MESSAGE
FROM THE PRESIDENT

There is no message... word has it, however, that it's full steam ahead for the ABANA Conference in August of 1980 at Santa Cruz, California, and that an ABANA slide lending library is being developed. More details on the latter appear in this issue.

THE ISSUE AT HAND

This issue at hand is the next step of the focus which the *Anvil's Ring* began several issues ago on the creative process as it relates to the artist-blacksmith. Having considered the singularity and portent of the creative process and its psychological underpinnings, we move on to a more concrete, smithing-related expression of that process in this issue.

After anthropologist Kurt Moore takes a brief look at the creative role of the modern smith, we hear from Germany's Manfred Bredohl on what creativity in smithing means to him and how it directly affects his work. It is so fitting that Manfred address this topic — not only is he an extremely creative smith, but his is a quick and eager voice answering the call in the previous *Anvil's Ring* for communication of smiths on an international level (indeed, this issue also contains contributions from Japan and England); he is, furthermore, as you will see, an enthusiastic devotee of the powerhammer, which also steps into the *Anvil's Ring* spotlight beginning this issue with the first in a series on the history, operations, tooling and maintenance of the power hammer by Associate Editor Jim Fleming. We also enjoy in this issue some "Burbles" from Bredohl on another aspect of the relationship of the smith's creativity to technology.

These, and many other thoughtful and related contributions by you, the readers, will hopefully make this issue at hand an enjoyable and thought-provoking experience. But let's not break our arms patting ourselves on the back; to keep the ball rolling for the December issue, send your contributions, queries, tips, book reviews, announcements of activities, ads, etc. by *October 2 at the latest*, to your editor: Dimitri Gerakaris, Upper Gates Road, North Canaan, New Hampshire 03741.

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COVER: Italian 50 Lire Coin
photo by Mary Gerakaris

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Official Publication of the
ARTIST-BLACKSMITHS' ASSOCIATION
OF NORTH AMERICA
Upper Gates Rd.
N. Canaan, N.H. 03741

Dimitri Gerakaris: Editor-in-Chief
Mary Gerakaris: Managing Editor
James Fleming: Associate Editor
Alex W. Bealer: Associate Editor

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The ANVIL'S RING
COMING EVENTS

September 9-22 ... Jim Kroepkin, resident smith at Campbell Folk School, conducts a two week course in introductory blacksmithing. Limited to 5 students. $65/week.

September 24-28 ... Francis Whitaker, Bruce LePage & Dimitri Gerakaris demonstrate at the first annual Cedar Creek Workshop, Cedarburg, Wisconsin. Toolwork, forging techniques from the most elementary to the very esoteric, including a damascus gun barrel forging demonstration, locksmithing, etc., will be presented. $50 registration fee for the weeklong workshop or $15/day; registration limited to the first 100 applicants. Make checks payable to "Cedar Creek Forge" and send to J. B. English Cedar Creek Forge N70 W6340 Bride Rd. Cedarburg, Wisconsin 53012

It is announced that there will be at the same time a meeting of the smiths of the Upper Midwest Region.

October 5-24 ... BLACKSMITHING USA, an exhibit of contemporary work, both functional and ornamental, at the Craftsmen's Gallery of the Old Market Craftsmen Guild, 511 South 11th, Omaha, Nebraska, 68102 (402/346/8887).

October 6-November 7, 1979 ... FINE FORGERY, a National exhibition of contemporary ironsmithing is to be held at the Gallery of Peters Valley. For further information, contact: Suzanne Turino c/o the Gallery, Peters Valley, Layton, N.J. 07851.

October 13 & 14 ... Horseshoeing contest at U. of Illinois, Champagne-Urbana, run by the Illinois Licensed Horseshoers Association. Forging and shoeing on Saturday. Forging Clinic on Sunday with an emphasis on hand-forged shoes. Ronald L. Dyer of Tampa, Florida will be judge. $15.00 registration fee for both days. For information contact: William S. Piek 117 N. Spring St. Burlington, Wis. 53105

October 15, 1979 ... DEADLINE for application to YOUNG AMERICANS: METAL, a national competition sponsored by the American Craft Council for craftspersons under the age of 30 working in metal and/or enamel. For applications, write: Young Americans: Metal, American Craft Museum, 44 West 53rd Street, New York, NY 10019.

Works selected for YOUNG AMERICANS: Metal will have a major showing in New York City at the American Craft Museum (formerly the Museum of Contemporary Crafts) in January, 1980. Selected works will then travel nationwide for two years.

The competition is open to all craftspersons working in metal and enamel who are between the ages of 18 and 30 and are residents of the U.S. The works must be original and have been executed by the entrant within the past two years. Student work is eligible only if it has been done without the help or supervision of an instructor. If other materials are used in the work, metal or enamel must comprise sixty percent of the composition.

The selection committee will be composed of Alma Eikerman, Professor Emeritus, Indiana University; Mary Lee Hu, Assistant Professor of Art, Michigan State University, and Albert Paley, Associate Professor, State University of New York, Brockport. Paul Smith, Director of the American Craft Museum will be an Advisor to the committee.

This is the thirteenth YOUNG AMERICANS competition held in the past twenty-eight years. The YOUNG AMERICANS concept, originated by the American Craft Council, was designed to bring recognition to young American craftspersons of exceptional talent. Past YOUNG AMERICANS competitions have included many who are today's prominent craftspersons and designers.

Because of increased numbers of craft artists, it was necessary to divide YOUNG AMERICANS into three media competitions. The first two competitions, YOUNG AMERICANS: FIBER/WOOD/PLASTIC/LEATHER and YOUNG AMERICANS: CLAY/GLASS, have already received national attention.

Notice: ACC NAME CHANGE EFFECTIVE SPRING, 1979

The American Crafts Council has been renamed the American Craft Council. ACC's Magazine of Contemporary Crafts has been renamed the American Craft Museum. ACC's bimonthly magazine Craft Horizons has been renamed American Craft.

The American Craft Council is a national nonprofit membership organization founded in 1943 to stimulate interest in contemporary crafts. ACC publishes the bimonthly magazine American Craft (formerly Craft Horizons) and maintains the American Craft Museum (formerly the Museum of Contemporary Crafts), a showplace for crafts since 1957. Membership is open to all.

Through its marketing subsidiary, American Craft Enterprises, Inc. (Box 10, New Paltz, NY 12561), ACC presents the Northeast Craft Fair, the Baltimore Winter Market, the Pacific States Craft Fair and the St. Louis Spring Market.

October 26-28 ... Francis Whitaker demonstrates at the Fourth Annual Northeastern States Hammer-In at Kingston, New York. For details, contact Kent A. Reeves, Ashokan Field Campus, RD #3 Box 216, Kingston, N.Y. 12401 (914-657-5333).


October 29-31 ... Francis Whitaker demonstrates for the West Virginia Appalachian Blacksmith Association. Contact George Nichols, Rte. 1, Box 263-0, Weston, W.V. 26452

November 1 & 2 ... Francis Whitaker demonstrates for the Tennessee Appalachian Blacksmiths Association. Contact: Joe Humble, 5029 Monterest Drive, Chattanooga, Tenn. 37416

September 1979
REGIONAL ACTIVITIES

2ND ANNUAL OABA CONFERENCE

by Bruce A. Washington

On July 7th and 8th, Hyphaestos, Eloi, and Dunstan gathered over the Studebaker Estate in Tipp City, Ohio for the second annual Ohio Artist Blacksmiths Association Conference. Their efforts combined with the hard work of the Association's staff and the demonstrators resulted in an excellent and worthwhile conference including comradeship, learning opportunities and, in general, a good time.

Over one hundred professional and amateur smiths attended the conference. Demonstrations were given by Dimitri Gerakaris, professional smith and editor of this publication; Jack "Edge of the Anvil" Andrews of the Philadelphia College of Art and the Diamond Forge; and Steve Rosenberg, professional smith and member of ABANA's Board of Directors. OABA demonstrators included Barry Wheeler and Paul Browning.

Subjects demonstrated and discussed included metallurgy, toolmaking, repousse, forge welding, mechanical fastening, trip hammer technique, design and much more. Of special interest was the slide show and presentation given by Jack Andrews after the banquet discussing some of Yellin's work.

A special thanks are extended to Emerg Studebaker for the use of his beautiful grounds, and to Barry Wheeler who did an admirable job of coordinating the event. Funds for the event were provided in part by the Ohio Arts Council.

Barry Wheeler — headed for the Anvil
photo: Bruce A. Washington
On April 12 and 13, in Edwardsville, Illinois, there was an Ornamental Iron Symposium on the campus of Southern Illinois University, Edwardsville. In spite of a bad thunderstorm that changed or delayed airline schedules, all of the participants were able to arrive and perform during the two day lecture/workshop/exhibition.

The demonstrators were Thomas Bredlow of Tucson, Arizona, and Eric Moebius of Plain, Wisconsin, assisted by Stuart Hill of Ipswich, England. Lectures and slide presentations were given by Richard Quinnell of Leatherhead, England, Jack Andrews of Paoli, Pennsylvania, and David Driskell of College Park, Maryland.

Also included in the symposium (top photo) was an exhibition of iron work from the Yellin Collection which was on loan from Harvey Yellin. In addition, Southern Illinois University Edwardsville displayed works from its extensive collection of Louis Sullivan Ornamentation.

Thomas Gipe organized the symposium and exhibition. Thanks to support from the University’s Office of Cultural Arts and University Museums, there was no registration fee to attend the conference.

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Exterior railings by Joseph Bonifas and Michael Bendele for a residence in Delphos, Ohio.
LETTERS FROM
THE MEMBERSHIP

Re: Creativeness at the Forge
by Dr. Raymond Sobel

Dr. Sobel's article is of much interest to me, since I have been trying for some time (years) to determine the difference between "art" and craft. I would like to make the following observations:

1. Page 13 paragraph 3... "the artist never knows exactly what he is going to create until he has created it..." This is a very strong statement which doesn't agree with my previously held conceptions of art or artist. Certainly a painter would know what he wants to show in his painting, etc.

2. If creativity is a function of the state of mind of the artist, then how can we judge a work without having this data? Is the Mona Lisa a portrait by a craftsman or a creation by an artist? What was DaVinci's state of mind at the time of producing this piece?

3. Is there a difference between creativity and basic problem solving? Bill Smart, from down the road, brings a broken wriggler into the shop to be fixed. The reason it broke (determined through discussion) is that it is the proper wriggler for the job for which Bill has been using it. When this wriggler has been modified and repaired so that it will function properly, has the process been creative or just problem solving? Fine article.

Daryl Meier
Carbondale, Illinois

Cutter Ceramics
47 Athletic Field Rd.
Waltham, Mass.

Minnesota Clay Co.
8001 Grand Ave. So.
Bloomington, Minn. 55420

I very much enjoyed the two issues of *Anvil's Ring* that I've read. Hope that a dialogue between medias will continue and flourish.

Peter Land
Potter Deluxe
Canaan, N.H.

Photo Format

You and your wife are doing a great job on A.R. I'm sure you don't, but there are many of us that wish it was a weekly publication.

I have one question. What format should we use when submitting pictures of work? Thanks for the info.

Lloyd Kirley
Leverett, Mass.

Of your three assertions, the middle one is correct: regarding your query, photos can be of any size, preferably black & white glossyies with clear contrast between work and background. If you are unsure of the photographic quality, send the photo and let us decide... sometimes the printer can actually improve a photo's quality. The important thing is that you enjoy what you are doing... and we will do what we can to help you share that joy with your fellow smiths.

Ed.

Horse Manure!

In the June, 1979 *Anvil's Ring*, Russell Pope mentions trouble with exploding clay and the editor suggests combining, of all things, horse manure with the clay. Now, blacksmiths may be fond of horse manure but potters prefer something more refined: kaowool! Kaowool is a fiber insulation available in bulk or blanket form and used either as a kiln insulation material or wedged into clay for wet fire raku to prevent explosion due to extreme thermal shock. I would suggest a combination of clay, coarse grog, and kaowool wedged together to solve Mr. Pope's problem.

Be nice to your local potter and he just might give you these materials. If you're unsociable, you can get this stuff from:

Dear ABANA,

In your June issue of *The Anvil's Ring* on page 29, you printed photos of different leaves and rosettes submitted by Jim Wallace, which dates back to pre-WWI.

We used them as late as 1933 here in Philadelphia. They were very good — welded well and saved us a lot of time. However, I don't remember the supplier we bought them from.

Max Segal

Does the name Braun ring a bell? Ed.

The ANVIL'S RING
Patented Inventions

The drawing of a patented swage attachment is self-explanatory. It complements the contribution by Eric Bauer to the June issue of AR.

From my research of a year ago, the U.S. Patent Office in Arlington, Virginia contains 360 power hammer inventions, 80 for olivers, and numerous others for diverse tooling and equipment. The patents, which include standardized drawings and written specifications, are in the public domain now after the expiration of their grant duration of 17 years. Patents in my search date from 1836 to 1940.

I hope to offer a steady flow of patent copies to complement Jim Fleming’s series of articles pertaining to the history, operation, tooling and maintenance of the power hammer.

John Dittmeier
Alexandria, Virginia

Dear Editor

I have read several of the journals and am so glad to see what you are doing! It has to be one of the greatest things done for the Blacksmith and his art that has ever been done. The Anvil’s Ring brings together the isolated blacksmith with his colleagues and helps anyone wanting to try his hand and at least get a foothold. Love live the Blacksmith.

I am living in Houston, Texas and working as a machinist, but I have been doing blacksmith work since 1972. I’m from Glendale Springs, N.C. and had worked as a blacksmith there for several years before moving. Right now, I am trying to get a shop set up here so I can get back to the trade I love. I have done a great deal of wagon wheelwrighting and thought you might want to know that I’ll tell you anything I know to help if you need it.

Sometime in September, I am going to England, Germany, etc., and sure would like to know anything you know about blacksmiths there and the availability of grants to work under them. Anything you could send me, such as addresses, etc., would be appreciated greatly.

Enclosed is a picture of lining up a tire on a 54” wheel at Ashe Ordnance Works, where I worked as blacksmith on and off since 1972. The People are left to right: Kyle Mash, master wheelwright and woodworker; Don Long, blacksmith, woodworker pattern maker, machinist, researcher, and all-around amazing person; Welch Howell, wheelwright and woodworker.

Some articles — starting from point zero — about wheelwrighting would be most welcomed by the Anvil’s Ring. Liaison with English smiths might be best made through Richard Quinell, who is president of the British Blacksmith Association (BABA), at Rowhurst Forge, Oxshott Road, Leatherhead, Surrey, England. German smiths have not followed our practice of having formed a national organization, and would have to be contacted individually. There are many laws, however, making it difficult for foreigners to work in German shops. The National Endowment for the Arts, which makes various grants available to American Craftsmen can be reached at this address: 2401 East St., N.W., Washington, D.C. 20506

September 1979
On Apprenticeship

I’d like to speak on behalf of a hopeful prospective smith. Recent trends in the Anvil’s Ring offer hope that an amateur might learn the secrets of the trade, in time. I have harbored the hope that I might someday earn my living as a fulltime smith. There are two seemingly overwhelming obstacles to this dream: (1) the age of 26 seems far too late a beginning to hold any chance of becoming a competent craftsman, (2) there is too much “reinventing of the wheel” involved.

The best course, it seemed to me, would be to apprentice myself to a knowledgeable smith, and learn the basic skills, methods, etc., which would start me on my way. A second, and probably more likely possibility, would be to work as often as possible with a blacksmith as "mentor", on a regular basis — either as an apprentice or paying student. I had no success in establishing either arrangement, and have worked on my own, attending conferences where possible.

In a society where a craft such as blacksmithing is at best a tenuous means of livelihood, and then only for a small number of practitioners, an apprenticeship system would seem to be quite an infringement on the economic viability of a shop. I can understand why a smith would be reluctant to devote time and effort to teaching and training prospective blacksmiths.

That understanding is no consolation to me, when it seems to wipe out any prospect of my learning a craft which is so important to me, and leads to the following question/proposition:

Whereas there is an interest among amateur smiths and ABANA members in becoming competent, professional smiths and in learning a craft which is traditionally passed
Dear Editor

The enclosed photo is perhaps a monument to a smith of an earlier era. It's from the Pere LaChaise Cemetary in Paris, France.

Yours truly,
David Benedek
Pittsburgh, Pa.

Anvil's Ring; for the same reasons, mouseheads, ram heads and Fritz Kuhn birds have lost their novelty. Craft fairs, exhibitions and the literature provide evidence that, on this subject, imaginations need stirring.

The study of ornamental and architectural history is one source of ideas and stimulation. Floral, faunal and geometric motifs, natural or stylized, from Eastern and Western cultures can be adapted for contemporary applications, while obeying the rules of good taste and sound design. For the craftsman, originality should not be an issue, aesthetics is.

John Dittmeier
Alexandria, Virginia

For Dragon Lovers...

For all the dragon lovers among the readership... I suspect that there are many, I highly recommend a delightful fantasy trilogy by Ursula K. Leguin — The Earthsea Trilogy — A Wizard of Earthsea, The Tombs of Atuan and The Farthest Shore being the titles... published by Bantam paperbacks. The books are a delight indeed, and the descriptions and personifications of the dragons in these are particularly grand.

David Zatz
Brooklyn, New York

And Snuff the Magic Dragon

With open-mindedness the makers of the dragon head should realize that its use has become abuse. The medieval motif has been too frequently and, at times, inappropriately attached to today's ironwork. For instance, more than a dozen dragon heads stare from the past three issues of the

Cataract Prevention

Having read various reports about protective lenses, I would like to submit my solution.

Calobar Super Armorplate. Just ask for a Calobar lenses, available through safety equipment suppliers. It can be ordered as glasses, goggles, etc. They come in three shades, and I use the extra dark, which is no darker than a very light shade of sunglasses, thus, there is virtually no problem with ascertaining the color of the iron. The extra dark lenses eliminate 98% of infra-red and ultra-violet rays which are generated by the fire.

Better yet, the price. I paid about $3.50 for a pair minus the goggles.

Robert Owings
Point Reyes Station, California

Response to Mike Spencer

To safely lower the effects of your anvil's ring try an ear plug designed to lower dangerous noises to a safe level without noticeably altering other sounds such as conversations, etc. Check local safety equipment distributors or: General Scientific Equipment Co.
7516 Limekiln Pike

Eoghan C. Ballard
EYE PROTECTION
FOR THE METAL WORKER

Blacksmiths and others who work with various metals to form, shape and mold, submit themselves to physical and emotional abuse from the raw material of their trade. Perhaps the foremost consideration from the bodily standpoint, aside from staying alive, is protecting your eyes. The blind artist may achieve success sculpting clay, but the blind blacksmith will be prone to missing his forge welds.

This assault on our vision is in two forms: flying objects and matter, whether hot or cold, and radiation in the infra-red and ultra-violet regions. Fortunately, we can control both forms by wearing the proper protective devices designed for the exposure to which we are subjected.

Generally, protection against radiation is not important for metal-working operations not involving gas or arc welding processes. The problem, why we say generally rather than never, is the difficulty in assessing the exposure to radiation, particularly to infra-red. Occasional work at the forge, staring at incandescent materials, may produce no harmful effect within our lifetime. Continuous exposure at forge welding heats over many years may produce the same cataract problems said to affect some glass blowers. Radiation protection for general forging operations is a matter of personal concern and decision. Should it be elected, then a filter shade of #1 or #2 would be a recommendation.

The proper protection for flying material must be determined from an analysis of the likely hazards of the job at hand. If we are some distance from small low velocity particles, safety glasses or industrial visitors plastic spectacles may be suitable. If we are at the grinding wheel, lathe, sander or milling machine, a goggle of soft plastic protecting all directions of access to the eyes is advisable. Certain operations such as sandblasting require a full face shield, possibly incorporated with a helmet. Even if we are using equipment with enclosures, barriers or visual safety guards we should have facial protection. It is not unusual to sustain injury from an object ricocheting from an unsuspected direction.

When engaged in welding by gas or electrical processes, we must add radiation protection to the problem posed by flying sparks. The two basic processes differ in their hazard and must be considered individually. Gas welding is primarily acetylene, oxyacetylene and oxyhydrogen. The problem is primarily infra-red and is suppressed by using green or brown filters generally in the range of #2 to #6. Airacetylene is a soldering or brazing process requiring #2 filtration. Oxyacetylene welding requires #4 for light gauge work to #8 for heavy welding. The most common value is #5. Oxygen cutting presents similar requirements. A #5 filter is most common with #3 to #6 available to meet individual requirements. Oxyhydrogen welding on aluminum will brighten your whole day. It requires cobalt blue filter in the range of #3 to #6, the spectrum is broad and has significant UV.

Electric welding by most methods presents a twin hazard of flying sparks and ultra-violet radiation. UV radiation is an immediate problem, producing sunburn to exposed parts of the body. Several days suffering with burned eyes will establish a willingness to play by the rules. The rules suggest shades from #10 to #14, with flux covered electrodes presenting the least output (#10-#11), gas shielded torches requiring #12 and carbon arc welding requiring #14. When arc welding, an additional concern is glare and reflection from light colored clothing and surroundings. This indirect exposure can be dangerous. If it is a problem, flash goggles (#1 or #2) should be worn beneath the helmet. In fact, if you haven't had a molten slag particle bounce around inside your helmet and come to rest on your nose, you probably wouldn't have considered flash goggles or a clear safety goggle.

Suitable protection should be given the devices which protect our vision. Glass filters should be covered by clear plastic of a type that minimizes damage from hot slag and sparks. Change the plastic protector when vision is obstructed. Throw away clear protective goggles when they darken with age and become scratched. Poor vision is like a dull knife — it means trouble. If you have problems with sweating and fogging of the lens, use one of several products that are "anti-fog" agents. If the weather is cold, try to warm the lens first.

The most important admonition of all is the appeal to put away the gambling instinct. That one or two second touch of the grinding wheel, or glance away as we make a quick tack weld is no substitute for safety. All the statistical analysis in the world will not restore an eye destroyed.

Bill Durrett
courtesy SEBA

Anvil Noise

In the March issue Stephen Mackenzie raised a spectre which can be easily laid to rest. For most of us the ringing of the anvil is exhilarating music rather than the object of Naderesque scrutiny. Properly secured to a solid wooden base the noisiest anvil's resonance will be damped well below any danger level. For those with extra-sensitive hearing, a strip of inner-tube wound tightly around the waist of the anvil will act as an effective mute. This expedient is widely practiced by horseshoers using Japanese farriers' anvils, notoriously raucous ringers. A pick-up tailgate is an ideal sound-board, and working such an anvil there raises an excruciating racket for man or beast. Fabrication of a simple angle-iron or pipe anvil stand alleviates this problem.

A final solution for the hypersensitive ear might be the acquisition of one of the "dealer," less resonant anvils. Fischer-Norris, Vulcan and Arm & Hammer are three names that immediately come to mind.

Actually, any blacksmith who spends eight hours a day hammering on cold diamond rim shoes (the conditions of the tests) is going to hell anyway, and might as well get there deaf.

Sincerely yours,
Jim Rich
Cave Junction, Oregon

Minimizing Anvil Noise

A suggestion to Mike Spencer on how to tone down his noisy anvil. He could try dropping a drift into the pritchel hole; it should be placed in loosely to cut down the ringing. To avoid loosingingers the drift should not protrude much above the anvil's face.

I like the paper you are using.

Sincerely,
Russell Pope
Newmarket, N.H.
Canopy and window rails for restaurant-jazz club "101 Bowery" in lower Manhattan. Restaurant front, interior and jungle-aviary designed and executed by Hayton and Assoc. Preliminary scale and concept for canopy — Richard Hayton; ornamental and structural detailing and execution by David Zatz. Window rails and canopy frame of 1/4" 1D schedule 40 pipe, vines forged from 3/8" round stock. Five ornamental collars have double bolt-ends, securing canopy to the cedar beam front. (All large forging of leaves and vines was done at the Greeley Ironworks, Greeley, Pa. Special thanks and deep appreciation must go to Morris Kargman and Eliot Scolnick for making their excellent facilities available.)

Firescreen by Francis Whitaker of Aspen, Colorado with double frame rivetted with 1/8" brass rivets to match the requested brass decoration. Tightener tongs (see Tips & Techniques section June issue) were used to stretch the screen.
FORM EMPHASIS FOR METALSMITHS
by Heikki Seppä
illustrated. 146 pp., 7 × 10 in. paperback
Kent State University Press, 1978
(Kent, Ohio 44242)
$9.50 plus $1.00 postage

by Dimitri Gerakaris

It is a great joy when somebody has a fresh and provocative insight and an even greater joy when that person shares his ideas in a most articulate manner. That is precisely what Heikki Seppä does with this book. Awarded master status in silversmithing from the Ministry of Education in his native Finland, Heikki (pronounced “Hay-key”) Seppä now teaches metalsmithing in the School of Fine Arts of Washington University, and has a bold new approach of import to the design of metalwork (or, for that matter, to any three dimensional design). The germ of his idea lies in his recognition of the tremendous shaping power exerted by the very words we use to conceptualize our design. He explains that once mastery of the material has been achieved, even greater facility and freedom of artistic expression arises with the shedding of “product-oriented vocabulary” in favor of what he calls “generic terms.” He explains:

“Another hindrance to freedom of artistic expression lay in the product-oriented vocabulary. I felt that a more scientific nomenclature was needed to free artists from thinking of their work solely in terms of its end-product. Coupled with this idea was an increased consciousness of form and a searching examination of both old and new techniques.

A host of terms had to be unearthed or minted afresh to teach and discuss developments properly. For example, *anticlastic* and *synclastic* sinking had never been suggested in the classrooms or in the professional books since neither these terms, nor satisfactory substitutes, were in common use. As a consequence, no developments had taken place in this area. The forms themselves were taken for granted until the suggestion for their analysis in generic terms was adopted. Until then, analysis had been done strictly in terms that referred to already existing objects, with the consequence that “Everything looked like something else.” It is now time for the art to move on to a higher creative plane, with a professional language all its own, and a greater awareness of its potentials.”

He then proceeds to help us organize a systematically arranged and illustrated vocabulary of existing, understandable words not commonly used in design, which we can use as tools to approach conceptualization in a fresh light, greatly unfettered by existing conventions. (It can be argued that this approach, when used to excess, can become restrictive by its imposition of new conventions; however, this can be countered by arguing that it allows for an infinite variety of possibilities.)
In addition to an illustrated glossary, which includes generic terminology with etymological origins and alternate terminology for a good number of the forms developed in the text, this book includes a wealth of information explaining basic techniques employed in sheet work that certainly can have many applications in heavier stock — including raising, hinging and linkage mechanisms, layouts, planishing, soldering, development of shell structures, etc.

The only tinge of regret comes when the reader realizes that the book comes to an end after 146 pages. The reader at that point consoles himself with the thoughts of Eric Hoffer who expressed the idea that in the stacks of libraries one will note many authors having numerous titles bearing their names lined in a row. The first book of each author is normally short, informative and to the point, while the rest usually run on trying to cover the tracks of what that author does not know; it is at that point that the author becomes what Hoffer calls a “Crappist”. Mr. Seppä is not a Crappist. 

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reproduction to the right from Form Emphasis for Metalsmiths by Heikki Seppä. courtesy of Kent State University Press.

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Inspired by the teaching of Heikki Seppä, Jack Hemenway of Stonington, Maine shows that Mr. Seppa’s system of “form emphasis” has great benefit for the artist-blacksmith with this table that he created:

Dining table base about 50” long and 28½” high — designed for a ¾” thick, oval glass top. Legs are three and four pieces, hollow, and the upper “arms” are four pieces. The middle section is three pieces. All oxy-acetylene welded; “and I spent a good deal of time climbing on the piece to make sure it would support at least 160 pounds. It does.”
YELLIN... sketches

It is the marriage of the soul with Nature that makes the intellect fruitful, and gives birth to imagination.

Henry David Thoreau

photos by Jack Andrews
OLIVER
the foot-powered sledge hammer

by John Dittmeier
Alexandria, Virginia

In his many demonstrations, Francis Whitaker has encouraged the use of a striker. An often-heard lament among the spectators has been the want of a skilled helper for delivering the solid blows of the sledge. A solution for one-man operations is the foot-powered mechanical device, called the oliver.

The schematic drawing (not to scale) depicts the basic features of an elementary oliver. A sledge handle of wood is affixed transversely to a rotary steel axle; a spring element, here a large tree limb in the rafters, keeps the sledge head at its rest position above the anvil and beyond the arc of the hand hammer. A strong leg action upon the foot treadle brings the sledge forcibly downward upon the anvil; upon release of foot pressure, the spring element returns the treadle and hammer upward for the next pump of the leg and strike. Coil and leaf springs are modern alternatives to the wood branch; readily available are the helical springs of overhead garage doors.

Like the striker, the oliver offers functions unavailable from hand and power hammers. Single blows, the use of top tools, and difficult two-handed forge welds are some advantages of the oliver. Its simple mechanisms encourage a homemade creation from scrap materials. An industrial make is illustrated in the Shelburne Museum text Blacksmith's and Farriers' Tools (p. 104); another is found in Eric Sloane's Museum of Early American Tools (p. 93). Various types have been developed for the trades of chain-, nail-, bolt-, and clogmaking. The historical precedent of olivers should help to diminish the criticism that the smith pumps the treadle while awkwardly balanced upon the other leg. Note that the treadle will support the power leg with a counter force, originating from the extended spring element.

So here is the challenge for the Lehigh engineer in all of us to design the optimal, universal oliver. This invention would provide angling of the hammer blow, adjustable height, lateral motion over the anvil and a blow of maximum energy; the Blacker oliver, the description of which is with the editor, is one attempt to satisfy these demands. The design efforts and purposeful thought of this writer will be submitted for future publication.
Door knocker by Thomas Googerty, from a private collection. Thomas Googerty was a prison locksmith and a master blacksmith who is also known for his smithing text, Hand Forging and Wrought Iron Ornamental Work, 1911, upon which many subsequent texts were based (including Ernst Schwarzkopf's Plain and Ornamental Forging, 1916.) It is hoped that the Anvil's Ring will in the future be able to present you with more information regarding Googerty's work, which has been described as "unique, American, and of amazing quality."

The following tidbit of the lore and history of the smith was submitted by Glenn Horr of West Alexander, Pennsylvania:

In The Presence Of The Blacksmith

West Alexander offers a uniquely human side of history as a clandestine marriage capital. In the period between 1825-1885, this tiny village of 402 denizens provided a haven for all matrimonially inclined young folks, when over 5,000 marriages were performed. Cruel parents and guardians might object, the county clerks, ministers and squires of their home towns might refuse the appeals of the young, but a panacea for all their sighings and longings could be found in West Alexander.

An 1834 account states that the ceremony was customarily performed in the unlikely shelter of the blacksmith shop where no one would look for the couple!

The Scotch-Irish heritage of the local residents prompted them to liken the town to Gretna Green, Scotland, where similar events occurred.
Emile Robert . . .
Art Nouveau Gatework

by John Dittmeier
Alexandria, Virginia

This gate of 1900 finely exemplifies the artistry of the master smith of Paris, Emile Robert (1860-1924). French literature credits this man for the restoration of his craft during the resistive period of Historicism and for the creative expression in iron of the Art Nouveau style. Robert’s early foe was the ubiquitous cast iron, which had thrived for the one hundred years of Neo-Classicism and which was spreading from the foundries of the new industrial age. His revival of forgework pioneered the way for Edgar Brandt and Raymond Subes, masters of the Art Deco and Moderne styles. The tales of his accomplishments, his school and his heirs therefore deserve a respectful hearing.


The Blacker Power Sledge

by John Dittmeier
Alexandria, Virginia

The September, 1978 issue of AR provided scenes of the British gathering held that same month and hosted by Richard Quinnell, Ltd. Two photographs showed the motor-driven Blacker power sledge at work. For the interested membership, the patent drawings of its foot-powered predecessor are reprinted here with the written specifications of legal and technical prose for those given to patent reading.

Features of this patented hammer include adjustment of the head for the varying depth of workpieces and travel of the head along the face of the anvil. The toothed arc and related assembly seen in the side view act upon the helical spring to perform the first feature. The bar with teeth and the gear mechanism seen in the front view cause the sliding of the frame with the head. Modern, motor-driven Blackers provide a foot pedal on the side for this second function. Note that all makes demand a permanent installation and a fixed anvil.

The Blacker hammer is still being manufactured in England; used ones are often found for sale in British blacksmith journals and equipment lists. Bill Gichner of Iron Age Antiques has a Blacker for sale, formerly owned and operated by Josh Greenwood of Petersburg, Virginia. The Blacker evolved from the elementary oliver, which is discussed elsewhere in this issue.

UNITED STATES PATENT OFFICE
WILLIAM BLACKER, OF STALEYBRIDGE, ENGLAND
TREADLE-HAMMER
Application filed February 19, 1918. Serial No. 218,051.

To all whom it may concern:
Be it known that I, William Blacker, a subject of the King of Great Britain and Ireland, residing at 62 Stocks Lane, Staleybridge, in the county of Lancaster, England, engineer, have invented new and useful Improved Treadle-Hammers, of which the following is a specification.

(continued)
This invention relates to an improved treadle hammer and in particular to that type of hammer in which the head is swung on parallel arms or their equivalent.

The attached drawings show the improved treadle hammer.

In the said drawings:

Figure 1 is a side elevation of the hammer.

Fig. 1 is a fragmentary detail view showing the connection between one end of the rail d and one of the tubes e.

Fig. 2 is a detail plan view.

Fig. 3 shows a front elevation omitting certain of the parts.

I make use of suitable end standards a, a, which are attached to the base b, or otherwise supported, and such end standards are suitably stayed the requisite distance apart as for example by stays b', b'. A treadle device is combined with the base casting, or otherwise sustained, and same may consist of a bent tube c fulcrumed at e', e' on either side of said base b and passing around the front of the hammer and clear of the anvil or block.

Across this treadle, extends a rail d which may be round or of other cross section, and same is firmly attached at each extremity to the tube member of the treadle e by U-bolts and nuts d' (see the detail view Fig. 1'), or other means.

The end standards a, a, are bored and if necessary bushed or otherwise prepared to receive a sliding frame which may consist of a number of horizontal shafts or rods, as for example three shafts or rods e, e', e'' which are of greater length than the distance between the end standards. The shafts or rods e, e', e'' are sustained or carried by end bars or uprights f f connecting being effected by nuts or other means. A transverse steel or other bar g is also built up in the frame and is provided with teeth g' over a portion of its length. The shafts or rods e, e', e'' are conveniently round in cross-section so as to slide easily through the end standards and to turn in the stout uprights f f, and the complete frame is moved left or right as required by means of a spur pinion g' being geared with the rack teeth, said spur pinion g' being supported in brackets g'' bolted to the frame. Any other form of gear mechanism may be used for traversing the frame. Upon the two upper horizontal shafts or rods I mount the parallel arms, and, while two parallel arms such as h, h'' only are employed one is arranged in connection with each shaft or rod. The manner of attaching the parallel arms may be greatly varied, as for example the tapered extremities may fit tapered holes in enlargements formed on the shafts, the arms being keyed in place; or bored sleeves such as h, h'' may be fitted on the shafts and the tapered or shaped ends of the arms may be held in place by keys or otherwise. These bored sleeves are firmly pinned on the shafts e, e'' as shown by Fig. 1. In connection with the lower parallel arm h', h'', or more conveniently with the supporting sleeve h', I form a bracket or jaws h', h'', or other preparation, and such brackets or jaws are bored, and jointed thereto at h', is a pendent bar or rod I the same having a suitable bored head or stop collar i'. A coiled spring f surrounds this pendent bar or rod I. The lower extremity of the pendent bar or rod I passes through a small bored rocking plate or swivel abutment k' having trunnions k', k', which rocking plate or abutment is accommodatedly carried by two small levers or brackets i', i' keyed or attached to the third or lower shaft or rod e''. As these, the coiled spring f lies disposed and confined between the head or stop collar i', and the rocking plate or swivel abutment k', and its function is to return or elevate the hammer head and to maintain same in raised position. I may vary the manner of holding the lower extremity of the pendent bar or rod.

Jointed to the lower parallel arm, or to some suitable attachment in connection therewith (as for example to the pivoted link k), is an adjustable connecting rod l which terminates in a bracket l' or the like supporting a bowl or runner l' which engages below the treadle rail d, such connecting rod device l' effecting the swinging of the hammer head when the treadle is worked.

The entire traveling frame e, e', e'', g, f, f can be adjusted laterally as so as to place the hammer head at any position over the anvil, by simply working the rack and pinion gear, or the mechanism used in lieu thereof.

In order not to interfere with the strength of the blow or the arc through which the head is swung according as the depth or size of the work on the anvil varies, mechanism is provided whereby the hammer head can be raised or lowered from a mean position (or raised from the lowest position) and such mechanism takes the form of devices which act on the coiled spring. By way of example, I may mount a crank or arm m on the third or lower shaft or rod e'' which crank or arm when moved up, would (if the bar or rod I were immovable held) act to bring about compression of the coiled spring f, and so the hammer head is raised. Such crank or arm m can be acted on by a connecting rod or link n joined to a control lever o fulcrumed at o' on one of the upright bars f of the frame, and such control lever o carries a spring pressed detent or locking appliance o' fulcrumed at o'' and capable of engaging a toothed quadrant p or equivalent device fixed also to the upright bar or otherwise carried. The locking detent o' is easily withdrawn by acting on the guided rod or spindle o'' as is clear from an inspection of the detail plan Fig. 2.

From the foregoing, that the sliding frame e, e', e'', g, f, f, may be easily and quickly traversed to bring the hammer head to any position over the anvil and that the elevated position of the hammer head can be regulated or adjusted as required by the mere movement of the control lever o, and the setting secured. As the hammer head is swung by acting on the treadle c the shafts e, e' turn or rotate slightly as required.

In the matter of mere constructive detail I may make considerable variation and I might if desired use more than one coiled controlling spring making suitable modifications to that end.

I declare that what I claim is,

1. A treadle hammer having a head, parallel arms for said head, a sliding frame carrying the parallel arms, a traversing device for said frame, hammer head adjusting means carried on said sliding frame, locking means therefor, a foot treadle and a connection to work the parallel arms as set forth.

2. A treadle hammer, having a sliding frame, parallel swing arms mounted thereon, a central hammer raising rod, a spring device in connection therewith, means to work such hammer raising rod, and hammer adjusting mechanism carried on the sliding frame and means to lock such hammer adjusting mechanism for the purpose described.

3. A treadle hammer comprising a frame, parallel arms pivoted to said frame, a hammer head carried by said arms, a foot treadle operatively connected to said arms, a second frame slideable on the first frame, a bar connected to said arms, a spring surrounding said bar and acting on said arms, and means for adjusting the tension of said spring to vary the normal position of said arms.

4. A treadle hammer comprising a frame, parallel arms pivoted to said frame, a hammer head carried by said arms, a foot treadle operatively connected to said arms, a second frame slideable on the first frame, a bar connected to said arms, a spring surrounding said bar and acting on said arms, a quadrant rack mounted on the first frame, a lever operatively connected to said spring for adjusting its tension, and a pawl carried by said lever and engageable with said rack for locking said lever in adjusted position.

In testimony whereof I have signed my name to this specification.

WILLIAM BLACKER.

The ANVIL'S RING.
an Anthropologist Looks at the Modern Blacksmith

by Kurt Moore
S.I.U. Carbondale


Contemporary Smith, photographed by Thomas Gipe at the "Ornamental Iron Symposium" held April 1979 at SIU, Edwardsville, Illinois.

For those people who realize that there are still a few blacksmiths left, there is also the realization that the craft is not what it used to be. True, there are many vestiges of the old craft that remain, but many innovations have taken place. These innovations are not just limited to advances in metallurgy, technology, or equipment, but also include new perspectives on the state of the art. These new perspectives are due to changing demands placed upon the smith by an increasingly urban-industrial society. Aided by the sustained growth of the arts and crafts movement in the United States, the modern blacksmith has been successful in meeting these new demands through the creation of new aesthetic goals and the successful presentation of himself and his work to various audiences.

Thus, the modern blacksmith is confronted with many more and varied problems than his predecessors of previous eras. In addition to the more traditional areas of production items, specialty tools, and ornamental wrought iron there is a demand for creativeness and innovation that brings the smith into the area of art and sculpture in iron. New approaches to old problems and the creation of new aesthetic problems has resulted in new design formats, an increase in three-dimensional work, mixed media work, and an overall growth in blacksmithing. As a result, there are many smiths who see themselves not only as highly skilled craftsmen, but also as artists and sculptors.

The obvious impetus to the change in blacksmithing was the fluorescence of the Industrial Revolution. By and large, the general shop smith of the nineteenth century and before was engaged in the production and repair of items for everyday use. As Alex Bealer (1969, p. 24) and others have noted, the rise of the factory system led to the decline of the Smith and other craftsmen. The volume and lower prices of articles produced by the factory system hurt the smith economically as he saw the demand for his handcrafted items diminish.

The introduction of the automobile on a large scale was a mixed blessing for many smiths. For those smiths whose major activity was farriery, the drop in horse transportation was an economic disaster. However, for some smiths it did open up new opportunities as many smiths became garage men and mechanics (see Steinmitz and Rice 1959). Yet it was still not enough.

At the time that smithing was on the decline, new avenues of exploitation were opening up through the growth of the arts and crafts movement. Early organizations such as the Chicago Arts and Crafts Society and the Boston Society of Arts and Crafts, both founded in 1897, presented the blacksmith and other craftsmen the opportunity to exhibit their work and gather prestige and recognition from peers, critics, and the public. The smith's work was represented in the Boston Society of Arts and Crafts first juried show in
judgements concerning the merits of works under scrutiny. Their comments can greatly influence the careers of craftsmen and artists, and quite often critics (those of whom are judges) wield the power of bestowing recognition and prestige rewards through their actions.

Last, but perhaps foremost, is the art and craft buying public. These are the people who keep the smith in business, and place upon the smith the new demands of twentieth-century society. Their demands are more of an aesthetic nature than customers of previous ages. They not only expect fine craftsmanship (which in itself is aesthetically pleasing) but something beautiful, especially in the area of ornamental and sculptural blacksmithing.

The fact that blacksmithing is thriving in the United States points to a successful presentation of the smith and his work to his audiences' demands. Although blacksmithing has changed greatly during the twentieth century and many of the items produced are entirely new, one important aspect remains: the production of a finely hand-crafted item, in itself possessing qualities that no assembly-line can reproduce.

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Table by Albert Paley, Rochester, N.Y.
Forged and fabricated mild steel with brass top. 26" × 28" × 19½".
Who can live in a world of plastic? I cannot, and an increasing number of "modern people" cannot. It is not only fashionable nostalgia that reaches back for ancient things. It is for a reason that not only antiques, but handfired bricks, oak, and wrought iron as well are enjoying a renaissance in Germany. The pure line of nature beats the coldness of plastic.

And here lies the opportunity for our profession. For without financial success, the creative person is denied a part of the satisfaction and essential motivation needed to take up the fight with a material such as steel. He who forms steel will have his character formed by steel. Brute strength and slick technology are no substitute for solid education, technical proficiency and continual practice. But all would mean nothing without the ability to see. This, in my opinion, is a quality that many people have forgotten. To search the world with open eyes — to see the setting sun, tree bark, a blade of grass in the wind, a drop of rain — how many worlds of form lie in these things?

The smith’s realm of forms has been delineated by limits defined by human strength, the nature of the material, and tools, whose handling and means of working have been for generations handed from father to son, from master to apprentice; I now constantly attempt by experiment in my work to explode these narrow limits. And I see thereby that new paths are continuously created.

The foundation for every artist-blacksmith naturally should be a fundamental training in craftsmanship. To upset, to draw out, to split, to punch, these elements of our work are always the basis. The intimacy with and the command of the elements of fire and water are essential for fruitful work. But once these essentials have been attained, one should not give oneself to contentedness. The search for new ways and methods and the introduction of new techniques has always been a concern and challenge to me. For example, fascinated with the rigid form of a double T-beam, I attempted to dissolve the rigidity of this industrial component through splitting and deformation and with subsequent additions rejoined the piece. Thus arose my sculpture "Peiner" which was placed in my hometown in front of the chamber of handicrafts. The utilization of industrially prepared structural elements in my work occurs not solely from convenience, but also from an economic viewpoint. For example: all candleholders made by me have a candle cup made by industrially prepared pipe bases. I order them in great quantity for reasonable prices. I thereafter deal with them in a manner, characteristic of much of my work, that I discovered by experimentation so as to give them some "nobility".

The particulars: This raw product of industry is intrinsically and optimally useful for the catching of candle wax. The high edge and the round shape is not just useful, but its shape is beautiful as well. I now lay this piece in the fire of the forge and heat it to over 2,000 degrees centigrade. Steel, always falsely designated as iron, is an alloy of carbon and elemental iron. At high temperatures, the carbon is driven off, the alloy loses its cohesiveness and disintegrates. I have in the course of time learned to control and regulate this process. From the burnt surface originates a strong expression and interesting variety. The industrialized aspect disappears and the solid useful shape remains. The observer can see and feel the enormous forces that were encountered that led from the polished, plastic-world form to the individual candle bowl acted upon in a process of nature.

WROUGHT IRON BRINGS WARMTH TO OUR WORLD OF PLASTIC

by Manfred Bredohl
translated by Dimitri Gerakaris
My use of this technique is considered by conservative smiths as an unpardonable mistake. Overheating the material is a mistake for which the apprentice is punished. But to make yourself free from the traditional work rules is basic for free experimentation and makes possible the finding of new ways and forms.

Likewise, development of the "smithing machine", the air hammer, was just such a revolution in the field of the artist-blacksmith. These machines which originate in the industrial sector increase my creativity tenfold. Entirely for economic reasons, considering only inflation, I cannot even conceive of working without the powerhammer. I own two 80 kilogram airhammers and I will be installing two more in my new studio — one of 50 kilos and the other of 300. I hope with these to greatly increase my design capacity. With such large machines, it is possible to forge forms that would, by hand, as well as with the assistance of a striker, be impossible to form. Even disregarding the time element, it would not be possible to attain many of the forms that arise under the powerhammer, which has so influenced my work and which has so become an integral part of my style. It is my opinion that no artist-blacksmith of this day can set up his own business without using a powerhammer — just from the economic point of view. A multitude of forging dies and aids makes possible an infinite number of uses. Of all the available machines, such as the drop hammer, the trip hammer, the hammer press, etc., it is the airhammer, in my experience, that is the most effective one.

But not only machines broaden the scope of my design program. I also use new materials, first experimentally, then also in my creative production — most recently, cor-ten steel from the U.S.A. A steel which resists corrosion, it has no place in our polished and programmed world. It is a rust-steel. The iron-oxide rust protects like the oxide on aluminum. That means the material will rust for about three months and then no more. Can you imagine a better association of material-to-statement for a crucifix? Beside the shape, the material (rust) makes it clear that all things must pass. Cor-ten can be worked like steel, except that when welding, different electrodes and current must be used.

I also use non-corrosive V2A and V4A for forged forms. Chrome-nickel steel can also be forged but is harder and more difficult to forge than steel. The red, never white, glowing material is, even in this state, hard and tough. Furthermore, at greater heats it cracks and readily breaks. Its working requires special tools and chemicals. To merely work the surface requires six times as much energy as the working of steel. The strong coating of oxidation requires strong pickling and steady brushing or sandblasting. But the trouble is worth it. Under the oxide the forging is revealed in a very porous but very expressive surface. The contrast of shining to dark gives the possibility for the play and variation of light. Contrast, a major element found in my design, is based on the longing of men for changes and events. I use rust on chrome, wrought iron with glass, noncorrosive steel, light and so forth.

Another creative element often talked about concerning my work is electric welding. My modern iron design shows, in addition to riveting and forge welding, electric welding seams. The older generation of blacksmiths refuses this. But my point of view is that a modern form of joinery belongs with a modern form, therefore, electric welding is legitimate. If former generations had known of this way of welding they would have used it, most of all because of the expense and time-saving advantage for which electric welding was developed as an alternative to the time-consuming forge welding, rivetting and gas-welding which was often also used. I leave the welding seam for the viewer — only the spatter, as I see it, is an ugly by-product and has to be removed. On the other hand, the welding seam is used as a naturally arizen structure, documenting the state of the material (fluid) and as a design element provides the observer with an eye-pleasing structure.

And now to another element of design and construction: Coloration. I spoke of rust with relation to cor-ten steel and of brilliancy with chrome-nickel steel. With my forgings, I differentiate between two different types of finishes: Those for interior use and those for exterior use. A previously often-used finish for forge work is the burnt black finish, whereby linseed oil is applied to the surface of the completed forging and heated to about 600 degrees centigrade. The oil must be brought to the smoking point, not burnt off. With this, a shiny black surface is achieved that feels firm and which should protect the steel against rust. Controlling the temperature properly to adequately apply this finish is really only possible with smaller pieces. My experience indicates that the protection from rust is deficient. It works well on the inner places, but it feels greasy and discolors and it is difficult to remove the dust. My work is cleaned of iron oxide with a rotary, wire brush. It consists of a reddish-brown to a black coloration and is not covered or hidden; the observer can see the naturalness of the material, and the
steps in forging come to mind. The battle with the material remains visible. I consciously leave hammer and burn marks in the work. I want to allow something to flow to the observer that Valery describes in "The Transcendent Majesty of the Arts Which are Wrought by Fire" (die Überragende Würde der Künste, die das Feuer Bewirkt) and allow the observer to be more involved with the work — to feel the heat and to see its growth and to identify its form. Every brushstroke would here erect a barrier, a falsity. However, this approach to finish is possible only for work in interior spaces. All work to be placed in the open and subjected to weathering are fire-zinced, as follows: They are freed of oils, iron oxide, and dirt by a 24 hour bath in hydrochloric acid. They are then sprayed with ammonia and dried. Thereafter, they are dunked in a hot bath, heated by oil burners, where they are covered with about a 3/10mm coating of zinc. The fluid zinc penetrates the smallest splits and slots. The zinc, being impervious to weathering, protects the work. But it is now a shiny, silver color. This can often pass on my work as the finish, but most would now paint the work with a satin black after the drops and thick spots of zinc have been cleaned off. After drying, my workers go over it with steel wool. This is done so the surface characteristics of the forging come to the fore. Rusting is not possible now.

This process pays for itself over the course of time and counters the argument I heard when I began my business that "It's not at all wise to purchase iron grilework — it costs too much to maintain." This is a strong argument and many of my colleagues do the same; they are persuaded to zinc coat by their customers — much to the joy of our zincing facilities. Zincing is a plus for ironwork; it makes large exterior pieces feasible and extensive use of it reduces its expense. And, not to mention, herein lies a substantial source of income for my shop, for practicality is much more readily marketable than things which serve no practical purpose.

And herein lies a great challenge, in my opinion, for the designer of today. I try to elevate the majority of "consumers" beyond "practical art" to "fine art", to the beautiful or the expressive. So now and again a little disguised candleholder finds its way into the house of a stress-plagued person who has never been concerned with such things as form, color, composition or abstraction. Now, suddenly the work is found in his house. They come to rest directly opposite each other. He notices the difference from the other things in his environment and consciously begins to see and to reflect. Hopefully.

The reception of my work gives me hope that I move in the right direction; and from many conversations with clients comes the drive to further pursue the craft and be involved in smithing. One can not go into our profession solely on profit motive. There is more money to be earned in industry, but if one has learned to fight with steel, to force a form from one's will and then stand before the finished work — that is something money cannot buy. The economic considerations should not be undervalued — the raising of capital which is so necessary for the conducting of a forge is considerable and must be conducted. The search for a greater clientele and the popularization of our work is every bit as important as a solid technical training, and that includes knowledge of traditional techniques, experimentation and the finding of new contemporary forms.

Paul Valery describes this phenomenon exactly in his essay "On the Transcendent Majesty for the Arts Which are Wrought by Fire" (Paul Valery, "Über Kunst" [on Art], Deutsch von Karlo Schmidt, Sürkamp, 1959): "Every work unites in itself a desire, an action, an image, a substance. The nobility of a work of art is dependent upon the purity of the desire from which it arises and the uncertainty of the creator over the success of his actions. I certainly know of all the arts, none which are a greater adventure and full of uncertainty and therefore nobler than any others, than those which employ fire. Their nature excludes all carelessness or repays it with punishment. No relaxation of tension, no pause for breath, no wavering of consciousness, or courage of the spirit. They force — and in the most dramatic fashion — the hand-to-hand combat of man with form. Their main tool, fire, is at the same time their greatest enemy. It is a fearful precision tool whose wonderful grasp on the material, whose glow makes one feel at home, is, through a physical or chemical constancy, the reckoning of which is too difficult to sustain, pitilessly bound to narrow boundaries, and defies definition." To broaden these boundaries, with consideration of the old traditions and techniques, the search for new and modern forms investigated by experiment is always a duty for and challenge to me.

To sum it up for the artist-blacksmith of today: Steel is a tough material. One must master it in order to form it. Fire, water and hammer blow are essential. Less is usually more. Imitations are dishonest; wasteful and suffusive forms are violations of the material. The surface must make clear the process of formation. The structure should radiate calm and not be treated by violence. The function stipulates the formation of the entire form in my point of view. Modern technology is desirable, mastery of the old ways of working is necessary. Experiment is necessary. A work is a mirror of the time and the character of the creator. He who forms steel is also formed by steel.

Born in 1944, Manfred Bredohl studied metalworking for five years at the Arts and Crafts School in Aix-la-Chapelle and also holds a state certification as Graduate Designer of the Arts. Manfred has been self-employed since 1959 in Aachen Brand where he operates his forge and studio.
BURBLES FROM THE SLACK TUB

... a personal view

by Thomas G. Bredlow

I have run across an obscure work that might just be timely at this point, and having the sanction of our Editor to do so, I insert here a short paper called "On the Anxieties Caused by the Use of the Arc-Welder" by the eminent Metamorphologist, Wladzio Glurg. It is translated from a foreign tongue that has been only recently identified. Mr. Glurg intones:

"Let us explore, for one curmudgeonly moment, a view that is so nihilistic that it borders on Conservatism. Let us say that owning and using an anvil is not the same as being a blacksmith. Let us say that intellectualizing blacksmithing isn't either. Let us say, further, that there is such a thing as a real blacksmith, and that hardly any of us are there, yet. (Let's assume that anyone who is a real blacksmith would not be too interested in reading — or writing — this, too, while we're at it.) The line between who are the blacksmiths and who aspire thus drawn, witness the insertion of the most emotion-laden term in the ironworker's lexicon — that of the arc-welder.

Nearly everyone knows what comes with the arc-welder: the leads, clamps, helmet, welding rod, chipping hammer, vise-grips, body grinder, and a full line of excuses for using it, like 'the guy wasn't spending enough money,' and 'this is a bread-and-butter job,' and 'I gotta do something to pay the rent,' etc., etc., to be kept handy for whenever the user is detected. The petite morte that accompanies explanation as to why we did not forge-weld something at the time is nearly universal (Well, that's easy. Anvils and power lines are in nearly similar distribution, when you think about it!); even when the thing constructed is made out of square tubing. It's crazy, but the embarrassment is there, even then. Ever try jumping that stuff together in the forge?

There is pressure from a public who has heard of the old ways and asks if you did it the way the Old-Time Blacksmiths used to do it; and pressure from other anvil-owners who want to see it done the 'Real Way'; and, always, that realization that you've let somebody down because it didn't meet the universal 'specs' of having been forge-welded.

But wait a minute. Who set up that disappointment if it wasn't we, who dragged out the anvils and called ourselves blacksmiths, when there was no one around to stop us? We've all had the joy of knowing an honest-to-God Blacksmith. And they love the side of the trade we are lucky enough to get them to do for us now and then. But did any of those fellows ever say to us once that we should deny ourselves a tool that they welcomed like icewater on the desert? If one did not have a living blacksmith around when he started up in the last several years, the guy's work was there, arc-welding and all, and what fun a lot of the old guys had with it.

Now, how would we like this to happen? We're standing in front of a piece of ironwork that is a mix of fun-and-simple hammered leaves and the odds and ends of resourcefulness placed throughout the work — stamped bosses here, cold strap collars (or sleeved bits of square tubing, to build stepped collars) there; maybe some lathe-turned knobs for finials, all arc-welded together. The general groan emits: "Isn't it too bad! The thing would have been so much nicer if it had been done the real way." When who walks up but the old fellow who made the thing — who himself took the drawing that some decent architect came up with to go on the building, and himself changed the elaborate details and specifications in the print to have fun with the thing. And we're going to stand there and tell this old gent that we know better? We could probably make him feel bad, but winning an argument and showing who the real blacksmith in the crowd is, are two different things.

What I didn't tell you is, the guy who made the window grilles I have in mind worked a 1500 lb. Massillon steam
hammer during World War II. He and his father had come into town with the railroad shops decades before; and later, in their own shop, made buggies and along with a huge amount of ‘better ornamental iron’ around town, did the completely forged rejas for the inside of their town’s Catholic Cathedral — floor to ceiling, all of it the most satisfying completely forged church-ironwork we’d ever want to have our own excuse to do from time to time. He was all there, with the whole show all of his life, and as it turns out, my disappointment in finding that he didn’t do everything the old way notwithstanding, the grilles that he played with in another way are exactly the thing for the simple but good looking building they decorated. They cannot be improved upon, even though a take-off on them can be produced using all forged work; but then they wouldn’t go with the building.

He lived a long life, did some of the most delightful ironwork in his town or anyone else’s, owned a beautiful home, bought an apartment building, and put his kids through college; and he taught me something. He taught me to shut up when it came to calling someone on it every time the arc-welder was used, because if I’m saying it’s a disappointment every time it shows up, I’m telling old Vasquez he was wrong. I can’t say that to a blacksmith. And even if I say he was right, he’s still the blacksmith, while I simply own some anvils. It is my ambition to become a good blacksmith. So far as I can tell, Vasquez had always been one.

So, if we are troubled with anxieties over someone’s using the arc-welder, how are we going to feel about telling a real blacksmith he’s dropped the ball?”

Well, it is evident that Mr. Glurg, thus unburdened, certainly was subject to a different kind of strain. I’m not sure what century he lived in, and his other writings are obscured to the point of defying research (maybe he metamorphosed!), but the only thing I’d like to add is this: I love forge-welding, and use it wherever it doesn’t push a piece of work beyond its required level. I even sneak it into a lot of stuff where I don’t think it will show, just because I like to keep my hand in it. But Vlad Glurg might be happy to know that secretly, down in the little corners in the depths of my soul, I am completely and unabashedly in love with the arc-welder. (Oops! Don’t tell anybody!)□
Power Hammers . . .
a survey of the different types

by Associate Editor
James Fleming

The power hammer is one of the most versatile and useful tools of the modern blacksmith shop. Many blacksmiths who have regularly used a power hammer often consider it an indispensable and essential machine, especially when used for high volume production or for working large dimensioned stock. The power hammer has a long history in the blacksmith shop. The earliest designs were very simple and straightforward, requiring little maintenance having almost no precision parts. Those were water powered, later being replaced by steam, air, and electrically powered versions with increasingly complex components.

One of the earliest types was the "tennant helve," also called the "Marteau frontal," activated by a water wheel powered cam which lifted the hammer head from the front end next to the working dies (fig. 1). The falling part of the hammer was a large mass of cast iron which pivoted on one point opposite the anvil die at about the same height to provide a parallel match of the hammer and anvil dies. The entire weight of the hammer arm was lifted by a cam at the hammer head die on the opposite side from the pivot point. The operator faced the machine from the side, the water powered cam lifting the falling weight on a projecting pin through a set distance when it was then allowed to drop under its own weight, striking the work, to be lifted again by the next projecting pin, repeating the cycle. This is called a dead fall system.

The tennant-helve design was easy to build and maintain, offering a direct acting hammer with few moving parts. The main disadvantages were that the action was slow, the force and speed of the blows were set, and the operator was limited in the positioning of the metal to be worked because the placement of the lifting cam beside the dies obstructed a frontal approach.

Owing to certain disadvantages of the tennant-helve hammer the "tilt-hammer" was developed. Instead of lifting the front of the hammer at the dies it acted to depress the pivot arm opposite a fulcrum which acted to lift and drop the dies, much as a see-saw where one partner slips off his end when it touches the ground, allowing the other partner to drop freely (fig. 2). The pivot arm was a beam of a resilient, tough wood such as oak which was fitted with iron bands where the cam acted upon it and wedged into an iron ring at the fulcrum. The hammer die fitted over the end of the beam where it was also wedged into place. This design allowed the operator to move around the front of the beam.
hammer with the placement of the work being unobstructed from three sides. One inherent disadvantage of the tilt hammer is the limited range that the upper and lower dies remain parallel as the stock is reduced or when a very large piece of stock is worked.

A third major development in the water powered hammer was the “belly helve” (fig. 3) in which the cam lifting the hammer arm is located between the pivot point and the dies, lifting from below and allowing the arm to fall of its own weight. By eliminating the central fulcrum which in the tilt hammer was its weakest point, greater weight could be manufactured into the hammer arm thus lending itself to heavier forgings. The contact point of the cam and arm, a projection called the bray, was adjustable for larger or smaller forgings. Prior to the development of the steam hammer, in 1843, this type hammer worked the largest forgings, up to three feet in diameter!

![Fig. 3](image)

**The Belly Helve**

The helve type hammer was later adapted to belting running from a line shaft to a flywheel on the hammer which turned a cam similar to that of the tilt hammer. The speed and therefore the power of the blows was regulated by applying pressure to the belt which engaged a clutch more or less according to the pressure applied causing the cam to turn. The cam did not act directly on the hammer arm itself but instead moved rubber bumpers up and down, which contacted the arm fore and aft of the pivot. As the bumper raised the right side of the helve hammer, the arm and dies raised up against a spring loaded cushion which increased the quickness and severity of the blow when released. In some later types of helve hammers the dies are guided through ways for greater stability.

In 1843 the first steam power hammer was built in France by a Mr. Nasmyth, of Manchester, England. It was a simple, direct acting hammer built in a vertical frame with a steam piston connected to a hammer die which moved vertically downward to contact a stationary anvil die (fig. 4). In the earliest type steam was used to raise the hammer die, and when a blow was to be struck the steam was released from the chamber allowing the upper die to fall under its own weight, whence steam was re-introduced and the cycle repeated. This application is called a dead fall, single acting type because the hammer is dropped by gravity under its own weight.

Later, the double acting hammer was developed which added a second steam chamber, over the piston, through which steam could be introduced on the downward blow delivering a much harder blow. Thus steam could be rented into the lower piston, raising the hammer die and holding it there while the hot stock is placed on the anvil die. When a medium force blow is to be struck the steam is released and the hammer die falls under its own weight. If a harder blow is desired increasing amounts of steam can be introduced into the upper chamber driving down the hammer die forcefully, or if a very light blow is to be struck the steam can be released slowly from the lower chamber, acting as a cushion for the falling die.

The first steam hammers required an operator as well as a hammerman. Later, automatic controls working through a series of cams and valves made it possible to set any desired strength of blow, speed of operation, and length of throw giving the user maximum control and freedom. By introducing steam into the upper piston and holding it there the upper and lower dies can hold work in place, acting as a vise or press.

![Fig. 4](image)

**The Steam Hammer**

In more recent times the steam hammer has been replaced by the compressed air system which has many advantages over steam as it is easier to produce and store compressed air, and there is no water from condensed steam running down the chambers onto the hot stock. Many old steam hammers were converted into air hammers as the technology developed with very satisfactory results.

By far the most widely used power hammer today is the motor driven eccentric drive guided ram “trip hammer,” usually a “Little Giant.” (figs. 5 & 6) These hammers have seen long service because of sturdy construction and excellent design which reduces shock and stress. The motor drives a clutch pulley which when tightened sets in motion a flywheel the edge of which is connected to a sliding ram which moves up and down as the flywheel rotates. The bottom of the ram is a removable hammer die which strikes a similar anvil die located in the base of the hammer. The guided ram is indirectly connected to the eccentric by hinged toggle arms and a tension spring, thus alleviating the stress caused by the impact of the dies. The base containing the anvil die is usually an integral casting with the upper frame which holds the moving parts, though in some cases, particularly with very large hammers of this type, the anvil base sits within the hammer frame, unconnected, so as to further reduce stress.
The guided ram eccentric trip hammer is classified by the weight of the falling parts, including the ram and dies. This hammer allows the operator to move around three sides making it possible for an assistant to position extra tools or to help hold stock. The hammer die, which falls vertically, always contacts the work and the bottom die squarely and parallel.

One type of hammer which could be used in a modern blacksmith shop is the board drop hammer. (fig. 7) Primarily used for semi-open and closed die forgings, a falling weight is raised vertically several feet and allowed to drop under its own weight—a dead fall system. The hammer die is connected to a hardwood board, usually maple or beech, which extends through the top of the frame. Two rollers, turned either mechanically or manually, squeeze the board between them, and by rolling in opposite directions lift the falling assembly to its full height, when an operator can release it to fall through guides to the anvil die below. Disadvantages of the board drop hammers are the frequent wearing out of the boards and the difficulty of controlling the force of the blows.

Other forging machines which could perform some of the tasks the foregoing hammers are asked to do include bulldozers (upsetting machines) and hydraulic presses, both of which are so specialized in their functions as to have little general application in the modern blacksmith shop as a replacement for a power hammer.}

While these hammers cannot perform the same output as the larger, powered hammers, they have the advantages of being simple enough to be constructed by the smith at low cost, of obviating the need for a striker, and of freeing both the smith’s hands for holding stock and tools at once.
EDUCATE THE PUBLIC about

THE GOOD, THE BAD AND THE UGLY

by Rolando DeLeon

If you mention the words “wrought iron” today, most people would reply with images of welded window grills, railings and gates that adorn many Southwestern homes. To the individual home builder or the professional builder of homes and businesses, selection of wrought iron work for a particular structure has a very simple, clear cut solution: wait until the last minute or during the last phase of construction when funds are low and time is short. Then call several “wrought iron” shops and request bids on the needed work. The lowest bid will be the one chosen, providing that it will all be completed and installed in a matter of days, if not sooner.

As an ornamental iron craftsman who has fashioned and studied ironwork for several years, I have to say that there are some things terribly wrong with the process of selection mentioned above. As a craftsman who loves his trade, I and many others, would like to see a true and honest revival of ironwork in the public eye and in the hands of the craftsman. I feel that it is time for someone to step forward and say a few words about a skill considered by the majority a few hundred years back as the “king of the crafts.”

What is true wrought iron?

I mentioned “wrought iron” at the start and will begin with a few notes on the evolution of these words and what they mean to us today.

A few years back, “wrought iron” had a double meaning; one being wrought iron as a commercial metal, malleable and relatively soft, containing a very low percentage of carbon. In the process of smelting the metal, it had to be worked or wrought into the fine quality mass, otherwise known as “black iron.” Prior to the advent of steel, “black iron” was used almost exclusively for construction of all types. It was, and is different from all other metals, in that it is extremely resistant to deterioration by the elements. Large ocean liners like the Queen Mary, and structures like the Eiffel Tower, for example, were made of “wrought iron.”

Webster’s dictionary defines “wrought” as “worked into shape by artistry or effort, beaten into shape by tools, hammered. In reality, this definition describes “hot” iron work or forged iron as it was done extensively, as far back as recorded time and as recently as thirty years or so ago. There are still a few “hot iron shops,” such as the one I operate in Santa Fe, that also offer workshops in blacksmithing. Today, very little of this type of work is done and for the most part, we adorn our homes and businesses with “cold iron work,” which is “wrought iron’s” present day meaning. The difference in the two would be very evident if placed side by side and visually examined. Briefly, hot or hand forged iron is iron stock whose cross section has been changed, as in stretching or drawing of a bar (see Fig. 1, a.), or the opposite, in which a piece of stock has been pushed in on itself causing a bulge, called “upsetting” of a bar. (see Fig. 1, b.). Those readers interested in “hot iron work” can get some idea of its nature through the photos here displayed, and I also refer you to a recently published book; Decorative and Sculptural Ironwork by Dona Z. Mellach, which has page after page of pictures of contemporary “hot iron.”
What is cold iron work?

Wrought iron as we know it today or "cold iron" is just that — metal that has been worked cold, being bent, twisted and shaped, with little or no use of fire or heat. It usually involves using stock (steel) as it comes from the mill — solid squares, rounds, round and square tubing, all of it fabricated with the use of modern conveniences, such as electric arc welders and oxy-acetylene equipment.

Artistic limitations between hot and cold

As you might guess, iron work done the "old way" with hammer, anvil and fire, has few if any limiting factors physically or aesthetically. Iron and steel, when taken to proper "working heat", become extremely plastic and yield to the full range of treatments from very simple to the extremely intricate... Cold or commercial iron work is limited in several ways, the most obvious being that you can only bend, twist or shape cold metal up to a certain point or size, after which it becomes difficult if not impossible to work. Hence, the very thin metal used in the spirals or "scrolls" we see on many homes today.

The name switch

Why then, has the term "wrought iron" evolved as it has, and cold iron replaced hot? There are several reasons, foremost of course, is the cost of the product to the consumer or builder. Hot work or "hand forged iron" requires a lot of time to execute, not to mention the years involved in the actual learning of the craft. As we look back in history, most of us would be surprised to find that much, if not all of the fine ornamental iron work done was executed for the Church or royalty or the kings and queens of different empires through time. They were the only ones who could afford the incredibly lavish works of art that required as many as a hundred fine craftsmen working for several years to complete.

Let's look for a better approach — and here's why

As mentioned earlier, cold iron has replaced hot iron work almost totally now, but that doesn't mean that cold iron work would be considered a poor investment. Good "cold" or "commercial" iron has a valid and appropriate function in architecture today. It is the bad, or "junk" iron that I am concerned about. Surely a skill that was regarded as "king of the crafts" deserves more attention and consideration from the artisans of today. The consumer or builder has a responsibility also, and that is to seek out the shops doing the good work and patronize them. The consumer should expect and demand good iron work and not slap just anything on their homes and businesses as long as the price is right. It never ceases to amaze me how a builder will take such pains in choosing just the right tile, carpet, or hand-carved doors, with perhaps a bit of stained glass, and then — at the last minute — have a bunch of garbage installed in or around the structure, because "the price is right, and it's all the same anyway." It is not all the same! There is good "cold" iron work and bad. The inferior metal work purchased at Mexican border towns and similar work fabricated in the states, is so incredibly bad, that most ornamental iron craftsmen of the past would roll over in their graves if they could see it. The public only perpetuates this rip-off by continuing to purchase such "junk".

With a few guide lines, the buyer who wants, expects and is willing to pay for good quality work, can in a very real way, help to elevate the craft to its proper station with other contemporary crafts.

I realize that for some, these words may be hard to accept, but for those of us who care on both sides of the fence — whether consumer (builder) or craftsperson, I feel a few guide lines are long overdue. I have talked with many fine iron workers over a long period of time, and they all speak of organizing for the purpose of formulating some standards for our craft. I only hope such an organization can be formed within the near future.

Guidelines for good work

Here are some guide lines or key aspects of good cold work that we should all be aware of... first and foremost is the function and appropriateness of the work. If the work to be done is of a protective nature, the size of the stock used (regardless of its shape) is a consideration of major importance. The finished product may be a work of art, pleasing to the eye and interesting in design, but if it is not of an appropriate size stock, it will not serve its function, which is to protect. Many craftmen are incorrect in believing that if the work is of a Spanish design that it should be cluttered with dozens of paper thin scrolls, which many times are shaped poorly, and when fastened together, provide little, if any structural soundness. Such thin, lacy scrollwork comes from a style of iron work fashioned in Spain and Mexico a few hundred years back and called "churrigueesco." In its proper tradition, this style was not used in rejas or window grills, but only in smaller utensils and interior implements of the home. This style has been carried over to the present day, but usually is not deployed in the proper fashion.

Cold work fabrication

Next to consider is the fabrication of the work or how it is welded together. In most instances with cold work, it will be fastened together via arc welding. Trust your own common sense and ability to spot a sloppy job. Arc welded beads should be cleaned of splatter, scale and ground smooth — always! Lack of such care is always considered poor work. If an iron worker of one hundred years ago could have somehow obtained an electric arc welder, you can bet that he would have made sure his work was a good reflection of his skill and good taste — and properly "cleaned" each finished piece.

Overall appearance and general design quality

Again, these aspects are "key" to and similar to the "old" way. For most of us, the considerations here have to do with spirals or curly-cues, properly called the "scroll" or "scrolls." Inspection of how a scroll is executed and finished will quickly tell us whether the work in question is good or bad.

The type of scroll is determined by the letter of the alphabet it resembles... we see a "J", "C" and "S" scroll. In good work, all scrolls will have graceful lines that are pleasing to the eye. Never, for example, will an "S" scroll have a straight or flat look between the two spirals... The spirals themselves should have that same graceful look,
without kinks, and as your eye travels from the center, the spiral should open, increasing gracefully as your eye moves around. An increasing radius, so to speak.

The ends of the spirals in a scroll may be finished in a variety of ways, but always, the skill of the iron worker should show. The ends must never be simply hacked off with bolt cutters, but forged out hot, the minimum treatment being to flatten them out into what is known as a “fishtail.”

Use of collars — another sign of good work

Look for “collars” on the scrolls, connecting them to bars, the frame of the entire piece of work or to another scroll. In the past, they were small, flat pieces of metal, wrapped around as fasteners. In cold work today, they also serve that function, as well as to cover the arc weld bead (which should have been ground clean) and to add a certain balance to the design. The collars are a subtle addition, but if they are not used, the overall appearance of the piece will be lacking, . . .

In summary

Train your eye to quickly spot good or bad work whenever you see a “wrought” iron gate, support or window grill (reja). You will soon discover that most of what is out there on the landscape is little more than junk, but on occasion, your eye will fall on a piece of real art work in which the skill and pride of the iron worker is apparent.

I am thankful for the builders in this country who do demand quality work, whether in the way adobes are laid, the installation of the tile, the carving of the doors or the design and finishing of the iron work. They help us pay the rent and we can sleep at night, gratified that we have done the best we are capable of with each and every project.

Garden by Steve Rosenberg of Stamford, Connecticut.
Approximately 32” X 37”. This gate appeared in “House Jewelry”, the first exhibit of the National Ornamental Metal Museum in Memphis, Tennessee. (A photo of this gate was, regrettably, not available for the article reporting this event in the June 1979 issue of the A.R., pp. 30-33)
TIPS and TECHNIQUES

TWISTING DEVICE
submitted by Jim Ryan
Dubuque, Iowa

Learned something new the other day from an 83 year old blacksmith named Burkhard Reigel in Clermont, Iowa. I saw a railing that he had made with twisted half inch bars and asked how he twisted them. He dug under the bench and showed me a rig like the one pictured here, except that it was welded all along instead of drilled for different spacings. His advice, "If you have a bunch of dem to do, gett some (one) big and dumb. If he's too shmardt, he vont do very many."

But the rig does work, for hot or cold twisting. It can be made with interchangeable units for short twists, different size bar stock, or what ever your imagination will let you do. And it is very simple. I made the square hole for the bar go all the way through the handle section so that reverse twists are possible too.

REPAIRING A BREAK OR BURN
submitted by Paul Lacy III
Covington, Virginia

Is there not one of us who at some time or other, upon nearing the end of a particularly intricate project, hasn't broken or burned a part at a point where a forge weld would not be possible, due to either the interference of the design, such as a twisted area, or interference with access due to some other part?

If you have arc or acetylene welding equipment, consider making the needed repair and then covering the anacronic weld with a wrap, hot, or butt welded collar. At times this may even add to the appearance, if not overdone. Or a slight change in motif may be effected by balancing this collar with one in another location, in order to maintain the continuity of design. In studying the work of some of the greats of this century, one wonders if perhaps this technique was used occasionally in original construction of more complex pieces, especially in jiggling work.

This is not to suggest using modern aids as a crutch to compensate for lack of skill, but rather as an economic salvation for that occasional costly accident to a large and complex piece.

HAND CARE
submitted by Ray Sobel
Lebanon, New Hampshire

Ordinary soap flakes (such as Ivory flakes) dissolved in water to a paste-like consistency serve as an excellent preventive for black hands and nails. Apply before you start work. It also provides a protective film against burns. Add a little hand lotion to provide the needed glycerin.

A WHIPLASH BLOW
submitted by John Dittmeier
Alexandria, Virginia

Accuracy and maximum energy are the requirements of hammer blows for large stock movement. The arm motion should take full advantage of the wrist, elbow and shoulder rotations. By whiplashing the arm and, in particular, the wrist, a heavy hammer head upon a medium length handle (a four pour cross-pein on a fifteen inch handle) will have the important increase of angular momentum. The back, moreover, may add to this swing. The handgrip is somewhat loose on the upswing so that the handle may return to a backward cock position. The grip tightens as the wrist whips the hammer forward. In the manner of a leaf spring, the thumb, in an up position, provides control and accuracy.

Novices deliver weak blows partially because their swings are ones of translation, not of rotation. The text The Modern Blacksmith by Weygers discusses this very subject in Chapter 2. My lessons came from Bill Gichner of Delaware and Bob Sidaway of West Midlands, England.

September 1979
FORGE TUYERE

submitted by Francis Whitaker
Aspen, Colorado

During the past two years, I have worked with so many different forges, and read so much about the easy homemade ones, that I should comment. There is no real substitute for a good cast iron tuyere, beware the home made ones of mild steel and a sink strainer to let the air in. One case, the clinkers stuck to the mild steel so badly that it took a chisel to clean them off. The sink strainer blast makes forge welding more difficult, not less. The cast iron tuyere is worth every cent it costs, build your own forge around it any way you want, but don’t short cut on the heart of the forge.

At one recent workshop, one of the students was determined to master forge welding chain links. After a lot of work, including making first a pair of chain link tongs, essential in doing that operation, and after struggling with his own forge, I worked with him at the main forge, a good Buffalo pot. That turned the trick, the proper pot, the proper blast, and a bit of coaching on welding heat and flux. Made the whole workshop worthwhile, and emphasized this point dramatically.

TOOL DRESSING HAMMERS

submitted by Douglas C. McIver
Winston-Salem, N.C.

In view of the two articles on bevel face hammers in recent issues of the Anvil’s Ring, I am enclosing pictures of three such hammers in my collection. They were made by and used by men working in the shops of nearby granite quarries.

The smith I got them from said they were used when sharpening chisels and other rock tools. It seems a hardie with a bevel on its face was used with the hammer to speed the pointing of the tools. I am told that the hardie shank extended through the anvil and a wedge was driven through a hole in the shank to securely lock the hardie in place. The last blow of the hammer cut the end of the tool off squarely on the sharp edge of the hardie.

ON SLACK TUBS

submitted by Mack Beal
Jackson, New Hampshire

For me the best slack tub is half of a 50 gallon oak whiskey barrel, which is available for about $15.00 (empty), that has six steel hoops/bands, and the bung hole in the center of a side, rather than at either end. If the barrel has not been used for other things, like cider or vinegar, less fungus or crud will result. A handsaw will do a cleaner job of cutting the barrel into two ½-barrel slack tubs than any electric saw. If you put the other half barrel in dry storage, place it with the widest diameter down, so the hoops will slip down to contain the staves as it dries. Any excess charcoal may be wire brushed or scraped away from the inside of the half-barrel tub you will use. I plan to recycle the water Fall and Spring to avoid the Bredlow “gassy bubble” syndrome.

Now, to avoid the past distress of having steel hoops snap due to rust, etc., causing a flood in my shop, I have now placed a chain just above each of the steel hoops/bands on the tub. (See fig. A) When the original hoops let go, as they will in a couple of years, I will still have a good slack tub until the wet oak gives out in 10+ years.
Relative proportions: Discarded side chains of regular auto snow/ice chains, minus the cross links, are just about right. These links of 3/16" welded steel are 1 1/2" long × 3/4" wide. Prepare each length of chain about 2" to 3" shorter than the diameter of the tub just above each steel hoop. Then bend the end link of each chain 90° in its middle. (See fig. B) A 4" or 5", 5/16" bolt can then be used between the two right angle end links to really snug up the chains. An oak slack tub so prepared will give 10 years plus of use, with attendant aesthetic joy and lack of worry.

Although safely close to the shop woodstove, my slack tub can freeze solid overnight. I find using a 150 watt chicken brooder lamp suspended several inches over the tub's surface for a few hours of the winter night is safer and cheaper than using an electric immersion heater and could also be used with metal slack tubs.

I still wanted a hand and an electric combination, so I mounted the stoker blower near the floor and, on a stand above, I mounted the Buffalo hand blower. Gentlemen, you know how what it is all about, know exactly how my forge came alive. It was hard to realize that for 5 years I've been struggling with this Mickey Mouse oil furnace blower. Even a vacuum sweeper would have been better.

So, fellow blacksmiths and demonstrators, when next you happen to use my forge, I'll not need to apologize. I'm in the hot air business for real!

BAD AIR

submitted by Paul Browning
Columbus, Ohio (courtesy OABA newsletter)

Have you wondered why your customers are staying away or at least up-wind of you while you are working? Your problem could be "Blacksmith's Body Odor." Some of you might try using baby powder to stop the perspiration, that's kid stuff. I recommend using rubbing alcohol (Isopropyl Alcohol). Splash it on the pits before forging or as you see a perspective customer approaching. It's cheap & it kills whatever you have growing down there.

RIVET CUTTER

submitted by Paul Hubler
Rockford, Minnesota
Courtesy "The Metalsmith"

This is a rivet cutter for making rivets shorter. I always need a size of rivet that I don't have. I have a lot of long rivets and I need short ones, so I made this rivet cutter out of a piece of a snow plow blade. It is six inches long by an inch and a half high. With another smaller piece rivetted to it so it can pivot. I made this for 7/16" rivets and I drilled a hole straight through both pieces after I rivetted them together. I put the rivet to be cut into the hole and hit it with a hammer as indicated on the drawing. PRESTO! You have a short rivet. It works slicker than a whistle. Now I have a lot of short rivets and no long rivets. Does anybody have any long rivets?

A HOT AIR STORY

submitted by Emmett Studebaker
Tipp City, Ohio (courtesy OABA Newsletter)

I owe an apology to Francis Whitaker, Dimitri Gerakaris and a half dozen other artists blacksmiths who used my forge for demonstrations and never once complained about the bloomin' thing. At least they didn't complain to me about it.

I've struggled along for five years as a rank amateur trying to learn a little bit here and there, blaming myself for poor results on many occasions.

My setup has been a hand operated Buffalo blower joined by way of a "Y" connection with an electric blower which originally furnished draft for an oil furnace. The hand blower worked pretty well, but occupied a lot of my time and took a lot of energy. The electric blower worked after a fashion, but was pretty weak.

At an auction for $2.00 I picked up an old squirrel-cage type blower with a 1/2 hp motor, formerly used on a coal stoker. This I decided to install it to see if I could improve combustion.
HAMMER DRIVEN SHEAR
submitted by Bob Patrick
Bethel, Missouri

I had heard of Francis Whitaker’s hammer powered shear, and upon seeing an odd tool which I decided was such a shear in Craftsmen of Necessity by Christopher Williams, I decided to make my own. I did so as follows: I cut two ¼” × 2” × 10” pieces from leaf spring, straightened them, rounded them as shown in the drawing and punched a ½” hole in the end of each. I tempered to a purple color, using brine to harden and temper in. I next sharpened them to a slight bevel as shown. I “set” the blades so they would meet properly, when hot, after drawing the temper. I then welded one of them to a shank which fit my hardy hole and riveted the two blades together. With this simple shear I can cut up to ¼” mild steel plate at an orange heat. I can split leaf springs lengthwise with ease when they are hot and I have cut knife blanks for forging from 3/16” 440c stainless when hot. All in all, it is a very handy, compact tool, which leaves work with a neat edge.

2 pieces
¼” × 2” × 10”

Bottom piece

Top piece

Riveted together

Round end

½” hole

Weld bottom piece to shank to fit hardy

Strike here

Bevel of blades (rivet so sharp edges Meet)

ANVIL TOOLS
submitted anonymously

As tips go, I have a few but feel funny. I know that there is very little I could do or say to those master blacksmiths that they haven’t tried. They could tell me many times over why my tips are not so good. But I try anyway.

Take a piece of square stock the size of the hardie hole, and put a plate on it and bolt the a vice to it. You have a vice at the anvil with which you can off-set the square stock and get the vice out of your way. Put it anywhere you want it. The bigger the anvil, the bigger the vice that you can use. My anvils run from 30 lbs. to one that is over 400 lbs., so I can use a good sized vice.

Also, I have some hardies fixed up so they will go in the pritchel hole. They don’t turn like you would think they would. Thanks for the time and trouble . . .

A HAND-HELD DIE
submitted by Richard Quinell
Surrey, England

This is a handy die that I’ve noted in my recent travels. Rather than making an intricate set of dies for achieving a collared effect, the top and bottom dies are simply clamped together, drilled through the center, the edges are relieved and there you are. Merely rotate the piece of hot iron. And of course, shapes with a square cross-section can also be formed, giving the tool added versatility.
FORMING HINGE EYES COLD IN SHEET
submitted by David Court
Northfield, N.H.

To make this tool, use square stock just a bit larger than your hardie hole and taper to fit, leaving the taper long so as to project below the anvil heal. Cut the top section at about 5° and cool. (The steel I have used in my tools is mild steel, and has held up well.) Next, drill a hole 1/32" oversized to the outside diameter of the finished hinge eye and as many inches down from the top as the hinge leg is wide. (Hole diam. = pin + thickness of sheet + 1/32").

Next, cut a straight line down and through one side of the hole. To make this cut use 2 hacksaw blades mounted side by side in the hacksaw frame. Spend some time filing off any ridges so as to reduce friction as much as possible, and the tool is done.

To use the tool, thin the eye tab of the hinge at the edge of the anvil and leave it slightly curled. Place the hinge in the tool with the pin in place and work a light hammer along the protruding upper edge. When the fit becomes snug, remove the hinge by driving it with a short pin. Use a sharp single beveled cold chisel to tuck under all edges. Return to the tool to finish rolling the eye. Remember, a short piece of pin stock should be in place at all times. I usually oil the tool every now and then.

REBUILDING POST VISE SCREWS
submitted by Paul Lacy III
Covington, Virginia

After reading Dimitri’s article on forging a screw for the box of a post vise, I would like to relate a repair I made to a post vise at the Winter Cedar Lakes workshop. Upon examination of the vise to be repaired, it was determined that the male screw threads were sufficiently intact to preclude any work other than cleaning with a sandblaster. As the threads in the female member were all but gone, I chucked this portion in the lathe and bored out what remained of them until the boring bar just began to “clean up” on the inside diameter. Next I sandblasted the inside in order to remove any rust from pits which remained. (Acid pickling will accomplish this where sandblasting is not available.) The intact screw was then wrapped with a piece of one inch key stock in the following manner: One end of the key stock was clamped in the thread with vise grip pliers at the eye end of the screw. It was then twisted around the threads in the direction of the opposite end with the aid of a crescent wrench to keep the key stock from turning over, keeping constant tension on the key stock as it was wrapped into the helix. Upon reaching the far end, the key stock was again gripped with vise grip pliers and the handle length sawed off. A piece of .015 brass shim stack was then cold-formed around a bar to be a tight fit in the bored out member. The screw and wrapped thread were driven into the box. The screw was then untwisted, the cold-worked key stock having enough spring to expand against the brass shim stock, and, in turn, the box. The assembly was then fluxed with plain borax and slowly heated and turned in a cage fire to a medium red and allowed to cool slowly. The screw was re-assembled without lubrication.

I might add that except for the slow heating, this process takes about the same length of time to perform as to describe.
MAKING BOTTOM SWAGES

submitted by Ed Small
Cumberland, Maryland
courtesy Appalachian Blacksmiths Assoc.

Material selection: Medium to high carbon steel should be used ranging from carbon content of 1045 to about 1085. I do not recommend harder steel because of possible damage to the hammer face. You can find this grade of steel in buggy axles, air hammer bits, large coil springs measuring ¾ in. or larger. The advantage to using buggy axles and air hammer bits, is that they have a collar built in somewhere along the shaft to provide you with stoppage over the hardy hole. Otherwise you are in for a lot of forging or welding a collar on.

Hot cut your material on both sides of collar keeping in mind how much stock you are going to need for the forging. You should have about 2 inches beneath the collar and forge that to a taper so as to prevent seizure in the hardy hole.

To form your swage you need to heat to a light orange and upset the stock to form somewhat of a mushroom shape. This takes a 4 lb. hammer at least and maybe 3 to 5 heats depending on your skill. Do not deform the collar and do not quench when working this steel, you will fracture it!

You may leave the profile of the swage round or forge it square depending on your taste. The top of the swage can be dressed concave or convex to be used in making spoons, depressions, etc. For round or V-shaped swages you should heat the swage to light orange and use a high carbon rod that is the size of the depression you want to make. I use the piston rod taken from shock absorbers for one size. You can also use a lug wrench which is a little larger. You then hammer this rod into the top of your “hot” swage to the depth you want. Mild steel can be used but it deforms too much upon hammering.

After forging is complete, heat to a medium red color and anneal for at least 5 hours. Then heat to where there is no magnetism (medium red) and quench in oil. Heat only top part of swage and quench face first until you can just touch it or cooler. I then draw color to purple and quench once more. You need the swage a little softer than your hammer face so as not to ruin your hammer. This job took me about ½ hr. and beats paying $15-$20 for a tool plus the added pride of being custom made to your own liking.

AN APPROACH

submitted by Francis Whitaker
Aspen, Colorado

At one time or another in your career, the experience I had with these candlesticks must have happened, if it has not yet, it will.

This very fine commission came by mail, with an imaginative sketch, which so often can delineate wrought iron better than a rigid drawing. At first glance, it seemed not too difficult, after all, baskets are part of the work, but it turned out to be one of the most challenging jobs I have had in years.

I realized that each piece, 24 of them, would have to match exactly. To start, I used something better than a piece of string for a pattern, a length of wire solder. This will hold its shape in a piece up to 24 inches long, and can be bent to get the right contour, while holding its shape well.

From this evolved a form to bend the identical pieces, swelling from ¼ inch stock to 1 inch for the top half, and to ¼ inches for the bottom half. The ¼ inch rounds, 12 inches long were first flattened off center, with a simple stop jig to get all the flat places exactly the same. I tried flattening the ends, too, but they did not align, so I had to do them after forming. The formed and flattened pieces were then drilled, and a jig made with three pins to which each piece was finally formed so that the three holes dropped onto the three pins.
This was to be a riveted job, but it became apparent that it would not be possible to back up the rivets, so 72 6/32 machine bolts had the slot welded shut, leaving a nice round button head. Try it some time. Assembling went along well until the last few pieces. I then had to resort to a new trick. The nuts for the bolts were on the bench as well as a dab of contact cement. A finger dipped in the cement, I could then pick up the nut and slide it inside the assembly while screwing the bolt in from the outside. It worked, and the result was most pleasing. Just goes to show that one never stops learning.

![Completed candlesticks by Francis Whitaker](image)

WELDING FLUX
Submitted by By William Clyde Payton
Courtesy of SEBA

The story of David Wall vs. Ivan Bailey, on the matter of who has the best flux for Blacksmith Forge Welding, or the Case of the Great Flux Argument.

Ivan was dutifully giving his demonstration of forge welding and all the while was talking under his breath about the conference providers not having the right kind of flux available to him for this most important of demonstrations. In between words of lecture intended for the audience, I overheard him admonish himself for not bringing his own.

In the meantime David is trying to subtly and quietly interject some differences of opinion regarding the flux. Ivan isn’t about to agree with David’s opinions and grows more stern as to the merits of his flux. Meanwhile he diligently tries to withdraw all the iron filings from the available flux mixture with a magnet.

Here Ivan is, trying to do battle on two fronts at the same time, with a piece of ornery weld metal, (he even dropped it once,) and on the other hand a persistent David Wall. Then things really got comical when Ivan accidentally raked a hot coal off in his shoe top. He did the cutest jig dance you ever saw. I thought for a minute there that Ivan might put a hot coal under the cute little Swiss-Alpine hat which David was wearing and pat it down twice with his four pound hammer — but it was a Mexican Stand-Off. Nothing happened but a lot of good fun and an excellent demonstration on forge welding.

I know for a fact that both these guys are great smiths. I’ve seen both their welds and they both use their own flux formulas with excellent results. I suppose the moral of this little story is that if it works well for you, then it works well.

A LOCK
Submitted by Joseph Bonifas, Delphos, Ohio

Diagramed is a lock which is very simple to make and works well. The lock used is a cabinet lock which makes it perfect for this setup because it doesn’t take a lot of space. This will serve for medium security.

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September 1979
FORGING GRAPLINS

submitted by Michael Spencer
Port Medway, Nova Scotia

The big iron swage is called a "sow" by smiths here and mine is one of three in the area. A lady here sold the building where her grandfather's smithing gear was stored, and hired two fishermen to take it all to the junkyard. This was the only piece that was too heavy for two men to lift into the truck, so they threw a chain around it and dragged it home. It came to my shop on a stone boat.

It weighs maybe 450 lbs. and is indispensable for bending claws on 100 lb. graplins (4 or 5-clawed net and trap anchors).

Tips formed into ribbed flukes or tapered to take ¼” plate pads.

This whole thing is heated where the claws join the shank, up-ended, with some awkwardness, into the 4” hole in the sow, and the claws bent over with a pipe.

BRAIDED HANDLE

submitted by George Nichols
Weston, West Virginia
courtesy Appalachian Blacksmiths Association

Select 4-16” pieces of ⅜ rd.
1-piece of ⅜ rd.
1-piece of ½ rd.

Take a ³⁄₄” round piece and upset to form a ball ¾” round on end. Reduce the ¾” to ¾” for 2 to 3 inches.

Be sure to leave enough of the ¾” at the ends to weld to the ½” shank of the firetool. It will be easier to heat without disturbing the fire if you leave the ends in a vertical position when finished with each braid.

This can be used in candle stands, log basket handles, hanging lights, etc. I have used as large as ¾” material for the braid.

For the ¾” stock it takes about 1 hour to complete including cutting the stock and welding to the shank after braiding.

Variations are using 8 #16 welding rods twisted into 4 pairs of two each before welding to stem of ball.

Smaller size wire can be used. I have seen 32 small diameter wire lengths twisted into 4 bundles of eight each and braided very tight for a very pleasing handle.

Use your imagination to come up with your own braided design.

Keep the bends tight and even on each side and when you finish you should have a four sided braid (practice on a piece of wire) with each bend directly above the last bend.
ON APPROACH
submitted by Rolando DeLeon
Santa Fe, New Mexico

There are some aspects, with regards to blacksmithing that I really believe are of great importance to us all, as we grow in knowledge and experience of this craft.

It is these aspects, I feel, that are most often left out or disregarded when we read or hear of the "how to" or "techniques" of the craft.

The aspects I'm referring to are those of "approaches" and "attitudes" of blacksmiths towards iron and the activity of working it.

Mr. Joel A. Schwartz's thoughts on the questions of "why" in examining the work of the great Samuel Yellin, (Letter to the Editor A. R. March 1979) were very significant, I felt. In fact, when we inquire as to the "why's" of the work of fellow smiths, past or present, we are really recognizing these aspects above mentioned.

The "attitudes" and "approaches" of a good smith are very bit as important, if not more so, to us as we strive for knowledge, than the questions or aspects of "how to" and "techniques" as I see it.

The questions posed by Mr. Schwartz suggest several good examples of this topic of "attitudes" and "approaches." Another example which comes to mind as I write is the approach to "taking measurement" as done by good smiths of the past. There was often no need for a rule or a specific calibrated device for taking measurement as he worked. The smith had spent many years training his eye in taking quick measurement. One tool or aid he did have available to him as he worked, as a gauge in measurement, was the anvil upon which he worked.

For example, no matter how good the condition of an anvil, it will always have nicks along the edge and/or small pits or impressions in the face. So the smith knew that from the shoulder edge of the cutting table to the first visible impression or nick on the anvil face was approximately 1\(\frac{1}{4}\)". To the next pit or nick on the edge was approximately 2\(\frac{1}{4}\)". He also knew his anvil face was 5 inches wide, the hardy hole 1 inch, and from the back edge of the hardy hole to the heel edge, it was 3\(\frac{1}{2}\)" in measurement, and so on.

By laying a piece of stock to be fuller at the anvil face and gauging it with our eye we realize the great value in this "approach to measurement."

The anvil is truly an incredible tool and it is many more "tools" than we realize sometimes.

STEEL FINISHING HINTS
submitted by David Zatz
Brooklyn, New York

1. Recent research turned up an excellent (though dreadfully expensive) rust inhibiting product manufactured by the INSL-X company, called "Zinc Rich." It is 93% pure zinc metal carried in an organic resin base which can be painted on or sprayed as with conventional paints and is said to provide the finest protection available... particularly when applied to newly filed or sandblasted work. (Though it is supposed to be quite effective over badly rusted surfaces and was designed for severe marine applications where corrosive conditions are at their worst and complete cleaning of base metal is at times impossible. (Price, around $25/Gallon.) INSL-X also makes a wide assortment of less expensive products as well.)

2. Tip from my paint supplier... While contemplating buying a dark primer paint, he reminded me that the tremendous advantage in using a bright colored primer and dark top coat is that the painter can easily distinguish areas missed by the primer coat which contrasts sharply with raw metal, and final finish as it contrasts with the primer. (One of those wonderful... OF Course!!! suggestions.)

3. I have not been at all happy with either the glossy or dead flat paints available for exterior use. I have experimented mixing flat and glossy paints and have had good success provided the paints are completely compatible and are mixed thoroughly... preferably some days before use. Many of your better "siliconized" enamels are manufactured in gloss and flat, and these are perfect for mixing. (Pratt and Lambert "Effecto" enamel being one good one.) Also, 2 part epoxy paints are available and a gloss resin can be mixed with a flat hardener (or vice-versa) to produce a semi-gloss finish, though I have never tried these, and suspect that the range of possible finishes from gloss to matt could be far wider with mixed enamels than with the epoxy as the 1-to-1 proportions for the epoxy resin and hardener are fixed.

Entry gates for an art gallery in Lima, Ohio by Joseph Bonifas and Michael Bendele. Locks are engraved and decorated with textured brass. These gates were installed at separate entrances of the gallery. Each gate measures 4' x 9'6".
ELIMINATING MISTAKES
courtesy SEBA

1. When changing cutting tools, turn off the machine. It's not only faster but safer.
2. Pay attention to all prints and drawings. Note that they have two sides; use the side with the brighter image on it.
3. The sharp end of the drill should face the work. This will reduce the number of drills broken and the work will go faster.
4. When using cutting oil a cutting tool must be used as well. The oil will not do the job alone.
5. Work which has just been heat treated or welded should not be touched until the red color disappears.
6. When using welding helmets, the dark glass window should face towards the front of the head, not to the rear.
7. The practice of using micrometers as C clamps should be discontinued.
8. When using hand-held electric drills, hold securely by handle. Longer extension cords will not work.
9. Dimensions in meters and millimeters may not be interchanged unless the decimal point is moved accordingly.
10. No more wire will be machined from bar stock.

BREAKING IN A NEW ANVIL

submitted Jim Converse
Grants Pass, Oregon
courtesy, CBA Newsletter

The following describes Jim’s treatment of his new Kohlswa (Swedish) anvil:

The face was a reasonably good ground finish and the flame colors along the edges, heel and horn were very clear. I started using it with the greatest of care as I was warned by their warranty that I should ‘break it in’. I DID NOT do any cold working of any kind on it for a year. Today my anvil is serving me well, it is quite hard, very few marks, no bad edges. The horn is near perfect shape. I consider it a good anvil of very good design. A few suggestions to help you—

1) An anvil is an expensive piece of fine tooling. Never force it or abuse it.
2) Break it in easy, give it a chance to work harden. Never do any cold working on a new anvil. Keep your hammer face OFF the face of that new anvil until it has hardened up some.
3) Never let any kind of cutting or punching tool come in contact with the face.
4) Don’t believe every thing you read in the book. Don’t grind away any edges until you know why and what you are doing. Any modification you may consider should be predicated on the future use of this tool.

Kohlswa states in part— ‘Anvils are cast in one piece and should be treated accordingly. The face is very hard and for this reason the anvils, especially when they are new, should be handled with proper care and judgement. Never strike on the edges or point of the bick direct with hammer or sledge. Heavy blows on hot iron lying on the anvil can never cause any damage; on the contrary, after the anvil has been used sometime, the heat from the hot metal and the blows temper the surface and make the structure denser, which produces greater toughness and less susceptibility to blows.’

PORTABLE FORGE & HOOD

submitted by John Perris
Auburn, N.H.

I have been greatly impressed with the continued improvement of both the Anvil’s Ring and the ABANA organization.

I am a practicing smith — I practice, and practice and... the Anvil’s Ring, conferences and off-shoots such as the New England Blacksmiths Assoc., have helped improve my skills and knowledge and brought new contacts.

I have two offerings which might help other non-professional enthusiasts. The first is a small portable forge suitable for demonstrations or occasional work, and the second is a “hood” I built for forging indoors (in my cellar).

The forge grew out of my first blacksmithing experience as a member of the crafts section of the Brigade of the American Revolution, an organization devoted to
recreating and re-enacting the life and times of the Revolutionary soldier. We needed a portable forge which had more visual appeal than the cast iron one we used. The design is not authentic, but was built with materials on hand—scrap lumber and a firepot I acquired when I first began forging.

The dimensions are variable and should be tailored to individual needs and uses. Mine is 24" × 20" at the top and 28" high. It allows for a suitable worksurface.

(see figure for details)

The “hood” was designed to solve the problem of smoke in a basement, where I did (and do) most of my work at home. The box is built of plywood and lined with aluminum from an old above-ground pool. The window fan was built into the box, with some modification, with the cord run out through the box’s wall. 8” stove pipe runs from the fan to a window. I installed a damper between the fan and the window. A dryer-type vent could also be used outside.

I’ve kept the hood within 2 feet of the forge and it has effectively removed smoke from the fire in all phases of forging.

The firepot I had to work with was built of four triangular sheets welded to a pipe with drilled air holes. It didn’t have any cleanout. For a better firepot, alterations could be made in the shelf to allow for the tuyere. A side panel could be removed (easily done) for cleanout.
### COMMON NAMES OF CHEMICAL SUBSTANCES

Many of you have rightly noted the great frustration involved with reading a precious, old formula infused with colorful, but cryptic, ingredients. Here, to set you straight and put your mind to ease, is a lexicon of the common names of chemical substances, compiled and contributed by the Whisenants of the Oregon Bladesmiths Association. One word of caution, if you are unsure of the dangers of using any of these substances, play safe and avoid their use. The only thing more precious than that piece of iron is you.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Chemical Name</th>
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<tbody>
<tr>
<td>Meerschaum</td>
<td>Magnesium silicate</td>
</tr>
<tr>
<td>Milk of lime</td>
<td>Calcium hydroxide suspended in H2O</td>
</tr>
<tr>
<td>Mosaic gold</td>
<td>Tin bisulfide</td>
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<tr>
<td>Oil of vitriol</td>
<td>Sulfuric acid</td>
</tr>
<tr>
<td>Oleum</td>
<td>Fuming sulfuric acid</td>
</tr>
<tr>
<td>Orpiment</td>
<td>Arsenic trisulfide</td>
</tr>
<tr>
<td>Oxene</td>
<td>Sodium peroxide</td>
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<tr>
<td>Peach ash of pearl ash</td>
<td>Potassium carbonate</td>
</tr>
<tr>
<td>Peroxide</td>
<td>Hydrogen peroxide</td>
</tr>
<tr>
<td>Plaster of paris</td>
<td>Calcium sulfate</td>
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<tr>
<td>Plamago, black-lead</td>
<td>Grafite</td>
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<tr>
<td>Potash</td>
<td>Potassium carbonate</td>
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<tr>
<td>Potash alum</td>
<td>Calcium carbonate</td>
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<tr>
<td>Prussian blue</td>
<td>Ferric-ferrocyanide</td>
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<tr>
<td>Prussic acid</td>
<td>Hydrocyanic acid</td>
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<tr>
<td>Pyro</td>
<td>Pyrogallic acid</td>
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<tr>
<td>Quick lime</td>
<td>Calcium oxide</td>
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<tr>
<td>Quick silver</td>
<td>Mercury</td>
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<tr>
<td>Realgar</td>
<td>Arsenic sulfide</td>
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<tr>
<td>Red lead</td>
<td>Lead oxide</td>
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<tr>
<td>Red orpiment</td>
<td>Arsenic bisulfide</td>
</tr>
<tr>
<td>Red prussiate of potash</td>
<td>Potassium ferricyanide</td>
</tr>
<tr>
<td>Rochelle salt</td>
<td>Potassium and sodium tartrate</td>
</tr>
<tr>
<td>Salammoniac</td>
<td>Ammonium chloride</td>
</tr>
<tr>
<td>Saleratus</td>
<td>Sodium or sometimes Potassium bicarbonate</td>
</tr>
<tr>
<td>Salsoda</td>
<td>Sodium carbonate</td>
</tr>
<tr>
<td>Sal volatile</td>
<td>Ammonium carbonate and bicarbonate</td>
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<tr>
<td>Salt peter (bengal)</td>
<td>Sodium nitrate</td>
</tr>
<tr>
<td>Salt peter (chili) niter</td>
<td>Ammonium carbonate</td>
</tr>
<tr>
<td>Salt of Harts horn</td>
<td>Potassium nitrate</td>
</tr>
<tr>
<td>Salt of sorrel</td>
<td>Sodium nitrate</td>
</tr>
<tr>
<td>Sig</td>
<td>Ammonium carbonate</td>
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<tr>
<td>Slaked lime</td>
<td>Potassium acid oxalate</td>
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<tr>
<td>Soda ash</td>
<td>Urine</td>
</tr>
<tr>
<td>Sour water</td>
<td>Calcium hydroxide</td>
</tr>
<tr>
<td>Spirits of Harts horn</td>
<td>Sodium carbonate</td>
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<tr>
<td>Spirits of salts</td>
<td>Dilute sulfuric acid</td>
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<tr>
<td>Sugar of lead</td>
<td>Ammonia</td>
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<tr>
<td>Tanic acid, tannin</td>
<td>Hydrochloric acid</td>
</tr>
<tr>
<td>Tartar emetic</td>
<td>Lead acetate</td>
</tr>
<tr>
<td>Tin ashes</td>
<td>Galle tannic acid</td>
</tr>
<tr>
<td>Verdigris</td>
<td>Antimony potassium tartrate</td>
</tr>
<tr>
<td>Vinegar</td>
<td>Stannic oxide</td>
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<tr>
<td>Vermillion</td>
<td>Copper acetate</td>
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<tr>
<td>Vitriol</td>
<td>Acetic acid</td>
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<tr>
<td>Vitriolic acid</td>
<td>Cinnabar</td>
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<tr>
<td>Washing soda</td>
<td>a sulfate of iron or copper</td>
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<td>Sodium carbonate</td>
</tr>
<tr>
<td>White lead</td>
<td>Sodium carbonate</td>
</tr>
<tr>
<td>White vitriol</td>
<td>Sodium silicate</td>
</tr>
<tr>
<td>Yellow prussiate of potash</td>
<td>Zinc sulfate</td>
</tr>
<tr>
<td><strong>TAIL OF NEWT AND BATS WINGS</strong></td>
<td>Lead carbonate</td>
</tr>
<tr>
<td></td>
<td>Zinc sulfate</td>
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<tr>
<td></td>
<td>Potassium ferrocyanide</td>
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<td>YOU CATCH</td>
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</table>
INTERNATIONAL SMITHING LEXICON

Response to the development of an international lexicon of smithing terms has been slow. Below, to facilitate contributions from the polyglots among us, is a list of words we may wish to translate (remember to include both noun and verb forms of the same word when applicable). Even if you do not know the correct translations for all terms, send in what you do know. This lexicon can greatly aid in smithing related research, travel, correspondence, etc. If you find any holes in this listing, please feel free to submit additional terms:

anvil
anvil mandrel
ballustrade
drift
beach work
drill
bickiron (bick)
bottom
brass
brine
fire
cast
cast steel
chamfer
charcoal
chisel
carbon
carve
clamp
coal
cold
coke
collar
copper
curve
cut
design
die
draw out
diagonal
down
drift
drill
drill press
file
finish
fire
flatter
flux
forge
fuller
gate
grille
grind
hacksaw
hammer
harden
hardie
hinge
hook
horn
inlay
jig
leg vice
mandrel
mild steel
oil
offset
poen
picket
pipe
power hammer
punch
quench
railing
raising
repousse
rivet
round
saw
scarf
screen
scroll
scroll fork
scroll wrench
set hammer
shears
square (tool)
split
sinking
spring
stainless steel
stake
swage
swage, bottom
swage, top
swage block
straighten
temper
tenon
tongs
tool steel
top
true up
tuyere
twist
upset
vise
water
weld
widen
wrench
wrought iron

WANTED . . . anyone interested in making a group purchase of coal. Please write and advise how much you would expect to take. I need at least 15 tons to make a truck load or 50 tons to make a car load. Bob Carlson, 17 Frederick St., Newington, Conn. 06111

BLACKSMITH WANTED . . . Sauder Museum, State Route, 2, Archbold, Ohio 43502; Telephone (419) 445-5251

FOR SALE . . .

One portable hand-crank forge and one electric blower. Must be able to provide your own transportation for these. Any reasonable offer considered.

Contact: Mrs. Margaret Hennelly
10159 S. Prospect Ave.
Chicago, Ill.
312-779-5433

Several 100 to 300 lb. anvils, forges, cone mandrels, tire benders and shrinkers; and one trip hammer. Send self-addressed, stamped envelope for details, and $1 for a photograph of any equipment.

J. Voss McGuire
RD #2, Frenchtown
Towanda, Pa. 18848
717-265-2614

Selling out a blacksmith shop: 2 anvils (1 Peterwright, 1 Centaur); 2 pole vices; lg. asst. of tongs, hammers & anvil tools; 1 Champion fire pot & tulley iron; 2 Champion blowers; 1 electric blower; 1 wood lathe; 1 sickle grinder; 1 table saw; assortment of tools used and made by me in last 2 years. Write with self-addressed, stamped envelope to:

Dan Smith
Box 955, Kayenta, Navajo Nation
Arizona 86033

50 lb. Kane & Roach power hammer in good condition; 50 ton punch press. Contact: Bud Swann, Rt. #1 Box 64-B, Blanch, N.C. 27212 (919) 694-6260 after 7 P.M.

ERRATA . . . June issue

—Photos on pages 5 and 9 were credited to James Garvey, when in fact they were submissions of the Rochester Folk Art Guild Blacksmithing Studio, Middlesex, N.Y.

—On page 31 under the House Jewelry display, captions were transposed for the door knockers of Bob Griffith and Richard Prilliman . . . Bob's is the one in the lower right hand corner, and Richard's is the one in the center of the page. We're very sorry!
NEED NEW IDEAS?  
NEED HELP SOLVING TECHNICAL PROBLEMS?  
WANT TO SEE WHAT ELSE IS GOING ON?  
YOUR PROBLEMS ARE (almost) SOLVED!!

As a special added bonus to ABANA members, free loans of slides are available. This includes work by the growing ABANA membership, historical items, technique sequences. This new free service (or almost free) can be used for your personal enrichment or as teaching materials for the local Lions Club or workshops.

There is only one minor problem with acquiring a loan. The collection of slides at this time is extremely limited. In fact, it is almost nonexistent. So in keeping with the time honored ABANA tradition of free dissemination of information, SEND US YOUR SLIDES. We want photographs of your work, your company’s work, historical work in your neighborhood, special techniques and generally whatever else strikes your fancy. If you wish them returned, send them anyway and we will copy them and return the originals.

Since ABANA has received its appropriate nonprofit tax status, we will (upon receipt of your slides) send you the appropriate tax deductible certificate for the value of the slide of the collection. You will also get a gold star in Heaven.

For the new ABANA lending library, send one set of your slides to:

Jim Wallace
NOMM
374 W. California
Memphis, Tenn. 38106

And for the Anvil’s Ring archives, send one set to

Dimitri Gerakaris,
Upper Gates Rd.,
Canaan, N.H. 03741

MEMBERS, PLEASE NOTE!
Although commercial suppliers are naturally required to pay for regular ads, there is never any charge for members to insert small classified ads for items sought or offered, nor will there ever be any charge for “BLACKSMITH WANTED” situations.

CHANGES OF ADDRESS
Should your address change, do NOT send notification directly to the ANVIL’S RING. Changes of address, as well as application for membership, and all other inquiries and information not directly related to the publication of the ANVIL’S RING should be sent to:
The ARTIST-BLACKSMITHS’ ASSOCIATION OF NORTH AMERICA
P.O. Box 1191
Gainesville, Florida 32602

Coming Next Issue!
—It all depends on you.

Please Note . . . tips and techniques and any other contributions for the December issue should be in the hands of your editor, Dimitri Gerakaris, Upper Gates Rd., Canaan, N.H. 03741, by October 2 at the latest. Any form of contribution is greatly appreciated; however, those contributions done with illustrations on a sheet separate from the explanation would greatly simplify the task of getting the next issue out on time to you. Furthermore, all who type the text (double spaced, with a wide margin at the left) shall, upon their arrival at Blacksmith Heaven, be given a free anvil of their choice plus an eternal supply of clinker-free coal (mined by those who in their former lifetimes never contributed to the Anvil’s Ring).

The Response to the query regarding the paper upon which the Anvil’s Ring is printed overwhelmingly indicates preference for this paper; indeed, although tricky to print photos on, this paper is exceedingly durable and has an excellent shelf-life. Thanks for your input.

ADVERTISING RATES
Advertising will be accepted under the following rates & conditions:
$230 per full page ad = 7½” × 9½”
126 per ½ page ad = (horiz.) 4¼” × 7½”
   (vert.) 3½” × 9½”
70 per ¼ page ad = 3½” × 4½” (vert.)
38.50 per ¼ page ad = 2½” × 3½” (horiz.)

Ads placed for a full year’s run, i.e., for four consecutive issues, will receive a 10% discount.
Closing dates for ads will be TWO months before month of issue (e.g., closing date for the December issue will be October 2nd). Issues will be published in March, June, September, and December. Checks for space must accompany each order payable to “The Artist-Blacksmiths’ Association of North America.” Inquiries regarding advertising may be sent to: The ANVIL’S RING, The Upper Gates Road, North Canaan, New Hampshire, 03741.

Bronze Fish by Ivan Bailey of Savannah, Georgia; 8” in length.
Hammer Marks by Smit 1977

Securing the anvil using principle of the electromagnet!

Copper wire wrapped 200k around 1" pipe
(Or more depending on gauge of wire)

Cooking tips for the forge

Hot tea for lunch

Low heat

Coal around paper bag

When water boils place in tea bag, let steep for 30 sec. Then
then ladle out with ladle you made earlier.
M-M-M Hot & Good!

Next month: My Helper
An homemade robot!