PRESIDENT’S MESSAGE

Welcome to the President’s Corner.

The Florida Artist Blacksmith Association is a volunteer organization and has its strength in numbers. This strength is surely demonstrated at our annual conference, but, with that being said, the strength is not always demonstrated at our monthly regional meetings. To this end, the board has passed a budget to stimulate attendance by increasing support for Statewide Regional Meetings.

At this point I know that Ed Arrons, the SE Regional Coordinator, is in the process of setting up a Statewide Regional Meeting and needs our membership’s support by attending this meeting to make it a success.

The NW Regional Coordinator, Roger Bell, has set the NW Statewide Regional Meeting for the second Saturday in April. The meeting will be held at the Panhandle Pioneer Settlement in Blountstown. The demonstrator will be Eddie Rainey of Gallop Forge, Milner, GA. He will demonstrate the making of a hammer head and the tooling needed (www.gallopforge.com).

Along with the above, Lisa Anne Conner, SW Coordinator, and Bob Jacoby, NE Coordinator, are planning Statewide Regional Meetings. As the information is developed, we will keep you informed. Try to attend as many of these meeting as you can.

We have six new FABA members. Welcome to Andrew Guian of Lake City, William Wallace of Naples, Steve Janis of Umatilla, Chuck Wahl of Sarasota, Clinton Busbee of Christiana, TN, and Jeff Bennett of Orlando. When you see these new members at our meetings, extend a warm welcome and invite them to your forge.

Be Safe and Happy Hammering,
John Boy Watson

STATEWIDE REGIONAL MEETINGS

April 12th – NW Region Statewide Meeting will be held at the Panhandle Pioneer Settlement at Sam Atkins Park in Blountstown. Eddie Rainey of Gallop Forge, Milner, GA <www.gallopforge.com> will be demonstrating hammer making.

May 17th - 18th SE Region Statewide Meeting will be held at Tanah Keeta Boy Scout Camp. Camping available at $10 per person with other options close by. Other Regions are encouraged to participate. At this time, we're in a planning stage, probably tong and tool making and traditional demonstrations with open forges with mini-classes if time permits.

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From the Editor

Hi Everybody!

I’m always looking for contributions to the Clinker Breaker. Submissions are due on the 10th of each month and I try hard to have the CB out before daylight on the 16th of the month, but you can send submissions to me at any time. Often I help to polish up a piece. From a single photo with caption, to an in-depth study, I will be glad to work with you to deliver a quality product. I’m looking for:

- Articles on anything related to blacksmithing
- Step by step how-to articles
- Articles on people and places important to blacksmithing or FABA
- Photos, with captions, of things and tools you’re making or using
- Information on upcoming events and reports on events you’ve attended
- Reviews of books and products
- Classified ads from members in good standing
- Anything else you think might be of interest to FABA FAMILIES

Letters to the editor!

David Reddy

Florida Artist Blacksmith Association (FABA) is a not-for-profit organization chartered with the State of Florida and is dedicated to promoting and expanding the horizons of architectural, artistic and practical blacksmithing while preserving the rich heritage of this craft. FABA Officers and members assume no responsibility or liability for injuries or damage caused as a result of the use of any information, materials, design, techniques, etc. contained in this newsletter, our website, http://www.blacksmithing.org, our Facebook Page or provided at meetings or demonstrations.

Contributions to FABA are tax-deductible to the extent provided by law. FABA publishes the Florida Clinker Breaker monthly and FABA membership includes a subscription. We solicit correspondence and unpaid articles on any subjects related to FABA’s purposes. Send to: editor@blacksmithing.org Materials submitted must be your own work and citations of others must be clearly identified. By submitting material, you are allowing FABA to edit, print and post them to FABA’s website. ABANA Chapter newsletters may reprint non-copyrighted material if it is credited to the author and this newsletter. You need the publisher’s permission to reprint copyrighted material unless otherwise noted.
The calendar includes events of interest to the blacksmithing community. The regions have no boundaries - everyone is welcome everywhere. Come to more than one if you can. We hold regular meetings in each region on the following Saturdays of each month: NE-1st, NW-2nd, SE-3rd, SW-4th except for quarterly Statewide meetings. The actual dates vary so check the schedule below. Our meetings are informal gatherings around the forge. Prospective members are always welcome. Come for all or any part of a meeting, bring your tools or just watch. Most meetings run from 9 AM to 4 PM and you'll want to bring a bag lunch if not otherwise noted. If you have any questions about meetings, please contact the Regional Coordinators:

Northeast Region  Bob Jacoby  904-613-2626  bobjacoby@bellsouth.net
Northwest Region  Roger Bell  850-566-4629  bellrgr@yahoo.com
Southeast Region  Ed Aaron  561-748-9824  edaaron9824@bellsouth.net
Southwest Region  Lisa Anne Conner  813-977-3743  MelisandeAubrey@hotmail.com

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### NE Mar. 1, Pioneer Settlement for the Creative Arts, Barberville

![Map of Barberville and Pioneer Settlement]

### NW Mar. 8, Mike Bettinger’s Welding Shop, 3440 Garber Dr., Tallahassee

![Map of Tallahassee and Garber Dr.]

### SE Mar. 15, Tanah Keeta Boy Scout Camp

![Map of Tanah Keeta and Boy Scout Camp]

### SW Mar. 22, Jerry Wolfe’s Forge, Sarasota. Sword maker Jeffrey Robinson.

![Map of Sarasota and Jerry Wolfe's Forge]

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**Calendar of Events**

- **NE Mar. 1**, Pioneer Settlement for the Creative Arts, Barberville
- **NW Mar. 8**, Mike Bettinger’s Welding Shop, 3440 Garber Dr., Tallahassee
- **SE Mar. 15**, Tanah Keeta Boy Scout Camp
- **SW Mar. 22**, Jerry Wolfe’s Forge, Sarasota. Sword maker Jeffrey Robinson.
REGIONAL REPORTS

NW - January Meeting

The January 11th meeting of the NW region was at Jeff Mohr's Mockingbird Forge in Crawfordville. As usual, Jeff and Brooke were great hosts, the shop was set up and ready for the demonstration.

The demonstrator was 15 year old Thomas Kovaks. Thomas was the recipient of the Walt Anderson scholarship and attended the Bill Moran School of Bladesmithing. Assisted by his younger brother Daniel, Thomas made a knife blade showing all steps from forging through heat treating. When he finished making the blade he demonstrated cutting a rope, a 2 x 4 board, and then bent the blade to a 90 degree angle without it breaking. It was very impressive and held the attention of all in attendance for the full time.

We had over 70 in attendance. Following the demonstration, Roger conducted the Iron in the Hat drawing with Lloyd Wheeler drawing and calling out the numbers. We had a good number of handmade items and a collection of $317, which included the auction of the knife Thomas made. The lunch menu was smoked ribs and many covered dishes brought by members providing an excellent meal. A great time was had by all.

I see a bright future for FABA, with young members like Thomas Kovacs. Last Monday, Thomas helped teach some of the 14 beginners in attendance at Jim Labalito's Fernwood Forge weekly class.

The March 8th NW meeting will be at Mike Bettinger's. We will have T. Paul McGowen and Bob Stott, a couple of our very good knife makers.

Roger Bell

SE January Meeting

For our January 18th meeting, the SE Region met at our usual location, Tanah Keeta Boy Scout Camp. Several of our regular attendees were away representing the Florida Artist Blacksmith’s Association at the South Florida Fair. We did however have some new members join us, Sean and Heather. In addition, the meeting was attended by our fearless leader, Ed Aaron, Steven Rzo, Leandra Argyros, Nicole Alcaro, Shaun Williams, and, returning after a long hiatus, Jan Dion.

There has been steady growth in attendance at our monthly meetings and we are pleased with all the new members expressing interest in learning. Ed and Jan demonstrated some basic blacksmithing techniques, including drawing, bending and twisting, to Sean and Heather, while Shaun and Nicole worked on making various tools, including a scrolling jig and a pair of v-bit tongs.

Due to some recent construction at Tanah Keeta, we have had to move to a temporary location. At our last meeting Ed announced that Tahah Keeta had designated an area to be our new permanent meeting place. There was discussion as to planning our move to a new permanent location and strategizing on how we will set up once we move. Ed is working hard to have the Southeast Region host a regional conference with a demonstrator and we are currently planning to hold such an event in May.

Our March meeting will be held on the 15th and it is our hope that we will be set up in our new location and ready to spark up the forges.

Shaun Williams

SW January Meeting

The SW met at David and Kathy Reddy’s house in Tampa on Jan 25, Gasparilla Day for the rest of Tampa. It was a bright sunny day, a bit chilly, perfect if you’re working. Ten people attended the meeting, several for the first time.

Trez Cole demonstrated making a collaring vise. The collaring vise is featured in Mark Aspery's book; Mastering the Fundamentals of Traditional Joinery (The Skills of Blacksmithing, Vol. 3) and in Otto Schmirler’s
book; The Smithy’s Craft and Tools. The collaring vise is one of the tools identified by Aspery as basic to every well-rounded blacksmith’s tool kit. It allows the lone smith to precisely secure two pieces of stock for processing.

Steve Berglund demonstrated making a knife billet from chainsaw chains. He bundled 3 chains together and welded them into the billet about an inch at a time. In a new wrinkle, Steve shaped the handle out of the billet rather than using wooden handles. The chain handle is striking and speeds up the knife production.

Iron in the Hat brought in $34 and we had a nice potluck lunch built around my wife Kathy’s chili.

**David Reddy**

**SW March 22nd meeting will be at Wolfe Forge**
Demonstrator will be Jeffrey Robinson - Sword maker Jeffrey will talk about all the steps required to make swords and will demonstrate the heat treating process. Jeffrey will have samples to show how a sword is made from "raw steel" to the finished product. The "bronze parts" of the sword will be discussed and parts shown concerning how the investment casting process is done.

**NE February Meeting**

The NE Region February 1st meeting was held at Steve and Dina Estenson’s shop in Fruitland Park.

FABA Past President Jerry Wolfe demonstrated with Steve’s assistance. The first project is a sculpture Jerry is creating which involved piercing holes through heavy round stock so that parts of the sculpture will interconnect. The second project is a Damascus billet Jerry is forging from layers of 4600, 52100 and wrought iron. Jerry, who worked as a professional metallurgist for The Timken Company, also brought along pictures of highly magnified Damascus steel which illustrate that carbon does not migrate across grain boundaries as much as some speculate. Specifically, Jerry’s analysis suggests that carbon does not migrate over a boundary (between different types of steel) as narrow as 0.002” wide. Hardness within this region varied from 40 Rockwell, in the lower carbon steel, to 50 Rockwell for the higher carbon component—again over an area only 0.002” wide! We’re very fortunate to have Jerry as an active FABA member and everyone learned a great deal [and had a lot of fun!].

John Fee, a member of the New York State Designer Blacksmith chapter, is spending some time down here in Florida to escape the Northeast winter and attended the meeting. Last year, John taught us how to make fork animals, which if you’ve never done is really fun, (except the forks are difficult to eat with afterwards!). This year, John will attend several meetings in February and will hopefully demonstrate again.

New FABA member Jeff Bennett attended his first meeting. Jeff is a History teacher in Orlando and recently took up the craft after making his first piece, a coat hook, at the Georgia Mountain Fair blacksmith’s shop. The meeting was well attended, the weather turned from cold to not-so-cold, and we had a great lunch – I can’t think of a better way to spend the day! Big thanks to Steve, Dina and Jerry!

**NE March 1, 2014 Pioneer Arts Settlement, Barberville - Open Forges, possible demonstrator or project**

**NE April 5, 2014 Pioneer Arts Settlement, Barberville - Tailgate Tool Sale - bring your unwanted or surplus items to sell; Program TBD**

**Bob Jacoby**

David,

Greetings from the Pioneer Settlement in Barberville. We would like to let your readers know that we continue to have blacksmithing coal available. The current price is $35.00 per 100 lb bag, lots sold in 100 lb increments, pick-up only, sorry we don't ship. To purchase some of this fine coal, please call ahead with your order and we'll have it ready for your pickup. Accepted modes of payment: cash, check, MASTER Card, VISA and DISCOVER. Pick-up available during our regular opening hours: Mon-Sat, 9a-4p. Ph: 386-749-2959.

Best regards
Gudren Benson
Pioneer Settlement
P.O. Box 6
Barberville, FL 32105
 Forge Welding

By Dan Nauman
Illustrations by Tom Latané
Photos by Dan Nauman

Lesson Number 10– Forge Welding

Definition:
Fusing two or more bars together by bringing them to a high heat in a forge, and applying pressure to the area being fused by hammer blows.

Lesson: Upsetting, scarfing (see *Definitions, below), and forge welding the ends of two bars of equal size together to make one bar.

Intent: The smith will learn the technique of welding two bars of equal size together, accurately maintaining the original stock size and shape after welding.

Materials: Two 15" bars of 1/2" square mild steel.

Tools needed: Basic tools include standard cross peen hammer and anvil. Flux (see *Definitions, below), either borax or EZ Weld. Calipers and a square can be used to evaluate your work.

Method:
Forge welding is used in several circumstances: to produce a smooth transition of adjoining elements; to secure several elements into a bundle (i.e. leaves, grapes, acorns, basket twist); to join a bundle to another element; to close the ends of a single bar shaped in a ring, oval, or rectangular shape (as in a frame); to join mild steel to high carbon steel (as in an ax bit); or to laminate several bars together to form a billet (as in Damascus laminate).

Definitions:
1.) Scarf (scarfing): Preparation or preparing a portion, often the end of a bar, for welding by tapering to a thin edge which can be blended into the mating material.
2.) Flux: The product applied to the areas to be fused to reduce oxidation, and lower the melting temperature of the scale. (Examples: borax, EZ weld, etc.)
3.) Clinker: The hard, gritty, often glassy mass that congeals in the bottom of the fire-pit.
4.) Coke: Soft coal that has had the bulk of its impurities burned out. Coke's appearance is puffy. As good quality soft coal burns, it expands and congeals to the neighboring coal nugget forming a larger mass. Almost entirely carbon in its makeup.

Note: Just as there are different approaches to other aspects of forging, the same is true for forge welding. It cannot be said that any one way is best, as there are many experienced smiths who produce consistently sound welds in a different manner than explained here. Different scarf forms, different fluxes, and several other aspects of forge welding can be learned and utilized. To introduce these differences in this lesson would prove confusing to the student. Thus, this lesson will concentrate on the method taught to me in the 1970's. Differences aside, the fundamentals usually prove to be similar or identical. In all cases, a high heat is needed at the point of fusion to successfully weld the bars together. The color of the bars should be yellow to yellow/white when removed from the fire. The only exception to this would be when welding high carbon steel to mild steel. A lower heat of orange/yellow should be the highest heat applied so as not to burn the carbon out of the carbon steel.

The gray scale that forms on a bar when heated is the enemy of the forge weld. The bars will not fuse properly when scale is present. Scale forms on the outside of the bar in the presence of oxygen. Flux forms a barrier around the areas to be fused, protecting it from oxidation. It is applied to the bars at an orange heat. Flux is not glue, or a bonding agent, rather it lowers the melting temperature of this scale, and prevents more scale from forming while heating in the fire. Some smiths theorize that to

A forge welded sample from Cyril Colnik

Figure 1: Upset end preparation
some degree flux also raises the burning temperature of the metal. Another important aspect of welding is to be absolutely sure you have a “clean,” domed fire. A clean fire is free of a clinker in the fire-pit, and has no fresh coal burning in the center of the fire. A good welding fire also has an abundance of coke domed and banked in the fire-pit. Should the fire “hollow out” while heating the bars, only coke should be added to the fire to replenish the fuel. Fresh coal cools the fire, and also introduces impurities naturally found in coal. These impurities are largely burned out as the coal becomes coke.

When taking a welding heat, a good deep fire with the bar in the center of the fire under a good two or so inches of coke will reduce (but not eliminate) the amount of scale which forms on the bar during heating.

Step One—Preparing the scarf:
Taking a short high (yellow) heat on the last 1" of the bar. Then upset about 1" of the end of the bar so that the bar measures at least 9/16" square. (See previous lesson Number 7) Next, forge one dimension back to 1/2" producing a cross section measuring 1/2" x 5/8".
Step Two:
Take another yellow heat on the end of the bar, again on the last 1" of the bar, place the end of the bar (with the 5/8" sides vertical) squarely on the anvil’s face with the end of the bar 1/4" from the inside edge of the anvil. The edge of the anvil should be somewhat sharp for this step. Hitting straight down with the hammer’s face halfway above the anvil face and halfway beyond the anvil face (Figure 2, photo), reduce the cross section to about 1/2 the thickness of the material, in this case to 5/16".

Tip: In order to create a clean shoulder in this operation, put a slight downward pressure on the bar so the bar stays where you put it. Then after the first or second blow add a slight forward pressure to keep the bar from “stepping” off the anvil.

Step Three:
The forging dynamics of the material will cause the area of the bar on top of the anvil to slightly spread wider than desired. In the same heat from step two, turn the bar 90 degrees, and forge this area back down to 1/2" in thickness.

Step Four:
Take another yellow heat on the last inch of the bar. Place the shoulder produced on a sharp edge of the anvil, pressing the shoulder squarely against the side of the anvil. The hand the bar is holding should be lowered slightly so the face of the scarf is off the anvil face. (Figure 4, photo). Move the hand holding the bar to the left of square, and take a blow. Moving the bar back and forth at a 90 degree angle (right to left), and using each step produced by the previous blow to brace against the side of the anvil, slowly step the bar off the anvil. (Figure 5, photos). In this same process, the profile of the bar should be drawn out to a flat point. (Figure 6, photo). If done correctly, the face of the scarf should have steps as shown in the figure 7 below. When the scarf
is drawn out, forge a slight curve at the end of the scarf. (Figure 7) You should be able to do all of step four in one heat.

Notes on scarves: The reason for the curve at the end of the scarf is simple. The anvil acts as a heat sink when hot metal is applied to it. If the end of the scarf is not off the anvil when welding, it might cool too rapidly, and the weld will not be properly fused in this area. The curve keeps the thin edge of the scarf off the anvil before the first blow, retaining the heat longer to produce a sound weld. The thin tapered edge of the scarf is formed to produce a smooth weld joint. A scarf with a thick edge will produce a weld with a very visible seam (Drawing, figure 8).

Step Five:
Repeat steps One through Four on the second bar.
Step Six: Fluxing the scarves.

SAFETY! - Some fluxes may emit noxious fumes when heated. Make sure your forge and building are vented properly. Reduce the air blast in the fire if you have an electric blower. If you are manually applying the air blast, reduce the force of the blast to more of a whisper. This will reduce the chances of burning the scarves while fluxing by reducing the available oxygen in the fire. Making sure you have a clean and deep fire, place the scarves into the center of the fire, face up. If the bars are not covered with coke, cover them. When the bars reach a bright orange, with the bars remaining in the fire, take your fire rake make a hole in the fire over the scarves so flux may be sprinkled on the face of the scarves. With a small spoon with a long handle (so you do not burn your hand), apply enough flux with to cover the scarf, as well as beyond the scarf where the other scarf will join. (Figure 9, drawing). Cover the bars once again with coke. When you are finished fluxing the scarves, position them so they are facing down in the fire.

Notes:
One of the biggest mistakes beginners make in welding is not applying the flux back far enough on the bar where the bars will be fused. Some smiths prefer to flux all sides of the scarves, while others simply apply flux to the scarf faces. The theory behind fluxing all sides of the bar is to insure that all surfaces are free from scale, as well as to increase the burning temperature of the bar. The bar can and will burn if allowed to get to a full sparkling white heat, at which point the flux will also burn off. The bars likely will not weld at this high temperature. Also, the molecular structure of the material will break down, creating a weaker joint, and often an unsightly weld.
If you choose to flux all sides of the scarves, turn the bar 90 degrees only after you are certain the flux has adhered to the scarf surface. You will know when this happens, as the flux will be the same color as the bar. If one bar gets hotter than the other, move it to the side of the fire where the fire is cooler, or reduce the air blast further.

Fluxing the scarves in the fire keeps them hot, and reduces the amount of scale formed, therefore shortening the time it takes to produce the weld. Removing the bars from the fire to flux the scarves is not necessarily wrong, as many smiths prefer this procedure, and do so successfully. Sometimes, fluxing in the fire is virtually impossible (i.e. welding a wagon wheel tire.) In these cases, removing the bar from the fire is necessary. Always keep coke on top of the bars when not in the act of fluxing.

Tip: Rub soapstone or chalk on the face side of the bar to indicate direction of the scarf face when pulling the bars from the fire.

Step Seven: Welding the bars
Have your hammer at the anvil in a position to grab it quickly. The scarves are at a welding heat when they are at a yellow-white appearance in color (Often referred to as a “welding heat.”) Make sure the scarves are heated well beyond the shoulder where the mating bar will join. Some smiths wait to see just a few sparks coming from the fire, indicating the piece is just starting to burn. This is not necessary, and can lead to burning the tips off of the scarves.

Tip: If you are not sure if the pieces are at a welding heat, gently touch the pieces together in the fire. If they want to stick, almost like a magnet, they are probably ready to weld. With experience, this touching in the fire will not be necessary.

SAFETY: When welding, molten sparks fly from the bars which can burn others, as well as you. Alert others in the area when performing a weld, and make sure other items in the shop that are flammable are protected from the sparks. Some smiths wear a protective leather apron when welding to prevent their clothes from burning. You and anyone else present should be wearing eye protection with side shields at all times. After welding, be aware of the possibility of fire caused from stray sparks in the surrounding area i.e. shop rags, charcoal, dry wood, etc. These items and others ignite easily from molten metal and flux spattered from the forge welding process.

Figure 9: Fluxed face heated from below.

Some other forms of bar end scarfs. The 90° shoulder on the scarf described in the text will aid in quick alignment of bars to be welded, preventing overlap beyond upset material.

Figure 10
Bring the pieces out of the fire, rotating one piece 180 degrees so that the scarf is facing up. Place the bar with the face up on the center of the face of the anvil, coming in from the far side of the anvil. (This bar should be in your hammer hand.) Place the other bar on the near edge of the anvil, with the scarf off the face, pointing up at about a 45 degree angle. (Figure 10, photo). In a hinging fashion, lower the scarf down onto the opposing scarf, keeping contact with the edge of the anvil to control the accuracy of the placement of the scarf (Figure 11, photo) and press down on the opposing scarf. The heels of the scarves should be placed together as shown. (Figure 12, photo). Press down hard enough so you can release the bar in your hammer hand. Release the bar in your hammer hand, grab the hammer, and strike firmly in the center of the joint. Forge the entire joint rapidly with six or seven blows. Make sure you forge the thin tip of the scarf as it will cool rapidly. Next, flip the now welded bar 180 degrees to forge the opposite side. Hit six or seven blows on the entire joint and then turn the bar 90 degrees and repeat five or six more blows on the joint. Flip the bar 180 degrees and hit the joint once again five or six blows. Repeat as necessary, never forging colder than a medium orange heat.

Note: Dark spots on the joint indicate cooling of the material and will not weld there. This may be caused by too low of a heat, or inadequate fluxing.

Note: Timing is important. If you take to much time getting the pieces from the fire to the anvil, you may lose too much heat to weld the bars together. To increase your proficiency, you may want to take a few "practice runs" by removing the bars while cold from the fire pit positioning them on the anvil as described in Step Seven. Do this until you are comfortable with the procedure. You will then be able to release the bar from your hammer hand and grasp the hammer without the bar falling to the ground.

Tips:
- Some fluxes, such as EZ Weld brand, are very aggressive and may adhere to the metal after the weld has been completed. To remove it, take another welding heat, remove the bar from the fire, and scrub vigorously with a stiff wire brush. Flux is harder than a file, so do not try to file the flux off, as it can ruin your file.
- A lighter hammer of 1 1/2 to 2 pounds may work better than a larger hammer. With a lighter hammer, the hammer can be swung faster, and more accurately. Also, the chance of forging...
down beyond parent stock size is reduced with a smaller hammer, as you will not have the heavier force of the larger hammer.

-You may want to first practice a more simple weld to get used to the properties of forge welding. The faggot weld is a simple, crude weld which has no end preparation (no scarves.) Try bending a 3/16" x 3/4" piece in half and weld the last 3/4" of the end of the bars together. (Figure 13, drawing). Be extra careful when performing this type of weld, because the larger surface area causes more molten flux and sparks to fly from the joint.

Step Eight: Refining the weld (If necessary)
If the cross section of the joint is still larger than the parent stock size, place the bar back in the fire and bring the joint to a welding heat. Remove the bar from the fire, and carefully forge the joint back down to the parent stock size.

Potential problems and solutions:
If the weld is properly executed, the joint is invisible, the bar has no bulges or "necked in" spots, and has sharp 90 degree corners. (Figure 14, See drawing of bulge and necked in spots). To refine the bulge, proceed as described in Step Eight.
If the bar is necked in it will be more difficult to fix. The portion of the bar where it is necked in is taken to a welding heat, and then upset (refer to Lesson Seven) back to the parent stock size. A poorly executed weld will begin to come apart or fail entirely in the upsetting process.
If a parallelogram was formed at the joint, first upset the joint, then take another heat and forge down the acute angles slightly. (As explained in Lesson One.) Then carefully reduce to the parent stock size.

Targets:
- The scarf is produced in one heat.
- The weld is completed in one to two heats, and the joint returned to the parent stock size.
- The joint is to be square in section with sharp corners, no necked in areas, and no bulges. You can check your accuracy with a pair of calipers. Check for squareness with a steel square.
- The welded bar is to be straight, have no twist, be free of flux residue and the bar should have no visual evidence of a seam.

This article first appeared in the Fall 2004 HAMMER’S BLOW, a quarterly publication of ABANA. For more information, go to www.abana.org

This concludes the initial ten lessons of ABANA’s “Forging Fundamentals: Controlled Hand Forging.” ABANA’s original objective, and mine as editor of the Clinker Breaker, was to provide a unified series of lessons covering the basics of blacksmithing. ABANA’s lessons go on to delve into each area more deeply. The lessons are available at http://www.abana.org/resources/education/chf.shtml

The Clinker Breaker will not be publishing more of these lessons at this time. FABA has recognized the need to teach a unified approach to the fundamentals and the Clinker Breaker needs to support and stay in step with those efforts. I hope people have enjoyed and benefited from these lessons.

David Reddy

More examples of forge welding from Cyril Colnik

Steve Berglund welds a billet.
Any fees incurred by returned checks will be passed back to the member.