

THE HOT IRON SPARKLE

* Newsletter of the North Carolina ABANA *

www.ncabana.org

Volume 29 Number 1



1st Quarter 2011 – Jan/Feb/Mar



Peter Ross Working With Wrought Iron



Inside This Issue					
President's Message	P 2	Interview With Peter Ross – Wrought Iron	P 17	Fire On the Mountain	P 31
Editor's Notes	P 3	The Last Blacksmith Standing – Chuck Beattie	P 24	2011 SBA Conference	P 32
Secretary's Report	P 3	Blacksmith's Guild of the Potomac Spring Fling	P 25	Controlled Hand Forging – Splitting	P 34
Meet our New Treasurer – Jim Kennady	P 4	The Stirling Cycle Engine – Robert Timberlake	P 26	New England School of Metalwork Summer Classes	P 38
Treasurer's Report	P 4	Wanted: Blacksmith Staff	P 27	Blacksmith's Exchange	P 39
Regional Group Meetings	P 5	Book Review – The Backyard Blacksmith	P 28	Forms	P 42
Letter To The Editor	P 12	Bill Tannenberg's Latest	P 29	2011 Chapter Calendar	P 43
Forth Quarter Chapter Meeting	P 13	Yadkinville Journeyman – Allan Green	P 30	New Members	P 44
Upcoming Chapter Meetings	P 16			Chapter Officers	P 44

A Message from Our President



Cindy Alexander

PRESIDENT'S LETTER

The chapter held our 4th quarter meeting at Peter Ross's shop with Peter demonstrating to an attentive crowd. Lunch was cooked by Jim Kennady with no one leaving hungry. Thanks to the Ross's for hosting us.

We held our elections at the last quarter meeting with Jim Kennady being elected as treasurer and myself as your president.

Madison will be here before you know it. By now everyone should have received their conference brochure in the mail. You will notice that everyone at a forge (except for green coal) is from N.C. I did that on purpose as I plan to dedicate this conference to Jimmy! He would like that.

I would like the chapter to host a conference next year. Let me get through Madison and I'll start planning one for us. There is a lot of work involved so we'll have to all work as a team to put on a good conference. I'll be asking for volunteers to help with this.

There was apparently some confusion on who could demonstrate at the State Fair this year. We need to make sure we keep the shop safe and our insurance from being canceled, so we need to follow some guidelines. In order to demonstrate. You must be current on your dues, which expire at the end of the month. When the time comes for the fair please sign up to demonstrate so that we can make sure your dues are current. Walk on demonstrators will be discouraged. Everyone in the forge area MUST have safety glasses on and abide by all safety rules.

Our 1st quarter meeting will be the 8th (WOW) annual meeting at Dean Curfman's shop in Morganton on March 19 at 9:30 am. Dean usually has vendors there and we'll have lunch catered by Firehouse Caterers. Hope to see you there it's always a great time!

Forge Safely,
Cindy

Submissions to the HOT IRON SPARKLE can be made to:

Martin Lyon
6 Carolina Meadows, Apt 203
Chapel Hill, NC 27517

or e-mail at: northcarolina.abana@gmail.com
(919) 918-4180

The Hot Iron Sparkle is published quarterly by the North Carolina Chapter of ABANA. Chapter dues of \$25.00 per year (\$35.00 outside of the USA) includes a subscription to *The Hot Iron Sparkle*. Any original material herein may be copied in any Blacksmith Newsletter provided appropriate credit is given. All other rights reserved.

EDITOR'S NOTES

I apologize for getting this newsletter out so late but I have had some distractions lately. I moved in January and had other personal matters that took up a lot of time.

Please make sure you read Randy Stoltz's local meeting reports of the Triangle Blacksmith Guild's December and January meetings. Randy made a lot of good comments about the value of these get-togethers. The chapter meetings and local meetings are important. They provide the opportunity for people to get together and share information, see and talk to others with the same interests, and to share a laugh or two. Between demonstrations, at the last meeting at Roger Barbour's shop, nobody was standing around by themselves. There were all these groups of people just talking including a large crowd talking to Robert Timberlake, the demonstrator for the day. It's just beautiful that blacksmiths are so generous with the knowledge they have and share so readily. This is why I hate that we no longer have active local groups in the eastern and western part of the state.

We do have hope for the Wilmington area, however. I think Paul Whitty and Mike Kelly will come through and form a group that meets at the Poplar Grove Plantation. Now, we need a group around the Ashville area, and maybe further north in the Boone area. Most of our local groups hold all of their meeting at one shop. I think that it may become an imposition for that one shop owner to hold every meeting. The Triangle Blacksmith Guild does things differently; their meetings rotate between those members with shops that can accommodate a crowd. This means the same guy doesn't have to clean up his shop for every meeting; maybe he has only one meeting a year. Please, someone in the western part of the state consider forming and leading a local group with the idea of moving your meetings around. Our membership concentrates itself where we have local groups. The more local groups we have, the larger our membership will be. And – the happier I will be with the knowledge that we are serving our membership better. It will also help our finances. Note from Jim Kennady's treasurer's report, on the next page, that we lost about \$200

Our Google Group seems to have taken off lately. There has been a lot of good discussion, some very interesting posts. Those of you who have not joined (45% of members who report they have email) please let me know and I will connect you to the group.

Happy Reading and Good Blacksmithing,

Marty Lyon, Editor

SECRETARY'S REPORT

No Secretary's report this month

Marty Lyon, Secretary NC ABANA

Meet Our New Treasurer, Jim Kennady



I would like to introduce myself as the new NCABANA Treasurer.

A bit of my personal history. I was born and raised on a small farm near Jasonville Indiana. In 1992, I relocated to North Carolina for a job in Research Triangle Park. I work for Glaxo Smith Kline as a chemist. My family and I live just north of Raleigh in the county near Creedmoor. I have been an NCABANA member since 1999. I am also an ABANA member.

I became interested in blacksmithing after pounding on a scrap of metal over an I-beam. This lured me into many hours of reading about blacksmithing. I slowly began acquiring a few basic blacksmith tools and spending more time forging. I enrolled in my first class, Modern Metal Forms from the Durham Arts Council taught by Jimmy Alexander. A few years later I took my first class at the Folk School and became hooked on Blacksmithing.

I would like to thanks Parks Low for his many years of service as the previous Treasurer. He kept a superb set of records. I found it quite easy to find the financial information.

TREASURER'S REPORT

For the Year Ending 2010

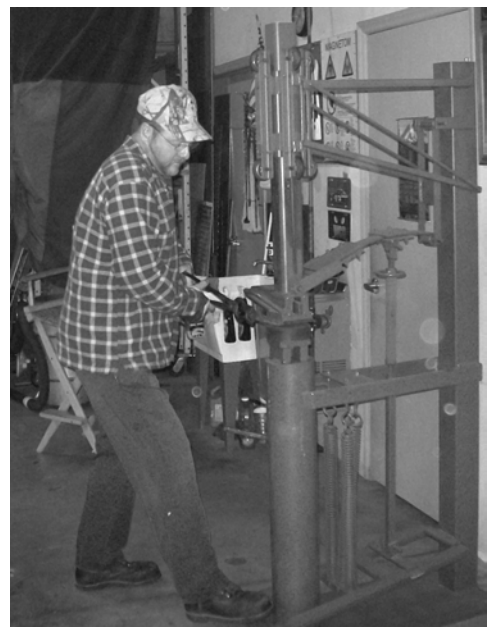
	Checking	Savings
Income	\$ 7,718	\$ 298
Expense	\$ (7,916)	\$ (500)
Net	\$ (198)	\$ (202)
Balance ending 2010	\$ 6709	\$ 2575

Jim Kennady, Treasurer NC ABANA

Regional Group Meetings

Southern Foothills Blacksmiths – Ray Clontz

The Southern foothills Blacksmiths met at Steve Barringers shop on Sunday Dec. 12th. We had 14 people attending with 5 being visitors interested in learning how to forge knives and tomahawks. The meeting started off with Ben Andrews heating two large pieces of steel in the coal forge and forging two large candle holders on one of the BIG BLU power hammers. The meeting then turned to the forging of knives and tomahawks. Brian Swink and Steve Watkins led the demos, using the propane forge, an anvil and the Clay Spencer in-line treadle hammer to complete some knives out of flat stock and some railroad spikes. Butch Silver led the demonstrations on tomahawk forging. Butch had brought a piece of one inch square 4140 with a slot milled in to do the demo with. After drifting the hole for the handle, he forged the blade part using the BIG BLU power hammer and finishing by hand on the anvil. We in this group are very appreciative to Steve Barringer for letting us hold our meetings in his VERY well equipped shop. THANKS STEVE



B.O.L.T.S. Blacksmith Guild – Amos Tucker

December Meeting

BOLTS had it's second Christmas party this past December and we made candle holders for ourselves and for Christmas presents.



January Meeting

Chris Winterstein (past president of ABANA) caused an impromptu meeting for BOLTS when he passed through our area visiting from PA where he works at the Samuel Yellin shop. He was gracious enough to demonstrate three different forge welds for us on a very cold January day. In appreciation we took him to eat at Bill's Barbecue and introduced him to our fine southern cuisine.



Triangle Blacksmith Guild – Randy Stoltz

December 2010 Meeting

Triangle area members met at Jason Craft's shop in Roxboro, NC on December 11th for a hands-on workshop on forge welding. Helping out the attendees with expert tutelage were Robert Timberlake, John Fluke, and Dick Snow. For this meeting we set up four portable forges outside in addition to the forges in Jason's shop. The multiple forges allowed everyone the opportunity to try their hand at forge welding without having to wait too long.



John Fluke demonstrates cutting the bar prior to folding and welding it

The purpose of this meeting was to learn and practice one of the fundamental skills for blacksmiths. At separate forges Robert, John, and Dick demonstrated how to cut, fold, and weld a 3/8 inch bar much like you would do to make a fireplace poker. Then everyone, including several people just getting started in blacksmithing, got to try it themselves. All the materials and tools needed for this workshop were provided. All the participants had to bring were themselves and safety glasses. In addition to forging there is always a



Robert Temberlake observing as workshop Walt Beckweth works on forge welding.

lot of information exchanged at our meetings with many questions and answers getting bantered about among the members and guests. I often find this informal part of our meetings very useful and frequently I solve some problem while participating in the discussions. There is more to meetings than just watching a demonstration. The threatening weather held off until late in the afternoon and started raining as we wrapped up the meeting.

Hands-on workshops like this are a great way to get people started with blacksmithing. They get to watch a demonstration and then try doing it themselves with the help of an experienced blacksmith. They get to try forging without having to invest a lot of money in equipment or attending expensive classes. Hands-on activities like this can also be a great selling point for NCABANA. At the State Fair and other blacksmithing events, many spectators express an interest in learning more about the craft. I tell them that joining NCABANA is the cheapest way to get started in blacksmithing and learn more about it. They not only get to watch demonstrations, they can get experience forging with help from experienced smiths, gain access to a network of blacksmiths eager to share information, they can find tools and equipment at tailgate sales, and get an excellent quarterly newsletter filled with useful articles.

Be sure to take a stack of the NCABANA brochures (contact Marty Lyon if you need some) to all of your blacksmithing events and hand them out to people who express an interest. Recruiting new members helps NCABANA grow and become a stronger organization.

February 2011 Meeting

Triangle area members met at Roger Barbour's large shop in Clayton, NC February 5th for a workshop on forging tomahawks and axes. Despite cold weather and a pouring rain, more than 30 people showed up for this meeting. As a follow-up to our December meeting, where we focused on forge welding and not making something specific, this meeting was to focus on applying the skill. However, due to the large turnout, I decided to make this meeting a demo and discussion only and schedule a separate workshop with multiple forges for people to make their own tomahawk.



Great turnout for the February Triangle area meeting despite the weather.

The meeting started with Robert Timberlake demonstrating forging a small tomahawk using 1 x 1/4 inch flat bar for the body and a small piece of spring steel for the blade. In this morning demonstration, Robert folded the flat bar over to form the eye and welded the two sides together leaving the ends of the unwelded to form a pocket for the blade. He then tapered the edge of the spring steel and welded it into tomahawk body. Later in the day he would demonstrate another method for making a tomahawk where the blade is welded onto the body using a lap joint instead of a pocket.

Following Robert's excellent demo there was a brief wait before lunch was served. This worked out great as there were a lot of questions and discussions about the different methods of making tomahawks, what materials to use, how to heat treat and temper the blade, and many other topics. This discussion session was



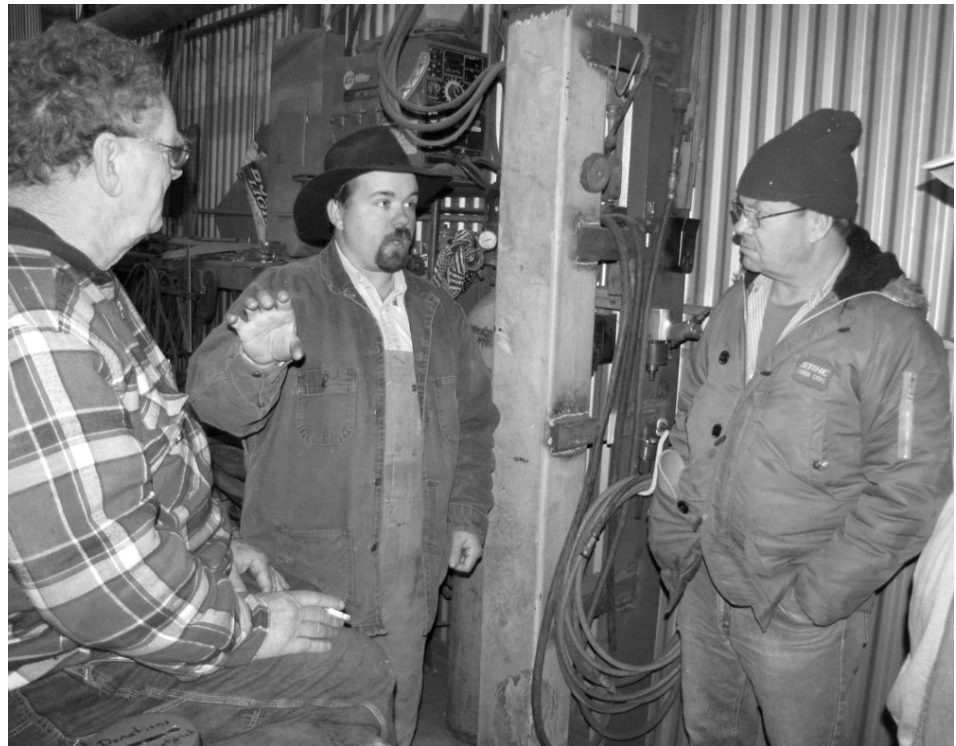
Robert Timberlake forging a tomahawk.

meetings extremely useful and think it is one of the underrated benefits of belonging to NCABANA. Despite the vastness of the internet and the books available today you cannot find everything. Frequently, there is no better source than talking to others who have encounter the same problems. There seemed to be so much going on with these discussions that lunch time was extended.

Following lunch, Robert demonstrated using a lap weld on the tomahawk blade instead of sandwiching the blade between the two sides of the flat bar used for the body. This method was also commonly used in the

great as there were several people there for their first meeting who were just getting started in blacksmithing. At least two of these guest joined NCABANA so they must have had a good time. For lunch we had grilled bratwurst with sauerkraut which were great (and something different from the usual hot dogs and hamburgers). Thanks to Cindy Alexander for coordinating and shopping for lunch. Thanks to Jim Kennady for grilling up the brats.

As I walked around before and during lunch, I saw groups of people discussing various topics. From how to do or make something to where can I find supplies or tools. And it's not just the new people asking the questions. I know I find this aspect of our



Donny Covault, Jason Craft, Randy Marshburn, and others talking shop.



Robert Timberlake at the anvil with Randy Stoltz looking on.

making of axes, chisels, and other edged tools. Again, following this demonstration there was a question and answer session with many attendees participating.

To finish up this meeting, I showed how to easily make a tomahawk handle using a broken sledge hammer handle or a long engineer hammer handle. Sure, you can buy tomahawk handles but you still have to fit them and pay shipping in most cases. I displayed a number of handles I had shaped with hand tools and demonstrated the different tools that could be used. Using a broken sledge hammer handle (I always have some broken handles around) I showed how to use a draw knife, spoke shave, and farriers rasp to shape a handle. Note that for the inexperienced woodworker the rasp is the

quickest and easiest way to shape a custom handle. For the smaller tomahawks a long engineer's hammer handle can be used upside down to make a handle. I had two new, USA made, hickory handles on hand that were curly hickory throughout and only cost \$2.29 each at Agri Supply in Garner. With 20 – 30 minutes of shaping these will make beautiful handles at a fraction of the cost of mail order handles.

Even though we ended up not following the planned agenda of a hands-on workshop, I think this was a very good meeting. We will still have the workshop at a later date when we can have multiple forges set up to handle the crowd. The meeting had a good turnout with most staying the whole day. Everyone seemed to enjoy themselves, the demonstrations were great, and a lot of questions got answered. Our members seem to be very good at freely sharing information and helping other members with problems or questions. There are far too many people in this world who do not want to tell you or show you how to do a task. Helping others learn, especially the new members and the younger members, helps make NCABANA a growing and vibrant organization.

Triad Area Blacksmiths – Marshall Swaringen

The Triad Area Blacksmith's first meeting in October was held on Tuesday night at the Dixie Classic Fair. We had about twenty members present. Tuesday night was fish fry night. Richard Howard supplied the fish and Billy Phelps did the cooking. We declared the night to be fellowship and fun, and no business was conducted. Demonstrators rotated in and out of forge area so everybody could enjoy the meal.

The October Saturday meeting, was set aside as a work day. The forges were not drawing very well during the Fair. When the smoke stack was removed, a large squirrel stick nest was found. The nest appeared to be old. The dirty coal we were burning sent lots of ash up the chimney. Finally, the ash stopped up the chimney. With everything reassembled, and some work to side draft chimneys, the smoke was going out the smoke stack again. Thanks to Joe Allen and Anderson Phillips for handling the dirty part of the work.

The first Tuesday meeting in November had eighteen people present. Victoria Schilling, a student from The North School of the Arts joined us for the night. In the stage props degree, they learn basic blacksmithing. Sometimes they have to produce a knife or sword or other object that matches the period of time the scene is set. She made an S hooker with a twist in the middle. She also made a small leaf. Both were very good.

November Saturday meeting had some competition. Deer season is in full swing and some members are trying to put a tasty snack in the freezer. Attendance was still good, over a dozen.

December meetings were hampered by the weather. Attendance was still around a dozen for each meeting. There seemed to be more people standing around the forge than wanting to work.

The work at the fair has really paid well. Since the fair, we have had new people at each meeting. We have been able to put an experienced blacksmith with each visitor. After a short safety lesson, they were shown the basic to tapering and drawing out. Some did well enough to be shown how to make a leaf. The leaves they made may not have been perfect, but they looked like a leaf and they made it themselves.

The visitors are encouraged to come back and join us anytime they can. We explain that we do not have any dues for our club, but encourage them to join NCABANA if they decide to continue.

May 2011 bring lot hammering joy everybody.

Letter to the Editor

EDITOR'S NOTE: In my interview with Clay in the Third Quarter, 2010 issue of "The Hot Iron Sparkle", there was the impression that Francis Whitaker cursed at his students. Clay sent me the following clarification:

When I was talking about Francis Whitaker the translation didn't come out quite correct. I hope you can print this explanation in your next issue.

Before I met him, I had heard a lot of tales I thought were about him cussing students.

Never in any of his classes did I ever hear him curse or talk to students with belittling words. If you did wrong by not following his instructions, he would ring the bell and show how it should be done or a couple of times made a student wear a dunce cap at supper. After the second time a student did not follow his instruction, he just ignored him for the rest of the class.

Clay Spencer

Forth Quarter 2010 Chapter Meeting

Peter Ross' Shop, Siler City, NC – November 20, 2010

NC ABANA had another great meeting at Peter Ross' shop. Peter, who makes his living at the forge and bench (he files a lot) is one of our chapter's true treasurers. He has an active schedule of classes he teaches and demonstrations to give, and television shows to visit. He can be seen pretty regularly on Roy Underhill's "Woodwright's Shop" on PBS. He also is assisting Roy in classes he gives from Roy's Pittsboro shop. All of that and a busy business to run means we appreciate the time Peter has devoted to the chapter. Lately, we have had quite a few posts on our Google Group from Peter. We especially appreciate his generosity in sharing his knowledge of blacksmithing and metal work, in general.

About everything he made at this meeting was of wrought iron. I noticed that there are always a lot of questions for Peter about wrought iron. Consequently, I spent a couple of hours at Peter's home one morning and we talked about wrought iron and steel manufacturing and the differences in handling the two materials. So, please check out my interview with Peter starting on Page 17 of this issue.

There were over 50 people at the meeting. Frankly, I was a little disappointed. I was sure there would have been more attending. I would have come for the lunch alone. Thanks to Cindy and Jim Kennady for that part of the day.

Peter was at the forge all day. He started by forging wrought iron pintles. The pintle is the hook part of the hook and hinge combination used for doors and gates. He made two varieties of pintles: one is the forge welded two-piece design and the other a one-piece, bent pintle. The bent pintle is used for lighter duty applications. After the pintles, he made a socketed chisel. The chisel was made with a wrought iron body and a carbon steel end welded to it.

Peter wasn't finished. He gave a wonderful demonstration of making repairs to a pole vice. He made the spring, wedges and



washers. I don't think Peter stopped for lunch.

When he wasn't demonstrating, there was always a big crowd around him asking questions.

Thanks again Peter for a great meeting.





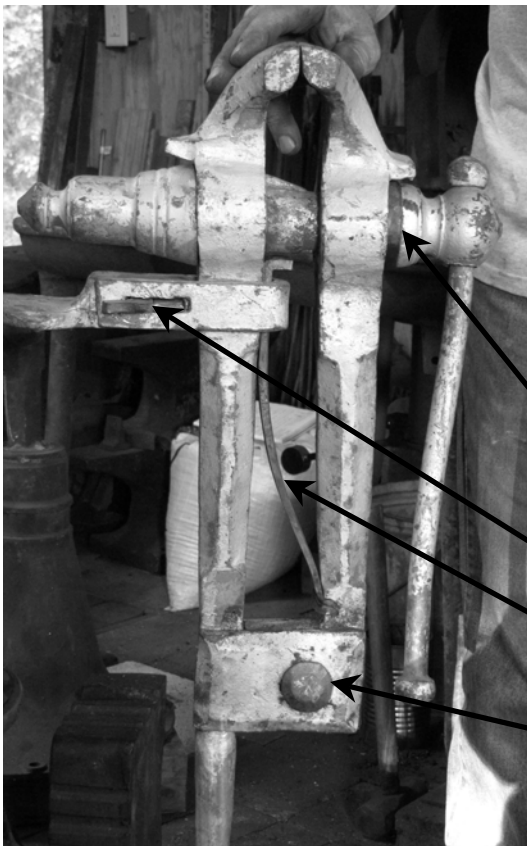
Two Piece Forge Welded Pintle



One Piece Bent Pintle



Socketed Wrought Iron Chisel With Steel End

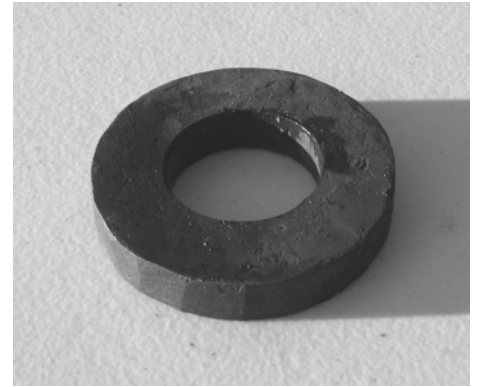


Repaired Pole Vice



Working On The Vice Parts

- New Washer*
- New Wedges*
- New Spring*
- New Pin*



*New Forged Parts For
the Vice.*

*Clockwise From Top
Left: Spring, Washer,
Wedges, Pin.*



Upcoming Chapter Meeting – Oak Hill Iron

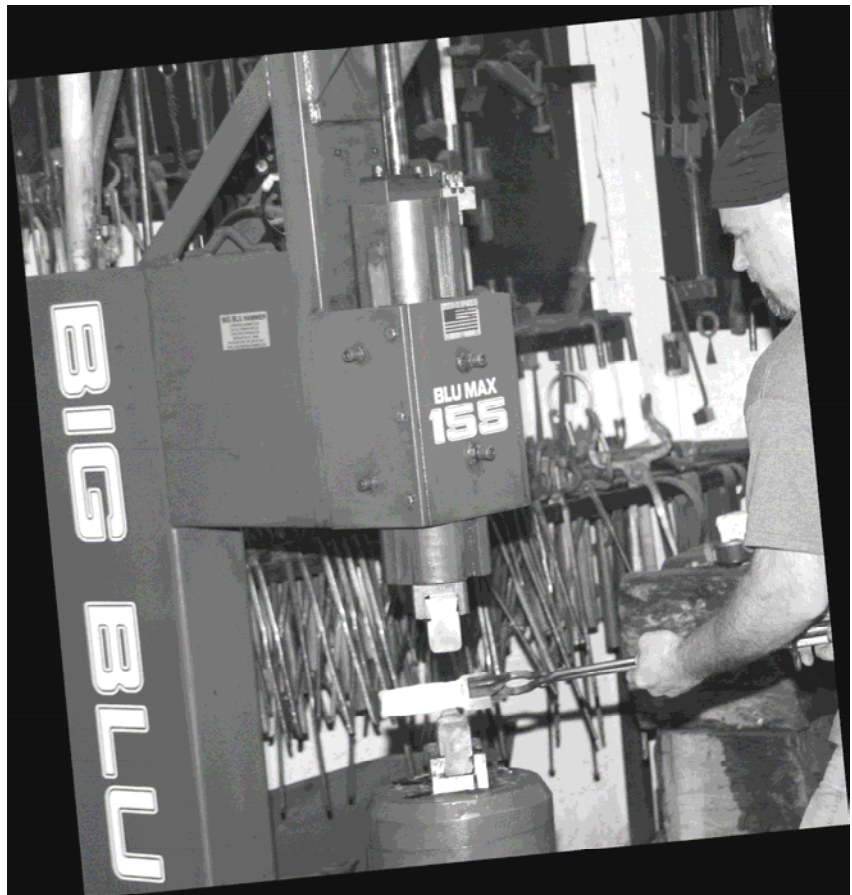
Morganton, NC – March 19, 2011, 9:00 AM

Eighth Annual Hammer On The Hill at Big Blue Hammer Mfg.

3308 Frank Whisnant Road
Morganton NC 28655
828-437-5348

Directions to The Meeting:

1. Get off exit 105 on I-40. Go north at the off ramp - go 1.9 miles.
2. Continue on S GREEN ST - go 0.5 mi
3. Continue on N GREEN ST - go 3.7 mi
4. Continue on NC-181 NORTH - go 0.9 mi
5. Turn Left on FRANK WHISNANT RD - go 0.2 mi
6. Bear Right on FRANK WHISNANT RD - go 1.0 mi (Water Mill Road goes straight)
7. Arrive at Big BLU Manufacturing Co.,



Interview With Peter Ross – Wrought Iron

We had a several meetings at Peter Ross' shop where he discussed working with iron and the various processes for making iron and steel. I thought the audience was really interested with the topic. Consequently, I went to Peter's shop and interviewed him to find out a little of what he knows about iron. I didn't think up enough questions so I have augmented some of the interview with a little research. My source of this research was pretty much confined to Wikipedia on the Internet.

Peter makes reproductions of 18th century hardware, tools, locks, and utensils for clients who want items of the colonial era. Many of his customers are willing to pay the 50% premium to have Peter use wrought iron instead of low carbon steel.

Editor: I was wondering where blacksmiths in colonial America got their iron. Did they smelt iron ore themselves?

Peter: In the period before 1800, a tremendous amount of iron was smelted in the colonies. Almost every one of the colonies had supplies of iron ore and became producers and exporters of iron. I don't see much evidence that blacksmiths would do smelt iron themselves. Blacksmiths made their own charcoal but smelting iron was a specialized skill. There were plenty of blast furnaces around to make cast iron with secondary processes to make wrought iron.

By the time of the Revolutionary War, iron production in the colonies exceeded the output of England. Two forms of iron were sold: one form was cast iron pigs for products like kettles, andirons, and wagon wheel bearings. The other form was wrought iron bar. In the 1700s and 1800s wrought iron was hammered, not rolled, so there was flat, rectangular, and square bar, but not round.

Editor: What can you tell me about iron production?

A little research first: Iron ore exists naturally (most abundant material on earth) and is in the form of iron oxide (iron chemically bound with oxygen). It has plenty of other chemically bound compounds, foremost of which are silicates. But, there are other impurities like sulfur and phosphorous.

The earliest production method, dating back about 3000 years used a bloomery. A bloomery is a lined furnace with pipes called tuyeres for the natural or forced (with bellows) addition of air. The bloomery burned charcoal to heat the iron ore. Charcoal was also used as a pure source of carbon, which entered into chemical reactions to strip the iron ore of its oxygen. The carbon and oxygen exited as carbon dioxide. The reaction was never hot enough to actually melt the iron ore but some of the impurities, called slag, did melt and run out of the furnace. Because the iron did not actually melt into a liquid phase, the carbon did not diffuse into the iron. Iron from a bloomery did not contain carbon. When the process was complete, the iron was removed from the furnace in the form of a bloom, which was a porous mass of iron and the remaining slag. This slag, mostly a compound of silicon and oxygen and other impurities filled the voids in the iron. Afterwards, the bloom was reheated and hammered to drive out most of the molten slag. The resulting product would be hammered into a bar of wrought iron. What is important to note is that not all of the slag is removed and filaments of this material remain within the iron bar. These filaments form a grain in the wrought iron. This grain gives wrought iron similar characteristics to the grain in wood. Like working in wood, working wrought iron requires one to strongly consider this grain. This grain does not exist in steel made today.

A bloomery makes a relatively low volume of iron. Early bloomeys produced about 1kg. to 15 kg. per batch. Later, when water wheels were used to power the bellows, a maximum of 300 kg. were produced with each batch.

The blast furnace, around during colonial times supplanted the bloomery because it could produce large volumes of product. There are some indications that the Chinese had blast furnaces about 7000 years ago. The blast furnace does not make a useful product. Its output is a material called pig iron. Because it operates at temperatures high enough to melt the ore, it produces iron with dissolved carbon. The carbon content can be as high as 6%. This material is much too brittle for use. Pig iron is further refined to make cast iron (2.5% to 4% carbon), wrought iron, or, today to make steel.

In the blast furnace, iron ore, fuel (charcoal until the early 18th century, now coke), and limestone (calcium carbonate) are added to the top of the furnace. As the material falls down through the furnace it is heated until it melts to a liquid. Air is forced into the bottom and rises through the material. When the molten material reaches the bottom, it consists of slag and pig iron (pure iron with dissolved carbon). The limestone has converted the slag to a liquid material that is heavier than the pig iron so sits below. This separation allows the pig iron to be drawn off leaving most of the slag behind. Besides large carbon content, pig iron also has fairly high silicon content (up to 3%). Wrought iron from pig iron made in a blast furnace still contained slag. Actually, the slag was desirable or even necessary, as pure iron was not strong enough to be very useful. You either wanted steel, or iron with slag included.

The pig iron can be reheated and mixed with scrap iron to lower the carbon content to become cast iron. Impurities such as sulfur and phosphorous are also reduced in this process.

Pig iron was also further refined to make wrought iron in a process that heated up the pig iron with air. The oxygen in the air combined with the dissolved carbon to make carbon dioxide. The first main process for this was done in what was called a Finery forge. Here, charcoal was used to remelt the pig iron. The resulting, carbon free product was removed as a bloom, much like the product from a bloomery. In fact, the bloom was similar: porous iron with slag within the pores. It was handled in the same way, heating and hammered to produce a bar with filaments of slag.

In the latter 18th century, the Finery forge was replaced with a process called Puddling. In the Finery process you did not dare use coke or coal to melt the pig iron because the impurities in the coke or coal would become part of the iron. The puddling process used what is called a reverberatory furnace. Here, the fuel and the material to be heated, or melted, did not come into contact with each other. The fuel produced hot gases and radiant energy. Thus, coke or coal could be used in the puddling process - a much more economical process. The result was large puddle balls, which were hammered out to redistribute the slag and form the wrought iron bars – much like the blooms from a bloomery or finery forge. The puddle furnace was used until it was replaced by the Bessemer process. The Eiffel Tower was made of “puddle iron”.

The Bessemer process could have resulted in cheap wrought iron, but instead, it was such an economic improvement, it made it possible to make cheap steel. If you had cheap steel, you did not need cheap wrought iron. The Bessemer converter was placed right next to the blast furnace and took its output of molten pig iron. The equipment consisted of a crucible lined with refractory material. Air was pumped in at high volume. The pig iron was oxidized at temperatures high enough so that all impurities and carbon and silicon were converted to their oxides and left as vapor or solid slag. The oxidizing reactions added to the heat keeping the batch molten. Measured amounts of carbon and other alloying materials, like manganese, silicon,

and vanadium were added back to make steel of the desired carbon content and with the desired properties. The great economic advantage of the Bessemer converter is the speed of the process. Steel made from the Bessemer converter costs about one sixth as much as when made from previous processes. Now, even the Bessemer process is obsolete. It replaced with the electric arc furnace.

Editor: Back to my discussion with Peter about iron was produced. Remember, I asked Peter about iron production.

Peter: A bloomery is a smaller alternative to the blast furnace. They are thousands of years old and some were still commercially operated well into the 20th century. I know people near Brasstown whose grandparents ran bloomeries to make a little extra money during the depression. Upper New York State was a tremendous area for Bloomeries – also working well into the 20th century.

Editor: Why was pure iron (without the slag) not made and used?

Peter: The processes of the time could never get the slag out because the batch of iron ore would never become molten. Later on, the blast furnace, which makes pig iron, could get the batch molten because the addition of carbon lowers the melting point. Furnaces and bloomeries were not capable of separating out pure iron because the batch is mixed in with the fuel. Now we can make pure iron if we wish, but wrought iron (containing slag) and steel is much stronger than pure iron. Pure iron is made today and used in such industries as electronics and the electrical industries. The core material in transformers, motors, and electrical generators are iron. They don't have to be structurally strong just magnetic.

Editor: Steel has existed for quite a while. How was it made? Did it have slag like wrought iron?

Peter: Most modern steel does not have slag but older steel did. Going back to the 1700s, there were three basic qualities of steel. The lowest quality was Blister Steel. This was made of wrought iron that was carburized by packing it with layers of charcoal and baking in a furnace in an oxygen free environment. The process was also called Cementation and it described how you add the carbon to the iron, through packing and heating, not through melting. The iron did not get molten, just quite hot. Carburization does not remove the slag. The drawback of blister steel was it did not have even quantities of carbon throughout the bar. Essentially, it absorbed carbon on the surface like today's case hardening process. Structures of Blister steel can be found dating back a couple of thousand of years ago. It can be found in columns in the Greek Parthenon.

The next best quality of steel was called shear steel. This started as blister steel, but the rods were cut up and welded back together. This is similar to making a Damascus billet. And like Damascus, the billet was drawn out again. If this process was repeated, it was called double shear. This method of making steel was particularly popular in England.

In the mid 1700s a process called cast steel was used. Blister steel was put into a crucible and melted. Once molten, the ingredients would mix equally throughout making the carbon content uniform. The steel was poured into an ingot mold to cool. The ingot would be hammered or rolled out into a bar.

Ironically, in the 18th century, steel was considered to be a purer form of iron. It was thought something was taken away from iron to make steel. Actually, it is the reverse as carbon is added.

Editor: Why couldn't steel be made directly in a blast furnace? Why not just try to make pig iron with lower carbon content to begin with?

Peter: In the open blast furnace it was not possible to accurately control the carbon content. Also, it was difficult to know the characteristics of the product you made. With the materials of the day, it would have been difficult to even do a spark test. Therefore, it was easier to just remove all of the carbon from pig iron than to try to control the carbon content. There was very little demand for steel, in volume, due to the extra cost of conversion. Probably 98% of iron ore was made into cast iron or wrought iron.

Steel was used mostly for tools – anything requiring a sharp edge. It also was used for its abrasion resistance and in making springs. Early firearms used very little steel. In a flintlock, there are two steel springs and the face of the frizzen is steel. Barrels were made of iron, not steel.

During the second half of the 18th century the Bessemer Conversion process allowed steel to be made more economically. The process started with pig iron. This process allowed the slag to be removed and the amount of carbon removed from the pig iron to be controlled. The carbon content could be judged by the appearance of the flame issuing from the converter. The Bessemer process was mostly used to make high volumes of relatively low carbon steel for construction purposes. High-grade tool steel still was made using the cast steel process.

The Bessemer converter still starts with pig iron. It could stand right next to a blast furnace so the pig iron from the blast furnace could be dumped right into the Bessemer converter. A main improvement of the Bessemer converter was that the slag found in wrought iron and early steel was not present in the final product. The Bessemer process was able to melt the material and the freed slag would rise to the top of the batch where it could be mechanically removed.

Actually, the blast furnace removed nearly all of the slag. What is left winds up in the wrought iron, but is still a small percentage of what was in the ore originally.

Editor: How could you improve the quality of the iron?

Peter: Wrought iron has included slag filaments in it. The bloom of wrought iron, from a bloomery is a ball about one foot in diameter of iron and bubbles of slag. When you take that big ball out of the bloomery and roll or hammer it into a long bar, say 1" square, all the bubbles of slag get stretched out in length to become filaments. In some batches of iron, you could get bigger pockets of slag. One of the ways to make a better grade of iron was to make the pockets of slag uniform in size and distributed evenly throughout the bar. You could use the process similar to improving blister steel: cutting, stacking, and welding and drawing out again. This was done well into the 20th century. The first run was sometimes called muck bar or direct rolled. Then you could have a single, double, or even triple refined iron, each describing a bar that had gone through cutting, stacking, welding and drawing out once, twice, or three times. The better iron worked more predictably and lessened the chance of the bar splitting open at one of those slag pockets. Of course, the more you refined the bar, the more the iron bar cost.

Editor: Today, can you tell the grade of iron just by looking at the grain?

Peter: I tell by working it. If I see a bar lying in the scrap yard, I can't tell how good it is. There are a couple of tests though. You can cut or saw it halfway through then break or bend it cold and see how it tears. You look to see whether the fibers of the slag stick out.

You can also work it hot by punching a hole near the end and seeing if it tears, you are looking to see if the stress of punching and stretching will make it tear.

If you feel that you have layers of poorly distributed slag, you can rectify that by doing what is done to refine iron, namely: fold, weld, and draw out the bar several times.

There are two other conditions that can affect the quality of iron: One is a hot shut and the other a cold shut. A hot shut is a condition where there is too much sulfur in the bar (perhaps the bar was made of high sulfur scrap). When you work the bar hot, it tends to crack. A cold shut is just the reverse; it cracks when you work it cold. This is caused by too high a phosphorous content. You can't do anything about those two conditions.

Editor: Please describe the wrought iron bar you find today

Peter: It varies tremendously. Because there is such a limited supply of iron, it forces you to be less and less particular. Because a lot of iron made in the first half of the 20th century was manufactured for its corrosion resistance (for fire escapes, water tower strapping, and silo hoops) manufactures were not too concerned about how it would forge. You could buy hot shut or cold shut iron much cheaper. So, if you were not concerned with forging, that would be what you would buy. Today, this describes a lot of the iron you find.

Editor: What are your sources of iron?

Peter: I look around to find people who have salvaged something.

Editor: Do you try to find out what has been salvaged?

Peter: No I don't, because I do not find much of a correlation between what was salvaged and the quality of the iron. For example, some say wagon tires are a good source of iron. Some of this iron is exceptionally good and some exceptionally bad. Some is not even iron, but steel.

Editor: How far back was iron recycled – adding old new iron to new a new batch?

Peter: As far back as the end of the 18th century when the puddling furnace was built. You could throw in cast or wrought iron and it reduces the batch to wrought iron. It decarburizes the batch. It uses the same principle as the Bessemer converter except it is built differently. One of the fascinating points about the puddling furnace is that the pig iron melts at about 2500 deg. F, but as the carbon is drawn off, the melting point increases so the batch solidifies into a semi-solid lump. You can pull the lump out of the furnace with a pair of tongs and it can be hammered and drawn out.

Another way to recycle scrap was to pile up scrap bar, heat it to a welding temperature and weld it together under a big hammer. That was the normal way to make big forgings such as anchors and crankshafts for steam engines.

Recycled iron is part of the dilemma of purchasing iron. It could have been made of scrap and that scrap determines the quality of the iron. For example, I have used wrought iron that worked beautifully but had one corner that was something else, perhaps steel that was welded in.

Editor: Can you use the same techniques working with wrought iron as you work with steel?

Peter: The slag is a drawback because when you have grain in the material, like wrought iron it no longer has the same characteristics in all directions and it is difficult to machine. You have to think about it like a piece of wood. Wood is not as easily machinable as a material that is equally strong in all directions. Wrought iron is the same: not as strong in all directions.

Working with wrought iron takes a different set of skills. Most blacksmiths today have learned their techniques around mild steel. You can't use these techniques indiscriminately with iron. For example, you

can't cut sharply across the grain to make a corner to set a shoulder. The piece will break at that spot. If you hit half off/half on your anvil with steel you can do this at the anvil's sharp edge. You can't do this with wrought iron. You must use a rounded edge.

Editor: How do you make a nice sharp right angle bend in wrought iron if you are making something like a frame?

Peter: You do that by upsetting or welding two pieces together. If you upset wrought iron too much and get even a slight hot shut at the inside corner you will lose about 2/3 of the strength at the corner. In working with steel you can get away with a lot that you can't with wrought iron. So keep a radius.

Editor: How do you draw wrought iron out to a fine point?

Peter: Heat the bar to a welding temperature, which is hotter than for mild steel. This welds the strands of iron together and the slag acts as a flux. This means that as you are drawing out to a point you are forge welding as you go along. Welding heat for wrought iron is a couple of hundred degrees hotter than for steel.

The grain direction determines if you can make something out of one piece or not. For example, if you need an "L" shaped piece you will have to forge weld two pieces together. If you could cut an "L" shape out of wrought iron plate, you would have grain running the length of one leg (good) and across the other leg (bad) of the "L". You do much more forge welding with wrought iron. You have to weld pieces together to get the grain running in the proper direction to maintain overall strength.

Editor: Is it easier or harder to forge weld iron, do you have to worry as much about cleanliness of the fire?

Peter: You have to get the work hotter. The slag in the bar acts as a flux so you conceivably have a self-fluxing material. When you get up to a welding heat, the slag is molten and covers the iron keeping oxygen away.

Editor: Do you use other flux?

Peter: Yes! Use of flux though is not universal. While most American smiths use flux, most smiths in England do not use flux even for steel. I use the same flux for wrought iron as I use for mild steel.

Editor: How does iron work cold? How is it for filing?

Peter: Iron is a lot softer than steel. You can adjust things much easier cold in wrought iron than in steel. Because it is softer it tends to bend easier. It rivets nicely too.

Editor: How do you repair a historical piece of ironwork?

Peter: Riveting, brazing, or by peening.

Editor: Is there any difference in hammer control working with iron?

Peter: Since iron is softer than steel you don't have to hit it as hard. Since it has a higher melting point, you can get it hotter without burning it up. This makes the work softer still. The challenge is that you must be more precise in your forging. For example, when drawing out a bar, I watch a lot of smiths today who are going to draw out something and make it round. They draw it out square and start rolling the bar to make it round without making it octangular first. If you do that with iron, it will split. You must draw down

perfectly square. Don't let it get to be a parallelogram or rhomboid in cross section. Then hammer it to be octangular in cross section. Finally, you can hammer it round. Each step must be done very crisply. If you are sloppy in any of those steps you will cause cracks in the iron. It's often not a matter of the technique you use, but how carefully you use that technique.

We haven't talked about iron's corrosion resistance. Iron excels at resisting rust. Iron will often last a lot longer than steel. It develops a surface rust coat that becomes quite stable. It's not that iron does not rust; it's just that it doesn't wither away to dust. It also lasts a lot longer in water. I like to use iron for exterior hardware even if it will be painted.

Editor: Why would a blacksmith want to use wrought iron today?

Peter: For most people, there is no advantage at all. It's harder to find, it's harder to determine the quality of the raw stock, and it's more technically difficult to work. But for me, making historical pieces that would have been originally made of iron it makes perfect sense.

Editor: What premium do you charge for making something out of wrought iron?

Peter: It costs about half again as much to use wrought iron, so that is what I charge my customers. It's due to the time to procure the iron. When I get it, it is rarely the right size so I have to resize the bar. Actually making the object is rarely much different. Sometimes it is actually faster making a piece of iron because it is a softer material. There is just that added cost to get it to the starting point.

Editor: Do you ever get a shipment of iron that is unusable?

Peter: Yes, but my experience working in iron allows me to salvage stock that a beginner would not be able to salvage. My customers, who are familiar with historic ironwork specify wrought iron because they know the difference. They can see the grain in the finished work. They are more discerning than the typical customer. To them, it's worth the extra cost.

Many smiths may try wrought iron but do not continue with it. The biggest obstacle is that you have to relearn your technique. It's never great to hear that what you have been doing for 10 years is not good enough. But for those who really want to improve their technique, it can be a very enjoyable material because it is softer and it is beautiful to forge once you know how. But, you really have to learn how.

EDITOR'S NOTE: Lee Sauder of Lexington, Virginia has done extensive work with his homemade bloomery. He wrote an article in the July 1999 issue of ABANAs "The Anvil's Ring". You can see his unedited version of the article at: <http://iron.wlu.edu/anvil.htm>. He also has much more information on his website: <http://iron.wlu.edu>.

I thank my wife, Frannie, for proofreading this article. She hopes that newbie blacksmiths realize that when we talk about upsetting iron that we are not discussing its emotional condition.

The Last Blacksmith Standing

By Chuck Beattie

EDITOR: Chuck retired from 36 years of Air Force/Air Force Reserve and commercial flying to Oriental, NC. He owns and operates a small forge there named Oriental Ironworks. All lovers of hot iron are welcome anytime to come by for a visit. His e-mail is cpbeattie@gmail.com and you can visit his web site www.orientalironworks.com.

The street is appropriately called Blacksmith Street in Hanoi, Vietnam. There, according to a November 25, 2010, article in the NY Times by Seth Mydans, stands working the last blacksmith in Hanoi. Mr. Nguyen Phuong Hung, now 49, grew up "in the business" as a son of a son of a blacksmith. At first he resisted his father's call to work at the forge having stood by his side since age 6. Better paying work and the stigma that "no modern woman would marry a blacksmith" kept him away. However, at the urging of his father, at age 35, he returned to the forge. Now he is alone at his anvil as the last smith in Hanoi.

The Old Quarter of Hanoi has 36 such named streets after the guilds that once plied their trades there, e.g. Sweet Street, Silver Street, Conical Hat Street or Sweet Potato Street. Under French colonial rule in the 19th century, metal workers were recruited to help build the Long Bien Bridge, designed by Gustave Eiffel (of the Eiffel Tower), between 1898 and 1902. Blacksmith Street must have been a noisy and polluted place, emulating Pittsburgh's many steel mills in its heyday. Mr. Nguyen says he remembers when it was raining slightly that all you could hear was the sound of hammers ringing on their anvils up and down the street. Unfortunately, modern times have caught up with Hanoi as with other cities around the world.

Blacksmith Street and the Old Quarter today means tourists, restaurants and travel agencies but Mr. Nguyen still does a brisk trade. He is clad in plastic sandals ignoring the sparks of the forge and anvil about him. Like blacksmiths everywhere he is covered with soot at the end of a day. The owner of a wrecking business needs his jackhammer bits reshaped and building renovators need to match the French architecture in the Old Quarter. It must be like restoring Paris one piece of grill work at a time. But still it is not glamorous work as most of the NCABANA members know first hand. It is hot and dirty work, work his children now educated in college, have no interest in continuing into the 4th generation of Nguyen's. At the end of the day Mr. Nguyen cleans up and changes into fresh cloths. He now strides back into the modern world wondering what will happen after he is gone.

I was a guest worker in South Vietnam from 1970 to 1972 flying the C-130 Hercules from Saigon (now Ho Chi Minh City) at Tan Son Nhât AB. Our flying Wing and 4 C-130 Squadrons were permanently located at an air base in Taiwan. We rotated planes, personnel and equipment into Tan Son Nhât daily. We would spend between 18--21 days "in country" before rotating back to Taiwan for a week. The typical airlift mission--airlifting beans, bullets, assorted cargo and personnel--was routine with flights into the large bases like Cam Ranh Bay and Da Nang. Another day you might have a multi-hop shuttle to short, dirt airstrips carved out of the jungle by Army engineers ferrying in combat troops and their supplies. The challenges of the heat, humidity and landing on short fields the Hercules was perfectly designed for kept me alert.

My son and his new wife visited Hanoi in late February 2010 on their honeymoon. While more budget minded than I might be, they said the prices for food, transportation and hotels were great. They stayed in the

Old Quarter for \$15.00 a night--all prices subject to haggling--at a nice hotel recommended in the Lonely Planet travel guide. Haggling seems to be the rule for almost anything, as prices are not marked on most items. They said the best thing to do in Hanoi is enjoy the street scene--day and night. One young Hanoi resident they met while eating said that "street food IS Hanoi and street food vendors and that life around them is what moves Hanoi." They recommended the Hanoi section of SavourAsia.com for recommendations on the best eats in Hanoi. Each entree of food was \$1.00. A 5-course will cost you \$5.00. Pretty good.

They usually walked or took a taxi around Hanoi. They recommended avoiding the "tourist trap thing" of getting into a bicycle rickshaw. (You will be taken for a ride--literally.) The traffic congestion is horrendous. When taking a taxi without a meter set an "agreed to" fare on what you will pay (see haggling above), and know beforehand how far you have to travel. They visited the Ho Chi Minh Palace and its park with many cafes and tea shops. There are also magnificent French colonial architectural buildings surrounding the park. The Thông Nhất Park (Reunification Park) is worth a stop and away from the hustle and bustle of center city life. Hoan Kien Lake is especially vibrant at night with all its lights and people. When they were there it was Vietnamese New Years, a time of reverence to one's ancestors and great joy for all.

They took a side trip to Ha Long Bay on the Pacific Ocean and stayed on Cat Ba Island. While very touristy in season it was tranquil in February with misty, rainy weather. They rented a motor scooter to explore the island, climbed some rocks and wandered around the quaint fishing villages. On another day they took a boat ride to visit other islands. "It was beautiful and bucolic..." they wrote.

They had a wonderful visit to Hanoi. Perhaps they glimpsed Mr. Nguyen working in the Old Quarter at his forge and anvil. We all know that our sons and daughters are not "duty bound" to follow us in our paths. I just hope that Mr. Nguyen can find a group of young apprentices interested in following him into blacksmithing so his anvil in Hanoi won't be silenced forever.

Blacksmiths' Guild of the Potomac's Spring Fling

April 15 – 17, 2011 at:

Clarke County Ruritan Fairgrounds, 890 West Main Street, Berryville, Virginia 22611

Matt Waldrop and smiths from Colonial Williamsburg will be the demonstrators.

There will be tailgating, Iron-In-The-Hat, auction, display tables, and a contest.

There is a registration fee for this event. For more details visit their website at www.bgop.org.

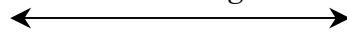
The Stirling Cycle Engine

By Robert Timberlake



EDITOR: So why do we have an article here about the Stirling Engine you ask? Well, because Robert Timberlake built one and it was a hit at the December meeting of the Triangle Blacksmith Guild at Jason Craft's shop in Roxboro.

Robert's Engine



When you first see one of these things and are informed it is an engine that runs on hot air the initial reaction is usually "Say What?!" Yep, hot air. Remember that air expands as temperature increases and contracts when cooled. Capture this and mechanical motion can be

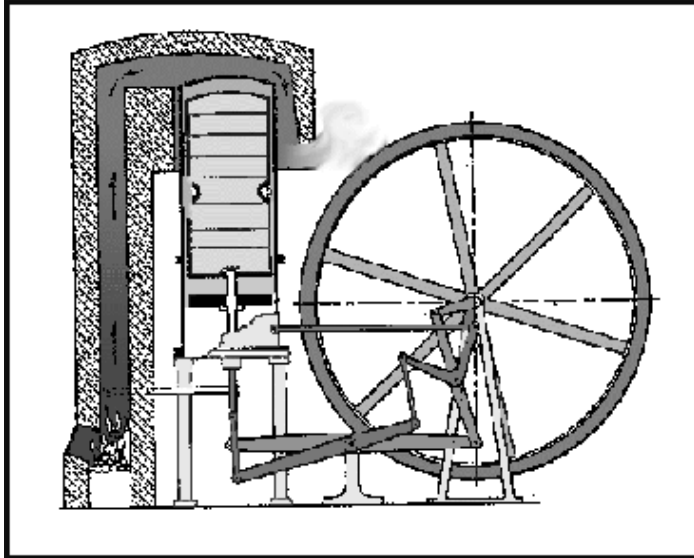


achieved. This idea was explained and patented in 1816 by the Rev. Dr. Robert Stirling (1790-1878), a Scottish minister, as a "heat economizer". In 1818 he had manufactured an engine based on his principle that was used to pump water out of a quarry. The hot air engine genie had been let out of the bottle. Since then there have been hundreds of designs based on this principle. Do a Google search on this subject and enjoy what you find.

The little engine I displayed at the last Chapter meet is one of these many designs. At one point this Stirling powered fan was available commercially for use in remote locals. I have two sets of drawings with a few minor differences of the same engine, one named Myranda and the other Moriya. A few cosmetic changes on my behalf were included in this version. Not much in the way of blacksmithing unless the angle iron legs count. But they were bent cold and electrically welded.

I refer to this engine as a "politengine" because it runs on recycled hot air. The cycle circulates a volume of air between a hot end and a cold end via a very loose fit displacer piston. The hot end is obviously where the flame is, the cold end is the veined cylinder on top of the hot end. The air is heated in the hot end and expands before being displaced to the cold end where it contracts. This pressure differential is passed to the power piston by way of a passage between the two pistons. Keep in mind this is the same air being cycled back and forth; there is no exhaust from this engine since it is external combustion. The only exhaust is from the alcohol lamp flame. As a result it is very quiet there being no bang of air/fuel mix igniting in a confined space.

So why a hot air engine? At the time it was invented steam engines were the only source of power other than water and limited wind. The Stirling cycle engine was based on low pressure so a skilled steam tech wasn't



Drawing based on Stirling's patent.

needed to watch over the fueling. A limited skilled individual could mind a fire, and therefore the engine, and not worry about a catastrophic steam explosion. Since it is external combustion any fuel of sufficient BTU's can be used to power up; combustible bio fuels (wood) the usual petro fuels, solar, nuclear, any heat source. Alcohol lamp in this case.

This engine is constructed mostly of aluminum. The crank shaft is steel and stainless steel. The power piston and power cylinder is cast iron and bronze respectively. Since this is a sealed design care had to be given on most moving parts to insure airtight fits. It will run continuously and as long as the fuel lasts in the lamp. Like I said, not much on blacksmithing. A lot on machine shop work and some precise fitting but a fun and bit of a challenging project from a different genre of metalwork. Plus they are just plain cool to watch run.

Wanted: Blacksmithing Staff

Pound some steel, pour iron and teach campers the art and fun of traditional blacksmithing over traditional coal forges.

Camp Arrowhead is one of the few summer camps that offers this exciting and creative program to our campers. 80% of our campers involve themselves in the blacksmith program with many of the boys creating amazing personal art.

We're looking for a blacksmith to take our summer program to the next level and to teach the next generation of artists. Come join the fun!

Nestled in the heart of the Blue Ridge mountains, Camp Arrowhead has offered a summer haven of fun and adventure for young boys since 1937.

Here in our 217-acre back yard in Tuxedo, NC, campers and staff stomp in cold mountain streams, bike across rugged dirt trails, play games on sunlit grassy meadows, and spend summer nights listening to the soothing sounds of cicadas and bull frogs.

Neighboring state and national park-lands offer an additional two million acres of preserved forests, bold climbing rocks and racing rivers that scream exploration and discovery.

Our mission is to build character, confidence, courage and compassion in young boys' lives through time honored camp traditions and the biblical teachings of Jesus Christ. It is our desire to help every boy become the man that God intends him to be.

If you enjoy mentoring boys ages 6 to 16 and enjoy the outdoors, please complete our staff application on our website, www.camparrowhead.org. Feel free to call or email for additional information.

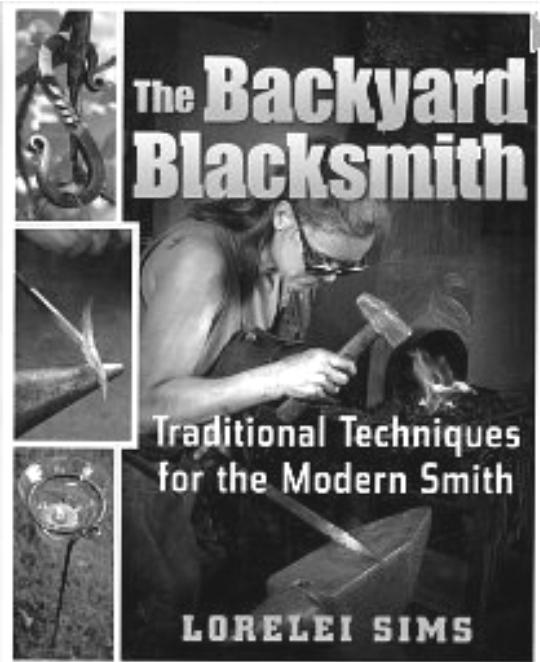
We offer both **summer internships and paid positions** in various areas...we have a place for you! Jobs at Camp Arrowhead also include: free room and board, scheduled time off, pro deals and some of the best outdoor activities in the Southeast. We offer employment from mid May to early August, with several different options, according to individual availability.

Please Apply at: PO BOX 248 TUXEDO, NC 28784 828-692-1123

On Line at: OFFICE@CAMPARROWHEAD.ORG

Book Review - *The Backyard Blacksmith: Traditional Techniques for the Modern Smith* by Lorelei Sims

Review by Chuck Beattie



Like most beginning blacksmiths with one course of "Hooks and Pokers" at John Campbell Folk School under my belt I sought out further reading on the subject. I purchased a number of fine books but the one that I have benefited from and used the most is *The Backyard Blacksmith* by Lorelei Sims. It is not that Randy McDaniel, Mark Asperry or Jack Andrews are not good authors on the subject. All the books on blacksmithing cover pretty much the same material as Ms. Sims: Setting up a shop; Forge welding; Making tools, Projects, etc. I just like her usage of color photographs with additional black and white illustrations. She also adds Tricks of the Trade and Safety Tips in offset boxes that further guide you toward a safer and better result. Following her excellent directions I made a great basket weave (at least I thought so) on my first try--but I used a mig welder for the ends. Sorry, Lorelei, my propane forge just doesn't get hot enough for forge welding and I am not sure my friendly neighborhood will support a coal one. Anyway, she walks you through each

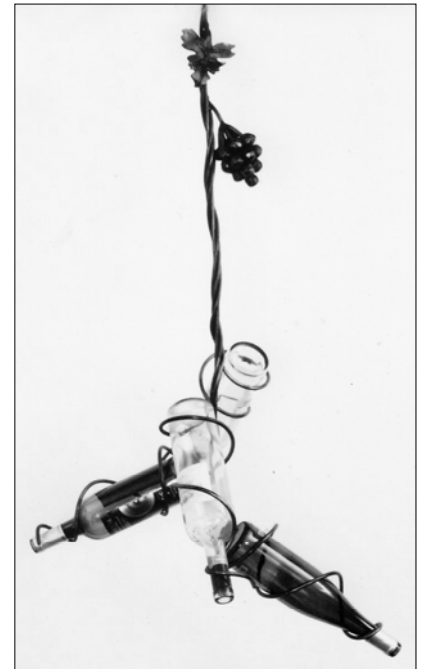
project with step-by-step color pictures so you can see what it should look like when you try the to duplicate her efforts. I have also tried to make her favorite demonstration project--a snake. Unfortunately I have made a lot of heads that look like screwdrivers. She warns you about this but encourages you to keep trying. I think I'm getting close--which is good in horseshoes but apparently not in snake heads. Enjoy the book. I got my copy at Amazon. Not too expensive and well worth the money. Chuck Beattie, NCABANA member

Bill Tanneberg's Latest Work



EDITOR: Bill Tanneberg is a NC ABANA member from New Freedom Wisconsin.

Bill has been busy making 89 bowls out of copper, brass and steel. The weights vary from 10 to 90 lbs., and all are mounted on bases from singles up to four bowls. They are accented with cattails, swings, and flowers and some include candle holders.



(upper right): Grape Vine Wine Bottle Holder



(right): floral candle holder made to match floral king-size head board



(below), 1 of 15 he has made with various materials (copper, steel), and some with brass cattails.



Yadkinville Journeyman – by Allan Green

Yadkinville is a long way from Hillsborough at 6:30 in the morning. At least, that's what I was thinking last Sept. 18th as Chris Paul, a new member of our local ABANA guild, and I got under way to do a blacksmith demonstration for the Yadkin Valley Harvest Festival. The organizers had asked the Triad area chapter, but they were already committed to another event, so the Triangle chapter – represented by Chris and me - was filling in. I had loaded the truck the previous evening, but it was still going to be a long way before breakfast.

I was, however, looking forward to the event. It would give my new portable “Eric Campbell” post-vice a really good shakedown trial. Eric had spent a morning a few weeks earlier providing me with the design, steel, and general fabrication advice so I could build my own. Chris Paul and I had practiced



with one of the nail headers made at our February 2010 meeting and I was planning to give it its public debut. I had been assigned a prime location adjacent to the outdoor stage, and could look forward to hearing great local artists perform all day long. And, the weather forecast was favorable – a little warm, maybe, but just right for an open-air show.

We arrived in Yadkinville around 8:15 and started setting up for the 9:00AM opening. My traveling forge is an old farrier's forge with a crank blower I have modified to also use a little squirrel cage electric blower. I also have a small anvil with a good oak stump for a base, the post vise mentioned above, a quench bucket, and of course, coal, tools, table, awning, and enough spare stock for ten demonstrations. With a lot of hard work, Chris and I had steel in the fire when the festival got under way – not a moment too soon, because we had an audience as soon as the coal smoke began drifting over the area.

One lesson I have learned by working at our State Fair booth is that the best demonstrations are for familiar objects that can be made start to finish in roughly 20 minutes – about the attention span of a walk-up audience. Sure, there are smiths whose artistry is so impressive people will watch for hours, but I am not one of them. Chris and I made lots of hooks, nails, pokers with fancy handles and twists, and door pulls – all simple, but which allow people to see steel transformed from raw stock into something familiar and even beautiful. Of course, there are always questions. “How hot is the fire?” (Between 10 and 15 times as hot as boiling water). “Have I ever been burnt?” (Yes, but not recently). “Do I make horse shoes? (No – blacksmiths used to, but modern horse shoes are stamped by machine and farriers do the actual shoeing) One father and son pair was interested in learning knife-making. “Did I make them?” (No, but they should look up a Triad chapter meeting and hook up with someone who does). We were busy most of the day, accompanied by some very talented folk and blue-grass artists on the stage across the square.

The best memories, though, are of the people you meet, like Karla Causey, a young folk singer who had a 2-hour gig from 1-3. Two quite lovely ladies of, ahem, suitably mature years, who made my day when I overheard one of them confide to the other, “Look at the arms on him!”. The surprise and delight from everyone to whom I gave whatever I had just made as a souvenir of the festival. But one couple stands out. He was tall, white-haired, almost certainly over 60 (like me) and his height, ramrod-straight posture, western garb, and fluent Spanish suggested “Texan”. She was petite, Latino, dressed somewhat traditionally, and quite beautiful. And whether it was a recent discovery or the work of years together, you could tell they were in love. I decided to make her a “pass-thru” cross. My version is about 4” tall, made from 3/8” square stock, with the horizontal bar passed through a 3/8” square hole split and drifted in the vertical bar. Its quick, fairly easy, but also has “blacksmith magic” - only a blacksmith can put a 3/8” hole in a 3/8” bar. Brushed, brassed, and clear-coated, the result was one of my better efforts.



“Here, this is for you”, I said, and held it out to her.

Her English was sketchy, and evidently not sure what I was saying, she looked up at him. Smiling, I repeated, “Yes, its for you. A souvenir”.

Her tall, quiet companion managed a “Thank you”, then turned and in rapid-fire Spanish confirmed my offer.

As she turned back to me I placed the cross in her hand. “It is my gift”, I said, and was startled to see her eyes fill with tears. I’m not sure exactly what she said after that, because it was in Spanish. I caught “gracias”, and “Christos” and possibly “Salvador” but it obviously meant more to her than I had ever expected. By now he, tall Texan notwithstanding, had tears in his eyes, and my shop glasses were a little clouded too. She produced tissues for them both from wherever it is that women carry these things and with some final “thank-yous” and “gracias” off they went. Soon after that it was 4:00pm and time to pack up.

So, that pretty much sums up our day at the Yadkin Valley Harvest Festival – good company, good music, good weather, hot steel to hammer – and a couple who will never forget a small town in North Carolina and a blacksmith's blessing. Oh, and the blueberry smoothies were an absolute slam-dunk!

Fire On The Mountain – Spruce Pine, NC

Where and When: Downtown Spruce Pine, NC, April 30th, 2011, 10am – 4pm.

We are excited about this year’s return of Fire On the Mountain to Downtown Spruce Pine, NC April 30th. We expect another great turnout of blacksmiths. Blacksmithing has deep roots in Western North Carolina. The Fire on the Mountain Festival will both honor and celebrate its history and broaden awareness of quality contemporary ironwork. Experience a day of forging techniques and ferrous materials.

This festival is a great event for families, kids, artists, and metal workers. Sell your work. Network with other blacksmiths. Shop for tools. Demonstrate your technique. And much much more....

Featured Master Blacksmith: Tom Latané will lead a workshop on Friday April 29th 9am – 4pm at Penland School of Crafts. Registration required. Email stacey@penland.org for registration and details.

Lucas House will be demonstrating as well! Lucas began working metal in high school, which led to a job with a local blacksmith. He received a Bachelors of Industrial design from North Carolina State University, with a focus on furniture and materials. Lucas currently runs IronHouse Forge located in Raleigh NC, which specializes in a wide range of high quality hand forged metalwork.

If you need a booth to sell your work, volunteer for their “Hands-On” area, or attend their Pig Roast please obtain the brochure for this event.

EDITOR’S NOTE: I expected to find the brochure at the website they listed for this event, which is www.sprucepinesfestivals.com. However, the website was not operating when I wrote this up. If you need the brochure and the website is still down I suggest you email Bryan Freeborn at bryan@downtownsprucepine.com

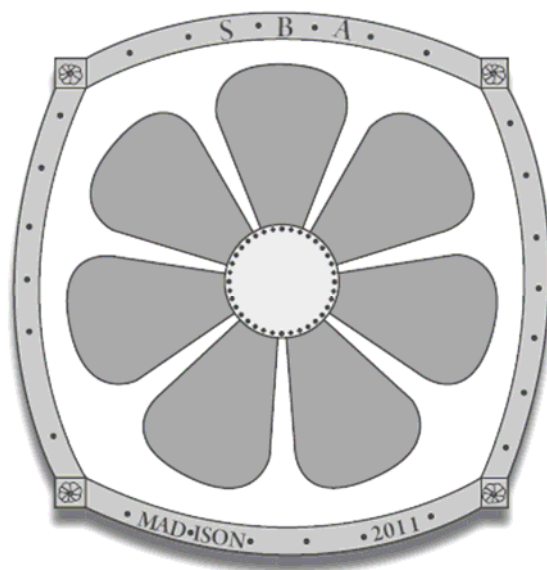
2011 SBA Conference – Madison, GA

May 19 – 21 at the Lions Club Grounds, 1190 Lions Club Road, Madison, GA 30650

The “Madison Conference” is soon upon us.

This year the conference is special for NC ABANA as we will be the host chapter. For those new members who are not familiar with the conference, it is held every other year in Madison, Georgia (near Atlanta). The Southern Blacksmith Association (SBA) holds the conference, and they are made up of seven, southern, ABANA affiliates. Those affiliates are:

- Alabama Forge Council
- Alex Bealer Blacksmith Association of Georgia
- Appalachian Area Chapter
- Florida Artist Blacksmith Association,
- NC ABANA
- Ocmulgee Blacksmiths Guild
- Phillip Simmons Artist Blacksmith Guild



The host of the conference rotates each time and this year NC ABANA has the honor to be that host.

All members of NC ABANA should have received a brochure from SBA that contains all of the details about the conference and contains a registration form. If you have not received your brochure you can download it at SBA's website, <http://www.sbaconference.com/>. If you are not a computer person please call me, Marty Lyon, at 919-918-4180 and I will mail you the information.

This conference is dedicated to the memory of our past president Jimmy Alexander who passed away last year.

Some of the conference highlights include demonstrations by George Dixon and Chuck Patrick, both of North Carolina.

George Dixon was Head Blacksmith at the Samuel Yellin Metalworkers of Philadelphia (For those new to our art, Samuel Yellin was one of the most important and influential blacksmiths of modern times).

Chuck Patrick is a Damascus bladesmith as well as a blacksmith.

In memory of Jimmy and of Bert Smith, one of our most active members who passed away in 2009, there will be a forging station dedicated to them. At that forging station there will be work and demonstrations by North Carolina blacksmiths including Tal Harris, Robert Timberlake, Clay Spencer, Jack Wheeler, Jim Kennady, Andy Chapman, Andy Phillips, and Elmer Roush.

Besides excellent demonstrations there will be green coal (blacksmithing classes), vendor and tailgate sales, Iron-In-The-Hat, a fabulous auction, a blacksmith contest, Blacksmith Exhibition, programs for family members, and Tim Ryan's memorial anvil shoot.

You are encouraged to bring something to show at the Blacksmith Exhibition. Visitors to the exhibition vote on the exhibition pieces and the resulting “People's Choice” winner receives \$100

I have included the registration form on the next page.

REGISTRATION FORM

Name _____ Total number of classes filled in above _____ X \$10.00 = _____
 Spouse/Children _____ Family Registration for the conference, postmarked by _____
 May 1st includes admission for you and your family. + \$50.00

Address _____ **Late Fee** if you register after May 1st, add \$10.00. _____

Phone () _____ E-mail _____ Total amount _____

Name for name tag: _____

Name for name tag: _____

Please include your phone number or email in case classes are full.
 That way we can get in touch with you for an alternate choice. Classes
 are first come first serve. Register now to guarantee a space. You may
 register at the conference if space is still available. All classes have a
 \$10.00 class fee to help cover conference costs.

Please send this form with your check or money order payable to:
 Southern Blacksmith Association
 Judd Clem, 111 Yorkshire Drive, Athens, AL 35613
 (256) 232-2645 or email judd@clem.aff.net

MC or Visa # _____ VCode _____
 Signature _____ Exp date _____

Each instructor's material fee is separate and will be collected by the instructor at the beginning of each class.

Family registration for the conference is \$50.00 postmarked by
 May 1st. If you register after May 1st add \$10.00.

Student Name	Class code	
	Thu-PM	Fri-AM Sat-AM
*	*	*
*	*	*
*	*	*
*	*	*
*	*	*

ACKNOWLEDGMENT, NOTICE AND RELEASE

THE UNDERSIGNED does hereby, for himself, his heirs, executors and administrators acknowledge that BLACKSMITHING activities are inherently dangerous, due to the very nature of hot metal, hot sparks, sharp objects, machinery and other activities. The use of safety glasses, long sleeved cotton or wool shirts and long cotton pants and leather high topped boots are recommended, in addition to any other safety devices available, as well as not going behind barriers and keeping a safe distance from all activities.

WARNING

I wish to participate in these activities knowing they can be dangerous. I accept and assume all the risks of injury (including death) to property and me. Should any person listed below require medical assistance for any reason during this activity and not be in a position to obtain, request or authorize such treatment at the time, such person hereby authorizes the Activity Sponsors to obtain such medical treatment or emergency care as they may deem necessary or desirable and such person agrees to hold the Activity Sponsors harmless with regard to any such emergency care or the expenses arising therefrom. The Activity Sponsors do not condone the drinking of alcohol or taking of drugs at Activities. If you are taking any drugs or medications that might affect your ability to participate in this Activity or are otherwise do not have the experience, knowledge or ability to participate in this Activity please do not participate. If your group includes a minor child, a parent or legal guardian must sign this Acknowledgment, Notice and Release for each minor child and the minor's name must be printed next to the parent or guardian's name.
 In case of emergency please notify:

Name: _____
 Telephone () _____ day of _____, 2011.
 Acknowledged and agreed to this _____ day of _____, 2011.

Your Signature _____

Your Spouse's Signature _____

EDITOR'S NOTE: This article was originally printed in the Winter 2007 issue of "Hammer's Blow". It is from a series of educational articles, directed towards beginning blacksmiths, made available by ABANA

CONTROLLED HAND FORGING

Splitting the End of a Bar

Text and photos by Dan Nauman
Drawings by Tom Latané

Lesson #19. Unit: Cutting

Definition: Using a sharp edged tool to cut or alter a bar, or to remove material from a bar.

Intent: To learn to use a hot-cut chisel to cut down the centerline from the end of a bar.

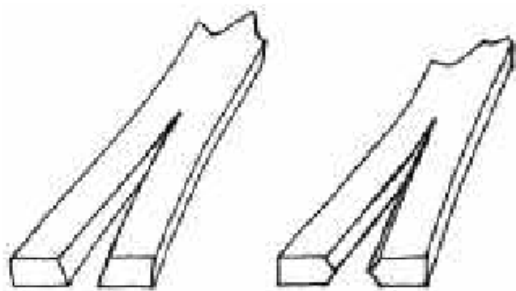
Tools: Basic tools, plus a hot-cut chisel, cutting plate or saddle, tool to hold the hot cut, tool to hold the work-piece.

Material: 2 pieces of 1/4" x 1" x 24".

Note: There are two methods of cutting we will teach in this lesson. Method one(M1) will teach cutting a bar from one side all the way through. Method two(M2) will teach cutting a bar from opposing sides.

Each method leaves a very distinctive kerf. (See Drawings #1 and #2.) Image #1 shows the kerf made by method one. Image #2 shows a kerf made by method two.

It is important to determine which method to use in order to achieve a specific goal. Thinner materials, 1/4" (one quarter inch) or less, are often (but not always) cut using method one. Thicker materials are often (but not always) cut using method two



1 & 2. Method 1 kerf, left, and method 2 kerf, right

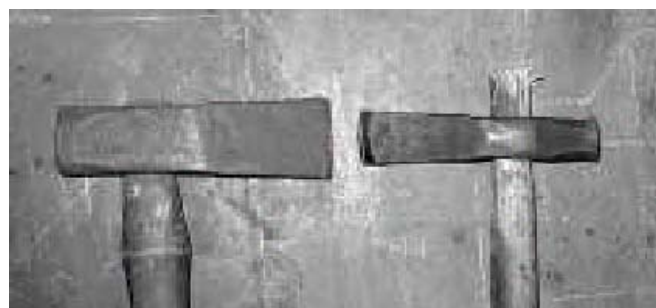
Forging Dynamics: On either side of the kerf, the bar-stock will be displaced by the thickness of the chisel. The chisel should be thin so the amount of stock displaced is minimal. As the bar begins to split, the opposing sides of the kerf (legs) will peel away from the line of the cut. This stretching is caused both by the material being pushed apart by the hot-cut chisel.

Note: It is important to use the correct chisel. A cold-cut chisel, as the name implies, is used to cut cold stock. This type of chisel needs to be heavier, or backed up by enough material so the chisel does not snap or crack from the shock of cutting the harder cold stock. Because it is cutting softer material, the hotcut chisel receives less shock, and can have a more acute bevel. (Photo #3 a+ b shows the difference in blade bevels of the hotcut chisel and the cold-cut chisel.) Note that both chisels have



3. Notice the difference in the thickness between the cold cut (left) and the hot cut (right).

rounded, not square edges. This allows the chisels to easily track in the kerf, and in some cases, allows you to make a curved kerf. (Photo #4 a+ b shows the side shape of the two chisels.) A square chisel is harder to control, as the abrupt wall left by its impression makes it necessary to lift the blade out of the kerf track to advance. (See Drawing # 5 of the potentially bad kerfs made by a square chisel) In this lesson, we will be using the hot-cut chisel. The specific purpose of the cut may determine which method you choose. For example, if the legs formed by the cut are to be drawn out, it would be easier to draw out a M2 kerf, which has a center crown, being beveled from both sides, rather than a section with one tall beveled edge as seen in the M1 kerf. On the other hand, an M1 kerf might be desirable as the naturally beveled edge left from cutting may serve as a decorative accent. Method one could be used for making a split scroll with a beveled edge, while method two could be used for beginning the end of a fork. Holding the bar steady while cutting must be considered. There are several methods of holding the bar for cutting. One method for cutting bars is to use a



4. This photo shows the rounded edges of the hot and cold cut, which allows the tool to slide along the workpiece more easily. Than if the edges were square.

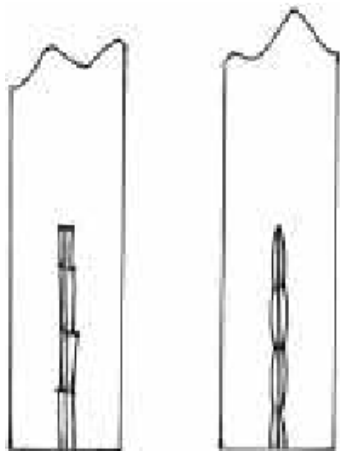
CONTROLLED HAND FORGING

holdfast, as seen in Photo #6. A holdfast can easily be made out of mild steel, of a slightly smaller diameter than your anvil's pritchel hole. To use the holdfast, simply slide the shank into the pritchel hole, and place the flange on top of the work-piece. Lightly tap the top of the holdfast to secure the work-piece onto the anvil.

For longer bars, you could use a "blacksmith's helper" which is an adjustable stand. Some smiths prefer to use a weight to keep the piece steady while cutting. One way to apply the weight is to attach a chain to an "S" hook, and attach the weight at the end of the chain. (See Photo 7.) When using the blacksmith's helper, adjust the stand so the bar rests flat on the face of the anvil.

The important thing is to keep the piece flat and stationary on the anvil while cutting. If the bar is not resting flat on the anvil face, the bar will bend more dramatically, and the impact of the chisel will be lessened as well.

Holding the chisel is also a consideration. If you have a chisel with a long enough shank, you may be able to hold it while cutting without burning your hand. It might be easier for some to use a pair of chisel tongs to hold the chisel. Many smiths prefer to use a chisel with a solid handle of either a bar wound



5. Scars potentially produced by a square-edged chisel and a wavycut potentially produced by an overly rounded chisel.

around the chisel, or a wood handle that pierces the chisel. (See Photo #8 showing the tongs, and two types of handles) For this lesson, we will use a chisel with a wooden handle.

Cutting Method #1

Step One Measure 2" from the end of the bar, and with a centerpunch, mark the exact center of the bar. Make the punch mark large enough to see when the bar is hot, but not too large, as a large punch mark might remain visible after cutting.

Step 2 Heat 3" of the end of the bar to yellow. Place the end of the bar flat on the anvil. Place the center of the chisel on the end of the bar at the bar's center. Lightly tap the chisel to create a light impression, about 1/32" or less deep.

Note: In this step, you do not wish to drive the chisel through the bar, nor create a bold kerf as you need to first establish the proper kerf track. If your judgement is off, the light impression will not usually be deep enough to ruin the project, and can be corrected by simply adjusting the chisel to create a new kerf. The new kerf will push material towards the old kerf, closing it up. Unless you are dramatically off in your initial judgement, this correction will likely be undetected in the finished piece.

In the same heat, move the chisel by sliding, not lifting it, one half the width of the chisel, and take another light tap. You should always slide the chisel towards you, as you can see where the chisel is in relation to the bar. When moving the chisel, always leave a portion of the cutting edge in the track of the kerf from the previous blow. Some smiths prefer to linearly rock and then slide to advance the chisel. These procedures insure that a double kerf line isn't accidentally formed.



6. The holdfast slides into the pritchel hole, and holds the workpiece firmly with a light tap of the hammer above the holdfast's vertical shank. To remove the holdfast, lightly tap the side of tool's vertical shank with the hammer.

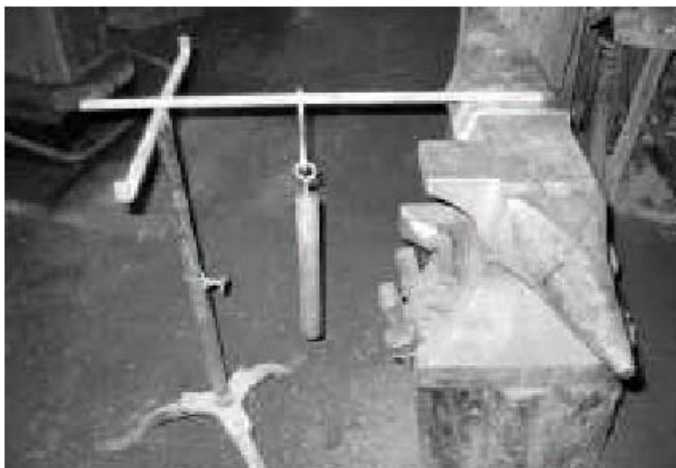
Continue the light kerf all the way down to within 1/16" of the center-punch mark, making sure you remain in the middle of the bar. If you make an errant blow along the way, make the correction immediately before continuing down the bar. Make sure the chisel remains perpendicular to the workpiece at all times.

Forging Dynamics: The bar will begin to curl upward as the force of the chisel makes impact. To cut properly, the bar must be tapped down flat on the anvil every time you retrace the kerf to deepen the cut.

Note: When cutting heavy stock, some smiths prefer to quench the chisel after four or five blows to keep the chisel blade cool. This is more important when using a chisel of simple carbon steel.

Step 3 Take another yellow heat 3" long. Place the bar on the cutting surface.

CONTROLLED HAND FORGING



7. A blacksmith's helper stand helps to hold longer bars. The attached weight helps keep the workpiece steady. Adjust the blacksmith's helper so the workpiece lies flat on the anvil or cutting saddle.

Note: STOP! Do not even think about cutting through the bar on an unprotected anvil. It is believed by some that the table of the anvil, sometimes referred to as the step of the anvil, is to be used for cutting. Doing so will only scar the surface to the point where it is no longer useful. The bottom of the hot bar will sink into the scars left by the chisel from past cuttings, leaving unsightly marks on the work piece.

A piece of 1/8" to 3/16" thick (or thicker) plate of copper, brass, or a piece of low carbon steel can easily be used as a base beneath the bar being cut. Make sure it is large enough to effectively support the workpiece. Some smiths prefer a more stable cutting surface, and may shape the cutting plate to fit snugly over the edges of the anvil. This tool is called a cutting saddle. (See image 9 of a cutting saddle.) This not only protects the surface of the anvil, but also protects the chisel edge. When the surface of the plate or saddle becomes scarred, simply throw it away and make a new one, or if it is thick enough, you may remove the scars by grinding or forging.



8. A wooden-handled chisel, left, dedicated chisel-holding tongs, center, and a wrapped handle (on a punch), right.

As you did in step two, place the chisel at the end of the bar and this time strike the chisel with a medium to heavy blow as now your aim is to drive the chisel through the bar.

Move the chisel down the bar as you did in step two, creating a deeper kerf. Again, stop short of the center-punch mark. If you have not split the bar at this point, repeat the process until the bar is split through, hitting with less force to save the cutting plate from getting deep scars.

Step 4

You now want to finish the cut with a nice square edge at the bottom of the cut. The reason the initial cut is not cut right down to the center-punch mark is that since the chisel is curved, you will not have a clean square kerf at the end of the cut.

Note: In some cases, a tapered kerf at the end of the cut may be desired as a design element. For the purpose of this lesson, we are explaining how to finish the cut with a squared termination. (See image 10 showing the two types of terminations.)

To finish the cut, place the bar tightly in a vise with the centerpunch mark 1/4" above the vise jaws with the legs in the vertical position. Place the chisel between the legs of the cut and carefully drive the chisel straight down until the chisel just pierces the center-punch mark. This last step can be done at a low orange to orange heat. A lower heat may be easier to control, as the chisel will meet more resistance, and you are less likely to cut too deep. Properly executed, the bar should now look like image 10.



9. This cutting saddle was made from 1/2" x 3", lies flat on the anvil face and fits snugly over the edges. The thickness has been reduced by re-dressing the surface to eliminate surface scars made from cutting through the workpiece. "blacksmith's helper so the workpiece lies flat on the anvil or cutting saddle.

Targets

- The kerf must be through the middle of the bar within 1/32" per side.
- The kerf must have a clean appearance, with no ragged edges.
- There must be no double kerf lines.
- The kerf must be 2" long within 1/64" (one sixty fourth inch).

CONTROLLED HAND FORGING

- The face of the bar must be flat.
- The inside end of the kerf must be square to the face of the bar.
- You should be able to split the bar in three heats. With practice, you could split it in one heat.

Cutting Method #2 (Review method one for forging dynamics, and notes to the cutting procedure.)

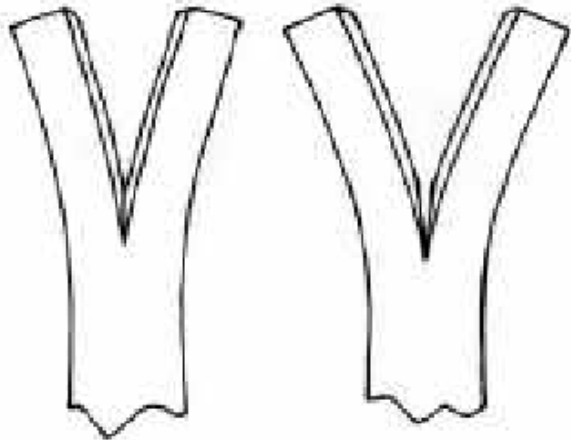
Step 1

Measure 2" from the end of the bar, and with a center punch, mark the exact center of both sides.

Step 2

Heat 3" of the end of the bar to yellow. Place the end of the bar flat on the face of the anvil. Place the center of the chisel on the end of the bar at the bar's center. Lightly tap the chisel to create a light impression, about 1/32" or less deep. Move the chisel by sliding, not lifting it, one half the width of the chisel and take another light tap. Continue the light kerf down to within 1/16" of the center punch mark.

In the same heat, tap down the end of the bar to regain a flat bar. Retrace the kerf with the chisel, taking a heavy enough blow to cut half-way through the bar.



10. A tapered kerf end, left, and a straight kerf end, right.

Step 3

Heat 3" of the end of the bar to yellow. Rotate the axis of the bar 180 degrees. As you did in step two, cut a light kerf to within 1/16" of the center punch mark, then tap the end of the bar to regain a flat bar.

Note: Accuracy is important! If you do not cut a line down the middle of the bar, you will get a kerf offset from the kerf on the other side. (See Drawing #11 of offset kerfs vs. two opposing kerfs.) To make sure you begin the second kerf in exact opposition to the kerf on the other side, look at the end of the bar to view both kerfs simultaneously. If they are offset, make the correction immediately.

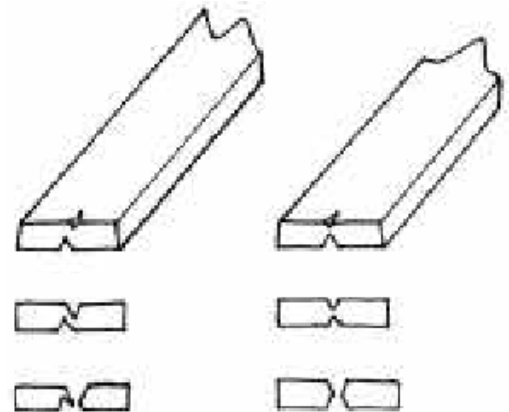
Next, with heavier blows, retrace the shallower kerf with the chisel, and drive the chisel through the bar. Remember to use a cutting plate or saddle!

Step 4

To finish the cut, at a low orange to orange heat, place the bar tightly in a vise with the center punch mark $\frac{1}{4}$ " (one quarter inch) above the vise jaws, with the legs in the vertical position. Place the chisel between the legs of the cut and carefully drive the chisel straight down until the chisel just pierces the center punch mark.

Targets

- The kerf must be through the middle of the bar within 1/32" (one thirty second inch) per side.
- The kerf must have a clean appearance, with no ragged edges.
- There must be no double kerfs.
- The opposing kerfs must meet cleanly; no heavy burr from offset kerfs.
- The kerf must be 2" long within 1/64" (one sixty fourth inch.)
- The face of the bar must be flat.
- The inside end of the kerf must be square to the face of the bar.
- You should be able to split the bar in three heats. With practice you could split in two heats.



11. The result of offset kerfs (right) compared to opposing kerfs (left).

Notes about dressing the edge of the kerf:

- 1.) The kerf can be filed to suit the job.
- 2.) The legs can be bent away in a "Y" shape to 90 degrees, or one leg may be gently folded over the bar. The kerf can then be lightly forged with the face of the hammer, retaining the beveled edge. Afterward, the legs may be bent back.
- 3.) The legs can be bent or folded as above, then the kerfs can be forged so the cut edge is square to the face of the bar.

New England School of Metalwork Summer Session Classes

This is a big year, our 10th year anniversary of the Summer Session of guest metalsmiths. I have worked hard to produce an exciting session of workshops and instructors. This summer's highlight, and to highlight our first 10 years, falls in August, a special Master Smith Series of workshops will fill the entire month. The series in August comes with some special pricing as well on multiple class enrollment and dorming, all these details are on our website under August. This special series is to spawn some further challenge to those of you who have been dedicating time to the craft of blacksmithing and wanting something more professionally based.

The catalog of classes will be mailing nationwide in 2 weeks or so, giving you some heads up time to look through the website and this summer's offerings. As always please feel free to contact me with any questions or concerns about these wonderful workshop opportunities. Here is a quick listing on what's coming up this summer.

- | | |
|-----------------------------|--|
| May 13-16 (4 days) | Forged Damascus Knives with Rob Hudson |
| May 20-23 (4 days) | Beginners Blacksmithing with Andy Dohner |
| June 10-13 (4 days) | Laminated Tools of the Trades with James Viste |
| June 10-13 (4 days) | Its Better in Bronze - Casting with Jimmy Rhea |
| June 24-28 (5 days) | Going Dutch - Hardware with Jonathan Nedbor |
| June 17-21 (5 days) | Burt Foster-Bladesmithing 101 |
| July 18-22 (5 day) | Jim Batson - ABS; Knife Handles and Guards |
| July 25-29 (5 days) | Sketches In Iron with Bob Compton |
| July 8-11 (4 days) | Lucian Avery-Introduction to Blacksmithing |
| Master Smith Series: | |
| August 1-5 (5 days) | Part 1 Doug Wilson - Design and Deliver |
| August 8-12 (5 days) | Part 2 Peter Ross - Blacksmith's Helper and Scroll investigator |
| August 15-19 (5 days) | Part 3 Jay Close - Historical Joinery
Exploring 18th Century Smith-craft |
| August 22-26 (5 days) | Part 4 Dan Nauman - Cyril Colnik Inspired Candlestick;
Exploring and Applying Traditional Repousse' |
| September 5-9 (5 days) | Mark Aspery - Fundamentals of Blacksmithing
Level 1: Basics |
| September 12-16 (5 days) | Mark Aspery - Fundamentals of Blacksmithing
Level 2: The Ring-thing |
| September 19-23 (5 days) | Darryl Nelson-Garden Gate Joinery |
| October 3 - 6 (4 days) | Green Foundry - Art Casting Iron Sculpture |
| October 13-15 (3 days) | Nick Rossi - American Style Tanto |
| October 17-20 (4 days) | Susan Madacsi - The Art of the Scroll, beginners |

Dereck Glaser

New England School of Metalwork
Administrative Director
Metalsmithing Program Director
Resident Blacksmith
7 Albiston Way
Auburn, Maine 04210

Phone: 207-777-3375
Fax: 207-514-1562
Email: dglaser@newenglandschoolofmetalwork.com
Website: <http://www.newenglandschoolofmetalwork.com/>

Blacksmith's Exchange

Have something for sale, or looking for something? This is just the place to look.

Send your "for sale" or "looking for" requests to Marty Lyon (at the address or email address on the back cover). Please include your name and phone number

For Sale: Small Oxygen and Acetylene Tanks with a plastic carrier.

Easily carried with place for hose. No hoses or regulators included. Originally purchased from National Welders. Current price is \$250. Selling them for \$150.

Parks Low at 919 818-3036

For Sale – Antique Forge

I have an antique forge with some tools- it appears to still work. It is from the Champion Blower and Forge Company, Lancaster, Pa. I was told it is about 100 yrs. old. I also have a few blacksmith tools to go with it. I am interested in selling it. I live in Florence, S.C. E-mail me if you are interested in it. I bought it for my brother who has done some blacksmithing, but he has become disabled from cancer and is unable to use it. Thanks Martha Smith - memarmarsc@yahoo.com

Fire Bricks – Brand New, Industrial Grade. \$1 ea. Ed Sylvester, Columbia, SC

803.414.2487 803.796.3749

Ray Clontz Tire Hammer Plans by Clay Spencer

Ray Clontz Tire Hammer Plans, \$30, including postage to US and Canadian addresses. Send check or money order, e-mail me for cost to other countries

Tire Hammers for sale, 50 lb. hammer head, approx. 250 blows per minute, 1 hp motor, 6" diameter anvil, 700 lbs., 2 ft. square base, Contact me for price/availability. Reasonable delivery if I am headed to your area..

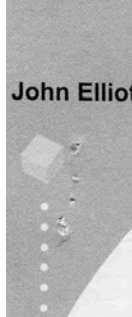
Beverly Shear blades sharpened, \$35 + postage. Blades must be removed from shear, extra cost for deep nicks or blades previously sharpened at angle.

Clay Spencer, 73 Penniston Private Drive, Somerville, AL 35670, 256-498-1498, cell 256-558-3658, clay@tirehammer.com

For Sale

Blacksmithing/ Knifemaking/ Forging POWER HAMMER - 50# Little Giant

Little Giant 50#, manufactured in 1947, modern style (clutch at rear) excellent condition, Plug and pound! Has drawing dies, 2hp original motor, single phase, runs like a sewing machine can forge up to 2" solid metal. \$3800.00
919 / 444-1665



Blacksmith Supply
Tools and Supplies For The Modern Blacksmith

John Elliott

P.O. Box 3766
Chester, Virginia 23831

Phone: 804-530-0290
Fax: 804-530-0290

E-mail: jelliott@blacksmithsupply.com
Website: www.blacksmithsupply.com

Wrought Iron Rods (up to 14' long) Available

Wisconsin Woodchuck LLC has iron rods ranging from 5/8" to 1 1/2" in diameter (from a 1887 grain elevator). They also have iron flat bars and millions of iron square nails. Prices start at \$2 per pound. Call to check inventory.

Wisconsin Woodchuck LLC

2 Banks Avenue P.O. Box 97 * Superior, WI 54880-0097
Phone: 715.392.5110 * Fax: 715.392.5112
Email: d.hozza@wisconsinwoodchuck.net
Web site: www.wisconsinwoodchuck.net



**NEW! Blacksmith Depot
KISS Hammer!**



Anvils



Hammers



Tongs



Gas Forges

**Professional Quality Tools for the
Blacksmith, Metalworker
and Fabricator**

See our work at
www.customforgedhardware.com

www. Blacksmithsdepot.com
Kayne and Son
100 Daniel Ridge Road Candler, NC 28715 U.S.A.
Phone: 828 667-8868 Fax: 828 665-8303
International Shipping available
Inquiries welcome

Coal For Sale

I have roughly 15 tons of Sewell Vein pea stoker washed coal from the Green Valley Mine. 15.5 BTU, 1.25-2% ash. I sell it in 50 lb. bags for \$10.00 and no charge for the bags-you pick up. Whatever bulk load the buyer wants, my front end loader bucket holds 400 lbs. \$10.00 loading fee (or I can furnish shovels). I prefer not to make deliveries. I should have a consistent supply for several years. References available. Fred Pugh 5332 NC87N Pittsboro, N.C. 919 542 4164

POWER HAMMER SCHOOL
Learn from the Pro's




Sign up for October classes NOW!
Free form forging and hand forging with Amit Har-lev. Spaces limited to 8 per class.
Call 828-437-5348 See web site for details

www.powerhammerschool.com

Here is an Excellent Source of Tool Steel:

The Atlantic Steel Corp
35-27 36th St.
Astoria, NY 11106

NC WHISPER LOW BOY



Low Profile

- 3 Burner, Large Fire-box
- Insulated Door
- 3" h x 12" w x 9" Front to Rear
- Ideal For Competition Shoe Making
- 3" x 2" End Ports
- Rapid Heat Recovery Time

Call your dealer today — shipping by UPS

NC **NC Tool Company Inc.**
6133 Hunt Road, Pleasant Garden, NC 27313
Web site: www.nctoolco.com



BIG BLU MAX

MADE IN THE USA

**QUICK CHANGE
DIE SYSTEM!**

**BLU MAX
155
\$6,795**

**BLU MAX
110
\$5,795**

**BLU MAX
65
\$4,895**

**Dual Valves
With Improved
Valve Timing
(155 & 110 Models Only)**

**Optimized
Air System**

**Clamping
Feature
(Standard on 155 Model
Optional on 110 & 65 Models)**

**Increased
Stroke**

**18 Inch
Throat**

**35 Inch
Working Height**

There were two, now there are three. Big Blu Hammer is proud to introduce the all new Blu Max 65. The Max 65 comes with the same control and power that larger Blu's are known for while operating at 90 psi. All Big Blu Hammer models ship worldwide.

**OSHA Approved
Foot Guard**

BIG BLU HAMMER MFG. CO.
3308 Frank Whisman Rd., Morganton, NC 28655
PHONE: 828-437-5348 • FAX: 828-437-9217
www.bigbluhammer.com

MEMBERSHIP APPLICATION

NORTH CAROLINA CHAPTER OF ABANA

Name: _____

Address: _____

City: _____

State: _____ Zip: _____

Telephone: (_____) _____

E-mail Address: _____

ABANA Member?: Yes No

Blacksmithing Experience: _____

DUES: \$25.00 per year (within USA)
\$35.00 per year (outside USA)

MAKE CHECK PAYABLE TO: NC ABANA

REMIT TO: Marty Lyon
6 Carolina Meadows, Apt 203
Chapel Hill, NC

If you are renewing your membership and your address and phone number have not changed, you do not need to use this form.

ABANA APPLICATION

Name: _____

Address: _____

City: _____

State: _____ Zip: _____

Telephone: (_____) _____

E-mail Address: _____

- DUES: Regular (US/Canada/Mexico) \$55.00
- Senior 65+ (US/Canada/Mexico) \$50.00
- Student (US/Canada/Mexico) \$45.00
- Foreign \$65.00
- Library (US) \$45.00
- Contributory \$100.00

Make check payable to: ABANA

Credit Card: American Express MC
 Discover VISA

Card #: _____

Expiration Date: _____

Signature: _____

REMIT TO: ABANA
15754 Widewater Dr.
Dumfries, VA 22025-1212

NC ABANA LIBRARY BOOK ORDER FORM

Date of Request: _____

Requested by: (Please Print)

Name: _____

Address: _____

City: _____

State: _____ Zip: _____

Telephone: (_____) _____

Library Code of Item: (if known) _____

Title of Item: _____

Mail this request form to:

Dick Snow, NC ABANA
4222 E.L.G. Road
Efland, NC 27243

If you are a member in good standing of the NC Chapter of ABANA, the book you select will be mailed to you as soon as it is available. You may keep it for up to 30 days and then you must mail it back to the librarian. A return address label will be included when the book is mailed to you. All books must be returned in the condition they were received in or you may be charged for the damages. You may have ONE book (Code BK) or up to THREE Hot Iron Sparkles (Code HIS) or THREE magazines (Code MAG) at any one time. A new copy of this form will be sent with each book.

Chapter Calendar 2011

January	☞ <u>Regional Meetings</u>
February	☞ <u>Regional Meetings</u>
March	☞ <u>Regional Meetings</u> ☞ <u>1st QUARTER CHAPTER MEETING</u> March 20, 2011 AT 9:00 A.M. DEAN CURFMAN'S, OAK HILL IRON WORKS MORGANTON, NC
April	☞ <u>Regional Meetings</u>
May	☞ <u>Regional Meetings</u>
June	☞ <u>Regional Meetings</u> ☞ <u>2nd QUARTER CHAPTER MEETING</u> June 25, 2011 AT 9:00 A.M. DIXIE FAIRGROUNDS WINSTON SALEM, NC
July	☞ <u>Regional Meetings</u>
August	☞ <u>Regional Meetings</u>
September	☞ <u>Regional Meetings</u> ☞ <u>3rd QUARTER CHAPTER MEETING</u> Date and time T.B.D. Andy Anderson's Shop GOLDSBORO, NC
October	☞ <u>Regional Meetings</u> ☞ <u>Dixie Classic FAIR SEPTEMBER 30 – OCTOBER 9</u> ☞ <u>NORTH CAROLINA STATE FAIR OCTOBER 13 - 23</u>
November	☞ <u>Regional Meetings</u> ☞ <u>BONUS MEETING</u> November 5, 2011 at 9:30 a.m. J.C. Campbell Folk School, Brasstown, NC
December	☞ <u>Regional Meetings</u> ☞ <u>4th QUARTER CHAPTER MEETING</u> ☞ December 3, 2011 at 9:30 a.m. ☞ Rodger Barbour's Shop, Clayton, NC

Regions

See map on bottom of the page for approximate locations of each region within North Carolina

- (1)
Triad Area Blacksmiths
Marshall Swaringen Advance, NC
(336) 998-7827
1st Tuesday 6:30PM for demos
3rd Saturday, 9AM for business
and all day forging
Dixie Fairgrounds, Winston Salem, NC

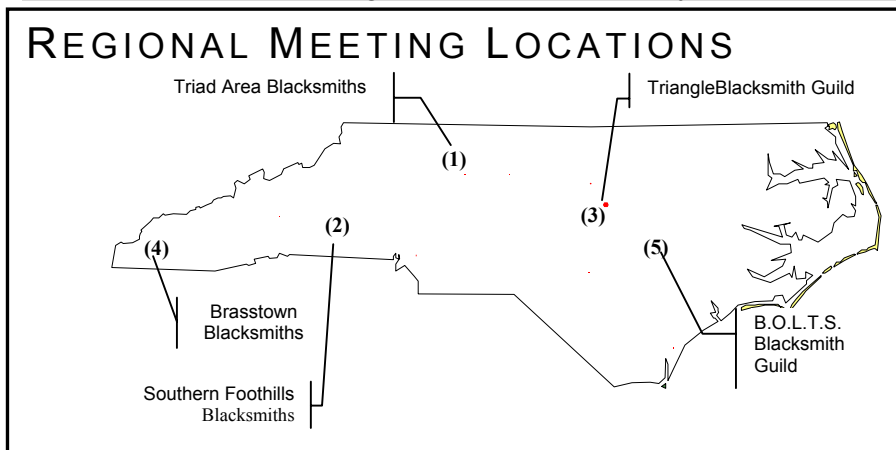
- (2)
Southern Foothills Blacksmiths
Steve Barringer Mooresville, NC
(704) 660-1560
2nd Sunday, each month

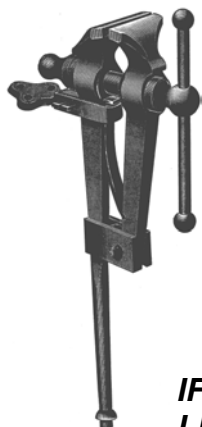
- (3)
Triangle Blacksmith Guild
Randy Stoltz Cary, NC
(919) 481-9263
1st Saturday, even # months

- (4)
Brasstown Blacksmiths
Paul Garrett Brasstown, NC
(828) 835-8441
3rd Saturday, even # months
Noon to 4PM

- (5)
B.O.L.T.S. Blacksmith Guild
Amos Tucker Kenly, NC
(252) – 289-7317
1st Sat or Sun. Even # months

Note: Any member is welcome at each of the Regional meetings. Call host to confirm date, time and location.





North Carolina Chapter Artist Blacksmith Association of North America

THE HOT IRON SPARKLE

Marty Lyon, Editor
6 Carolina Meadows, Apt. 203
Chapel Hill, NC 27517
919 / 918-4180

**IF YOU ARE MOVING PLEASE
LET ME KNOW SO YOU DON'T
MISS YOUR NEWSLETTERS!!!**

Non-profit
Organization
US Postage Paid
Durham, NC
27705
Permit No. 344

DATED MATERIAL
Return Service Requested

**MEMBERSHIP
EXPIRES**



TO:

President

Cindy Alexander
922 Lakeside Drive
Durham, NC 27712
919 / 684-7820
alexa007@mc.duke.edu

Vice-President

Garret Dunn
119 Tanager Ln.
Chapel Hill, NC 27517-6452
919 / 469-1317
gngdunn@gmail.com

Secretary

Marty Lyon
6 Carolina Meadows, Apt 203
Chapel Hill, NC 27517
919 / 918-4180
northcarolina.abana@gmail.com

Treasurer

James Kennady
1171 Cash Road
Creedmoor, NC 27522
919 / 528-5636
jimkennady@gmail.com

PLEASE WELCOME THESE NEW MEMBERS

George Breuer	Wilmington	NC
Elton Etheridge	Elm City	NC
Chris Lew	Apex	NC
Don Reese	Siler City	NC
Zane Carney	Mooresville	NC
Joe Goolsby and Johanna Justice	Oxford	NC
Chris Moore	Franklin	NC
Eric J Morlino	Black Mountain	NC
Tyler Rasche	Cleveland	NC
Tim Rowland	Cary	NC
Derrick Simcox	Winston-Salem	NC
Brian Swink	Cherryville	NC
Mark Lew	Apex	NC
David Scott Trompower	Statesville	NC
David Gough	Wake Forest	NC
Brandon James	Madison	NC
Jim Smith	Raleigh	NC
George Smith	Raleigh	NC
Max Soetermans	Pinnacle	NC
Kyle Stenersen	Burlington	NC
Mike Tanner	Amelia	VA

Don't Forget: 2011, 1st Quarter Chapter Meeting

Saturday, March 19 - 9:00 AM

Oak Hill Iron Works, Morganton, NC

