N.J.B.A. Newsletter

NJBA Volume 18, Issue 1 11/10/13
http://njba.abana-chapter.com

Editors Soapbox

News letter is late, so I apologize , I need to get myself back on the old schedule. But its only by a few weeks this time.

We are working on setting up 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 2013

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.

December 7th—Damascus Workshop, Marshall's farm information this page
December 8th—Annual Holiday Party, Marshall and Jan's house. Information on page 3

Damascus Workshop

Saturday December 7th,

This will be a basic damascus steel class for knives or specialty tools led by Mark Morrow (http://www.swordsmith.net/). This will be a beginner level class. We will be making a simple pattern bar of folded steel in both gas and coal , coke forges, tools and forges will be provided. Attendees will need to bring leather gloves and safety glasses. The patterns will be twist , ladder and random , also covering types of steel to use , grinding methods and heat treat of finished blades and how to bring out the pattern in the steel.

Charge to be $125 per person. (Open to members only, but anyone may join NJBA on the day of the event.) To be held at Marshall's shop. Mark's email address is;
swordsmith201@verizon.net
and also the shop phone 7324585823 , we need a at least a $20 deposit and balance at the door. There is a minimum of 4 participants and a maximum of 8.

Directions:
Marshalls farm is at 663 Casino Drive, HowelI (Monmouth Co.). NJ. which is about 1/4 mile east of Route 9. Casino Dr. is a few miles north of 1-195. and a few miles south of Rte. 33. Either of these routes can be easily reached from the major north-south highways. including the Garden State Parkway. the NJ Turnpike. 1-195. Rt. 18 or Rt. 34. Marshall can be reached at his shop at (732) 780-0871.

Renewals, Now is the time! Send in the renewal soon!
If you have not renewed, this is probably your last newsletter!

The NJBA Web Site!

The NJBA Web Site is:
http://njba.abana-chapter.com/

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

NJBA
P.O. Box 224
Farmingdale, NJ
07727-9998

Rather than use room in the newsletter, All correspondence between ABANA and NJBA can be found on the ABANA web site. If you cannot access it there, contact me and I will send you copies.

NJBA Board of Directors

Directors are not listed on line

Sunday December 15th Annual Holiday Party Marshall and Jan's house.

The holiday party is to be held on December 15th, 3PM at Jan and Marshall's house. Many thanks again, to Marshall 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 Marshall for advice 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 Middlesex County Fair

Report by Bruce Freeman

David Macauley ran the show. Marshall and I helped with the set-up, at a very nice location in the fairgrounds, near both water and power. I also made a point of showing up for the first three days, for which we were being paid. I don't recall demonstrating anything unusual, just trying to keep the attention of those who stopped by to watch.

Report by Larry Brown

I was able to make it to the Fair twice during the week. We had three forges set up around a nice tent and we were in a great location. We had to be moved from our previous spot as they built a building there, but we were close to the old spot and this one was even better. The weather was good on the days I went down and the public was interested in the demonstrations. I made a few test pieces, more to have something to do than have a definite planned item. A handful of members of the public got to try forging and hopefully they want to continue. This is a great event and I hope to see more of you next time.

Report by David Macauley

This will be a quick report on the fair. We had at least two people at the fair every day and night it was open. A big thank you to all who demonstrated at the fair:
Marshall Bienstock
Bruce Freeman
Larry Brown
Joel Weiner
Dan O'Sullivan

A big think you to Pat and Brody Halpin who helped break down on Sunday afternoon and brought the trailer back to Marshall's on Monday night.

I think the fair was very successful in bringing out some members Joel who was there at least 5 nights and days and Pat. Pat works for PSE&G at one of their power plants along the Delaware. His plant is/was a coal fired plant that also uses natural gas. The plant has quite a supply of metallurgical coal that is not being used. He will be investigating our ability to buy some of the coal in bulk.

We had several folks take our cards. Some were metal workers and farriers. I would expect getting some memberships from the fair. I

personally worked with four scouts - a tradition for myself. We had another Iron worker who tried blacksmithing. Dan might soon have his own sub chapter.

The weather was quite cooperative. We had rain on only one night and then only briefly. For most of the fair the temperatures were at worse in the low 80s - very pleasant change. We were provided a tent by the fair association which really helped. We were located across from the new pole barn housing the tractor collection. We had water and power very close by. We were also able to keep the trailer at our site. Really could not do better in terms of a locations.

I will submit a financial statement later. We earned $300 in fees, but most was spent on coal, steel and fuel for trucks pulling the trailer. We have plenty of stock and fuel for the rest of the year. I brought 6 bags of coal and we only used 2

Report on the Weekends at Historic Cold Spring Village

Report by David Macauley

NJBA participated in two weekends at HCSV in August - Seafarer's weekend and Fun Fest Weekend. For both weekends we did demonstrations to the public and helped some young folks try blacksmithing The big news was Jerry Goldman showing up. He brought along his nephew who did some blacksmithing over two days. Jerry has to use a walker but he is vertical. You could see the utter delight in his eye being around blacksmithing again.

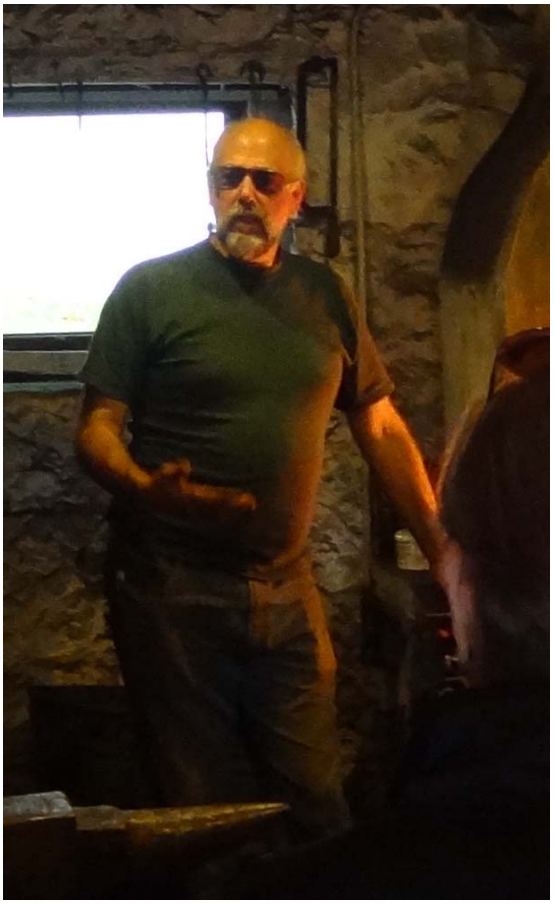
Helping at the events were Jose Torres and Joel Weiner

Report on the Red Mill Hammer-in and Tool Swap

Report by Larry Brown

The Red Mill Museum Village hosted the annual Hammer-In on Sunday, September 15th from 10am-4pm.

The Red Mill Museum Village resident blacksmiths Robert Bozzay and Dave Ennis did a lot of work to make this a nice event. We had a beautiful day weather-wise and there was a lot of tailgating and haggling going on as usual. The demonstrators in the shop were a young woman who I'm sorry to say I never got her name, Leonid Karelshtayn, a Ukrainian smith who demonstrated for us several times in the last few years and Jonathan Nedbor of High Falls, NY. I didn't get to see much of what was demonstrated in the shop as I try to let the public and other members get a good look as the shop is small, so I really can't say what was made other than Leonid's rose and my pictures were not good. Susan Dunsmoor demonstrated forging aluminum using a gas forge, outside under the trees, and had a nice display of her work.



Jonathan Nedbor

Susan Dunsmoor

Report by Bruce Freeman

The credit for this event goes to Dave Ennis and Bob Bozzay. Dave, in particular, handled all the arrangements, and much of the work, of the picnic lunch. I don't know what he did to arrange it, but the weather was beautiful for this picnic.

Dave brought a vise and a 75# anvil on a stump. Sue Dunsmoor brought her anvil, as did Kevin Weber his small anvil and a gas forge used by Sue for her demonstration of forging aluminum. As usual, a number of folks showed up with stuff for tailgating, and much equipment changed hands. The IITH put this event into the black by perhaps $100, after the picnic expenses were paid.

Leonid Karelshtayn

Days of the Past Engine Show

by Larry Brown

I only managed to get out there for a few hours on Saturday which was my wedding anniversary so I didn't get to spend the time I wanted to. John Chobrda brought his trailer up from Delaware and while I was there Mike Erdie was demonstrating and teaching a few people. There is a good interest in the forging from the crowd and more people should try to get to this meet.

Log splitter

There is a tool/truck/auto flea market with displays of antique trucks, cars tractors and old engines. There are working steam traction engines, a sawmill, and other examples of old tractors and engines running equipment, even belt powered washing machines. I always enjoy this meet and recommend it to all.

by Bruce Freeman

I stopped by the show on Sunday and found John Chobrda at work at the forge, with Mike Erdie and Larry Fogg also present. They told me that the crowds were less on Sunday, but there were people stopping by to watch the show. John tells me that he's been going to this show for a decade, now.

Belt driven washer

Report on Walnford Day

By Bruce Freeman

We had lovely weather this year for Walnford Day -- cool and overcast, but without rain. I rode down in Marshall's truck, pulling the NJBA trailer, while David came in his own pickup truck with some of his own equipment. We were greeted by the rangers, particularly Sarah Bent whom we have long known, and were given a volunteer to help us set up. This lad, whose name, alas, I forget, was enormous and quite strong. He said he was a regular volunteer at the park, but expected to spend the day handing out brochures or something, so was not expecting to work with dirty forges and blowers, etc. Fortunately, he lived locally and phoned his mother to bring a couple spare shirts, instead of the white one he was wearing, so we got some work out of him and later put him to work at the forge.

Set-up seemed unusually slow this year, but eventually we had the site ready. Attendance

was adequate, but the "blue" weather apparently had dissuaded many folks from attending. Bill Ker stopped by with a lady friend, and we had a number of families stop by and watch for a while.

I attempted to make a sort of a hasp, like the one on the Walnford ice house door, but belatedly discovered I should have made scale drawings and thought through my approach. I did manage to make the main piece, more or less, but got hung up on the hook. I don't recall what the others were working on, but no doubt David made a leaf and probably a candlestick holder.

Princeton: Man of Steel

by David Macauley and Bruce Freeman

The announcement to the University students read, "Princeton Materials Research Society presents: Man of Steel, a Blacksmith and Metallurgy Event. The Princeton Materials Research Society Club (PUMRS) is hosting a metallurgy event ... . Want to participate and hammer some steel? Please join us for this fun and cool event! ... " They report the event on their website (http://www.princeton.edu/prism/blacksmith2013/photos/), "On Saturday, October 19, ... [PUMRS] hosted the second annual blacksmithing event ... . Three professional [sic] blacksmiths were on hand to demonstrate the techniques of ironwork with their forges and anvil. More than 80 students participated in this popular event and each student got to hammer out a keepsake!"

We had a great great time. We had a total of four forges: David brought 2 coal forges. Matt Vallon who is graduate student in chemistry leads a blacksmithing club at Princeton. He brought a gas forge that I have long term load to their club. Tamara Pico brought a coal forge that was sitting in a lab. She also brought a small anvil that we had to rig a stand for with a pail and milk crate. Tamara and Nigel are the current leaders of the materials club at Princeton. The event was supported by the Princeton Institute for the Science and Technology of Materials (PRISM). This is quickly becoming a strong relationship. They really love us coming to the University and support the demonstrations.

The NJBA members participating are Bruce Freeman, Jose Torres, David Macauley and Matt Vallon. The four of us split up into 4 groups supporting students who wanted to try blacksmithing. I estimate we had at least 10 -

15 students going through each station. I am pretty sure all of the students had a wonderful time. We arrived around 9:30, Set up was s solid hour in the middle of the patio area in front of 87 Prospect St which in turn is just behind the rows of Eating Clubs at Princeton. We finally shutdown the forges around 5PM, packed up and were out by 6PM.

PRISM even provided a nice barbecue lunch. Towards the end of the day Bruce lead a few folks to tour some of the Yellin ironwork. Bruce was disappointed that we couldn't get into (old) Frick Hall, due to an ongoing renovation project. In that hall are a couple magnificent iron gates, and what with the renovations, I was concerned what might happen to these gates. Magnificent ironwork has too often been sent out for scrap, so I wrote to Princeton U. administration and cc'd it to the head of the Princeton U. art museum.

"... Visiting your campus today, I noticed that extensive renovations of the old Frick Hall are under way. I am writing out of concern for two pairs of gates that are (were?) inside the foyer of that hall, through which one passed immediately after entering the main entrance on Washington Ave. ... . These gates were made by Samuel Yellin, a preeminent artist-blacksmith of the early 20th century. They are literally priceless. I hope these gates will remain in place, unmolested, but if that is not to be, I hope the University will appreciate their true value and see to it that they get an appropriate new home. (Your own art museum would be a very appropriate place for them.) ... " -- Bruce Freeman, New Jersey Blacksmith Association."

To which, I got the following reply: "Many thanks for your email. Certainly I join you in appreciating the tremendous historic value of Yellin's ironwork, both for Princeton and elsewhere. Indeed, our curator of American art, Karl Kusserow, has done some work on the artist and this is an area in which we would be pleased to build up our holdings. I am not, however, familiar with the intentions for the gates you name in the old Frick Lab, but will look into this. Again, thanks for reaching out, and for advocating for one of the great masters of the Arts & Crafts movement." -- James Christen Steward, D. Phil., Director, Princeton University Art Museum. Subsequently, he wrote me, "I've ... heard from several colleagues who assure me that all the Yellin fixtures (there are light fixtures as well) are being protected and preserved as part of the heritage element of the Frick project. Following construction they will be in place once again." -- James Christen Steward

Blacksmithing Workshops and Classes:

Peters Valley Craft Education Center
19 Kuhn Rd., Layton, NJ 07851 (973)948-5200
pv@warwick.net www.pvcrafts.org

Academy of Traditional Arts
Carrol County Farm Museum
500 South Center St. Westminster, MD 21157
(410)848-7775 (410)876-2667

Touchstone Center for Crafts
R.D.#1, Box 60, Farmington, PA 15437
(724)329-1370 Fax: (724)329-1371

John C Campbell Folk School
One Folk School Rd.
Brasstown, NC 28902
1-800-365-5724 www.folkschool.com

Open Forges

If any members have a forge at home and work in the evenings or weekends and want to open it up to help a few local guys, let me know, Larry Brown, editor, as we get requests from members who have a hard time traveling to some of the open forge locations.

Please contact, Larry Brown, Editor.

We want to encourage all to join us at:

Monday Night Open Forge in N.J.

Marshall Bienstock is hosting an open forge in his shop at 7 pm almost every Monday night (Please call ahead on holidays to make sure , (732-221-3015)

Open Forge in Long Island

Sunday from 10:00 am to 6pm.
Starting the 1st Sunday in November until the end of April. Please call ahead to confirm and get directions. Ron Grabowski, 110 Burlington Blvd. Smithtown, NY (631) 265-1564
Ronsforge@aol.com

In Southern NJ contact
Joshua Kuehne, 543 Amos Ave.
Vineland, NJ 08360
(856) 503-5297 iforgeiron88@yahoo.com

Business Members

We would like to thank those who joined with our new Business Membership category .
Business dues are $40
Please show them our support

Marshall Bienstock, Marshall's Farms
663 Casino Dr., Howell, NJ 07731
732-938-6577, 732-780-0871
jlfmib@optonline.net

John Chobrda, Dragon Run Forge
P.O. Box 315 Delaware City, DE, 19706
302-838-1960 jchob@verizon.net

Eric Cuper Artist Blacksmith
109 Lehman Lane, Neshanic Station, NJ 08853
908 642-6420 ericuper@msn.com

Bruce Hay, Jr.
50 Pine St., Lincroft, NJ 07738

BLACKSMITH TOOLS FOR SALE!
John Chobrda
Has a large selection of tools for sale.
Anvils – Forges - Leg Vices—Blowers
Tongs – Hammers
and/or resurfaced Anvils
Call John for prices and availability
(302) 838-1960 cell (609) 610-3501

In Northern Delaware and Southern NJ, contact Kerry Rhoades or John Chobrda
Kerry (302) 832-1631 John (302) 838-1960
(609) 610-3501 (cell)

Blacksmith Vise Improvement

by John Emmerling Gearhart Oregon

This great idea originated with Al Bakke of Saskatoon, Saskatchewan Canada. George Dunajski, of Los Gatos, saw it at CanIron this year and told us about it at Gary Gloyne's hammer-in at Mt. Shasta this August.

To make your blacksmith vise work 100% better (George says, "1000%"), simply replace the curved friction disc between the outboard vise jaw (1) and handle with a throw-out bearing (2 & 3). This improvement not only allows the lead screw to operate more smoothly, but also grips the work much tighter and releases easier.

To obtain the proper size bearing, take the friction disc to a bearing supply store and match the inside and outside diameter to that of a throw-out bearing. If your vise is like mine and does not have a friction disc, you may need to take the screw itself. (What I now miss is jumping up and putting my full weight on the screw handle to tighten the vise. -Ed.)

For more about John Emmerling, visit his website: www.gearhartironwerks.com. +

Major Alloying Elements in Steel

by Paul Mills, Victoria, Australia

While most of the work we do as decorative or artistic smiths is done in what we term mild steel, there are times when you need material with a special characteristic like hot hardness, increased tensile strength or toughness, such as when forging your own anvil or chasing tools. Generally speaking from that point on, you enter the world of alloy steels.

Alloy steels are those which contain appreciable quantities of one or more alloying element in addition to carbon. For instance, 1021 (mild steel) is a plain carbon steel; it is defined as such because it contains no significant amount of alloying elements other than carbon. One method of identifying steel is using S.A.E. codes. The S.A.E. (1021) number of the material shows the elements and their percentages. The first digit gives the controlling element. The second gives the percentage of the controlling element if an alloy steel and the last two digits give the percentage of carbon.

Therefore, 1021 is a plain carbon steel with 0.21% carbon. This is commonly referred to as mild steel.

Steel defined as S.A.E. 9172 contains silicon manganese at 1% with 0.72% carbon. This is an example of an alloy steel and is typically used as railhead.

You can use the S.A.E. Code Element Key below to establish the material specification, but from the blacksmiths point of view, the best way to identify the material is to use its chemical composition.

1 = Carbon; 2 = Nickel; 3 = Nickel Chromium; 4 = Molybdenum; 5 = Chromium; 6 = Chromium Vanadium; 7 = Tungsten; 8 = Nickel Chromium Molybdenum; 9 = Silicon Manganese.

To many, alloy steels are a mystery, but it's not really that hard once you know what you're dealing with.

If you have a specific requirement the job must fulfill, the easy way to get the correct material is to ring your local specialist steel supplier and talk to the experts. Tell them what you are making, how you intend to make it, and they'll be sure to send you in the right direction and give you a spec sheet for the steel supplied. That sheet will cover all manner of information about the material from typical application, chemical composition, temperatures for forging and heat treatment, machining, right down to its coefficient of thermal expansion.

While you may not think all of these things are important to you, they are important to the performance of steel. To get the most out of the material, you need to know these specifications; otherwise you're just playing with fire.

Carbon (C). Although it is not generally regarded as an alloying element, the effect it has on steel must be illustrated. It is the most important constituent of steel and as such has the strongest influence on its properties of hardness, strength and ductility. The progressive increasing addition of carbon to steel raises the hardness and wear resistance and lowers the melting point, ductility and weldability.

Nickel (Ni). Pure nickel is used as a corrosion resistant protective coating on wrought iron and steel and can be highly polished (nickel plating). When added to steel, nickel imparts strength and toughness without the loss of ductility and also increases resistance to shock and fatigue. Nickel is commonly found in case hardening steels, stainless and heat resisting steels.

Chromium (Cr). Pure chromium is a soft and ductile material, and can be used as a protective corrosion resistant coating on wrought iron and steel (chrome plating).
Chromium forms a carbide mixing with carbon and iron in the steel and imparts hardness and toughness. It greatly increases the resistance to wear and corrosion when present in amounts greater than 13%. It can be added to steel in varying percentages up to 35%.
A major effect of chromium is its ability to harden the steel to a greater depth than ordinary carbon steel. Chromium is the basic element in stainless, heat resisting and high speed steels.
Tungsten (W). Like chromium, tungsten is also a carbide forming element. It adds great strength, hardness and toughness to the steel. Tungsten is found in high speed steels.
Perhaps its best feature is the fact that it gives the steel greater stability at high temperature. This property is known as red-hardness, meaning that it does not lose its hardness even when red hot. Steels containing tungsten should never be quenched on water as it will cause them to split or break. Hardening is done with an air blast or in oil bath.

Alloying Elements

Molybdenum (Mo). The effect of molybdenum on steel can be characterized in much the same way as chromium (gives deep hardening properties) and tungsten (gives strength at high temperatures) it also improves hardenability, strength, toughness and corrosion resistance. Molybdenum when combined with chromium, nickel and vanadium is found in various hot die steels.
Vanadium (V). Added to alloy steels as a purifier and de-oxidizer to assist in the production of high quality steels, vanadium imparts great tensile strength and refines the grain structure of steel while increasing its resistance to fatigue. It is often found in high speed steels and high temperature steels. Vanadium is also found in spanners, springs and gears.
Manganese (Mn). Able to combine with sulphur to form manganese-sulphides, this element reduces the harmful effects of iron-sulphides in the steel, thus reducing red-shortness (brittleness) while increasing free cutting (machinability). When present in amounts from 7 to 15%, the steel will be very hard and very tough. In this range, steels with elevated carbon content are austenitic and as such are noted for their ability to work harden on the surface while the core remains tough. Manganese is found in work hardening steels such as train and tram line.
Silicon (Si). This non-metallic element is the main constituent of sand, quartz, opal, etc. Practically all steels contain silicon in some percentage. It is added as a de-oxidizer, and as an alloying element, is rarely used alone, being combined with other alloying elements such as chromium, manganese, molybdenum, etc. In combination with these elements, it adds strength and toughness. The addition of silicon greatly increases steel's elastic limit. When combined with manganese in amounts from 0.5 to 2%, they are generally referred to as spring steels which are used in all shapes and sizes of springs, from tiny volute springs to large leaf springs.

There is a host of other elements that are added to steel to impart this property or that or to control other elements, but this overview gives you a basic idea of the major elements and their effects on steel.

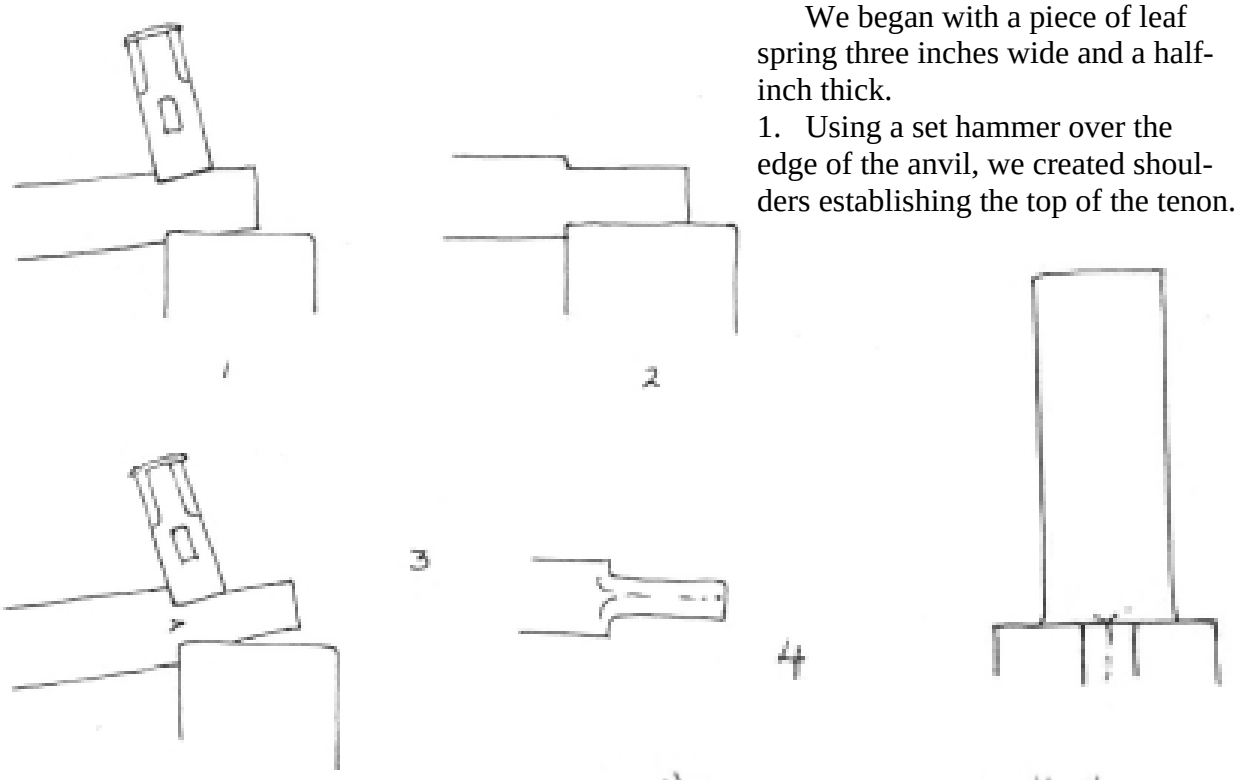
Anvil Bridge

by Tom Latane

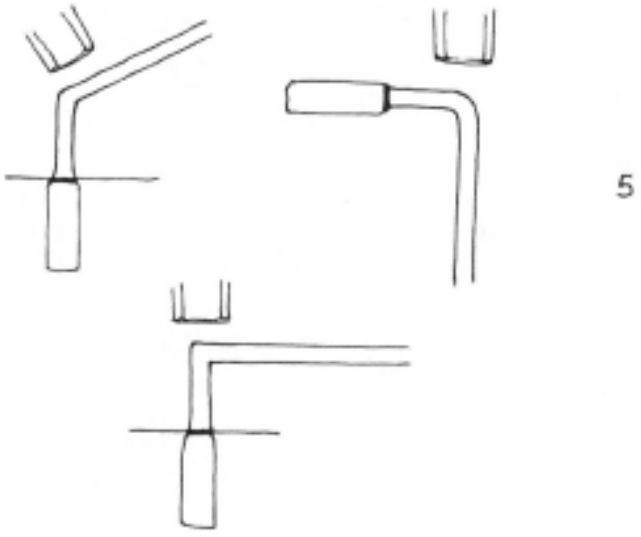
An anvil bridge provides the acutely angled edge backed up by the mass of the anvil. I designed mine to have one edge beveled like the hatchet stake, one square edge, and a small spur with a longer taper. I considered making the spur a small square horn but thought that the thinner edge might be handier when this tool was in use.

We began with a piece of leaf spring three inches wide and a half-inch thick.

1. Using a set hammer over the edge of the anvil, we created shoulders establishing the top of the tenon.

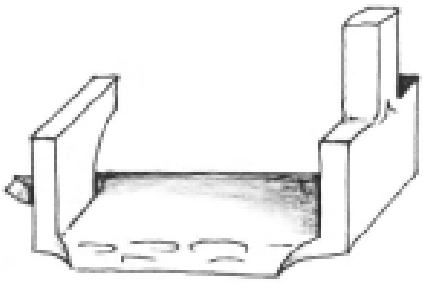


With the help of Louie Fisher, who works in my shop one afternoon a week, I recently made a tool for which I have felt a need for some time. The forging of hinges and other scrollwork with chisel- split branches has always been difficult. Using the edge of the anvil has meant spreading the split members ninety degrees apart for dressing, then working them back together at the desired angle. Working over a tinsmith's hatchet stake held horizontally in the vise always involved a lot of repositioning the stake after hammering.



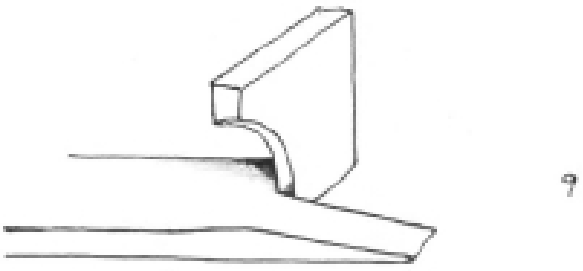
2. The remainder of the tenon was forged to the depth of the shoulder.

3. This was repeated several times until the width of the tenon had decreased to an inch and the thickness increased to an inch. Some upsetting can be done if the thickness does not increase enough. Longitudinal folds do not compromise the strength of the tenon.



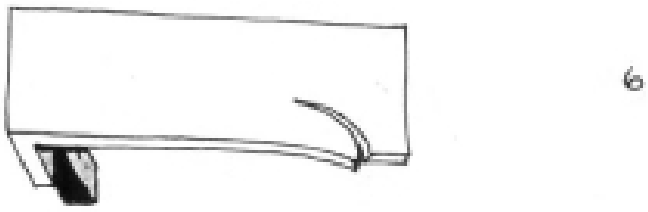
4. With the tenon fit to the hardy hole, the material was cut to a convenient length and the shoulders upset to seat well on the anvil face.

5. The next step was to forge a right angle bend, toward the horn, about 2 1/2" above the anvil surface.

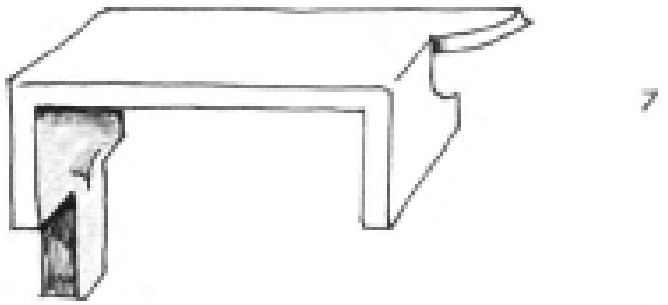


6. I marked a spot 2 1/2" from the far end and chisel cut the spur away from the side which would not be beveled. The spur was short leaving a full width at the end for the foot.

7. A second right angle bend was then formed leaving the spur material in the same plane as the bridge top. The foot was then upset or drawn out to create a level bridge top and solid contact for the foot.



8. A cross pein hammer was used to draw out the edge of the bridge with as little gain as possible in length. A curve in the bridge top resulting from stretching of the beveled edge can be corrected by upsetting the beveled edge from the ends or drawing out the opposite edge.



9. When the heavier forging was all done and the bridge was adjusted to sit solidly once again on the anvil face, the curved end of the spur was cut and it was forged to the desired taper. The bridge was not hardened or tempered.

METALSMITH Volume 34, No. 2, June 2010

WHY H13 IS A GREAT STEEL FOR A HOT CUT OR PUNCH

By David Brandow

To give credit where credit is due, the first time I heard this, it was at a demonstration Lloyd gave in Waldie's. At the time, while I deferred to Lloyd's experience and expertise and believed him, I didn't fully understand why it was true. As a result, I didn't try using H13 until fairly recently.

As time went by, though, I had heard other blacksmiths talk about different kinds of steel and I was lucky enough to win various pieces of 4140 and 4340 in some Iron-in-the- Hat draws, so it eventually sparked enough interest to do some reading about it. There are still a number of gaps in my knowledge but based on what I learned, I started with a thought experiment to determine what the best tool for hot work would be.

Normally, when you temper a tool, you bring the temperature up to the straw-purple range, which is somewhere in the 430 F to 520 F range, and lock it in by quenching in water or oil, depending on the steel (e.g. water for 1045, oil for 5160). Having done so, though, we then lay a piece of steel that's about 1900 F on it and hammer on that steel for a while, driving our carefully heattreated piece into it like a wedge. Or we might punch our carefully heat-treated tool into our very hot piece, surrounding it on all sides with that hot steel. As we do so, that 1900 F is bleeding into our tool. If our tool is well polished and we are paying attention, we might notice, from a distance, when it hits purple and have enough time to quench it. If not, it might turn blue, grey, red or even orange before we notice, ruining the temper. Knowing me, I'd probably quench it and keep using it anyway, but it's won't be very good. The edge will mush (deform) the first time I use it, and I'll have to continually grind it to reform the edge until I finally break down and heat treat it properly again.

The reason for this is that most of my tools were made out of car springs and the hardness of 5160 (car spring) when first quenched is 62, when tempered at 500 F is 57, but when brought to 1000 F it drops way down to 38. Similarly, 4140 and 4340 start at 56 and end up down at a hardness of 40 by the time you hit 800 F. So none of these tools are ideally suited for hot work, at least not unless you are scrupulous about cool them off between, and during, use.

H13, though, instead being tempering at around 500 F, is instead tempered at around 1000-1100 F, a dark red, where its hardness is still 54. Similarly, A2's hardness at 1000 F is 56 and S7's hardness at 1000 F is 51 (1000 F is where you'd want to stop with A2 and S7, though). That means that these steels can stand being brought pretty hot and still keep their temper, still be hard and resistant to deformation. You are far less likely to ruin them, although obviously you'll still want to be careful to cool the tool down between uses, particularly on the thin ends.

From this, we can see that steels like H13, A2 and S7 are the best candidates for hot tools. But heat resistance isn't the only category we want to measure. Our next consideration is toughness. A2 is only rated Fair on the toughness scale, and if I'm going to be beating on a tool with a hammer, I'm thinking it should be at least Good, so we can rule out A2. 4140 and 4340 are Good on the toughness scale, making

them good for cold work, but they don't have enough temperature resistance for hot work, so we can rule them out. H13 and S7 are both rated Excellent on the toughness scale. H13 gives us better hardness at a higher temperature, so we'll give the nod to H13 as our winner.

Life rarely gives you anything for free, though, H13 does have a number of drawbacks. H13 is pretty expensive, hard to come by, and rates a Difficult on the formability scale. What is the formability scale? Again, I'm no expert, but from my experience, I think a better name would be the "you-have-to-beat-the crap- out-of-it-to-get-it-to-move" scale. H13, like S7, 1045 and 4140, only rate a Fair on the weldability scale. You can't use the magnet test when hardening H13, its hardening temperature is way up at almost yellow, at 1850 F, so you need to do that by eye or, better yet, with temple sticks (S7 hardens around orange—light orange; 4140, 4340 and 5160 are around light cherry-light red). Finally, H13, like S7, is an air hardening steel, so you can't quickly quench it when it does start to get hot.

Despite those disadvantages, though, this thought experiment turns out to be true in reality. I ran across a bar of H13, made some tools out of it, I have found H13 to be the best steel I have used for hot work. That's not to say that other steels can't be used and work just fine, it's just that H13 seems to work better. So yes, the short version of the story is that I should have just listened to Lloyd.

THE IRON TRILLIUM
FALL 2012

NAME _____

ADDRESS _____

CITY_____

STATE/PRO V. _____

COUNTRY_____

ZIP (+4)/POSTAL CODE_____

PHONE # _____

EMAIL _____

Order Online, Mail, Call or Fax your Check or Credit Card Payment to:

ABANA Central Office

259 Muddy Fork Road,
Jonesborough, TN 37659
Phone: 423-913-1022
Fax: 423-913-1023 Website; www.abana.org Email; centraloffice@abana.org

ABANA

___ Regular Member	$55.00
___ Senior Citizen (Age 65+)	$50.00
___ Full Time Student	$45.00
___ Foreign Member	$65.00
__ Public Library-USA	$45.00
___ Contributory	$150.00

MASTERCARD OR VISA ACCOUNT NUMBER

_____-_____-_____-_____

EXPIRATION DATE _____ _____

Join ABANA or Check out other area chapters!

Northeast Blacksmiths Association

Northeast Blacksmiths holds its meets twice a year at the Ashokan Field Campus in New York State.

The Ashokan campus is located in Olivebridge, N.Y., several miles west of Kingston, N.Y. The meets are held the first weekend in May and in the first weekend in October every year. The main demonstration is in the blacksmith shop and there is a "Hands On" workshop for beginners. A main demonstrator is brought in for each meet, food and bunk-house style lodging are provided as part of the cost of the weekend long meet.

Contact : Tim Neu
to register for hammer-ins
or subscribe to the newsletter;
Tim Neu, The Ashokan Center,
447 Beaverkill Rd.
Olivebridge, N.Y. 12461 [914]657-8333
For more info check out the web site;
http://www.northeastblacksmiths.org/

Join The Pennsylvania Blacksmiths Association!

_____
Name

_____
Address

_____
City, State, Zip code

_____
Home / work Phone # E-mail (optional)

New Member ____ Renewal ____

Do you have any particular skills (welder, accountant, carpenter, doctor) that may be helpful to the group or membership?

_____

_____
Suggestions for PABA demonstrations

What is your skill level?

O Beginner O Intermediate O Advanced O Professional

Membership paid by ___Cash ___Check # _____

Send your completed application with $ 25 (one year dues) to;
PABA, Jeff McComsey, Treasurer
124 W Franklin St
Strasburg, PA 17579
(make Checks payable to PABA)

PABA Membership Application

Membership is from *Jan. 1 — Dec. 31*

New Jersey Blacksmiths Association
Attn: Larry Brown, Editor
90 William Avenue
Staten Island, New York 10308

Index For NJBA
Volume 18, #1
11/15/13
Meets and Reports
Pages 1–8;
Ad Page 9,
Vise Bearing 10,
Alloys 11 — 12,
Anvil Bridge 13— 14,
H13, dragons 15– 16

How to Join or Renew your Membership in NJBA:

NJBA Dues are $20 per year.
NJBA Business Dues are $40 per year
Please make your check out to: "NJBA"
Please mail checks to:
NJBA, P.O. Box 224, Farmingdale, NJ 07727-9998

Please include payment with the information listed below.
"I want to join NJBA, and I am enclosing my check for $20 ($40 for a business) to cover annual membership dues and newsletter subscription. "I understand and acknowledge that NJBA dues are credited from June to June, that I will receive for my first years dues the current volume, and that dues will be payable again in June."
The following information will be listed in a roster available to other members.

Name _____ Home Phone_____
Address _____ Day Phone _____
City _____
State _____ Zip _____
E-Mail _____ Skill Level (optional)_____
Comments _____