

EUGENE 5160 CLUB ~ SEPTEMBER 2019

<https://www.facebook.com/5160Club>

newsletter archive: <http://www.elementalforge.com/5160Club/>



SEPTEMBER MEETING

Thursday September 5th – 6:00pm at David Thompson's shop. Please do not arrive before 5:45pm. If you didn't get the directions in the meeting notice, email me for them: michael@elementalforge.com

I'm caught up in end-of-Summer stuff and won't make the meeting – Mike Johnston will be wrangling the meeting and taking notes for the next newsletter. Thanks Mike!

Bring your show-n-tell!

Request from the Thompsons:
“Please **drive very slowly** down our lane. The maintenance is all ours. Thanks.”



NOTES AND REMINDERS

Check out the “Classes for Knifemaking, etc.” section at the end of the newsletter for offerings around the region. Let me know if there's more that I should add to this list.

David Thompson – has coke and coal for sale (near Jerry's in Eugene, OR) – Talk to him at one of our meetings or call 541 688-2348.



AUGUST MEETING

TRYSTAN was first up (check out the chain mail shirt he made).

“I've always wanted to make my own sword... I've made a couple but something usually happens half way through the process... this one turned out pretty well...”



Frank Bobbio helped him with getting the guard soldered on. At the hammer-in Trystan got some mentoring on engraving and inlay – and used that knowledge to inlay copper in the guard and handle.

The blade is 5160 that he ground on a 2”x72” grinder he built from a treadmill. Trystan noted that the 3hp motor on the treadmill is not sealed, and you need to blow the dust out occasionally to keep it going.



He uses skateboard wheels on his grinder – which wear out after a while. He has found that using 500°f silicone lubricant keeps them going longer. Folks suggested getting bearings from McGuire Bearing Company in west Eugene – or from a water pump.

A couple of folks recommended 2”x72” grinders from Origin Blade Maker aka Oregon Blade Maker if you can pony up for it.

In response to a question Trystan said he took the blade up to 600 grit Trizact belt on the grinder, then back to 400 grit sandpaper.



The pommel-piece is a sphere of rainbow obsidian Trystan saw at a rock shop in Salem – which inspired him for this sword design.



“How did you heat treat the blade?” someone asked. Trystan took the ammo-can-forge that he started out with – put it end-to-end with his new ribbon burner forge and that gave him a long enough chamber to heat the blade to critical and quench in oil.



MARTIN BRANDT came forward next – with a work-in-process blade. “This one's been here before... it's a san mai blade with chainsaw Damascus on the outside and a piece of Wayne's Black Diamond file scraps in the middle...” He's re-ground it to eliminate a flaw.

Martin tried out Frank's process for setting a ferric chloride etch by boiling – seemed to work well,

though since all of the steels are high carbon it produced a low contrast etch.



It was noted that boiling water (212°f) would not be hot enough to change the tempering of the steel.

Martin remembers that Wayne would torch the tip of his blades to peacock blue – so that they would pass his “concrete drop test”... if you drop the knife tip first onto concrete from about 4' will the tip break or chip – or be just fine?

Martin noted that the rhombic grind on this puukko is common in some areas of Scandinavia.

FRANK BOBBIO was up next, and started out with a handsome hunter: ATS-34 with Paul Bos heat treating. Silver guard and pommel, turquoise and stag handle.



This is one of Frank's early knives – from 1991 or 1992.



Frank then brought out a couple of venturi burners (no fan involved). One is a T-Rex that Frank bought from me years ago – the other is his copy of it.

He has worked with other versions of “atmospheric” burners like this – with and without tapers.



Frank went into details on the construction of this burner. And there was quite a discussion on burner design pros and cons.



LYNN MOORE had a couple of things for us: first was a new work knife that he forged at last year's hammer-in. The steel is the bearing race from the rear end of his pickup that needed new bearings. The handle is walnut burl and ebony joined in a V with a stainless spacer. The stainless does not touch the steel of the blade, and there are

no pins in the handle because Lynn (being an electrician) wanted the handle to be insulated from the blade.

In response to a question about doing the V layup Lynn explained that he rough cut the blocks with a bandsaw, then used a speed square (45° angle) on his grinder to clean up the cuts. "It came out just perfect" and he did not need to do any further tweaking for a snug fit - "I was surprised!"



The next pass-around was a work-in-process. The blade is from the circular saw blade that Dennis Ellingsen supplied the group with. Stock removal for distal taper and profiling. The handle wood was a bit of a mystery – probably from Wayne Goddard.



"One of the things when you make a knife like this – you want to get the front of the handle finished first – and you want to get the blade [where it meets the handle] finished – before you glue it – so you're not

trying to [do finish] work on that area once you've got it glued together because if you work on one you're going to mess up the other! So you want to get as close to 100% there as you can [before gluing up]." Lynn noted that he cleans up any excess glue in the bolster area with acetone and Q-tips.

There was discussion about etching a full tang knife after assembly. If you were to etch before assembly any etching on the tang of a full tang knife would be sanded off in the final shaping of the handle after glue-up. One person noted that it can be done by careful masking of the wood with fingernail polish. I'd assume you'd want to use clear polish in case some got into pores in the wood. Finishing wax might work also. Also some synthetic handle materials can be immersed in etchant without damaging them.

Lynn's third pass-around was another work-in-process from saw blade. It's been profiled, tapered, beveled, and heat treated.



Lynn's next sharing was one of six or seven of his early knives from 2002 with blades out of ATS-34 stainless. He made this one for his dad and got it back from them when visiting recently.



He also got back a railroad spike knife (photo on next page). Lynn noted that he's been playing around with the belt attachment on sheaths so that they rest on the belt at an angle.



Another knife he got back is a trailing tip style that Lynn no longer favors. He made this knife with his dad when they visited him in 2004. Maple handle. Brass pins.



His last pass-around was one of Wayne's knives that Lynn purchased. "They called it an ulu" but possibly it was inspired by a leatherwork head knife or skiving knife – or a lead knife used for cutting leading in stained glass.



PAUL HAINES was up next with a couple of new knives. Both in cable Damascus. The first one was his first time using elk antler.



The other one is a neck knife – Paul's version of a D.H. Russell bird & trout pattern:



Next up, Lynn helped this fellow at the hammer-in forge a blade from a tine off something like a spring-tooth harrow. This is his third knife – destined to be a camp knife.



The hidden tang on this respectable sized knife started a spirited discussion about the durability of a glued hidden tang versus through-tang construction. Martin Brandt talked about historical saexes almost exclusively having hidden tangs – and a lot of the parangs of Indonesia are hidden tang, out in the jungle where you don't want your blade flying off the handle.



STEVE GODDARD came to the front and presented me with a couple of bars of 5160 in thanks for the work I do for the club – Thanks Steve!

His first pass-around was a



camp knife in 5160 with sambar stag handle and mosaic pins. The butt cap is a piece of mokume gane that Wayne made at Gene Martin's place on a 5160 Club trip some years ago. Steve doesn't usually work with antler, and he noted that with antler scales you want to sand the inside down to the desired handle thickness *before* you glue it up so that you don't have to sand into the bark when shaping the handle. On the other hand, if you have to grind off some of the bark for whatever reason, you can jig the surface and dab it with potassium permanganate "and you'll never even know... it goes on purple and then dries brown."



Next Steve passed around another good sized blade with multi-wood handle, fitted with 45° chevrons. Copper guard.



There followed a lively discussion of soldering techniques for guards and bolsters and the importance of (1) using a good flux and (2) neutralizing the flux afterward. Boiling in water and baking soda or spraying/wiping with a 1:3 solution of ammonia and water. Some folks use a trisodium phosphate (TSP) solution.



Our next presenter, **ADAM** shared his first knife – which he completed shortly before our hammer-in. "This was a heck of a battle... I love it, I don't want to sell it, but it's already spoken

for." He started with O-1 steel but had some failures with that – this blade is 5160 type steel – from a '90s Jeep leaf spring.



Next he passed around knife number 3. A work-in-process Gurkha style knife. He noted that he's tested his heat treat by breaking off a bit to see the grain structure and it looks good!



"This one is my first hidden tang construction, and I'm in love with this one... this was a huge challenge too." Not quite finished on sanding and handle finish. 5160 blade, lacquered stabilized redwood burl. There was some discussion about various finishes, about home stabilizing, and about extending a handle with casting resin. Erik Land – a cabinet maker – cautioned that lacquer has some long term issues with being in contact with skin oils. Extra thin superglue was suggested for a top coat.



The next one to the front stated "I have a one brick forge in my shop – to make hooks and such... but I do make knives – I use a sander!" And proceeded to pull out a wooden knife and spoon. "I make these for the grandkids and the great-grandkids..."



He makes wooden forks as well as the knife and fork – and bowls etc. He shared some photos of a

granddaughter reacting to getting her wooden set:



He went on to say that he had attended the hammer-in “and watching Marty teaching and Lynn teaching! Do more of it! Teach these young fellows!”



And lastly, **ERIK LAND** plopped down a small box of give-aways: some buffing wheels, a chunk of sheer blade and a chunk of mystery material that nobody could really figure out what it was.

... and we broke up into informal conversations and wandered into the night...



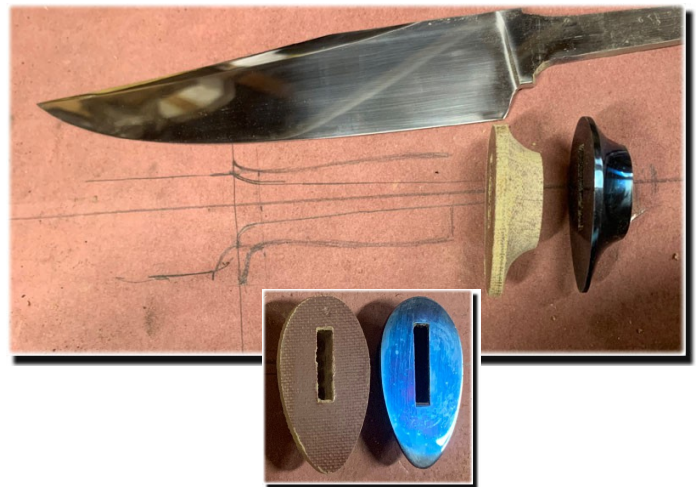
Have fun and work safe -

Your Scribe ~ Michael Kemp



A couple of notes from Mike Johnston – first,

How to fit up a stacked handle without damaging the heat blued finish on the steel guard? Make a sacrificial guard with the same dimensions as the steel guard! Micarta in this case. It fits tight to the tang but only took about 30 minutes to make. That's a lot easier than refinishing the heat blued steel guard and I can take the stacked handle pieces apart as needed to fit them.



And second, anybody want big chunks of steel or railroad spikes? There's piles available at:

Swift & McCormick metal processors inc
3192 NE Sedgwick
Terrebonne, Oregon
541 548 4448

Everything is \$.30 per pound. Large structural square tube, heavy plate, round stock and some smaller pieces of interstate railroad track (biggest stuff). You can walk around in the yard and pick out what you want (can't do that most places) if it's too big they can torch cut it for you (might charge a little extra).



WEBSITE LINKS

5160 CLUB

5160 Club Newsletters are archived at:
<http://www.elementalforge.com/5160Club/>

Hint: to Google the archive for a specific knife style or presenter name, use a search like this:

sami site:<http://www.elementalforge.com/5160Club>
or this:

ron lake site:<http://www.elementalforge.com/5160Club>

OREGON KNIFE COLLECTORS ASSOCIATION (OKCA)

The OKCA hosts monthly dinner meetings where you are guaranteed to see treasures from the wide world of “things that go cut!” OKCA also puts on a small show in December and the big knife show in April – if you haven't seen it you've been missing something special!

<http://www.oregonknifecollectors.org/index.html>

Go to the “Knewsletter” link and scan a recent newsletter for a membership form and contact info.

FORUMS

Bladesmith's Forum aka Don Fogg Forum

<http://www.bladesmithsforum.com/>

Knifedogs Forum (USA Knifemaker)

<https://knifedogs.com/>

American Bladesmith Society

<http://www.americanbladesmith.com/ipboard/>

Usual Suspects Network

<http://www.usualsuspect.net/forums/forum.php>

Blade Forums

<http://www.bladeforums.com/>

Hype-Free Blades

<http://www.hypefreeblades.com/forum>

Peter Newman of Bent River Forge/Farrier Supplies has a closed Facebook group: Blacksmiths of Oregon

<https://www.facebook.com/groups/blacksmithsofOregon>

REFERENCES

Wayne Goddard's books are available at Amazon:

<http://www.amazon.com/Wayne-Goddard/e/B001JS9M10>

And you can email the Goddards directly for his DVD at Sg2goddard@comcast.net

Most of the companies in the “Knife Maker General” links (below) have a section for how-to books and DVDs.

Verhoeven's Metallurgy For Bladesmiths PDF – this is a very deep dive, not an introduction. I no longer see the original free PDF – but here's the updated book on Amazon:

<http://www.amazon.com/Steel-Metallurgy-Non-Metallurgist-J-Verhoeven/dp/0871708582>

ZKnives – Knife steel composition/comparison/etc.
<http://zknives.com/knives/steels>

Kevin Cashen's Bladesmithing Info
<http://www.cashenblades.com/info.html>

Knife Steel Nerds – a metallurgist's blog on the technical details of steel
<https://knifesteelnerds.com>

Tempil Basic Guide to Ferrous Metallurgy
[http://es.tempil.com/assets/5/31/Basic_guide_to_ferrous_metallurgy_\(2\).pdf](http://es.tempil.com/assets/5/31/Basic_guide_to_ferrous_metallurgy_(2).pdf)

From the Heat Treating Society of the ASM – the Heat Treater's Guide Companion for Android devices.
<https://play.google.com/store/apps/details?id=com.pfiks.mobile.heattreaters&hl=en>

My own “Knife Info” has musings and cheat sheet charts – plus Oregon and Eugene knife laws:
http://elementalforge.com/tips_notes/

CLASSES FOR KNIFE MAKING, ETC.

Erik Olson is teaching intro to forged knives in Eugene. I don't have a business contact but his personal Facebook page is:
<https://www.facebook.com/erik.olson.77715>

Farrier Supplies aka Bent River Forge offers intro and advanced blacksmithing classes – and supplies. 26729 99W, Monroe, Oregon
Coal, coke, forges, parts, tools, classes...
<https://www.facebook.com/FarrierSuppliesOR>
(541) 847-5854

Gene Martin offers personal instruction at his shop south of Grants Pass for a daily rate.

<http://www.customknife.com/>

Bear Iron in Cottage Grove offers blacksmith classes through Lane Community College.
<https://www.beablacksmith.com/sign-up>

Michael and Gabriel Bell of Dragonfly Forge offer an ongoing series of small group classes in Japanese style sword forging and fittings. Located on the southern Oregon Coast.
<http://dragonflyforge.com/>

Murray Carter offers small group classes in a variety of subjects, primarily focused on traditional Japanese cutlery. Located in Hillsboro, Oregon.
<http://www.cartercutlery.com/bladesmithing-courses/>

White Hart Forge offers intro to blacksmithing classes plus some advanced classes and some intro to knife making classes. Oak Grove, Oregon (just south of Portland). <https://whitehartforge.com/classes/>

Blacksmithing and some bladesmithing workshops are hosted regularly by the Northwest Blacksmith Association: <http://blacksmith.org/>

David Lisch is an ABS Master Smith who teaches classes in Washington.
<http://www.davidlisch.com/>

The ABS (American Bladesmith Society) offers classes in Washington, Arkansas and elsewhere – if you are up for traveling across the country to take classes, check out their “Schools” link:
<http://www.americanbladesmith.com/>

James Austin offers forging classes in Oakland, CA – axes, tongs, viking anvil, etc.:
http://forgedaxes.com/?page_id=148

Keep an eye out on California Blacksmith Association for workshops and events:
<http://calsmith.org/CBA-Events>

USA Knifemaker has a lot of fun & informative videos on their YouTube channel:
<https://www.youtube.com/user/USAKnifemaker/videos>
... and hey - “free” is a hard price to beat!

Nick Wheeler also has a good YouTube channel with a lot of how-to videos:

<https://www.youtube.com/user/NickWheeler33/videos>

GENERAL TOOLS & SUPPLIES

Zoro

<https://www.zoro.com/>

MSC Direct

<http://www.mscdirect.com/>

McMaster-Carr

<http://www.mcmaster.com>

Grainger

<http://www.grainger.com>

Surplus Center

<http://www.surpluscenter.com/>

Victor Machinery Exchange

<http://www.victornet.com/>

Widget Supply - Dremel tools, needle files, craft knives, drill bits, etc – Albany, Oregon.

<https://widgetsupply.com>

And of course there are the local hardware stores like Jerry's, and chains like Harbor Freight and Woodcraft.

KNIFE MAKER GENERAL

Knife kits, steel, tools, machines, supplies such as handle material, fasteners, belts, glues, finishes, etc.

Jantz Supply – Davis, OK

<http://www.knifemaking.com>

Texas Knifemaker's Supply – Houston, TX

<http://www.texasknife.com>

USA Knife Maker's Supply – Mankato, MN

<http://www.usaknifemaker.com/>

Knife and Gun (K&G) – Lakeside, AZ

<http://www.knifeandgun.com/>

Alpha Knife Supply – Cedar City, UT

<http://www.alphaknifesupply.com/>

True Grit – Ontario, CA

<http://www.trugrit.com>

Especially Abrasives – lower cost 2x72 belts

<http://www.especiallyabrasives.com/>

KNIFE STEEL SOURCES

New Jersey Steel Baron

<http://newjerseysteelbaron.com/>

Kelly Cupples (High Temp Tools) – Alabama

<http://www.hightemptools.com/steel.html>

Niagara Specialty Metals – New York

<http://www.nsm-ny.com> (click Products/Knife Steels)

SB Specialty Metals – New York & Texas

<http://shop.sbsm.com/>

Sandvic – stainless steels – Texas & Pennsylvania

<https://www.materials.sandvik/en-us/products/strip-steel/strip-products/knife-steel/sandvik-knife-steels/>

Pacific Machinery & Tool Steel – Portland, Oregon

<http://www.pmtsco.com/tool-die-steel.php>

Alpha Knife Supply – Cedar City, UT

<http://www.alphaknifesupply.com/>

KNIFEMAKER EQUIPMENT

Beaumont (KMG) [Ohio] – the industry-benchmark 2x72 belt grinder

<http://www.beaumontmetalworks.com/shop/>

Travis Wuertz [Arizona] – premium versatile grinder

http://www.twuertz.com/Home_Page.php

Pheer [Gresham, Oregon] – affordable grinder made in Oregon

<http://www.2x72beltgrinder.com>

Origin Blade Maker – aka Oregon Blade Maker [Portland, Oregon] – affordable chassis and accessories, good reputation – with or w/out motor
<https://originblademaker.com>

AMK [Ohio] – affordable grinder, quick-change between platen & contact wheel
<http://amktactical.com/>

Northridge Tool [Ohio] – precision manufactured belt grinders <http://www.northridgetool.com/>

Coote [Port Ludlow, Washington] – affordable, simple grinder – you supply the motor
<http://www.cootebeltgrinder.com>

Marinus Kuyl [Hillsboro, Oregon] – another affordable grinder made in Oregon – and parts – you provide the motor.
<https://originblademaker.com/>

Grinder-In-A-Box – grinder kit, assembly required
http://www.polarbearforge.com/grinder_kit_order.html

The “No Weld Grinder” plans can be purchased from <http://usaknifemaker.com> either as a booklet or as a download – just use the search box to enter “no weld grinder”

Wayne Coe [Tennessee] – grinders, motors, VFDs...
<http://www.waynecoeartistblacksmith.com>

Contact Rubber Corp – wheels etc.
<http://contactrubber.com/contact-wheels.asp>

Sunray – drive wheels
<https://www.sunray-inc.com/products/wheels/>

Anyang [Texas] – air hammers from 20# to 165#
<http://www.anyangusa.net/>

Meyer Machine Tool [Ohio] – treadle hammer
<http://www.meyermachinetool.com/Blacksmith-div-.html>

Spencer/Clontz tire hammer plans/workshops
http://www.alaforge.org/Trading_Post.html

Helve Hammer and Quick-Change Dies Video – from a BladesmithsForum.com thread.

<https://www.youtube.com/watch?v=uzruqYkKGNM>

True Grit – under “All Products”/“Machines & Accessories”
<http://www.trugrit.com>

FORGE & REFRACTORY

Chile Forge
San Marcos, Texas
<http://www.chileforge.com/>

Mankel Forge – Muskegon, Michigan
<http://mankelforge.com/forges.html>

Mathewson Metals – forges, burners, anvils... Tacoma Washington
<https://mathewsonmetals.com>

Western Industrial Ceramics Inc.
All things refractory – Tualatin, Oregon
<http://www.wicinc.com/>

High Temp Tools (scroll down the page for the category buttons) Tuscaloosa, Alabama
<http://www.hightemptools.com/supplies-mainpage.html>

High Temp Inc. for Kaowool, castable refractory, fire brick up to 2,600°f, etc. Portland, Oregon
<http://hightempinc.net/>

Omega – thermocouples & measuring equipment Stamford, Connecticut
<https://www.omega.com/en-us/>

Auber – more thermocouples and controllers, etc. Alpharetta, Georgia
<http://www.auberins.com>

Hybridburners – home of the venturi T-Rex Smithville, Georgia
<http://www.hybridburners.com/>

Pine Ridge Burners – for ribbon burners and all associated fittings, blowers, valves, etc.
Conway, Massachusetts
<https://www.pineridgeburner.com>

Zoeller Forge – low cost venturi & parts: Z Burners
Lanesville, Indiana
<http://zoellerforge.com/>

Here's the original article on making a ribbon burners that John Emmerling wrote back in 2005 for the NWBA Newsletter:

<http://blacksmith.org/2005-1-hot-iron-news/>

You can download the PDF from that site. John's article starts on page 11.

BLACKSMITH

Farrier Supplies aka Bent River Forge
26729 99W, Monroe, Oregon
Coal, coke, forges, parts, tools, classes...
<https://www.facebook.com/FarrierSuppliesOR>
(541) 847-5854

Blacksmith Depot
<http://www.blacksmithsdepot.com>

Pieh Tool
<http://www.piehtoolco.com>

Centaur Forge
<http://www.centaurforge.com>

Quick and Dirty Tool Co.
<http://quickanddirtytools.com/>

LOGO/ETCHING/STAMPS

Ernie Grospitch – Blue Lightening Stencil
<http://www.erniesknives.com/>

IMG International Marking Group
<http://img-electromark.com/>

Marking Methods, Inc.
<http://www.markingmethods.com>

Electro-Chem Etch
<http://www.ecemmi.com/products.html>

Steel Stamp, Inc.
www.steelstampsinc.com

LectroEtch – Ohio
<https://lectroetch.com/>

HEAT TREAT SERVICES

Here are some folks who provide heat treating services for blades. While all of these have been recommended by one reputable person or another I have not had experience with them. If you use one, let us know how it went!

Paul Bos Heat Treating at Buck Knives. Paul Bos has retired and handed the torch to Paul Farner. Highly reputable. Post Falls, Idaho:
<http://www.buckknives.com/about-knives/heat-treating/>

Peters Heat Treating is another highly reputable operation. Meadville, Pennsylvania:
<http://www.petersheattreat.com/?s=cutlery>

Texas Knifemaker's Supply offers heat treat services. Houston, Texas:
<http://www.texasknife.com/vcom/privacy.php#services>

Tru-Grit provides heat treat services. Ontario, California: https://trugrit.com/index.php?main_page=index&cPath=34

K&G also provides heat treat services but I can't find a reference on their web site – you'll have to contact them for details. Lakeside, Arizona:
<http://www.knifeandgun.com/default.asp>

Byington Blades heat treat service is in Santa Clara, California: <http://www.byingtonblades.com/>

WOOD & HANDLE MATERIAL

Burl Source – handle blocks/scales – So. Oregon
<http://www.burlsales.com/>

Shelton Pacific – stabilized wood – Shelton, WA
<http://stores.sheltonpacific.com/>

Gilmer Wood – N.W. Portland
<https://www.gilmerwood.com/>

Bamboo Oasis – wide variety of bamboo –
Beaverton, OR phone 503-703-1345
<https://bambooasis.com/>

North Woods Figured Wood – Gaston, OR
<http://www.nwfiguredwoods.com/>

Atlas Billiard Supplies – Wheeling, IL – cue blanks
of Micarta and exotic woods – with some sizes
suitable for knife handles. <http://www.cuestik.com/>

For Eugene area boards, planks, etc. there's:

Crosscut Hardwoods at 2344 W 7th, Eugene
<http://www.crosscuteugene.com/>

Tree Products Hardwoods at 150 Seneca, Eugene
<http://treeproductshardwood.com/>

and it doesn't hurt to check Mike's Bargain Center on
Hwy 99 just south of Beltline, Eugene
<https://www.facebook.com/MikesBargainCenter/>

WOOD STABILIZING

K&G (Knife and Gun) – Lakeside, AZ
Good reputation with everybody.
<http://www.kandgstabilizing.com>

Gallery Hardwoods – Eugene, OR
<http://www.galleryhardwoods.com/stabilized.htm>

WSSI (Wood Stabilizing Specialists International,
Inc.) – Ionia, IA – some folks have had issues with
them, some folks are totally happy.
<http://www.stabilizedwood.com/>

Alpha Knife Supply – Cedar City, UT
<http://www.alphaknifesupply.com/>

Turn Tex Woodworks – San Marcos, TX
“Cactus Juice” and pressure chambers etc. for the do-
it-yourself folks.
<https://www.turntex.com>

OTHER GOODIES

Grey Leather Company – Eugene – Hannah Morgan
does custom leatherwork, including sheaths.
<https://www.facebook.com/GreyLeatherCo/>
<https://www.etsy.com/shop/GreyLeatherCo>

Sally Martin Mosaic Pins – So. Oregon
<http://customknife.com/index.php?cPath=13>

Oregon Leather – 810 Conger Eugene and 110 N.W.
2ND Portland
<http://www.oregonleatherco.com/>

Coyote Steel – wide variety of new steel, scrap,
copper, brass, bronze – Garfield & Cross St. Eugene
<http://www.coyotesteel.com>

Burcham's Metals – Albany, Oregon – recycled metal
of all sorts. Very good pricing.
<http://www.burchamsmetals.com>

Cherry City Metals – Salem, Oregon – metal
recycling and useful objects
<http://www.cherrycitymetals.com/>

Amtek – tool steel & cutting tools
<http://www.amteksteel.com/index.html>

Rio Grande – jewelry tools/supplies
<http://www.riogrande.com>

Otto Frei – jewelry tools/supplies
<http://www.ottofrei.com>

M3 Composite – space age mokume & other
<http://www.m3composite.com/>

Voodoo Resins – striking resin handle material
<http://www.voodooresins.com/>

The Engineering Toolbox (formula & info reference)
<http://www.engineeringtoolbox.com>

Valley Stainless (that does water-jet cutting) is one of Craig Morgan's customers. They told Craig “bring in a pattern” and they'd work with you on small batch cutting. They don't have a website yet. 29884 E Enid Rd, Eugene, Oregon 97402 (541) 686-4600.