

The Drift

Edition 103

NOV 2016

Quarterly newsletter of
The Australian Blacksmiths
Association (Victoria) Inc.
Reg. # A0022819F

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Note for your calendar
Sunday 11th December 2016

Extraordinary General Meeting
"Swap and Sell"
Christmas Break-up BBQ

A Fond Memory

Rick Stadler

I unearthed a photo from an ABA event at Hoddles Creek some years ago that brought to mind a fond memory of one of our earliest members, Bill Bunting.



Rick Stadler, the late Bill Bunting, holding a the item being discussed, and Matthew Holdernesse mid-talk at Hoddle's Creek some years ago.

Hoddles Creek was a very well run and really good fun event. It always got an excellent turn out of members, was very well attended by an interested public and generated a lot of interest for the Association. Bill was a regular attendee and this one was no exception.

One of the Draught Horse people had approached one of our members, Matthew Holdernesse with a request for assistance. They asked if Matthew could forge a

couple of C links.

These links were about 2 ½ inches in length with a thick back and two balls on the ends of the C. A leather strap passed through the C, anchoring it to the draw pole of some sort of carriage allowing two chains to be held on the ends of the C to a draught horse on either side of the pole.

Matthew and I discussed how you would go about forging such an item and Matthew decided to ask

our resident expert, Bill.

The photo was snapped just as Matthew asked, "How would you forge one of these Bill?"

Bill took it, examined it briefly and replied, "Well, I wouldn't."

We thought, 'That was a fat lot of help Bill', then asked, "Why?"

Bill handed it back to Matthew and said, "'cause it's cast."

Sure enough, closer inspection revealed the tell-tale joins along the back of the C.

Matthew did manage to forge two links, which were supplied to the grateful requestor.

Bill passed away in 2010 but his memory lives on strongly in the Association and his presence and wry, dry humour is greatly missed. It almost seems that he is still watching over your shoulder on Number 1 forge at The Barn and you are waiting for a comment or correction.

Life Members

In *The Drift* 102 a list of ABA (Vic.) Inc. Life Members was published, omitting two notable names from the Association's early times. My apologies to Norm Foun and the family of the late Bill Bunting, as these gentlemen's names were not included in that list.

The ABA (Vic.) Inc. Life Members list now also shows the year each member was invited to Life Membership. Jim Deering.

Norm Foun (*Image right*) was one of the early members to join the Victorian Blacksmiths Association, as we were formerly known.

He has contributed greatly to the fit-out of the Barn, in particular with his plumbing skills. All the water connections, water-cooled

Australian Blacksmiths Association (Victoria) Incorporated Life Members

Bill Bunting * - 1994

Norm Foun - 1994

Don Marshall - 1994

Keith Towe - 1994

Kevin Rapley - 2000

Doug Tarrant - 2000

Steve Nicoll - 2013

Nick Hackett - 2013

Roland Dannenhauer - 2015

Amanda Gibson - 2016

* member deceased

tuyeres, hot water system and loads of other fittings and assemblies were carried out by Norm; his contribution was first class.

As a member of the National Trust, Norm established regular demonstration days at Gulf Station in the Yarra Valley, which continued over many years.

We remember Norm when we use the various water fittings at The Barn, wish him improved health and hope to see him at The Barn soon. Keith Towe.



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The Drift 104 out Feb. 2017

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Deadline for articles is
14 JAN. 2017

Barn Roster

REGULAR WORK DAYS - R

Regular work days are fortnightly on Sundays 10:00am - 4.30pm. The Committee will open The Barn at other mutually convenient times; please contact the Secretary.

DORIS DAYS - D

Doris days are every second Saturday 10:00am - 4:30pm. The male membership is respectfully requested NOT to attend Doris days unless invited, as these days are for the female membership.

COMMITTEE MEETINGS - C

The committee meets every six weeks at The Barn on regular work days at 11:00am. **Members are welcome to attend and, if invited, may participate.**

DATE	SAT 08 OCT	SUN 09 OCT	SAT 22 OCT	SUN 23 OCT	SAT 05 NOV	SUN 06 NOV	SAT 19 NOV	SUN 20 NOV	SAT 03 DEC	SUN 04 DEC	SUN 11 DEC	SAT 07 JAN	SUN 08 JAN	SAT 21 Jan	SUN 22 JAN	SAT 04 FEB
EVENT	D	R	D	R	D	R C	D	R	D	R	EGM Swap and Sell Xmas BBQ	D	R	D	R	D
Forge master AM	Alice	Tony	Alice	TBA	Alice	Steve	Alice	Rick	Alice	Andrew		Alice	Doug	Alice	Tony	Alice
Forge master PM		Steve		TBA		Dan		Shane		Phil			Ben		Ste	

The Barn is open on **WEDNESDAYS** following normal Sunday work days for the use of ALL members as a trial.

ALTERNATE SUNDAYS The Barn is open on alternate Sundays for the use of experienced members.

PLEASE NOTE The Barn Roster is subject to changes, depending on the Forgemaster's availability.

Purposes & Objectives of the ABA (Vic.) Inc.

To promote, preserve and develop the craftsmanship, design aspects and techniques of all the various disciplines of blacksmithing to the highest standard possible.

To provide a means of communication between mature people with an interest in the craft of blacksmithing, for the exchange of ideas, experience, techniques and information for their mutual benefit, by the publication of a regular newsletter.

To encourage a greater

awareness of and interest in the application of the skills of blacksmithing among architects, interior designers, art/craft groups, and the general public and to provide links between blacksmiths and potential customers by means of exhibitions, demonstrations and publications.

To promote, and actively provide opportunities for training in all the various aspects of blacksmithing by means of demonstrations, displays, lectures, and special

tuition sessions.

To act as the representative body of the interests of Australian blacksmiths, locally, nationally and internationally.

To undertake community service, providing always that these services are within the comfortable limits of the time, talents and costs that the Association and individual members can afford.

To encourage communication and goodwill among blacksmiths everywhere.

Advertising

Commercial advertising, deemed by the Committee to be of interest to members, may be published in *The Drift*. Contact the Treasurer to book in and organise payment.

Advertising rates are
\$60.00 Quarter page
\$120.00 Half page
\$240.00 Full page
Colour Add \$75.00

Members are invited to place classified advertisements free of charge. Contact the Editor to book in and for details required to publish the advertisement.



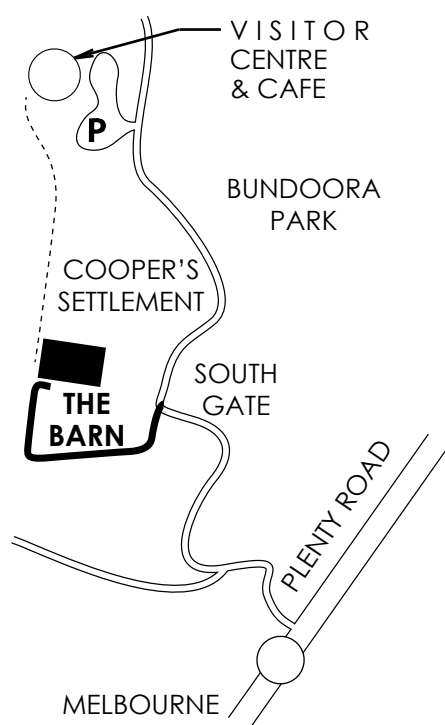
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The Barn Location

The Barn is part of The Cooper's Settlement, Bundoora Park, Plenty Road, Bundoora.

Melways reference Map 19, F4



The Barn Policy

Members can enjoy use of ABA (Vic.) Inc. equipment at The Barn.

- Forge fees are \$5.00 for a half day and \$10.00 for a full day.
- Forge availability is on a first-in first-served basis.
- You will need to clean out the hearth and start the fire.
- Due to coke supply issues keep your fire to a size which suits the stock you are working.
- **Ask the forgemaster if you are unsure or need advice.**
- If you plan to forge in the afternoon, arrive in time to pick a forge to use. Members who arrived early and started their fire are not always receptive

to late arrivals asking to share.

- Members who wish to use the power hammers must either be trade-qualified and experienced in the operation of this sort of machinery or have successfully completed the ABA Vic. (Inc.) power hammer course.
- When you finish, let the fire go out, clean up your work area and replace tools in their storage locations.
- Always clean up spilt coke.
- Report damaged equipment.

Library Policy

Members can enjoy access to the ABA (Vic.) Inc. library of books and magazines. The library is open from 12:00pm until 1:30pm on regular workdays.

- Borrowing members must have completed the self-paced learning exercises and attended the three regular workdays immediately prior to the borrowing date.
- Up to 4 books may be borrowed at any one time.
- Books must be signed for, including the borrower's name and contact details.
- Books are due for return by two calendar weeks of the borrowing date.
- If another member has reserved the titles, this member has priority for borrowing the books next.
- If unreserved, the loan may be extended for another two weeks, provided the books are returned to The Barn after the initial two weeks and the member signs for the extension period.
- Returning books late will result in the member being prohibited from further

borrowing for a period of one calendar month.

- Magazines are not available for borrowing.

If you know of a title that may be of interest to the membership, please contact the librarian so a purchase can be considered.

The Drift Articles

Articles for *The Drift* are always welcome and may be emailed, preferably in Word. In the text, place the words "Image of..." and the image file name. Do NOT place images in the text file.

Unaltered high-resolution digital images, preferably in colour straight from the camera or phone are preferred and of a maximum single file size of 5MB.

Hand-written articles and hardcopy photos may also be submitted via the ABA (Vic.) Inc. P.O. Box; so don't let a lack of computer skills get in the way. If you want your photos back though, please include a stamped, self-addressed envelope.

Legals

This entire publication is copyright. No part may be reproduced without the written authority of ABA (Vic.) Inc. Contributors retain copyright of their work. Opinions expressed in *The Drift* are those of the authors, not necessarily those of ABA (Vic.) Inc. or the editor. All articles are presented for information only. Persons using this information must ensure their safety and that of on-lookers if acting on this information. No liability whatsoever for injury, financial loss or damage to persons or property will be accepted by ABA (Vic.) Inc., the editor or contributors caused by using information in *The Drift*.



Librarian's Report Treasurer's Report

The Library lending system will be upgraded in the next couple of months to allow easier borrowing and tracking of loans to members. Watch this space for further, fuller details coming to you soon.

At the Mont de Lancey event on 09 October, we were introduced to **Ron Short** who kindly donated four books for our Library.

'Forging Handbook' by Waldemar Naujoks and Donald C. Fabel, 1938

A comprehensive guide to heavy forging techniques, heat treatment, cleaning of forgings, etc.

'Industrial Furnaces Vol. II' by W. Trinks, 1925.

A technical publication on oil-fired furnaces and salt and lead baths, also aimed at heavy industrial applications.

'Wrought Steels' British Standards Institution, 1955.

A very useful publication if you require the specifications for most steels. Eg. The various EN42 grades are carbon spring steels for oil-hardening and tempering, whereas EN43 grades are for water-hardening and tempering. There is a wealth of hardening and tempering information together with chemical compositions of the various grades.

'Drop, Press and Machine Forging' By J.C. Sharman.

This book discusses press and drop forging equipment, die design and cleaning of forged components.

We are grateful to Ron, who worked in the knife die manufacturing industry in Melbourne, for donating these books, which will be available for borrowing by financial members, to our Library.

Regards,
Phil Pyros.

Report

Cheque Account Balance as of 22/9/2016 was \$12,341.78

Term Deposit Account as of 22/9/2016 was \$624.15

At the last Committee Meeting it was unanimously decided to put a total amount of \$10,000 into a new Term Deposit account when the current one matures, leaving the balance in the Cheque Account for any forthcoming expenses.

Regards,
Phil Pyros.

President's Report

Well, the first quarter of the new financial year is about to close and it has been a period of settling in for all on the new committee, particularly me.

The first thing that I should mention is the quite good attendance numbers we have on our work days. This also applies to our Doris members who attend on Saturday. Having recently seen some of their work they show considerable talent which reflects well on Alice Garrett's instruction and guidance.

The number of inquiries and the subsequent new members resulting from these inquiries is encouraging and demonstrates the perennial attraction of blacksmithing.

Due to the increase in people wanting to start and the limited number of forges available at any one time **we have commenced a trial of having a Barn workday on the Wednesday following the normal Sunday work day.**

This is to allow those members who are retired, tertiary students or work on a shift basis the opportunity to use a forge without any time or crowding constraints. As this trial is still in its early stages the results thus far are difficult to judge but

we shall persevere with it for the time being to ascertain its ongoing viability.

I am happy to say that, after some haggling on our behalf, Steve and Rick managed to purchase the wood for our new coke bin which is in the process of being constructed as I type. The problem now is to fill it and the cost of this could be quite substantial. Hopefully more news on the fuel situation will be available next edition.

In the meantime, I ask all members, in order to **save fuel**, please **ensure that your fire is of a size commensurate with the work you are doing.**

You will also note that the **11th of December, 2016** has been set down for an **Extraordinary General Meeting** for members to vote on several matters, **full details** of which are set out in this edition on **page 17.**

I urge all members that are able, to attend and cast your vote.

It won't be all work as we intend to have a **"Swap and Sell"** event afterwards, prior to our **Christmas BBQ.**

Finally, if you are reading this, thanks must go to our magazine editor, Jim Deering. The recently-produced editions have been of a highly professional quality, but as always you only get out what you put in. So I will repeat on his behalf the editor's initial plea for material.

Remember; Think Safe - Work Safe - Be Safe

Until next time,
Andrew.



New coke bin outside The Barn.



European Ironwork Photo Study

Andrew Mobilia

The following photos are further examples of iron work I found in Europe.

Due to the vast range of examples available I have concentrated in this article only on fences or railings as opposed to doors, window grills, fanlights or gates. Hopefully I will be able to provide some photos of these other items in later editions of *The Drift*.

The one thing that stands out is the consistently high degree of craftsmanship in all of these examples.



Paris. This small rail is an unusual use of a double rail with the upper edge serrated for decorative purposes. Riveted between each rail is a stylised version of the French royal symbol the 'Fleur de Lys'.



Toledo. Small railing at the entrance of a private residence. With simple but effective decoration the use of this rail may be to scrape mud from shoes.



Monserrat. Only a few metres from flower bed rail is this work. There doesn't appear to be any definite design planned but considering where the work is, those who commissioned it must have been happy with the result.



Cordoba. Security railing with an extensive use of collars. Note the sharpened spear points along the top of the rail.



Toledo. Highly decorative and very intricately worked balcony railing. Work of this intricate nature is quite common in the main cities.



Detail of the simple rail shown right. Something to try?



Monserrat. Here is the simplest design I saw throughout my travels. A basic but effective garden rail of what I would estimate being a fairly modern manufacture due to the evidence of the welding used.



Detail of an altar rail in one of the old churches in Rome. How did they do it? It does your head in trying to work it out.



To paraphrase the late Bill Bunting, "...it's cast..." as evidenced by join line, which shows the item to be made up using cast panels.

When 10/32 is Not a Fraction

John W. Foster *

Machine screws, screw threads, sheet metal screws, and wood screws - they all have threads and sizes. Hopefully the following information will take some of the mystery out of what the sizes mean.

Before getting into this, perhaps a little history will be in order. Around 1900, when the automobile industry was just getting started, there was no standardization of bolt or thread sizes. The local blacksmith or machine shop made a bolt, or hundreds of bolts, when you needed them. They had rather primitive machines that were run by an overhead jack shaft and lathes that had a set of gears that had to be changed and set for each thread cut (called change gear lathes to this day).

If your local smith or machine shop had change gears that could be set to cut 10, 20, 30, or 40 threads per inch (TPI), he had to choose one of those for your bolt. The shop in the next town might have a lathe that would cut 12, 24, 36, or 48 TPI and he would have to choose from those threads. This was no big problem, so long as you stayed in your original location so that the next time you wanted a matching bolt you could get it.

The shop had to judge which

thread was best for each diameter of bolt; ten TPI would be too coarse for a 1/4" bolt. The thread would be so deep that there would be nothing left for strength and the bolt would break easily. At the other extreme, 40 TPI would be so fine that the thread would strip and have little holding power. Twenty TPI made a good compromise between breaking and stripping, but 18, 22, 24, 26, 28, or 30 would work also.

If your lathe was set up to cut 18 TPI, that would be your thread. On some old cars, it is not unusual to find every thread is 20 TPI (or some other number such as 24, etc.). If you've ever had to change a set of gears and get them adjusted correctly so that they ran quietly, you would understand the reluctance of the machine hand to perform this tedious operation. Twenty TPI was a good compromise for everything from 3/16" to 3/4", and even bigger if holding power was not important, so it was commonly used.

All of this was fine so long as you were trading in a small area say within a 30 mile radius - a distance that could be covered in a day or two by horse, team and wagon, or early automobile. As transportation improved and manufacturing became more concentrated, all products were available at ever increasing distances and as rail freight improved, eventually clear across the country. So, a 1903 Oldsmobile made in Detroit could be purchased most any place in the country. The lack of thread standardization became more of a problem all the time.

Everyone agreed that we should standardize, but everyone wanted the standard to be what they were using! The Society of Automotive Engineers (SAE) was one group that was large enough and had enough influence to do this standardization. I believe it was in the 1920s that they brought forth the standards. All bolt sizes were standardized as to coarse and fine (SAE) threads, plus head sizes were also established, all according to engineering standards. Henry Ford was the main hold out, which accounts for many of the special Ford wrenches still found; 19/32" comes to mind.

Why have coarse and fine threads? If you are working in a soft material such as cast iron, aluminium, or brass you need a coarse thread for holding power. Why fine threads then? Torque! A thread is simply an inclined plane wrapped around a cylinder. A coarse thread is a steep incline, while a fine thread is flatter and therefore easier to "climb." Think about it. Many studs have a fine thread on one end and a coarse thread on the other. The coarse end goes into the block (cast iron or aluminium) while a nut goes on the other and is torqued. Which is stronger? In steel, with the same length engaged, the fine is

TABLE 1

NUMBER	OUTSIDE DIAMETER	COARSE SERIES THREADS	FINE SERIES THREADS
0 (1/16")	0.060	-	80
1	0.073	64	72
2	0.086	56	64
3 (slightly larger than 3/32")	0.099	48	56
4	0.112	40	48
5 (1/8")	0.125	40	44
6	0.138	32	40
7 (slightly smaller than 5/32")	0.151	32	36
8	0.164	32	36
9	0.177	32 Special	-
10 (3/16")	0.190	24	32
12 (7/32")	0.216	24	28
14	0.240	20 Special	24 Special
30	0.450	14 Special	20 Special



slightly stronger.

Thread form was also established. The 60° V-form thread was the choice for general use. The exact shape, with a flat at the crest and root, was chosen to replace the old V-sharp form. Actually, the flat at the root more or less established itself as it is very difficult to maintain a sharp point on the tool over long production runs. The engineers just established how big the flat should be. You can cut any form of thread you want to grind a tool for and name it after yourself, if you want. There were and still are many thread forms, ranging from square to round (like on a light bulb).

The larger thread sizes are fairly easy to understand; 1/2-13 means 1/2" diameter with 13 threads per inch. The problem arises below 1/4" diameters, where the sizes change from fractions to whole numbers. A 10-32 bolt is a No. 10 size with 32 threads per inch. This happens to be very close to 3/16" in diameter, and if you went to the hardware store you might find a 3/16-24 stove bolt. No. 8 and No. 6 do not fall on convenient fractions, but a No. 5 is 1/8". This system starts with a No. 0 at .060" (1/16" for all practical purposes) and originally went to No. 30. The diameter increases by .013" for each size. Table 1 lists the diameters.

Never heard of a No. 7 screw? Just look at your wood screws in a well-stocked hardware store and you will find No. 7, No. 9, and No. 14. The machine screws of this series are also used in some of your older cars, so always check the diameter when a 6-32 seems loose and an 8-32 won't go on, you may just have a 7-32. This numbering system applies to sheet metal screws as well.

The sizes below No. 0 are jeweller's screws and you do use at least one of them. That screw you lose out of the hinge in your eye glasses is a 00-90.

I hope this discussion has been helpful in clearing up what can be a confusing system for the

beginner.

This article, and the permissions necessary to reprint it, were obtained by Andrew Mobilia, who commented, "Although this article does not relate directly to blacksmithing, it should be of enough general interest for our members..."

**ABA (Vic.) Inc. wishes to acknowledge the kind permission to reprint this article granted by the author, John W. Foster, and the publisher, Village Press Inc.*

Article sourced from "Machinist's Workshop" February / March edition, 2013.

Sunday 11th December 2016

Extraordinary General Meeting

"Swap and Sell"

Christmas Break-up BBQ

Sunday the 11th of December is going to be a busy day for you.

Please note that an **Extraordinary General Meeting** (EGM) for members of the ABA (Vic.) Inc. has been arranged to be held on the Sunday of our Christmas Break-up, being 11th December, 2016.

This meeting, which will commence at **11.00am**, is proposed to seek approval (or not) from our members to changes to our Constitution and the potential sale of our Bradley hammer.

Proxy voting forms are enclosed for those members that are unable to attend. Hopefully the meeting will be over in thirty minutes.

Full details of the proposed changes are set out separately in this edition of *The Drift* on page 17.

Furthermore, we hope to re-introduce a feature of previous Christmas Break-ups. This is a **"Swap and Sell"** where members are able to sell or swap any tools, equipment or books and publications that they may have no further need for. Needless to say, this used to be a very popular part of our Christmas Break-up and we hope that many of you can participate, either as a buyer or seller.

Please note that this event will take place **AFTER** the EGM!

Finally, we will partake in our **Christmas Break-up BBQ**, which gives members a chance to catch up with old friends.

Please note - there will be **NO FORGING** on this day.



Event Notice - Tongala Hammer-in Date To Be Confirmed

Dan Brady

Simon Baxter's Hammer-in is actually still "upcoming" as the recent weather put it on hold.

I received this report and images from Simon.

"Hey Dan, hope this gets through.

Hopefully the weather starts to dry out my yard to have a hammer-in next time and have a few blacksmiths from down south.

The weekend was washed out due to very wet ground; couldn't camp out.

Until next time cheers, Simon."

A few of my regular local blacksmith guys came for a hammering session.

Peter, Carl, Terry and Gordon fired up two gas forges and got into making sets of tongs and forging a rather large bar a metre long by 20 mm into different twisting patterns, plus a few blade shapes with railway dog spikes.



Twisted bar - heated in a 10-inch gas forge.

It was Gordon's first time at making a poker and he was also helping to forge the large bar that Pete was forming with a dragon's head and various twists along the shaft; all had a good time.



Pete and forged dragon's head.

The slight postponement has definitely worked in my favour as I was still in Sydney for school that weekend so once the ground dries up we will be heading to Simon's place to camp out for a night and get a couple of days of solid forging in.

Simon is well set up with a few home-built treadle hammers, gas forges, a coke forge, two areas to forge in and a campfire in between to sit around at the end of the day.



A sample of Simon's workshop.

It would be great to get a few members up his way.

Anyone that wants to travel up and meet some of our country members, have great time forging away from the confines of The Barn and without the expectations of the public at demonstrations, give me a call or email me and I'll let you know what day we are heading up.

Cheers,
Dan Brady.

Event in the Planning - ABA VIC EXHIBITION 2017

At the last committee meeting it was suggested we approach a local council-run gallery about holding an exhibition of members' work. An application for a show around March / April 2017 to include around fifty works has been made.

The works would have to consist of mainly small to medium items (capable of being carried by one person) and three or four larger ones, owing to space limitations.

As yet no decision has been received, but hopefully we should have an answer by the Christmas Break-up if not sooner, so keep your ears open!

Members who are interested in exhibiting please contact the committee so we can establish a register of those wishing to participate in this exhibition.



Secretary's Report

Rick Stadler

Taking up the reins in the ABA Committee is a continuing challenge, but progress is being made.

Much as I would like to vent my spleen at the frustrations of the internet and the hoops required just to get email access, I would only be telling you what most of you would already have experienced at one time or another. I just find it disappointing that something that could be smooth, powerful and very efficient is complicated and stalled by some misguided brainiacs hell-bent on making life difficult for no good, valid reason!

Big News – The Barn is now open to ALL members on alternate Wednesdays on a trial basis!

The Committee has decided to trial opening The Barn on each Wednesday following the regular Sunday Work Day for any members who cannot make it on the normal Sunday Work Days, or who want to quietly work on a project.

The Forgemaster duties are to be shared between;

Steve Nicoll, Shane Kenny, Andrew Mobilia, Phil Pyros and Tony Srdoc.

There is no formal roster yet, as we are waiting to see how popular the Wednesday session is.

I managed to call in on Wednesday 14th September to find Andrew and two other members working steadily, with fires lit and anvils ringing.

The Barn seemed to have a calm, convivial atmosphere, with members able to do their own thing, at their own pace, without having to share forges or hurry to

let someone else have a go.

So, if you can make it during the week, give the Wednesday a go. I think you will find it a pleasant and effective time.

The modern administration of an incorporated association requires registration with Consumer Affairs Victoria. I have accessed our



Can't find room to swing a hammer at a weekend session at The Barn? Look at all the space available in The Barn on alternate Wednesdays!

registration and am working to maintain it as it may become vital in our application for Deductible Gift Status.

The Committee is working on Club rules, which will also probably become part of our registration.

Thus we will have a central repository of these important Association documents that can be updated and maintained as required.

Regards,
Rick Stadler.

Welcome to New Members

ABA (Vic.) Inc. would like to welcome the following new members. Please make yourselves known when at The Barn.

Kieran Gleeson of Colac
Hugh Matthey of Clayton
Jodie Phelan of West Heidelberg
Isaac Cussen of West Heidelberg

Andrew Stewart of Frankston
George Buscema of Gladstone Park
Russell Shepherd of Yallambie
John Meertens of Newport

Alex Powerlett of Mordialloc
Angus McMurray of South Morang
Sarah Edwards of Brunswick West
Cameron Stewart of Yea



Training with ABA (Vic.) Inc.

Jim Deering and Gavin Brown

Looking to learn blacksmithing? ABA (Vic.) Inc. offers blacksmithing courses at The Barn. Here is a step-by-step guide from the Barn Induction, through to our most advanced courses offered and current up-coming course dates.

BARN INDUCTION

ONE DAY - No cost, but mandatory for new members.

New members are provided with a Barn Induction upon visiting The Barn for the first time. Safety in the forge, housekeeping, identification of the major tools and personal protective equipment is discussed so you'll have an understanding of these topics before you start forging.

INTRODUCTION TO BLACKSMITHING

ONE DAY - Cost \$50.00

29 October 2016, 06 May, 2017,
12 August, 2017, 07 October, 2017,
04 November, 2017.

This OPTIONAL one-day course is designed to introduce new members to The Barn and the blacksmithing equipment it contains. You'll get to meet other members of the Association; so next time you're at The Barn you'll probably know someone!

Lighting a forge fire will be carried out and we will help you understand what makes a good fire and how to manage the fire correctly. This is foundation learning and it will form the basis for all your future learning with the Association.

SELF-PACED LEARNING

NO TIME CONSTRAINTS - Cost; forge fees.

When you commence the Self-paced Learning (SPL) course, the ABA (Vic.) Inc. trainer will provide you with a set of forging exercises to complete which are designed to improve your knowledge of hand-forging techniques. These exercises must be completed at The Barn and signed off by a senior member as being completed to a satisfactory standard as you work through each one. A senior member will provide you with guidance upon request.

Of course if you are having trouble with something you MUST ask!

This may sound somewhat onerous and in essence it is, because it is designed not only to improve your blacksmithing knowledge and skills, but also to show senior members you are serious about learning blacksmithing; not just coming along, bashing some steel and vanishing. Whilst forging can be fun, it is for a purpose to the Association and its members; being to fulfil one of ABA (Vic.) Inc.'s Purposes and Objectives, which is to preserve the traditional blacksmithing skills. We have you undertake the SPL to see you are genuine about learning the craft, before we invest in you.

Completion of the SPL is a pre-requisite for all of the following courses. So the sooner you complete the SPL, the sooner you can proceed to other courses.

TONG MAKING

ONE DAY - Cost \$100.00

The Tong Making course covers all the skills required to enable you to make your own blacksmith's tongs.

HAND FORGING

FOUR DAYS - Cost \$250.00

13, 26 and 27 November and 10 December 2016.

11, 25 and 26 March and 08 April, 2017.
09, 23 and 24 September and 07 October, 2017.

The Hand Forging course teaches you techniques such as slitting, punching, drifting and basic heat treatment. At the conclusion of this course you will have a set of tools to take with you including; round punch, tongs, hot sett or side sett, bending forks, cold chisel, centre punch and a tong link.

WROUGHT IRON

FOUR DAYS - Cost \$250.00

01, 02, 15 and 16 July, 2017.

NOTE – EITHER completion of the Hand Forging course or demonstrable sufficient prior experience is a pre-requisite for this course.

The Wrought Iron course covers making of scrolls of various types, simple riveting, collaring, different types of decorative twisting and rudimentary design aspects related to manufacture of wrought iron items.

ADVANCED WROUGHT IRON

FOUR DAYS - Cost \$250.00

Techniques and skills learnt in the Wrought Iron course are further developed in the Advanced Wrought Iron course as the Advanced Wrought Iron course concentrates on advanced joinery techniques such as riveting, collaring and mortise and tenon for examples.

POWER HAMMER

ONE DAY - Cost \$100.00

03 June, 2017.

In this course you will be introduced to working under the power hammer. Techniques such as drawing, tapering, upsetting, punching and swaging will be covered.

Please note - The course dates are provided so that you can plan around attending them.

Those courses which do not have dates nominated are scheduled as demand arises, so please enquire.

Contact us for more information - refer to page 03.



Ypres 2016 International Blacksmithing Event Kieran Gleeson

The idea was conceived in 2009 when Luc Vandecasteele asked Terrence Clark could BABA (British Artist Blacksmiths Association) help organise an event to commemorate the centenary of World War One.

The city of Ypres agreed to hold the event in the Grote Markt (Market Square) this is a spectacular setting for an amazing project. Twenty five panels were to be forged at the Ypres 2016 event, each of these has been designed by a renowned international master blacksmith and depict the designers personal response to World War One. These twenty five panels will be permanently displayed at the German war cemetery at Langemark-Poelkapelle, (12km from Ypres).

The panels will be placed around a seven meter tall weathered steel slab featuring the negative and positive image of a single poppy. The negative representing the fallen and their loved ones, the positive representing the hope for a better future that sprang from their sacrifice. A field of 2016 poppies will surround the base of the 7m cenotaph. These poppies were forged by hundreds of blacksmiths from around the world. The poppy is the iconic symbol of remembrance.



The Setting.

The market square in the centre of the city of Ypres is breathtakingly beautiful; it covers an area of about one hectare. The magnificent Cloth Hall **COVER IMAGE** topped with a 70m belfry was completed in 1304. This provided the backdrop for the blacksmithing event. Many



of the buildings surrounding the market square were built in a similar period. Almost all of these buildings were completely destroyed during the bombing of World War One. All of these buildings have been meticulously restored.

The Set-up.

The set-up for the Ypres 2016 International Blacksmithing Event was a phenomenal undertaking – I can't speak highly enough of the efforts exerted.

The set-up included two 15m x 30m marquees, positioned end-to-end adjacent to the Cloth Hall (Image page 13). A third small marquee was set up for children's forging of poppies.

A comprehensive array of blacksmithing equipment was available, items included: thirty-five anvils, thirty coke forges and eight gas forges, six power hammers, one fly press. Each marquee had two small shipping containers to

act as storage as well as enclosed workshop areas for welding and grinding, plus an enclosed storage/workshop area for materials storage and also for welding and grinding and including a TIG bay.

The Event.

Wendy and I arrived at lunch time on 1st September. The event had started early that morning. Upon arrival delegates (blacksmiths who had paid to forge) received a Ypres 2016 International Blacksmithing Event commemorative bag, a tee shirt and a pair of safety glasses. Each Master Blacksmith had a team of approximately six or seven blacksmiths, plus a forge steward. Each team was allocated two days to complete their panel, forging started at 8:00am each morning and finished at 7:00pm.

The team I was involved with comprised, Achim Kuhn, Master Blacksmith from Germany, who only spoke German, Daniele Baudino from Italy who only spoke Italian. James Abbott, Tim Mackereth, John Sleath, Chris Wilson and myself. Roy Abbott was our forge steward. The remaining six all spoke English but no German or Italian. We were not the only group who struggled with a language barrier.



Panel by Master Blacksmith Achim Kuhn of Germany and team.



Australian blacksmiths at Ypres 2016, front row left to right, Will Maguire, Denise Axelsen, Kieran Gleeson, Colin Dray, Troy Honeman, Steve Gale and Bruce Beamish. Back row left to right, Kyle Andrzejewski (almost hidden), Craig Drew, Peter Birchall and Don Gabriel.

Our panel comprised of two large panels of 10mm steel plate, positioned one either side, this was cut with a gas torch, we then heated these plates in the forge and forged them to a very exact look that Achim wanted. We also forged a hand out of the same plate. The hand was riveted in a central position above the top rail of the panel. A globe of the world was suspended below the hand on stainless steel wires; the globe was made prior to Wendy and me arriving.

The Blacksmiths.

I understand there were more than one hundred and seventy blacksmiths in attendance, over twenty nationalities were represented. Many comments were made on the high number of

Aussies attending.

From Qld we had; Troy Honeman and partner Sandy.

From NSW; Craig Drew, Don Gabriel, Peter Birchall, Steve Gale and wife Leonie, Colin Dray and partner Wendy, Will Maguire and wife Ali.

From Vic; Bruce Beamish and wife Linda, Denise Axelsen, Kieran Gleeson and wife Wendy.

From WA; Kyle Andrzejewski.

Children's poppy forging.

Children were instructed and assisted in the forging of poppies at the Ypres event. A mobile setup of this was taken to schools, clubs, museums and various shows across England, Wales, France, Belgium, Italy and Germany. Poppies made by the children had been assembled into a wreath. This wreath was laid at the Last

Post ceremony on 5th September, 2016. A huge crowd attended this wreath-laying presentation.

Kieran and Wendy Gleeson, Ypres 2016.

My wife Wendy is self-employed in the patchwork industry.

We were able to combine blacksmithing and patchwork into a fabulous five-week overseas adventure.

We landed at Heathrow on the 27th of August where we spent three

big days exploring London plus a day tour that took us to the Avery Stone Circle, Bath and the tip of the Cotswolds.

1st – 6th September: we attended the Ypres 2016 event staying at the Regina Hotel, located about a one-minute walk from the blacksmithing event. Several of the NSW blacksmiths also stayed at the Regina Hotel.

Wendy and I did quite a bit of sightseeing through the local area including a tour of many of the war cemeteries. My grandfather



Australian Master Blacksmith Will Maguire and team working on their panel.



Australian master Blacksmith Will Maguire, fourth from left, with his team and panel in front of the cenotaph.



Completed panel by Australian Master Blacksmith Will Maguire and team.



fought at Passchendaele, 13km from Ypres.

7th – 12th September; we spent six days in Bruges, relaxing and sightseeing.

13th – 27th September patchwork tour of France.

An ironic part of the patchwork tour was – when I initially made enquires on going on this patchwork tour, I was assured all would be OK as there are always at least two to three blokes on these trips – however on this occasion there was only one, me! I momentarily found this to be a bit daunting, but within a short space of time it wasn't an issue. Our patchwork tour took us to Riquewhir, Mulhouse, Avignon and Paris as well as many towns and special places throughout the regions of France that we travelled.

Wendy and I had an incredible

five weeks away, we saw and experienced many amazing things, we made many new friends through both the blacksmithing event and the patchwork tour.

Special thanks to Henry Pomfret for an insight into the set-up of the Ypres 2016 event. Henry and his assistants spent two years planning the set-up of this event.

Kieran Gleeson,
Yambuk Blacksmith,
Colac, Victoria.

Thanks for your efforts to write this very interesting article Kieran. Ed.



Wreath made from poppies forged by children.



A sample of activity and panels from the Ypres 2016 International Blacksmithing Event



Many thanks to Denise Axelsen for some of the images used in this article. For information about Denise visit her facebook page "Denise Axelsen Artisan Blacksmith" and website which is www.artisanblacksmith.org Denise is one of the nicest people I've encountered in blacksmithing. Ed.

Australian Blacksmiths Association (Victoria) Inc.

Extraordinary General Meeting

11:00am on 11th December 2016

This meeting will be held at The Chapel, Cooper's Settlement, Bundoora Park, Plenty Road, Bundoora.

In accordance with the requirements of our Constitution, formal notice is hereby given of the following proposed amendments to the Constitution of the Australian Blacksmiths Association (Vic) Inc.

Amendment No 1.

Clause 6.1

Amend the current wording of "... the committee of management shall consist of eight (8) officers, President, Vice-President, Secretary, Treasurer and four (4) members.." to read as follows

"... the committee of management shall consist of President, Vice-President, Secretary, Treasurer and **a minimum of four (4) members...**"

Amendment No 2.

Clause 6.10.

Delete entirely the wording as follows

"No committee member may hold the same position for more than four (4) successive years".

Amendment No 3.

Clause 8.2.

Amend the current wording of "...a committee member shall be appointed as the Forgemaster..." to read as follows

"...a committee member or **a senior member** shall be appointed as Forgemaster..."

Sale of the Bradley hammer.

A matter not relating to our Constitution but certainly of considerable importance to the ABA (Vic.) Inc. are the assets owned by us. In light of this we advise that we have received an offer to purchase the Bradley hammer.

As this piece of machinery represents a very large asset of the Association the committee has deferred upon making any decision on this matter until the ABA (Vic.) Inc. membership has had a chance to consider and vote on whether this piece of equipment is sold or not.

Please note that you will be voting only whether the hammer is sold or not. If the vote is in favour of the sale of the hammer, the committee at that time will decide upon the price, proposed method of sale and eventual use of sale proceeds.



Teef (Teeth), Tricuspid Molar

Ben Sokol

As a tribute to an artist I know I decided to forge them a tooth for their birthday.

Luck being on my side I fear the steel had some chrome and or possibly molybdenum in it; the scrap bin has some wonderful treasures.

Although the odd bit of gal finds its way in, there's also a piece of consecrated steel in there that'd put holes in vampires.

The process of making it involved;

First upsetting some round bar.

Raising the upset section over a stake (which was the back end of a ball peen sledge shut in the vice).

Then squaring off the raised end. This created a rough internal texture (fire scale) for the masticular surface of the tooth.

Next it was cut off hot and any sharp bits filed back.

The main part of the work was reduction by hand-filing, with a hacksaw being employed to attempt to remove more material faster in between the roots. The files used were triangle, square and half-round.

The roundness of the tooth was given mostly by the round half of the half round.

Polishing back to 7K with wet-dry grit then a felt buff with steel cutting compound (likely aluminium oxide and stearene wax), then red jeweller's rouge.

The finish is blacked (or blued, however you want to say it) with an LPG torch.

Perhaps the photos don't do it any great justice, but the object was tactile. It's heavier than it looks, has rough bits and smooth bits, pointy bits and smooth bits.

The recipient was very happy with what they'd been presented.

Get it hot, think while it's in the fire, strike true.

Ben out.



Pneumatic Hammers - Part 2

Jim Deering

In this edition of *The Drift* we'll have a look at what to expect from the air hammer during testing and some "hidden" aspects relating to power hammers. It'll help if you read this article in conjunction with the spring hammers article from *The Drift 101*, and the pneumatic hammers article from *The Drift 102* as we're building further on that knowledge.

At the very start of learning to operate one of these machines, the entire contraption is often regarded as a hulking, chattering, wheezing, humming Goliath, imbued with mythical powers and shrouded in horror stories of crushed body parts; capable of delicately closing a matchbox with one stroke and detonating the contents with the next, which is often achieved by just thinking about moving the controls, rather than actually doing so. Certainly any forging hammer must be treated with the utmost respect, as they are fast-moving, powerful machines. But they must also be learnt about to demystify them and allow operators to gain the most from them, with the least risk.

Some people, new to air hammers, only notice the sort of subtlety we will look at initially once they start to observe what is going on with the *whole machine*, instead being of fixated on the workpiece, which most of us did when we were at hour one, day one of air hammers. Getting people to STOP hammering is a big part of initially training them to use an air hammer.

TEST RUNNING WARNING

As mentioned briefly in *The Drift 102* article, the flywheels on air hammers are far heavier than those on spring hammers and may cause the machine to topple if it is not secured to a foundation. Some air hammers may lack sufficient inertia to remain steady when operating if they are unsecured, due to out-of-balance forces generated by the rotating flywheel. Be wary of this.

TEST RUNNING

Before you can determine if the air hammer you are looking at is operating correctly, you must

understand how the air hammer you are looking ought to function. Otherwise, how can you tell if it is working properly? The tup might be moving up and down but is it moving correctly? Does it do what it should do in with the controls in each position? If you know what to look for, you may spot behaviour of the tup which highlights a problem elsewhere in the machine. *Nothing, nothing at all, beats the experience gained by driving numerous air hammers before you start looking at any with a view to buying.*

There are two main areas to check during the test run part of inspecting an air hammer; functions and noises.

FUNCTIONS

Most air hammers will provide at least three distinct functions, or control modes, for the tup, being 'Hold Up', 'Hold Down' and 'Automatic Blows', which increase in intensity the further the air control valve is moved. 'Automatic Blows' may also be referred to as 'Full Work'. A fourth function in some air hammers is referred to as 'Neutral'.

Many air hammers must be started in 'Neutral' to avoid damaging drive belts or overloading electrical systems. In this position, the tup rests at its lowest position, with the palletts touching, and no air flow being delivered from the pump cylinder to the tup cylinder. Instead, air flow from the pump cylinder is directed to atmosphere.

In some air hammers 'Hold Up' may be the default control valve setting, and this is often the case in air hammers that have no 'Neutral'. In this sort of air hammer, the tup moves immediately upon starting of the air hammer to the top of its

stroke and "hovers" there, pulsing slightly in time with the pump.

In other air hammers 'Hold Up' must be selected, which causes the tup to act as described above.

An air hammer with good seals, air control valving and clearances will usually only take a few pump strokes to lift its tup into 'Hold Up'. If it takes say, a dozen or more, it may have wear in the internals of the pump, control valve, tup or in all of these. This should be viewed as a concern because it is expensive to rectify if the wear is significant. This behaviour is amplified as the air hammer heats up with use, as the internal clearances increase.

From 'Hold Up' some air hammers will move directly into 'Automatic Blows' as the control lever is moved. The tup will begin to stroke, travelling progressively further downwards until the palletts begin to touch, with each stroke of the pump. Usually the tup will not retract all the way to the top of its stroke at this stage. From this point, the blows become increasingly forceful in until the maximum power of the air hammer is delivered, with the tup not travelling through its entire stroke to do so; the control lever now being in the bottom position for 'Automatic Blows' of full power in this type of air hammer.

With other air hammers the control lever must first be moved into a position which gives the desired action of the tup, often from 'Neutral'. In these air hammers the control lever must be moved to the top of a range of movement

Background image is of a newly refurbished B&S Massey Ltd. 40cwt (2,036kg) 'Clearspace', provided courtesy of www.masseyforging.co.uk Thank you to John Nicholson.



for this lever. This range controls the 'Automatic Blows' from very light to very hard.

In these air hammers the tup will stroke further downwards from the 'Hold Up' position as the control lever is moved until the palletts touch or come close to doing so. At this stage the tup will begin to perform progressively longer strokes upwards until it performs full-length "elastic" strokes, without the palletts touching or if they do, the touch will be light. From this point the intensity of the blows will increase and the upward stroke length reduce, to the point where the blows will reach their maximum impact. The control lever will now be in the position for 'Automatic Blows' of full power.

Another blow characteristic may be shown with yet another type of air hammer, where, from 'Hold Up', the tup travels all the way to the bottom of its stroke if the control lever is moved too slowly into the 'Automatic Blows' position. From there, as the control lever is moved further, the tup will begin to make short strokes until the palletts clear, after which the stroke of the tup will increase to its maximum, being similar to the "elastic" blows described above. From that point the tup stroke will begin to extend downwards, delivering progressively harder blows to the maximum obtainable. Again, the tup will not usually travel all the way up when delivering maximum power blows.

In the last two cases, a cushion of air is forming beneath the tup piston, causing the tup to be entirely suspended by air which is rushing back and forth between the pump and tup cylinders via the air control valving, hence the long, "elastic" blows described. As less air is directed under the tup piston the blows become harder, with more air being directed above the tup cylinder. This is what reduces the upward travel when maximum blows are being delivered.

The differences can be quite subtle to observe, hence the suggestion

to operate a number of these machines so you get a feel for what to expect *before* committing to a purchase.

The third function is 'Hold Down', which is quite simple to describe; 'Hold Down' turns the air hammer into a vice. By moving the control lever to the 'Hold Down' position, air is directed into the top of the tup cylinder and exhausted to atmosphere from the bottom. In some air hammers a partial vacuum is drawn beneath the tup piston cap to increase the downward force applied in 'Hold Down' by pressurised air above the tup piston. This causes the tup to be pushed downwards - which should be done slowly with a steady movement of the control lever - and grip any object placed between the palletts. The air hammer will continue to grip the object until the control lever is moved to another position. Leaving the air hammer in this position consumes a large amount of power and creates a lot of heat. If left in this position for too long, damage to the air control valve components may occur.

To some extent or another most air hammers can also deliver a single, hard, fast "stamping" blow. Some air hammers rely on the skill and timing of the air hammer driver to achieve this. In such cases the control lever is put into 'Hold Up' then quickly moved into 'Automatic Blows' at the lower end of the range and straight back to into 'Hold Up'; the result being a 'Single Blow'. It requires practice to achieve a reliable single blow with this sort of air hammer. In other air hammers, dedicated internal chambers within the standard hold air under pressure in reserve for the purpose of delivering this 'Single Blow', which is somewhat easier to achieve reliably in air hammers with a dedicated 'Single Blow' or 'Stamp' function. In these air hammers the control lever is put into 'Hold Up' and, with the aid of a stop, is then moved quickly down until the control lever touches the stop - usually at the 'Hold Down' position - the moved back to 'Hold

Up'. Perhaps keep this in mind if you are looking for a more versatile air hammer.

'SINGLE-ACTING' AIR HAMMERS

In air hammers referred to as 'single-acting' types, the upwards movement of the tup is caused by the combination of a partial vacuum drawn upon the upper surface of the tup piston and atmospheric pressure bearing upon the outer surface of the tup. Generally-speaking 'single-acting' air hammers run more slowly than the 'double-acting' air hammers, as described previously, for a given tup rating. This may be worth considering if you are new to air hammers, as the slower-running 'single-acting' air hammer is easier to learn under, simply because there is more time between blows. Many experienced air hammer operators prefer to teach learners under large air hammers because they run more slowly than smaller ones. 'Single-acting' air hammers usually have only 'Hold Up', 'Hold Down' and 'Automatic Blows', with 'Neutral' available in larger models.

NOISES

Testing to see if these functions work properly will reveal wear or malfunction of the air control valves and the state of the pump and tup piston rings and their internal clearances. It also confirms the mechanical and electrical drive parts are working, or not, as they ought, as function tests load things up in all combinations.

Excessive clearance related to air flow will often be noticed as "shrieking" or whistling from the air hammer. That said, it is not always easy to determine exactly where the air leaks - yes, plural - that are making these noises are. This is can be an involved process, which we won't delve further into with this article. Suffice to say it should be checked for and an allowance made for repair if needed.

Other noises may be from a lack of lubrication, rubbing parts or



incorrect fits between items, usually from excessive wear or parts which can be adjusted being left unattended, like the tup slides in "With Slides" air hammers. Generally these noises can be located and identified at least. This gives a clearer overall impression of the state of the air hammer, which leads you into your decision to buy, or not.

The heavy "knocking" from a worn big end and / or gudgeon pin in the flywheel, crankshaft, pump piston and connecting rod area of the air hammer can be somewhat expensive to repair. In the fit between these parts, clearance of 0.03" (0.8mm) can be the difference between 'good' and 'not so good'. That's the thickness of eight of these pages; and it can be heard! In air hammers with gross clearances in this assembly, heavy thudding can be *felt* by touching the air hammer, in a safe, non-moving location, whilst it is running but not hammering.

This is an assembly of parts which sees full motor power transmitted through it, operates at full running speed and has been known to fail and cause severe injuries to blacksmiths. In short, if this area needs repairs DO THEM, especially if these parts are external to the standard.

Another distinctive noise is the rapid "clicking" sound of air valves working. This is not always audible in air hammers and it can be muffled by a build up of carbon and oil. If this crud is removed, the clicking of the valves will become more noticeable.

As has been noted previously, using the air hammer to forge hot steel is the "first and final" check for many examining a power hammer with a view to buying the machine.

For the remainder of this article, unless noted, I'll refer to air, spring, helve and other types of power hammers simply as 'hammers' because what follows applies to all types.

THE "HIDDEN" ASPECTS OF BUYING A POWER HAMMER

Sometimes over-looked are the "hidden" costs of buying a hammer; available space, transportation, repairs, foundations and electricity requirements.

People who have not purchased a hammer before sometimes don't consider the "hidden" aspects of until after they buy. This can be a trap, but once you know what comes after buying a hammer, factoring in these aspects is fairly simple.



Crane and cement trucks access must be considered ahead of buying a hammer but need not prevent a purchase. However, installing the hammer may involve more work if access is difficult.

AVAILABLE SPACE

Will the hammer you are considering fit in your workshop, or even through the doorway, can you lift it high enough to install it, can you remove parts if you need to perform repairs? Many of us operate in spaces which often have limited headroom. Buying

a tall hammer may mean you will need to lift the roof, locally at least, in order to create a high point to permit the hammer to be installed or even build an annexe to install the hammer in. The cost of doing this may not be overly high; blacksmiths are a creative bunch when it comes to making things fit so I won't go into details on changing your workshop. But do consider permit costs and possibly engineering if it is needed, as these formal and professional expenses can add up.

TRANSPORTATION

Don't underestimate the cost involved with shifting this sort of machine. If the hammer is still installed you may need to spend quite a bit of time removing it from whatever it is mounted on before you can transport it. Some sellers will do this job for you; others will help you do it and some look on.

Also, some sellers don't put a value on this task then wonder why buyers haggle. It should be blatantly obvious, but it is surprising just how many sellers simply don't 'get it', particularly if they have never done this activity themselves, which does occur.

As a seller, try to understand the buyer doesn't stop spending as soon as you are paid; there is more to it than that, so try to see the picture the buyer is. Not your problem? It is if the buyer walks. There will be another buyer! When? Remember too; if you have bought a hammer, you will, one day, probably be a seller.

In the case of hammers which need to be dismantled to load them onto transport the same considerations apply; if it's going to take a lot of time to do, and the seller won't help or budge on the price, don't be afraid of walking.

Hammers that are ready to move, or are readily moved, are a different prospect, just as smaller, easily-shifted machines are often dearer, pound-for-pound, than larger machines *because* they are



easier to handle and install.

Make sure you can get the hammer loaded where you have bought it and unloaded at your end of the journey. Really consider access for large equipment if you need to use it, especially headroom and turning circles. Ground conditions are important too, as most trucks and plant like forklifts have very limited off-road capabilities.

In the event that you have purchased a smaller hammer, say under 1.5 tonnes, you can probably transport it yourself. This of course depends on your equipment, its load limits and your capabilities.

Spring hammers tend to have oddly-shaped, relatively small bases and are comparatively tall, making them inherently unstable. Some spring hammers are moved more securely by laying them on their sides, suitably chocked to protect the frame from bending stresses, rather than upright.

In the event you have bought a titan from what seems, sadly, our industrial past, you are probably the type of blacksmith that is not going to need to read any of this, being well aware moving of this sort of machine is best left to experts.

In case you are in the middle, perhaps you have bought a "huge" lump of a machine and are now thinking the Moke and fold-up trailer are not going to cope with shifting it, then hire experts.

REPAIRS

To go into details on all the repairs which might need to be done on a hammer is beyond the scope of this article.

However, there are a number of things we can list so there is something for you to consider.

As examples you may need to factor in; sand-blasting and painting, pouring of new bearings, hiring a machine shop to perform the machining of various parts - some of which need to be kept to

close tolerances, especially with pneumatic hammers - or making of new items from hot work die steel, heat treatment where required and use of other contractors, such as electricians and concreters, all of which means there may be extra costs that will rapidly make an otherwise fairly affordable hammer into a rather more expensive item of plant.

Yes, of course you may not be intending, or even need, to do anything at all to your hammer and plan to just use it in the as-bought condition. If the condition of the hammer is such that this is possible, and safe, there is no need to spend any extra funds.

But if you plan to buy a 'fix-'er-up' hammer - one with a high-tide mark in the bores say - and you don't



Lowering hammer over its anvil onto timber bedding on inertia block cast directly into the ground.

have a complete machine shop at your disposal, considering these costs *before* you buy a hammer, I think, is worthwhile. At least you will have formed some idea of what costs are involved in fixing certain faults.

Things NOT to skimp on are guards and making sure all the moving parts, especially those which operate the tup in mechanical - that's spring and helve type - hammers are in good and sound order.

These items are very important from a safety perspective, as a failure may result in parts of the hammer coming free from the machine. This can have nasty consequences. Guarding is cheap insurance, but unplanned downtime when you are under the pump can be avoided by getting things right *before* committing to a deadline with a less than healthy hammer, upon which you may be relying for an income.

Few blacksmiths will put a hammer through a full rebuild but for those who wish to get a very detailed understanding of their hammer there is nothing quite like turning your machine into a 3D jigsaw puzzle on the workshop floor!

There are books, such as Richard R. Kern's '*The Little Giant Power Hammer*' ISBN 1-880173-02-6 or 1-880173-03-04, which go into great detail on the process for spring hammers.

For those with air hammers there are few modern books on the subject, but one is '*How to Rebuild a Nazel Powerhammer*', by Mark Krause, which comes with a CD, sundry brochures and diagrams. The website www.oldworldanvils.com - based in America - is a source for this information. With some interpretation, the information may be applied to other air hammers.

FOUNDATIONS

With this I'm not saying don't buy a hammer; rather *understand* what you are buying. Big, old hammers can be expensive to set up, even if they are cheap(ish) to buy. We'll examine this aspect in some detail, as it is vital to understand the importance of installing proper foundations under your hammer.

Hammer manufacturers, past and present, provide installation instructions for their hammers and even long-defunct, obscure companies left footprints which can be researched on-line or in print.

Most hammer manufacturers



stipulate minimum installation requirements, designed to provide a long installation life in a production environment. Aside from the initial purchase price of the hammer, installing manufacturer-recommended foundations for the hammer is probably the most significant cost in setting up one of these machines. This aspect may even exceed the cost of the hammer, especially if your installation needs a substantial foundation for reasons such as poor ground conditions or prevention of vibrations adversely affecting your neighbours.

There are three main types of hammer foundation we will look at.

INERTIA BLOCK ISOLATED IN A PIT

By its nature, the isolated inertia block in a pit is the premier hammer installation. It is by far the most expensive, most complicated to construct and most effective foundation for full-time production use and is the standard for industrial use.

The mass of the inertia block increases the effectiveness of the hammer's blow and the inertia block's mass, in concert with the isolation materials, keeps the majority of vibrations from being transmitted from the hammer installation to surrounding areas, which wastes an amount of the energy of each blow. This type of installation also helps to maximize the duration of each blow, giving the energy from the tup time to take effect through the workpiece, working it more thoroughly than a blow of short duration, which only affects the workpiece to a shallow depth.

This sort of installation takes the form of a reinforced concrete pit, cast into a hole in the ground. Inside the pit the floor is lined with isolation materials designed to carry the mass of the inertia block and hammer and the upper inside perimeter of the pit is sometimes also lined with isolation materials. Once lined, cement to form the inertia block is poured into the pit.



Some manufacturer's stipulate no reinforcing in the inertia block and some recommend extensive reinforcing, leaving it up to the individual to choose to reo or not reo... A concrete strength of 32MPa seems to be commonly recommended for the pit and inertia block.

In the case of 'Two-piece' hammers, the anvil is placed into a recess formed in the inertia block on top of isolation material. Some blacksmiths prefer to use a proprietary material called Fabreeka™, which is a cloth-reinforced rubber sheet, cut to size, whereas others have had long-term success with canvas-reinforced conveyor belt. Steel cable-reinforced conveyor belt tends to chop out along the cables and causes blows to be harsh. For decades before the industrialisation of the use of rubber, hammers were installed on rafts of timber and this will work satisfactorily too. The timber rafts can be surprisingly thick, with allowances necessary to achieve the correct anvil pallett height if using this material.

The hammer is placed on timber slats to take up irregularities on underside of the hammer bedplate and the top of the inertia block and to permit the hammer to move, just slightly, with each blow, which keeps stresses in the hammer bedplate to a minimum. The rest of the hammer - or the entire 'One-piece' hammer - is then bolted down to complete the assembly.

INERTIA BLOCK IN THE GROUND

Many manufacturers nominate an inertia block cast directly into a hole in the ground. The assembly from there on is the same as it is for the isolated inertia block in a pit. In this case, it is the mass of the inertia block which reduces the transmission of vibrations to the surrounds.

This type of installation is somewhat simpler, but from my experience it is not as effective at stopping vibrations as the inertia block



isolated in a pit. Often this is to do with the inertia block being too small - due to the effort required to dig the hole, underground obstacles, access for digging machinery, the concrete cost or all of these considerations. At other times ground conditions permit vibrations to travel away from the hammer installation. The water table being close to the bottom of the inertia block hole will readily transmit vibrations, sometimes quite a distance, like water hammer (no pun intended) in water pipes.

It is worth noting many old technical manuals stipulated hammer foundations be placed well below the building foundations, otherwise vibrations from the hammer may interact with the foundations and then emanate from the structure. *

HAMMER ON A CONCRETE FLOOR

The final installation is the one many readers are likely to utilise. It may be a case of cost, rental agreements which do not include cutting holes in floors or just a matter of, "This is simple, we'll do it this way".

In many cases, so long as the floor, and more importantly, the sub-base which the floor is supported by, are sufficiently strong, a smaller hammer - to say 1cwt [50kg] - will work quite readily merely secured to the floor. A floor 4" [100mm] thick with a single layer of reinforcing mesh has been carrying one of the Massey 1cwt 'With Slides' air hammers at The Barn for many years, and although noticeable vibrations are transmitted as far as the brew-room and there is some cracking in the floor, neither is overly dramatic.

Whilst this installation is in common use, for the reasons noted, if you have close neighbours you may be well-advised to make the effort to isolate your hammer thoroughly to keep vibrations to a bare minimum. Moving the hammer to the other side of the workshop may suffice.

FOUNDATION FUNCTIONS

Foundations serve three functions.

1. They carry and keep the hammer in its original position.
2. They add inertia to the hammer assembly.
3. They reduce the vibrations transmitted by the hammer to the surroundings.

Whilst we won't be looking at the mathematics of soil mechanics, we can get a grasp of what needs to be considered by covering the basics conversationally.

In order to carry and keep the hammer in its original position, the pit - or the inertia block where it is cast directly in the ground - must be of sufficient plan area to keep the pressure applied to the ground beneath it to less than the bearing capacity of the ground. If this is not the case, the hammer assembly may sink with use and time. If the ground under the assembly is not of consistent bearing strength - as can be the case with fill - the hammer assembly might tilt. This isn't likely to be a problem with small hammers, but it can be a real issue to address in the case of large hammers.

Based on hammer information I've looked at over the years the rule of thumb seems to be to make the inertia block plan 600mm longer and wider than the base of the hammer. As for the depth, again, the rule of thumb seems to be to make the inertia block three times the weight of the hammer. So if your hammer is 500mm wide and 1,500mm long, the foundation should be 1,100mm wide by 2,100mm long. If the hammer weighs 3 tonnes, the inertia block should be 9 tonnes, which calculates to 1,700mm deep §.

Some blacksmiths prefer to make the hammer inertia block large enough in plan to stand on whilst they operate the hammer, whether it is in a pit or cast directly in the ground. Now if the hammer moves noticeably during operation, the

§ $1,100 \times 2,100 \times D = 9,000 / 2,300$
 $D = 3,913 / 2,310 = 1,694$, say 1,700mm
 Where D = depth of inertia block
 Inertia block mass = 9,000kg
 Concrete density = 2,300kg/m³

blacksmith standing on the same block, 'moves' with the hammer. This also helps with flotation, courtesy of the larger plan area. Others prefer to keep the inertia block close to the plan size of the bedplate, which does minimize the cost, but it might mean there is some relative movement which has to be compensated for, as the blacksmith will now be standing on a firm floor and the hammer on a moving - though only slightly - inertia block. This might matter more to you if you are suspending the workpiece from a jib or similar. If you want to make a pit to carry the inertia block on isolation materials, an allowance must be made for the thickness of the pit walls and floor, along with whatever isolation materials you choose to make use of. As you might expect, that is a rather expensive hole, especially if you need to dig it by hand or pay someone to!

Using an inertia block under the hammer is recommended by most manufacturers as it adds



Alldays and Onions 1cwt 'One-piece' air hammer on a plinth to raise the anvil pallett to a comfortable height for a tall blacksmith. The original foot pedal has a sliding pedal fitted to enable the 'smith to stand well-balanced. Another solution might be to lower the entire pedal for easy access all around the hammer. This hammer's history is in the story on page 27.

to the mass of the hammer and this provides better blow characteristics. This is the same principle that results in a big anvil providing more rebound to a given hand hammer than a small one does. Using "conservation of linear momentum" and "impulse" as key words in an internet search will provide much detail on these topics. It is beyond the scope of this article to explore these topics, but they play a very important part in all hammer forging.

The final benefit of using a significant inertia block is the absorption of vibrations by the mass of the block. It follows that bigger is better, but making the block deeper can be just too hard, and too costly, especially in rocky ground.

If your situation is such that you're intending to use the hammer to its limits day in, day out, installing the hammer as per the manufacturer's instructions will result in the hammer working at its best. A properly installed hammer operates quite differently to one that is not.

In the case of smaller hammers, or where a larger hammer is to be used occasionally, rather than for many hours every day, it might - just might - be feasible to install the hammer on the simplest of foundations, the workshop floor, and still find the hammer functions satisfactorily. This will reduce the installation cost dramatically.

Whilst a simple concrete floor may indeed carry the hammer, there are the shortfalls of far less inertia and far more vibration transmission to consider. It is also awkward to install a 'Two-piece' hammer directly onto a concrete floor without packing it up to account for the distance the anvil extends below the bedplate. The result is a hammer sitting on a raft of timber bearers for example. This makes the hammer difficult to operate safely, which is all-important. Raising a "One-piece" hammer has the same effect. A blacksmith operating a hammer with one foot up in the air to reach the control foot pedal - as though the 'smith

is about to climb up a ladder - is a 'smith poorly balanced. With a large piece of hot steel and tooling under the hammer, and a helper or two near by, this stance has the potential to be quite hazardous if the 'smith over-balances.

In the case of known poor ground conditions *beneath the workshop floor, it is prudent to cut through the floor and dig a hole into the substrate until you strike a suitable sub-soil, which is *not* topsoil. Then use an inertia block, either directly in the ground or isolated in a pit, to mount the hammer onto. With a concrete floor that is not well-supported, due say to settling of the sub-base beneath it, the slab is essentially suspended and will be very prone to vibrations and cracking and a poor choice to mount any hammer onto.

If you are working on an existing floor you'll probably have to use the 'suck it and see' approach. Just be prepared to cut a hole in the floor and make either a pit and block, or a block foundation.

Beware of underground services!

There are people who have

** Loose fill is bad, whereas firm sub-soil - soft rock, firm coarse sand and compacted gravel for example - is good. Well-compacted crushed rock is best used, placed in shallow lifts to a suitable thickness, over a questionable sub-soil. There is a cushioning effect from some classes of sub-soil, which also assists in dampening of vibrations. If an inertia block is set into hard, compact rock, additional resilient material is required beneath the anvil, otherwise the hammer blows will be harsh. This blow characteristic is best avoided as it is very hard on the hammer. The rock will also transmit vibrations, making an inertia block isolated in a pit perhaps the best choice to control vibrations in such circumstances, despite the extra cost involved. A water table close to the bottom of an inertia block will also transmit vibrations, sometimes quite a distance, as water is almost incompressible and any shock energy applied at one end of a captive stream will travel along that stream, being transferred to the surrounding ground where that stream is further restricted, or changes direction due to things like building column piers.*

received sound advice on installing a hammer, only to ignore it; they've ended up with hammer installations which move excessively when they shouldn't, might begin to tilt after some use, do not hit as hard as they should and / or transmit significant vibrations to the surrounding workshop and sometimes well beyond. It seems one may lead a blacksmith to a hammer, yet find it impossible to have them install it properly.

ELECTRICITY

On start-up hammers may draw up to seven times their running amperage, depending on how they are wired, so it is worth checking that your workshop has sufficient electrical capacity to operate a suitably sized hammer before you go looking for one. Power upgrades can be very expensive, depending on the distribution company that serves your property. The analysis can be quite complex, due to 'torque ripple' created by the unbalanced and often irregular current draw from some hammers influencing how much power is required.

Your electrician is the best point of reference for answers here, and has the know-how to determine the power required to run your power hammer and what power is available to you. Alternative starting methods and changes to wiring can help in cases where the power hammer may cause issues to neighbours drawing from the same supply.

CONCLUSION

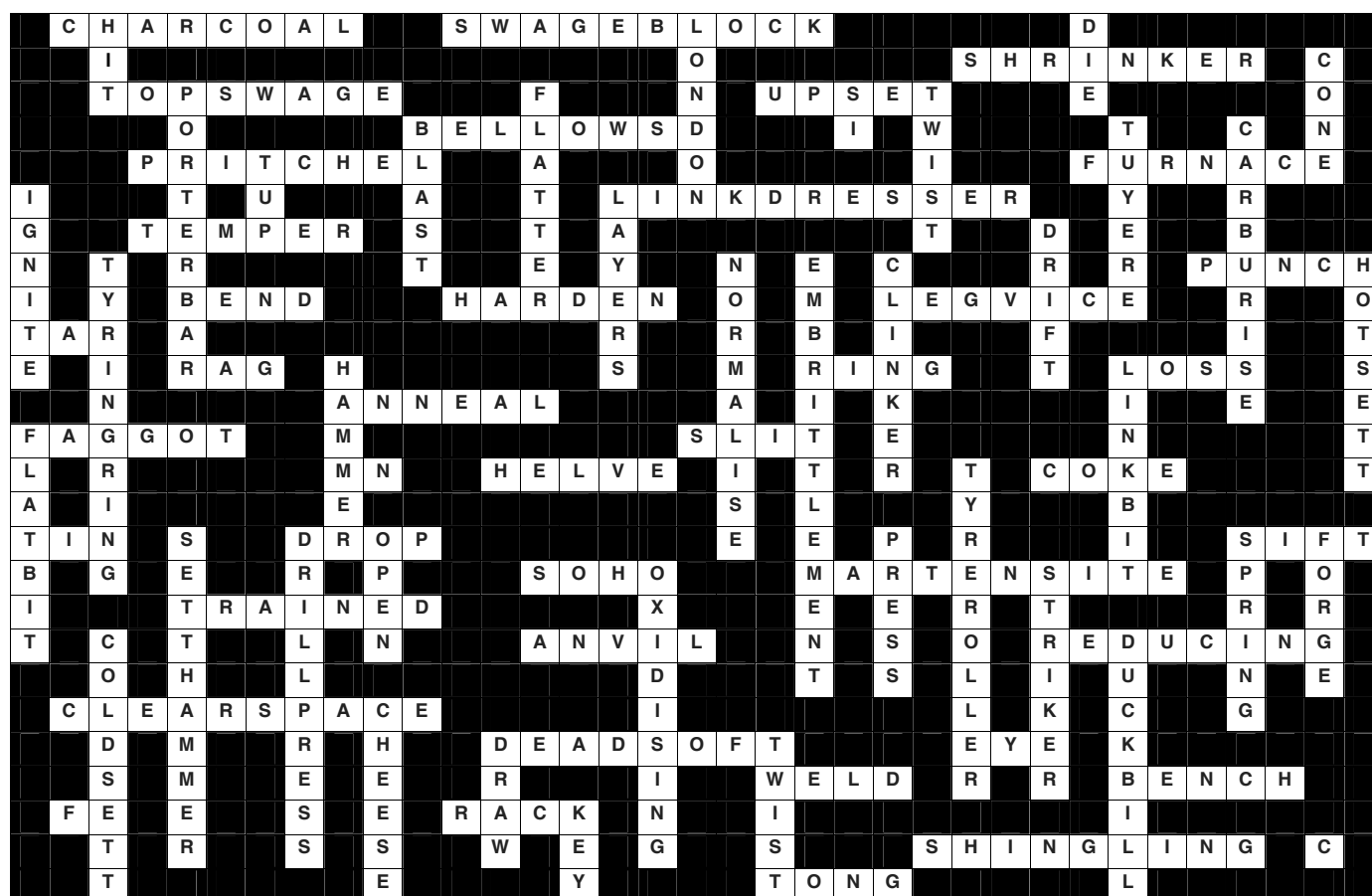
I hope these three articles help you out with learning about power hammers. ABA (Vic.) Inc. has some very experienced hammer-smiths in the membership, so don't hesitate to chase these people up. If there is anything else about these machines you're interested in, please feel free to ask!

Many thanks go to Colin Little, Deb Milligan and Hans Pehl for some of the images and information used in this article.



The Drift 102 Crossword Solution

Jim Deering



No Solution Yet...

We are still wondering about this item. It is around a metre [40"] left to right, 450mm [18"] top to bottom and 150mm [6"] thick, with radiused holes of different diameters and what seems to be a mounting lug at one end.

How about asking around your contacts? You might just solve this one for the Association.

Editorial You didn't miss the editorial; it is just the shortest editorial, **ever**. Merry Christmas and Happy 2017. Regards, Jim Deering.

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Thirteen Years for a 'Broken' Hammer Deb Milligan and Colin Little

In April 2011 our power hammer came home to rest on a nine tonne floating concrete block in a pit Col had dug thirteen years earlier. In Col's mind she was always in the workshop; it just took a while for this vision to become reality.



Col and pit "...imagine a hammer.."



The "test drive".



Manoeuvring the hammer.

This is a little hammer by industrial standards - just 1cwt - and was made in the 1920's by "Alldays and Onions Pneumatic Engineering Co." of Birmingham and shipped to Melbourne.

Brand new and beautiful, she was dropped on the docks and her casing cracked. It turned out to be cheaper to re-cast her casing at McPherson's Machinery Merchants of Melbourne rather than get a new one so she has a unique cast-in scar and no longer has the Alldays and Onions logo.

The power hammer's working life started at the Hawthorn Men's Institute until the Institute merged and became the Royal Melbourne Institute of Technology. It was moved to the Melbourne campus of RMIT where apprentice blacksmiths continued to learn their trade on her until the early 1960's when she was replaced by a bigger model and came to rest on the landing. She then became the smoko spot, where students gathered around her, resting their cups on her ample form.

One of those students was Daniel Jenkins who bought her when he left and took her to a new life at Whitehall Enterprises and Arts Collective in Footscray. Around that time Col and I were moving from Melbourne to a bush block

in Gippsland and starting to make work together. When Daniel moved to East Gippsland he sold her to Tony Summers in central Victoria, who kept her safely but not installed for a decade.

By then, on the other side of the state, we had moved from our bush block into the heart of the tiny (but very arty) Briagolong and Col had built his workshop. He had decided that, one day, he would own a power hammer so had included a 2.5m x 2.5m x 0.6m pit in the floor of the workshop. He explained that in the pit there would be a floating slab of concrete with very special sound and shock absorbing rubber insulation. No one knew what he was talking about, it all sounded a bit farfetched, but sure, you can have a pit if you want a pit Col.

It became a bit of a running joke - Col and his boarded-over pit - as a decade passed and we raised children and worked in other careers. But all the time, Col was talking to blacksmiths and looking at power hammers.

Then, in January 2011, we visited Little Newsham Forge home of artist blacksmith Brian Russell, and what an inspiration that was! They make extraordinarily beautiful work there. We had turned up right at the end of the day in Little Newsham - which is a town in the

north of England - and the only light left on in town was at the forge. They were just packing up and so Brian showed us around and demonstrated his hammers. We talked about how we were in the middle of town.

"Oh, well, you need one like this then," he said and showed us his 1cwt Alldays and Onions. He then heated up a piece of metal for Col and said, "Have a go on her."

Col fell in love with the hammer. As he described it, it is still a beast, still able to do the hard work, but very 'touchy feely'. It had a degree of manageability that you can lose with a bigger machine.

When we returned to Australia, Col started asking around the blacksmith networks to see if anyone had a 1cwt Alldays and Onions, and eventually struck gold! He bought the hammer from Tony and we started the journey of transporting her across the state and installing her on the (logistically quite tricky) floating concrete slab.

little milligan

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US Blacksmith Rachel David at The Barn

Beka Hannah

On the eighth of June, 2016, Rachel David came to a Blacksmith Doris day at The Barn. Rachel is a practising artist blacksmith based in New Orleans, USA. She was working in Tasmania and was in Melbourne for only a couple of days and we were lucky enough that she decided to spend some time with us.

When Rachel walked into the Barn, she looked like a child in a lolly store, she was amazed by the quantity of tools and gear that somehow manages to squeeze into the Barn and couldn't wait to have a look around and try out the power hammer.



Rachel working on the power hammer.
Image by Dominique Richards.

Rachel talked about how she got into blacksmithing, her practice where she squashes and manipulates metal to create a change in volume, mass, form and line in order to create a vocabulary to explore her ideas and emotions.

Rachel then went around and discussed with the members their current individual



Zoe working with Rachel.
Image by Dominique Richards.

projects and aims as well as offered advice and help with techniques.

Rachel travels and teaches and works with other blacksmiths to create collaborative sculptures and large works, she showed us some her designs and some of the group assisted her with creating some elements of this piece and Rachel took this teaching opportunity to improve some members' sledgehammer skills.

I found Rachel's visit to be inspiring, her seemingly endless enthusiasm for blacksmithing and the act of forging was infectious and this has encouraged me to explore my work on a larger and more ambitious scale.



Alice working with Rachel.
Image by Dominique Richards.

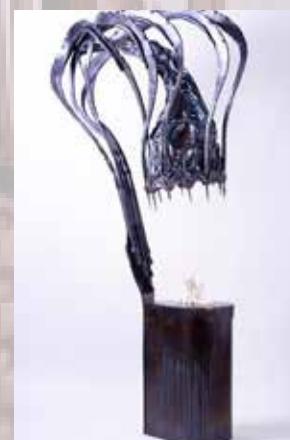


Beka working with Rachel.
Image by Dominique Richards.

Images [right] of Rachel's work are from her recent exhibition **"Holding Pattern"** and more of her work and her artist statement is at <http://redmetal.net/>



Bursae.



Darlingtonia.



Lycorum.



Spinning Wheel.