

Betty Haines Archive © Rosie Bolton

# LEATHER AND RELATED MATERIALS WORKING GROUP

## Newsletter 12 - June 2023

### Contents

Message from the Coordinator	1
Review of our 12 <sup>th</sup> Interim Meeting 2022	2
20 <sup>th</sup> ICOM-CC Triennial Conference	3
Betty Haines Archive	4
“Little Red Riding Hood” from Tuva	5
Comparative study of sustainable materials for leather bookbinding infilling	7
Conservation of an oriental binding	10
Publications	12
Archaeological and red rot leather courses	13
Reviews of Practical Leather Conservation course	14

Editors: Theo Sturge & Laurianne Robinet  
[theosturge@leatherconservation.co.uk](mailto:theosturge@leatherconservation.co.uk)

Dear members, dear colleagues,

Please welcome the final Newsletter of this triennium for our Leather and Related Materials Working Group !

We are pleased, first of all, to report on THE major activity of our Working Group this Triennial that is our 12<sup>th</sup> Interim meeting, hosted by the Cultural Heritage Agency in the Netherlands on 12-13 October 2022. It was such a new and exciting adventure as it took place for the first time online and gathered an amazing number of participants, get to see the review to learn more.

Next on the agenda is the ICOM-CC Triennial Conference that will take place next September in Valencia. We are actively working on the preparation

of the Leather Working Group session and we are delighted to have four contributions to be presented on topics related to the conservation treatment and historical study of leather. This conference will also be an opportunity to meet in person at last, and discuss with you future plans and activities for the Working Group. Registration for the conference is open, do come and hope to meet you there !

In this Newsletter, you will learn about the recent activities and research from some of our members with four very interesting articles including the Betty Haines archive of skin and leather samples, the study and restoration of a leather cap excavated from Siberia, as well as articles of two student thesis on the conservation treatment of leather bookbinding. We also include a review from delighted participants of the practical leather conservation course directed by Theo. More opportunities to learn about leather conservation are also given with two upcoming courses at the Leather Conservation Centre.

As you might know, September will mark the end of my second (and final) term as Coordinator of the ICOM-CC Leather and Related Materials Working Group, therefore this is my last Newsletter. Thus, I would like to use these last few words to thank all the people that shared this adventure with me during these six years (and plus), I learned so much. I am particularly grateful to the different Working Group Assistant Coordinators for their energy and support to make plans a reality, in such a lively atmosphere. Through the interaction with the members, I learned a lot (as a scientist) about leather conservation and its challenges, but also made great encounters, so thanks also to the members. Now, to keep our Working Group active, we need members from different backgrounds (conservator, scientist, historian...) to join the team, so if you are interested, do get in contact !

The very best for the future.

*Laurianne Robinet, Coordinator*

## Review of the 12<sup>th</sup> Interim Meeting of the ICOM-CC Leather & Related Materials Working Group

AMERSFOORT 12-13 October 2022

Online

Laurianne Robinet

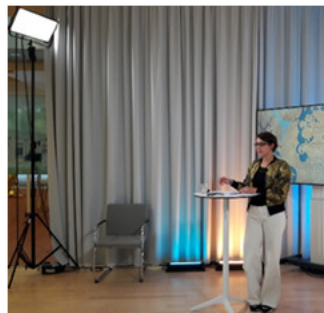
[laurianne.robinet@mnhn.fr](mailto:laurianne.robinet@mnhn.fr)

feedback on this first online meeting and wishes for the next one. Based on these, the aim is to continue these meetings in a hybrid format in the future in order to maintain this link with the wider community. **Applications are now open to host the next Interim Meeting of the ICOM-CC Leather and Related Materials Working Group in 2024 or 2025, so please get in contact or spread the word!**

After Paris in 2019, the 12<sup>th</sup> Interim Meeting of the ICOM-CC Leather and Related Materials Working Group was hosted by the Netherlands Cultural Heritage Agency in Amersfoort on 12 and 13 October 2022. This free event, which for the first time took place entirely online, was attended by over 570 participants from 44 countries, an impressive figure that shows the value of opening up this type of meeting online to reach professionals who do not have the opportunity to attend international conferences. The meeting brought together conservators from many disciplines, as well as curators, scientists, and (art) historians, but also many students and young professionals, some of whom were able to present their work to the community.

During the two afternoons, 20 inspiring lectures, and short video presentations, were given by speakers from all over the world. Gilt leathers were once again strongly represented, with examples involving the study, restoration and even reproduction of exceptional wall-hangings held in collections in Norway, Belgium, Germany, Italy and Spain, as well as typologies of gilt leather objects such as cushions and chasubles. The potential of different analytical techniques was also discussed for the characterisation or study of the degradation of leather, including carbon-14 dating and optical coherence tomography (OCT), as well as various spectroscopic and thermogravimetric techniques. Finally, several papers provided an opportunity to broaden our knowledge of the treatments used for leather restoration, with a particular focus on their evolution. New approaches and feedback were presented for leather restoration, on the use of various adhesives, including their comparison to starch paste, on consolidants and filling materials with for example the development of more eco-responsible substitutes.

The conference was a great success, particularly in allowing meetings and exchanges, albeit virtual, with professionals in many countries. The questions asked during the intermezzo sessions of the conference and the survey sent afterwards (summary below), helped us to know better the participants of the conference, their practice and get their



*The organising team in Amersfoort behind the organisation of the 12<sup>th</sup> Interim Meeting of the Leather and Related Materials Working Group: Eloy Koldewej, Martine Posthuma de Boer, Susan Lammers, Ciska Borsboom, Letty Spieker, Sara Bernert and Rémon Wilms, as well as Theo Sturge (online), Laurianne Robinet (behind the camera). Many thanks !*

### Summary of the feedbacks from the participants

The conference reached professionals well beyond the ICOM-CC membership, since only a third of the participants were ICOM members (and 20% members belong to the Leather and Related Materials Working Group), and motivated non-members to join our Working Group. Participants were very grateful for the possibility to access the meeting free of charge, as many conservation professionals and students are not able to get funding to participate to conferences.

Most survey contributors were happy with the variety of topics discussed during the Interim Meeting, nevertheless the need for more topics on archaeological and ethnographic leather as well as more practical conservation on a diversity of objects was raised...a call open to conservators working on these topics for future events !

For the next Interim meeting planned in 2024 or 2025, the majority of respondents want it to be in a hybrid format, and some would be interested in a meeting shared with other ICOM-CC Working Groups, in particular textile and graphic documents. To make this happen, we just need to find THE place to welcome our Working Group !

**The conference proceedings will be on the ICOM-CC website and on the Lulu publishing platform in late 2023.**

# 20<sup>th</sup> ICOM-CC Triennial Conference

18-22 September 2023

València, Spain

Conference Theme:

**WORKING TOWARDS A SUSTAINABLE PAST**

This promises to be a great conference in a wonderful setting. All the Working Groups will be there so whatever your speciality there should be plenty to interest you.

<https://icom-cc2023.org/>

**The Leather and Related Materials Group session** will include the following

## *Papers*

**A gravity-based suspension system with real-time monitoring for gilt leather hangings**

BRANDS Godfried, Elizabet Nijhoff Asser, Eloy Koldewei, Herre de Vries, Martine Posthuma de Boer

**Five biblical figures on gilt leather: conservation, study, and dating**

BONNOT-DICONNE Celine, Elsa Puharré, Jean-Pierre Fournet, Laurianne Robinet, Lucile Beck, Marie Heran

**Natural Fungicides - solution for fungus prevention in the preservation of cultural artefacts**

KUMAR Nitin, Achal Pandya, Gabriela Krist, Satish Pandey

## *Posters*

**A 16<sup>th</sup> century instrument to damask leather: from Månsson's drawing to the prototype**

MORETTI Frederica, Marina Marchese, Mara Nimmo, Mariabianca Paris

**& the Working Group Planning Session** to discuss between members the scope and aims of the Working Group as well as plans for projects and activities.

## Betty Haines archive

Rosie Bolton

Leather Conservation Centre, UK

[info@leatherconservation.org](mailto:info@leatherconservation.org)



An example from the archive: Karung snake, surface grain.

© Rosie Bolton

In November 2022, the Leather Conservation Centre launched the Betty Haines Archive available <https://bettyhainesarchive.co.uk/>. The archive currently hosts over 400 skin and leather sample slides collated in most part by Betty M. Haines between 1940 and 1970, and include a wide variety of species types from around the globe, prepared as grain and cross sections.

Betty graduated from the University of London in 1945 with a BSc in Botany, Chemistry and Zoology, and had a long and distinguished career as a leather chemist. She applied her knowledge of protein science, bacteriology, and entomology to a vast array of innovative research projects including in the fields of hide quality, pretanning processes, and collagen aging. Throughout her celebrated career, Betty actively collected samples to further research and education.

Betty also had a strong interest in leather conservation and, along with others, is celebrated for introducing chemistry into the field of leather conservation. Betty collaborated with many museums throughout the UK, including with Dr Baines Cope of the British Library, which resulted in the publication of *The Conservation of Bookbinding Leather* in 1984 and the British Standard BS7451:1991 for archival bookbinding leather.

Our understanding of the collection's history is fragmented and clearly holds some interesting stories, including comment on the culture of collecting practices during this period. The need for digitisation was imminent as deterioration of some of the mounting mediums and fading of the handwritten notes, meant that information was at risk of being lost. Several of Betty's colleagues, now retired, have helped shed some light on the many questions the collection provokes, but there is much more to be unveiled.

We hope that digitisation encourages wide use of the collection, as a technical resource for conservators (we use it for species ID and teaching), as well as further afield, such as the study of species evolution and biodiversity. We also encourage use of the collection in relevant research projects.

This is a working archive and we welcome any comments or information users may have. We are also actively expanding the collection and are accepting donations of additional material including skin, leather, and hair samples. For further information or to discuss use of material from the archive, please contact the Leather Conservation Centre:

[info@leatherconservation.org](mailto:info@leatherconservation.org)

*Editor's note: This is a very impressive resource and it is worth visiting the web site.*

<https://bettyhainesarchive.co.uk/>



## "Little Red Riding Hood" from Tuva

Varvara S. Busova\*, Samantha Brown,  
Marina E. Kilunovskaya, Vladimir A. Semenov  
Institute for the History of Material Culture RAS,  
Russia

[kulturnijkarman@gmail.com](mailto:kulturnijkarman@gmail.com)

In 1988, members of the Tuvinian Archaeological Expedition, studying burial № 5 in the 2<sup>nd</sup> mound of the Saryg-Bulun burial ground in Central Tuva, discovered a unique burial of a child in a wooden box with a closed lid dating from the end of the 7<sup>th</sup> - beginning of the 6<sup>th</sup> centuries BC. The child was lying on her left side with a belt, bow and chase, a quiver with arrows laid next to him. Initially, it was believed that this individual was a boy of 12-14 years old however, genetic studies have shown the opposite. This burial in fact belonged to a girl (Kilunovskaya et al. 2020) and microfocuss radiography has made it possible to "rejuvenate" the person (Kilunovskaya et al. 2021). In the upper part of the burial, almost under the head, a "flap" of dry skin was preserved however, the purpose of this fragment was not entirely clear.

The authors of the excavations and the first publication (Semenov, Kilunovskaya 1990) V.I. Semenov and M. Kilunovskaya suggested that the skin fragment belonged to the buried individual as her head lacked the skin in the occiput. Further research confirmed the absence of any manipulation of her head and the object was identified as a headdress or cap.

The cap (Fig.1) was sewn from thin light-beige fragments of carefully dressed leather of various shapes (elongated strips of irregular shapes and small almond-shaped inserts between them). For stitching a tendon thread was used. From the top to the brim, a spiral geometric ornament painted with red pigment "descended" over the entire surface. Micrographs, and examination of puncture marks from stitching of leather fragments, indicate that it was previously fattened. A characteristic feature of fat tanning are rounded holes from needle punctures.

In the Department of Scientific and Technical Expertise of the State Hermitage, S. V. Khavrin



Fig. 1 The cap of the boy/girl from the Saryg-Bulun burial ground (Tuva). © Varvara Busova.

using X-ray fluorescence analysis, determined the pigment which was used for the red ornament - it was cinnabar (HgS). At the same time, isotope studies helped to establish the difference in the diets of the girl and the animal from which the headdress was made. Presence of light and heavy isotopes of nitrogen and carbon and their ratio in bone and skin collagen made it possible to reconstruct the specifics of the environment and the diet of the ancients. N. G. Svirkina (Institute of Archeology, Russian Academy of Sciences, Laboratory of Contextual Anthropology) saw significant differences in the  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  amount of biological materials of the child and cap skin (Kilunovskaya et al. 2020).

With the support of the Society of Antiquaries of

London (Jane Arnold Award, 2019) and Dr. Peter Hommel and with the direct participation of Dr. Samantha Brown, a proteomic analysis of the headdress skin (ZooMS) was carried out. The result was even more unusual than expected. The skin belonged to the mustelid family which includes: marten, mink, otter, badger, ferret, etc.

The shape of the headgear is not completely traceable. There are three main types of soft hats known at this time: conical, hemispherical and cylindrical, made of felt or leather with the addition of wooden elements. The shape of the hemisphere can be clearly seen at the top, including the neatly cut edge of the product on one side.

The children's hat was conserved in the Department of Archaeological Leather and Textile Restoration of the Grabar Art Conservation Center by the N. P. Sinitsyna. The object was very dry, dirty, brittle and flattened. It was difficult to guess its purpose. First of all, the method of remote moisturizing was applied, and then the leather was gradually neatly laid on the form and secured to the duplicating material - dark brown silk gauze. Thus the form was reconstructed (Fig. 2).

As we can see, one small object of organic origin can tell more about the past of a single individual than voluminous statistics. Such studies cannot be carried out without the participation of a large team of specialists who help to look into the



Fig. 2 The cap after conservation. © Varvara Busova.

"bowels" of the subject. Burial 5 at the Saryg-Bulun burial site has caused a lot of unrest in the scientific community, not only because of its preservation but also because of the unexpected sex of the individual (Kilunovskaya et al. 2020) which was determined by genetics. Nothing else of the clothes has been preserved so the headdress of the "red riding hood" serves as an additional clue to unraveling female burials with weapons typically associated with men. We must only find analogies.

### Acknowledgement

The ZooMS work presented in this paper has been funded variously by the Society of Antiquaries of London (Jane Arnold Award) with the support of Max Planck Institute for the Science of Human History. We are particularly grateful to P. Hommel.

### References

KILUNOVSKAYA ET AL. 2020: Килуновская М. Е., Семенов Вл. А., Бусова В. С., Мустафин Х. Х., Альборова И. Э., Мацвай А. Д., „Уникальное захоронение ребенка раннескифского времени на могильнике Сарыг-Булун (Тува)“ in *StratumPlus*, № 3, 379–423.

KILUNOVSKAYA ET AL. 2021: Килуновская М. Е., Семенов Вл. А., Бусова В. С., Мустафин Х. Х., Альборова И. Э., Потрахов Н. Н., Староверов Н. Е., Медникова М. Б. „Мумифицированное погребение ребенка из могильника Сарыг-Булун (Центральная Тува). В свете данных археологии, рентгенографии, антропологии и генетики“ in *Уральский исторический вестник*, № 4 (73), 6–18.

SEMENOV, KILUNOVSKAYA 1990: Семенов Вл. А., Килуновская М. Е., „Новые памятники раннего железного века в Туве“ in *Информационный бюллетень ЮНЕСКО. Международная ассоциация по изучению культур Центральной Азии*. М.: Наука, № 17, 36–47.

## Comparative study of sustainable materials for leather bookbinding infilling

Nina Mourat

[nina.mourat@gmail.com](mailto:nina.mourat@gmail.com)

*Master thesis conducted in 2022 at the Institut National du Patrimoine, France*

Bookbinding mechanical degradations such as split joints or lost caps are common in book collections. The book conservator faces the issue of which material to use in such cases. Traditionally, leather losses were to be filled with leather, but since the 1980s Japanese paper almost gradually replaced leather. Leather offers a great combination of flexibility and strength; yet, its tanning techniques and stability are not always satisfying in terms of conservation standards. Japanese paper on the other hand has proved its stability and offers the option of executing less invasive treatments. However, its plasticity and, sometimes inadequate aesthetic aspect (e.g., for highly textured materials), can be unsuitable.

In addition, a new concern grew in conservation, as well as other fields: sustainability. The need to connect people, environment and cultural heritage preservation intensified, and recently we have seen the emergence of reflection groups and studies towards a greener practice.

For these reasons I conducted a comparative study of sustainable materials for leather bookbinding infilling. The project involved selecting supposedly sustainable materials, compare their stability, strength and sustainable ratio to leather and Japanese paper, then apply the results to the treatments of a 16<sup>th</sup> century leather binding.

The first material selected was from the new and growing range of vegetal leather surrogates. The main requirements of these materials were to be animal cruelty free and less polluting than the leather industry. Among the range of vegetable leather surrogates, Piñatex® was chosen. The information regarding its ingredients and manufacture was available on the manufacturer

website - Ananas Anam. Fibers from pineapple leaves are extracted, dried, purified and mixed with polylactic acid, forming a non-woven fabric which is coated and colored. There were different models available, and the basic and neutral colored Piñatex® was chosen for this study. It contained 72% pineapple leaf fiber, 18% polylactic acid and 10% polyurethane.

The second material selected was recycled leather, manufactured by grinding leather scrap and mixing it with latex. For consistency, the basic and neutral colored type of recycled leather was chosen. According to the vendor, it was composed of 60% leather scrap, 20% natural latex, 10% vegetal grease and 10% non-specified additive (such as water or dyes).

The last material chosen for comparing was not from the sustainable category, but rather one synthetic material used in conservation. In the past ten years, book conservators have developed two synthetic leather substitutes. The first one known as textured fill or cast-composite was invented in the United States and the second one, called SINTEVA, was created in France. Due to SINTEVA production requiring a high concentration of white spirit, it was decided not to include it in the study. The cast-composite recipe followed was presented by Sarah Reidell at the 11<sup>th</sup> Interim meeting of ICCOM-CC Leather and Related Materials Working Group in 2019, and consisted of mixing two parts of acrylic paint, one part of Heavy Gel Mat, one part of GAC 100 and one part of GAC 500, all manufactured by Golden Artist Color®. The acrylic mix was then dried on a material, in this case a cotton cloth. Thus far, no test results on the stability and mechanical behavior of the cast composite were found except for information on its making. Therefore, it was important to include it in the study.

The strength and stability of each material were tested through three experiments. The first one aimed to determine the effect of light through potential color changes. Samples were exposed for 170 hours at 765 watt/m<sup>2</sup> in a xenon arc weathering test machine (SUNTEST XLS+). Color change was evaluated with a spectrophotometer, before and after exposure. Results showed that the cast-composite was the most stable to light exposure with color change imperceptible to the



naked eye. The recycled leather, however, showed a high level of color change. Piñatex showed a slight change immediately after the removal of the sample from the climatic chamber. However, the change increased over time, despite its storage in the dark.

The second experiment aimed to determine the pH of each material and determine if artificial aging had an impact on the pH. Samples were exposed for 10 days changing the climate every day from hot and dry (40 °C and 30% RH) to cold

Materials	pH before exposure	pH after exposure
Cast-composite	8.2	7.9
Piñatex®	6.7	6.5
Recycled leather	4.3	4.4

and humid (10°C and 70% RH). Results showed minor pH differences before and after exposure, as presented in the following table.

The last experiment was conducted to measure the strength of the materials through a traction test. The machine used allowed us to determine the force needed to break the sample. Results showed that Piñatex was the weakest material, with a breaking point largely below the Japanese paper (Kozo, 25 g/m<sup>2</sup>). Recycled leather showed a breaking point slightly above a 0.5 mm thick calf leather, and cast-composite, despite its 0.2 mm thickness, showed the highest breaking point.

As sustainability was an important part of this experiment, a ratio was assigned to each material, including leather and Japanese paper, based on their origin, manufacturing process and end of life. Data was collected from vendors and manufacturers websites when available, and assigned a point when criteria were met (e.g., raw material recycled or final product biodegradable, etc.) The grading, from the most to the least sustainable was established as followed: Japanese paper > recycled leather > Piñatex® > leather > cast-composite.

To conclude, Piñatex®, which presented low light stability, low strength and medium sustainability, was determined as unsuitable to be used in

conservation. Recycled leather, though resistant and sustainable, due to its high reaction to light, seemed unsafe to use without further tests. The cast-composite obtained the best results, except for its sustainability ratio.

Despite the importance given to sustainability in this study, the appropriate treatment for the book was prioritized. It appeared that the range of sustainable materials available did not yet meet the conservation standards.

Following the experiment, the cast-composite was chosen for the treatment of a 16<sup>th</sup> century book belonging to the city library of Angers, France. Untitled *De la materia medicinal*, this book is the first Spanish translation of Dioscoride's (c. 40-90 AD) treaty on pharmacy. It was translated by Andrés Laguna (1499-1559) and published in Antwerp in 1555 by Hans de Laet. Printed on paper and illustrated with woodcut prints, it was bound in full leather, gilded and



Figure 1: Cover assembled with Photoshop, « *De la materia medicinal* », Dioscoride, transl. Andrés Laguna, Antwerp, 1555. City library of Angers, France. © Nina Mourat

painted (Fig. 1). The boards showed the name and coat of arms of the English cardinal Reginald Pole (1500-1558).

The main degradation of the binding was due to an old repair. Caps were lost, and joints appeared to have been partially split. The previous repair was made, probably in the 19<sup>th</sup> century, using two pieces of sheep leather, which were pasted down at the head and tail of the spine, and largely spreading onto the boards, probably in the 19<sup>th</sup> century (Fig. 1). Not only did the pieces hid an important part of the binding ornaments, but also the sheep leather was acidic, and with a high





Figure 2: Lower board after treatment, « *De la materia medicinal* », Dioscoride, transl. Andrés Laguna, Antwerp, 1555. City library of Angers, France.  
© Chloé Bernard (Inp)

degree of collagen denaturation. Consequently, following discussion with the library curator, it was agreed to remove and replace the repairs with a more suitable material: the cast-composite.

Before using it on the book, a malleability test of the caps was conducted using cast-composite. The flexibility and aesthetic rendering were

unsatisfying. Thus, it was decided to infill the missing caps with calf leather (tanned with hydrolysable vegetable tannins) and the flat losses on the spine and lower board with the cast-composite. The textured infills were cut to the exact shape of the loss in order to paste them down from edge to edge. The joins between the infills, the new leather and the original leather were blended in and reinforced with pre-toned strips of Japanese paper. Finally, to restore the unity of the binding decoration, and lessen the eye attraction to the infills, it was decided to paint the gilding outline, using acrylic, solely on them (Fig. 2).

This study was a valuable opportunity to try out new materials and reflect on what sustainability actually means. Even though the results were not as expected, new possibilities are coming up. For instance, the Nera company, based in the Netherlands, developed a new biodegradable tanning agent using zeolites, called Zeology. In addition, a French company, La Tannerie Végétale (the vegetal tannery) is developing a leather substitute by reconstructing leather molecular structure using biobased proteins from animal feed residues. To be continued ...

### **Master thesis reference**

Mourat Nina, "De l'humanisme à la science". Étude et traitements de conservation-restauration d'un herbier pharmaceutique illustré et couvert de cuir peint (1555, Bibliothèque municipale d'Angers). Étude comparative de matériaux écoresponsables pour le comblement du cuir, mémoire de fin d'étude, Institut national du patrimoine, 2022.

This link will take you to Nina's thesis:

<https://mediatheque-numerique.inp.fr/documentation-oeuvres/memoires-diplome-restaurateurs-patrimoine/lhumanisme-science-etude-conservation-restauration-dun-herbier-pharmaceutique-illustre-couvert-cuir-peint-1555-bibliotheque-municipale>

## **Conservation of an oriental binding. Removal of an old repair from the book spine and filling of the uncovered loss**

Kerstin Merz, Andrea Pataki-Hundt and Bert Jacek  
[kerstin\\_johanna.merz@smail.th-koeln.de](mailto:kerstin_johanna.merz@smail.th-koeln.de)

This BA thesis was conducted in the year 2022 at the University of Applied Sciences Cologne, Institute of Conservation Sciences (CICS), Germany

The object of the bachelor thesis in the year 2022 was an Ottoman manuscript with full leather binding from the 18<sup>th</sup> century. The focus was on elaborating and implementing a concept for the conservation of the manuscript, for which reason a codicological examination and a damage assessment of the object were conducted.

Two main types of damage became evident: Firstly, large parts of the inner book ornamented with illuminations containing copper were affected by copper corrosion, which manifested in a general brittleness, numerous breakages and losses. Secondly, an old repair in the form of a rigid adhesive layer and heavily degraded goatskin which had been pasted over the book spine and partly onto the front and back cover. This repair caused the book significant stiffness and deformation.

Regarding both types of damage, urgent need for action was determined, as both seriously restricted the manuscript's usability and also posed the risk of further breakages and losses particularly within the inner book. Apart from securing and stabilising the copper corrosion, the thesis' goal was to identify an appropriate method for removing the old repair from the binding.

### **Analysis of the adhesive and test series**

As a first step, the adhesive used for the old repair had to be identified, which was possible by means of the Fourier Transform Infrared Spectroscopy (FTIR). The results narrowed down the possibilities to a modern adhesive on the basis of polyvinyl acetate (PVAC), which proved

partially dissolvable in acetone and methyl ethyl ketone (MEK). During subsequent test series using samples made of calf leather and PVAC-adhesive, several methods for partially dissolving the adhesive and subsequently separating the samples were compared.

Mechanical separation as well as the application of gellan gum, which had been priorly loaded either with acetone or MEK, caused damage to the samples, such as splitting of the leather grain, deformation, discolouration and shrinking of the leather. As an additional method, the use of a solvent chamber was explored: blotting paper soaked in the respective solvent was placed in a tub; the samples were put on a screen and elevated several centimetres above the blotting paper. The tub was closed by means of a glass sheet. Compared to the use of loaded gel, the exposure time was drastically reduced down to about 30 min for acetone and 45 – 60 min for MEK. Additionally, the separation of the samples was decidedly successful and without causing any of the afore mentioned damages. With acetone, it proved important to remove the samples from the solvent chamber shortly after the adhesive was sufficiently softened. After around 60 min, the adhesive started to penetrate further into the leather which made a subsequent reduction of the adhesive less feasible.

### **Implementation and Results**

Corresponding to the results from the test series, the removal of the repair leather was realised in a solvent chamber, for which acetone was employed, due to the reduced exposure time and lesser health-damaging effects. An exposure time of only 30 minutes was sufficient, at which point the repair leather was easily removable from the cover using a spatula. In doing so, it became clear that the original leather covering the book spine was still completely preserved and just torn along the joint, so that there was no connection between the front cover and the rest of the book. The reduction of the adhesive residue was mostly carried out mechanically using a rubber, for which the adhesive was softened using acetone. In general, the use of the solvent chamber went very satisfactorily, the old repair and adhesive residue were mostly removed.



*Figure 1: After 30 min. inside the solvent chamber, the repair leather was easily removable using a spatula. Before being placed inside the chamber, the inner book and most of the binding were covered in transparent foil to shield them from the solvent fumes.*

For filling the loss along the book joint and therefore reconnecting the front cover with the spine, a laminate made of Japan paper and 5 % Klucel G in isopropanol was applied. To increase the connection's stability and the surface's abrasion resistance, a thinly paired leather was selected as the uppermost layer. The use of a laminate made for a strong and yet flexible connection between the front cover and the book spine. The manuscript's opening behaviour was significantly improved.

With regard to securing and stabilising the inner book damaged by copper corrosion, a concept for treatment was developed which makes do without introducing moisture. To this end, remoistenable tissue made from Japan paper (3.7 g/m<sup>2</sup>) and Klucel® Hydroxypropylcellulose in isopropanol was applied on both sides of breakages and smaller losses. The damaged sections were successfully stabilised without affecting the legibility of either writing or illumination.

### References.

1. Regarding solvents: Banik, Gerhard; Krist, Gabriela: Lösungsmittel in der Restaurierung. 3. ed. (Restaurierung, Konservierung, Technologie). Wien 1989; Kite, Marion; Thomson, Roy; Angus, Aline: Materials and techniques: past and present. In: Conservation of leather and related materials. 1. publ (Butterworth-Heinemann series in conservation and museology). Marion Kite und Roy Thomson (Hg.). Amsterdam 2006, S. 121–129.
2. Regarding the mending of copper corrosion: Hofmann, Christa; Hartl, Andreas; Ahn, Kyujin; Druceikaite, Kristina; Henniges, Ute; Potthast, Antje: Stabilization of Verdigris. Application of research in conservation practice, in: Journal of Paper Conservation 2016.
3. Pataki, Andrea: Remoistenable Tissue Preparation and its Practical Aspects, in: Restaurator. International Journal for the Preservation of Library and Archival Material (30) 2009, S. 51–69.



## Publications



### Corami

The superb catalogue for the exhibition in Mantua last year is available to download as a pdf. Note: this is a large file, 24 MB. Follow this link:

<http://www.leatherconservation.co.uk/corami%20baroni.htm>

*The images in this catalogue are of a very high quality. We are very grateful for the permission to make it available.*

— Ed

### Two exhibitions

Both exhibitions by Juan J. Garcia Olmedo. [garciaolmedo@gmail.com](mailto:garciaolmedo@gmail.com)

There were two exhibitions on leather art in Cordoba earlier in the year. **When the Craftsmen Looked Up** in January and **The Light of Gilt Leather** March/April.

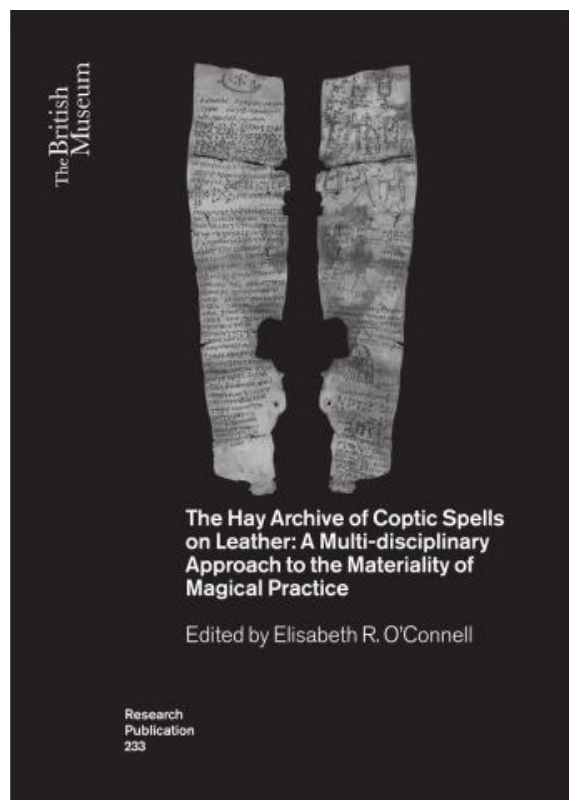
There are two videos available on you-tube:

<https://www.youtube.com/watch?v=XtzF5WzVmOs>

This is about making gilt leather, and

[https://www.youtube.com/watch?v=\\_5-QlaR7PK0](https://www.youtube.com/watch?v=_5-QlaR7PK0)

This is about the second exhibition.



### The Hay Archive of Coptic Spells on Leather: A Multidisciplinary Approach to the Materiality of Magical Practice

Editor Elisabeth O'Connell, The British Museum Press, 2022

#### Abstract

The Hay archive of Coptic manuscripts consists of seven fragmentary sheets of leather bearing spells for divination, protection, healing, personal advancement, cursing and the satisfaction of sexual desire. Purchased from the heir of the Scottish Egyptologist and draftsman, Robert Hay (1799–1863), the manuscripts arrived at the British Museum in 1869. Since they were first published in the 1930s, they were understood to be the work of a single copyist writing around AD 600 in the Theban region of upper Egypt. The present volume has confirmed, nuanced, or challenged these assessments on the basis of scientific analysis and close study of the manuscripts. Prompted by the urgent conservation needs of the corpus, this study seeks to provide a model integrated approach to the publication of ancient texts as archaeological objects by providing a full record of provenance and collection history; scientific analysis; conservation approach and treatment; a new complete edition and translation of the Coptic texts; and an extended discussion of the cultural context of production. Written on poorly processed calf, sheep and goat skin, the manuscripts were copied by multiple non-professional writers in the 8<sup>th</sup>–9<sup>th</sup> centuries. Employing a striking combination of ancient Egyptian, Graeco-Roman, biblical and extra-biblical motifs, their contents represent a Christian milieu making use of the mechanics of earlier 'magical' practice in a period well after the arrival of Islam.

Conservation and Science were able to contribute much to the understanding of these documents.

## Courses

### An Introduction to Archaeological Leather and its Conservation

Taught by Angela Middleton, Senior Archaeological Conservator, Historic England, and Rosie Bolton and Arianne Panton, Leather Conservation Centre

**Monday 12<sup>th</sup> June 2023, 10am – 5pm**

£ 140

The course will be held at the Leather Conservation Centre in Northampton.

This course combines presentations and handling sessions to introduce course participants to the lifespan of leather, from production to burial and subsequent conservation. Topics covered are listed below and will be illustrated throughout with case studies and practical examples. Participants are welcome to bring their own objects / image to discuss with the tutors towards the end of the course.

#### *Topics include:*

- The making of leather - Transforming skins into a useable material
- The preservation of leather - Conditions required, where to expect leather finds, first aid and recovery.
- Analysis and identification – Introduction to analytical techniques used to extract information from leather, and a practical session on species identification using grain patterns.
- Documentation and conservation options for archaeological leather and associated materials.
- Packaging and recommended storage environments
- Case studies and discussion

This course is suitable for conservators and conservation students who have not worked with archaeological leather or curators/ collections managers who want to learn more about archaeological leather, as well as experts in related fields.

A light lunch and refreshments will be provided.

To book your place, please email your contact details and a brief summary of your interest in this topic to Cyd Clift at [info@leatherconservation.org](mailto:info@leatherconservation.org)

Please let us know in advance if you have any specific mobility requirements.

### Acid deterioration of leather and approaches to its conservation

Taught by Dr. Anne Lama, University of Northampton, Rosie Bolton and Arianne Panton, Leather Conservation Centre

#### **Date to be confirmed**

£ 400

This course will be held at the Institute for Creative Leather Technologies, University of Northampton.

Acid deterioration (or red rot) of leather is found in many different contexts and can lead to the complete disintegration of historic leathers. This course teaches participants about the causes of acid deterioration in leather and methods of identifying it in collections. Participants will be introduced to past conservation approaches and how these have aged, as well as current techniques and emerging technologies.

Participants will be introduced to research carried out by the Leather Conservation Centre on the use of Aluminium Alkoxide and Oxazolidine II as a conservation treatment and have the opportunity to undertake the treatment during the course with guidance.

This course is intended for practicing conservators working with leather and will include an element of leather chemistry. It also involves handling hazardous chemicals so experience of this is essential, PPE will be provided. The course will be restricted to 5 participants for practical purposes and to allow for maximum interaction and discussion.

Participants are welcome to bring small objects to carry out treatment on, however arrangements for this need to be made in advance.

#### *Course outline*

- What is red rot? - Presentation on the factors and chemistry behind the deterioration process.
- Identification of red rot – Demonstration and practical session on various methods used to identify red rot in leather.
- Approaches to conservation - Presentation and discuss on conservation methods and ethical considerations.
- Treatment of red rot using Aluminium Alkoxide and Oxazolidine II – practical session for participants to carry out treatment.

Refreshments will be provided, please bring lunch with you.

To book your place, please email your contact details and a brief summary of your interest in this topic to Cyd Clift at [info@leatherconservation.org](mailto:info@leatherconservation.org)

Please let us know in advance if you have any specific mobility requirements.



## Review.

### Practical Leather Conservation Course.

Danielle Stobbe MSc, APP1 student at the University of Amsterdam, The Netherlands

[danielle.stobbe@gmail.com](mailto:danielle.stobbe@gmail.com)



*Group photo of participants of the leather conservation course with Theo Sturge*

In a small town called Wooburn Green a group of eleven people came together in the Wooburn Craft School from the 14<sup>th</sup> until the 17<sup>th</sup> of February 2023. Despite the fact that they spoke different languages, there was one thing that united them: their desire to learn about leather restoration. But before the leather workshop even started, there was a hurdle to overcome. Theo Sturge, the leather conservator and professor for that week had caught corona. But like leather, Mr. Sturge was strong, and together with the appropriate measures, and more importantly, his assistant Ernest Riall, who runs the Craft School, they made the week a success.

After a small introduction of the participants, the workshop started off with an assignment. The assignment was to iron leather that was completely wet. Little did we know, we were trapped. This method taught us the most important lesson of leather restoration, never use heat and water on leather at the same time. I will never forget. Each morning started with a cup of tea and a treat, followed by theory that would introduce the practical for that afternoon. The theory was accompanied by many case studies from Theo's working experience. Several subjects were covered; ranging from cleaning of leather, to preparing filling materials and filling leather, to retouching and dyeing leather. The group seemed to have a preference for gilt leather. Therefore, the course content was slightly shifted towards gilt leather restoration.

Next up in the workshop was to create our own gilt leather because, in order to understand gilt leather, it is important to understand the production process. Therefore, on the first day we applied silver leaf to a piece of leather. The

silvered leather was then manipulated by means of a mould. We had the choice to use a mould depicting a beautifully curved (and carved) dragon, or a bird designed by Mrs. Sturge. After the leather had dried, we applied a layer of varnish to give it its golden appearance. Theo also taught us how to identify different types of animal leather and the difficulty of this identification. The same day we made some preparations for filling materials. For instance, BEVA 371 was coloured with pigments and left to dry for the night. Also the subject of feathering the edges for leather patches was covered.



*Daniëlle Stobbe applying varnish to silvered leather, photograph made by Julia Hartmann*

During the following two days we performed several adhesive tests with different adhesives and different materials. We experienced their advantages and disadvantages for adhering to leather. The results from these tests were put to practice during the process of filling leather pieces with BEVA, Reemay (polyester non-woven), leather and other materials that were introduced during this workshop. The fillings were matched as close as possible to the original leather by means of creating relief, dyeing the leather and by retouching with dyes and acrylics.

All in all, personally I learned that leather is a peculiar material that is as much alive as it is dead. It requires knowledge for a proper restoration and in order to continue to live on. Many thanks for the blood (especially from the saddle stitch), sweat and fortunately only tears of happiness that were put into this workshop by the participants, and first and foremost, Theo Sturge and Ernest Riall.

## And

Julia Hartmann Stitching Restauratie Atelier  
Limburg (SRAL), Maastricht, The Netherlands

[j.hartmann@sral.nl](mailto:j.hartmann@sral.nl)

"Life's too short" could be the informal motto of the four-day Practical Leather Conservation Course with Theo Sturge, which took place from 14<sup>th</sup> to 17<sup>th</sup> of February 2023 in Wooburn Green, UK.

Theo Sturge, ACR-FIIC, has more than 40 years of experience in conservation-restoration. In the last 25 years he has specialized in leather conservation and now teaches internationally, running his own studio, the Sturge Conservation Studio, since 2000.

The housing institution of this course, the Wooburn Craft School Ltd (Ernest Riall), welcomed the participants (twelve





*Julia Hartmann performing the saddle stitch, photograph made by Daniëlle Stobbe*

conservators with diverse conservation backgrounds from five different countries) with open doors, tea, sandwiches and well-prepared working stations equipped for each person.

Not even a Covid-19 infection could stop Theo Sturge from passing on his knowledge about leather, leather-objects, gilt-leather and its risk factors, alterations and degradations - as well as damage phenomena and, of course, the professional approach to leather conservation.

The four-day-course was divided into sessions of theory and case-studies, followed by practical hands-on experience.

Each participant made their own piece of gilt-leather, step-by-step, and experienced the challenges behind this historic technique. Apart from developing an understanding of leather in general, its behavior and risk factors, the course clearly focused on the different degradation patterns of leather and their conservation. We learned how to address these from an ethical and professional perspective for preservation and exhibition purposes, as well as for objects that are still intended to be used after conservation.

Repair materials for structural conservation treatments as well as consolidants, glues and fillers, dyeing and retouching media, finishes and dressings, as well as the techniques for deformation treatment and surface-cleaning were discussed, tested and evaluated by each participant.

While the course was clearly based on the years of expertise of Theo Sturge, the diverse perspectives of conservators specialized in books, paper, furniture, textiles, gilt-leather, historic interiors, social history, paintings and

modern art also led to interesting discussions and additional ideas.

The course offered a professional platform to learn general approaches of leather conservation, but also time and a workspace for each participant to concentrate on topics and challenges that are of personal interest for their field of work. The knowledge that was developed and transferred during these four days was dense and intensive but also very hands-on and realistic. We learned about basics, recent research, Theo's life-long experiences and instructions, but also by working with each other, by making mistakes and by purposely testing the limits of leather. Common and historic tools, materials and techniques were presented, tested and discussed but also critically and scientifically evaluated.

With my background as a conservator for paintings and modern art, my focus was so far on the surface finishes of leather objects. Personally, I therefore appreciated the hands-on structural work with leather and the positive learning atmosphere of the group the most. The course definitely taught a proper understanding of leather as a material, its needs and challenges, in order to ask the right questions when choosing adapted conservation materials and treatments.

I had the feeling that Theo and his assistant Ernest were constantly at my side, demonstrating and giving constructive critiques whenever possible. Even with the full program, Theo still found time to demonstrate and teach one-to-one, especially when it came to basic leatherworking techniques like skiving with different skiving knives or basic saddle stitching.

I am therefore very grateful for the chance to experience Theo Sturge's Leather Conservation Course, and to benefit from his experience and teaching skills. I can wholeheartedly recommend his course to any professional conservator with an interest in leather and gilt-leather conservation.

Weblinks: <http://leatherconservation.co.uk/training.htm>  
<https://thewooburncraftschool.com/>

**Stop Press:** Theo's next **Practical Leather Conservation Course** is again at the Wooburn Craft School . 28th—31st May 2024.

For details see:

<https://thewooburncraftschool.com/class-book/?id=1151>