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How to Read Bookbinding Leather –

by Karen Vidler

When choosing leather for a new bookbinding or book repair an understanding of this material can assist in deciding on the best leather for the job. This includes recognising the animal species, how the leather was tanned and dyed and whether the leather was finished with a pigmented and embossed surface finish. These are just some of the processes that influence the final look, workability and durability of leather for bookbinding.

Bookbinding leather making requires a series of physical and chemical processes than can be broken down into three fundamental stages: 1. Removal of unwanted material such as hair, flesh, fat, interfibrillar (within the fibres) materials leaving a network of high protein collagen fibres, softened and interspaced with water 2. Tanning or treating the skin with a tanning agent to displace some of the water and combine with and coat the collagen fibres. Tanning increases the skins resistance to heat, hydrolysis (decay involving water) and microbial attack and 3. Finishing: where the final required thickness and appearance is achieved for the end use of the leather such as bookbinding.

Structure of Animal Skin

A skin of leather can be divided into different areas to help understand why the leather responds the way it does during the book covering process. Mammalian skins used for bookbinding leather have specific areas that indicate the arrangement of the leather fibres during the life of the animal and the final leather properties. The more elastic areas are where the animal skin stretches such as during movement or increasing weight. This includes the legs, neck and belly regions. The less elastic areas are dimensionally more stable such as the shoulders and butt. In the illustration below these areas are labelled across a mammalian skin. The red areas of the Daniels diagram indicate the optimum selection area for bookbinding and book repair purposes based on measured tensile strength and stretch.
The collagen fibres are arranged into fibre bundles in a woven network running through the thickness of the skin. As can be seen in the well-known cross section diagram by Sharphouse, fibres are arranged into three distinct layers common to all mammals used for bookbinding leather. 1. The upper layer is the all-important grain that the tanner seeks to preserve 2. The central corium layer which is the strongest section of the skin structure 3. The flesh layer of which most is removed during the early stages prior to tanning as this is not required for the final leather. The fibre bundles become more ordered with an increasingly shallow angle of weave as they move from the flesh through the corium to the grain layer of the skin. The hair shafts pass through the skin at varying depths depending on the animal species.


The most commonly used animal species for bookbinding leather include calf, goat, sheep skin and kangaroo and can be ranked for durability. Species recognition can be done following some basic characterisations of each skin and examination with a hand magnifier and lots of practice.

Calf

Goat

Sheep

Kangaroo
Calf skin is characterised by a hair follicle pattern within the skin surface that is evenly sized and spaced along the grain layer with no distinct pathways. The skin has relatively straight and shallow hair shafts that do not interrupt the junction between the grain and corium with uniform fibre bundles through the corium into the grain to impart strength through the leather. But the fibres are arranged at a steep angle so paring will reduce the strength of the final leather at the grain and corium junction.

The grain pattern of goat skin consists of clusters of large guard hairs and small fine hair follicles running in wide pathways across the surface of the skin. The skin structure has an even distribution of fibre bundles throughout the corium and grain and a shallow angle of entry of the guard and fine hair follicles which are evenly spaced throughout the skin. Goat skin leather is considered a durable animal skin for bookbinding purposes because of this strong internal structure.

The grain pattern of hair and wool sheep can be difficult to identify as like goat skin they contain clusters of large guard hairs and small fine hair follicles. Sheep skin is the least durable animal skin for bookbinding leather purposes due to the location of sebaceous (fat) glands that lubricate along the hair shaft being located at the grain and corium junction which leave a ‘looseness’ to the final leather after tanning. Also sheep skin has been, in recent history, tanned and surface finished with materials and processes that have ensured the leather is less durable over time.

Kangaroo skin has a distinct grain pattern of even sized, fairly straight and narrow hairs arranged in clusters of three or four fine hairs. Clusters run in long pathways across the skin. Internally the fibre bundles are evenly distributed at a low angle of weave with a highly uniform orientation of fibre running almost parallel with the skin causing a high tensile strength between grain and corium. Kangaroo has a thin grain and thick corium layer so paring will not greatly reduce the final strength of the leather. For these reasons Kangaroo is considered to make the most durable leather for bookbinding if tanned and finished correctly.

Tanning Materials

The other main raw material for bookbinding leather making is the vegetable tanning material. A vegetable tannin can be defined as an astringent mixture (quick to bind) of plant polyphenols and non-tannins that chemically bond to the collagen fibres and sourced from barks, leaves, roots and seed pods. The non-tans include sugars, starches, salts and acids that enter the leather, but do not directly react with the collagen fibres. They are thought to be important as they influence the progress of both tanning and the final qualities of the leather such as degree of water resistance, firmness and resistance to atmospheric pollution.

![Oak Bark sourced from Great Britain and Europe](image1)

![Mimosa sourced from South Africa and Australia](image2)

![Sumac source from Africa and Mediterranean](image3)
Traditionally bookbinding leather was tanned with oak bark. With the increased shortage of this raw material in the 18th century new tannins were investigated at a time when the British Empire was exploring the New World. At the same time as the discovery of alternative tanning materials, the discipline of leather chemistry was developing and this led to an understanding of the difference between these agents. Vegetable tannins can be divided into two groups commonly referred to as the condensed and the hydrolysable groups.

The condensed tannins impart a reddish-brown colour to the tanned skin. They are very astringent so penetrate and fix to the collagen fibres quickly so are more popular tanning agents. The red colour is due to the high amount of the phlobaphene compound present in the tannin that reacts quickly to form red products in leather. Condensed tannins are more effective ‘sinks’ for sulphur dioxide adsorption (on the surface) from acid gas pollution so acid decay is more aggressive. These tannins include Mimosa, Quebracho, Mangrove and Hemlock.

The hydrolysable tannins have been described in the research as the good tans for making more durable bookbinding leather. Usually a yellow-olive or yellow-brown colour is imparted in the tanned skin. This is a less astringent group of tannins so penetration and fixation is generally slower. The tanned leather is thought to contain more carbohydrates or salts (non-tans) which assist in making the skin more resistant to ageing from heat, light and gaseous pollutants. Examples include Sumac, Myrabolans, Chestnut, Valonia and Tara. Oak bark is considered a mix-tan.

Tanning Process

This system was gradually replaced by the drum tanning method in the mid-18th century or possibly earlier. Modern tanning drums have shelves or spokes that catch the skin during the tanning process which hold it in the air and allow it to drop with some force as the drum turns. This mechanical action squeezes and compresses the skin increasing the rate of penetration of the tannin.

Pit tanning was the common vessel for vegetable tanning groups of skins together prior to the 19th century. These pits were based on the counter-current system whereby skins are put into an old, almost exhausted tanning liquor, then progress through a series of pits of increased strength liquor to fix more tans at a controlled rate. There is very little movement or mechanical action of the skins apart from gentle agitation and the cycle of lifting the skins to inspect and move from one pit to the next.

Claytons Pit tanning

Wooden Tanning Drum
Dyeing the leather

The dyeing of bookbinding leather is also an ancient practice that changes from the use of traditional raw materials to faster acting modern dyestuffs. A dye is a coloured substance that has to have an affinity to the substrate in order to colour that material.

Prior to the 1880s the most common dyestuffs were natural dyes of plant and animal extracts. Natural dyes such as logwood (blacks, blues, violets) or brasilia wood (browns, reds) were precipitated in water with an inert binder or mordant of metal salts to ensure this affinity with the leather fibres. Most natural dyes were derived from plants sources such as roots, berries, bark, leaves and woods and animals such as the Kermis bettle (pink, red) and Murex Trunculus (Tyrian Purple). These were often found to not be lightfast on ageing and offered a limited colour range.

The development of modern dyes is believed to begin with chemist William Perkins, Manchester, 1856. Perkins first observed a synthetic dye colour from coal tar experiments. This led to the production of mauve and the development of the aniline and azo dye industries that are relied on today for the dyeing of textiles including leather. With the development of lightfast synthetic dyes the dyeing process became simpler and made it possible to drum dye leather almost any shade.

Fatliquoring and Drying

The dyed leather then undergoes the fatliquoring and drying processes. Fatliquoring mostly determines the final mechanical and physical properties of the leather such as it workability. This process separates the leather fibres in the wet state preventing them from sticking together too much during drying - without this leather would be hard and inflexible, as the fibres are not able to pass over each other during flexing. When too little lubricant is applied there is ‘looseness’ between the grain and corium layer. Application of too much lubricant can cause poor adhesion of any surface coatings during finishing.
Drying is done with the wet skin under tension to set the final arrangement of the leather fibres. Traditional toggling onto a toggle frame is still used by some tanneries or by pasting onto glass sheets and passing through a glass dryer at a controlled temperature and humidity. Pasting on to glass offers a greater final yield in the finished leather. Uneven drying can cause migration of unfixed compounds in the leather up to the surface as well as create loose areas in the skin which are not suitable for bookbinding leather use.

![Glass Dryer](image1)

**Surface Finishes**

Generally leather finishing is a group of processes using a mucilage (viscous substance) and mechanical processes to alter the grain layer. This takes place after the drying and softening which requires different manual or mechanical processes to further separate the fibres and increase flexibility of the leather.

Traditionally bookbinding leather was seasoned and polished after dyeing. Seasoning mucilage could contain egg albumin, waxes, glycerine, shellac, beeswax, or casein all made soluble in an alkaline solution. This can be slicked on or sprayed applied and polished by hand with a leather covered strop or using a glazing machine.

![Glazing Chieftain Goatskin with glass roller](image2)

In the 19th century there were several developments in the leather industry for altering the surface of bookbinding leather instead of dyeing and traditionally surface finishing. These techniques were all intended to improve the natural appearance or reduce defects in the grain layer of leathers or provide an inexpensive imitation of luxury leathers such as Morocco grain for bookbinding purposes. Processes included applying a simple aniline finish layer or coating with a pigment and stamping an embossed pattern.

The aniline finish provides a transparent layer that does not contain any pigment allowing the original grain surface to be seen through the finish. Semi-aniline finished leathers have an application of a small amount of coloured pigment but do not completely conceal the grain. This is intended to disguise minor defects in the leather.

![Surface Spraying Bookcalf with Aniline Dye](image3)
A pigmented finish means the grain layer has a surface coating containing particles that leaves the surface opaque. This is often combined with a heat embossed pattern onto the grain surface altering the natural grain appearance. Since the 17th century, plates have been made of wood then metal for leaving an embossed pattern in leather. These are composed of figures in relief that are stamped on to the leather. The effect is transferred by applying a pigmented coating to assist in imprinting the design. Usually the embossed effect on the grain surface is a reproduction of a superior grain such as Morocco goat onto inferior leather that can be sold at a lower price to the binder. Such processes can result in stiffer leather with limited long-term durability.

Conclusion

When selecting leather for bookbinding or repair purposes there are several factors to take into consideration. The leather selected should take account of the required durability of the animal skin, where Kangaroo, when tanned and finished correctly is the most durable, then goat and calf skin. That the vegetable tanning agent impacts on the long term stability of a bookbinding leather. Fortunately, in the UK the bookbinding leather Tanners prefer using the more stable group of tannins, the hydrolysable tans, such as Tara and Sumac for their calf and goat skin leathers. Then whether or not to opt for a dyed leather that retains the natural grain of the animal skin or choose an embossed leather which over time is less durable. But, always remembering when selecting leather for bookbinding the cost of the final leather selected is passed on to the client and the leather must also meet their expectations for cost and aesthetic suitability.

Karen Vidler - is a qualified bookbinder and book conservator, trained at both Guildford College and West Dean College. She has managed a small book conservation practice, Book Conservation Services, since 2006. Her work has included establishing a book and paper conservation studio with the Leather Conservation Centre, Northampton as well as being a Book Conservator with the V&A Museum and The National Archives, Kew. She is a Visiting Tutor on the Books Program, West Dean College, where she teaches the conservation of leather bindings as well as teaching conservation skills to students and qualified Conservators in UK, Europe and more recently Australia. She pursues ongoing research into improving the understanding of bookbinding leather deterioration and treatment.

www.bookconservationservices.com
www.facebook.com/bsbindery
email: bcsbindery@gmail.com
Traditional Bookbinding Technique

We are now selling, Nick Cowlishaw's excellent 'How To' DVD's, Traditional Bookbinding Technique. There are three double DVD's in the set, Casebinding, Forwarding and Covering in Leather.

£28.00 each (10% discount if all 3 are purchased)

Detailed information on the content of these beautifully produced DVD's can be viewed by clicking on the images above.

Alum Tawed Pigskin

We are delighted to announce that after a very long absence, Alum Tawed Pig is back in stock. Alum Tawed Leathers are known for their archival qualities, phenomenal strength and longevity. The Alum Tawed Pig is produced in a white shade.

Average Skin Size: 1.21 - 1.30m² (13 - 14ft²). Approximate cut size:
'A' quality skins will yield clean panels of approximately 75 x 75cm
'B' quality skins will yield clean panels suitable for A4 Bindings
'C' quality skins will be suitable for spines. small pieces, sewing thongs, etc.
Standard Substance: 0.9mm
Colours available: White
Grades: A, B and C (C grades are also available to purchase as half-skins)

Prices for single skins:
Grade A - £334.00 per skin
Grade B - £264.00 per skin
Grade C - £126.00 per skin
Grade C Half skin - £75.00 per skin

Quantity discounts are available

(subject to shipping charges and VAT where applicable)
Sharpening Guides

We are excited to launch two Arrotino Sharpening Guides. The first for the English Paring Knife and the second for Spokeshave blades.

Paring Knife Guide

The first beech guide is designed for use with the *English Paring Knife*. It is simple to operate, and even inexperienced users can produce outstanding results. It is approximately 25cm (9") long.

£40.00 each

Spokeshave Blade Guide

The second beech guide is designed for use with a *Spokeshave Blade* modified for paring leather, i.e. with a bevel angle reduced from 25 - 30 degrees down to approx. 10 degrees. It too, is simple to operate and will produce outstanding results. It is approximately 15cm (6") long.

£30.00 each

*(both guides are subject to shipping charges and VAT where applicable)*
The Designer Bookbinders Competition 2014

The J. Hewit & Sons Award for The Interesting Treatment of Leather
Winner - Kari Tveite
Book - *Breakfast at Tiffany's* by Truman Capote

A full description of the binding, materials used and a bio of Kari can be found in our online Showcase.

Our very warm congratulations go to Kari.

Society of Bookbinders Journal 2014

Contents:
Hannah Brown: Mayflies of the Driftless Region
Richard Nichols: Case Studies in Conservation
A Royal Restoration: Philippa Räder
Louise and Stuart Brockman: Binding Partnerships
The Cuie-ciselé: Tony Russ
Ian Andrews: Fans, Lace and Tulips
Sue Hufton: The Saint John's Bible
Recent Bindings: Glenn Malkin, BenjaminElbel/Maria Wilgenkamp and Paul Delrue

Only £18.00
*(subject to shipping charges)*
Bookbinding in Pictures

Angela Sutton's critically acclaimed 'Bookbinding in Pictures' is now available from J. Hewit and Sons. It offers a comprehensive introduction to the absorbing craft of bookbinding and provides all necessary instruction for beginners, describing the tools, equipment and materials needed and how to work with them. It is intended for people working on their own who will be able to achieve the goal of rebinding a favourite book and thereby gain confidence to progress to further studies.

Paperback, 162 pages
297mm x 210mm
Over 550 colour photographs

Only £25.00

(subject to shipping charges)

Online Bargain Basement

We are pleased to announce that we still have listed, a few remaining items in our online 'Bargain Basement'. These include an exciting selection of used, second-hand tools and equipment and a selection of discontinued and special offer materials.

These items are selling quickly, but those remaining may be viewed and purchased here.
Siltex Moiré Taffetta

We are pleased to be stocking Siltex Moiré Taffetta, a satin taffeta cloth with a traditional moiré design. It is paper lined and is ideal for covering books, albums and presentation folders. It is also suitable for endpapers and box making. Siltex is available in 9 shades on a roll width of 740mm. The grain pattern runs along the length of the roll.

Prices:
0-49 metres - £6.48/metre
50-249 metres - £4.64/metre
250+ metres - £4.29/metre

(Prices are subject to delivery and VAT where applicable)

We are now featured on 'Make Works'

We have been listed on 'Make Works', an online factory finding service for designers. The listing includes a lovely short video.

makeworks.co.uk/companies/jhewitandsons/
We were recently contacted by Family Business United who have done research into the oldest family run businesses in Scotland. To my surprise we came in as the third oldest private family firm still in existence. As you will see later on in this article the 31st of December 2014 was an important day in the history of J. Hewit & Sons Ltd, and having discovered some inaccuracies in our historical information, this prompted me to start writing down the history of the Company. Over the next few editions I intend to elaborate on the history of the Company.

J. Hewit & Sons Ltd can trace their history in the leather trade back to 1814, however the business of Thomas Hewat/Hewit Leather merchant did not start until 1822. Thomas was the younger son of Thomas Hewat and Sarah Gavin, Thomas (senior) being a writer, which I believe meant that he was probably a clerk in a lawyer’s practice.

Our Thomas was born around 1800 in Edinburgh. Thomas' father died when he was young and in 1814 he was apprenticed to John Moir, a shoemaker in Candlemaker Row, famous to many as the statue of Greyfriars Bobby is situated at the top of the street. After his apprenticeship Thomas qualified as a shoemaker and in 1822 married Mary Moir, the daughter of John, setting himself up as a leather merchant at 29 Niddry Street, in the heart of Edinburgh's leather district, off the Royal Mile. The "Boot and Shoe" department as it was called in later years ran until the late 1960's servicing the independent shoemakers of Edinburgh.

Thomas and Mary had two children including Jane, my great great grandmother. Tragedy struck the family in 1828 when Mary died in childbirth, however a year later Thomas married his wife's cousin Janet Murray. Over the next few years Thomas and Janet had three sons of their own, Thomas, David Gavin and Charles Murray.

I am unsure of the causes, but in 1830 there was an article published in "The Scotsman" that indicates that Thomas had gone bankrupt.

The business however appears to have continued trading and must have received funding from somewhere, possibly from Thomas' father in law, as within 3 years the family was living in Surgeon Square, one of the more prestigious addresses in Old Edinburgh.
From the street directories it is evident that the company had also begun Currying (dyeing and oiling) their own leather. The listing in the 1834 Edinburgh postal directory states "Hewat Tho. Currier and Leather Mercht.". Currying is an old term that is barely heard of these days. An act of Parliament around 1600 made it illegal for the process of tanning leather and the subsequent currying of skins to be done on the same premises. This state of affairs lasted until around 1820 when this act was repealed.

Surgeons Square

To understand the role performed by the currier, it is necessary to look at the earlier stages in the leather-making process. The animal skins were delivered to a tannery and there they were soaked and cleaned before liming, the process that opened up the fibres and facilitated the removal of the hair. After being cut to a suitable size, the skin was placed in successive tanks of progressively stronger tanning solution. The solution used for tanning was traditionally made from oak bark.

After careful drying the unfinished leather then passed to the currier, whose craft was to transform the stiff material into a pliant, workable material for the final craftsman to transform into the finished product. Just as tanners were prevented from being curriers until the 1820s, curriers were also forbidden to be leatherworkers. After this date however curriers were often shoemakers, so this would have been a logical move by Thomas, giving him better control of the products he was selling.

The art of currying leather involved hard manual labour, needing great skill and a range of special hand tools. The hide was first trimmed to a suitable size and shaved to substance by hand.

Hand Shaving

After this the hide was stretched on a frame and the currier would gradually tighten the frame in every direction until satisfied that the hide was as taut as possible. Once stretched, the tanned leather was washed and scrubbed. This part of the process was demanding physical labour which softened the skin. The currier then went to work with a "slicker", a short bladed blunt knife. The sleeker forced the remaining unfixed tanning fluid from the hide. The skin was then ready to be dressed.

Shaving Knife
We still use slickers here today (see page 7), both for squeezing water out of skins on our plate glass drying machine and when softening calfskins cracking. Once curried, leather could be used for a wider range of purposes, and also stained or dyed.

A currying shop including the use of slickers on the tables

Having finally prepared the skins the currier carried out the process of currying. That is, massaging the leather using beef tallow, neatsfoot oil or cod liver oil. This had the effect of softening the skins and preventing the leather from cracking. Once curried, leather could be used for a wider range of purposes and also stained or dyed.

Thomas almost certainly obtained most if not all his skins from the City Tanworks, 125 High Street, run by George Girle as this tannery was only 100 yards from his premises.

Thomas suffered poor health, and temporarily closed his business during 1844 before reopening. After a prolonged period of illness Thomas died on the 30th December 1846 leaving his wife, Janet, and the three boys aged 16, 10 and 4. The business then continued initially under the name Thomas Hewit jnr, then Mrs T Hewit, and finally in 1854 J. Hewit & Sons.

Running any business in the mid 1800’s was quite an achievement for a lady, particularly a heavy industrial process like currying. Janet was obviously a very strong-willed lady and showed this when a year before Thomas’ death she had persuaded him to change his will to leave nothing to the children from his first marriage. The lawyer noted on the will that Thomas was so weak at the time that he had to rest in the middle of signing his name. Thomas did recover sufficiently to add a codicil to leave some assets to his first two children.

The company obviously thrived over the next twenty years, and adverts in 'The Scotsman' in the early 1860’s give some ideas of the many different areas they became involved with during this period. Interestingly the third advert shows that we were already dealing with bookbinders as early as 1861.
When Mr Girle decided to retire in 1864, taking over the tannery was the next obvious stage allowing the expansion into the tanning of their own leather. The following article was published in 'The Scotsman' on several days around the year-end. The 31st of December 2014 was therefore the 150th anniversary of J. Hewit & Sons starting to tan leather.
The map below was published in 1852 and shows the City Tanworks in its original form. The tannery consisted of liming and tanning pits along with some yardage for storing chemicals, oak bark and skins. The tannery was very much cheek-by-jowl with the local tenement blocks down North Grays close, barely 4 feet at its widest and only a couple of hundred yards from John Knox’s house on Edinburgh’s Royal Mile.

The site of our first tannery is now bare land, and the area was recently excavated. I was allowed access to the site along with my father, and these original tanning and liming pits were still very much in evidence.
Study Opportunities

Understanding Leather - From Tannery to Collection, Northampton, UK

5 days CPD training for Conservators (10 participants only)
Dates - Monday 29th June to Friday 3rd July 2015
Cost - £495 tuition only. £395 thanks to Leathersellers grant)

Main Subjects
- Understanding Leather
- Understanding the threats to the preservation of leather in your collection

The course is a mixture of theory and practical (tanning, handling different leathers and examining deterioration problems). Each aspect of leather production is explored in both a theoretical and practical way, and explained in relation to deterioration processes and resultant care and conservation problems. Participants will have opportunities to try some of the production methods using both modern and traditional methods. Experienced professionals are on-hand to answer questions and the course takes place in an informal group, where students are encouraged to take part and get involved.

Participants - This course is aimed at conservators, curators and other museum professionals with responsibility for collections which include historic leather items, who wish to understand (a) leather making processes and (b) common deterioration problems found in historic leather objects. Those who attended the course in 2014 found it to be immensely useful as well as enjoyable.

To be held at
The Leather Conservation Centre and Northampton University's Institute of Creative Leather Technologies
The University of Northampton
Boughton Green Road
Northampton NN2 7AN

Notes
- Accommodation may be available on campus.
- The course will not run with less than 10 participants.
- Lab coats, gloves, boots and other necessary PPE will be provided.

Please note the course does not cover conservation treatments or techniques. (Please visit the West Dean website www.westdean.org.uk for information on CPD course on conservation of leather).

For further information or to book a place on this course please contact
Yvette Fletcher, Head of Conservation, The Leather Conservation Centre on
email lcc@northampton.ac.uk

Teaching Opportunities at the London Centre for Book Arts

Come and teach at the LCBA! The centre is looking to add more workshops to their schedule. If you have an idea for a workshop to teach at the Centre, please let them know by filling in the form on their web site.

You can see examples of their current workshops at www.londonbookarts.eventbrite.co.uk

Questions? Get in touch with Simon at simon@londonbookarts.org
Perfect Bindings - Workshops in Traditional and Contemporary Book Forms at arts centres and book festivals in Devon, Cornwall and Somerset

Three new workshops for May and June:

**Japanese books and single-section case binding**

*Saturday 23rd May 2015*

10.30-16.30

Exeter Phoenix

£38

**Coptic binding and concertina binding**

*Monday 15th June 2015*

10.00-16.00

Truro Arts Company

£50

**Coptic binding and Chinese accordion book**

*Saturday 27th June 2015*

10.00-16.00

The Plough Arts Centre, Torrington

£38

Full details can be found on the website www.perfectbindings.co.uk - email megan@perfectbindings.co.uk
Telephone 07582 783965 - Tutor Megan Stallworthy

Southern Bookcrafts Club Training Days, Winchester, Hampshire

**Sonia Bradford on Repairing Pages & Cleaning Paper**

*Saturday 23rd May 2015*

Instruction and practice. Apply by 9th May. £35

**John Jameson on Dyeing Leather for both Restoration and Design Binding**

*Saturday 27th June 2015*

Using 2 types of water-based dye and 1 type of spirit-based. Apply by 13th June.

The Southern Bookcrafts Club exists to develop the craft of bookbinding and book restoration in our region. We have a fully equipped dedicated bindery for use by bookbinders individually (or in groups for training days). Most members meet at the bindery on Friday mornings but full members have 24x7 access to the bindery. We are privileged in that Maureen Duke, past President of The Society of Bookbinders has agreed to preside over the SBC. Maureen leads a team of specialist tutors for the Training Days. The Club welcomes new members. Please contact Jack Walters if you would like to visit us or just drop in on a Friday morning. The bindery is between the centre of Winchester and Junction 9 of the M3, easily accessible by road and served by local bus services.

There will be an additional charge of £5.00 per person payable at each session for materials etc. All courses take place at the club's bindery in Winchester and run from 10:30 to about 16:00

More information, including Application Forms and detailed maps on how to find the bindery are available on the club's web site at www.sbookc.org.uk

or

please contact the Club's Secretary/Course Registrar, Jack Walters on tel. 0238026 6969 or email jwalters@care4free.net
The Maureen Duke Educational Award

The Norie Trust is a small charitable trust based in the South West of England. The Trust funds various projects, many of which are associated with literature and the arts. The Trust also assists community-based projects which aim to improve the quality of people's lives.

The Trust have generously offered the Society funds of £2,000 a year for the next 5 years to fund an educational award to assist professionals in the book field. The Trust wishes to recognise Maureen Duke's inspirational teaching and dedication to education and the award will therefore be known as The Maureen Duke Educational Award.

The recipient of the award each year should be a bookbinder, book conservator, book restorer or book artist who has worked professionally in the U.K. for the last two years prior to the award. They should be intending to continue to work professionally, preferably in the UK.

SoB's Education & Training Task Force has been asked by the Trust to administer the award and after discussion it has been agreed that the award panel will consist of the Chair of the Society, Chair of E&T and Maureen herself. The applicant will be required to submit the following:
- Hand written letter of application
- CV
- A brief outline of the nature of study wishing to be undertaken, indicating how this will enhance their work, and their plans for the future
- Full Breakdown of costs - fees, travel and subsistence
- Images of work completed in the 2 years prior to application
- Two references

The recipient will be required to write a report of their study and experience gained for others in the field.

Applications should be sent to:
Claire Redfern, 21 Moat Way, Goring by Sea, West Sussex, BN12 4DR

Workshops & Short Courses at the Black Fox Bindery in North London

Nicky Oliver offers a range of courses and workshops at Black Fox Bindery from beginners bookbinding and box-making to advanced book design classes such as leather dyeing techniques and onlay work. Nicky can also tailor classes to your requirements. All materials and equipment are provided.

Please contact her on nicky@blackfoxbindery.com or 07929 549 140 for details and bookings.

North Bennet Street School, Boston, MA - Full-time Bookbinding Program plus Workshops and Short Courses

Established in 1986, this popular two-year program attracts students who share a passion for books and materials, problem-solving, the creative process and working with their hands to make, restore and preserve books and other printed cultural treasures. Students learn fundamental bookbinding techniques including tool use and modification, non-adhesive bindings, cloth and paper bindings of various styles, edition binding and an introduction to book repair and conservation. The second year provides a comprehensive examination of leather bindings, decorative tooling and finishing and re-backing and repair of leather bindings. Advanced paper treatments including washing and deacidification and other conservation procedures are covered. In addition to the full-time program, the school offers one-week and longer short courses in bookbinding, calligraphy, paper marbling and more.

For more information go to: www.nbss.edu
An Introduction to Bookbinding with Mark Cockram at Studio 5, London

Case Binding

*Rationale* - This module develops the students' ability to use basic materials such as cloth and a number of machine made papers. It will allow students the opportunity to explore differing adhesives and covering techniques in the production of case bindings.

*Aims*
- to develop hand skills related to paper and cloth work and hand foil work
- to enhance professional skills, awareness and responsibility
- to stimulate creativity in design
- to develop awareness of choice of suitable styles

*Learning Outcome* - On completion the student will be able to:
- select suitable styles of case binding
- fold sections
- be familiar with various sewing techniques
- forward the book to the required standard
- make a case binding including the use of modern design techniques

*Assessment Strategy* - Assessment will be in line with the STUDIO 5 criteria and will be evident through examination and discussion of 5 finished items of work. The student will demonstrate an ability to apply the techniques to a good standard and understand the reasons for their use. The Module is delivered over 6 days with all materials included. Fee £700

Bradel Binding

*Rationale* - This module develops an awareness of strength and structure specific to this type of binding. It will give students the opportunity to work with leather and apply the relevant techniques involved in the production of the disappearing spine Bradel binding.

*Aims*
- to introduce the student to leather binding and manipulation
- to identify the correct materials specific to the binding style
- to understand the need for and limitations of the binding style
- to apply the relevant techniques
- to assess the suitability of the binding style

*Learning Outcome* - On completion the student will be able to:
- select suitable text blocks in need of this structure
- forward the book to the required standard
- make a Bradel binding including the use of modern design techniques

*Assessment Strategy* - Assessment will be in line with the STUDIO 5 criteria and will be evident through examination and discussion of 1 finished item of work. The student will demonstrate an ability to apply the techniques to a good standard and understand the reasons for their use. The Module is delivered over 6 days with all materials included. Fee £700

Box and Enclosure Making

*Rationale* - This module is intended to develop the students ability in making 3 styles of boxes for the books made during the 2 previous modules. The student will be able to select and use suitable materials and incorporate style and design ideas.

*Aims*
- to identify the correct materials specific to the box style and use
- to explore design and material manipulation
- to apply the relevant techniques
- to understand internal measuring

**Learning Outcome** - On completion the student will be able to:
- select suitable box styles and construction methods
- apply the techniques for making boxes including a two tray drop back box
- apply techniques suitable for various uses

**Assessment Strategy** - Assessment will be in line with the STUDIO 5 criteria and will be evident through examination and discussion of 3 finished items of work. The student will demonstrate an ability to apply the techniques to a high standard and understand the reasons for their use. The student will be expected to be able to demonstrate and rationalise design, process and protection. The Module is delivered over 6 days with all materials included. Fee £700

**Artist's Book or Complete Book (Option A)**

**Rationale** - This module is intended to develop the students' ability to explore print, book manipulation and creative journeys with the book.

**Aims**
- to identify differing print techniques
- to explore the book as a means of artistic and social expression
- to apply the relevant techniques, working practices and mediums

**Learning Outcome** - On completion the student will be able to:
- select suitable print techniques and mixed media
- forward the book to the required standard and manipulate as required
- to understand the relationship of the artist and the book

**Assessment Strategy** - Assessment will be in line with the STUDIO 5 criteria and will be evident through examination and discussion of 2 finished items of work. The student will demonstrate an ability to apply the techniques to a high standard and understand the reasons for their use. The student will be expected to be able to demonstrate and rationalise working processes. The Module is delivered over 6 days with some materials included. Fee £700

**Introduction to Contemporary Bradel Design Binding (Option B)**

**Rationale** - The Introduction to Contemporary Bradel Design Binding gives students the opportunity to make a Design Binding using contemporary and traditional techniques and materials.

**Aims**
- to expand existing skills and techniques whilst learning relevant traditional skills
- to explore Design Binding with contemporary arts practices
- to apply the relevant techniques, working practices and mediums

**Learning Outcome** - On completion the student will be able to:
- select suitable construction methods - forward the book to the required standard and manipulate as required - to boldly go where no one has been before

**Assessment Strategy** - Assessment will be in line with the STUDIO 5 criteria and will be evident through examination and discussion of 2 finished items of work. The student will demonstrate an ability to apply the techniques to a high standard and understand the reasons for their use. The student will be expected to be able to demonstrate and rationalise working processes. The Module is delivered over 14 days with basic materials included. Fee £1,400

The STUDIO 5 BEGINNERS COURSE is delivered in 3 modules of six days each. Upon successful completion the student will be issued with a Studio 5 Certificate. The fee is £2,100.00
per person. The fee covers all tuition, hand tool use, workshop equipment as required and materials as outlined in the module information. A 50% non returnable deposit is required to confirm booking full payment being made no less than 2 weeks prior to the beginning of the course. The modules can be delivered in a block or days to suit the individual student. Two further modules, options A and B are individually priced.

To book a place or for more information please contact us at:
Mark Cockram at Studio Five, First Floor The Mews
46-52 Church Road, Barnes, London, SW13 0DQ
Tel: 0208 563 2158 e-mail: studio5bookarts@aol.co.uk

Handmade Art Workshops, London

Handmade Art Workshops design and deliver unique analogue art projects that encourage hands on creativity. We are artists, designers & craftswomen combining our experience and skills to teach drawing, printing and bookbinding to a range of ages and in a variety of community settings.

Get a Sketchbook is suitable for anyone over the age of eleven. It aims to engage its participants with the importance of sketchbooks in the creative process by enabling them to work with two professional artists and a bookbinder to make and use their own personalised hand-made, hardbound sketchbooks. These sessions can be booked individually or as a three session package.

Stages of the Get a Sketchbook workshop:

Workshop 1
Relief printing a cover using an etching press for your own sketchbook with artist Rachel Thomson
running time 2 hours
numbers max 20
price £250 includes materials & refreshments

Workshop 2
Making and binding your own sketchbook with professional book binder Nicky Oliver
running time 2 hours
numbers max 20
price £250 includes materials & refreshments

Workshop 3
Introduction to use of sketchbooks, speed drawing and information gathering involving use of different media with artist Agnes Mitchell
running time 2 hours
numbers max 20
price £250 includes materials & refreshments

Further details are available from www.haccamoirai.co.uk

The Artworks, Halifax, Yorkshire

Printmaking and Bookbinding - Please visit their web site for a full list of available courses.

“All of our workshops offer the highest quality tuition in a relaxed, welcoming, open and conducive atmosphere. Our workshops are structured, providing you with the necessary skills and techniques to master the craft and are flexible too, allowing you to work on different projects from traditional to contemporary. You can work at your own pace and all materials and tools are provided at the class to get you going.”

Further information is available from www.theartworks.org.uk
Binding in Powys at The Farthing Press & Bindery with Alan Fitch

There are available a variety of courses, which run throughout the year, offering the opportunity to learn in an idyllic location and relaxed atmosphere. With only a maximum of three people on any one course, tuition is on a very personal level, with each student having their own work station and all tools and materials supplied.

The courses run from Monday - Friday (9 - 5). Over the period of the course you will be guided through all the aspects of bookbinding, relevant to each course. There are at present four courses available:

**Basic Course** - This course has been designed for the beginner and covers all the basics of binding a book.

**Refresher/Repair Course** - This course is designed for the student who:
- Has completed the Basic Course but would like to spend more time developing their basic skills before moving on to finer things.
- Has had some experience in the past of binding a case bound, round and backed book but would like to refresh their skills.
- Would like to develop their skills in repairing old cloth cased books.

**Full Leather Course** - This course is for the person who wants to develop their bookbinding skills and progress to binding in leather.

**2 Day Bookmaking Course** - This course has been designed to allow you to spend two days making a variety of types and styles of book, none of which require any specialist equipment or tools.

Accommodation is available

For further detail please telephone +44 (0)1938 590733 or view the web site at www.farthingpress.plus.com

**The School for Bookbinding Arts, Winchester, VA**

The school is committed to providing quality training in the craft of hand bookbinding. Its ongoing series of two-day workshops is designed to teach techniques that are immediately useful to the student as well as to create a solid foundation of skills for further bookbinding study. The curriculum includes both basic and advanced courses that are geared toward the needs of book dealers, collectors and anyone interested in learning the art of hand bookbinding. Each workshop features demonstrations of the techniques being taught coupled with ample supervised practice time for the student. A complete package of printed notes accompanies each of the workshops to aid the student in assimilating the body of information being presented.

Workshops are taught in the studios of Cat Tail Run Hand Bookbinding near Winchester, Virginia. Cat Tail Run Hand Bookbinding is a fully operational hand bookbinding and book restoration facility established in 1991 by Jill Deiss. Instructors for THE SCHOOL FOR BOOKBINDING ARTS include Jill Deiss, Dee Evetts, Susan McCabe and Bill Deiss.

**Foundation Level Course**

**Beginning Cloth Binding Restoration:** This course teaches a wide variety of skills that are immediately useful for the repair of cloth bindings and also serves as a foundation for later courses. Techniques taught include: repairing damaged corners, endcaps and joints on cloth bindings; toning of discolorations; and minor paper repair techniques. Limited to 9 students. $235

**Beginning Leather Binding Restoration:** Students will learn various treatments for leather bindings including repairs for damaged corners, endcaps, and joints. Also included are techniques for polishing and improving the condition of leather surfaces. $235
Advanced Cloth Binding Restoration: Learn the professional technique for restoring a cloth binding using original boards and spine. Requires Beginning Cloth Binding Restoration for participation. Limited to 7 students. $235

Advanced Leather Binding Restoration: The leather reback is the companion repair to the cloth reback but for leather bindings. All portions of the original binding are retained in this professional restoration. Techniques for thinning and paring leather will be featured in this workshop. Requires Beginning Leather Binding Restoration for participation. Limited to 7 students. $235

New Cloth Bindings: Two styles of new bindings will be taught to enable students to put covers on books that have lost their original bindings. Introduction to book titling will be featured as well as methods for endsheet attachment. Limited to 9 students. $235

Clamshell Box Construction: Students will learn the craft of creating custom-fit clamshell boxes. Limited to 9 students. $235

Paper Marbling [Beginning & Advanced]: Students will learn many traditional marbled patterns as well as how to set up their own marbling studios. Inquire for course fee.

Further information from:
540-662-2683
www.CatTailRun.com
email: info@cattailrun.com

CBL Ascona, Switzerland

The Association centro del bel libro in Ascona is the parent institution of an internationally known and recognised technical school with the specialised areas of Bookbinding and Design and Book and Paper Conservation. The Association exists for the continued development and ever higher qualification of its instructors in both areas. Competitions and exhibitions help inform the public about their activities and expand public awareness of the book. The Association makes it possible for experts in related fields and for interested laypeople to acquire knowledge and skills pertaining to the book through special courses of instruction. The Association is a not for profit organisation. Its departments assure the smooth functioning of the school and an especially well organised office assists course participants with their stay in Ascona. The Directorate, among other duties, is charged with attracting new supporting members for the Association to ensure the continued work and development of the School. Should you be in agreement with the stated goals of the Association - we would be pleased to welcome you as a new member!

Department of Bookbinding and Design - The study areas of Bookbinding and Design offer discerning bookbinders the opportunity of technical and creative challenges. Course participants have the opportunity to further their qualifications through learning internationally recognised methods and techniques, are able to hone their skills and increase their knowledge, evaluate themselves and be inspired by colleagues. They will exchange ideas and find paths in creativity and through self reflection; paths which open up by being away from job demands and daily stress, away from routine, and the pressures of time and expectations of productivity. The annually changing course offerings are continually enhanced by timely developments to expand students depth of understanding. They include classic hand bookbinding techniques, such as the French full leather binding, the Bradel technique, as well as hand gilding. Another area of program concentration is the contemporary design of bookbindings, in which design, technique and material complement each other and fulfil the functional and qualitative aspects of a book.

Department of Book and Paper Conservation - The study of book and paper conservation at the centro del bel libro ascona assures further education specifically for book and paper restorers and delivers timely, inclusive and internationally recognised competencies in theory and practical
applications. Scientific bases of restoration, restoration ethics, as well as documentation and decision making are encouraged and fostered in order to increase the knowledge of course participants in these areas. The opportunity to engage in dialogue in related disciplines, support and evaluation of innovation, and most of all development of practical skills to assure correct restoration and conservation measures - all are addressed in this context. The exchange of ideas among experts, and the addition of highly specialised guest lecturers provide the best conditions for exploring all relevant subjects in depth. Highly qualified teachers, a pleasant study and work environment, course participants from countries world wide, and the much renowned southern joie de vivre facilitate learning, ignite the desire to learn and communicate, and reward the student with improved self confidence. Building on these facts, it becomes an easy task to develop conventions for the protection of our cultural heritage, the book - a task which the centro del bel libro ascona has set itself and which it fulfils.

Further information regarding courses programs can be found on the school's web site at: www.cbl-ascona.ch

If you have a listing that you would like included on this page please let us know by e-mail to sales@hewit.com
Customers Recent Bindings

Lysistrata of Aristophanes Bound by Kate Holland

Being a facsimile of that published by Leonard Smithers of London in 1896. No.391/515
Illustrated by Aubrey Beardsley

The book is covered in full hand dyed terracotta alum tawed calf with gold tooling. The top edge is coloured gold and there are hand sewn silk endbands, hand dyed and sanded reverse goatskin doublures and hand coloured endpapers.

Kate wanted to emulate human skin with all its mottlings and variations and this could only be achieved by dying an alum tawed skin herself. The tooling reflects the sinuous lines and delicate pointwork of the illustrator.

Kate is happy to undertake commissions for design bindings.

For further examples of her work please go to www.katehollandbooks.co.uk
by Glenn Todd and Andrew Hoyem
Anion Press, San Francisco, CA 1981

Blue Hewit Pentland goatskin binding with recessed panels on front and back covers. Pop up strips of goatskin with title over spine. Onlays of goatskin, snakeskin and laminated Mylar. Sanded leather and acrylic paint. Top edge polished graphite. Paste-downs and flyleaves of cork.
The binding is focused on the shape of writing and mark making, particularly the segmented Mylar laminated painting.

Donald Glaister is a book artist now living and working on Vashon Island Washington, near Seattle. He began his bookbinding career after taking degrees in painting and sculpture from San Jose State College in California, and studying binding privately with Barbara Hiller in San Francisco and Pierre Aufschneider and Roger Arnoult in Paris. His over thirty year professional career in design bookbinding has centered on the exploration, development and use of unexpected binding materials, visual humor and spontaneous visual expression, while working within the classical framework of the European binding form. Beginning in 2002, Don's work expanded to include the design and production of editions of artist's books which include painting, sculpture and poetry that Don has made.

Don has taught binding and design privately and as Professor of Book Arts at The University of Alabama. He currently teaches classes and serves as the Director of Fine Binding at the American Academy of Bookbinding in Telluride, CO.

Dates for your Diary

The Bookbinding Competition 2015

The set book for the Competition in 2015 is Nineteen Eighty-Four by George Orwell. The Folio edition is 234 x 156mm, 304 pages, including 10 full-page colour illustrations by Jonathan Burton.

War is Peace, Freedom is Slavery, Ignorance is Strength

George Orwell’s masterpiece, Nineteen Eighty-Four, is perhaps the most pervasively influential book of the twentieth century, making famous Big Brother, newspeak, doublespeak and Room 101. Winston Smith, drudge editor of historical records for the Ministry of Truth, writes a diary, and in that act lies his catastrophic rebellion. In many ways a grown-up Brave New World, Nineteen Eighty-Four was published in 1949 on the eve of the Cold War, and feels unbearably prescient in its portrayal of totalitarian systems of power.

To obtain a copy of the 2015 set book and entry details, send your cheque for £20 (to DB members) and £25 for non-members to include packing, postage and entrance fee. Cheques should be made payable to Designer Bookbinders and sent to Lester Bath, 25 Ffordd Ffrydlas, Bethesda, Bangor, Gwynedd LL57 3BL. Each entrant must bind the set book and we welcome open choice books and artist’s books.

The annual Bookbinding Competition is sponsored by Designer Bookbinders and The Folio Society and is open to anyone resident in the UK except Fellows of Designer Bookbinders. Charity Registration No. 282018.

*The Society of Bookbinders Education & Training Conference 2015
Keele University, Staffordshire
20th-23rd August 2015

There will be lectures and demonstrations on: gold tooling; book arts; paper marbling; techniques; boxes and much more. Keele University is in Staffordshire, in central England, just twenty minutes’ drive from junctions 15 & 16 of the M6 motorway. There are direct rail links to Stoke-on-Trent from London, Manchester and Birmingham with a direct bus link to the campus.

Thursday Afternoon - please note that at this stage these are provisional and we cannot guarantee arrangements until nearer the time. However, we are planning to offer the following:

- A tour of historic Keele Hall. This lasts about an hour and will take place twice during the afternoon.
- A visit to a display in the University Library, which holds some rare and interesting books; items include De Fidei Sacramento by Hugh St Victor, a vellum-bound 13th century manuscript, and three volumes of finishing designs by G T Bagguley, a binder from Newcastle-under-Lyme.
- A coach trip to the William Salt Library in Stafford where we hope that Richard Nichols, who was a speaker at our last Conference, will be able to show us round. (However, please note that a major reorganisation of the Staffordshire records is about to take place, and this may not be possible.)
- Showing of a DVD.
- Demonstrations of techniques.

For those who would like to make their own arrangements, there is a regular bus service from the campus to the centre of Stoke-on-Trent. The Museum (free entry) holds interesting collections of costumes and textiles, jade and ivory, a good collection of fine art and prints, and the best collection of Staffordshire ceramics in the world. The Museum also holds part of the Staffordshire
Hoard, a find of beautiful Anglo-Saxon gold inlaid artefacts whose workmanship disproves the common belief that pre-Norman times were the Dark Ages, and a Spitfire aircraft.

Many of the historic potteries - Wedgwood, Moorcroft, Spode - are in or near the city centre and are open to visitors; some allow hands-on experience of the manufacturing process for a small charge. Brochures will be available at reception. There is more information at www.visitstoke.co.uk

**Thursday Evening** - The Society's Annual General Meeting will take place at 6.00 pm on the Thursday. This will be followed immediately by the International Competition awards at approximately 7.00 pm and drinks and dinner will be from 7.30 onwards.

**Friday / Saturday** - Lectures and demonstrations will take place on the Friday and Saturday, and will all last one and a quarter hours. Morning sessions will be from 9.15-10.30 am and from 11.15 am to 12.30 pm; the afternoon sessions 2.00-3.15 pm and 4.00-5.15 pm. There will be three lectures / demonstrations taking place at any one time except on the Friday evening when there will be one lecture at 8.30pm.

Accommodation will be in one of the halls of residence a few minutes’ walk from the Chancellor’s Building. All rooms are single occupancy with en suite bathrooms, tea and coffee-making facilities, telephone and free internet access.

For the less mobile there are some rooms with full disabled access and suitable bathrooms; if you would like one of these please request it on the application form. For anyone who finds the walk to the Chancellor’s Building too far we hope to be able to run a shuttle bus from the accommodation to the Chancellor’s Building at busy times. However, there is car parking by the accommodation so it will be possible to drive there and back.

Further details, pricing and booking information are available from www.societyofbookbinders.com/events/conference/index.html

*The Guild of Book Workers - Standards of Excellence Seminar in Hand Bookbinding 2015
14th-17th October 2015, Cleveland, Ohio*

Held annually at a different location around the country, participants attend presentations by leading experts in the fields related to the book and paper arts. Tours of binderies, conservation facilities, rare book libraries and papermaking establishments are regularly arranged in conjunction with the event.

Presentations and Presenters - To be Announced

A supplier’s trade fair will also be held throughout this event.

Further details and booking information are available from the Guild of Book Workers web site at www.guildofbookworkers.org

J. Hewit & Sons will have a stand at the event(s) marked "*".
Was there a shortage of Goats in Roman Britain?

by Roger Barlee

In November I went on a bus-man's holiday to the Archaeological Leather Group conference in the Royal Armouries in Leeds. The conference was fascinating with lectures on a wide variety of topics including Samurai lacquered leather helmets, the use of raw hide in armour and the types of leather used in padding medieval jousting armour.

The first lecture by Carol Van Driel-Murray however caught me completely by surprise as it was regarding the research done on the Roman tent pieces found at Vindolanda, a Roman fort on Hadrian's Wall. When the soldiers went on route marches they slept in tents made from the skins of 77 tallowed goatskins. The floor area of each tent was 10x10 feet with a height of 6 feet at the apex and weighed in the region of 40Kgs. The tent slept 8 people in 2 shifts including all their kit. A single legion of 4800 men would therefore have needed 46200 tallowed goatskins for tents.

During the 1990's we supplied leather to a Roman re-enactment society, the Ermine Street Guard, who made two tents following the templates found at Vindolanda. There was sufficient evidence to know that the panels were stitched in such a way that there was no stitching evident on the outside of the tent. It took over 800 man-hours for the Ermine Street Guard to sew one tent by hand using the same techniques and the first tent was completed in 1993, the picture was taken when I saw the tent that year at Maiden Castle in Dorset. The tents have held up extremely well and are still waterproof!

At the time when Hadrian's Wall was being built there were approximately 30 legions in Britain alone. If all British 30 legions had their own tents that would be 18,000 tents or 1,386,000 tallowed goatskins - now that would be a nice Government contract to get!!!