N.J.B.A. Newsletter

NJBA Volume 19, Issue 4 09/11/15
http://www.njblacksmiths.org

Editors Soapbox

News letter is late, so I apologize , I need to thank Bruce Freeman for getting out the last edition after my computer got hacked and I was not back to working order yet. We have a new web address do to problems the old server was having, www.njblacksmiths.org

We have some meets with opportunities to learn, forge or teach others what you know. Come out and chat or get your hands dirty! Let's boost the attendance at the upcoming meets. If you are interested in helping please contact one of the board members listed on page 2.

Larry Brown, Editor

Upcoming events for 2015

Get you calendars out and mark these events down. Please bookmark our web site and check for updated meet information. Remember most of our meets have an "Iron in the Hat" drawing, so be sure to bring something. Meet information starts on this page and continues on page 3.

September 19, 2015 through January 4, 2016 The Barnes Foundation exhibition
September 18th - 20th Old Time Engine Show Washington Crossing Park, NJ
Sunday, September 20th 10:00am - 4:00pm Red Mill Tool Swap/Picnic
October 10th Open Forge at Princeton University, Princeton, NJ
November 22nd Historic Waterloo Village "Feast on History" Day
December 8th —Annual Holiday Party, Marshall and Jan's house. Information on page 3

This exhibition looks like it will be well worth the trip for individuals and groups of us. The email announcement also includes an industry exclusive discount ($2 off adult admission with code IRONWORK2; student price is $10) for their next Barnes visit which I assume works if you get tickets on line.

THE BARNES FOUNDATION PRESENTS: STRENGTH AND SPLENDOR: WROUGHT IRON FROM THE MUSÉE LE SECQ DES TOURNELLES, ROUEN AND ELLEN HARVEY:
METAL PAINTING

Two new exhibitions on view September 19, 2015 through January 4, 2016

The Barnes Foundation presents two concurrent exhibitions, Strength and Splendor: Wrought Iron from the Musée Le Secq des Tournelles, Rouen, featuring masterworks from the world's most important collection of wrought iron, and Ellen Harvey: Metal Painting, a site-specific installation by artist Ellen Harvey (b. 1967) commissioned by the Barnes Foundation. Metal Painting engages with Dr. Albert C. Barnes's iconoclastic placement of his extensive wrought iron holdings alongside his collection of paintings by old and modern masters, such as Paul Cézanne, Jean-Baptiste-Siméon Chardin, William Glackens, El Greco, Frans Hals, Henri Matisse, Pablo Picasso, and Pierre-Auguste Renoir. Both exhibitions will be on view in the Barnes Foundation's Aileen and Brian Roberts Gallery from September 19, 2015 through January 4, 2016.

If you have not renewed, this is probably your last newsletter!

The New NJBA Web Site!

The NJBA Web Site is:

http://www.njblacksmiths.org

The Newsletter is at:

http://www.lightningforge.com/njba/index.htm

or use the link on the NJBA web site for the newsletter.

Official NJBA Address

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NJBA Board of Directors

Directors are only available with hard copy

Strength and Splendor: Wrought Iron from the Musée Le Secq des Tournelles presents approximately 150 magnificent wrought iron objects—including door knockers, jewelry, escutcheons, locks and keys, plaques, signs, strongboxes, and tools—that combine technological innovation with virtuoso artistry from the comprehensive holdings of the Musée Le Secq des Tournelles in Rouen, France. The exhibition complements the 887 pieces of European and American wrought iron that punctuate the Barnes Foundation's signature wall arrangements of old master and modern paintings, and offers visitors the unique opportunity to experience a collection that Dr. Barnes likely knew and visited. This is the first time that the Musée Le Secq des Tournelles has sent an exhibition of its celebrated masterworks to the United States.

Dr. Barnes underscored the formal affinities that the wrought iron in his collection shared with the "motives and arabesques" in the paintings. Often, he combined disparate objects—shoe buckles and door hinges, ladles and hasps—to create new forms. In a 1942 letter to the American artist Stuart Davis, Barnes noted that the anonymous craftsman of such functional items was "just as authentic an artist as a Titian, Renoir, or Cézanne."

Ranging in date from the Middle Ages to the early 20th-century, the objects from the Musée Le Secq des Tournelles's collection reveal iron as unexpectedly versatile, with its capacity to convey both masculine heft and an impossibly fragile delicacy that is hard to square with its industrial image. Objects ennobled with silver and gold inlays show iron as more than base metal. There are locks that represent their own function, for example, such as one with a built-in faithful guard dog and one with spring-loaded trap ready to catch a lockpick. Others show a more whimsical side: an 18th-century sign in the shape of a greyhound that looks like something Calder might have made two centuries later, and a bat-shaped light.

Strength and Splendor: Wrought Iron from the Musée Le Secq des Tournelles, Rouen will be accompanied by a catalogue featuring an essay on Dr. Barnes's practice of collecting metalwork, one on the collection at the Musée Le Secq des Tournelles, short essays on groups of works, and an illustrated glossary of technical terms.

Ellen Harvey: Metal Painting

The Barnes Foundation's fourth visual arts commission of 2015, Metal Painting is composed of 887 oil paintings on magnetized panels of varying sizes installed as a large-scale collage on a steel wall. Harvey has painted each piece of metalwork in the Barnes collection as a metallic silhouette. Invoking Barnes's celebration of the wrought iron collection for its formal values, she distills the essence of these objects, emphasizing their shapes.

Both exhibitions are curated by Judith F. Dolkart, the Mary Stripp & R. Crosby Kemper Director of the Addison Gallery of American Art at Phillips Academy, Andover, MA, and former Deputy Director of Art and Archival Collections and Gund Family Chief Curator at the Barnes Foundation. Anne-Charlotte Cathelineau, curator in charge of the objets d'art at the Musée Le Secq des Tournelles, selected the objects included in Strength and Splendor and authored the catalogue's essay on the holdings in Rouen, as well as several entries on individual objects.

"When Dr. Barnes first installed his now iconic

wrought iron collection on the gallery walls, he divorced the objects from their functions and celebrated them for their formal properties—the ways in which they underscored forms in the paintings and other objects" says Dolkart. "With Strength and Splendor, we are able to re-contextualize the magnificent objects of Le Secq Destournelles collection. Ellen Harvey's Metal Painting recombines the forms of the wrought iron in the Barnes collection, creating a new kind of ensemble or arrangement."

Strength and Splendor: Wrought Iron from the Musée Le Secq des Tournelles, Rouen is sponsored by
Morgan Stanley
The contributing sponsor is
Comcast Universal
With generous funding from the William Penn Foundation.
This project is supported in part by a grant from the National Endowment for the Arts.

Old Time Engine Show

September 18th, 19th, and 20th

NJBA will again be at the Delaware Valley Old Time Power and Equipment Association's "Days of the Past" Engine Show at Washington Crossing State Park, in Titusville, New Jersey. Come on out and bring the family, there are hay rides for the kids, a metal heads flea market, and a lot to see. We will have a couple of forges going so bring a hammer, also if you have some items for sale we will have a table out. Come on out and join the fun. For more information check out their web site http://daysofthepast.com

Directions: The Engine Show is located in Washington Crossing State Park off of Rt. 29 (River Rd.) South of Lambertville and North of Trenton signs are posted to show the way.

BLACKSMITH HAMMER-IN & TOOL SWAP

At the Red Mill Museum Village

Sunday, September 20th, 10:00am - 4:00pm

Red Mill Museum Village 56 Main Street, Clinton, New Jersey 08809
www.theredmill.org

The Red Mill Museum Village resident blacksmiths Robert Bozzay and Dave Ennis will host the event. The day's activities will center at the museum's blacksmith forge where members of NJBA, some who are local blacksmiths, will be forging in the Red Mill shop. Smiths will also be working and demonstrating on portable forges set up along the riverbank. Blacksmiths' work will be available for purchase and creating an individual's specific project can be explored as well.

The New Jersey Blacksmith Association is a group dedicated to the promotion of the art and craft of blacksmithing, Members are active throughout the state teaching, demonstrating at events and fairs as well as being resident smiths at a variety of historic sites in NJ, DE, NY, and PA. This is a good chance to ask one for more information- smiths always enjoy talking about blacksmithing.

Tool dealers and collectors are invited to tailgate along the riverside to sell and swap their blacksmithing tools and accessories. Among the items to be found will be anvils, blowers, forges, vises, hammers, and tongs, some quite old.

Visitors who have "what is it?" objects cluttering up the garage can bring them along and members of NJBA will be glad to identify them. NJBA will have it annual picnic BBQ lunch, members are encouraged to bring side dishes

The Red Mill's admission for the day's activities is $10 for adults, $8 for seniors, active military and veterans, and $6 for children (6-12). Free for NJBA members, children under 6, museum members.. Included in the price is admission to the museum's historic buildings, grounds, and exhibits, with a guided tour included with admission offered at 2 p.m.

For more information contact the museum at 908-735-4101, ext. 102 or email programs@theredmill.org. Interested blacksmiths can contact David Ennis at (908) 713-1679.

Directions: Red Mill Museum; Take exit 15 on I-78 onto old route 22 going North (routes 513 and 173), make a left onto main street before bridge. Museum straight ahead.

Open Forge at Princeton University

Saturday, October 10th, 9:00am - 5:00pm

Princeton Materials Research Society
70 Prospect Avenue,
Bowen Hall, Princeton, NJ 08504

This is an Open Forge Meet. We will have tarps set up and several forges. If you can attend and bring equipment, contact Bruce Freeman.

This is an nice meet and we introduce students to forging hot metal. Last year was a great time. We had professors, undergraduates and graduate students all trying blacksmithing. Come out and forge and help teach others!

Waterloo Village "Feast on History"

Hammer-in by the Morris Canal

November 22, 2015. 11 AM-4 PM

Historic Waterloo has invited us to demonstrate, and show our wares at their "Feast on History" event. Tailgating is encouraged, and space will be made available In the parking lot, next to the park entrance.

The Blacksmith shop will be available to us, as well as the surrounding area, to set up additional demonstration forges and displays. Everyone is encouraged to bring a smithed item or items to exhibit, Those of you selling smithed items are also encouraged to set up your displays, as this is great timing for the holidays.

Set-up time inside the park is 10 AM. After 11 AM traffic will be not allowed inside the park, so breakdown will be 4 PM.

The park is the setting of an iron finery and forge that fell into disuse, and was later purchased by the Smith family. They turned it into a successful business at the half-way point of the Morris Canal. Historic structures, as well as the recreated Indian Village, will be open to visitors. As I understand, JAM the leasing caterer will have food and drinks available.

This is a great family venue with plenty to see for non-smiths. There is a $5 parking fee that will be waived for those participating in the event. Questions/comments contact, Ron Jani at Blkpnfrg@ aol.com

The **address** for the village is: 525 Village of Waterloo Stanhope, NJ 07874
Directions: Travel West on I80 and take exit 25 then follow the signs.

NJBA Holiday Party!

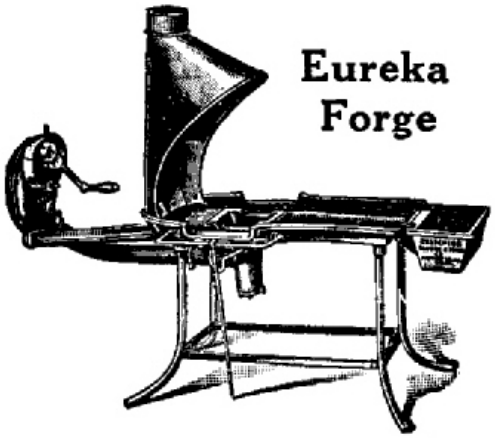
December 13th at 3PM

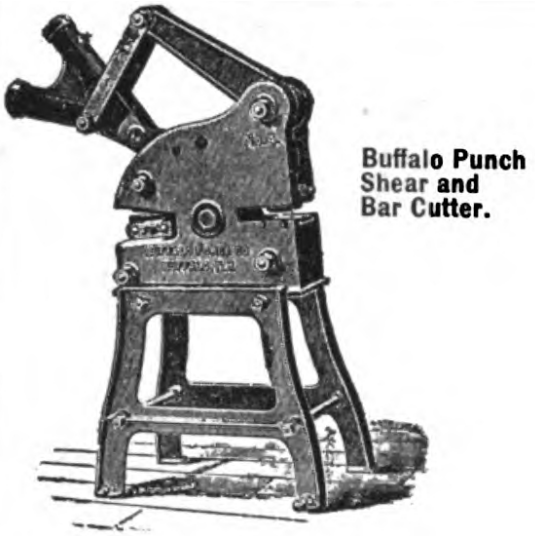
The holiday party is to be held on December 13th, 3PM at Jan and Marshall's house. Many thanks again, to Marshal and Jan for opening their home to us in the holiday season. Members are asked to also bring various trivets, candle holders, or other holiday items they are making to the party. Despite the emphasis on blacksmithing, members are encouraged to bring their families. Bring a dish, beverage or dessert. Contact Jan or Marshal for advise on what to bring.

Directions to Marshalls' Home:

Marshall and Jan's "cabin" is not on Marshall's farm, but about 3 miles east of it on the same road. Casino Drive is just off Rt. 9, about 3.5 miles north of interstate I. 195 (exit 28). and about 4 miles south of Rt. 33. Either of these routes can be easily reached from the major north-south highways including the Garden Sate Parkway, the NJ Turnpike. 1-295, Rt. 18 or Rt. 34. From Rt. 9 northbound. make a right onto Casino Dr.; southbound. take the jug handle to make a left onto Casino Dr. Continue past Marshalls' Farm to #301 Casino Dr., Howell, N.J.

(ph# 732-938-6577) jlfmib@optonline.net





Report on the Second Lightweight Forge Workshop

by Bruce Freeman

On Saturday, June 27, Marshall Bienstock hosted another workshop for the fabrication of firepots and folding forge tables. The turn-out for this workshop was excellent - I counted nine participants: Michael Baker, Patty Miller -Pitman, Eric Fox, Eric Van Arx, Ben Suhaka, Ron Jani, Bob Tomczyk, Marshall and I.

We had cut most of the major parts for the equipment in the week or two before the workshop, so had a head-start on the fabrication. I spent most of my time keeping the participants occupied, no simple task considering the number of different operations needed and the fact that some had to be finished before others could be started. With four competent weldors in the group, Marshall didn't even start to do welding till mid-afternoon. In the meantime, he helped with the bottlenecks - principally the drilling operations, in which started falling behind almost immediately.

By the end of the day the firepots were complete except only for the pivots for the ash gates, and the forge tables were perhaps 80% finished. Across the next few Monday eve-

nings, Chris Gilpin, Patty Miller-Pitman and Damian Toryak worked on the leg assemblies for the forge table -- doing some remedial grinding, as the fit wasn't adequate. One Monday evening, I clamped up the firepot pivots, and Marshall welded them on. I am now in the process of finishing up the forge tables, which proved a bit trickier than expected.

Thanks to all who showed up and helped out at this workshop and subsequent Mondays, we will soon have six functional forges. Thanks also to Patty, who graciously donated an angle grinder, some grinder disks, and some 14" cut-off disks to NJBA.

We will hold at least one more of these workshops -- to fabricate vise stands. Watch for the announcement.

Forge Hoods for the Lightweight Forges

by Bruce Freeman

Before the Middlesex County Fair, I prototyped a forge hood from stainless steel. The job went pretty well and we used that hood at the fair, along with the two I'd made from galvanized steel many years ago.

Rather than schedule another workshop for the forge hoods, I solicited assistance at the 8/24 and 8/31 Monday night open forge meets at Marshall's shop. Damian Toryak joined me both days, and Tom Majewski on the second day. Despite some problems with the HF metal shear, we succeeded in cutting out the remaining hood blanks. On two of these, we then folded up the tabs and made the two creases to square off the base, then rounded the top, ready for riveting and for receiving the collar piece. One more we did some work, but not so much, and the other two blanks remain to be worked on. Not bad progress for only a few hours' work.

Anyone caring to assist should contact me.

Holcombe Jimison Farm Museum

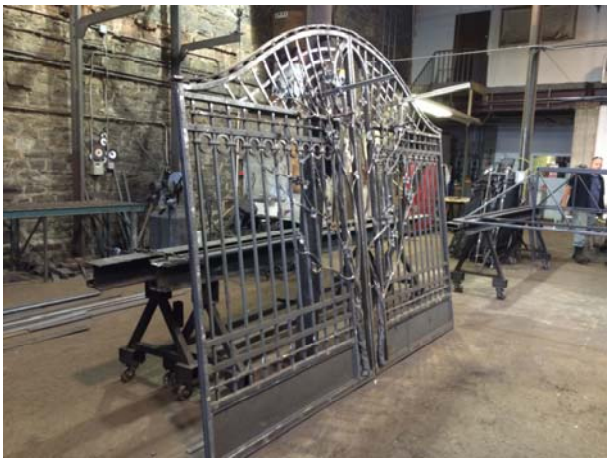
In the photo from left to right Ben, Kevin Veno and Zack Majorossy, behind us is Wayne.

Congratulations are in order for Kevin Veno and Zack Majorossy on completion of the coat rack at the Holcombe Jimison Farmstead Museum. Both have received their certificate of completion. Zach entered his coat rack in the arts and crafts competition. Not only did he get first prize but he also got best of show.

:NJBA Meet at Art & Anvil Liberty, Inc.

By Bruce Ringier

Len Karelshteyn of Art & Anvil Liberty, Inc. hosted the NJBA on July 18 at his studio in Red Hook, Brooklyn. The shop features an 88 kilo Anyang power hammer and a Swan forge; Leonid's shop does not have giant anvils or vices, but the work they create there – mostly architectural railings and gates – is impressive. Most of the work at the shop is done with top tools under the hammer.



Leonid Karelshteyn, Bruce Ringier, Jonathan Nedbor, Masiamovne Lajvardisdze and Petro Grab Paruta in Brooklyn, New York.

Pictures at Leonid's shop are from Bruce Ringiers Facebook page and by Larry Brown

Leonid and his colleagues, Petrov and Tengo, demonstrated their use of floret, taper, and fullering top tools made in the studio; they used them to create pieces for gates, railings, and a bar base that are in progress.

This event was organized by Bruce Ringier; it was attended by:

Bruce Ringier (Maplehurst Forge), Larry Brown, Ron Grabowski, Joshua Kavett (Fisher and Norris Factory Museum), John Enanve (Sunset Forge), Bob Borchester (Forged Creations), Anthony G. Lockhart (a kid), Bruce Freeman, John K. Kweselait (Custom Wood Furniture), Marsha Trattner (She-Weld), William Barrett (Barrett Custom Knives), Greg Phillips, Tom McDonald, Johnathan Nedbor, Tom Ryan, Kelly Scott Anson

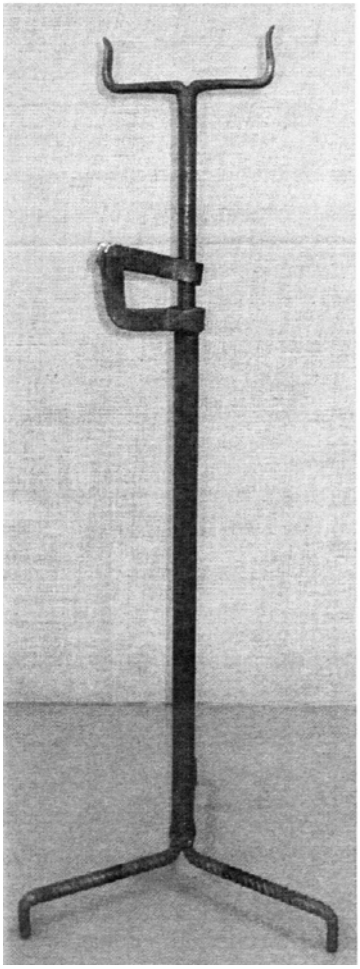
Bruce Ringier and Jonathan Nedbor

Leonid on the hammer

This guy is up on the rack overseeing everything

With A Little Help from My Friend

by Bob Selvaggio



List Of Materials
1 piece of 3/4" x 24" round bar ; 1 piece of 3/4" x 20" I.D. black iron pipe
3 pieces of 1/2" x 9 1/2" rebar
1 piece of 3/4" x 1/4" x 7 "1/2" flat bar
1 piece of 3/4" x 1/4" x 12" 1/2 "flat bar
1 - 1/4" x 1" round headed rivet .

I wish that I could take credit for this handy little Blacksmith Helper. I received this stand from a fellow that got it out of the Allegheny County Workhouse, which was located in Blawnox, Pa. The workhouse had a blacksmith shop as well as many other shops. When the facility was closed my friend gave me the stand.

It is a handy little thing, just right for keeping off to the side and moving it into position when forging long items that need to be supported. Being lightweight, reaching for it, and adjusting the height can be done with one hand while holding onto the material being forged.

The original stand is a mixture of traditional forging and newer arc welding. I decided to keep it that way when reproducing a couple more. The way the support piece moves up and down through the adjusting device, it is locked into place by the downward motion of the top bar.

To make this helper, begin by making the feet. Take the three pieces of 1/2" rebar and forge the ends over. The one end is forged over 1" and the other is forged in the opposite direction at 1-1/2". The three one inch ends will go up into the pipe, of which a small flair is forged. The flair permits the three pieces of rebar to fit. The 3/4" round bar is split back 4" on the one end and forged into the "T". For the adjusting device, I start out with a longer piece of the 3/4" x 1/4" bar so that I can hold onto it without using tongs. The piece that goes around the top of the pipe I measure back 5" and center punch on the edge and measure up from that mark 4" and center punch again. At these two marks, I forge it to a somewhat 45 degree bend and forge it around to match up the marks. I have found 4" to be enough to slip over the pipe. At this point, you should have an eye large enough to fit over the pipe and the remaining materiel should be over lapped onto itself.

The piece is then brought up to a welding heat and forge welded about 2" back from the eye. The pieces are welded together just enough to stick , no need to reduce the size down at all. Heat the piece up again past the 2" section and clamp in the vise and put about a 80 degree bend starting at 2" from the eye. This remaining piece should not be welded together and will be opened up later to accept the top piece. Open up between these two pieces so that the top bar will move freely between them. The top piece has a smaller eye, one that should take about 3-1/4" of material for the eye. First forge a taper on the end, measure back about 1" or so, center punch once again on the edge, measure from that mark 3-1/4" center punch again and forge into the eye. This eye needs to be large enough to allow the 3/4" round bar to travel freely; so if it is tight you need to forge a bigger one! This top bar is riveted to the bottom bar, line them up when they are placed in a parallel position to each other and mark for the holes and drill. Tack the feet pieces together, place the pipe over the rebar and weld the pipe to the feet, use a level to get it plumb. Weld the bottom "eye" piece to the top of the pipe, rivet the top "eye" piece to the other and slip the "T" support bar into place.

Originally published by PAABA

Controlled Hand Forging Lesson 11

Drawing Down—Part 1

Table bracket by Jay Close. Every bar was resized from larger stock.

by Jay Close
Illustrations by Tom Latané,
photos by Jay Close and Jane Gulden

Lesson # 11- Drawing Down- Part One

Definition: Reducing the cross-sectional area of a bar.

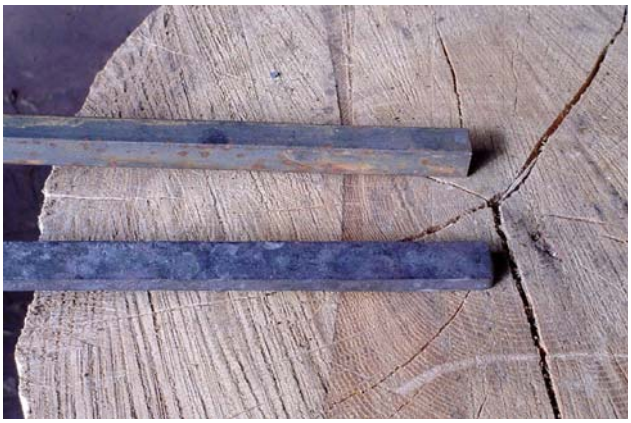
Lesson: Resizing a 1/2-inch square bar into a 1/4 by 5/8-inch rectangular bar by hitting the bar "on the flat."

Intent: This lesson is a first practical experience in hand forging. The student's primary mission is to strive for good technique: proper fire maintenance, good heat selection and use, and relaxed and effective hammering.

After familiarity with the process, the student should be comfortable working a bar linearly, from one end to the other, with minimal reheating of finished sections.

The student will also practice correcting twist and crookedness in the bar and gain experience working to given dimensions.

Tools: Basic tools are needed. Include a straight edge and a double caliper. Lacking a double caliper, two outside calipers can be substituted. Set one caliper to 1/4 inch, the other caliper to 5/8 inch.



1. The starting bar and the resized bar.

2. Properly ground hammer face

Hint: An easy way to repeatedly set your calipers accurately is to set them to an unworked bar of the target dimension. Collect an array of short bar sections that become your shop's standards for setting caliper dimensions. Make certain your hammer face is properly ground, without sharp corners. Prepare two "winding sticks" from 1/4 by 3/4-inch bar as described below. Feeler gauges will be helpful in evaluating the work, as will a dial caliper, if available.

Material: 1/2-inch square mild steel about 24 inches long.

Method: The bar is heated in sections and each section resized by hammering flat on the bar face. Each section is finished before moving to the next. Corrections to the bar are carried out as needed. When half of the bar is resized, it is turned end-for-end and the resizing continued from the middle where the work left off

Step One Review the earlier discussions on hammer selection, the ergonomics of forging, fire maintenance and shop safety. Place the bar horizontally in the neutral part of the fire. The tip of the bar will heat more quickly. Place it beyond the fire's hot spot and let the heat of the bar radiate to the end.

3. Bar placed in the fire horizontally, with the tip beyond the hottest part of the fire

To speed heating, keep the fire built up on the sides and keep the bar covered with loose coke. You should still be able to monitor the heat of the bar through this coke layer.

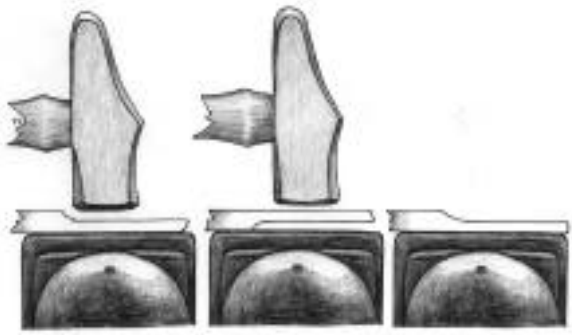
Heat no more of the bar than you can work at any given hammering session, perhaps three or four inches of the bar.

At a yellow or light welding heat, get the bar to the anvil where your hammer is waiting. The bar will never be hotter and never be softer than when you first take it from the fire. DO NOT WASTE TIME GETTING TO WORK.

Hint: Set your hammer in the same place on the anvil and in the same orientation, ready for each heat. This minimizes confusion and wasted time.

With the bar held horizontally and flat on the anvil, with the hot part in the middle of the anvil face, hit FLAT, HARD, and RHYTHMICALLY.

Hint: Regardless of the length of the heated section of the bar, only work on as much of the bar as you are able to completely resize in one or two heats–probably no more than two or three inches.



4. Step created by drawing part of the bar down. Bar is rotated 180° and kept horizontal as drawing continues.

The first blow inevitably creates an offset or step in the bar on one side. Keep the bar horizontal.

Hit HARD four or five times on the top, then roll the bar 180 degrees to work the surface that had been against the anvil.

Try to roll between hammer blows with no interruption of the rhythm. Keep the holding hand relaxed to help you quickly and assuredly

manipulate the bar.

When you flip the bar 180 degrees, the offset created by your work on the first face keeps the bar from sitting flat on the anvil. This is unavoidable, but your first blows on the new side will push the metal down to contact the anvil.

Hold the bar horizontally. Resist any tendency to raise or lower the holding hand.

As the re-forged section lengthens you can sometimes hang the unworked section of the bar off the anvil face and still be working toward the middle of the anvil. This will help you keep the bar horizontal.

Take four or five blows on the new face, then work the edges of the bar. Smooth them and note the effect of your hammer blows. You may need to adjust the strength of the blow because you are hitting a narrower surface. On the other hand, if these edge blows become too light, you risk the development of an I-beam cross-section to the bar. See the discussion in Part Two of this article under "Forging Dynamics," in the next issue.

Work all sides of the bar. Alternate heavy flattening blows on the faces of the bar with blows needed to refine the edges.

Develop a rhythm. For example:
five hard blows on one face.
roll the bar 180 degrees and hit five hard blows on the opposite face.
roll the bar 90 degrees, work the edge.
roll the bar 180 degrees, work the other edge, and repeat.

Hint: The tip of the bar heats fastest and reshapes easiest. There is danger of overthinning the end. Forge the tip when the bar is slightly cooler and offers more resistance.

If you reach an orange heat and are far from the target dimensions, put the bar back in the fire. Keep it soft.

Take a second heat on this section and continue forging.

Note: If you have been unable to complete a section of the bar by the end of the second heat, think about why this is the case. Are you not hitting hard enough? Perhaps you are spreading your efforts over too much bar? Did you start at a yellow heat to maximize softness and available time? Are you wasting time through ineffective hammering or taking too long to get to the anvil?

Intelligent analysis and self-correction are the foundations of progress as a blacksmith.

5-7. Working the face of the bar in the middle of the anvil, working the edge of the bar, and working the face with the unforged bar off the anvil.

If you near finished dimensions at an orange heat, make a check with the calipers and continue working to a dull red. The bar is much stiffer now and resists shape change. That is fine for lighter, smoothing blows.

The calipers should just slip onto the bar and glide over the surfaces without rattle or feeling sprung open. With practice you get a sensitive feel for dimension by use of these simple tools. Remember, unless the caliper points are opposite each other on the bar, they will not measure accurately.

As you smooth, pay more attention to the texture your hammer leaves. If you:

a) Maintain a clean, scale-free anvil face
b) Do not overheat the bar
c) Work all sides of the bar, and
d) Work all sides down to a dull red heat,

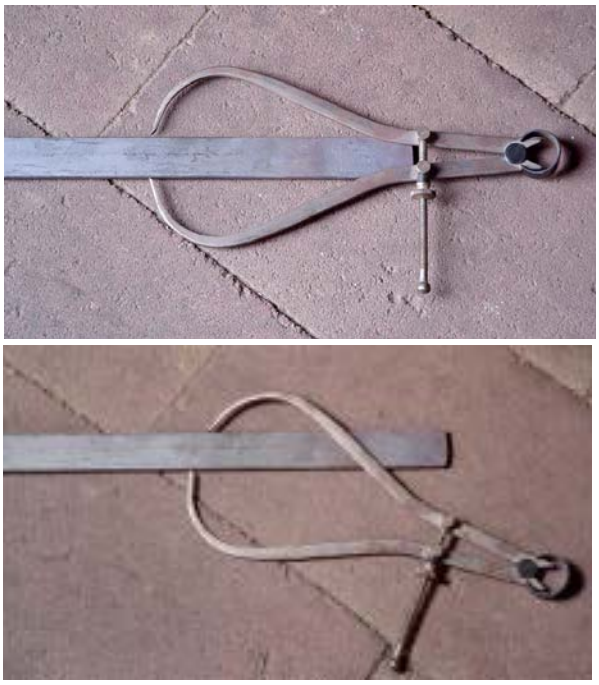
You can achieve a clean, hammered surface.

Often it is convenient when forging a long area to keep the hammer hitting in one spot on the anvil and work the bar back and forth beneath it. This can be particularly effective when working toward a smoothly hammered surface.

Hint: You may notice that the side of the work held against the anvil (if the anvil surface is clean) often appears smoother than the flat you are hammering. The broad flat of the anvil naturally creates a smoother finish than the hammer. Use this to your advantage, working each flat equally against the anvil as the bar approaches dull red.

Use the available heat wisely. The first part of the heat when the bar is softest is for the major shape change, the latter part of the heat is to refine the shape, smooth the surface, straighten the bar and get it ready to put back in the fire.

If this is your first experience at the anvil, the actual dimensions you achieve are almost irrelevant. You have been focusing on and learning much else. If on your first try you have resized a section to an even rectangular shape with straight sides, this is a significant achievement, but it is only the beginning.



8-9. Top– proper use of the caliper with points opposite each other. Bottom photo shows a false reading.

After one or two repetitions of this lesson, set goals for yourself. Check each section as you complete it with the calipers and hold yourself to their target dimensions before considering a section complete. This is mostly a matter of self-discipline.

Final evaluation will wait until after the bar is cold.

If you have completed the first section, you can now heat the next area. Work in a linear fashion, one section complete before moving to the next. This is a key to efficient forging.

In preparation for another hammering session, before the bar goes back in the fire, straighten it as best as you can. Put your hammer in its "ready position," put the bar back in the fire and finally wipe the anvil surface clean of scale.

Step Two

When reheating, push the finished bar section through the fire into a cooler part of the coals. Concentrate the heat on the area you will be working.

With another yellow or light welding heat on the bar, continue forging the next heated section. Remember your rhythm:

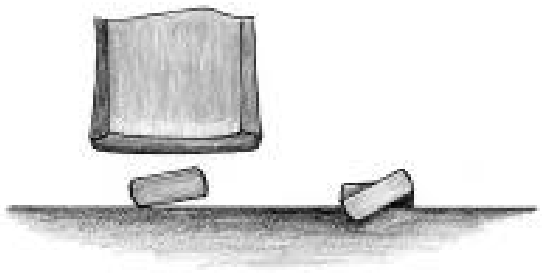
hit HARD on the bar face four or five times.
roll the bar and hit HARD on the opposite face.
forge the edge, dressing it straight.
roll the bar and forge the opposite edge, and repeat as needed.

After each session at the anvil, check dimensions. If oversize, keep forging. If undersize the bar can be upset to thicken it, but that is another technique and another lesson. For now, take note of your mistake and resolve to do better on the next section.

Keep the bar straight as you work. It makes manipulating the bar less awkward.

As you feel more comfortable with the reshaping, set some goals as you work. Determine how much of the bar you can complete to final dimensions in one or two heats. Once you can do that consistently, push your limits and see if by hitting harder or faster or using a higher heat you can get more done. Discipline yourself; challenge yourself.

As more of the bar is reshaped, watch for twist.

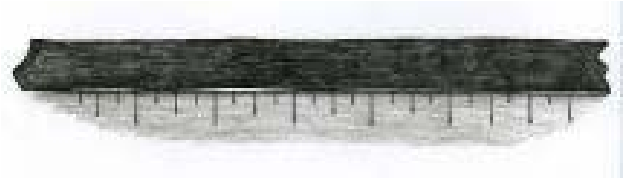


10. Development of a twist as the result of not keeping entire bar flat to the anvil face.

Note: Twist is the result of not holding the work flat on the anvil. The holding hand (left hand for the right-handed smith) rotates, raising the edge of the bar slightly off the anvil. When this slightly raised edge is struck, the bar twists. If not corrected, multiple, small repetitive errors create a major deviation from flat. Knowing how twist develops allows you to correct it as you forge: compensate with a purposeful cant to the opposite side.

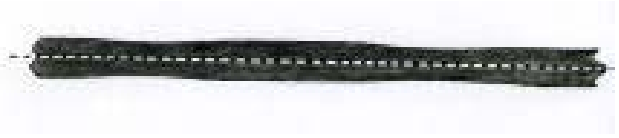
Step Three

When half (or a bit more) of the bar has been resized, the end that you started on will be at a black heat. Further cool that end in the slack tub.



11. Checking with a straightedge– dramatic deviation on left, close approximation on right.

12. Deviation from straight on left because of bend, on right because of narrow portion in the bar.



13. Wide and narrow portions of a bar averaged along its axis.

Hint: If you find that the end you hold gets uncomfortably hot as you work, cool it periodically in the slack tub. If this problem is chronic, you are taking too long to reheat the bar, allowing more time for heat transfer. Remember:

a) Heat in the hottest, neutral part of the fire.

14. Testing with the feeler gauge.

b) Keep the fire built up around the work.
c) Cover the bar with loose pieces of coke; and
d) Do not let the fire grow bigger than necessary.

Flip the bar end-for-end so that you are now holding the resized end in your hand. Continue to work down the length of the bar starting where you left off in the middle, reforging section by section until complete.

Targets

Shape targets

The bar must be straight. Without experience it is difficult to judge this by eye. Use the straightedge as an eye-training tool.

Put the bar in the vise with one flat up. Hold the straightedge on the flat of the bar and peer along the contact edge backlit by a strong light source, like a window. In even the best work you will not notice full, light-blocking contact. What you should see is an even pattern of contact from one end of the bar to the next.

Sometimes the straightedge rocks or pivots on a high spot. If a corresponding low spot exists opposite, then you have identified a bend in the bar.

If the straightedge pivots on one flat and at the same relative place on the opposite flat, you have identified a bulge in the bar. This is more of a dimensional issue than a straightness one. Take note of the width of any gaps between the straightedge and the bar. The eye can see light through an opening as small as a thousandth of an inch. A gap that is more than 4 or 5 thousandths can appear huge. We want to keep overall dimensional tolerance to plus or minus 1/64 of an inch. Use the feeler gauge to check the gaps. How small a problem can your eye easily see?

If you have such a large gap, check the area with your calipers. Does the gap exist because of a bend in the bar? Or does the gap exist because the bar is too thin at that spot? The bend can be corrected easily. The thin spot will need to be upset. For now it is best to "split the difference," thinking about straightening the bar along an imaginary axis line so the mass is equally distributed around that axis, regardless of "thicks and thins."

Before doing any corrections, sight down the length of the bar and test your eye judgment. Can you see the problems that the straightedge picked up? If not, keep looking, using the straightedge to guide you. Occasionally turn the bar and look from the other end.

15. Sighting down the bar to locate bends and help keep it straight.

Hint: Changes in thickness, a twist or an uneven edge of the bar can cause the eye to see a bend where none exists. Addressing these problems is rarely a neat, step-by-step process. You will often work back and forth among bends, twists and dimensional problems.

Do not become wedded to the straightedge and feeler gauges. Use them to train your eye so that you do not rely on them any more, but the straightedge, in particular, will never be completely discarded. Test all four flats of the reshaped bar. The bar must be free of twist. Bends and twists are first cousins. Some bends are localized twists and a twist in the bar can easily deceive the eye into "seeing" a bend. Eliminate twist before doing your final corrections for straightness. The goal is to learn to see twist without aids, but until that time make use of a pair of "winding sticks." A couple of straight sections of bars 1/4" by 3/4" and 8 or 10 inches long will suffice.

16. Major problems like this are easy to see sighting down the bar, but more subtle ones become evident too. Can you see the 2 sharper bends in this bar?

Lock the workpiece in the vise, grabbing it on the edges with the face of the bar above the vise jaws. Balance one winding stick on the upper face at one end of the bar and the other on the other end. Sight over these sticks. Are they parallel to each other? If not, the two areas where they lie on the bar are not in the same plane, i.e., the bar twists. Move the stick at the far end of the bar a couple of inches toward you and sight the sticks again. Continue testing the whole length of the bar. Without the winding sticks can you see these twisted areas? Test yourself– it is the only way to learn.

Dimension targets

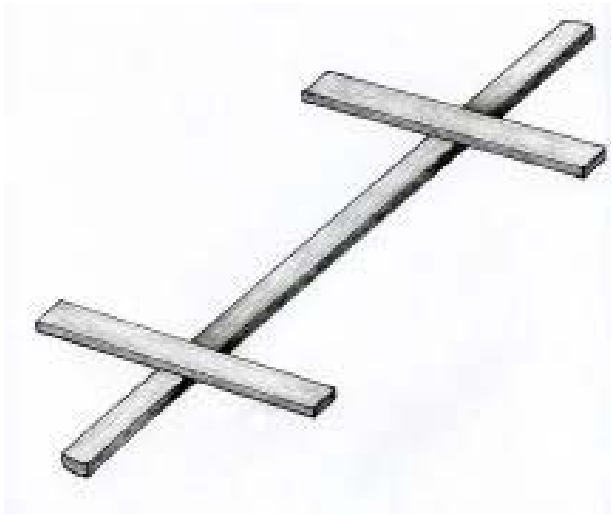
In a simple resizing exercise such as this, you should be able to work to plus or minus 1/64" in width and thickness of the bar. In other words, there could be as much as 1/32" of an inch difference between the thickest part of your bar and the thinnest. Use the calipers as your standard. Feel how they fit on the bar. Can you rattle the tips back and forth? If so, you are undersize. Perhaps you are evenly undersize. Compare the rattle at different points along the bar. At the loosest spot, how thick a feeler gauge can you readily slip between the bar and the point of the caliper?

Perhaps you have thick spots. The calipers slip over the bar but you can feel them sprung open. Test along the bar. Get a sense for the amount of spring necessary to use the caliper. This tells you in a relative way how much oversize you are.

If you have a dial caliper, use it to take measurements at several places along the bar. What is the difference between your largest and smallest measurement? Is it greater than 1/32 of an inch?

On a cold bar use your fingers to feel for thick and thin areas. They can be more sensitive than your eyes.

The calipers, feeler gauges, straightedges and winding sticks are training tools. Can you see where the major problems lie without



17. Winding sticks placed on a bar.

them? Work to identify these problem areas as you forge.

As an experiment, forge the first 3 or 4 inches of the bar carefully to dimension, using the calipers as a reference. Then forge the next section just trying to match the first by eye. Cool the bar and check your dimensions. You will be surprised at how close you can get.

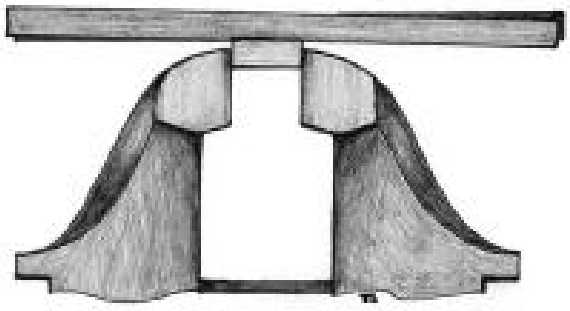
Texture targets

One of the hallmarks of skilled work is the quality of the hammered finish. On your resized bar you want a smooth, even texture. No one hammer blow should jump out as distinct from the rest. Likewise, the surface should be free of loose scale and from evidence of overheating. Comparing your work to the photos will be the best initial guide to evaluating its texture.

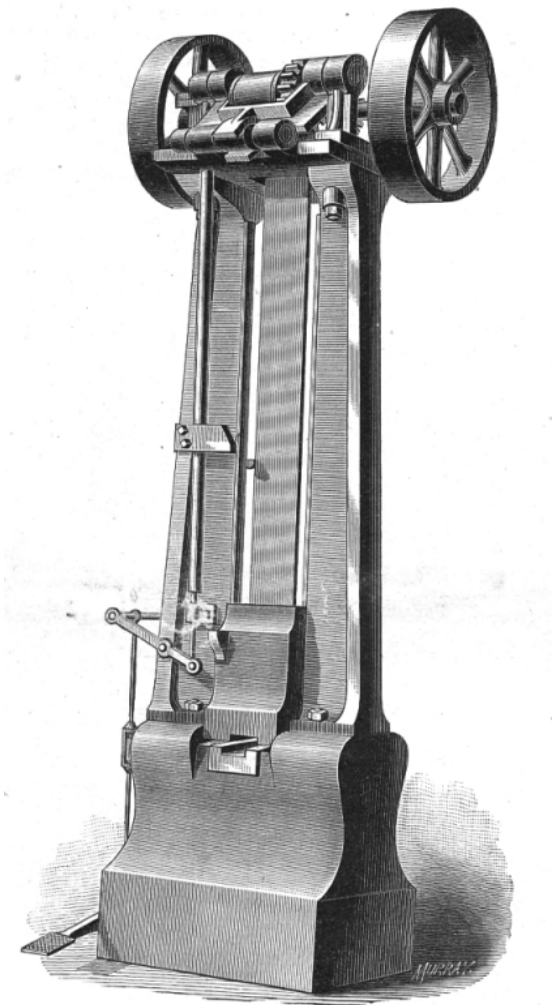
Time targets

For your first efforts, time is largely irrelevant. Going through this exercise a few times, you ought to be able to reforge two inches of the original bar to final size in two heats.

This article will continue with Part Two- Straightening- in the next issue of the Hammer's Blow.



18. Sighting winding sticks to locate twist.



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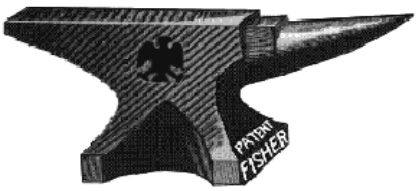

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