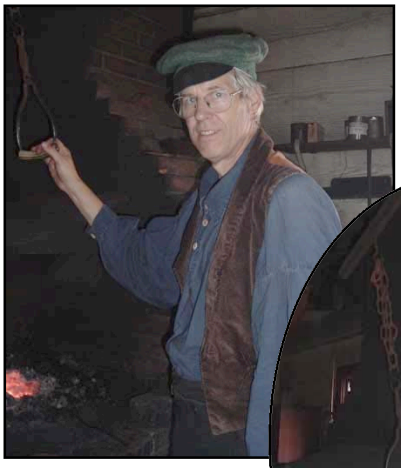
Official Newsletter of the Fort Vancouver Trades Guild

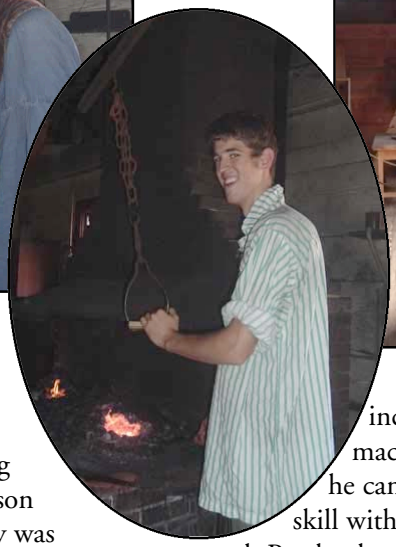
THE forge & plane

VOLUME VI, NUMBER 3 SUMMER 2008

Welcome to Some New (and not so new) Faces!

GARRY AND TYSON BENNETT are a father-son team who work in the Blacksmiths' Shop on Thursday afternoons. Like many volunteers, Garry and Tyson first came to the Fort as visitors, then decided it would be fun to volunteer. Tyson is home-schooled. He sees time spent in the shop as an opportunity to develop social skills (interpretation), expand his technical knowledge of tools, and examine history from a blacksmithing perspective. When I met the pair, Tyson was working on a trammel and Garry was making punches. Garry and Tyson live in Brush Prairie, where Tyson has plenty of company with a brother and five sisters. Both father and son enjoy the outdoors and spend as much time as possible bow hunting.





The Dynamic Duo
Garry Bennett *(above)*
Tyson Bennett *(right)*

JERRY (GERALD) ARMSTRONG has been volunteering in the carpenter's shop for more than a year, and *F&P* is sorry not to have caught up with him sooner. Jerry already had considerable experience with metalworking, including welding and machine and foundry work, so he came to the shop to hone his skill with wood. He was raised in north Portland, and "bounced around Montana for awhile" before returning to this area. Jerry is retired after thirty-plus years with the company now known as Qwest. He enjoys spending Saturdays at the Carpenters' Shop and interpreting some of the Fort's simple and ingenious period tools for visitors. Jerry lives in Vancouver with his wife and son. A grown daughter lives in Portland. ♦

Photos: S.Gawecki

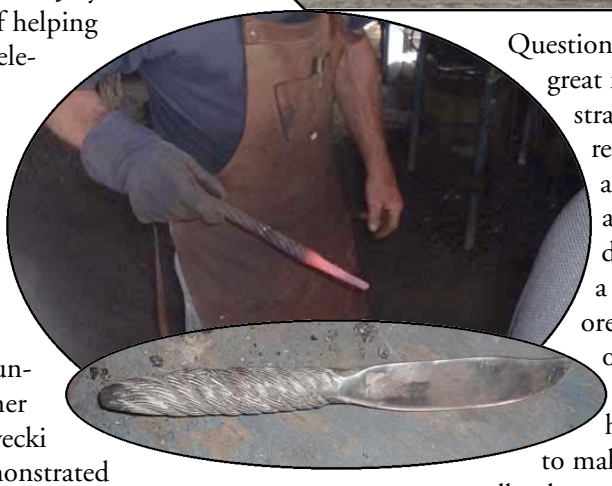
Jerry Armstrong

Busy Summer for Off-Site Blacksmiths

Clockwise from left:
Bob Connor and apprentice smith
Steam tractor making tracks
Dean Moxley's cable knife under construction and (inset) finished

Photos: S. Gawecki

GUILD MEMBERS spent a busy summer promoting the craft of blacksmithing and its history at Fort Vancouver. On hand for the Great Oregon Steam Up were Dennis Torresdal, Neil Pope, Dean Moxley, Glen Stollmeyer, Ralph Hinds, Garron Guest, Bob Race, Jeff Botts, Don Kemper, Bob Conner, and Gary Lewis. Dean made a cable knife as a demonstration project for visitors to the Steam-Up forge, and people who worked July 27 had the good fortune of helping Don Kemper celebrate his 75th birthday! For Blacksmiths Day and Farmstead Day at Champoeg, July 19 and August 30, volunteers Bob Conner and Susan Gawecki once again demonstrated blacksmithing from the portable forge. (Founding Guild member David Stearns also stopped by on Blacksmiths Day to give a brief demo.) Bob Conner had more than a few young participants wielding the hammer to put heads on nails. It is very evident that young visitors love to participate and take home the nails they've made as a souvenir of the day at Champoeg.



Questions from visitors are one of the great rewards and challenges of demonstrating blacksmithing. It often requires some imagination and creative imagery to frame appropriate answers, especially for young children. At Champoeg, for example, a young mother asked that "iron ore" be explained to her five-year-old. The child was asked to imagine driving by a place where earth had been cut away by bulldozers to make the road. If the dirt in the roadbanks was red dirt, then there was a good chance that there was iron in it, and that's just what "iron ore" is — dirt with iron in it! ©

Photo: Rob Lewis

Shelton Browder at the Anderson Forge

Shelton Browder Returns for Fall Workshop

COLONIAL WILLIAMSBURG blacksmith Shelton Browder is returning this fall to do another demonstration workshop at the Fort forge. Shelton, who has been practicing the craft since 1985, has been employed at Colonial Williamsburg's Anderson Forge for the past fourteen years. Projects at his Fort Vancouver workshop last year included a traditional nail header, a hacksaw frame, and a "buzz" or "bruzz" — a wheelwright's cornered chisel for making tenon holes in a wagon hub.

The three-day workshop will be held from Thursday through Saturday, October 30 – November 1. It lasts from 9:00 AM to about 5:00 PM, with a break for lunch. Fees, payable at the door, are the same as last year: $20 per day, plus a one-time surcharge of $10 for those who are not Guild members. Please join us (and bring a friend) for this unique opportunity to learn from one of the country's foremost craftsmen. ♦

Photo: S.Gawecki

Old-style yard sale? No . . . Carpenters' Shop cleanup!

The Great Carpenters' Shop Cleanup

GUILDmembers pitched in on June 28th to give the Carpenters' Shop its first spring cleaning in quite a while. Sawdust flew as the Fort pickup was loaded with scraps for the woodpiles. The shop interior is now neat and orderly for visitors. (Our mothers would be proud.) In addition, volunteer Jerry Armstrong has spent some time over the past year on the treadle lathe, adding counterweights to the wheel, which has improved it greatly.

The list of current projects for the shop is long, so please get in touch with Ranger Marv (360-816-6230, marv_binegar@nps.gov) if you can lend a hand. Ranger Marv has also developed a *Carpenter's Shop Primer* for volunteers. Please contact him if you volunteer

Stone Tool-Making Demo

GUILD MEMBER Dennis Torresdal was a demonstrator at the Ridgefield National Wildlife Refuge, where he participated in Traditional Technology Day at the Plankhouse. Dennis demonstrated stone tool making by flintknapping. His emphasis was on flaked tools, such as projectile points, small scrapers, and knives similar to ones recovered from Cathlapotle and other nearby sites of the Chinook Culture. ♦

Photos: S.Gawecki

Hammer-In at Harry's

GUILD MEMBER Harry Newton hosted what everyone hopes will become an annual hammer-in July 12 at his home, outside Battle Ground, Washington. Hauling around forges and anvils always requires engineering and effort, but Harry has definitely fine-tuned the process. Everyone enjoyed the shade under the pine trees, and we were even lucky enough to have a breeze. Pine trees, open fires, and a nice breeze . . . that's our little secret from the Forest Service. ♦

Above: Hammer-In host Harry Newton at the keyboard

Right: Only blacksmiths come out to play in 100°F heat. Jac Arnal (L) and Gary Lewis (R)

EVENTS FOR BLACKSMITHS

NWBA Fall Conference

Skamania County Fairgrounds
Stevenson, Washington
September 26 – 28
Additional information: see third quarter issue of *Hot Iron News* or contact
Tim Middaugh: 509-493-4418
tim@oldwestforge.com
or Mike Neely: 360-513-1355
nbforge@iinet.com

Williamsburg Weekend with Shelton Browder

Fort Vancouver National Historic Site
October 30 – November 1
See page 3 for details.

Meridian Forge Classes

Forge Welding in a Gas Forge
October 4 / Darryl Nelson ($125)

Forging Animal Heads
October 24 – 26 / Darryl Nelson ($350)

Tools for the Artist Blacksmith
November 8 – 10 / Mark Aspery ($350)

Traditional Forged Leaves
November 14 – 16 / Mark Aspery ($350)

MERIDIAN FORGE, EATONVILLE WASHINGTON
Additional Information: 360-832-6280, 253-318-1842
firemtforge@hotmail.com

Blade Show West

Monarch Hotel and Conference Center
12566 S.E. 93rd Avenue
Clackamas Oregon
September 26 – 28

User-Made Tools

Ike Bay

IN MY OPINION, bench work is much more enjoyable when using tools of your own making. Tool-makers can easily craft many of their own tools, including chisels, scrapers, turn screws, planes, and carving knives. The focus of this article is chisels. Rather than being a detailed step-by-step guide, the objective is to give readers a running start on something best learned by doing. And, although failure is sometimes the best teacher, we hope to keep that to a minimum. Our goal is tools that function well, look good, and feel good in the hand.

Research

A little book learnin' always helps. Wayne Goddard's *$50 Knife Shop* is a great way to start. *The Wonder of Knife Making* is also very good, but if your limit is one book, go for the *$50 Knife Shop* (available from the author at wgoddard44@comcast.net). *The Complete Modern Blacksmith,* by Alexander G. Weygers (Ten Speed Press), combines three separate books: *The Making of Tools, The Modern Blacksmith,* and *The Recycling, Use and Repair of Tools. The Making of Tools* is more directed to chisels, but all are worth owning.

Tools for the Trades and Crafts, published by Ken Roberts, and *Explanation or Key to the Various Manufactories of Sheffield, and Engravings of Each Article*, by Joseph Smith, published by The Early American Industries Association, provides great detail on the look of tools made in the period. (Most of my tools do not attempt to be period-correct.)

Making & Mastering Wood Planes, by David Finck (Sterling Publishing), is a detailed book on the Krenov "sandwich" method of plane making. *Wood Planes and How to Make Them,* by Perch and Lee, (Algrove Publishing) covers a wide range of traditional and contemporary methods. (My own experience with the sandwich methods has been very positive.) *Tool Making for Woodworkers.* by Ray Larson (Cambium Press), covers more than just forming and heat treating tools. *Making & Modifying Wood Working Tools,* by Jim Kingshott (Guild of Master Craftsman Publications, Ltd.), goes beyond the simple, but why limit yourself? With interlibrary loan you should be able to get any of these books to examine before you buy.

Recycled tools

There are a lot of secondhand tools out there that can be cleaned up or even reshaped into something very useful. Cheap chisels from Harbor Freight, cleaned up and re-heat treated often perform quite well. A new handle adds to the custom-tool look and function.

Scrap Steel

A wide variety of scrap is available. I prefer simple carbon steels and avoid the fancy alloys. My heat-treating methods and sharpening systems are all suitable for simple carbon steel, and the finished tools perform well. Sources of scrap carbon steel include buck rake tines, potato digger chain, coil springs, old files, and lawn mower blades, to name a few. Most plentiful and easiest to obtain are garage door springs. Most repair shops will give away the broken sections. (Even if they want a few bucks, you are well served.) Heat a good section just into the orange range, place on a pipe or rod, grab the hot end with vise grips and pull. You will be amazed at how easily the coil unwinds. (Be

Sources of scrap carbon steel include buck rake tines, potato digger chain, coil springs, old files, and lawn mower blades, to name a few. Most plentiful and easiest to obtain are garage door springs.

sure that your setup keeps you from getting burned.) Quarter-inch round stock will easily give you a cutting edge up to ½ inch wide and ⅛ inch thick. If you need a larger cutting edge, use larger stock. Folding over and forge welding will also create extra mass on the end, but that may take some practice. You need ample stock to experiment with to insure good results.

New material is not expensive, and you have the advantage of knowing exactly what it is. Knowing the steel specs is a *great benefit*. Many people use heat-treating specs for W-1 or O-1 as a guide on carbon scrap steels (see box). It is evident that 400°F is a good starting point. You know the feel of your best tools on your sharpening stones. You want what you make to be the same and to save you the cost of fancy testing equipment. Too hard and the tool breaks in use, too soft and the tool won't hold an edge.

Handles

Small bits of hardwood are everywhere. It just takes some effort to turn them up (try cabinet shop scraps, tree-prunings, pallet wood, firewood piles, etc.). Ferrules from brass, copper, or iron tubing and fittings work well. Brass compression nuts come in a wide range of sizes. Make the area to take the nut/ferrule slightly oversized, so the nut can be screwed on and snuggled up to the shoulder. Once it is in place, turn the flats on the nut to round. Metal electric conduit is thinner-walled than iron tubing and easily filed. Put a slight taper to the handle and drive it onto the ferrule. Weygers' book tells you how to convert a drill press to function as a wood lathe for turning tool handles: fit the ferrule first, then turn the rest of the handle. This allows you to make corrections if the first attempt to set the ferrule fails.

Tempering Temperatures, °F

W-1

350° = 63-65 R_C

400° = 62-64 R_C

500° = 58-61 R_C

O-1

300° = 63-65 R_C

350° = 62-64 R_C

400° = 61-63 R_C

450° = 60-62 R_C

500° = 58-60 R_C

(R_C stands for Rockwell C-Scale)

Design and preparation

Start with a drawing and a clear idea of how the tool will fit and feel in your hand. Test new designs with handle prototypes made from softwood. Forge or stock-remove to match your drawing or else the project may get away from you. Things that look OK hot may turn ugly when they are cold and viewed closely in your hand.

Gary Brumfield's inletting chisels have a 3-inch long handle, about 1 ⅛ inch outside diameter at the widest part. (For lots of detailed pictures, go to *www.flintriflesmith.com* > tools & techniques > shop made chisels.) The blades extend from the handle 4 ¼ inches, or more. Notice the clean fit lines between the tang and the washer. Everything is well fitted, a quality job all around. When you use the chisel with a mallet, the holding hand covers most of the handle and some of the upper blade. Commercial handles for carving chisels tend to be longer, but I find Gary's blade-to-handle ratio very pleasing. (These tools are actually what got me into the make-your-own mode.)

Production Suggestions

Are you going to use stock removal, forging or both to make your tools? Sometimes a few minutes with a file is easier than spoiling a forging. For example, forging the base of the tang often leads to trouble: better to pull a double taper and form the shoulder with a file. Viewed from the end, my tangs are a diamond in a square or round, so I get four good shoulders to hold the washer.

Making a tight washer is a lot easier than forging/filing a bolster to keep the tang from splitting the handle. (See website photos

of Gary Brumfield's chisels made from W-1 drill rod ¼-inch square)

Hand file the rough forgings rather than trying to use a grinder, which may prove to be too aggressive. Hand filing will reveal the true quality of your forge work: good forge work is very very close to final form.

A little fancy file work can really improve the looks of a tool.

Forge the bevel on the end of the blade. Most of my carving chisels have a 12-degree angle. The material spreads on the sides and front, which accommodates filing to set the outside edge profiles.

Ike Bay's Hand-Made Tools

Push the radius into gauges rather than beating it in. A forming tool and light hammer blows give better control.

Introduce the material to the heat behind the end of the bar. Both in forging and heat treating, you do not want to overheat the end.

Small chisels can be very tricky to heat treat because a even little too much heat can take you past the desired range (a major reason to use the "toaster oven" approach detailed in Goddard's book).

Quench simple carbon steels ¼ inch thick, or less, either in oil or Goddard Goo. Water-quenching runs the risk of cracking.

Don't final form the cutting edge before heat treating. Leave some extra mass to be removed after heat-treating to eliminate any decarbonized material

For handles created from prunings, avoid the center of the limb: it's too prone to split

Anneal and remove the teeth on files before you forge them, to avoid driving the cut into the metal, which could result in cracking.

SAFETY FIRST, but always remember to have fun! ♦

More Common Household Items Useful in the Shop

Club Soda – To improve their performance, substitute club soda for water when mixing soluble oil-type cutting fluids used in drilling or machining.

Cocoa Butter Soap – Can be used as a lubricant in metal spinning.

Dishwashing Liquid – (Dawn Blue preferred). An ingredient used in making Robb Gunter's "Super Quench" formula for hardening mild steel. (For details see: *http://www.cvbg.org/tips/superquench* >PDF Quench)

Eggs – Use to test a brine quench for proper salinity: toss a couple of uncooked eggs into the water as salt is added. Eggs will float when the proper salt level is reached.

Hand Soap – A bar of soap makes a good lubricant. Dry rubbing some on sliding surfaces will improve the operation of threaded fasteners, nails, saw blades, drawer and window slides, etc.

Hydrogen Peroxide – Commonly available in a diluted solution of about 2.5%to 3%. It is a weak acid and strong oxidizer. Primarily used as a disinfectant but also can be used to remove certain stains and to bleach certain materials. Used in metalworking to color some metals and to remove rust from iron. Several formulas for its use can be found on

Household Items *reprinted from* The Upset, *September 2007, published by the Mississippi Forge Council. The MFC and author Tommy Ward urge readers to inform themselves about the chemicals and use them responsibly and safely. Watch for the continuation of this fascinating list in future issues of* The Forge & Plane. — *Editor*

Field Trip: Oregon Barrel Works

Jerry Armstrong

ON AUGUST 21, 2008, Marv Binegar procured a van and drove a small group of volunteers to the Oregon Barrel Works in McMinnville, for what was to be a fascinating educational experience. We learned not only the basics of barrel making but also a very good lesson in entrepreneurship. Who might want a custom made barrel? Wineries, for one. In order to enhance the flavor of their wines, some request barrels that meet a set of very exact criteria: for example, barrels made with wood taken from a particular forest in a particular area of a foreign country, or barrels roasted to a particular finish. In addition, wine barrels are used at most for three seasons, so wineries are good repeat customers.

Photo: Marv Binegar

Spraying the barrels to control heat and moisture

Our host, Oregon Barrel Works owner Rick DeFerrari, was very generous with his time and knowledge, explaining how raw sticks turn into barrel staves, and how these turn into a finished custom-made barrel. As a young man, Rick discovered a niche market. His education was in forest management and his early work experience was in the wine-making industry. While touring in Europe after college, he was invited to work and observe at a cooperage. What was intended to be a week-long stay became a month, then a year, and finally 18 months. Working at the cooperage, Rick realized that Oregon Oak, an underutilized species, might be the perfect raw material for barrels for the wine industry. Returned to Oregon, he started a small business supplying raw stave material to cooperages. Then his clients requested finished staves. Rick imported some ancient machinery from France, upgraded obsolete drive systems from flap belts to electric and hydraulic power, and went to work. Some of the machines were nearly a century old, and maintenance was a problem, so he enlisted a retired machinist to help keep things humming.

Of course, Rick soon realized that if he was making the finished staves, why not make the barrels? After importing more old machinery, making upgrades and investments, and training an expert crew, the Oregon Barrel Works is producing several hundred barrels a year. They also produce inserts (wood used to flavor wine stored in older barrels or in stainless steel vats).

Oregon Barrel Works creates very little waste. Only the best wood goes into the staves because any defect can cause a stave to break when it is bent. Inserts are made from stave seconds. Fuel for fires to heat staves prior to bending and for roasting the barrels comes from stave ends and other scrap. Wood chips go to market. The whole operation is energetic, efficient, noisy, and hard work.

Much of the manufacturing is hand work. Each stave is machined and fitted, then staves are hand-fitted to a heavy forming ring. The future barrel is set loose ends down over a small fire and sprayed with water to control heat and the moisture content of the staves until it reaches the correct temperature. A steel cable is wrapped around the barrel and tightened with a hydraulic ram to force the loose ends together, then another forming ring is placed on the bottom and the cable is released. The finish steel hoops are hand fitted and driven into place, sometimes with tools from the late 1800s. Barrel openings are measured with a divider, and each end plate is custom cut, since diameters may vary slightly. The assembled barrel is leak-tested, then the central steel hoops are removed for sanding with hand power tools and a large belt sander mounted over a barrel fixture that rotates horizontally. After sanding, hoops are replaced and driven in place by hand, then a brand is burned in electrically. The final product is strong, functional, and aesthetically pleasing: a worthy example of an essential craft that dates back two thousand years. ♦

Left to right: Jerry Armstrong, Oregon Barrel Works owner Rick DeFarrari, and Ike Bay *(Photo: Marv Binegar)*

FORT CALENDAR

September

Run for the Reserve
Land Bridge connecting Columbia Waterfront
to Vancouver National Historic Reserve
Saturday, September 20, 8:00 AM – 10:00 AM
www.historicreserve.org

October

Washington & Oregon Archeology Month Walking & Collection Tours
www.oahp.wa.gov

Kids Dig
Fort Vancouver
Saturday, October 4, 11:00 AM & 2:00 PM

October

Cultural Demonstration
Bobbin Lace and Lacemaking
McLoughlin House, Oregon City
Saturday, October 11, 12:00 PM – 4:00 PM

Tales of the Engagé
Saturday October 11 and October 18
7:00 PM & 8:00 PM
A "campfire program" of the 1840s with the engagés of the Hudson's Bay Company

Spirits of Oregon City
McLoughlin House, Oregon City
Saturday, October 25, 6:00 PM – 9:00 PM
Spooky, but not scary! A mobile theater tour of several heritage sites, including Mountain View Cemetery.
$15/person.
Reservations recommended 503-655-7141

For more information on any events
360-816-6230 or *www.nps.gov/fova/home/htm*

Resources for Blacksmiths

Hand Forging and Wrought-Iron Ornamental Work, by Thomas F. Googerty. Lindsay Publications (Box 538, Bradley IL 60901; 815-935-5353; *www.lindsaybks.com*), 2005. 197 pp., illus., $10.95. Reprint of a 1911 Arts & Crafts text describes the basics of forge work and various forms of welding, twisting, and embossing to make drawer pulls, hinges, door plates, iron lamps, and more.

Smith's Work with Numerous Engravings and Diagrams, Paul N. Hasluck, ed. Lindsay Publications, 2005. 160 pp., illus. $9.95. Reprint of 1899 handbook on the art of the blacksmith.

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THE forge & plane

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