



BY APPOINTMENT
TO HER MAJESTY THE QUEEN
MANUFACTURERS OF LEATHER
J. HEWIT & SONS LTD. EDINBURGH

J. Hewit & Sons Ltd.

TANNERS AND LEATHER DRESSERS



Skin Deep

The biannual Newsletter from J. Hewit & Sons Ltd.

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Contents

Features

The Rigid Concave Spine	page 3
The Manufacture of Leather - part 2	page 9
A Wry Look at Papermills and their Customers	page 15
Leather 'Bloom' - Causes and Remedies	page 19

Regular items

Introduction	page 2
Agents Profile - Productos de Conservación, Spain	page 18
Letters	page 6
Product News	page 7
Bargain Basement	page 21



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Introduction

After a very encouraging response to the first newsletter, we are pleased to be publishing our second offering of 'Skin Deep'.

In this issue, we have articles from Chris Laver-Gibbs of Griffen Mill, giving us a light-hearted look at papermaking, Part 2 of the 'Manufacture of Leather' (for those who were not put off by Part 1!), The Causes and Remedies of Leather Bloom, a problem which many binders using leather will have come across and a guest item from our Spanish Agent.

We are also delighted to have a contribution from James Brockman on the subject of 'concave spines'. This is a topic which is being intensely discussed in various circles, not least on the Book Arts List, an Internet discussion forum, which anyone, anywhere in the World can subscribe to.

The Book Arts List is a means whereby like minded people involved in bookbinding can ask technical questions, receive answers and exchange information and advice on many topics relating to hand bookbinding and book & paper conservation and restoration.

If you are interested, and have access to the Internet, you can subscribe by sending the message:

SUBSCRIBE BOOK_ARTS-L [*your name*]
to
listserv@listserv.syr.edu

And on the subject of the '*Information Super Highway*', we ask that you watch this space as we are hoping soon to have our own 'home page' on the World Wide Web.

We have also introduced with this issue a Letters Page and would welcome from you any suggestions for future articles, anecdotes or comments - containing either praise or criticism!

We hope that you enjoy this edition of 'Skin Deep' - Happy Reading!

David Lanning
Sales Director

The Rigid Concave Spine: Time To Throw Away Your Backing Hammer!

by James Brockman

It is difficult to say when spine flexibility started to worry me. I had watched the Forwarders using sawn-in cords during my six year apprenticeship as a Finisher and had even bound a few books using this method myself. The Journeymen I worked under insisted on rock solid spines on which to tool and letter. Any spine that was too soft was swiftly returned to the Forwarder for correction.

After six years of this uncomplicated approach to binding structure, I went to work for Sydney Cockerell in Cambridge where I was introduced to a completely different philosophy. Sewing must be strong and flexible. Sawn-in cords were weak, damaged the sections and resulted in inflexible spines - they were never used! I was introduced to sewing on double and single cords. When a smooth spine was required, the book was sewn on tapes and split boards with a French groove were attached. I was happy to use these techniques on suitable books but I soon discovered that they were not always appropriate for some finer work.

I had heard of attaching boards by lacing tapes into the boards. After a few experiments I mastered this method for books that were not sewn on raised cords. This answered the Forwarding problems of sewing and board attachment with minimum damage to the text block. However, it still left the problem of rounding and backing - a damaging technique but if done with care and sympathy for the text block, the "damage" caused by the gentle use of the backing hammer is justified by the support given to the bound book by the shaped spine.

After leaving the Cockerell Bindery, my exposure to binding styles increased dramatically. I saw and handled bindings from all periods. My initial training as a Finisher meant I always had an eye for fine tooling and I was greatly impressed by the Forwarding and Finishing skills of the French binders. However, in their quest for perfection in Forwarding and Finishing, they had totally forgotten function. The books, with rock solid spines (perfect for sharp tooling impressions), would not open! I was intrigued by the strength of these French bindings with their over-lined spines. The spines do not move - therefore they will not break.

Wouldn't it be wonderful if the binder could produce a rigid spine for maximum support and durability that would allow the book to open well? The answer was all around me. Books that were heavily used, paper backs, telephone directories, all develop a concave spine with use. For hundreds of years binders have hammered, glued and lined spines into a convex round. We, as binders, have become used to seeing books closed. If we examined the open book, we would become aware of the contortions a

flexible spine endures when it travels from book closed to book open. Depending on the thickness of the book, this travel can be over one inch! Consider what is happening to the spine when this happens. The spine linings are compressed, adhesive stretched, sewing thread tightens in the sewing holes, paper fibres strain. The leverage that the boards and pages impose on the spine is enormous. Once the book is opened of course, everything gives a little. It is the start of wear (movement = wear). If it moves it is just a matter of time until it breaks!

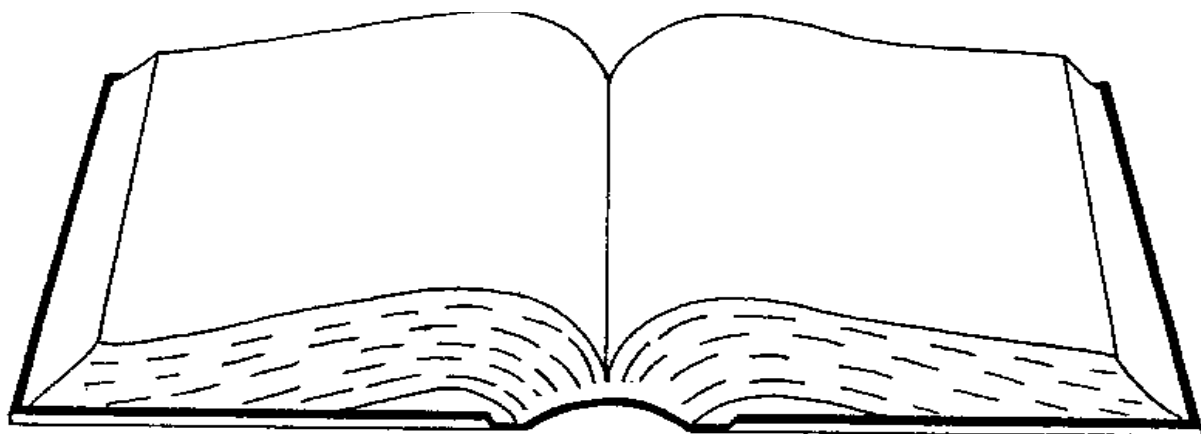
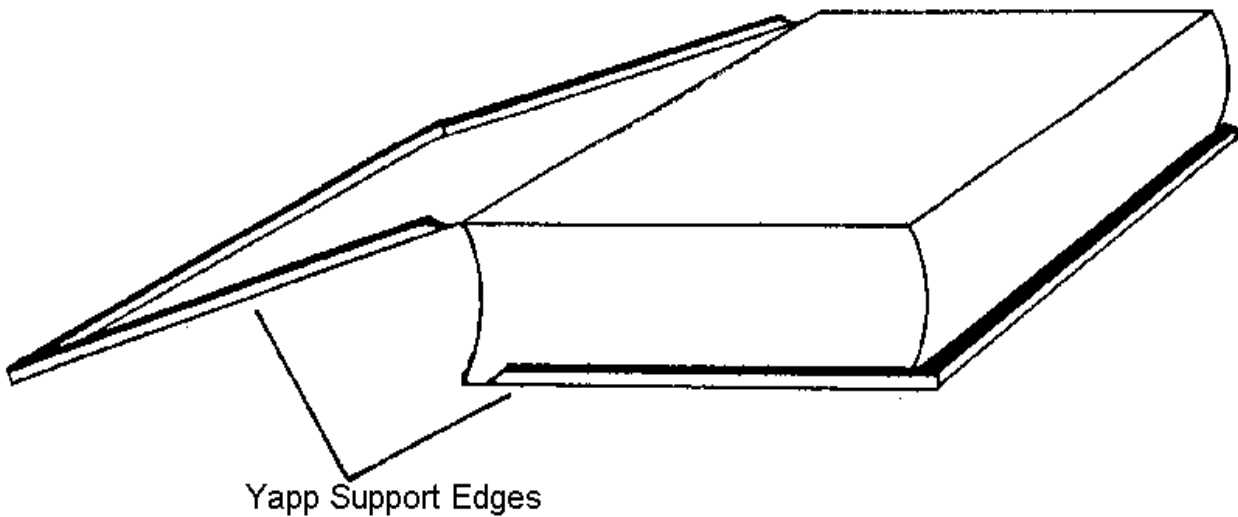
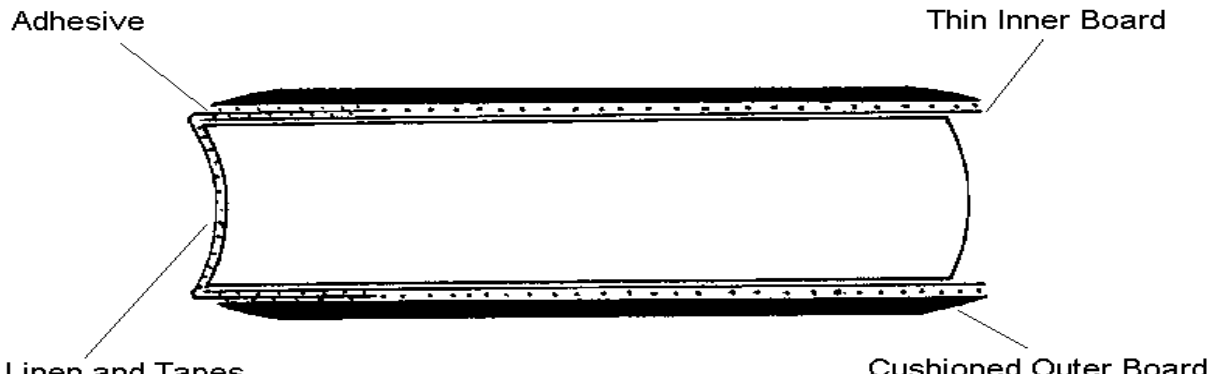
Therefore the solution is simple. An unbreakable spine that is permanently thrown up - THE RIGID CONCAVE SPINE.

Full details of the binding techniques were explained in my article "Rethinking the Rigid Spine" published in Designer Bookbinders, Journal The New Bookbinder - Volume 15, 1995

Briefly the sequence of operations are as follows:

1. Sew book on tapes. Some swelling is desirable.
2. Place under weight on edge of bench and gently tap spine concave with wooden dowel.
3. Glue spine and leave to dry.
4. Line spine between tapes with linen. Leave the linen as long as the tapes on each side.
5. Board construction is of the split board type. The inner thin board/card should go right to the joint under the lining and tapes with the outer board being placed about 2mm from the joint. The four edges of the top board may be cushioned for neatness.
6. Endbands may be sewn on through the linen spine lining.
7. The spine should be lined with eight or more layers of strong paper. Enough to ensure that the spine cannot flex.
8. With heavy books or better quality work, a yapp edge about 4mm high may be glued around the squares on both boards. This will support the text block when the book is standing.

9. The book is now covered with a tight back.
10. Lettering and decoration on the spine is possible with hand letters or labels. I have used small Finishing tools successfully.



Open Book showing Flow of Leaves and Rigid Concave Spine

NB. The position of the boards at the joints and the gap between the yapp edges and the text block should allow room for the covering materials.

To date, I have bound ten books with rigid concave spines. Nine of these were sewn on tapes and one on single raised cords. I have commissions for four fine bindings.



James Brockman was an apprenticed finisher in Oxford from 1962-68. From 1968-73 he worked with the late Sydney Cockerell at Cambridge. He started and managed The Eddington Bindery 1973-76 and started his own workshop 1976. He was President of Designer bookbinders from 1985-87. He has also lectured and demonstrated extensively in Europe, U.S.A., Canada and Australia.



Letters

Tickling the Filaments!

Thank you very much for sending 'Skin Deep' Issue No.1. Part 1 of the Manufacture of Leather tickled the memory filaments and took me back to pinning our salted rabbit skins on the coal-house roof. I can't wait for part 2 when I hope to read the solution to another old memory. This is of a swimming pool size vat of chemicals I almost fell into when visiting a London Tannery as a City messenger boy just after the.....well, in 1947. Please keep me on your list. Season's greetings to all - especially my contact there, Richard.

Peter Sewell, West Sussex

Thanks

Congratulations and well done. Your newsletter is most welcome and I look forward to future editions. Bookbinders have so few publications. I enjoyed Maureen Duke's article and David Lanning's - most interesting and informative.

Sincerely
Paul C. Delrue, Cheshire

Product News

As always we are keeping abreast of the latest developments in materials and sundries.

Marble Papers

We are pleased to announce that we have added two new sets of Hand Marbled Paper to our range to further enhance our already extensive stock selection of papers.

Leda (Irish) Marble Papers

3 patterns to choose from (more designs to follow) - 45 x 64cm	
singles	£4.21 each
for 25 sheets	£4.08 each
for 50 sheets	£3.95 each

Double Crown (English) Marble Papers

9 patterns to choose from - 51 x 76cm	
singles	£4.29 each
for 25 sheets	£4.16 each
for 50 sheets	£4.03 each

Sample swatches are now available

Product News

Hand Made Paper

Due to popular demand, we are now delighted to be in a position to offer you a selection of hand made papers from Griffen Mill. These archival papers are made by hand from the highest quality cotton, linen or hemp fibres and possess all the traditional characteristics associated with European handmade papers. Internally buffered, they have an alkaline reserve (pH range 7.3 - 8.4) and a good wet strength to ensure that they are dimensionally stable and have a long life expectancy. All papers have a NOT finish. The following papers are held in stock:

<u>Description</u>	<u>Colour</u>	<u>Type</u>	<u>Weight</u>	<u>Size</u>
Akbar	natural	wove	80 and 115gsm	510 x 620mm
Early Wove	cream or white	wove	80 and 115gsm	510 x 620mm
Falcon	antique with flecks	laid	80 and 115gsm	532 x 646mm
Griffen	tinted brown	laid	80 and 115gsm	500 x 640mm
Old Cleeve	antique white with flecks	laid	80 and 115gsm	532 x 646mm

Sample books have now been produced.

Other papers in the Griffen Mill range are also available and the mill can also produce papers to your own specification.

Please contact us for further details.

Modern Bookbinding - Alex J. Vaughan

This book first published in 1929, is one of the finest examples of bookbinding manuals ever produced. Recently reprinted, with a newly written forward by Maureen Duke is now available from us at £14.99

The Manufacture of Leather - part 2

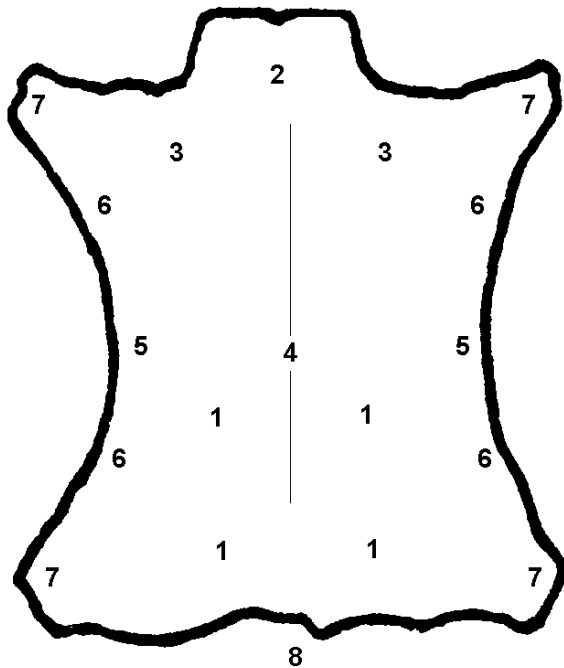
By David Lanning

Here is the second instalment on **The Manufacture of Leather**. In part 1, we covered the brief history of leather, the various sources of the pelts we use, the abattoir and the methods of preserving skins between the abattoir and tannery.

If you are reading this, I can only assume that you were not put off by the first article in this series. This instalment on the exciting world of leather manufacture, will cover the various processes undertaken by us to prepare the skins for tanning.

The Structure of Skins

Different parts of the skin have different names:



1. The Butt - is the thickest and strongest part of the animal and normally provides the best quality leather.

2. The Neck - is thick and strong but provides a poorer cut due to creases and growth marks

3. The Shoulder - is thinner and weaker than the butt or neck.

4. The Backbone - tends to be thinner than the butt area.

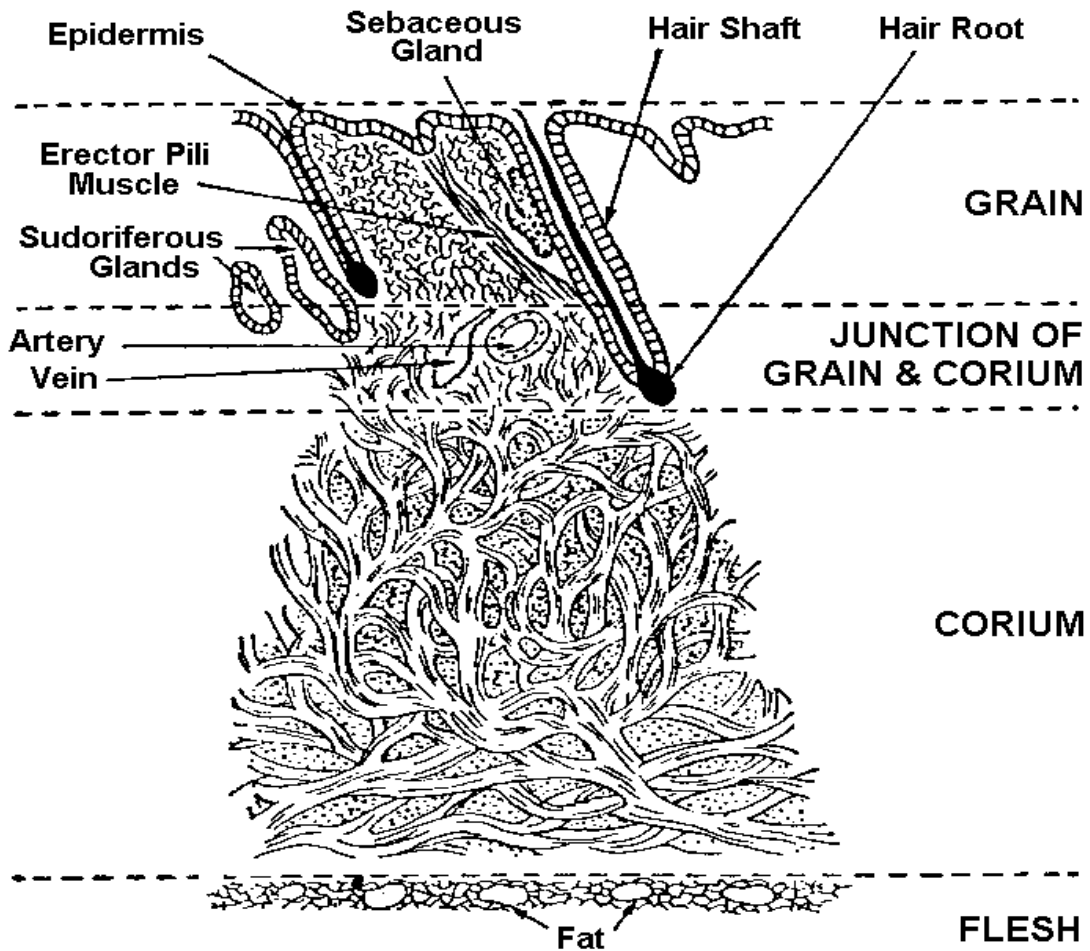
5. The Belly - is thin and has a less dense structure.

6. The Flanks - are the thinnest and weakest part of the skin.

7. Shanks

8. Tail end

Cross section of a piece of skin



Follicle

The skin is full of pore holes which penetrate into the skin. These are called follicles. In pigskin, they penetrate deep into the lower flesh area, and as a result when you look at the reverse side of a pigskin, you can see the pore holes

Hair/Wool

This grows in the skin through the follicle.

Hair Root

This lies at the bottom of the follicle.

Erector Pili Muscles

These muscles raises the hair on living animals and cause goose pimples.

Glands

The *sebaceous* glands secrete oils which lubricate the skin and hair. The *sudoriferous* glands exude sweat which is important in regulating the temperature of the skin and hence the animal.

Epidermis

The surface layer is called the epidermis. It consists of mainly dead cells which are relatively hard.

The hair/wool, the hair root and the epidermis are made from a protein called *keratin*. It is the most stable part of the skin, but has to be removed during manufacture, to expose the grain layer which lies beneath it.

Flesh

This deep layer is called the flesh layer. It contains high levels of meat and fat and is therefore of no use to the tanner.

Unless the leather is to be left with the hair on, as in the case of woolled sheepskin, it is the section between the epidermis and the flesh layer which is important to J. Hewit & Sons as tanners.

This important section is called the *dermis* and consists mainly of densely interwoven fibrous tissue. This tissue is made up of a protein called collagen.

If you look under a microscope, you will clearly see all of the fibre bundles. It is these fibre bundles which make leather such a strong, flexible and unique material.

The *dermis* is broken down into 3 parts.

Corium

Here the fibre bundles are large and strong. They lie at varying angles to the grain layer above. This angle varies in different animals, but to some extent, the angle can be altered during the leather manufacturing process. This angle is known as the 'angle of weave' and it effects the physical properties of the leather. A lower angle of weave produces a softer, weaker and less elastic leather.

Grain

It consists of more densely woven fibre bundles, which have a much finer construction. Towards the top of this layer, next to the epidermis, the fibres are extremely fine and form the layer we call the grain.

Junction

This is the area between the corium and the grain layer. In certain animals it can cause problems, e.g. in sheep (basil) where splitting can occur along the junction area.

There are a few other things worth noting:

- Running throughout the skin are many veins and sweat glands.

- Between the fibre bundles are inter-fibrillary proteins. These proteins can cause a problem. They are not like the collagen proteins which make up the fibre bundles. When they dry out, they form hard glues that clog up the leather. This would make the leather hard and inflexible.
- There are many fat cells within the corium. These can vary depending on:
 - i the type of animal
 - ii the breed
 - iii the foodstuffs used
 - iv the time of year it was slaughtered

Fats are easy to remove, but in sheep the fat can be up to 30% of the weight of the skin and once removed can leave large empty spaces, which can make the leather feel empty.

The Tannery

When the skins arrive at the tannery in their cured form, they would have to be examined, to check for obvious damage due to poor flaying or curing. At this stage it has been known for us to reject a batch of skins and to return them to their country of origin. However, it is extremely rare for us to have to do this.

We now have to prepare the skins prior to the tanning process commencing.

Soaking The first operation is to soak the skins. There are two reasons for this:

1. To return the skins to the state they were in at slaughter, i.e. to reverse the curing process, and
2. To remove all the blood, dirt and dung.

This operation, as do most of the following operations involving chemicals, take place at Hewit's tannery inside large wooden drums.

Skins are counted into batches and then weighed. Each batch is put in a drum and processing starts by soaking in cold water to which detergent, salt and biocide are added. The drum is turned occasionally and the water is changed if it becomes heavily contaminated. The process is finished when the water remains clean, and the skins have been re-hydrated. The time taken for this process depends on the method of curing which was

implemented at the abattoir. E.g. longer for dry cured skins (approximately 72 hours) and shorter for wet salted skins (approximately 18 hours).

The whole process can be speeded up by one or more of several methods:

- 1 Heating the water
- 2 Adding enzymes

But beware!!!!!! Soaking must be done correctly otherwise the skins won't relax properly. If this were to happen, the penetration of chemicals in all of the following processes would be patchy, resulting in an inconsistent leather.

Liming

The cleaned skins still have their hair on. In the case of our leather, this must now be removed together with the hair roots and the epidermis, in order to expose the grain layer. Sodium sulphide or sodium hydrosulphide is added to the soaked skins. After an hour or so, these chemicals would have penetrated deeply into the hair and grain of the leather, causing the breakdown of the keratin, the main protein constituent of the hair and epidermis. Lime (caustic soda), a strong alkali is then added, enhancing the breakdown which actually dissolves the hair root and epidermis away. No damage due to liming is done to the collagen (dermis) part of the skin. Another effect of the liming process is to remove the inter fibrillary proteins. These are proteins similar to egg white which, if not removed, would harden like glue and make the leather as stiff as a board.

Lime also causes two important physical effects - *Osmotic Swelling* and *Lyotropic Plumping*.* The result of these effects is that the skin becomes swollen and engorged with water causing the fibre bundles to open up allowing for thorough penetration of the tanning materials at a later stage.

**Editor's note - The precise definitions of these terms are beyond the scope of this article (and its author). If anyone would like further details, however, I'm sure I can persuade someone from the tannery to write a long and boring article to pad-out a future issue of this 'rag'. Letters to the letter page please!!!*

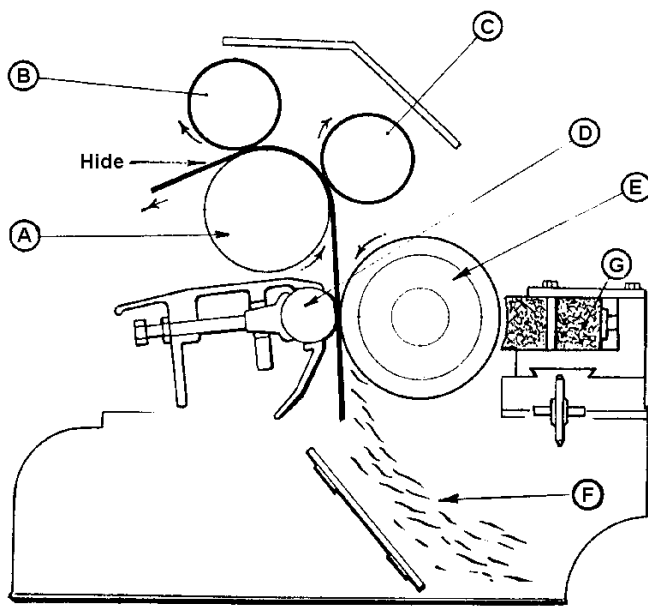


Washing

The skins are washed to remove excess lime and materials loosened during the previous stage.

Fleshing

The adhering fat and tissues on the underside of the skin form a significant barrier to the penetration of subsequent chemicals. Thus, removal of this 'flesh' at an early stage, is highly desirable. The fleshing operation not only removes flesh, but assists in relaxing the skins and it also aids in the removal of any remaining hair roots out of the skin. This procedure is carried out using a fleshing machine.



Rubber Roll Fleshing Machine

- A. Rubber-clad feed roller
- B. Fluted metal gripping roller
- C. Second fluted metal gripping roller
- D. Rubber-clad pneumatic pressure roller
- E. Fleshing cylinder
- F. Fleshings falling from hide
- G. Carborundum block for sharpening fleshing cylinder

sharpening fleshing cylinder

Fleshing can be carried out immediately after the soaking phase - when it is known as green fleshing. The advantage of this is that it allows for better penetration of chemicals during the liming process, but the big disadvantage is that it can lead to mechanical damage on the skin, because the skin has not been relaxed.

De-liming

The liming operation has made the skins very alkaline. In order to begin tanning, the alkalinity has to be lowered considerably. The chemical used for this is ammonium chloride.

As the lime in the skin is neutralised by the ammonium chloride, the skin starts to de-swell. As a result, the inter fibrillary and keratin proteins which were destroyed during liming, are washed out of the skin.

Bating

Bating is carried out in order to soften the skin even further, through the enzymatic removal of muscle fibres. When it is finished, the grain will be smooth and relaxed. Traditionally, this was the most unpleasant part of producing leather since various animal dungs, mainly dog and chicken would have been used as the source of the enzymes. The digestive tracts of these animals are a rich source of the relevant enzymes.

In more recent times the enzyme was extracted from pancreas of cattle and was readily available as a by-product of insulin production. Nowadays, this has been replaced by bacterial enzymes.

Scudding This is the final process prior to the tanning starting. By placing the skins on a rounded board, and by running a rounded blunt knife over the grain, any remaining hair-root, skin pigmentation and surface fat are squeezed out of the skin. We are one of the last remaining tanneries in the U.K. who still undertakes this process by hand.



A Wry Look at Papermills and their Customers - with apologies to Lewis Carroll.

By Chris Laver-Gibbs - Griffen Mill

The Griffen and Alice had not gone far before they saw the Mock Turtle in the distance, sitting sad and lonely on a little ledge of rock; drawing nearer, Alice could hear him sighing as if his heart would break. As they approached, the Mock Turtle looked at Alice with large eyes full of tears, but said nothing.

“This young lady,” said the Griffen, “wants to know about paper.”

“I’ll tell it to her.” said the Mock Turtle in a deep, hollow tone. “Sit down both of you, and don’t speak a word till I’ve finished.”

So they sat down and nobody spoke for some minutes. Alice thought to herself, “I don’t see how he can ever finish if he doesn’t begin”. But she waited patiently.

“Once,” said the Mock Turtle at last, “Paper was just paper.”

These words were followed by a very long silence, broken only by an occasional “Hjckrrh!” from the Griffen and the constant heavy sobbing from the Mock Turtle.

“When we were little”, the Mock Turtle went on at last, more calmly, though still sobbing a little now and then “paper was made quite simply by hand. Some papermills said their paper was good for wrapping things in, other mills said their paper was good for writing on and others said they made printing paper ...of course this wasn’t always true.”

“Why not?” asked Alice.

“Because it wasn’t.” said the Mock Turtle sadly.

“You ought to be ashamed of yourself for asking such a simple question!” said the Griffen; and then they both sat silent and looked at poor Alice. At last the Griffen said to the Mock Turtle, “Drive on old Fellow! Don't be all day about it!” and he went on with these words:-

“Later, because there were so many complaints from customers, it was decided to describe how each type of paper should *perform*.”

Alice thought the idea that a sheet of paper could *PERFORM* very funny and started to giggle. The Griffen glared at her so she hastily asked the Mock Turtle what he meant.

The Mock Turtle sighed heavily and looked at the Griffen and asked him whether he remembered the paper song.

“Oh, you sing.” said the Griffen. “I've forgotten the words.”

“Oh, a song, please if the Mock Turtle will be so kind,” Alice pleaded, so eagerly that the Griffen said, in rather an offended tone, “Hm! No accounting for tastes!”

The Mock Turtle bowed his head and then stood up. Waving his fore-paws to mark the time, he began to sing slowly in a voice choked with sobs:-

“Shrewd Lawyers love within its folds
To practice night and day;
Richer Bankers change it into gold
in a financial way;

Great men of thought and letters on
The milk white surface trace.
Rich jewels and precious gems are bound
within its soft embrace.”

Here, the Griffen shook itself, for it had fallen into a light doze and said “Of course, if you use the wrong paper for the wrong job, it won't work anyway”.

Alice wondered why anyone would want to do a wrong job in the first place and the Mock Turtle annoyed, by the Griffen's interruption, snapped “The papermaker's chorus is still to come, if I may continue?”

“By all means old fellow.” replied the Griffen, in a conciliatory tone.

The Mock Turtle blinked several times and drew the back of one flapper across his eyes. He looked at Alice and tried to speak, but for a minute or two, sobs choked his voice.

“Same as a bone in his throat,” said the Griffen; and it set to work shaking and punching him in the back. At last the Mock Turtle recovered his voice and with tears running down his cheeks, he went on with the papermaker’s lament:-

“Poets-princes and Conservators,
Painters and Bookish binders,
They undo what we all do
Down by the River Sheppey.”

“What does it mean?” asked Alice. “How can you undo a piece of paper?”

“Easy.” explained the Griffen. “First you wet it, then you attack it.”

“Attack it with what?” asked Alice in a surprised voice.

“With a stiff brush or a steel nib.” replied the Griffen, waving a paw.

“Don’t forget the glue, the knife and the needle.” sobbed the Mock Turtle.

“If I was a papermaker,” said Alice rather desperately, because her thoughts were still inexplicably with the lawyers, “I wouldn’t make any paper!”

“Then you wouldn’t be a papermaker,” said the Griffen in disgust.

“Probably best not to be!” added the Mock Turtle thoughtfully.

THE END

The Poem was taken from the words of an original song by a papermaker who worked at Turkey Mill in Kent in 1891. (The last verse has been altered slightly).



Christine Laver-Gibbs founded Griffen Mill in 1987, helped by practical and technical advice from Whatmans and St. Cuthberts Mill in Somerset.

Initially, hand made stationery was made at the mill, which supplied customers such as Harrods and the National Trust. However, the closure of Barcham Green in the late eighties, production was switched to supplying repair papers for bookbinders and paper conservators.

Since 1994, when Michael Gibbs joined the Mill, production has risen and Griffen Mill Papers can now be found in collections as far away as Japan, New Zealand, South Africa and the Americas.



Agent Profile - Spain

Productos de Conservación - Patricia Blake

Productos de Conservación, S.A. as a young company of 10 years, is proud to be the agent in Spain for such an old and distinguished company as is J. Hewit & Sons, nearly 200 years. One of the more delightful aspects of representing J. Hewit & Sons is the valuable and unlimited support we receive from their staff, who are always available to explain the many and intricate uses of their products in the bookbinding world.

Productos de Conservación is a small Spanish company which sells products and materials for the restoration/conservation of works of art throughout Spain. Apart from bookbinders we also cater to all fields of restoration/conservation such as painting, paper, textiles, objects, archaeology, etc. We enjoy contributing and being part of preserving the past for the future.

We are located in the so called 'Triangle of Art' in Madrid. This triangle encompasses the big three museums of Madrid; The Prado, The Reina Sofia and the Foundation Thyssen-Bornemisza. Our shop, on Calle Almaden is not an ordinary shop.... can such a shop be ordinary? Customers, do not walk in, take a product from the shelf, pay and walk out. On the contrary we often have long chats with our customers about the products, their present projects, up and coming conferences or courses, the small fees paid in Spain for their valuable and artistic

talents and their future prospects in a country where they are being told to tighten their belts.

Spain has a long history of bookbinding which is still strong and doing well as shown in a recent exhibition at the National Library, where the young bookbinders surprised the crowds with their strikingly beautiful and modern designs. This exhibition and other activities owe their origin to AFEDA, the recently formed Spanish Bookbinders Association, of which Productos de Conservación is proud to be a founding member. AFEDA publish a magazine which would be the envy of most associations. They are very active in the Spanish bookbinding world where they help bring together bookbinders from all of Spain and thus foster a sense of belonging to an old and worthy profession.

What a good idea it would be if AFEDA and the British bookbinding associations were to create an exchange programme. Something on a small scale whereby one English bookbinder and one Spanish bookbinder would spend a week in each other's country. Experience, new ideas and methods is one of the best ways to promote progress and understanding in any field.

Hasta la Vista

Leather 'Bloom' - Causes and Remedies

by William McLean

Author's note - The following article appeared first on the Internet and was written in response to a discussion in the Book Arts List. I have tried to cover a lot of ground without taking up excess 'bandwidth' (anathema to Net users!) and I apologise if, as a result, the wording is a little terse.

There are two principal reasons for the development of a bloom on the surface of leather - 1) micro-biological agents, i.e. the growth of fungal or bacterial colonies and 2) crystallisation of material emanating from within the leather.

- 1 Microbial growth - this is almost always indicative of storage under inappropriate environmental conditions. Most types of leather are hygroscopic and will draw in moisture from a damp atmosphere until a point is reached where micro-organisms can thrive. The visible sign of this is usually a white, powdery deposit on the surface but there is often penetration into the substrate which may not be immediately apparent. The biological processes are fuelled by digestion of the substrate resulting in an irreversible breakdown.

The important remedial actions are to halt further activity by returning the leather to a drier state and by the use of an appropriate biocide. The degree to which the original appearance can be restored is largely dependant on the nature and severity of the contamination. In many cases it will be possible to achieve a good result by brushing or lightly swabbing the surface, followed by an application of wax based penetrative leather dressing.

- 2 Crystalline surface deposits - known in the leather trade as "spues", arise because of the migration towards the surface of unbound, mobile components from within the leather. They are unsightly but are not, generally speaking, harmful and they often come about as a result of cyclical changes in environmental conditions, i.e. fluctuating temperature or humidity. Broadly, these deposits may be subdivided into salt spues and waxy spues. The classical method of differentiating is by applying a local source of heat, for example a match flame, which will usually cause a waxy spue to melt and disappear - at least temporarily, whereas a salt spue will be unaffected.

Salt deposits are often water soluble and can be readily swabbed away; however, as the leather dries out again further salt may be brought up to the surface causing a recurrence of the problem. It is important to bear in mind that soluble components are always carried towards the side where evaporation is taking place (this is the principle on which chromatography is based). Wet leather should, if possible, be dried with the grain side against an impervious sheet to encourage migration away from the grain and help prevent excessive build-up and crystallisation of salts on the grain surface.

Waxy deposits are, generally, not water soluble. Localised heating , as described earlier, or polishing may be all that is required to improve the appearance but neither of these methods actually removes the surface contaminant. It may be possible to remove this by swabbing with a weak solution of detergent or lactic acid but often it is necessary to employ an organic solvent. The same principles apply as described in the paragraph above, i.e. after washing off the excess, final drying should take place into the leather so as to carry any residual material away from the surface.

A special case exists for soap deposits which can form when certain metallic compounds react with oils in the leather. The types of soap most likely to cause a problem in leather are those resulting from a reaction between basic chromium or aluminium tanning agents and emulsifiable oils introduced during the leather-making process or naturally occurring free fatty acids. These soaps are highly insoluble and may be difficult to deal with. Oxalic acid has been suggested elsewhere as a suitable material for removing soap deposits but there are two significant disadvantages to its use - firstly, it is a moderately strong acid which could lead to damage if an excess were left in the leather, and secondly, it is poisonous by skin absorption and so should be handled with extreme caution. A better and safer option is to swab with iso-propyl alcohol which is a fairly good solvent for many of these soaps.

Aluminium and chromium soaps are not likely to be of concern to users of regular vegetable tanned bookbinding leathers. Chromium tanned leathers can be very difficult to work with and chromium/vegetable combination tannages have been shown to have poor performance under accelerated ageing tests. Aluminium tawed and aluminium/vegetable tanned leathers, which perform very well in these test, are sold as specialist "conservation" grades, so there should be no confusion as to whether or not aluminium is present. Other metals which may give rise to soap formation include calcium and magnesium from hard water areas but the tanner should have taken appropriate steps to deal with any potential problem and, in any event, these will only be present in trace quantities.

It goes without saying that any methods which are to be applied to a leather surface should be tested out first on an inconspicuous area, for example, to check for any effect on the underlying colour. The finish film on certain types of leather may be softened and rendered much more susceptible to damage while wet, and care should be exercised in handling the leather. Safe working practices should be adhered to when using any chemicals, this includes the use of appropriate personal protective equipment and the provision of adequate ventilation when using volatile solvents.



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