

Rocky Forge News

Volume 7, issue 12 – December, 2008

Next Meeting

The year is almost over and we will soon have a new president, gas prices are lower, steel prices are lower, we have lost a couple members, what a year. Our group has been involved in a lot of stuff this year and on top of it all we managed to get a building built, or at least mostly built and it is paid in full. It is your participation that makes Rocky Forge such a success, thank you for that. We also need to thank the wives who helped in so many ways, preparing food for you to bring to the meetings, selling tickets for the raffle and supporting us in our metalworking interests. Just tell her thank you from the Rocky Forge and invite her to our next meeting for lunch. Next year may be a challenging year for all of us and our country, so let's do what we can to maintain our interest in metalworking as a way to keep a healthy mind and spirit.

At the last meeting we voted to have a pitch in dinner for the holidays and we even voted to have a ham. That time has come and Carol is planning to cook a whole ham and chicken and noodles and everyone bring in a covered dish to share. Table service, coffee and ice tea will be provided. I'll bet we eat well that day. Saturday December 13th is the day. We also encourage bringing your spouse, we hope to have a good attendance and a good time.

Iron-in-the-hat is a go, so bring items for the drawing. We had some good stuff at the last drawing and there was some leave-er-rite too. It's all in fun and for a good cause so bring what you can.

I tried to hire Jill Thurman or Lorelei Sims as demonstrators, but they were busy that weekend so instead we will have the forges set up outside, brrrrrrr, or better still we will work inside to demonstrate what different effects can be made by twisting. In teams of two or more we will alter square and round stock sections of a given length and twist those to see the effect. The finished items will be mounted on a board to be hung in the new building as educational examples. If you have time

look in some of your blacksmithing books or the internet to see what can be done.

We are looking forward to seeing "all" of you and your spouse on December 13th at 9:00

Ted and Carol Stout

Iron "ore" from prospecting

DEC, editor

I really do not have much for you this month except for a project that I would really like to do. I have not found the time or energy that it deserves. We have talked in the past about setting up a bloomery and making iron. This is not necessarily a complicated thing. We have always gotten bogged down on coming up with ore to refine, both where and who has the time and energy to get it. The beginning of November I got an email about the Indiana chapter of the Gold Prospector's Association of America. It seems that when looking for gold you come up with much more "Black Sand" than gold. Like several thousand times as much. This black sand is heavy minerals that accumulate in the same places that gold might settle. Most of this black sand is forms of iron, some of which are even magnetic. Most prospectors throw the black sand back in the creek and forget about it. The president of the Ind. GPAA, Wayne Mercer, wants to make something out of black sand and is looking for someone to help.

I want to make iron and he wants to make something out of iron ore. I think that the two go together. Wayne thinks that he can get enough black sand to do something with when we figure out how to refine it. I think that I have a way but I have not tried it yet. I have a small sample of magnetic black sand (Magnetite) to play with. I hope at the December meeting to try small scale bloomery. I have always thought that making a solid mass out of a bloom is the hard part, but with enough voluntary hammer wielders we could get it done or, at least, learn from our mistakes.

From: Wayne <wam27in@yahoo.com>

Subject: [blacksmiths] Seeking a
Blacksmith In Indiana area
To: blacksmiths@yahoogroups.com
Date: Sunday, November 2, 2008, 1:01 AM

I am Wayne A. Mercer President of Central Indiana Gold Prospectors Association of America. We are looking for a blacksmith in the Indiana area willing to help our group refine and use our black sands recovered during gold prospecting activities. These "black sands" are mostly Iron and various types of Hematite. We are having an outing November 9th details can be found here http://groups.yahoo.com/group/Central_Indiana_GPAA/. I know this is short notice... basically we would like someone to talk about blacksmiths and their art. Someone willing to help at a future outing with metal refining casting etc... {possibly at a location they select due to equipment requirements} would also be a huge help. Our group of prospectors has many pounds of black sands... a large quantity of which is magnetic and easy to separate from our other "concentrates" we would like to refine and use them with a blacksmiths help.

If you're interested in the "project" please email me at wam27in@yahoo.com thanks for keeping this old art alive!!!

Central Indiana GPAA President,
Wayne A. Mercer

(Second letter)

David,

Hello, here are the photos I promised to email you. They include one of myself with some black sands {and gold} in a pan, then a close up of the same pan, a photo of the "blue bowl" running w/ black sands, etc. The yahoo group also has a ton of photos of us in the field running dredges, highbankers, and panning if you want you can use any of them you like.

A little back ground on myself... I have been prospecting in Indiana the last 19 years. I was born and raised in Indiana. I am proud to be a Hoosier. This black sand project is for the purpose of showing what we can do with materials and artists from our great state. I am President of Central Indiana Gold Prospectors Association of America.

Let me know if you need anything else for the story. Thank you for all your help I really look forward to this project!

Central Indiana GPAA President,
Wayne A. Mercer



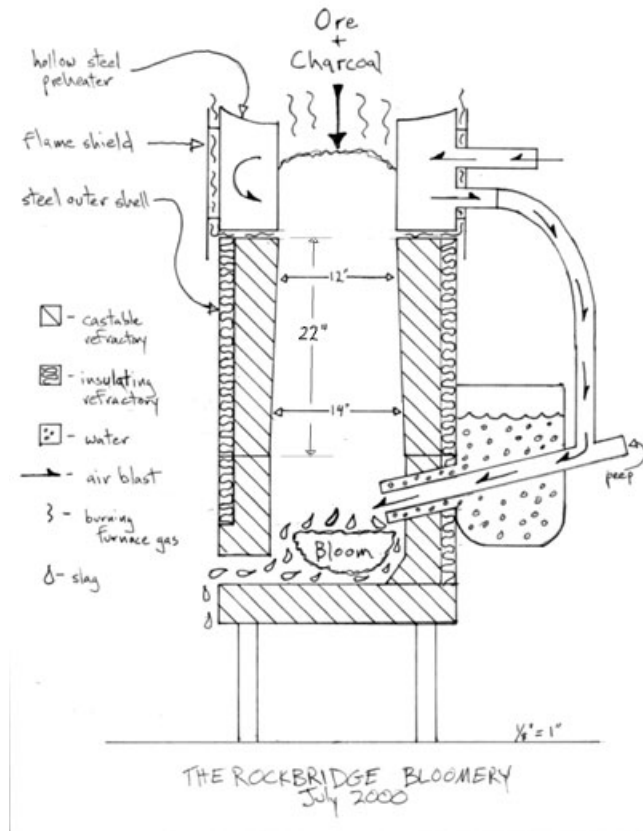
Above are Wayne and a sample of black sand in a prospecting pan.

The following is a bit off the internet about a simple bloomery. I am hoping to try a smaller simpler design. - DEC

This little iron smelting bloomery was inspired by the opportunity to work with Darrell Markewitz and Michael McCarthy at the Pre-Industrial Iron Symposium, Farmer's Museum Cooperstown NY in October 2004. Darrell constructed a very small and tidy Viking influenced bloomery that was a joy of sound and sight to operate

<http://www.pipcom.com/~dark/iron1004/index.htm>

Returning home Lee spied an old chimney flue liner in his blacksmithing ephemera and decided to see how small and inexpensive a bloomery he could build. This is it. I'll try to give you enough details in what follows so that you can build one for yourself!



Construction

The bloomery stack is simply a single 2 foot tall ceramic chimney flue liner available at your local brick store. This type of liner is a decent refractory but will crack and fall to pieces if we don't do something to hold things together. To prevent this tendency toward self destruction, Lee wrapped the liner with rebar wire (chicken wire should be ok) and plastered over the wire with an inch thick layer of fire clay mixed with charcoal dust and chopped straw just to hold things together (fire clay is also available at the brick store). The furnace was dried by burning a small fire both inside and outside of the liner. Not much to it!

Build your furnace on sand, gravel, a slag pile, anything that will keep it dry and insulated from the moisture of the earth. Inside this furnace there will be 1300 degree C slag right down to ground level. Possibly the most effective type of insulation is that of the Japanese Tataka furnace which is built upon a deep bed of pounded charcoal and ashes.

Air Supply

Operating conditions in the furnace are controlled by monitoring the charcoal burn rate. The actual type of air supply is not important. We use a two stage vane compressor because we happen to have one but anything, a small bellows, a squirrel cage fan, or a shop-vac should be fine.

Air is supplied to the bloomery through a tuyere (pronounced with a southern accent - tweeer) In these pictures we are using a copper tuyere which was made by forging a tapered tube from a bar of copper that was approx. 1/4 inch thick. The hole at the interior end of the tuyere is 3/4 inch across. The end outside the furnace has a removable sight glass through which you can watch the smelt progress. You will need to periodically remove the sight glass and clean the tuyere when it is blocked by slag.

Another option: Darrell Markewitz has had good luck using a black iron pipe. If anyone can figure out how to hand make a clay tuyere we would like to know how to do it, please email us.

Materials for the smelt

Minimum 150 lbs. wood charcoal of any sort is fine. Have your students, volunteers, people who just show up, break the charcoal into lumps smaller than a walnut. Screen out the dust so that no one will have their hair and eyes burned by flying ash during the smelt.

50-80 lbs Iron ore, roasted at a bright red heat but not hotter to drive off the water, and then broken to pea size. We don't bother to remove the dust. Everything goes into the furnace.

Operation

Preheat:

Slowly preheat the furnace for one hour with dry wood and no forced draft. A faster heat up just encourages the self destructive tendencies of the ceramic liner. Fill the furnace to the top with the charcoal you prepared. Turn on the forced air (but still at a low blow rate) and let the bloomery heat up for 20 minutes. Refill the stack with charcoal as needed. The tuyere should be inclined about 20 degrees from horizontal.

Smelting:

The bloomery is operated by adding equal weights of charcoal and ore to the top of the stack. We add 4 lbs charcoal and 4 lbs ore whenever the level in the stack permits. Adjust the air flow so that charcoal and ore are added about every ten minutes (that is 24 lbs ore per hour) Three to four hours of operation should produce a decent bloom.

Burn down:

Add another ten pounds of charcoal after your last ore charge and then let the charcoal in the stack burn down to the tuyere level. Stop your air supply and remove the tuyere. A copper tuyere might melt and should be pulled from the furnace anytime air is stopped!!!

Extracting the bloom:

A large bloom will be present a few inches below the tuyere and will be stuck to the walls of the furnace. You may be able to pry the bloom loose and remove it through the top of the furnace. If not just pull the furnace over and push the bloom and slag out of the bottom.

Results of the Rockbridge Bloomery smelt #55:

Smelt #55 resulted in a bloom and furnace bottom that weighed 50 lbs.

The bloom weighed 24 lbs.

Total ore 80 lbs.

Total charcoal consumption 127 lbs.

Total time 6 1/2 hours preheat to removal of bloom.

Tuyere angle 22 degrees from horizontal.

Best of luck with your smelting. Please email feedback to skip@wlu.edu

Announcements

The Rocky Forge News is available by E-mail and on our website (<http://www.rockyforge.org/>). If you wish to receive the newsletter via E-mail sent Dave Childress a note at trollkeep@gmail.com, or e-mail directly to rocky@rockyforge.org.