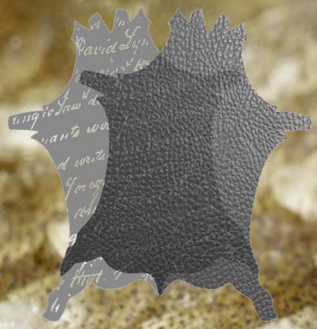
ICOM-CC
ICOM international council of museums – committee for conservation



Paris 2019

11th Interim Meeting of the *ICOM-CC Leather and Related Materials Working Group*

11ème Réunion intermédiaire du *Groupe de Travail Cuir et Matériaux Associés de l'ICOM-CC*

Musée du Quai Branly—Jacques Chirac, Paris
6 & 7 June 2019

Livret des Résumés – Book of Abstracts

MUSÉE DU QUAI BRANLY
là où dialoguent les cultures

CRC CENTRE DE RECHERCHE SUR LA CONSERVATION

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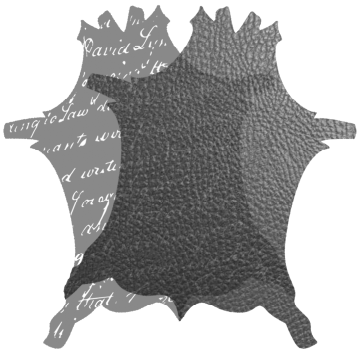

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DE RECHERCHE
SUR LA CONSERVATION

INSTITUTIONS ORGANISATRICES / ORGANISING INSTITUTIONS

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Musée du quai Branly - Jacques Chirac

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Theo Sturge - Restaurateur indépendant / freelance conservator, UK
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COMITE D'ORGANISATION / ORGANISATION COMMITEE

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Fondation des sciences du patrimoine
ICOM France
Maison Hermès

REMERCIEMENTS / ACKNOWLEDGMENTS

Nous tenons à exprimer notre profonde gratitude à Stéphane Martin, Yves le Fur et Véronique Rouchon pour leur soutien, ainsi que remercier les différentes personnes qui ont participé à l'organisation de cet évènement : Marie Radepont, Oulfa Belhadj, Sylvie Heu-Thao, Maria Rojas, Stéphane Vaiedelich, Jacques Cuisin, Giliane Devesa, Anaïs Diez, Nina Mourat, Asceline Pourcelot, Alimatou Desbrière, Laura Capogna, Valérie Boyer-Vidal, Laura Coelho et Benjamin Karamehmedovic.

AVANT-PROPOS

Le Centre de Recherche sur la Conservation et le musée du quai Branly - Jacques Chirac ont le grand plaisir de vous accueillir ces 6 et 7 juin 2019 pour la 11ème Réunion Intermédiaire du Groupe de Travail Cuir et Matériaux Associés de l'ICOM-CC.

Le groupe de travail Cuir et Matériaux Associés est l'un des 22 groupes de travail du Comité pour la Conservation de l'ICOM (ICOM-CC). Rassemblant plus de 150 membres, il a pour objectif de favoriser la diffusion et le partage des connaissances autour de la conservation des objets à base de peau. Depuis plus de trente ans, ce groupe organise régulièrement une conférence, appelée « réunion intermédiaire », pour permettre aux membres, et plus largement à tous les professionnels intéressés, de se rencontrer, d'échanger et de partager leurs travaux autour de ces matériaux.

Cette année, la réunion intermédiaire du Groupe de Travail Cuir et Matériaux Associés de l'ICOM-CC a lieu pour la première fois en France, à Paris. Elle rassemble des restaurateurs, des conservateurs, des scientifiques et des historiens qui ont à cœur une meilleure connaissance et conservation des collections à base de peau : parchemin, cuir, peaux non tannées, fourrures ou spécimens naturalisés. Ces deux journées seront l'occasion de découvrir des pratiques innovantes, les recherches en cours et les derniers développements concernant la préservation de ces matériaux. Les actes de cette conférence seront publiés à posteriori sur le site de l'ICOM-CC.

Dès sa conception, nous voulions rendre cet évènement accessible au plus grand nombre, favorisant ainsi les rencontres entre professionnels et étudiants issus de différents pays. De plus, pour encourager plus largement la participation des professionnels francophones et leur permettre d'exprimer leurs travaux dans leur langue, nous avons proposé une traduction simultanée français-anglais. Cette démarche a été rendue possible grâce au soutien financier de nombreuses institutions, notamment nos tutelles, le Ministère de la Culture, le Centre national de la recherche scientifique (CNRS) et le Muséum national d'Histoire naturelle (MNHN), le domaine d'intérêt majeur *matériaux anciens et patrimoniaux* (DIM-Map), la Fondation des Sciences du Patrimoine (FSP), ainsi que l'ICOM France et la maison Hermès. Leurs contributions ont permis de réduire les frais d'inscription de la conférence, ce qui a concouru à son vif succès. Nous leur en sommes très reconnaissants.

D'autre part, pour accueillir une conférence centrée sur le patrimoine en cuir et peau, le musée du quai Branly - Jacques Chirac est un lieu idéal, au vu de la richesse de leurs collections dans ce domaine. Nous remercions les différentes équipes et personnes au sein de l'institution qui ont œuvrée à la mise en place de cet évènement, et ont permis un accueil dans les meilleures conditions.

Nous souhaitons également vivement remercier l'implication et l'enthousiasme des personnes au sein de l'Institut national du patrimoine (INP), du Centre de recherche sur la conservation (CRC), de la Cité de la musique, du Muséum national d'histoire naturelle qui ont participé à l'organisation de la conférence ou ont accueilli les participants lors de visites en amont de celle-ci.

Nous espérons que vous profiterez pleinement de ces deux journées pour rencontrer et échanger, autour des cuirs et peaux, ainsi que pour découvrir ou redécouvrir Paris.

Laurianne Robinet et Éléonore Kissel,
pour les comités scientifique et d'organisation

FOREWORD

The Centre de Recherche sur la Conservation and the musée du quai Branly - Jacques Chirac are pleased to welcome you on 6 and 7 June for the 11th Interim Meeting of the ICOM-CC Leather and Related Materials Working Group.

The Leather and Related Materials Working Group is one of the 22 Working Groups of the Committee for Conservation of ICOM (ICOM-CC). Gathering over 150 members, its objective is to promote the diffusion and sharing of knowledge for the conservation of skin-based objects. For over 30 years, this group has organised regular conferences, entitled Interim Meeting, to allow members, and more widely all interested professionals, to meet, share and discuss their work regarding the conservation of skin-based materials.

This year, the Interim Meeting of the ICOM-CC Leather and Related Materials Working Group takes place for the first time in France, in Paris. It gathers conservators, curators, scientists and historians who are committed to better knowledge and conservation of skin-based collections in its different forms: parchment, leather, tawed or untanned animal skins, fur and natural history specimens. These two days will be an opportunity to learn about recent conservation experiences and current research initiatives, as well as innovative solutions regarding the conservation of these materials. The conference proceedings will be published online on the ICOM-CC website.

From the start, the aim was to make this conference accessible to the greatest number, and to promote discussion between professionals and students from different countries. Additionally, to encourage the participation of French-speaking professionals and allow them to present their work in their own language, we wished to provide simultaneous French-English translation. This was made possible thanks to the financial support of three public establishments, the Ministry of Culture, the National Scientific Research Council (CNRS) and the French National Museum of Natural History (MNHN), two professional networks the Domaine d'Intérêt Majeur H*eritage and Ancient Materials* (DIM-Map) and the Fondation des Sciences du Patrimoine (FSP), as well as ICOM France and Hermès. Their support permitted greatly reduced registration fees for the conference, contributing to its success, thus we are really grateful to them.

Furthermore, to host a conference on skin and leather heritage, the musée du quai Branly - Jacques Chirac is an ideal place, considering the richness of their collections in this area. We would like to thank the different teams and people within the institution that helped with the event organization and allowed us to welcome you in the best conditions.

We wish to express our deep gratitude also for the support and enthusiasm of the people from the institut national du patrimoine (INP), the centre de recherche sur la conservation (CRC), the music museum, and the National Museum of Natural History (MNHN) that got involved in the organisation and have offered guided tours within their institution to the participants before the conference.

We hope you will enjoy these two days to learn about leather and skin, meet and share with colleagues, but also to discover or rediscover Paris.

Laurianne Robinet and Éléonore Kissel,
For the scientific and organisation committees

PROGRAMME

CONFERENCE PROGRAM

Thursday 6th June

9:15-9:45 **Registration / Acceuil & Tea / coffee**

10:00 - 10:30 Welcome / Bienvenue - Introduction

Archaeological Leathers / Cuirs archéologiques - Christopher Calnan

10:30 - 11:00 La collection de cuirs archéologiques coptes du musée du Louvre : focus sur des objets exceptionnels - Céline Bonnot-Diconne*, Dominique Bénazeth*, Florence Calament*

11:00 - 11:30 The Turku Market Square Excavations Case Study: Species Identification of Archaeological Leather Shoes from Finland using Peptide Fingerprinting
Tuuli Kasso*, Kari Uotila, Maija Elamaa

11:30 - 12:00 Modified methods for species identification of archaeological skin-based objects: dealing with degradation and improving standards
Lucy Skinner*, Rebecca Stacey, Anne Lama, Krista Mcgrath, Barbara Wills, Caroline Cartwright

12:00 - 13:30 **LUNCH / DEJEUNER & POSTERS**

Scientific development / Développements scientifiques – Marie Radepont

13:30 - 14:00 Impact of old conservation methods on leather and parchment
Matthew Collins, Carla Soto, Sarah Fiddyment, Jiri Vnoucek, Matthew Teasdale, Patricia Engel

14:00 - 14:30 A multi-analytical approach to the characterization of naturally tanned leather : investigation of accelerated ageing protocols on model leather samples, effect of novel formulations used for cleaning and consolidation of leather, and case studies on historical leather samples Marianne Odlyha*, Angelica Bartoletti, Alexandra Bridarolli, Manfred Anders, David Thickett, Piero Baglioni, Rodorico Giorgi, David Chelazzi, Laurent Bozec

14:30 - 15:00 The potential of nonlinear optical microscopy to non-invasively quantify the degradation state of historical parchments – Gaël Latour*, Margaux Schmeltz, Sylvie Heu-Thao, Claire Teulon, Guillaume Ducourthial , Marie-Claire Schanne-Klein, Laurianne Robinet

15:00 - 15:30 Preserving our cultural and natural heritage ? the Berlin skin collection is under observation
Steffen Bock*, Christiane Quaisser, Manfred Anders, Katharina Schuhmann, Bernhard Trommer

15:30 - 16:00 **Tea / coffee**

Fur & skin / Fourrure & peau – Carole Dignard

16:00 - 16:30 L'organisation du tri des collections Naturalia - Raisons et modalités de la ré-évaluation et la hiérarchisation des collections d'histoire naturelle - Manon Legris

16:30 - 17:00 Fur and Skin Processing in Prehistory: an experimental approach to prehistoric tanning technologies - Theresa Kamper*, Linda Hurcombe

17:00 - 17:30 Leather Dressing: The Conservation of Leather and Fur in Fashion - Marina Hays

17:30 - 18:00 La conservation-restauration des collections de peaux, cuirs et matériaux associés au musée du quai Branly - Jacques Chirac - Stéphanie Elarbi*, Elsa Debiesse, Clothilde Castelli, Astrid Gonnon

18:00 - 19:30 **Museum visit / visite du musée**
20:00 - 00:00 **Boat reception / Réception sur une péniche**

Friday 7th June

09:15 - 9:30 **Opening / Ouverture**

Gilt Leathers / Cuirs dorés –

9:30 - 10:00 La collection Páramo. Muséographie et provenance des cuirs dorés dans les collections espagnols - Félix De La Fuente

10:00 - 10:30 Floor-coverings: leather carpets in the papal residences 1600-1740
Mara Nimmo* Mariabianca Paris

10:30 - 11:00 **Tea/coffee**

11:00 - 11:30 Conserving Gilt Leather in the Netherlands - Eloy Koldeweij

11:30 - 12:00 The development of a conservation and restoration methodology for embossed leather wall coverings in Moritzburg Palace – Gabriele Hilsky, Margitta Hensel*

12:00 - 12:30 L'histoire mouvementée de cinq tentures historiées en cuir doré, peint et ciselé du 17ème siècle représentant des scènes de l'Ancien Testament - Céline Bonnot-Diconne*, Jean-Pierre Fournet*, Muriel Barbier, Laurianne Robinet, Lucile Beck, Marie Heran, Marie Radepont, Sylvie Thao

12:30 - 14:00 **LUNCH / DEJEUNER & POSTERS**

New conservation approaches / Nouvelles approches de conservation – Theo Sturge

14:00 - 14:30 A "rehabilitation protocol" for a medieval codex in risk of disappearance
Diana Avelar Pires

14:30 - 15:00 Textured Fills: Replicating Leather Surfaces With Acrylic Media and Reusable Silicone Rubber Molds - Sarah Reidell

15:00 - 15:30 Le conditionnement anoxique : premier bilan d'une campagne de préservation sur les collections de fourrures au musée du quai Branly - Jacques Chirac
Eléonore Kissel*, Fabrice Sauvagnargues*

15:30 - 16:00 **Tea/coffee**

Technical history / Histoire des techniques – Theo Sturge

16:00 - 16:30 Gilt leather threads in 11th-15th century textiles - Cristina Scibè*, Caroline Solazzo*, Isetta Tosini, Thomas Lam, Edward Vicenzi, María-José González López

16:30 - 17:00 Carved leather of the Caliphate lineage: the heritage of the west of Iberia Peninsula - beyond the myth of Córdoba - Franklin Pereira

17:00 - 17:30 **Closing statement**

* Presenting auteur(s) / Auteur(s) présentant(s)

PRESENTATIONS ORALES

ORAL PRESENTATIONS

La collection de cuirs archéologiques coptes du musée du Louvre : focus sur des objets exceptionnels

Céline Bonnot-Diconne[1]*, Dominique Bénazeth[2]*, Florence Calament[2]*

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La collection des objets coptes en cuir du département des Antiquités égyptiennes du musée du Louvre (plus de 200 pièces) a fait ces dernières années l'objet d'une campagne de restauration régulière. L'objectif était de présenter au public ces objets en cuir, de façon alternée, afin de renouveler les présentations et faire connaître au public ces pièces souvent exceptionnelles.

Collectées pour la plupart au début du 20ème siècle, leur état de conservation est très variable. Malgré l'existence d'un catalogue des chaussures publié par Véronique Montembault (*Catalogue des chaussures de l'antiquité égyptienne*, Réunion des Musées Nationaux, Paris, 2000), origines, datations et traitements subis sont des données rarement précisées pour ces objets. La restauration pour exposition a donc été l'occasion de faire des découvertes et des remises en cause historiques et techniques.

Les interventions sur plusieurs paires de chaussures et d'un étui à calames seront évoquées afin de montrer les difficultés de la consolidation et de la remise en forme de cuirs découverts à l'état sec et qui présentent une très grande fragilité. La présence de décoration à la feuille d'or, de décors incisés ainsi que de teintures a parfois complexifié ce travail.

La politique de mise en valeur de ces objets du quotidien qui fascinent le public sera également exposée.

A gauche : E13887, avant et après restauration.
A droite : détail du décor incisé avec motif de lapin.

The Turku Market Square Excavations

Case Study: Species Identification of Archaeological Leather Shoes from Finland using Peptide Fingerprinting

Tuuli Kasso[1]*, Kari Uotila[2], Maija Helamaa[2]

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This paper gives an overview of the excavations conducted in Turku, Finland, focusing on the challenges brought by handling large quantities or archaeological leather material discovered during the excavations. Post-excavation work on the leather finds is also addressed, regarding the valuation of the preservation of the objects for conservation, storing and discarding. In addition to the historical and stylistic study of the leather finds, mostly shoes, this paper presents preliminary results from the zooarchaeological approach applied to the leather finds: identification of animal species used for leather shoes in 16th-18th century Turku as a viewpoint for shoemaker's choice of material and craft.

Organic finds are rare in Finland by standard due to the poor preservation caused by acid soil. Therefore, the recent excavations of the medieval market place in Turku have produced a phenomenal interest and group of finds, as the clay-rich soil has preserved organic material extremely well. During the excavation season May 2018 to January 2019, a large quantity of complete and fragmental leather objects has been found, including a variety of shoes representing the entire age curve of the population, starting from tiny leather shoes worn toddlers (Figure 1). Corresponding collection of finds dating to the 17th-18th centuries from Finland has not been discovered, further highlighting the remarkability of the Turku excavations.

A research project with such expanse as the Turku Market Square Excavations requires impeccable managing of finds and the sheer volume produces substantial challenges. Current estimation is that from the excavations extending to over a hectare in acreage, overall 30 - 40 000 finds have been made, ca. 2000 of leather. During the excavations, most of the leather finds were stored wet in cool temperatures until further handling and research. Understandably, the valuing of the objects chosen to undergo conservation treatments is critically decided based on the value for further research and need for preservation.

Figure 1. A child's shoe (picture M. Carpelan/Muuritutkimus Oy)

The leather finds are categorized for i) conservation ii) drying and preservation iii) drying and discard. Need for conservation i) was conducted based on the further research potential and condition and/or multi materiality of the find, whereas the drying process was conducted ii) via freeze-drying and iii) dried in room-temperature. However, each item will be cleaned, documented and catalogued before additional steps.

Minimum intervention to the leather as a material was avoided also due to the future focus of the leather finds, e.g. applying a PEG-treatment for leather generally in good condition, as this will introduce a contaminant affecting further research. Current development of methodology allows us to identify animal species from archaeological leather with eZooMS (Zooarchaeology by Mass Spectrometry) from micro-destructive samples (1mm x1mm). As each animal species has their own characteristic peptide fingerprint, analysing the proteins of the sample allows us to differentiate the animal used despite the poor preservation of hair follicles in the skin usually used to identify animals from leather objects. Conservation treatments acts as a contaminant for eZooMS, therefore sampling has been conducted prior to conservation, and PEG-treatment avoided for the potential further analysis of the finds.

Some studies of historical shoe making has found that cattle skin was chosen for the soles, goat for the upper and lamb for the strings of the shoes. This was likely not implemented as an economical reason, but as a choice based on the crafter. Cattle skins are thicker, therefore more durable for the soles compared to soft goatskin ideal for a comfortable upper of the shoe. At that, the absence of goats in Scandinavia would indicate mostly cattle used for the shoes. Majority of the complete and fragmental shoes found in Turku were sampled with a focus on this differentiation between the animal species. The preliminary results of the analysis of the Turku shoes are compared to these hypotheses and evaluated critically to cast light on life in late medieval and early modern age Finland – in the shoemaker's shop.

Modified methods for species identification of archaeological skin-based objects: dealing with degradation and improving standards

Lucy Skinner[1,3]*, Rebecca Stacey[1], Anne Lama[3], Krista Mcgrath[4], Barbara Wills[2], Caroline Cartwright[1]

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Skin-based artefacts survive, preserved in tombs, graves and settlement sites in the Nile Valley and the surrounding desert in Egypt and Sudan dating as far back as the 3rd millennium BC. A collaborative PhD research project, at the British Museum and University of Northampton, is using traditional microscopy and analytical techniques to identify (ID) the animal species of leather and skin-based materials and to investigate the processing methods used by ancient craftspeople. Traditional techniques used for species ID, such as examining the skin grain follicle patterns, are quite well understood in the fields of archaeology and conservation but the results are subjective and techniques, established by leather technologists working mostly with modern leather, have never been standardised, nor are they always applicable or easy to use on archaeological material.

This paper will describe the workflow and standardisation of methodologies adopted to identify animal species of ancient Egyptian and Sudanese leather and skin objects, held in museum collections at the British Museum, Egyptian Museum in Turin, and the National Museum of Sudan. It will also describe and illustrate the types of degradation exhibited and the challenges encountered when working with this material.

Three approaches have been used to carry out species ID:

1) Follicle pattern recognition

Optical and scanning electron microscopy images of leather cross-sections and grain surface follicle patterns are created and compared with images of reference material, at a similar magnification. Grain features such as density, shape and size of the follicle holes are also recorded and compared.

2) Hair thickness, cross section and scale-cuticle pattern recognition

If residual hair is attached to the skin/leather, their diagnostic features are microscopically observed and imaged, using a Keyence VH-Z250R high-powered digital microscope and Hitachi S37-00N VP-SEM. Images and data are compared to reference hair fibres.

3) ZooMS (Zoological Mass Spectrometry)

A method developed at the BioArCh lab at the University of York for identifying the taxa of organisms by protein mass fingerprinting. After chemically rinsing and isolating collagen fibres from a leather or skin object, the enzyme trypsin is used to digest the collagen, cutting it into shortened amino acid peptides. The collagen digestion is extracted and concentrated using ZipTip® pipette tips. MALDI-TOF MS (matrix assisted laser desorption/ionization – time-of-flight, mass spectrometry) is used to analyse the extraction, detecting peptides of certain masses, diagnostic for particular animal species.

Leather surface under x12 magnification.

Obstacles to obtaining definitive results include: a) original skin processing methods, use-wear, plus age-induced physical deterioration of grain and hair surfaces often cause diagnostic features to disappear; b) there are differences in the physical characteristics of ancient animal breeds compared to their modern counterparts, meaning grain follicle patterns and cuticular scales can be difficult to recognise; c) hair and grain follicle pattern recognition are subjective methods and therefore unreliable; d) age-induced denaturation of collagen diminishes the success rate of ZooMS because some diagnostic peptides may not survive; e) contamination by soil-humics, vegetable tannins, and human body fluids, obstruct the MALDI-TOF and are difficult to entirely separate from collagen, even it seems, after adopting the chemical rinsing method recommended in the BioArCh lab.

To mitigate these problems, microscopy methods have been standardised - by ensuring consistent magnification, lighting conditions, and orientation of the follicles for each sample, while building up a large collection of modern and ancient comparative images. Slight modifications to the ZooMS technique appear to have improved its success rate and where the method has been successful, it definitively confirms species ID, reinforcing interpretations.

The three methods described cannot stand alone, but by constructing a standard workflow, comparing and combining data, the methodology is generating robust, reliable and well-corroborated results. The work is building a clearer picture of which animal species were used to make different kinds of objects and filling gaps in current knowledge about ancient skin processing and animal husbandry methods, in the Nile valley during antiquity.

Impact of old conservation methods on leather and parchment

Matthew Collins[1], Carla Soto[1], Sarah Fiddyment[1], Jiři Vnouček[1], Matthew Teasdale[1], Patricia Engel[2]*

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Leather and parchment are the two collagen-based materials most widely used as part of the written heritage in Europe. Their conservation and restoration have not been studied in detail before the 1980s. Prior to that time, their conservation and restoration involved the application of various, more or less helpful, substances such as shoe polish and saddle soap for leather and oils and glues as surface treatments for parchment conservation. In the framework of the research work conducted by the team of Prof. Dr Matthew Collins (University of Copenhagen) a carefully selected range of old conservation methods was performed under fixed conditions at DUK in Krems (dr habil Patricia Engel), to study their impact on the material. While first presentations in Copenhagen (Care and Conservation, April 2018), Houston (AIC Meeting, May 2018), Bucharest (5th International Science for Art conference, July 2018) and Vienna (WAF Meeting, Nov. 2018) illustrated the immediate impact of the treatments, we now will be able to illustrate the results on artificially aged samples, which helps simulate an environment close to what is found in real archives and libraries.

The level of degradation in the collagen molecule was assessed using matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS). The resulting data was analysed by PCA using MassUp. This provided us with an idea of the variance in the sample set caused by the different conservation treatments and allowed us to identify samples of interest for in-depth sequence analysis by liquid chromatography-tandem mass spectrometry (LC-MS/MS). All analyses were performed at the University of York.

A multi-analytical approach to the characterization of naturally tanned leather:

Investigation of accelerated ageing protocols on model leather samples, effect of novel formulations used for cleaning and consolidation of leather, and case studies on historical leather samples

Marianne Odlyha[1]*, Angelica Bartoletti[2], Alexandra Bridarolli[3], Manfred Anders[4] David Thickett[5], Pietro Baglioni[6], Rodorico Giorgi[6], David Chelazzi[6], Laurent Bozec[7]

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Recent studies performed in the framework of the EU NANOFORART project (http://www.nanoforart.eu) have been continued and will be reported in this paper. The focus of this work is the methodology that was developed for characterising extent of damage to collagen-based artefacts [1]. Our approach involved the use of different analytical techniques for characterising changes in collagen structure, from macro to nanoscale. Mechanical measurements at selected conditions of RH (at macro level) together with those at the micro-and nanoscale level i.e scanning electron microscopy, atomic force microscopy, small angle X-ray scattering ,and spectroscopic techniques (FTIR) were used. In addition dielectric techniques indicated whether observed changes caused samples to become more or less hydrophilic.

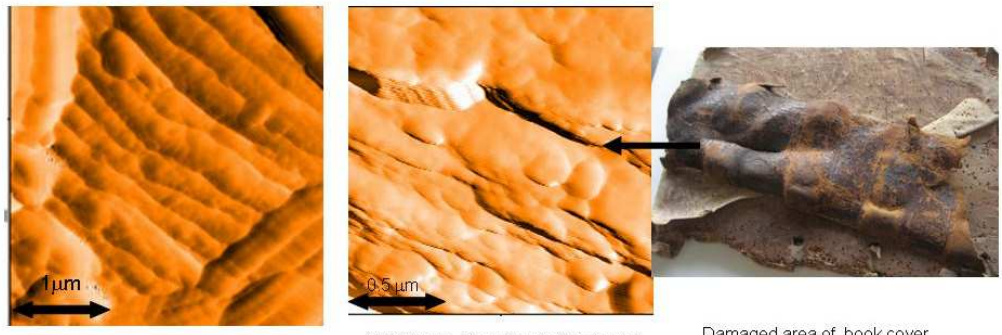
Using this approach studies were made to evaluate the extent of degradation that occurs when mock-up samples (i.e recently produced leather samples) are subjected to accelerated ageing. Ongoing collaboration with ZfB (Zentrum für Bucherhaltung) has involved variations to the ageing protocol traditionally used in leather-based research; reviewed ageing conditions and their impact on collagen will be reported.

This methodology was also used to assess the effect of novel cleaning formulations proposed for leather objects within the NANOFORART project, which included cleaning strategies and the use of nanoparticle dispersions for pH adjustment treatment. Novel conservation tools were mainly designed and supplied by CSGI (Centre for Colloid and Surface Science (CSGI), University of Florence). A recent publication describes the nanomaterials developed by this group such as dispersions of nanoparticles, microemulsions, and gels [2]. In addition some preparations from ZfB (Zentrum für Bucherhaltung GmbH, Leipzig) for pH adjustment were also included.

With respect to cleaning strategies the potential application of semi-interpenetrating (IPN) poly (2-hydroxymethylmethacrylate)/polyviylpyrrolidone) hydogels was tested on both on both modern and historical leather samples. Modern samples included vegetable tanned (sumac) leathers, whilst the historical samples were leather covers for a Luther bible dated 1749 and a Roman Missal (1725). Both the historical samples exhibited surface deposits of dirt, salts, or waxy (or lipid materials) which needed to be removed. After the cleaning procedure, which is described in detail in [3] the treated surface was checked by ATR-FTIR.

For pH adjustment tests, nanoparticle dispersions were applied on several areas of both the mock-ups and historical bookbindings, and untreated and treated samples were subjected to accelerated ageing tests by heating to 150C for 24hrs. The assessment of these samples was made initially using FEG-SEM, revealing the distribution of nanoparticles across the sample surface, and changes in sample appearance due to ageing. The IR spectra showed that for untreated samples a broadening of the Amide I peak occurred. In the case of the nanoparticle treated samples the ageing effects were reduced, demonstrating a protective action of the nanoparticle dispersion. Results from mechanical analysis showed that for treated samples there is no decrease in the measured displacement of the samples, indicating that no damage had occurred to the collagen in the leather. Small angle X-ray scattering measurements (SAXS) also showed that there was no effect on the structure of collagen at the nanoscale level. In contrast the effect of thermal ageing of untreated leather showed a decrease in the structure of collagen at the nanoscale level as evidenced by the reduction in D-banding of the collagen.

This multi-analytical approach has also been used to evaluate the physico-chemical state of collagen in historical leather in bookbindings. Recent and ongoing case studies have been performed in collaboration with English Heritage and these will also be described. Extracted fibre samples of leather (red and black) from bookbindings of selected Charles Darwin's notebooks were examined. It was found that differences in elemental composition correlated with differences in the state of collagen degradation of the leather. Studies are also ongoing on performing nanomechanics on extracted collagen fibres from a 16th cent leather book cover made available courtesy of Instituto del Patrimonio Cultural de Espaňa (IPCE) in Madrid.



AFM image (2μmx2μm) of unaged sumac leather showing evidence of periodic D-banding for collagen

AFM image (1μmx1μm) of damaged area from 16th cent leather book cover showing no evidence of collagen structure

Damaged area of book cover (courtesy of IPCE, Instituto del Patrimonio Cultural de España)

References

1. Odlyha M. et al. (2014) "Damage assessment of parchment at the collagen fibril level using atomic force microscopy and mechanical testing at the macro level". In ICOM-CC 17th Triennial Conference Preprints, Melbourne, 15–19 September 2014, ed. J. Bridgland, (ISBN 978-92-9012-410-8)

2. Baglioni P., Chelazzi D., Giorgi R., Nanotechnologies in the Conservation of Cultural Heritage: A compendium of materials and techniques. Dordrecht: Springer Netherlands; 2015

3. Baglioni, M., Bartoletti, A., Bozec, L., Chelazzi, D., Giorgi, R.,Odlyha, M., Pianorsi, D., Poggi, G., Baglioni, P., Nanomaterials for the cleaning and pH adjustment of leather, Applied Physics A: Materials Science and Processing. 2016; 122(2)

The potential of nonlinear optical microscopy to non-invasively quantify the degradation state of historical parchments

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Parchment was the main writing support material in the Middle Ages in Western Europe. It is made from an untanned animal skin, which is preserved by liming, scraping and drying under tension. Parchment is very sensitive to heat and water, which causes in extreme case the denaturation of collagen, its main constituent, to gelatin. The measurement of the shrinkage temperature, by differential scanning calorimetry (DSC) or the micro-hot table (MHT) method, is commonly used in the cultural heritage field to assess the degradation state of collagen-based materials. However, these techniques are invasive, as they require a sample, and destructive, which is an issue in the case of some historical artifacts. The aim of this work is to demonstrate the potential of nonlinear optical (NLO) microscopy, also called multiphoton microscopy, to investigate in a non-invasive and quantitative way the conservation state of historical parchments.

NLO microscopy enables three-dimensional (3D) imaging with micrometer-scale resolution based on an intrinsic optical sectioning. A key advantage is its multimodal capability. Two-photon excited fluorescence (2PEF) signals are emitted by a wide range of materials (fluorophores) in historical artifacts with specific absorption and emission fluorescence spectra [1]. SHG signals are specific for dense and well aligned structures such as fibrillar collagen, and vanish for centrosymmetric materials such a gelatin. Accordingly, SHG microscopy provides structural information about the 3D organization of the fibrillar collagen within parchments and other skin-based artefacts [2,3]. Notably, it enables *in situ* non-invasive assessment of parchment degradation, which is characterized by the loss of the SHG signal and the onset of a 2PEF signal [2].

In order to quantify intermediate states of degradation, we further implement polarization-resolved SHG (P-SHG) microscopy: the SHG intensity is recorded as a function of the linear polarization orientation of the excitation for each pixel of the image. P-SHG microscopy provides two quantitative information: the main orientation and the degree of orientation disorder at the submicrometer scale. P-SHG images are acquired in a set of modern parchments that were artificially degraded by exposure to dry heat for increasing duration. The degradation state of the collagen in these parchments is assessed using DSC. P-SHG data are in good agreement with DSC measurements and prove to be a complementary investigation tool that requires no sampling. Most importantly, P-SHG is shown to reveal the earliest states of degradation.

NLO imaging is used to investigate the conservation state of an historic parchment, the Mappa Mundi of Albi (8th century, France). It is one of the first representation of the occidental world, recently recorded in the UNESCO Memory of the World Register. *In situ* NLO images of this parchment confirm that it is well preserved, and further demonstrate that NLO imaging is a safe characterization technique for historical parchments.

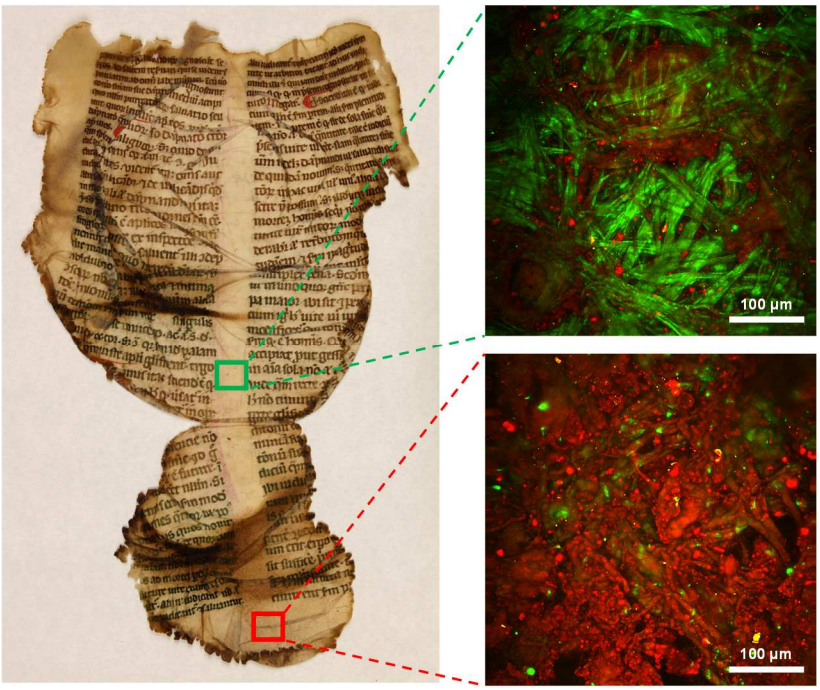

Figure 1: Investigation of the historical parchments from Chartres' library. At the center of the manuscript, some areas are well-preserved (SHG, in green) whereas in the border the fluorescence signals reveal the absence of fibrillar collagen (2PEF, in red). Scale bar: 100 µm.

At the end the 2nd World War, Chartres' library was partially destroyed. The manuscripts were exposed to fire and then water. The degradation states of the manuscripts are heterogeneous (Figure 1). P-SHG microscopy was performed on these manuscripts to determine their conservation states. Moreover, these analysis were also performed in restored and unrestored parchments and show that the performed restoration did not alter the conservation state of the fibrillar collagen within the parchment.

All these results show the high potential of NLO microscopy for *in situ* quantitative measurements of the conservation state of historical parchments. Moreover, this methodology could be extended to other cultural heritage materials.

References

[1] G. Latour *et al.*, Opt. Express **20**, 24623 (2012)

[2] G. Latour *et al.*, Sci. Rep. **6**, 36344 (2016).

[3] L. Robinet *et al.*, ICOM-CC 18th Triennial Conference Preprints, art. 1609 (2017).

Preserving our cultural and natural heritage – the Berlin skin collection is under observation

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Scientific collections have stored millions of mammal skins and hides collected from all parts of the world over the last 250 years. These large repositories serve as reference centers for past and present biodiversity that help to answer questions about taxonomy, variations in the environment and changes in species richness. Furthermore, the hides and skins are important elements of museum exhibitions and artistic inventions, and are part of our global cultural heritage.

A two-year lasting skin conservation project at the Berlin Museum für Naturkunde in Germany aims at the development of methods for the analysis and treatment of degrading historic flat study skins in natural history collections. Questions we are investigating focusing on the ongoing chemical degradation processes in the skins, historic preservation and conservation methods used in the past but hardly documented, best practice in evaluation of the current state and condition of large skin collections and possible treatment methods to stabilize degrading skins.

First results of the chemical analyses of selected historic red fox skins (*Vulpes vulpes*) supported our hypothesis that acidic hydrolysis causes the main damage to those skins. Probably, the regarding acids are coming from the preservation techniques themselves and decreasing the stability of the collagen and skins. Based on the results of in-depth analyses in cooperation with partner laboratories, we are now working on the development of cost-efficient, non-invasive and simpler methods for a collection profiling to find similar characteristics in the skin

collection and dependences between investigated parameters. Handheld x-ray fluorescence analysis (pXRF), surface pH, penetration resistance, hand-tested tear strength, test of flexibility and hair loss as parameters plus all information from the old inventory catalogues (collector, collecting date, preparations, historic documents etc.) are measured, collected and analyzed.

First findings show that pXRF can be used to determine preservation techniques. Comparisons to pXRF measurements of freshly preserved fox skins treated after different historic preservation recipes support the potential of using that semi-quantitative element detection method for preservation treatment determination. As far as we know, most of the Berlin skins were not mineral tanned. The skins were preserved only with a pickle or with alum. Analyses with pXRF show that the composition of detected elements depends on the collector and indicates the used preservation treatment: all skins were tested for Aluminium, Sulphur, Phosphor, Chlorine, Potassium, Calcium, Iron and Arsenic. To preserve and stabilize the historic skins, it is necessary to know the complete treatment that happened to every single skin. Different past preservation methods need probably different stabilization techniques so that pXRF can help us in relatively cost-efficient detecting.

L’organisation du tri des collections Naturalia

Raisons et modalités de la réévaluation et la hiérarchisation des collections d’histoire naturelle

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La réorganisation des collections est l’un des enjeux non-négligeables dans l’actuelle réalité des muséums d’histoire naturelle. Sur le plan pratique, cela permet de gagner de la place dans les réserves, de proposer des collections en adéquation avec les besoins des chercheurs et du public, de faciliter la consultation des objets, d’optimiser la lisibilité et la compréhension des réserves, de simplifier le rangement et l’organisation.

Sur le plan de la conservation, l’organisation du tri est un temps pendant lequel on peut évaluer les collections et ainsi repenser les valeurs attribuées aux spécimens, évaluer leur état de conservation, leur potentiel d’utilisation, etc. Aujourd’hui, les accumulations du passé, en plus des nouvelles acquisitions, obligent certains muséums à repenser l’organisation de leurs collections afin de gagner de la place et de revaloriser leurs objets.

L’idée de cet article est de proposer un ensemble de solutions possibles, adaptable à chaque établissement. L’objectif n’est pas d’imposer une réponse unique à la question du tri, mais plutôt de présenter les différentes orientations envisageables. Il convient aussi de préciser que l’ensemble des questions soulevées ne peut être résolu par une seule compétence professionnelle. La coordination et la communication entre les différents spécialistes sont primordiales afin d’adapter les réponses selon le type de collections et d’en assurer la bonne conservation.

Actuellement, la pratique du tri dans les muséums dépend beaucoup du statut et de la provenance des objets. Il faut savoir que ces collections sont divisées en deux statuts principaux : les objets patrimoniaux, soumis à la législation relative au numéro d’inventaire, et le matériel d’étude, non contraint par cette législation. Ces statuts sont donc plutôt définis par l’usage des objets qu’ont les chercheurs et professionnels des muséums.

Pour établir un protocole, il a été possible de réaliser un parallèle avec la pratique du désherbage mise en place dans les bibliothèques et les services d’archives. En effet, ces domaines sont confrontés au problème du surnombre de documents par la présence de doublons et l’accumulation de périodiques. Il y a une nécessité d’élimination par manque de place dans les magasins. Comme les collections naturalistes forment une sorte de bibliothèque d’histoire naturelle, elles sont donc concernées par cette même logique d’accumulation d’objets.

Ce protocole propose ainsi différentes issues pour un objet, à savoir : la conservation-restauration, la réorientation en matériel d’étude à valeur scientifique ou à valeur pédagogique, en prêts et dépôts, et la destruction. Ces différentes destinations ont chacune un certain nombre de spécificités et problématiques propres comme la législation selon le statut de l’objet, les valeurs associées, la lisibilité, le problème de l’approche et de la subjectivité dans l’évaluation des collections, etc.

La conservation de la matière est la raison-même de l’existence de la taxidermie. Alors, afin de mieux conserver les objets, il est impératif d’effectuer un tri pour hiérarchiser les collections et pouvoir au mieux en préserver la matière. En effet, ne pas faire cette hiérarchie revient à ignorer le statut des objets, et de fait, en cas d’urgence, il n’y a pas de prioritarisation pour leur évacuation.

Alors si certaines questions subsistent certainement, cette étude permet de présenter, non pas une solution unique, mais des possibilités de réponses qui peuvent être adaptées à la politique documentaire de chaque muséum.

Fur and Skin Processing in Prehistory

An experimental approach to prehistoric tanning technologies

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The importance of skin processing technologies, in the history and dispersal of humankind around the planet cannot be overstated. Tanning technologies can be hard to identify and yet the knowledge is both archaeologically useful and can be used to inform the conservation and ongoing curation of the artefacts.

This presentation outlines a systematic analysis methodology targeted at this specific material type, with the goal of determining the tanning technologies in use during prehistory, from extant archaeologically recovered processed skin objects. The methodology is a product of macroscopic and microscopic observations of a sample reference collection containing over 200 samples. These were used to produce a database of defining characteristics and tendencies for each of six tannage types; wet and dry scrape brain tan, bark tan, alum taw, urine tan and rawhide.

The sample collection is made up of twenty-two economically important species from both Europe and North America, as well as a collection of well used clothing and utilitarian items, made from traditionally processed skins. This research has demonstrated that archaeologically preserved objects made from processed skin can provide information about the tannage technologies in use prehistorically, as well as more detailed information such as manufacturing sequences and the conditions of use to which the object was subjected.

A case study of material from the Bronze Age site of Whitehorse Hill, Devon, UK will be presented. The organic finds recovered include at least four items that incorporate animal products. One is a complex artefact of nettle fibres (Urtica dioica) and processed skin sewn together into a linear textile. The tanning technologies determined using the methodology were able to inform reconstructions of some of the items from the site for the flag ship museum exhibit of this exciting set of artefacts.

Leather Dressing: The Conservation of Leather and Fur in Fashion

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There is a considerable body of literature on leather conservation techniques, but very little has been published on the conservation of Western-style garments made from leather and related materials. This presentation aims to address this deficiency by focusing on the challenges of and solutions for conserving fashionable dress objects made from leather and fur. These differ in key ways from other artifacts constructed using these same materials. For example, the drape of a skin may be a crucial part of a garment's aesthetic identity, whereas leather in many other types of objects (such as bookbindings) is attached to a rigid substrate, rendering the question of drape irrelevant. Leather and fur may be combined in garments with a wide variety of other materials, both natural and synthetic, which may or may not be sympathetic. Skins may be dyed, coated, or otherwise treated in ways not commonly seen in leather and fur used for other purposes. They may, furthermore, bear traces of the human body, in the form of deformations caused by the shape or movement of the wearer, or in degradation caused by somatic substances, such as perspiration. Relatedly, garments have unique and particularly demanding requirements for display; most treatments are planned and undertaken with the assumption that an object will ultimately be subject to the stress of mounting on a mannequin.

Treatment methodologies used in the conservation of books, upholstery, archaeological or ethnographic artifacts, and other objects made from leather and fur can and should be employed by conservators of costume. However, these techniques must generally be modified to respond to the particular material and aesthetic requirements of fashionable dress. Case studies describing the conservation of pieces from the collection of the

Metropolitan Museum of Art's Costume Institute—including a jacket made from a patchwork of reptile skins and a hair-on calfskin coat painted by the artist Maria Sol "Marisol" Escobar—will serve as examples of how methods developed and used by conservators in various specialty areas can be adapted and used in the treatment of garments made from leather and fur. These case studies will provide practical solutions to common condition issues, such as tears, losses, stiffening, and deformations. At the same time, they will serve as a reminder of the value of looking beyond the boundaries of our specialties and collaborating with conservators in other disciplines.

La conservation-restauration des collections de peaux, cuirs et matériaux associés au musée du quai Branly - Jacques Chirac

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Le musée du quai Branly - Jacques Chirac conserve une collection de près de 350 000 objets provenant d'Afrique, d'Océanie, des Amériques et d'Asie, constituée majoritairement de matériaux organiques. Les peaux, cuirs et matériaux associés représentent près de 18 000 items identifiés à ce jour. De typologies diverses - parures et vêtements, armes et armures, instruments de musiques, objets rituels ou objets du quotidien - leurs technologies comme leurs fonctions interrogent les modalités de préservation.

Quelles options retenir pour la gestion de cette collection hétérogène en réserves ? Faut-il envisager une conservation en climat spécifique ? Quels modes de conditionnement mettre en œuvre pour s'adapter aux différentes morphologies de ces objets ?

Quels dispositifs de présentation imaginer pour assurer la lisibilité et la conservation optimale d'une sélection d'objets lors d'une exposition, à court ou moyen terme ?

Comment adapter un traitement de conservation-restauration à la spécificité d'un objet ou à la cohérence d'un corpus ?

© musée du quai Branly – Jacques Chirac, photo Claude Germain

Des principes de gestion en réserves aux choix de présentation en exposition comme à l'élaboration des traitements de conservation-restauration, cette communication se propose de présenter les pratiques retenues par le musée du quai Branly - Jacques Chirac pour la préservation de ces collections spécifiques.
La politique de conservation-restauration sera abordée par le biais de plusieurs études de cas. La présentation du traitement curatif d'une rare cuirasse de Patagonie en peau de guanaco soulignera la nécessité de différencier les traces d'usage des dommages postérieurs que présente un tel objet et les choix de conservation qui en résultent.

L'étude technologique et les interventions menées sur quatre anoraks Inuits en intestins de phoques détaillera comment l'accès retrouvé à ces objets s'accompagne d'une connaissance matérielle améliorée.

Un projet de présentation de la collection sibérienne de robes et accessoires en peau de salmonidés a initié une étude complète de cet ensemble qui, associée à une identification des espèces employées, a révélé les caractéristiques de ce matériau et guidé les traitements de conservation-restauration. L'adaptation au cas par cas d'un protocole de traitement établi à l'échelle d'un corpus sera présentée, ainsi que les mesures mises en œuvre sur des pièces présentant des résidus de pesticides.

Nombre de pièces de la collection requièrent une identification affinée des espèces ou des modes de tannage, nécessité imposée par leur préservation comme par la circulation des objets dans le cadre de leur prêt (CITES). À cette fin, des collaborations et des partenariats entre institutions patrimoniales sont développés ainsi que certaines techniques d'exploration comme l'imagerie 3D dont les apports seront exposés. Enfin, les limites des pratiques de conservation-restauration posées par l'état de dégradation extrême de certains objets seront examinées afin de permettre la discussion autour des options existantes ou des développements à venir.

La collection Pàramo. Muséographie et provenance des cuirs dorés dans les collections espagnoles

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Une des difficultés de l'étude des cuirs dorés, notamment des cuirs dorés espagnols les plus anciens, est le manque d'informations sur leur origine. Dans quelques musées et collections particulières sont conservés des ensembles significatifs d'œuvres datant de la fin du XVe jusqu'au premier tiers du XVIIe siècle, mais en dehors de tout contexte, sauf pour de rares exceptions ; paradoxalement nous disposons d'un riche répertoire de références documentaires concernant la production, l'utilisation ou la localisation de cuirs dorés. En résumé il nous manque les liens entre les œuvres conservées et leur contexte, ce qui est un obstacle pour faire progresser la recherche.

Deux raisons essentielles peuvent expliquer ce phénomène :

– Les cuirs dorés produits à cette époque avaient habituellement une fonction de revêtement mural et constituaient souvent des tentures amovibles, "flottantes", non fixées au mur. Ainsi on pouvait les installer et les retirer de manière saisonnière, et même les transporter au cours des voyages de leur propriétaire ; cette façon de faire aboutissait à leur ruine rapide et facilitait la perte d'intérêt à leur égard en raison des changements de goût et des habitudes domestiques.

– Il y avait aussi la mobilité des cuirs, facilitée par les habitudes commerciales et le développement d'un "collectionnisme érudit" apparu à la fin du XIXe siècle et qui s'est poursuivi au XXe.

Le but de cette étude est d'essayer d'établir des corrélations entre certains cuirs dorés et leur lieu de provenance à partir d'un exemple très démonstratif : la collection d'Anastasio Páramo (1879 – 1945).

Anastasio Páramo était un aristocrate érudit, antiquaire, collectionneur, marchand, disposant d'un "palais – magasin" à Tolède. Son intérêt s'est porté sur de nombreux sujets, et parmi eux sur les cuirs dorés dont il a constitué une des premières collections particulières d'Espagne. Cette collection existait déjà en 1915 et il l'a alors exposée au Musée National des Arts Industriels à Madrid (MNAI), le précurseur de l'actuel Musée des Arts décoratifs (MNAD). En 1924 il a prêté 26 œuvres pour l'Exposition de cuirs dorés organisée à Cordoue par Rafael* Romero de Torres. Puis il a vendu l'ensemble de sa collection au marquis de Viana ; elle constitue aujourd'hui la collection de cuirs dorés du Palais de Viana qui existe toujours à Cordoue.

D'après le contrat de vente, la plupart des cuirs dorés proviendrait d'églises et de couvents de Cordoue et de sa région. Tous les panneaux de cuir doré étaient qualifiés d'espagnols. À partir de là, la collection du palais de Viana a été considérée comme le paradigme des "*Guadamecíes*" espagnols anciens.

Nous avons constaté qu'il existe dans la collection du Palais de Viana trois panneaux de cuir doré qui ont des similitudes avec des cuirs dorés conservés dans d'autres collections :

– Au MNAD : ici il s'agit de quelques cuirs qui proviennent de l'ancienne collection Páramo.

– Au musée de *Santa Cruz* de Tolède (MSCT) : il s'agit d'un autre ensemble qui ne provient pas de l'ancienne collection Páramo, mais qui a été acquis à Tolède.

La question est donc de savoir si tous ces cuirs dorés ont une provenance commune et – si cela est possible – quelle est cette provenance.

La méthode de travail a consisté à confronter les caractéristiques des œuvres avec les sources documentaires et bibliographiques. Nous avons donc examiné tous les cuirs des collections ainsi que les documents des institutions et ceux de Páramo. Les résultats nous ont permis de formuler les conclusions suivantes :

– Páramo a constitué sa collection de cuirs dorés à Tolède, essentiellement à partir de démembrements de couvents et d'églises de la région.

– Il a vendu la plus grande partie de sa collection au marquis de Viana mais il a déposé quelques cuirs au Musée des Arts Décoratifs de Madrid.

– La présentation muséographique des cuirs a été maintenue au Palais de Viana. Quelques panneaux de cuir ancien sont des compositions artificielles, à partir d'exemplaires différents réunis.

– En 1968 le musée Santa Cruz de Tolède a acheté une série de cuirs, provenant d'un même ensemble, dans un couvent de la ville.

– Nous avons trouvé sur un des cuirs dorés du Palais de Viana une inscription portant le nom de ce couvent, ce qui répond à notre questionnement.

– Nous avons prouvé la provenance des cuirs, ainsi que la cohérence de leur chronologie en fonction de la datation du couvent d'origine.

En conclusion cette étude apporte des données intéressantes pour caractériser les cuirs dorés en Espagne ; notamment :

– elle valide le bien-fondé de cette méthode de travail ;

– elle permet de déterminer la provenance de certains cuirs dorés ainsi que leurs modalités d'utilisation et leur chronologie ;

– elle contribue à la connaissance de l'histoire des collections et de la muséographie des cuirs dorés ; elle informe aussi sur la dispersion éventuelle des collections et sur la coexistence d'exemplaires de cuir doré semblables dans différentes collections.

Floor-coverings: leather carpets in the papal residences 1600-1730

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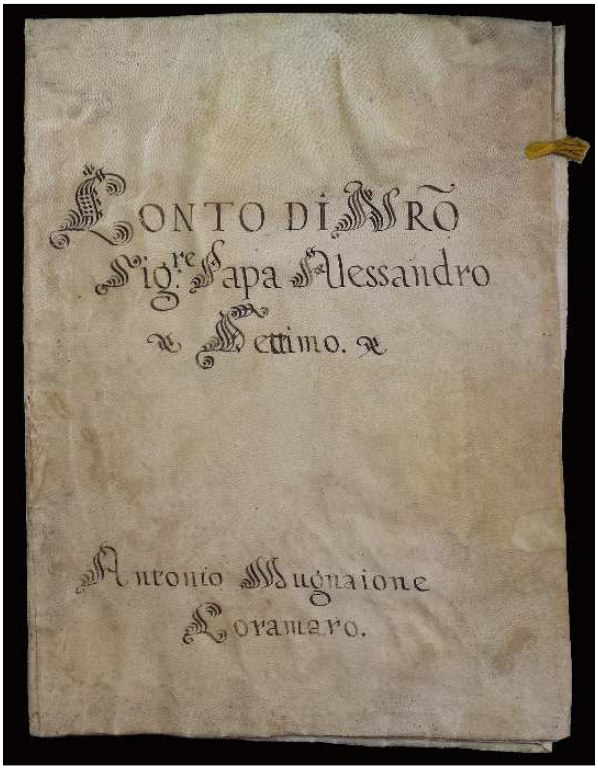
The data hereby presented pertain to a more extensive research initiated in the nineties on the occasion of the study of the leather artefacts from Palazzo Chigi in Ariccia aimed at more accurately outlining the figure of the *coramaro* (gilt-leather worker): the typology of the manufactured artefacts, the materials being used, the relationship with the employers, etc.

With reference to the topic and the period being reported here, the research carried out at the Rome's State Archives concerned the accounts of the Camera Apostolica (the Roman Catholic Church financial and administrative body) and more specifically those referring to fifteen Pontiffs, fifteen *Coramari di Palazzo* (Palace gilt-leather workers) and six buildings, both palaces and villas.



Antonio Mugnaione, Palace gilt-leather worker, cover of the account for the year 1655.
Archivio di Stato di Roma, Camerale I, Giustificazioni di tesoreria, busta 118.
(by permission of Ministero per i Beni e le Attività Culturali)

These accounts are quite detailed and thus provide a wealth of information about the materials and the structure of the leather furnishings that decorated the many residences of the Popes: the Vatican Palaces and the Quirinale Palace, as well as the Taverna and Catena villas and the Mondragone and Castel Gandolfo Palaces.

Out of the data that have surfaced, it is worthwhile to submit those relating to a specific type of artefact that pertains to the category of the floor coverings. Namely the leather carpet, for which the description of as many as 324 samples has been traced. All the more useful because these artefacts are an integral part of the history of gilt and painted leather, and yet scarcely known up to now except for some generic descriptions reported by the inventories.

In Rome within the field of the leather artefacts the carpet (*tappeto*) entry that will be used in this text was rarely adopted and solely to designate a large cover laid flat to protect furniture tops. Additional terms are instead used in the accounts: the entry is *panno* (cloth) at the beginning of the 17th century, *corame* - which in this case refers to more skins assembled together - well into the Century, whereas, starting from mid-century, *strato* (layer) is the almost unique term which later on will be often replaced by the term *sotto* (underneath) followed by the type of furniture.

The leather carpets covered the floor under large or small tables, chairs and kneeling-stools, or were placed on the ground along one or more sides of the beds, on the floor of the baldachins, on the stairs of the altars. Their structure would vary in complexity and the proportions reflected the size of the locations.

The rich archival documentation recounts the variety of the involved skins, the assemblage and decoration techniques, the reuse as well as the maintenance and reworking interventions required by the damaged carpets, mainly cleaned, unstitched, patched, reprinted, regilt, repainted.

The carpets were damasked or gilt, often punched, decorated with coats of arms, painted and even embossed. The skins were sewn or, in specific instances, glued. Hems, friezes, cascades or borders around the edges were added.

In the time frame under examination the artisans are replaced in accord with the incumbent Pontiff, which also entails a variation of the colour or the combination of the colours of the skins, the number of the new carpets and the ones that were repaired, or modified, or disassembled to obtain products such as table or bed covers and cushions.

In conclusion, it is open to debate whether the accurate descriptions provided by the documents will not only contribute to the history of the gilt and painted leather, but also aid in locating samples of these valuable but forgotten artefacts among the innumerable but fragmented specimens available.

Conserving Gilt Leather in the Netherlands

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In 1732 the London gilt leathermaker John Hutton advised the Leyden merchant Daniël van Eys about the cleaning of the gilt leather hanging he had recently acquired from him: *'pour le tenir nette et propre, pour prevenir que la pousier ne les gate c'est de les faires bien proter un fois tout les six semesne ou deux mois avec un linge net, secque, et bien doux, et s'il s'y faisoit destacher par la salté des mouches ou quelques autre insectes, il faut les laver avec une esponche tempé dans l'eau de pluye froide et bien nette, sans craindre de gater la painture ou l'orrure'* [*'To keep it [the gilt leather hanging] clean and neat, to prevent that smoke or coal dust will spoil it, it must be maintained well once every six or two months with a clean, dry, and very soft cloth, and if it needs to be cleaned of the dejecta of flies or some other insects, this should be washed off with cold, clean rainwater, without fear of spoiling the painting or the gilding.'*]

Cleaning and conserving gilt leather is from all ages. On March, 20, 1668 a person called Amsterdammer Bruyn Jansz Bruyning advertised in one of the Dutch newspapers, the Oprechte Haerlemsche Courant, that he had started up his business *'om oude Goude-Leeren te vernieuwen, uyt te halen, en een nieuwen luyster te geven, 't sy aen de Muer soo het hanght, of in sijn Huys, na eysch desselfs, voor een civiele prijs, alsoo hy extreme kennisse daer van heeft'* [*'to renew gilt leather, take it off, to renovate it either in situ or in his own workshop, at ones wishes, all for a very neat price, as he is very experienced in this'*.]

From archival researches many references for repairs, conservation, rehanging, and re-use are known. Various documents have been traced, talking about re-varnishing, re-painting and/or re-nailing. One document from 1765 mentions the use of not less than 3.991 brass nails for the repair of one single gilt leather hanging!

During the last century within the Netherlands almost all gilt leather rooms have been conserved and/or restored. In the first half of the century the gilt leather maker Jan Mensing (1869-1952), Amsterdam / Bussum, was the person to go to. He was making new gilt leather hangings, but has also conserved quite several old gilt leather hangings. It is known that he has been working, together with his assistants, on at least eighteen different gilt leather ensembles. More recently, in the years 1966-2000 the late Henk van Soest († 2005) has been working on at least 53 gilt leather hangings within the Netherlands, either in the 'Central Research Laboratory for Objects of Art and Science' in Amsterdam, either in his private workshop, the 'Maatschap ten behoeve van het restaureren en conserveren van Goudleer' in The Hague. Together, Henk van Soest and Jan Mensing have been working on at least 58 % of the surviving gilt leather hangings within the Netherlands. But they were not the only ones, several other persons have been working working on historic gilt leathers. Up till now not less than 19 different craftsmen and/or workshops have been identified who have been working in the Netherlands on gilt leather since the mid-19th century.

Presently, in an on-going project, we are collecting information from various gilt leather conservation projects. Primary, we are researching the archives of the former 'Central Research Laboratory' and the 'Netherlands Department for Conservation' [='Rijksdienst voor de Monumentenzorg'. But we are also looking at other places as in local archives and various institutions for written reports and other relevant documents. Aside these archival sources, we are collecting published material and articles in the divers media (from ICOM-CC post- and preprints to local newspapers) to learn as much as possible about these treatments during the years. Doing so we are able to get an overview of the restoration history of the gilt leather rooms within the Netherlands in recent times.

The proposed lecture will present this on-going project, will give aside an historical introduction, an overview of the results amongst which a very illustrative timeline, and will also address some of the further potentials.

The development of a conservation and restoration methodology for embossed leather wall coverings in Moritzburg Palace

Introduction to the exhibition "Reinstalling gilded leather wall coverings at Moritzburg Castle"

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Moritzburg Castle is home to the largest collection of Baroque leather wall coverings in the world; an outstanding cultural heritage site of national importance.
Despite the high durability of the material, in the course of almost 300 years environmental factors and the ageing process have inevitably led to signs of deterioration in the leather. In addition there has been significant damage caused by vandalism in the period after the Second World War as well as by the use of poor restoration methods.

In recent years it has been possible to undertake a series of restoration works in the context of a programme of fundamental conservational research. Since 2002 targeted restoration measures have been applied to stamped and painted leather wall coverings. The question was now, whether these techniques could also be used with embossed leather.

Objective of the conservation and restoration measures

Examination and Assessment of the damage to the leather and its causes led to the development and implementation of a conservation and restoration plan with the following fundamental aims:

- The repair of damage to the base material caused by earlier restoration work and great fluctuations in climatic conditions.
- The creation of homogenous wall panels with original pieces of leather and applied leather patches are essential from a conservational and aesthetic point of view.
- The improvement of the aesthetic appearance of the wall coverings by means of surface cleaning and the integration of newly restored fragments. The refurbishment should be limited to the addition of these leather pieces, which are silvered using traditional techniques and then painted.
- The application of treatment practices in line with the internationally recognised ethical norms for restoration, including the principle of reversibility of all procedures and the removability added

Challenges

- Earlier conservation work involving the use of fat made the leather very brittle and damaged the painted surface.
- In some places layers of paint were coming away from the leather.
- The wall coverings have been heavily overpainted.

- A well thought out approach was necessary for working on the large panels of the blue and gold wall coverings.
- Many of the leather fragments showed very different signs of ageing.
- It was necessary to develop a methodology for the sewing together of the leather pieces.

Results

Between 2012 and 2016 a team of six freelance restorers and one restorer employed by Moritzburg Castle completed the comprehensive restoration of a set of embossed leather wall coverings for three rooms at the castle, as well as fifteen accompanying chairs upholstered with gilded leather.

Over three years we worked with the Saxon State Office for the Preservation of Historical Monuments and the Research Institute for Leather and Synthetic Materials in Freiberg to develop a certified leather for restauration works.

Museum Presentation

The restoration project has now evolved into the first special exhibition in Moritzburg dedicated to the manufacture and restoration of this valuable artisan craftwork. Visitors will learn about the history of every room and its wall hangings. Details of the damage to the leather wall coverings will be explained as well as the losses and reinstallation process. The global importance of the Moritzburg gilded leather wall coverings should in future be more widely recognised than in the past. The exhibition will serve to strengthen public awareness, knowledge and understanding of the preservation of this precious treasure.

L'histoire mouvementée de cinq tentures historiées en cuir doré, peint et ciselé du 17ème siècle représentant des scènes de l'Ancien Testament

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Essentiellement produites dans les Pays-Bas du Sud, dans la première moitié du 17ème siècle, les tentures historiées en cuir doré polychrome sont des œuvres aujourd'hui exceptionnelles.

Trois de ces tentures étaient conservées au musée du château de Lunéville. Elles formaient un ensemble homogène par leurs thèmes, par leur origine et par leur style. Elles tiraient leur intérêt de leurs qualités artistiques et également de leur très grande rareté. Malheureusement un incendie causa leur disparition en janvier 2003. Etant parmi les derniers exemples de la production de tentures figuratives en cuir doré plat, peint et ciselé, leur perte est considérable.

Tenture en cuir doré La bataille de Gelboé, musée national de la Renaissance, Ecouen

Des recherches effectuées dans les années précédant leur destruction, à l'occasion de leur restauration respective, avaient révélé qu'elles faisaient en réalité partie d'une série d'au moins cinq décors. Tous représentaient des thèmes de l'Ancien Testament : *David victorieux* (3,50 x 3 m), *David jouant de la harpe devant Saül* (3,50 x 4 m) et la *Rencontre de Salomon et la Reine de Saba* (3,50 x 3 m) étaient les tentures du château de Lunéville ; des deux autres seul le nom était connu ainsi que les dimensions : *La bataille de Gelboë* (3,50 x 3 m) et *David composant des psaumes* (3,50 x 3 m). Or récemment cette série, dont la majeure partie avait donc disparu, s'est trouvée partiellement complétée par la découverte inattendue de ***La bataille de Gelboé*** puis de fragments de bordures.

La restauration de ce décor presqu'entier (il lui manque toute sa bordure d'origine) et sa présentation au musée de la Renaissance à Ecouen (qui l'a acquise en 2015) a suscité beaucoup de questions sur l'histoire de cette tenture et la façon de la présenter.

Des analyses nouvelles ont été effectuées à cette occasion parmi lesquelles un procédé inédit de datation au Carbone 14 comparant datations sur cuir et sur peinture au blanc de plomb.
En parallèle, des recherches dans des archives locales mais également familiales ont permis d'en apprendre plus sur l'étonnant parcours de ces cinq tentures au 20ème siècle.

Les auteurs se proposent de revenir sur l'histoire de ces tentures rarissimes et sur les dernières informations données par la découverte récente d'éléments longtemps considérés comme perdus.

A "rehabilitation protocol" for a medieval codex in risk of disappearance

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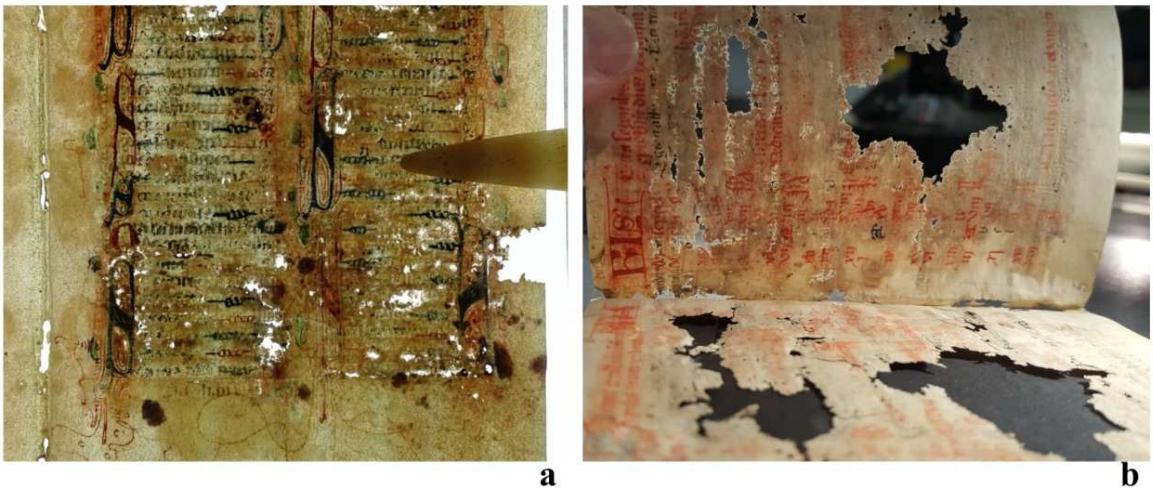
The protocol we are presenting was developed during the conservation treatment of a Diurnal according to the Braga rite, a medieval manuscript from the Braga District Archive. The conservation treatment of this codex was part of a larger project that occurred in 2016 at the National Archives Torre do Tombo (ANTT) in Lisbon. The main goal was to preserve and conserve four medieval codices: the Diurnal already mentioned, a Missal of St. Matthew, a Book of Hours from Rouen and the famous Liber Fidei. In this case, the Diurnal may have been the one that imposed greater technical challenges to the team of Conservators.

Regarding the Diurnal, its advanced deterioration state made the manuscript inaccessible to the public for several years. The text-block is made of very thin vellum, the text is written with metallogalic ink and side decorations are made with a red pigment. Several problems were identified that could lead to the complete loss of the document: the binder of the ink was powdery resulting in its detachment from the support and at the same time, the ink corrosion caused the loss of a significant amount of parchment matter. Besides that, the whole set - text-block, structure and binding were presenting signs of fragility and were disassembling, making handling very difficult.



Corrosion of the parchment folios caused by the degradation of the metallogalic ink: a) image obtained with transmitted light; b) image obtained during the process of disassembling the codex.

The development of the "Rehabilitation Protocol" was made during the process of identification and evaluation of the object, after several tests and analysis based on the experience and knowledge of the team. This protocol is an experimental model that stands on already confirmed techniques and materials validated by specialized Conservators: the use of an adhesive in an ultrasonic mist, the use of Japanese paper to consolidate or infill

parchment, and the use of an adhesive like Isinglass. By establishing a procedure based on controlled and monitored stages we defined a series of steps that ensured the homogeneity of the treatment throughout the total of 336 folios, making it an innovative way of recovering parchment manuscripts in advanced state of conservation.

Textured Fills: Replicating Leather Surfaces With Acrylic Media and Reusable Silicone Rubber Molds

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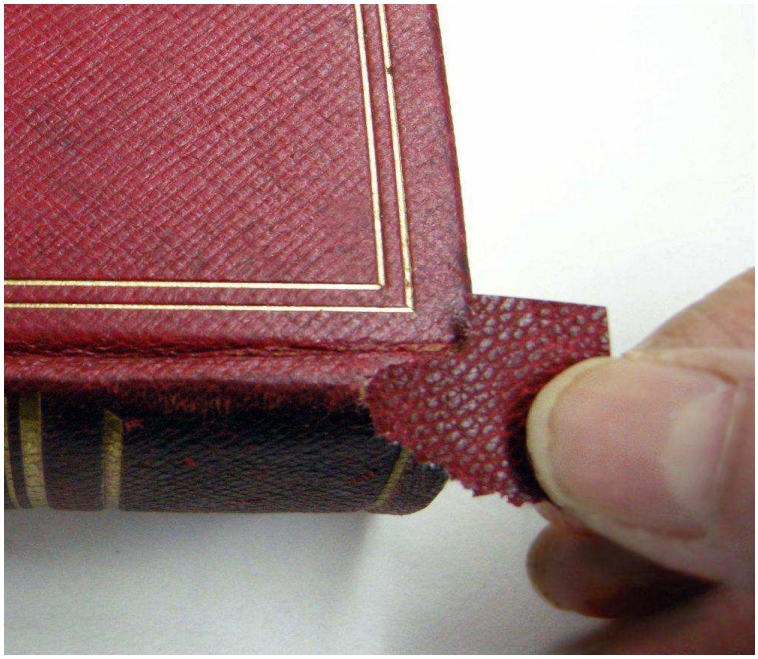
Conservators have long struggled with quick and easy ways to replicate original surface textures on leather objects without the use of noxious solvents, expensive materials, or fastidious techniques. This presentation will share a treatment technique, now common in the United States, for creating textured compensation fills by drying colored acrylic media and a repair substrate on a reverse mold.

The platinum-cure silicone rubber mold is formed on a surrogate texture that approximates the original surface of the leather object. Using a surrogate prevents possible delamination, staining, or other types of damage that can occur when taking a mold directly from a powdery, degraded leather surface. With care, these flexible and highly detailed molds can be reused indefinitely for the repeated creation of complex textures or follicular patterns that may be common within a given collection.

Acrylic media are carefully selected and mixed to provide high pigment load, match color saturation and sheen, hold peaks, and maintain flexibility. Substrates of fabric, paper, or non-woven polyester are easy to incorporate into the wet acrylic blend and dry on the mold at the same time, creating a very thin but flexible repair material. The dried material can be shaped to size and applied to the object using easily reversible adhesives.



The technique is particularly effective for bound volumes where there is partial or no access to the reverse of the original leather. Though created for and predominantly used in book conservation treatments, this technique has been adopted for other kinds of compensation repairs requiring a detailed, three-dimensional surface on objects like cased photographs, modern art, textiles, costume, and natural history collections. All of the individual components pass standard materials tests and are commonly used in conservation treatments. Survey results for users of textured fills are anticipated this spring and as available will be shared in the presentation. Overall, the technique is highly controllable, customizable, and cost-effective without sacrificing durability or strength. It is, however, not suited to leather objects with sueded nap or hair.

Le conditionnement anoxique : premier bilan d'une campagne de préservation sur les collections de fourrures au musée du quai Branly - Jacques Chirac

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Le musée du quai Branly - Jacques Chirac (mqB-JC) conserve une collection de près de 350 000 objets provenant d'Afrique, d'Océanie, des Amériques et d'Asie, constituée majoritairement de matériaux organiques. Les objets constitués en totalité ou en partie de fourrure naturelle constituent environ 400 items identifiés à ce jour.

Depuis 2008, une partie de cette collection – principalement d'origine arctique ou sibérienne, était conservée dans des réserves froides. Les points de consigne initiaux de ces réserves étaient de 6 ± 1 °C et de 50 ± 5 %. En 2012, la température a été augmentée à 12 °C et la tolérance de variation en hygrométrie sur 24h à ± 3 %. En 2015, la tolérance d'amplitude totale quotidienne a été augmentée à 2 °C (soit ± 1 °C) pour la température et à 10 % (soit ± 5%) pour le taux d'hygrométrie. À partir de 2014, des bilans climatiques systématiques ont permis d'identifier des dysfonctionnements récurrents dans les centrales de traitement d'air de ces réserves, qui a mené en 2017 à la décision de démanteler ces locaux au printemps 2019. De ce fait, les collections seront redéployées dans les réserves dites « générales », pour lesquelles les points de consigne climatiques sont de de 16 à 20 ± 2 °C et de 40 à 60 ± 5 %.

Dans cette perspective, eu égard au fait de la sensibilité élevée à la biodétérioration des objets contenant de la fourrure, il a été proposé d'initier un projet de conditionnement anoxique qui permette à la fois d'exclure le risque d'infestation par des insectes et de diminuer la cinétique de dégradation des peaux.

L'idée remontait à plusieurs années. En 2015, une journée de travail sur ce sujet avait été organisée pour le pôle Conservation-Restauration du mqB-JC avec Chris Collins, alors responsable de la conservation des collections au

National Museum of Natural History à Londres, où a été initié un projet de conditionnement anoxique de grande ampleur sur des matériaux météoritiques. En 2016, l'équipement requis pour cette opération a été acquis : oxymètre sans contact, films imperméables au passage de l'oxygène, absorbeurs, etc. En 2017, une mission a été confiée à une consultante pour assister le chargé de la conservation préventive à formuler les propositions de base du projet, en particulier la définition lorsque possible de formats standards associés à une certaine quantité d'absorbeurs d'oxygène. En 2018, un conditionnement anoxique a été réalisé sur 278 objets. Précisons que ces objets comprennent des pièces en fourrure, mais également des restes alimentaires qui présentent comme les peaux avec pelage une forte sensibilité aux infestations d'insectes.

Après descriptions du processus mise en œuvre des conditionnements, on conclura sur un premier bilan de l'opération, au moyen d'une série de contrôles-qualité effectués sur les contenants réalisés. Des perspectives seront également données pour qualifier l'état de conservation des peaux et en suivre l'évolution dans le temps.

Gilt leather threads in 11th-15th century textiles

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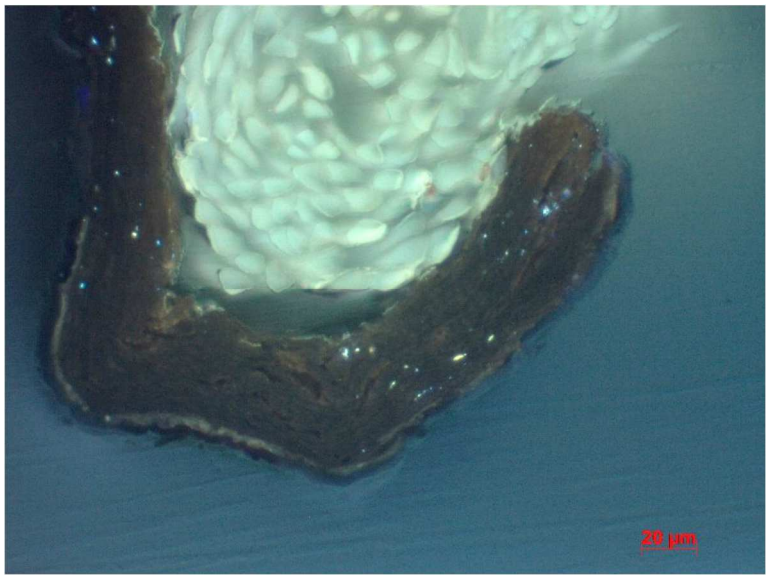
For thousands of years golden threads have been used for the decoration of textiles and clothes to create luxurious objects. Between the 11th and the 15th centuries, gilt and silvered organic strips (made with animal skin, animal gut or paper) were among the metal threads most commonly used, either as flat strips or wound around a fibrous core. These types of metal threads were very popular due to their flexibility and reduced price; indeed, the metal coating was applied in one or multiple thin layers on the organic substrate that made up most of the thickness of the thread.

While the use of paper as substrate was restricted to East Asia, animal substrates were widely used across Europe and Asia resulting in what has been called "membrane" metal threads. Membrane metal threads might have been in use in China as early as the 9-10th c. (e.g. Dunhuang) but evidence is scarce. By the 13th c. and under the influence of West Asia textile production, cloth of gold made with metal-coated leather threads ("panni tartarici") were common in Central Asia and Northern China. In Europe, the origin of the membrane threads is still uncertain: while it is assumed that they were imported from the East (Byzantium and Near East or Western Asian regions), they could also be of Northern Africa origin. The expansion to Southern Europe began through the ports of Cyprus in the 11th or 12th c., hence the name "Cyprus gold" [1]. Gilt and silvered leather strips were mostly used in the Arabian textile production (Iberian Peninsula and Sicily), while threads with animal guts were mostly produced in Italy and Northern Europe. From the early 15th century onwards, "solid" metal threads gradually replaced membrane metal threads due to the spread of the velvet fabrics production.



Leather metal thread cross-section, from textile CG I1bis, Civic Museum of Art of Modena, Sicily, 12th century. Image acquired with LEICA M205C stereo-microscope, Opificio delle Pietre Dure.

The organic metal threads have a layered and heterogeneous structure, of which the metal layer has mostly been the target of investigation, due to the complexity of studying the organic component. When applied on skin tissues (leather, parchment, vellum), the metal layer (powder or leaf) was bound with an adhesive medium (animal glue, egg or bole), before cutting the skin into narrow strips. De Reyer's DNA amplification study [2], was one of the few studies conducted on the organic component. However, to account for the extensive fragmentation of the DNA molecules and the presence of others protein-based materials in the complex structure of the organic threads, proteomics analysis appears to be a more appropriate method, both for the species identification of the skin substrate and for the characterization of the protein adhesive, if present [3].

In the present work, metal-coated leather threads from medieval Spanish, Sicilian and Middle Eastern textiles (from the Cooper Hewitt, Smithsonian Design Museum of New York, the Civic Museum of Art of Modena, the Textile Museum and Documentation Center of Terrassa, and the Textile Museum of Prato), and from Central and East Asian textiles (from the Brandenburg Textile Treasury and the Stralsund Museum), were investigated by a multi-analytical approach, combining traditional techniques (Optical Microscopy and Scanning Electron Microscopy/Energy Dispersive X-Ray Spectroscopy) with proteomics.

The complementary information that these methods have provided (identification of the metal layer composition, of the leather species, and of the protein adhesive) will contribute to identifying different production technologies, to predicting the age and provenance of metal threads, and to solving the controversial attribution of most of the ancient textiles, trying to understand whether materials and threads were imported or produced locally.

References

[1] M. Járó, *Gold embroidery and fabrics in Europe: XI-XIV centuries*, Gold Bulletin, 23(2), 1990, 40-57.

[2] D. De Reyer, A.Y. Jeantet, S. Pilbout, et al., *Les lamelles des fils métalliques organiques dans les textiles médiévaux: approche méthodologique de leur origine biologique*, Studies in conservation, 47, 2002, 122-133.

[3] A.K. Popowich, T.P. Cleland, C. Solazzo, *Characterization of membrane metal threads by proteomics and analysis of a 14th c. thread from an Italian textile*, Journal of Cultural Heritage, 33, 2018, 10-17.

Carved leather of the Caliphate lineage: the heritage of the west of Iberia Peninsula – beyond the myth of Córdoba

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Córdoba keeps on being praised for the arts of leather, namely guadameci/gilt leather and the heritage of al-Andalus regarding other aspects of artistic leatherwork. Nevertheless, in the lands that once were the Gharb al-Andalus – the West of Iberia Peninsula –, the echoes of Muslim heritage in its peak of wealth were developed and recreated into leather upholstery by late 16th century. Stepped triangles, four-petal flowers on squares, double 8, feline within a dotted circle, palmettos, other developments of the acanthus, leaves in scrolls, do show that Portugal kept and developed the al-Andalus motives that we can find in stucco, silks, marble, bookbinding, illuminations and ivory; some of these motives pre-date Islam, and show its absorption of aesthetics of different cultures.

About 20 leather carved chairs, scattered in Portugal, need further study, opening new doors into a past where too little clarity still exist, in particular identifying raw materials (like the "leathers of Cordoba", or "cordovan"/goat skin) with artistic work, or labelling guadameci after the Libyan city of Ghadames.

Most of these carvings on 5 mm thick cowhide were done using a sharp V-gauge, which takes a tiny strip of the dermis, similar to wood and stucco carvings. Very few tooling stamps were used: a dot, tiny ball and a curved non-sharp chisel are enough for such recreation of centuries-old patterns, which were considered official and worth of the Christian elite – male nobility and clergy – that used such chairs; the fashions of the time, still rooted in the Islamic heritage, considered cushions and tapestries to sit on, and silks and gilt leather on the walls of the palaces; hence chairs were few and restricted. The Renaissance fashions and its new patterns for leather carving erased the former ones; besides such change in aesthetics, a more lightweight chair became the recipient for

such change, and the old models were put aside. We had to wait a few more decades for the high-back leather carved upholstered chair to become more frequent in the Baroque style, and to be recognized as an icon of Portuguese furniture, also exported to other European countries.

POSTERS

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Survey on Excavation Methods and Conservation Treatment of Waterlogged Archaeological Leather Artefacts in Central Europe

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In the course of archaeological excavations vast amounts of organic artefacts sometimes emerge unexpectedly. While these materials are in a much worse condition to begin with, the recovery and lifting from the protective ground increases degradation processes rapidly. Due to lack of resources (staff, equipment and time) excavation teams cannot always provide adequate first aid measures. In addition, leather artefacts rarely appear isolated. Bundles or even bulks of leather request completely different work-flows regarding documentation, packing and transport. Also, the state of preservation relates to the soil characteristics whereby finds from same stratum are often in a similar state.

Many guidelines and excavation handbooks describe the procedure for approaching damp or waterlogged organic artefacts. Basic first aid measures are essential for effective conservation treatment and long-term conservation. The most important in post-excavation are stable conditions and surroundings, like packing in hermetically sealed bags or boxes. Cold storage is obligatory. The recruitment of a conservator is often suggested.

Common conservation methods for waterlogged artefacts include the pre-treatment with polyethylene glycol followed by (vacuum) freeze-drying. Though, some institutions do not have technical equipment available for the freeze-drying, resulting in controlled air-drying.

The survey aimed to record how institutions in Germany and Middle Europe manage to handle vast bundles of leather finds from wet or damp excavations. The questionnaire contains twelve questions covering the structure of institutions, recovery and lifting procedures, equipment and supply chains, documentation and conservation method. Time of implementation was February - March 2019, results are being processed.

The Conservation of Archaeological Leather from Tuva (Southern Siberia, I mill. BC)

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The poster report will present some experience in field conservation / restoration of leather items and the questions related to it. All materials come from burials of 8th– 2th centuries B.C. and belong to the Scythian and Xiongnu epoch. Almost all of them come from the excavations of the Tuvinian Archaeological Expedition of the Institute for the History of Material Culture in Tuva (Southern Siberia). Conditions of preservation are different in each case: wet or dry soil; archaeological objects from museum collections (serious deformations of items and against the background of an unsuccessful previous restoration (dried out too rapidly)) or objects that have survived only due to the contact with items made from copper alloys. In the latter case raises more questions. We are trying to take samples for analysis in the field and before conservation: this is important information for the archaeologists and the restorers (X-radiography, scanning electron microscopy of fur, X-ray fluorescence analysis, radiocarbon dating etc.). The poster report is based on the principle of describing special cases for each type of preservation of archaeological leather. It would be interesting to hear the specialists' opinion.

Leather purse from scythian burial ground Holash 83

(authors of excavations: M.E. Kilunovskaya and Vl.A. Semenov)

Découverte d'un lot de fragments de cuir du bas Moyen Âge dans l'Allier (Auvergne-Rhône-Alpes)

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Un lot de fragments de cuirs du bas Moyen Âge a été mis au jour à la fin de l'année 2017 par le SAPDA, à la faveur d'un diagnostic archéologique concernant la commune de Billy (Allier, Auvergne-Rhône-Alpes), réalisé en amont d'un aménagement routier. Cette opération était située au contact de la porte Chabotin, qui constitue l'unique témoin en élévation de l'enceinte défensive extérieure de la ville médiévale dont le château est daté du XIIIe siècle.

En probable contexte de fossé défensif, l'intervention a permis la découverte de nombreux vestiges, dispersés dans une stratigraphie dense, qui s'étend chronologiquement du bas Moyen Âge à l'époque contemporaine. Il s'agira ici de présenter la découverte rare et vraisemblablement inédite pour le département, d'un corpus riche et très bien conservé de fragments de cuir, identifiés comme les déchets d'un atelier de cordonnerie daté par les éléments céramiques associés entre le XIVe et le XVIe siècles. Malgré la quantité conséquente de restes, on ne dénombre en effet aucune chaussure complète, mais bien des éléments abîmés, redécoupés, ainsi que de nombreuses chutes semblant résulter de la découpe de semelles. Au total, plus de 300 fragments de chutes de découpe et de cuir brut et environ 80 fragments de chaussures ont été recueillis.

Ce mobilier a fait l'objet d'un traitement de conservation préventive basique (nettoyage doux, maintien dans un milieu humide et non oxygéné, et préservation à l'abri de la lumière dans une salle à atmosphère contrôlée), dans l'attente d'une étude exhaustive et de mesures conservatoires durables.

Légende et crédit de la photographie : Semelles découvertes à Billy (SAPDA)

Face down in the mud: the conservation of Tideway knee-high boots. Press expectations versus salvaging the leather

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In July 2018, a skeleton was found prone at the site of the Super-Sewer at London Bridge, wearing a pair of leather boots. In December, the media covered the story, marveling at the 'virtually intact' medieval boots. Little mention was made of the conservation process but the reality was that the leather of the boots was very unstable.

The leather was wet but in the hot weather, was drying out fast. It was so deteriorated that simply lifting it was not possible. It was clear that the aim of the treatment would be to salvage as much of the leather as possible to preserve essential features.

At MOLA, archaeological wet leather is treated by immersing it in a 20% solution of glycerol and water for three days and to freeze-dry it.

The boots differed from most leather finds in London, as conservation started on-site with a block lift and then adapting the traditional treatment to accommodate the object.

Finally, the poster will include a discussion of the issues encountered during the treatment: the size of the object, the fact that the leather did not absorb the glycerine as well as usual, and the idea of salvaging the features over the complete boot.

The media attention overshadowed the successful treatment. Although the leather was not well preserved, the treatment ensured the survival of essential features such as seams and the knee flap used to date the skeleton

Datation par la méthode du radiocarbone de peintures au blanc de plomb apposées sur des cuirs dorés

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Les cuirs dorés sont, depuis la fin du Moyen-Âge, particulièrement appréciés en Europe pour décorer les murs des riches demeures nobles et bourgeoises. Ces décors peuvent être peints, notamment avec du blanc de plomb, le principal pigment blanc utilisé dans l'histoire de la peinture européenne jusqu'au début du XXème siècle. Ce pigment est constitué de deux carbonates de plomb, la cérusite et l'hydrocérusite, synthétisés depuis l'Antiquité à partir de lamelles de plomb métallique, de vinaigre et de fumier de cheval. L'incorporation de CO_2 d'origine organique lors de son processus de fabrication a été récemment attestée (Beck et al, 2018). On se propose de dater les peintures à base de blanc de plomb par la méthode du carbone 14 en complément de la datation carbone 14 du cuir.

Dans cet objectif, nous avons développé un protocole permettant d'extraire de façon sélective le carbone issu des carbonates de plomb. La validité de notre méthode a été testée sur deux échantillons de cuirs dorés datant du XVIIème siècle, tous deux ornés d'un décor végétal sur fond blanc. Cette polychromie blanche a été caractérisée par différentes techniques analytiques (microscopie, fluorescence et diffraction des rayons X) pour s'assurer de la présence des carbonates de plomb et l'absence d'autre source de carbone. Le blanc de plomb et le cuir ont été datés par carbone 14 en utilisant le spectromètre de masse par accélérateur ARTEMIS (LMC14/LSCE, CEA Saclay, France) (C. Moreau et al., 2013).

Ce poster présentera le principe de notre protocole expérimental et la corrélation des résultats des datations du cuir et du blanc de plomb.

Gilt leather punch marks: evaluation on use of 3D technologies for documentation and punching tools reconstruction

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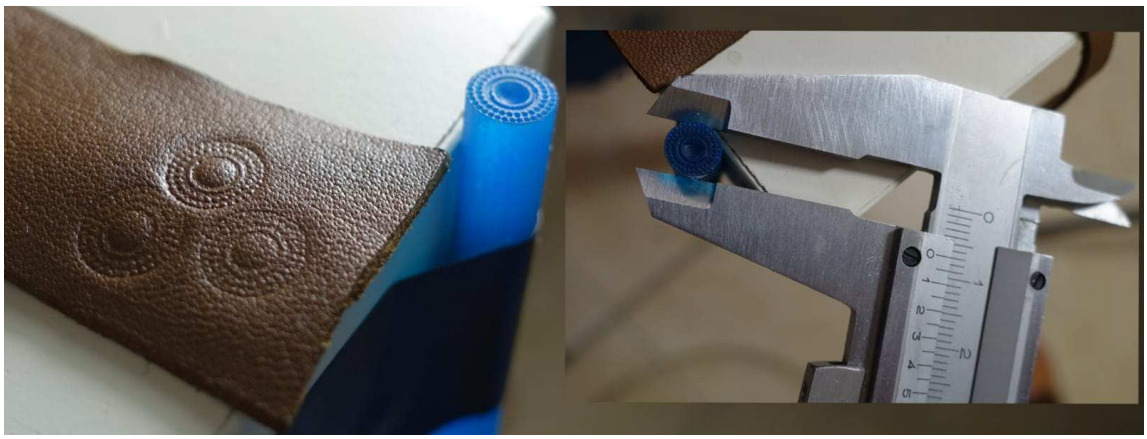
The impression with metal punches had a significant role in the decoration of gilt and painted leather furnishings, from the first known specimens well through to the 17th century. Data collection about punch marks shapes and sizes, together with their possible combinations, is of great interest both for art historians and conservators for a more precise geographical and chronological characterization of the artifacts and workshops, as well as for conservation purposes.

The documentation of punch marks has been performed so far with graphic techniques, such as rubbings, or photographic ones, mostly macrophotography with metric scale. Starting from the punch marks, steel reproductions of the tools can be obtained with manual craftsmanship, and they are used, in specific contexts, both for reintegration of the artifact's missing parts and for the manufacturing of copies.

The present study aims to examine the use of some 3D technologies as a possible alternative to the procedures traditionally adopted for documentation and reconstruction of punching tools. On a 16th century gilt leather fragment the shape and size of punch marks was acquired by 3D scanning and digital microscopic photographs. Subsequently the 3D graphic model was elaborated with dedicated programs evaluating both geometric reconstruction and the elaboration of the scans. Prototypes of the punching tools were obtained with 3D printing techniques and tested for clarity, depth and conformity with the original mark. The present study highlights the effectiveness of some of the 3D technologies adopted and analyzes practicality, easy accessibility and cost effectiveness of the process used.



Sample of a punch mark obteined with use of 3d technologies and got from an impression on gilt leather

The use of macro X-ray fluorescence scanning (MA-XRF) to study the decorative layers on a gilt leather altar frontal

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Le Musée Art & Histoire de Bruxelles en Belgique possède une collection très peu documentée de fragments de décors en cuir doré, dont un devant d'autel italien daté du XVIIIe siècle qui sera présenté dans la salle d'exposition permanente « XVIIIe siècle », après son ouverture prévue en 2020.

Dans le cadre de l'étude et des traitements de conservation-restauration réalisés sur la pièce, des analyses préalables ont été effectuées à l'Institut Royal du Patrimoine Artistique (IRPA) de Bruxelles. Ces analyses ont été réalisées au moyen d'un macro scanner de fluorescence à rayons X (MA-XRF). Cette nouvelle technique d'analyse non invasive permet d'identifier les éléments chimiques présents dans les différentes couches décoratives du cuir doré et d'en visualiser leur répartition. Par conséquent, cette technique apporte une valeur significative ajoutée par rapport à des analyses ponctuelles des pigments et des applications métalliques.

La présence de matériaux communs à la fabrication des cuirs dorés, tels que des feuilles d'argent ou certains pigments inorganiques, comme le blanc de plomb ou le vermillon, a été confirmée. D'ailleurs, d'anciennes interventions, telles que l'ajout de bronzine et de peinture à l'étain, ont également pu être décelées.

À l'exception de quelques retouches rouges composées d'un pigment non identifié, les analyses n'ont pas montré la présence de matériaux postérieurs au XVIIIe siècle qui auraient pu être utilisés en repeint. Le MA-XRF peut donc être considéré comme un outil non invasif et non destructif pour l'évaluation de la condition d'un objet culturel.

Devant d'autel en cuir doré analysé à l'IRPA ©HECR Arc, Goetz, 2018

Russia Leather: mysterious process, modern chemistry

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Russia leather was in production from c.16th-19th centuries in Eastern Europe [1]. It was very prestigious and desired for its characteristic smell, finish and waterproof properties. These were achieved by a highly irreproducible process using a combination of birch and willow bark for tanning and then treatment with birch oil, followed by dyeing to the desired red or black colours [2].

Five samples of Russia leather samples recovered from shipwrecks in Europe, including the famous *Metta Catharina* [3] were analysed to shed more light on this production process. The samples were investigated using Ultra High Performance Liquid Chromatography (UPLC-PDA) and Infrared Spectroscopy (FTIR) to obtain further information on their tanning processes, while X-Ray Fluorescence analysis (XRF) was used to investigate possible inorganic residues from the fabrication processes and / or archaeological context. The preliminary results from this study are discussed and contrasted with the analysis of barks and oil thought to have been used in the fabrication of Russia leather.

Samples of Russia leather samples recovered from different shipwrecks in Europe: Metta Catharina Von Flensburg (1), Juk tenskobben - Finland (2, 5), St Nicholas - Finland (3), Texel (4).

References:

[1] S. Mouquin, Cuir de Russie, mémoire du tan avec Elise Blouet, *Monelle Hayot,* 2017, **1**.

[2] (a) Russia Leather, *Sci. Am.*, 1859, **1**, 265. (b) Russia Leather, *Sci. Am.*, 1877, **3**, 845.

[3] F. De La Fuente Andrés, *UNICUM*, 2006, **5**.

Méthodologie analytique optimisée pour les échantillons de cuir

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Les possibilités de prélèvement sur un objet du patrimoine est souvent limité, pourtant l'obtention de celui-ci est souvent indispensable pour obtenir une information complète sur les procédés de fabrication et l'état de dégradation du matériau. Pout un cuir, plusieurs informations peuvent être recherchées, telles que l'espèce animale, la nature des tannins ou l'état de dégradation, mais celles-ci nécessitent de faire appel à des techniques d'analyses différentes.

Ce poster présente une méthodologie qui vise à recueillir un maximum d'information à partir d'un unique échantillon de cuir de seulement 3 mg grâce à un plan d'expérience séquentiel et optimisé. Dans une première étape, on utilise des techniques non-invasives comme la microscopie optique pour évaluer l'état des fibres et la spectroscopie infrarouge pour renseigner sur le mode de préparation. La seconde étape regroupe différentes techniques micro-destructrices. On commencera par prélever quelques fibres de cuir pour effectuer une analyse protéomique par la méthode de l'empreinte peptidique et ainsi identifier l'espèce animale, puis l'ensemble de l'échantillon est mis à tremper dans l'eau. A partir de l'extrait aqueux récupéré, on mesure le pH, afin de déterminer le taux d'acidité présent au sein du cuir, puis cet extrait est séché afin d'analyser les tanins par spectroscopie infrarouge. A partir de l'échantillon humide, on peut mesurer la température de dénaturation (Td) par calorimétrie différentielle à balayage (DSC) afin d'évaluer l'état de dégradation du collagène.

L'application de cette méthodologie sera présentée sur des cuirs de Russie du 18ème siècle issus de sites de fouille sous-marines et des gants en peau mégis.

Paire de gants en peau mégie

Humidification progressive pour le nettoyage des peaux et des fourrures : l'emploi de l'argile et de membranes cellulosiques

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L'argile et les membranes cellulosiques sont de plus en plus utilisées et ont fait leurs preuves pour nettoyer, décoller ou remettre en forme (ou à plat) des œuvres textiles mais aussi des papiers ou autres œuvres de nature organique. Le Nevek©, Agarose formulée par CTS, est utilisé pour le nettoyage des pierres et des peintures.

Ces méthodes sont particulièrement utiles dans le cas où le substrat à traiter est fragilisé ou particulièrement sensible à l'humidité car l'humidification se fait progressivement mais aussi du fait qu'elles présentent l'avantage de pouvoir utiliser des solvants apolaires. Plusieurs méthodes ont été testées sur des échantillons de peaux et de cuir tachés (Nevek© mis en gel ou non, pain d'argile, argile pure en poudre, argile en membrane cellulosique à différents pourcentages dans l'eau ou d'autres solvants).

Les propriétés physico-chimiques de l'argile et des membranes cellulosiques seront abordées puis le poster présentera les résultats de ces tests ainsi que les avantages et les inconvénients des différentes méthodes.

Test effectué sur une fourrure tachée : avant et après intervention

Humidification à l'aide de membrane cellulosique et application d'argile pure à travers un coussin de papier japonais

Restoration of water damaged parchment

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Description of the object: The Object consists of one sheet of parchment (date 1668) with four red wax pendant seals. Two seals are lost (only fragments of ribbons are left). Seals are attached to the parchment by pink silk ribbons. The protective capsules were made of wood. The parchment was folded in eight parts (visible fold lines). The text is written by dark brown ink. Parchment was covered with dirt, exposed to the effect of moisture. There are large amounts of tidelines, yellowing and browning along the edges of parchment.

As a result of above-mentioned damages, parchment is deformed (slightly shrunk along the edges), very fragile around the perimeter, there are lost parts of the original material. Text has been fading and bleaching due to damage, smeared. Silk ribbons has become fragile and partially lost. Wax seals were covered with dirt. In the current state, it is not possible to digitize or otherwise use the parchment because of risk of losing any of the original parchment fragments with text or seals.

Process of restoration: Dry surface cleaning, wet cleaning (isopropyl alcohol-water), plasticization (isopropyl alcohol-water-glycerin), flattening and drying of parchment. Japanese paper and starch paste glue was used for the repairs (losses, tears and fragile parts). Silk ribbons were strengthened. Wax seals were cleaned. An appropriate quality cardboard box was made for parchment with special fastenings for seals, to reduce the load on the fragile silk ribbons.

Pachment before restoration

SINTEVA, simili-cuir pour la conservation-restauration des cuirs, recherche et développement

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Issu d'une recherche débutée en 2015, le simili-cuir SINTEVA propose une alternative aux matériaux employés aujourd'hui en conservation-restauration des livres. Comme les pièces de cuir parées ou les papiers japonais enduits de peinture acrylique à l'empreinte de cuir (Owen G., Reidell S., 2010), SINTEVA permet de réaliser des comblements et consolidations de cuirs lacunaires. SINTEVA est composé d'une structure de toile de coton enduite de BEVA® 371 en Solution modifiée et colorée. Une empreinte de cuir réalisée par application à chaud permet de modifier la surface en faisant varier le grain.

Connue pour sa versatilité et sa stabilité dans le temps (Kronthal L., Levinson J., Dignard C., Chao E., Down J., 2003), la BEVA 371 présente une excellente compatibilité en tant que consolidant des cuirs. En revanche, les méthodes d'application à chaud peuvent provoquer une pénétration irréversible de la BEVA 371 dans les cuirs du fait de sa température de transition vitreuse, causant alors des dégradations (rétractations, noircissements, etc.).

Figure 1: Surface d'un prototype de simili-cuir SINTEVA

Grâce à sa structure en deux strates et à la modification de la BEVA 371 en Solution avec des charges, SINTEVA permet d'éviter ce problème et d'employer la BEVA 371 sans avoir recours à la réactivation à la chaleur au contact du matériau à restaurer. SINTEVA s'emploie de la même façon qu'un cuir de restauration et s'utilise avec les adhésifs employés habituellement en conservation-restauration de reliures, tels que la colle d'amidon.

La structure de SINTEVA avec une strate de BEVA 371 et une strate de toile offre certains avantages par rapport au cuir traditionnel. Elle évite les problèmes liés à l'acidité et permet par exemple d'amincir la strate de BEVA 371 de SINTEVA (correspondant au « côté fleur » d'un cuir) pour insérer une pièce de comblement sous le matériau d'origine. Les échantillons de SINTEVA obtiennent par ailleurs une résistance au test d'endurance au double-pli largement supérieure à celle d'échantillons de papiers japonais enduits ; plus de dix fois supérieure pour la seule couche de BEVA 371 modifiée, sans support toile (Département de Recherche Scientifique, Dépositaire de la Bibliothèque Nationale, République Tchèque).

Le développement de SINTEVA se poursuit avec la collaboration d'artisans du CERFAV (Centre Européen de Recherches et de Formation aux Arts Verriers) pour créer des moules en verre reproduisant la surface du cuir afin d'homogénéiser les plaques de produit fini, et faire varier le grain. L'autre axe de développement réside dans la structure même de SINTEVA avec l'ambition de remplacer à terme le support toile par un cuir végétal (type Piñatex®). L'utilisation de ces matériaux nouveaux et de leur structure « organique » en réseau de fibres végétales aurait davantage de cohérence au contact du cuir restauré.

Testing the Effectiveness of a Novel Treatment for Denatured Leather and Skin Materials

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Skin and hide materials such as leather and rawhide are prone to deterioration through a process known as denaturation, which involves the disordering of collagen molecules given sufficient free water and heat. Denaturation has no conservation treatment currently recorded in the literature; therefore, an experimental treatment was devised using catechin, a flavonoid commonly found in green tea. This treatment was compared against other treatments currently in use for deteriorated leather.

Samples were aged, treated, and examined using differential scanning calorimetry (DSC), Fourier-transform infrared (FTIR) spectroscopy, and fiber optic reflective spectroscopy (FORS). Analysis showed that on average, catechin-treated samples had improved properties compared to the control and the other treatments. Furthermore, the catechin treatment was less hazardous to the conservator and caused fewer side effects in the material than the other treatments. Therefore, the experimental treatment is considered a promising candidate for further research and possible future use. However, more study is needed to confirm these preliminary results.

The set of six armchairs in Louis XIII style from the collection of Palazzo Madama in Turin: technical study and conservation treatment

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The conservation work carried out on a set of six armchairs with leather upholstery from the collection of Palazzo Madama in Turin, represented the main research project for the training program in leather conservation attended by the students of the Master's degree in conservation, hosted at the Reggia of Venaria Reale. The paper will discuss the methodological approach employed within this project to conduct a thorough technical study, while serving as training platform for the students when introduced to the challenges related to the conservation of leather objects.

The set of Louis XIII style armchairs arrived to Venaria Reale Centre in poor conservation condition and with very little information regarding their history. A combined research through study of archival sources and style comparison was then necessary to make up for the absence of data regarding the manufacture and dating.
This study allowed to reveal the relevant past of the set of armchairs, featuring in the prestigious Trivulzio Belgioioso Collection of Milan, before appearing in the catalogues of Palazzo Madama in Turin.

In 1935 Palazzo Madama Museum, thanks to the mediation of the antique dealer Pietro Accorsi - one of the most important European art dealer of the XX century - and with the backing of the Prince of Piedmont, Umberto of Savoy, bought the Trivulzio Collection. This was a trade that caused political discontent and temporary disorder with Mussolini forbidding the antiquarian to move the collection from Milan.

Accorsi then reached a convenient agreement, obtaining outstanding masterpieces such as 'Ritratto d'uomo' by Antonello from Messina and the second part of the Trés Belles Heures of the Duke of Berry, miniatured by Jan van Eyck, together with other minor objects coming from the Trivulzio Collection, part today of the Civic Museum in Turin.

The comparison with those of similar armchairs allowed to date this set to the end of the 16th century and to place the manufacture context in the northern Italian area. With turned frame and leather upholstery, this set of armchairs is a beautifully manufactured example of Louis XIII style furniture. These chairs were of Flemish and Italian origin. In England, this type of chair became known as "the low leather," or "Cromwell chair." Essentially rectilinear in form, rather simple and severe, these are typical Louis XIII chairs of square pattern, with leather upholstered seat and back panel secured to the frame with decorative gilt nails. The back is of greater width than height. The legs are stiff and square with an H-form stretcher and an extra stretcher joining the front legs above, which both strengthens and decorates at the same time.

The embossed, gilded and painted leather is what surprised the most, revealing an unusual decorative technique never recorded before this study. The specificity of this unusual combination of techniques along with the assembling of various types of materials, called for a detailed investigation. The decision making behind the treatment aimed to address the conservation issues, whilst ensuring the permanence of the traces left of these functional objects by time and events.

Changes in animal husbandry practices in America from the 1600s to the present: an exploration of potential effects on leather quality

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The Leather Discussion Group was formed in 2016 by book conservators interested in acquiring a better understanding of leather and leather dyes used in conservation. The group initially aimed to determine the best products available to meet conservation needs, to make those needs more apparent to leather manufacturers, and to identify effective methods to evaluate a skin's quality and longevity.

Frequent conference calls and meetings provided the groundwork to pursue these goals. Unused skins and discarded leather-covered boards were collected for testing and analysis. In 2017, a survey was sent to a group of conservators and tanners to gather information on leather practices. An exploration of previous leather studies in both Europe and the United States yielded fascinating information. Ongoing conversations with leather chemists, tanners, and conservators in other disciplines continue to provide valuable feedback.

During a presentation at the American Institute for Conservation's 2018 symposium entitled "The Current Use of Leather in Conservation," the group discussed the need for a greater understanding of leather, a summary of previous and ongoing leather research, and an overview of proposed testing.

Now, in 2019, the group is considering the potential impact of animal husbandry on skin quality. Changes in animal husbandry choices driven by increased worldwide meat consumption may affect the properties of the leather, a byproduct of that industry. The group chose to initially focus on the USA to narrow the project's scope. This poster will examine diet regimens, breed choices, environmental conditions, abbatoir techniques, and changes leading to modern practices.

Devon cattle graze in a traditional setting.

LISITE DES PARTICIPANTS / PARTICIPANT LIST

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Aubry	Thierry	Institut National du Patrimoine
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Ruynat	Lucile	Indépendante
Sauvagnargues	Fabrice	Musée du quai Branly
Schaberg	Katja	State Academy of arts
Schneider	Helene	Academy of Applied Arts
Schulze	Andreas	Dresden University of Fine Arts
Scibè	Cristina	University of Seville
Selm	Rosemarie	Konservierungsatelier Selm
Siebel	Katja Franziska	State Academy of Art and Design Stuttgart
Skinner	Lucy-Anne	Institute of Creative Leather Technologies

Solazzo	Caroline	Smithsonian Institution
Sturge	Theo	Sturge Conservation Studio
Tengg	Verena	Staatliche Akademie der Bildenden Künste
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Vedoy	Diogenes Ricardo	Canadian Conservation Institute
Wagner	Katie	Smithsonian Institution
Weatherill	James	National Museums Scotland
Wright	Kristi	National Library of Medicine

ICOM-CC ICOM international council of museums – committee for conservation

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4) Connectez vous à votre compte ICOM-CC **choisissez** de rejoindre le(s) Groupe(s) de Travail que vous souhaitez
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Leather and Related Materials Working Group !

COCKTAIL DINATOIRE / COCKTAIL DINER

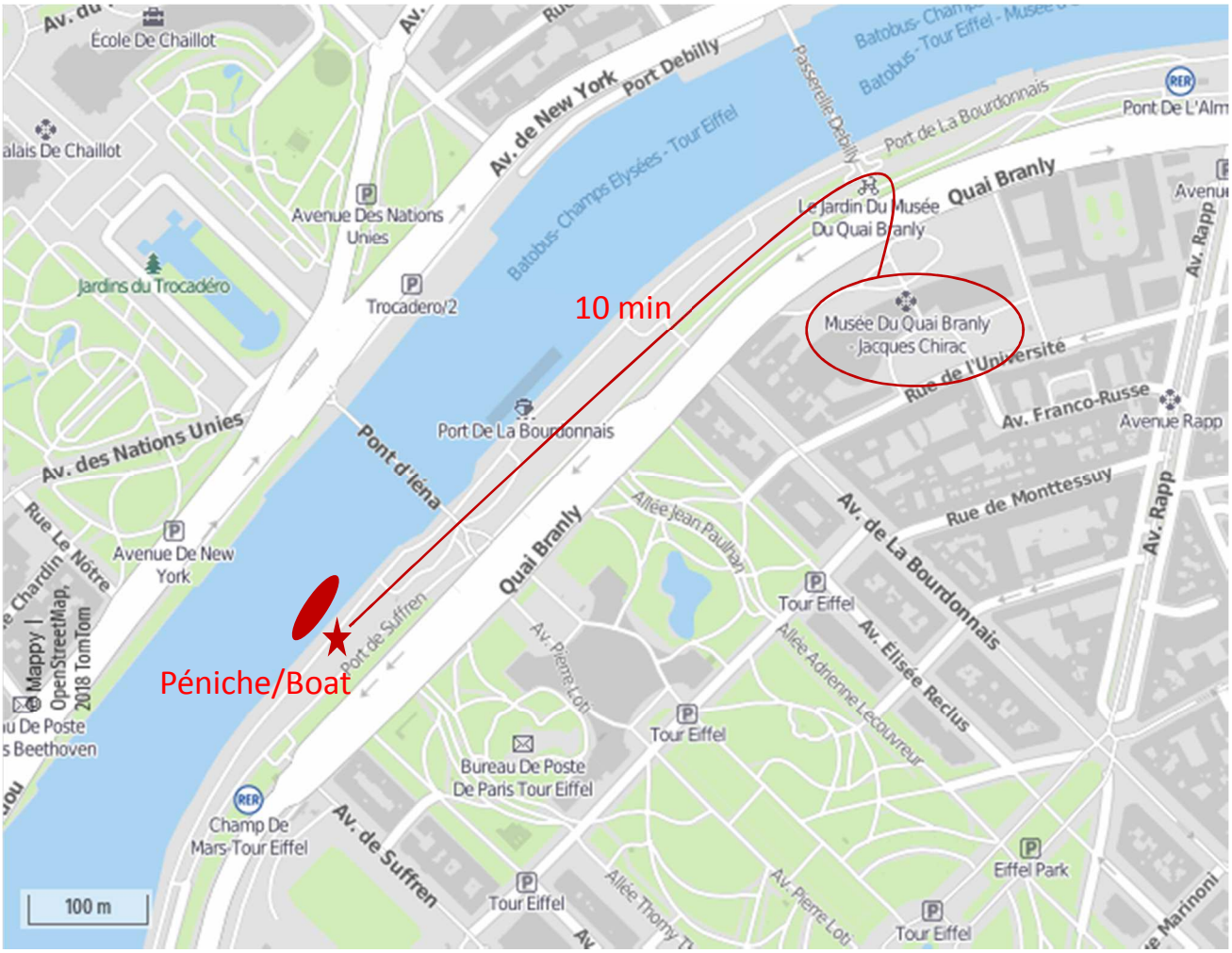
Jeudi 6 juin / Thursday 6 June

Rendez Vous / Meeting Point

Heure : 19h45 / Time : 7.45 pm

Lieu / Location : Vedettes de Paris - Port de Suffren

→ musée du quai Branly – Péniche : 10 min à pied / walk



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