Guild of the Potomac).

- Here's a good trick from Ian Eddy. Attach (weld) a vertical piece of 1/2" pipe with a thumb setscrew to your leg vice post. A piece of 3/8" round rod will slide up and down in this pipe and have a plate welded to the top. This plate can be set at various heights and acts as a stop when you need half a dozen pieces bent in the same place. A very handy item. (By Jonathan Herz from the newsletter of the New England Blacksmiths').

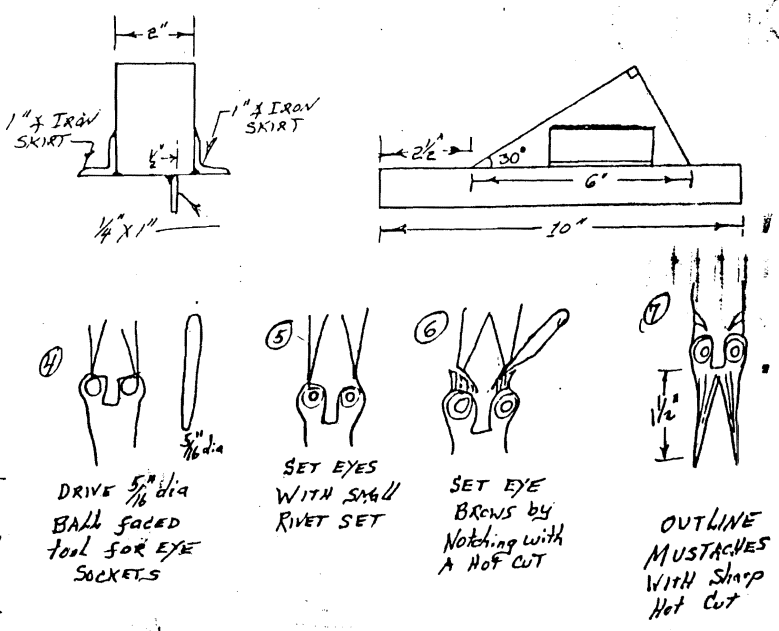
WIZARD HEAD

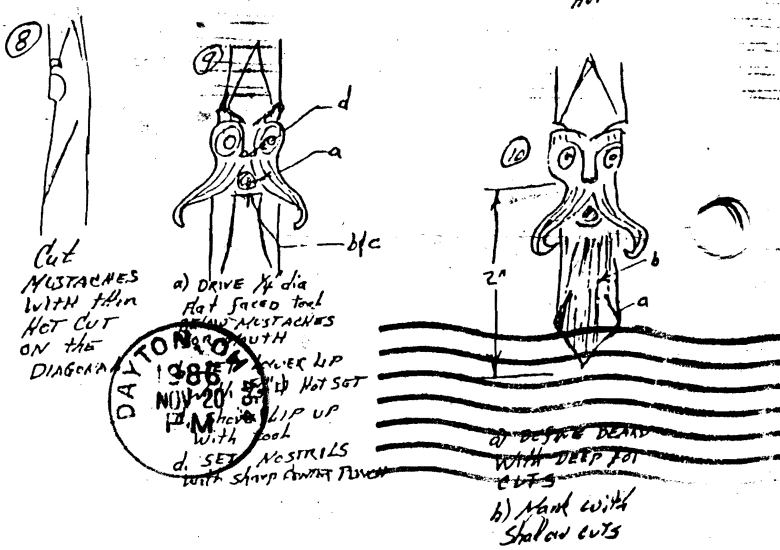


by Ron Smith



ANGLE WORK HOLDER





(From the newsletter of the Alabama Forge Council. Ron Smith demonstrated these at the 1986 ABANA Conference and always had a crowd around his forge. He uses these for poker handles, letter openers, etc. He made it look easy completing one from scratch in what seemed like 15 or so minutes. He does a number of variations of these heads).

SOFA SOUNDS is the bi-monthly newsletter of the Southern Ohio Forge and Anvil (SOFA) Chapter of the Artist-Blacksmith Ass'n of North America (ABANA). Other ABANA Chapters may reprint non-copyrighted material as long as proper credit is given to the original source. Unless otherwise indicated, the material herein was provided by the Editor. Membership in SOFA is $5.00 per year payable to S.O.F.A. in care of the Editor.

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