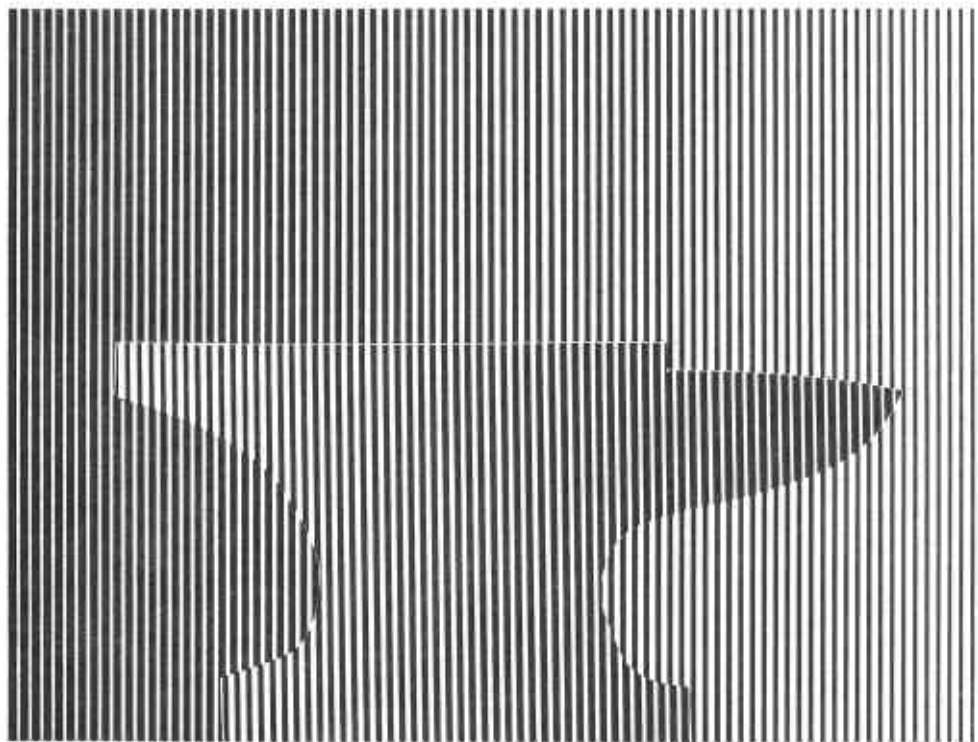


JUNE/JULY 1990

Newsletter <sup>of</sup> the  
Blacksmiths  
Association  
of Missouri



### VOL. 7 NO. 3

The Blacksmiths' Association of Missouri is a chapter of The Artist-Blacksmiths' Association of North America. This organization is devoted to preservation, advancement, and communication between blacksmiths of Missouri and surrounding areas. BAM's newsletter's goal is to support these ideas. Letters to the editor, tech tips, tools for sale, or any ideas which further these ends will be considered for publication.

Occasionally some material included in this publication will be copyrighted and may not be reproduced without written consent of the author. BAM welcomes the use of any other material printed in this newsletter provided the author and this organization be given credit.

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Name: \_\_\_\_\_:

Address: \_\_\_\_\_:

City: \_\_\_\_\_:

State: \_\_\_\_\_ Zip: \_\_\_\_\_:

Telephone: \_\_\_\_\_:

New Member: \_\_\_\_\_: Renewal: \_\_\_\_\_:

Dues are \$15.00 per year, which includes a subscription to the bimonthly BAM newsletter. Please make checks payable to Blacksmith Association of Missouri.

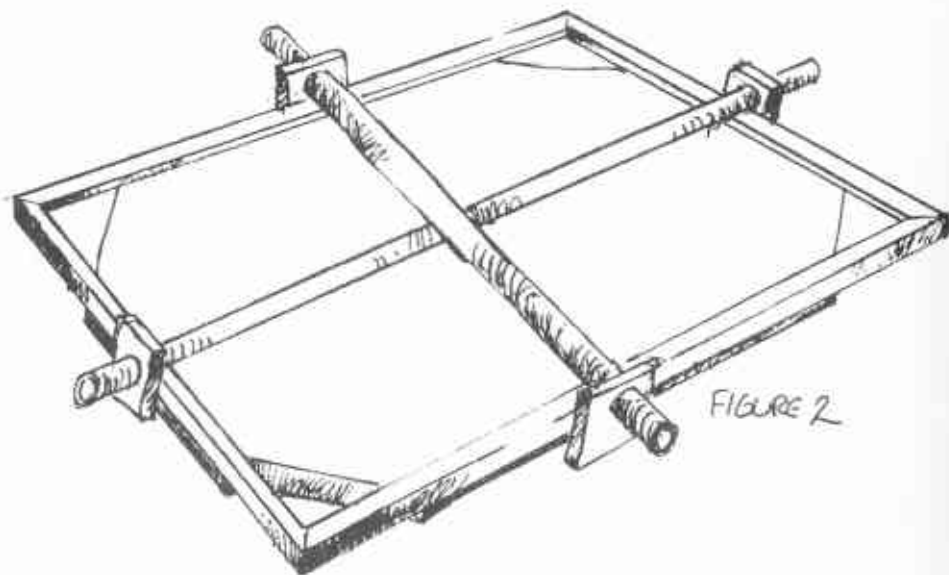
SEND CHECKS TO: Steve Austin  
44 N.E. Munger Road  
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#### MEMBERSHIP RENEWALS

Be sure to check the date on the label of your newsletter. This is your membership renewal date. We will include a renewal reminder in your copy of the newsletter when your membership is due to expire. If the date on your newsletter label is not correct, please notify Bernie Tappel as soon as possible.



tighting head bolts. If you get down on one corner at a time the frame may warp.



## July 28th Meeting

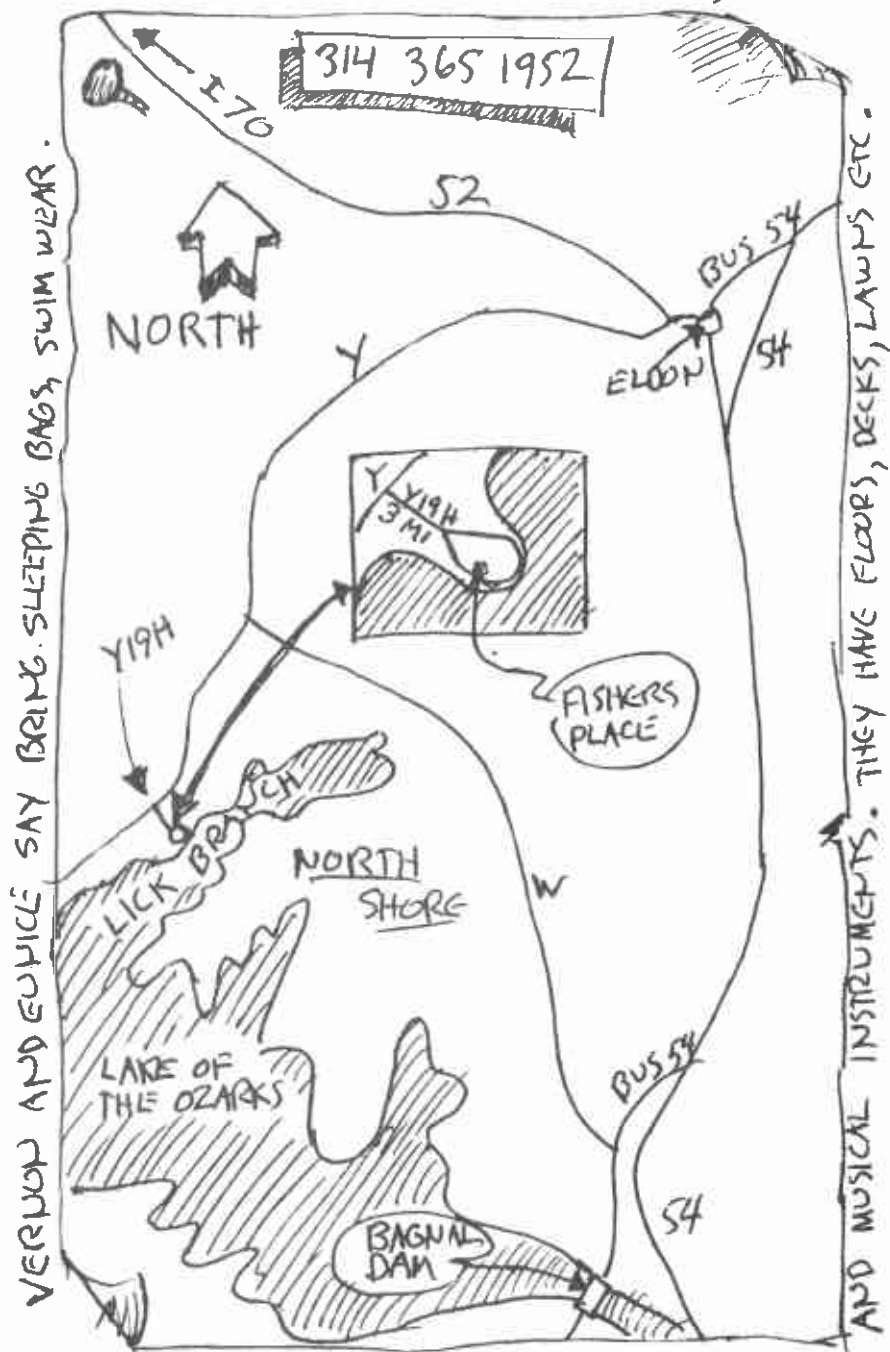
VERNON FISCHER  
 BOX 756  
 Rocky Mount, Mo. 65072  
 314-365-1952

Eunice and Vernon have a beautiful place on the Lake of the Ozarks and encourage all to bring swimming gear, fishing equipment and musical instruments. Vernon's shop is well equipped with a variety of tools not always associated with blacksmithing.

July is the time of elections for BAM Dan Whitmore's term as Vice-President is up so be thinking of his replacement.

The trade item for Vernon's meeting will be a poker.

JULY 28 - BAM MEETING - VERNON FISHER



# ABANA

Artist-Blacksmiths' Association of North America



P.O. Box 1181, Nashville, Indiana 47448  
Executive Secretary, Janelle Gilbert

Office Hours: 7:30-11:30am & 1:30-4:30pm  
Phone: (812) 988-6919

## PRESIDENT'S MESSAGE

June 1990

Dear Friends,

This month's message to the chapters is devoted to an issue concerning the reprinting of Anvil's Ring articles --a discussion that may address future questions and that has most recently come to our attention via the Appalachian Area Chapter.

The controversy concerns the decision by the ABANA Board not to allow Mr. Albert Cannella of the Appalachian Area Chapter to use articles from 10 years of the Anvil's Rings for the purpose of producing a booklet for sale. Mr. Cannella has already compiled excerpts from his chapter newsletter and sold the booklet entitled "Blacksmiths Helper, Vol. 1" for \$8.00 each. \$2.00 went to the Appalachian Area Chapter and \$6.00 was retained to cover his out of pocket expenses. Mr. Cannella contacted me to request using articles from the Anvil's Ring for a second volume using "Tips & Techniques" and "Building Blocks" which after his publishing would entitle him to copyrights. Enclosed is a copy of Mr. Cannella's initial letter which I answered by telephone conversation.

I am very surprised by the misunderstanding that came about after I went to great lengths to explain ABANA's position on the issue to Mr. Cannella. Letters to the editor published in the Appalachian Area Chapter newsletter from Mr. Joe Humble and Mr. Cannella question the educational objectives of ABANA. It is evident that the direction of the ABANA Board on this issue was misinterpreted and I find it necessary to outline the background on the decision in this mailing. I think you will find that there are many facets to this seemingly simple request.

FIRST AND FOREMOST, it is absolutely imperative that ABANA retain a Not-For-Profit status with strictest guidance to disapprove any activities that would jeopardize the organization's qualification with the IRS. While ABANA does not OWN the contents of the Anvil's Ring it falls within the IRS code 503-C3 for the Board of ABANA to oversee and control the use of articles. This means that even a small amount of "reimbursement" for out of pocket expenses by an individual from the sale of a publication does not fall within the IRS guidelines to retain the organization's Not-For-Profit status.

SECONDLY, proceeds from any sale of a publication such as the booklet proposed must be returned to benefit the ABANA membership as a whole since the source of the content is donated to ABANA as shared educational material (i.e. Anvil's Ring articles).

Hans Peot, Secretary of ABANA, as many of you know is currently compiling tips and techniques to have ready for our members. This volume will be targeted for the beginner blacksmith. Hans has been working on this for almost a year now. Proceeds from this project will be put back into our educational funding to benefit ALL the membership and ALL the ABANA Chapters. There are other people who have donated articles to the Anvil's

Ring that would like them put into a book. Bud Oggier's "Foundations" and Dorothy Stiegler's "Building Blocks" are to name a few. All proceeds, if any, from these booklets will be used to promote the art of blacksmithing through the perpetuation of funds for ABANA services and projects.

FINALLY, I have asked Mr. Cannella to abandon the idea of using these articles from the Anvil's Ring for the contents of his book for the reasons listed here. We understand that he is interested in the spirit of sharing information and helping beginners. With this in mind, the opportunity to do just that is open if Mr. Cannella would like to assist Hans Peot in the writing of the beginner techniques booklet. I'm sure that if Mr. Cannella's intentions are purely to achieve this spirited goal as stated in his editor's letter --and we have no reason to believe otherwise-- we could all benefit by his input. Leonard Masters of the ABANA Board of Directors has already suggested this and I think it's a fine idea. Mr. Cannella...?

IN SUMMARY, the ABANA Board of Directors has tried to be very careful to keep the organization on the right track by promoting the art of blacksmithing within the guidelines of the by-laws and the legal system. I do hope that past ABANA president, Joe Humble, of the Appalachian Area Chapter --and any other past board member-- will be better informed in the future so as to support the Board's efforts in keeping with IRS regulations; realizing how detrimental it can be to jump too quickly to conclusions. I did not respond immediately to Mr. Cannella's request because the ABANA Board was working to consider all the ramifications involved. It is our duty as stewards of the property of ABANA to make decisions for the benefit of the organization as a WHOLE.

We are sorry to hear that Mr. Cannella stated "I see no value in remaining a subscriber to it (The Anvil's Ring)," after receiving the board's decision. We feel there is far more value to being an ABANA member than for the resource of reprinting articles from our magazine. Instead we hope that Mr. Cannella will re-direct his energies with the same goal in mind by assisting with the organization's beginner technique booklet to achieve a more global spirit of sharing.

I look forward to seeing many of you at the upcoming ABANA Conference at Alfred, New York on June 27th. Many thanks to Charlie Orlando and his Conference Committee for being attentive to so many important details!

Warm regards,

  
Dorothy Stiegler  
ABANA President

# COAL BUY

At our May 12th meeting in Union, Doug Hendrickson presented a workable coal buy plan which the members present strongly approved. Here's how it goes.

1. BAM front the money for purchase and transportation of up to 20 tons of coal (50# bags) to Lesterville, Mo.
2. The coal will then be sold back to the membership to replenish the bank account.
3. A small fee beyond the coal cost should be charged members.
4. A larger fee should be charged to non-members.
5. When the coal gets to Lesterville a post card will be sent to the membership. First come, first served.

As of this writing the complicated process of dealing with a Mom & Pop coal yard 300 miles away is well underway. Stay tuned.

# May 12 Meeting Report

As you all know we have had some rain in Missouri lately. May 12th in Union was no exception. A little rain, a little sun, and lots of Blacksmiths, all in all a typical spring meeting weather wise. The atypical thing about this meeting was a demo and discussion about forge welding a cable knife billet by Roy Warden and J. V. McCrackin. Many of us have seen cable knives in their finished state but few understood the details. These two fine blade smiths will again demonstrate their skills in March at the two day knife making workshop in Edwardsville. I hope I get it next time. Walt Hull and Jerry Hoffmann each demonstrated their approach to forging tongs. I'm always amazed by how many ways a simple tool can be made. Jerry, with the help of striker Bill Miller, used a butcher to begin the shoulders. Walt used the edge of the anvil. Jerry forge welded the mild steel reins on while Walt feels spring steel reins are the way to go.

There must be as many ways to feed Blacksmiths as there are ways to make tongs. Colin demonstrated his latest feeding technique by bringing in a portable/mobile pizza baking truck owned by his son-in-law. What a treat! Hot, Hot pizza, Cold, Cold beer and 30 dirty sweaty blacksmiths. I'll never understand why we do what we do. In Steve Baker's absence Dan Whitmore called the meeting to order, traded the hinges, and otherwise dealt with BAM business. The coal buy, raising dues and possibly developing a scholarship program were discussed. You will find the details elsewhere in this newsletter.



## Dues increase for BAM membership Should we do it or not?

BAM treasurer Steve Austin brought up the subject of increasing the membership from \$15 to \$20 or \$25. The rationale for increasing dues is primarily based on the need for paid help in publishing our newsletter. Hiring someone to lay it out and get it printed and mailed would greatly relieve the editor of the pressure of just getting it out. Jim Waller's wife is a designer and has helped us out several occasions. Jackie Waller or someone with her skills would really help the editor maintain quality and get it out on time. For many of our members, the newsletter is the only benefit of belonging to BAM. So I think it's our responsibility to give it our best shot. Another reason to raise dues would be to offer scholarships to several members to study blacksmithing at one of the many craft schools around the country. A scholarship would benefit not only the recipient but also the rest of us in the form of articles in our newsletter and demonstrations at meetings.

Please take the time to register your vote with Steve Austin.

## BALLOT FOR MEMBERSHIP DUES

(Mail to Steve Austin, 44 NE Munger Road,  
Claycomo, Mo. 64119)

- NO increase in Membership
- RAISE membership to \$20
- RAISE membership to \$25
- RAISE membership to \$20 but allow retired folks to continue at \$15.
- RAISE membership to \$25 but allow retired folks to continue at \$15.



# Thanks

---

As you know this is my last newsletter. What am I going to do with all my spare time you ask? It's going to be strange. Most of all I hope to get to know my wife again, read some of Corrigan's whale stories, maybe start that llama ranch I've always dreamed about. Who knows? I'll think of something.

There is no way to thank everyone individually who has helped me get the newsletter out these last 3 years so I'm not going to try. I can, however, remember the folks who consistently and bi-monthly waded through our convoluted publishing process. Thanks Bernie and Patti Tappel for correcting my spelling and typing the whole mess I send you every other month. Thanks Jerry Hoffmann for giving the newsletter visual class with your maps, illustrations, 'grubby little smith', and graphics. Most of all I thank Karen Hoffmann's tongue. Without her talented tongue I would have had to personally lick somewhere between 5,000 and 6,000 stamps.

I gotta  
beat it  
Dr. Iron

## POWER HAMMER FORGING WITH CLIFTON RALPH

With much encouragement and aid by Paul Moffett, we have finished five tapes, approximately 2 hours each, on power hammer forging. They are available for sale or rent. Send \$200.00 (American Currency), check, or money order for purchase or rent of the tapes. If you return the tapes within 30 days I will return \$100.00 There are five (5) tapes, VHS, American Standard mghz.

The tapes cover hammer tools, dies, tool holders, some forging, safety methods and brakes on Little Giant style hammers.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Purchase: \_\_\_\_\_ Rent: \_\_\_\_\_

Allow two weeks for delivery

Send to: Clifton Ralph  
4041 West 47th Avenue  
Gary, Indiana 46408

## A Note from the Typist

by Patti

Just a few lines to give some long deserved credit to Dr. Iron for all of the hours he has put into this newsletter over the past several years. I can tell you he has really burned the midnight oil to produce this great newsletter, which has come a long way from the beginning. With all the writing, re-writing and scratching out (and sometimes the spelling) he was sometimes almost past going but he still remained determined to turn out a great newsletter. It is now time to give him a big hand for all the time he has given to BAM. THANKS Doug for a job well done!

And another Thanks goes to Jerry for the many hours spent on illustrations for the newsletter. This has taken more than a few days away from the wonderful forge work that Jerry is so good at. We know there comes a time when you guys need to move on to bigger things, in Doug's case maybe a llama ranch, for Jerry a publication of his own. To you both, many, many thanks and Good Luck with your future projects.

# Finishes for Metalwork

by Jim Fleming

Reprinted from Forge Facts

When the smith has finished a forging, the creation must be preserved and protected from the elements of weather and time lest in good time no solid part remains.

Very few pieces still exist more than 1000 years old, and those were generally protected within such long standing structures as cathedrals, churches, and public buildings. Even the best kept of these remnants are generally in poor condition if not regularly refinished and kept up.

That examples have survived of the early iron age is due more to the nature of the material itself than to any secrets of preservation. Wrought iron, used since antiquity for articles and architectural treatments, right up until the late 19th century, has locked up within its very structure the secret of its longevity. For wrought iron, unlike metals which are melted and cast from ores (gold, silver, copper, ect.), requires too much heat for the ancient smelters, and could only be softened to a semi-molten condition rather than to a liquid, and remains full of all the contaminants found in the ore and the fuel, including silica, or common sand.

Silica is trapped within the hot metal mass, called a bloom, or pillow, and is removed by forging the white hot, spongy bloom as it cools and is formed into a rough bar. Pockets of silica remain in the bar and are drawn into long strings of glass inside the metal.

Even triple refining the bar still leaves up to 5% silica dispersed throughout the bar, and eventually throughout the finished piece as well. When the finished product eventually rusts, iron flakes away from the surface, revealing a silica layer which of course will not rust, or even oxidize, forming a protective layer over the iron below. This relationship can be best seen on a well weathered wrought iron bar as a wood grain looking pattern which is nothing but the strings of silica once inside the piece, now exposed. This layer can provide a protection which outlasts all modern finishes, probably by hundreds of years, since it is distributed throughout the bar.

Eventually processes were developed to produce large quantities of iron from its ore by fully melting the ore, fluxes, and other agents in a crucible and pouring the resulting liquid into molds, forming ingots, which were rolled into bars and other finished shapes. The casting process afforded far greater control of quality for the iron and its alloy steel, all produced in vast quantities for ever increasing demand and uses. By the beginning of the 20th century, wrought iron was no longer produced, and was generally thought an inferior curiosity of the past. However, the new product lacked the wrought silica inclusions and

was lacking in rust protection. What developed instead were many new alloys which would resist the elements better than iron alone. Nickel and chromium alloys make stainless steels, but are too expensive and difficult to work with to be practical in general use.

For the blacksmith the only option was to find a surface treatment for the finished product which would withstand the elements and protect the forging underneath. Finishes for iron fall under several categories: waxes and oils; paints and polymers; chemical patinas; plating, covering and hot dipping with other metals; and combinations of these processes. Preparation of the surface prior to applying the finish is as important as the finish itself.

The following recipes contain many traditional methods, some individual's favorites, and few departures for new horizons. Try any of these with common sense and caution, observing safe practices (i.e. ventilation, eye protection, gloves, ect.), when dealing with inflammable, caustic or dangerous chemicals. Your experience, comments, or additions are welcome to *Forge Facts* and would help a future article be more broad based.

## SURFACE PREPARATION

### •Sand Blasting

Possibly the best method for removing scale and rust from ironwork. Requires compressed air and an isolated work area to recycle the sand and protect machinery. Leaves the surface a flat steel gray color with all hammer marks

still intact.

### •Bead Blasting

Similar to sand blasting except that the abrasive medium is made up of tiny glass beads. The surface is left smoother and less chopped up, therefore somewhat brighter in color, though still gray.

### •Filing and Scraping

Files and hard metal scrapers will remove scale, rust, and surface irregularities leaving a shiny metal surface the texture of which is determined by how fine a file is used or the size and cutting power of the scraper. This surface preparation was known as armor brightening in the Middle Ages, and was how all armor was brought from the forged state to finish. Removes all hammer marks while emphasizing any deep pits or hammer marks. This surface can be made even smoother with metal cutting sand paper. The wet type used with water works fastest and lasts longer because it resists clogging in the pores of the paper.

### •Wire Brushing

Hand brushing a finished forging while it cools will remove most scale and flux, ect from the metal, leaving a dark finish. A knotted cup wheel brush on a hand held grinder will remove all scale from hot metal as it cools and leaves a burnished dark color. If the cup wheel brush is used at a red heat the surface of the metal itself is removed and hammer marks and scale pits can be brushed right off of the surface.

Once cool the hand brush is rather ineffective and a wire wheel on a stationary grinder or a knotted cup wheel on a hand held grinder works best. The surface is smoothed and polished to a bright steel color.

#### •Pickling

For complex shapes or simply to save time and effort, a chemical rust and scale remover will prepare a surface for further finishing with little hassle. The chemical bath is prepared and stored in non-corrosive containers and can be reused many times. The chemicals used in pickling are hazardous, producing burns to all exposed body surfaces including the eyes and lungs. Use protective clothing and proper ventilation, read instructions on the containers, and be prepared with a plan to react to a spill or injury. Acids are generally neutralized with baking soda, so have some on hand. And, never! add water to acid or it could erupt in your face!

The following recipes will not only descale and derust, but will etch the surface and make it more suitable to hold the finish. The piece will usually be darker and duller when removed, but after rinsing and neutralizing it can be easily wire brushed if a brighter result is desired. Care must be used with timing the dip as these chemicals can etch and pit very deeply if given enough chance. Since the timing varies with concentration(which changes with use) and the temperature(hotter generally works faster), the proper exposure must be developed by practice.

1. Hydrochloric acid	1 gallon
Water	1 gallon
2. Sulfuric acid	1 cup
Water	1 gallon
3. Phosphoric acid	1-2
cups	
Water	1 gallon
4. Sulfuric acid	1 cup
Hydrochloric acid	1-1/4
cup	
Water	1 gallon

## WAXES AND OILS

#### •Some Notes on Finishes by

Tina Chisena

From a round robin discussion at a Tom Joyce blacksmithing workshop at Haystack in 1987. From Blacksmiths Guild of the Potomac Newsletter.

#### •Hot Waxing

Wire brush the piece while warm. Then apply paste wax while the piece is between 300-400 degrees F. A small amount of smoke is acceptable, but if the piece smokes too much, then the wax is only evaporating. The wax will dry as the piece cools, and then it can be buffed with a rag. Try to prevent an accumulation of wax in the deep places.

#### •Linseed Oil

Combine a mixture of 50% linseed oil, 50% turpentine or mineral spirits, and a tiny amount of "Japan drier" to accelerate drying. It can be applied to cold stock or hot work. If applied to hot work, a slight amber color may happen and may be uneven. Two coats are usual.

#### •Oil and Wax Combination

The formula for this mixture is approximately two parts linseed oil, two parts turpentine, one part paste wax, and a tiny amount of japan dryer. It is prepared by warming the linseed oil, the paste wax, and the japan dryer in a double boiler. When this mixture is even and fairly hot, remove it from the flame. Add the turpentine, and stir it to a consistent mixture. Tom applies this stuff to cold iron, but uses the mixture while it is hot. Once the piece to which it is applied has dried, you can buff this surface out. It comes out a bit brighter and tougher than paste wax alone.

#### •Wax and Dirt Antique Finish by Barry Berman

Taught to me by Russ Le Croix Van Norden, an 82 year old blacksmith and a fine friend.

Take an old tin can and melt some beeswax in it- then pour in some turpentine and mix it up. about two parts wax to one of turpentine. Be careful pouring turpentine into can, so it won't explode. When the mixture hardens, you have a good paste. What Russ did was to rub the paste on the piece with his fingers,

using an old tooth brush for the hard to get spots. He then would rub the whole piece in very fine Humboldt County dusty dirt. Then he'd take an old nylon stocking and rub the piece down. It would look like it was 300 years old. I've seen some of the pieces, 10 years old, they still looked fresh, like he just finished them. The secret is having the proper fine dirt. From *The Anvil's Ring*.

•**Liquid Floor Wax** such as "Liquid Gold" and "Future" work tolerably well as interior finishes on iron as they harden to a strong layer and apply easily to cold iron.

•**Paste Waxes** most mentioned are Johnson's and Carnuba.

## PAINTS, POLYMER COATINGS AND SEALERS

#### Sealing Compounds

•**Tectyl 151A** from California Choice Company, Anaheim, California. Seals steel containers on sailing vessels. It is 25 years durable, not a brittle as lacquer, nor as plastic-like as urethane. To use, wire brush the surface and apply by spray or brush. Somewhat thick to apply, and may not be wear resistant.

•**Penetrol** is a product used to seal garden furniture and fences. This product is thinner than Tectyl 151A. It needs three coats or so for an exterior finish. The appearance is similar to that achieved with linseed oil.

•**Val Oil** is a brand name for a mixture of varnish and linseed oil. It looks glossy and plastic-like when sprayed or brushed, and flat matte when rubbed in with a cloth while still wet. This is a good sealer which usually requires only one coat.

•**XIM Clearcote** is used by Detroit to seal chrome bumpers and trim. It requires Xylol to thin and may be brushed or sprayed. It dries quickly to a semigloss finish and one coat usually does the job. Available in gallon cans with a short shelf life once opened.

•**Tru-Test "Enrich"** is a non-toxic polyurethane finish made for wood but protects ironwork well. Available in shiny, satin, and dull "hand rubbed" finishes.

## PAINTS

•**A New But Old Finish** by Bill Callaway

While at a blacksmithing conference in Great Britain I saw a number of works that had a graphite shine. After talking with several British smiths I found that indeed this is a graphite finish and very similar to the stove polish many of us have used. They apply the graphite with a brush over fresh wet paint. The particles of graphite adhere to the wet paint and when the paint dries they rub briskly with a soft cloth which brings out a nice shine. From *SWABA Newsletter*.

•**Unique Color Finishes from Joe Pehoski** by Cathy Borthwick

Clear Shellac	1 part
Denatured alcohol	10-15 parts
Mason colors	1 T/ pint

Mason colors are what potters use to color clay and masons use to color concrete and can be purchased in small quantities in pottery supply houses. You can get the pigment in blues, pinks, whites, grays and browns and depending on how you apply it, you can add a subtle or intense dash of color to your work. This wash needs to be applied to painted metal and shows up best on a black surface. Depending on the look you want the wash can be sprayed, brushed or sponged on. You can then put on a clear coat of lacquer for interior use or urethane for outside applications. From *Arizona Blacksmith's Association Newsletter*.

•**Custom Color Finishes from Myers and Company**

Paint stores often mix pigments in various proportions to achieve any color or tint conceivable. These pigments can be purchased separately and mixed at the shop or job site. One distinct advantage is that these colors mix with any

medium including urethanes, wax, oils, and water making them very versatile. A rust color can be obtained by mixing various amounts of yellow ochre, burnt sienna, and raw umber with the base. To add surface richness the fresh paint can be modeled with sponges, paper towels, feathers, ect. or contrasting colors may be sparingly applied over a dried surface.

Metal powders have been developed which can be dabbed onto the surface of wet or tack dry paint for interesting highlights. These powders are available in bronze, brass, copper and muntz.

## CHEMICAL PATINAS

•**Real Rust Finish** Myers and Company

Sand blast or pickle to remove scale. Sponge, dip or brush straight hydrochloric acid, then wash off in warm water. Neutralize with baking soda, overnight if possible. Coat with hydrogen peroxide, repeating until desired rust is obtained.

•**Rust Finish** by Will Perry

Copper sulfate/water	1:6
Hydrogen peroxide/dishsoap	25:1
Salt/water	1:16

Brush on copper sulfate solution to activate the surface. Apply hydrogen peroxide/soap solution and keep wet with a salt water spray. Keep in a warm and humid environment (like a plastic trash can) separated from the other pieces.

•**Rust in a Rush** by Bill Morrow

Remove scale, oils, ect. Spray on hydrochloric acid and wash off with water. Warm the metal and spray on hydrogen peroxide, repeating the spray 4-5 times or until desired rust is achieved. A humid container will help the process.

•**Rust Pitted 100 Year Old Antique??** by Robb Gunter

It's almost disgusting, but occasionally I've been asked for aesthetic reasons, to make my carefully wire-brushed forging rusted and pitted to simulate a 100 year old rust heirloom or piece of hardware.

My first attempts were very time consuming and produced less than satisfactory results. Now, however, after consulting a chemist friend, I've been able to build up an authentic looking rusted and pitted surface in about 2 hours.

Take your beautifully forged part, free of any oils or fingerprints and dip it in hydrochloric acid (available from your pool and hot tub supplier). This activates the surface. Allow it to air dry. Next, submerge it in a concentrated salt water solution (1 cup of table salt dissolved in 2 cups of hot water) and allow it to air dry. The final solution is fairly nasty and requires some precautions in terms of ventilation. Mix 1 cup of granular chlorine (again from the pool supply) in 2 cups of tap water. Remember the fumes are deadly! dip your part and allow it to air dry again. Rinse your part off in water, blow it dry and wire brush it to remove any loose rust. A good finish is Johnson' Paste Wax. From *SWABA Newsletter*.

### •Browning Finish Solution

Mix 6 ml hydrochloric acid and 8 ml nitric acid together with 1 tsp iron filings. Add this mixture to 25 ml of distilled water. Let the solution sit until the filings have dissolved. Thoroughly degrease the metal to be treated and apply the browning solution repeatedly at about 4 hour intervals until the desired color is obtained (usually 4-5 coats). Metal may be lightly rubbed with steel wool between applications. Finally, rub with steel wool and finish with linseed oil, ect. Treat this solution with the usual respect given to acids. From *The Newsletter of the Blacksmiths Association of Missouri*.

### •Commercial Browning Solution

Antique Brown M-38 is available from:  
The Birchwood Casey Co.  
7900 Fuller Road  
Eden Prairie, MN 55344  
(612)937-7931

### •Greenish Brown Finish Solution by E.A. Chase

The following formula is for a rich greenish brown finish;

Copper sulfate	50% by volume
Sodium thiosulphate	50% by volume
Water	

Add chemicals to water and bring to a boil. Apply the solution hot to pre-heated and well wire brushed iron. Iron should be hot enough to boil off water. Brush solution on with successive ap-

plications, keeping metal hot, until desired color is achieved. Rinse thoroughly with water and let dry. Be certain all solution is removed as it is corrosive. After drying, wax for indoor use or varnish with a good quality urethane for outdoors. The color will darken with final finish. From *The Anvil's Ring*.

### •Red Rust Finish by Doug Carmichael

My most used finish for iron work I learned from Carl Jennings. It is very satisfactory for interior work.

Copper sulfate	1/4 cup
Water	5 gallons

Strong solutions on clean, wire brushed iron will do a light copper plating effect. Weaker solutions left for short time will just darken the iron; left for longer periods will turn the iron red. Wax for interior or urethane coat for outside. From *The Anvil's Ring*.

## METAL COATINGS FOR IRON

### •Metalizing Machines

Melt wire, and spray the liquid metal onto objects. The type of wire, distance from which it is sprayed, and the temperature of the object being sprayed can vary the results.

### •Gold Leafing

This traditional finish for the highest quality ironwork is rarely used today, perhaps because of the expense of the gold leaf. The process, however is simple

and yields some distinctly superior characteristics.

After the surface is cleaned and smoothed a coating of gold sizing is brushed or sprayed onto the surface to be gilded. Sizing is glue which holds the gold leaf to the surface and comes with different rates of drying. The slow drying type is best for surface gilding. The surface must dry out to a tacky state before the leaf is applied. The gold leaf is next laid over the area of interest and gently smoothed out with a soft brush. When all holes in the leaf have been patched and all the area covered, then the leaf is ready to be rubbed down and burnished. First, batten down with cotton to insure a good contact with the sizing. Then, rub briskly and lightly with absorbent cotton until all over laps and wrinkles have been removed. The resulting surface should not be varnished or otherwise coated as it needs no protection from the elements. Covering gilded surfaces with anything kills the brilliance unique to this finish. No gold paint will even come close in appearance to genuine gold. Silver leaf is also available.

Gold leaf is available from Art Essentials of N.Y. Ltd. (800)772-1212.

### •Brass Brushing

A layer of brass can be applied to a finished iron piece simply by rubbing vigorously with a brass brush. The longer the process is applied, the brighter the coating. Warming the piece slightly (200-600 degrees) will speed up the transfer. The brush can be a wheel on a power grinder or bench grinder, or a

handled variety. The resulting brass highlights are very thin and can be further protected with a clear covering.

### •Electrolytic Plating

A thin layer of any conductive metal can be deposited on ironwork by electroplating. Jewelry supply stores carry the necessary apparatus to gold and silver plate small items, while larger pieces may be plated at industrial locations where plating is done in large tanks.

### •Hot Dipping (Galvanizing)

Freddy Haberman took a finished driveway gate to a galvanizing company where the entire piece was hot dipped in molten zinc. The surface was protected by the zinc from the elements. Paint was then applied to mask the bright zinc.

### •Forge Bronzing by Malcolm Paine

A brass or bronze coating can be applied to a yellow hot piece which has been fluxed by rubbing at that heat with unfluxed brazing rod. The rod will flow out onto the surface, leaving a relatively thick deposit.

All of the smith's careful attention to detail, from original design to finished forging, will all come to naught in short time if no further consideration is given to finishing and preserving the surface of the piece from erosional destruction at the hands of time and the elements. Will the work of today endure effects of millennium?