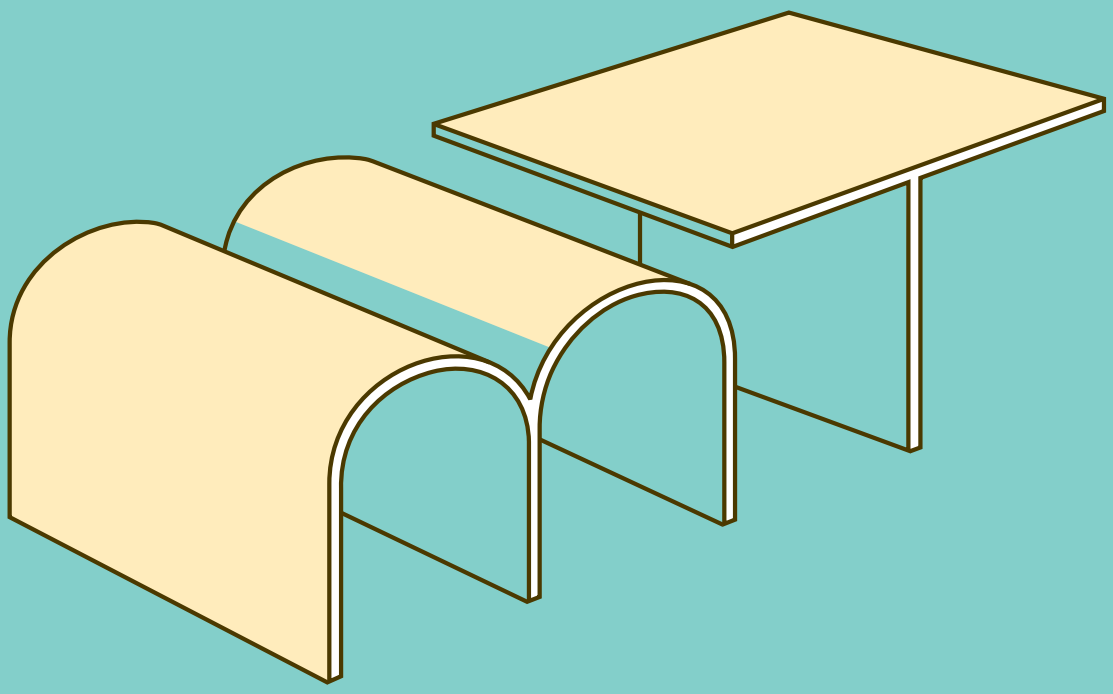
XX NKF Congress
21–23 October 2015
Helsinki, Finland

monumental treasures

Preservation and Conservation



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Picture on page *3: Skillful carving underlining facial details. Frederik Leils epitaph. After conservation. Photo: Roberto Fortuna.*
Picture on page *12: Hall of State. Photo: Tiina Tuukkanen / Eduskunta.*
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forewords

Nordic Association of Conservators, Finnish section, IIC Nordic Group (Nordiska konservatorförbundet rf - Pohjoismainen konservaattoriliitto ry) has hosted three NKF Congresses in Finland since 1972. Now, forty years later it is a great honor to host the NKF's XX Congress "Monumental Treasures - Preservation and Conservation" in Helsinki on 21-23 October 2015.

The Monumental Treasures theme is the most suitable topic for the celebration year due to the several ongoing massive renovations projects in Helsinki including the Parliament Building, built in 1931 and the National Library of Finland, built in 1840.
A renovation of the Presidential Palace (built in 1837) was finished in late 2014. These huge projects have challenged and offered great working and cooperative opportunities to the different cultural heritage authorities and conservators. In addition to learning about these Finnish projects we also visit some of the more important ongoing projects and hear from the authorities responsible for their renovation.

The congress theme appreciates the base idea of the Nordic meetings; that all conservation fields should be represented and all conservators have a possibility to get their work presented at the congress. The call-for-papers resulted in plenty of high-quality articles for the congress committee to choose from. It was our pleasure to see how comprehensively the monumental theme was handled in the papers: grave monuments, embroidered wall textiles, archeological treasures, wall murals, circus horses and epitaphs to name a few. The presentations do not only deal with technical conservation aspects; ethics, attitudes and involvement are also discussed: treasure or trash, who funds, who cares, who decides, for whom and why do we preserve. The publication also notes how these various projects succeeded, their strengths and the deficiencies that still need to be dealt with.

The NKF's main duty is to share our knowledge and expertise via these congresses. We possess an amazing cultural heritage and we strive to preserve it for future generations. The congress working language English has made the congress accessible internationally. We are delighted that in addition to Nordic presenters there will be presentations from Baltic countries and Europe and from the USA. We look forward to strengthening our collaboration with international and European conservation organizations (IIC, ICON, ICOM-CC, ICCROM and E.C.C.O.).

The NKF Finnish Section and Congress Committee would like to thank all the presenters, poster owners, invited speakers and authorities, and the chairpeople for their contribution in making this congress and dialogue happen. This congress and the publication are the result of the valuable cooperation between all contributors.

Funding has become a challenge and therefore we are sincerely grateful for all the grants, sponsors and funding sources small and large. Thank you for believing in the importance of these Nordic encounters and in the success of the congress. A special thank you goes to the Finnish National Antiquities and Director General Elina Anttila and Chief Intendant Kaija Steiner-Kiljunen in particular, for their immediate support in giving us venue in which to hold the congress, it took a heavy burden off our shoulders.We appreciate our employer, the Helsinki City Museum and Museum of Kymenlaakso the permissible attitude they have shown towards our contribution to make this congress happen. We also give our thanks to the senior lecturer of paper conservator Päivi Ukkonen, and the conservation students from the Metropolia University of applied sciences for their help during the congress.

Our sincerest thanks of all goes out to the congress committee for its simply great spirit; youthful, joyful, hard-working and fearless touch to everything.

Helsinki, on 11 August 2015

Maarit Jones, Head of Congress Committee, Textile Conservator, Helsinki City Museum
Jaana Kataja, Chairman NKF Finland, Textile Conservator, Museum of Kymenlaakso

Members of the congress committee

Stina Björklund, Objects Conservator, National Board of Antiquities
Satu Haapakoski, Objects Conservator, Koboltti
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Erika Tiainen, Paper Conservator, Elka Central Archives for Finnish Business Records
Marleena Vihakara, Paper Conservator, The National Library of Finland
Kaisu Voutilainen, Paper Conservator, Finnish National Gallery

greetings from the editind group

So,

How many conservators does it take to make a congress publication? In this case, six, which is not very many. There has been a huge amount of work between the call for papers and getting the freshly-printed publication to us for the first time. Although four of us are paper conservators, and thus, worked with different kinds of publications, we usually come along at the end, not in the beginning.

However, the quality made up for the quantity. As, among conservators in general, our team consists of pedantic pettifoggers, diligent executors and neurotics with the need to master the big picture. We had different means, but the same goal, and that is what made us so close-knit, efficient and motivated as a group.

Like the whole congress, this publication was also done by volunteer work (with the exception of our professional graphic designer, Roy Haapakoski, who created the layout of this publication). Nevertheless, our motivation has been high through the whole process; we have learned much, not only about making a publication, but also about each other and ourselves. When it comes to the congress and its content, we got the sneak-preview in the front row seats. We have proof-read, edited and laid out over 20 articles, 10 posters and everything else that you are now holding in your hands. And most importantly: we had the opportunity to be in touch with the contributors, who had the time and energy to polish their articles along with us, send us pictures again and again and answer our every question ever so patiently.

When we started working on this project a year ago, in Autumn 2014, we only had abstracts of the selected articles and posters and conservators who were not exactly sure if they would have the necessary skills to do- well, whatever it was that needed to be done. But the further we got, the clearer the destination loomed in the horizon. When the publication was finally ready to be shipped to the printing house, the feeling was a wonderful mixture of relief, pride and pure joy you get for being able to wrap up such a big project.

Did all this take up a lot of our time? Yes, it did. (What do you mean, “a life outside the congress”?) Were there moments when we weren’t sure if the whole project was ever going to end? …maybe a few. But we would do the same thing all over again – only this time, with much more experience! And be kind about any (hopefully only a few) errors you may find: we are still just conservators learning as we go.

Stina Björklund
Satu Haapakoski
Kaarina Holmqvist
Anna Rajainmaa
Erika Tiainen
Marleena Vihakara

congress committee

From left to right: Stina Björklund, Mari Saari, Marleena Vihakara, Jaana Kataja, Maarit Jones, Kaisu Voutilainen, Satu Haapakoski, Erika Tiainen, Kaarina Holmqvist and Anna Rajainmaa. Photo: Elisa Carl.

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CONTENT

invited speakers` articles

Elisa Heikkilä

decision making in monumental conservations

ABSTRACT

What to keep, what to conserve? The National library, the House of Parliament or other significant monuments, who decides and what? This essay is about the makers and the making of decisions in monumental conservations.

As a heritage authority, I often get the question, "who decides the conservation details in monumental conservations/ renovations?". The questions come both from the property owners as well as the private conservators working in the sites. This presentation tries to explain where the decision making is situated from my point of view.

My background is in stone conservation, and over a decade ago, when I was at building site working as practical conservator-restorer for the last time, I remember having the same questions. I always thought there would be someone who would have all the answers.

Currently, a European standard about the conservation process is being developed, but even there I think they do not tell us who makes the decisions.

Below, I have listed some of the participants and the decisions they make concerning conservation-restoration measures in an average monumental process.

Owner of the building
: The decision on how much money is invested. In Finnish building legislation, the owner has the responsibility of fulfilment of the protection (in listed buildings).

User of the building
: The decision on what functions and needs they want to have in the building does not normally include conservation as such, but most of the time, people are very aware or at least very interested in the cultural-historical values in their work environment.

Planner/ Architect
: The decision on the design of the whole renovation. Today in Finland, in listed buildings, it is more and more common that the architect also has a conservator-restorer in the planning team.

Planner/ Structural (& others) engineers
: The decision on the structural and technical solutions, e.g. lightning and HVAC, can affect the preservation of historical details.

Building Authorities
: Supervision of following the regulations and recommendations. Application of regulations due to the heritage issues, moderations in listed buildings.

Heritage Authorities
: The decision on minimum conservation demands, both quantitative and qualitative.

Conservator-restorers
: Condition reports and pre-investigations give a good concept of the planning phase. During the building phase, the decision on the scale of conservation works is usually too late.

Contractor
: The decision of timing and order of building works.

Chance / Accident/ Time
: The decision of the unknown?

It is often heard that conservation work slows down renovations, and the demands from conservator-restorers are huge (or maybe even monumental), e.g. no dust is allowed, climate conditions should be ideal, and time should not be an issue, etc. On the other hand, the goal of conservation – "not to mend anything that is not broken" – saves a lot of money. As conservator-restorers, do we know when to stop, what is "curious enough", e.g. in architectural paint layers? When to reveal the former outfit by losing latter layers, and when to leave something for the next conservator-restorer generations?

I also listed chance, accident and time as participants in the decision making process. I claim that they play a big role.

Accidents in renovation projects, although very carefully planned for, are inevitable; especially in demolition phases, things are either overdone, the structures are weaker or something else goes wrong, so unplanned things can (and will) happen.

And what about chance? *The Aboa Vetus & Ars Nova Museum* in Turku in 1995, for example, had plans for a museum of contemporary art within an existing building. Due to monumental archaeological excavations and findings plus a lot of good will, there are now two museums; the other one focusing on medieval history of Turku and situated in real ruins.

Time could be one more factor as well, as loss of object-related data is more likely to happen as time goes by. Dissociation is often counted as the 10th agent of deterioration. Decisions should be documented well and the documents should follow the process to avoid that.

So, who decides conservation-restoration matters in monumental conservations? We all do. Even in monumental conservations, the answers come as a chain of small, hopefully good decisions.

Keywords:
conservation
conservation-restoration
decision making

Jukka Jokilehto

significance and values of cultural heritage: appreciation of conservation

Keywords:
value
heritage
conservation
significance

ABSTRACT

The basic concepts associated with the value of something as heritage have a long history. These concepts have been re-elaborated in the 20th century by philosophers and art historians, such as Alois Riegl, Henri Bergson, Martin Heidegger and Cesare Brandi, to become the basis for the development of an international doctrine in the conservation of heritage resources. Such international doctrine is expressed in the conventions and recommendations adopted by UNESCO, as well as in the international charters adopted by ICOMOS. The application of the related new international norms and regulations however remains a major challenge in the reality of the specificity of the individual heritage properties representing the different traditional cultures and times.

INTRODUCTION

The modern world has inherited from the ancient Greek and Roman philosophers various concepts, which have been further elaborated from the Italian Renaissance onwards. Ancient philosophers, such as Plotinus, were convinced that all creation in nature had its origin in "prototypes" within the Creator. Raphael and Giovanni Bellori noted that an artist would need to study nature in order to learn about the original divine Ideas in Creator and to possibly even come closer to the original in a new work of art: "*originata dalla natura supera l'origine e fassi originale dell'arte*". [1] In the 18th century, Johann Joachim Winckelmann claimed that: "the highest beauty is in God, and the concept of human beauty is the more complete the nearer and the more in agreement it can be thought to be to the highest Being."[2] Ideal beauty found its expression in nature, and the Greeks themselves were considered an especially beautiful race. It became an ideal model for artists in the antiquity and consequently the antique sculptures could become a new model for modern art. Consequently, antique sculptures and architecture became the first object for conservation particularly for their aesthetic worth. The closer a work seemed to be to ideal beauty, the more valuable it was.

While the Age of Reason of the eighteenth century was characterised by idealism, the Romanticism of the early 19th century emphasised the individual human creation; consequently, also the appreciation of the concept of authenticity associated both with the aesthetic and historic aspects of the work became increasingly important. Indeed, the appreciation of the significance of and values associated with works of art changed drastically. This change was well perceived by Friedrich Nietzsche (1844-1900), who spoke about the "death of God", intending the abolition of the universal and Christian moral values that had earlier been associated with human society. It is these same values that also were a reference for the "imitation" of God's creation.[3] This development led to the gradual recognition of the creative diversity of human cultures and the specificity of the cultural expressions in each context. From the late 19th century, the conservation movement broadened, and several countries established their first modern heritage legislation. The second half of the 20th century can be seen as the period of an international movement in safeguarding heritage resources.

BASIC CONCEPTS

The developments of the 18th and 19th centuries were the basis for the further specification of concepts in the 20th century. In this process, the contribution of Alois Riegl (1857-1905) to the analysis of heritage values and consequent approach to conservation was certainly important. He established a balance between historical values (referred to age, history, memory) and present-day values (newness, art, use).[4] Depending on the priorities, one could lay more weight on the one, and consequently less on the other. In his identification of "*Kunstwollen*", he claimed that each period and each culture has its particular conditions, within which artistic production achieves its character through a mutual interaction between artist and society. This can be brought back to the fundamental creative capacity of humanity, discussed by the French philosopher Henri Bergson (1859-1941),[5] who also was the Chairman of the International Committee for Intellectual Cooperation (the precursor of UNESCO), founded by the League of Nations in 1922.

Even though Cesare Brandi (1906-88) does not seem to have completely agreed with Riegl's ideas, his *Theory of Restoration*[6] certainly reflects some of the concepts. Brandi considered a work of art as a special achievement of humanity, based on a particular creative process, anticipated especially by the German philosopher Martin Heidegger (1889-1976).[7] Brandi also makes reference to the American philosopher John Dewey (1859-1952), who wrote:

> "A work of art, no matter how old or classic, is actually and not just potentially a work of art when it lives in some individualized experience. As a piece of parchment, of marble, of canvas, it remains (subject, however, to the ravages of time) self-identical throughout the ages. But as a work of art, it is recreated every time it is aesthetically experienced." [8]

Referring to the creative process and to the distinction of the double character of a work of in the human mind and in material, Brandi notes:

> "This means that, until such a re-creation or recognition occurs, the work of art is only potentially a work of art, or, as we have said, it does not exist except on the most basic level - that is, as in Dewey's passage, it is simply a piece of parchment, or marble, or canvas." [9]

As a result of this reflection, Brandi defines the "restoration of works of art":

> "Restoration consists of the methodological moment in which the work of art is recognized in its physical being and in its dual aesthetic and historical nature, in view of its transmission to the future." [10]

Consequently, Brandi insists that restoration must start with the conscious recognition "in relation to the way it enters into the world, and into each individual's particular way of being in the world." [11] Accepting "art" as a product of human spirituality gives it its special position in human creative production.

Brandi's theory, which was published in 1963, became an important reference for the 1964 international conference in Venice, which produced the Venice Charter. The preface to this Charter was originally written in French by Paul Philippot, at the time Deputy Director of the recently founded Rome Centre, today known as ICCROM. [12] The English version of the preface starts with the following words:

> "Imbued with a message from the past, the historic monuments of generations of people remain to the present day as living witnesses of their age-old traditions. People are becoming more and more conscious of the unity of human values and regard ancient monuments as a common heritage. The common responsibility to safeguard them for future generations is recognized. It is our duty to hand them on in the full richness of their authenticity." [13]

The Venice Charter was later taken as the founding ethical statement of ICOMOS, and it was also recognised by the World Heritage Committee as a fundamental principle for judging restoration. The Charter has since been translated into a large number of languages, and it has become the basic reference for the body of the international doctrine of UNESCO and ICOMOS. It is therefore important that the original message of the Charter be properly understood. Unfortunately, not all translations necessarily correspond to the original French. It is of course normal that even the same terms can be interpreted differently in different languages based on specific cultures. For example, the Latin word "monument" has been differently interpreted. The first sentence in the French edition, speaks of "*les œuvres monumentales des peuples*" (i.e. the great works or important achievements of the peoples). The English version instead talks about: "the historic monuments of generations of people", which has not the same meaning.

The word "monument" was also taken into the name of ICOMOS (International Council on Monuments and Sites), and people have continued to struggle with its translation. In the past, official Chinese texts spoke about "cultural relics", which had a very archaeological feeling. The 2015 "Principles for the Conservation of Heritage Sites in China" have now introduced new Chinese characters. For example: "heritage site" is interpreted as a combination: ["culture + property + ancient + remains"]. The notion of "historically and culturally famous sites" is interpreted: [history + culture +famous + city + famous +town + famous + village]. [14] In Arabic languages as well there are some problems. In United Arab Emirates, for example, the notion "*turath*", corresponding to the international notion of "heritage", is referred exclusively to intangible cultural heritage and living traditions. Instead, another word, "*athar*", which also refers to heritage, is understood to mean "ruins". [15] Consequently, there is uncertainty about policies related to restoration of historic buildings, which can be interpreted as part of the intangible heritage and consequently allowing for replacement or reconstruction. This confusion is also reflected in the interpretation of concepts such as "authenticity" and "integrity", fundamental references for conservation policies associated with World Heritage properties.

DEVELOPMENT OF INTERNATIONAL DOCTRINE

In the 1990s, there were several international developments regarding conservation concepts. In 1992, the World Heritage Committee decided to adopt the notion of "cultural landscape" as a heritage category for nominations to the World Heritage List. This definition could be referred to rural as well as urbanised territories, which are

> "--illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal." [16]

So far as the definition of cultural heritage was mainly referred to "monuments and sites", as in the name of ICOMOS, the operations of safeguarding tended to be more stable, aiming at maintenance of the historic material and stopping the aging processes. One of the problems has been the definition of reconstruction, which in the Venice Charter was strictly limited to specific cases defined as "*anastylosis*". With the introduction of the new category of cultural landscape, it automatically brought into discussion vernacular built heritage and traditional continuity in their care. Already in 1987, the ICOMOS Committee of Brazil stated (articles 2 - 4):

- "Urban historical sites are part of a wider totality, comprising the natural and the built environment and the everyday living experience of their dwellers as well. Within this wider space, enriched with values of remote or recent origin and permanently undergoing a dynamic process of successive transformations, new urban spaces may be considered as environmental evidences in their formative stages.
- As a socially produced cultural expression the city adds rather than subtracts. Built space, thus, is the physical result of a social productive process. Its replacement is not justified unless its socio-cultural potentialities are proven exhausted. Evaluation standards for replacement convenience should take into account the socio-cultural costs of the new environment.

- The main purpose of preservation is the maintenance and enhancement of reference patterns needed for the expression and consolidation of citizenship. It is through the outlook of the citizen's political appropriation of urban space that preservation may contribute to improve life quality." [17]

The next step has been to work for the broadening of the concept of cultural heritage. In 2003, the General Conference of UNESCO adopted the "Convention for the Safeguarding of the Intangible Cultural Heritage". It referred to:

> "--the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage."

In 2005, there followed the "Convention on the Protection and Promotion of the Diversity of Cultural Expressions", which referred to cultural diversity, cultural content, cultural expressions, cultural activities, as well as cultural industries. "Cultural expressions" were those expressions that result from the creativity of individuals, groups and societies, and that have cultural content. "Cultural content", instead, refers to the symbolic meaning, artistic dimension and cultural values that originate from or express cultural identities. Together with the World Heritage Convention of 1972, these two conventions complement the general umbrella of UNESCO regarding the identification and safeguarding of cultural heritage.

Each of these conventions has its own rules, which should be respected. However, the introduction of the different rules has also caused some competition and rivalry as well as misunderstanding regarding the implementation of the objectives of each. This is felt particularly in the case of World Heritage Convention, which initially was intended for those parts of the cultural or natural heritage that are of "outstanding interest and therefore need to be preserved as part of the world heritage of mankind as a whole". The references for the identification of such properties have gradually been defined in more reduced contexts, and consequently there is an increasing number of vernacular heritage being inscribed. Another question is that, in the early phase of listing properties, the main attention was given to important public buildings or monumental urban ensembles. With the introduction of the notion of cultural landscape, the ordinary habitat with particular problems of maintenance and shared management has become a major issue for discussion.

At the same time, in 2005, the Council of Europe adopted the Framework Convention on the Value of Cultural Heritage for Society, so-called Faro Convention. Here cultural heritage is referred

> "--resources inherited from the past which people identify, independently of ownership, as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions. It includes all aspects of the environment resulting from the interaction between people and places through time."

This definition of heritage is interesting, because it is not speaking either of tangible or intangible, movable or immovable, not even cultural or natural, but generally of resources that are identified with particular meaning or significance. This definition is further complemented with the introduction of the notion of "Heritage Community", consisting of "people who value specific aspects of cultural heritage which they wish, within the framework of public action, to sustain and transmit to future generations". Indeed, the Faro Convention both offers a more general definition to what is recognized as inheritance, and secondly also identifies the people who should be responsible for its care. The Convention, as it states in the preamble recognizes: "the need to put people and human values at the centre of an enlarged and cross-disciplinary concept of cultural heritage." [18]

In 2012, at the occasion of the 40th anniversary of the World Heritage Convention, the participants of the closing conference in Kyoto, Japan, adopted the Kyoto Vision. It is here that the importance of the role of community is finally recognised in the World Heritage context. Even though the Convention itself already placed the responsibility for ensuring identification, protection and presentation of heritage to the States Parties, the people themselves tended to be left on the side. It is now for the first time that the role of the community in safeguarding heritage is recognised:

- "Only through strengthened relationships between people and heritage, based on respect for cultural and biological diversity as a whole, integrating both tangible and intangible aspects and geared toward sustainable development, will the 'future we want' become attainable.
- Such strengthened relationships should be grounded in a multi-disciplinary and participatory approach to heritage conservation, which would integrate the consideration of social, economic and environmental dimensions, paying particular attention to vulnerable groups respecting all relevant international standards and obligations…" [19]

At the time of writing the Convention, in the early 1970s, the requirement of the Outstanding Universal Value, OUV, will have been perceived as a value judgement. With further development, however, it has become rather more an administrative requirement for inscription. In fact, the Statement of OUV is based on the criteria for inclusion, the verification of the criteria in reference to integrity and authenticity, as well as the protection and management. Indeed, an increasing number of World Heritage nominations refers to properties that are not generally known. Therefore, the notion of OUV is increasingly a construct based on the manipulation of the nomination requirements. This question is not only related to World Heritage, but also more generally in the field of heritage protection. The involvement of the local communities and a variety of different stakeholders has further complicated the situation. As a result, the question of identifying the integrity has become crucial. This means identification of elements or features that together contribute to the justification of heritage quality, and subsequently the verification of the truthfulness and credibility of the sources of information, as is proposed in the 1994 Nara Document on Authenticity.[20] If properly managed, such processes of identification and recognition of heritage resources are an important challenge and a major step towards a balanced, culturally and environmentally sustainable development.

FROM VALUE TO SIGNIFICANCE

What is a value? Values are a mental association of worth to something. It can be the recognition of a particular quality normally based on comparison with other issues of similar characteristics. In a cultural context, values can relate to the norms or rules established by the society or community, which should be shared and respected. In a traditional society, values used to be inculcated over the generations. In modern globalised society, however, the traditional values are threatened by abolition, and Nietzsche for example feared that the result could be nihilism. Instead, in our contemporary society, values have become a product.

Taking note of the above discussion regarding the development of the international doctrinal framework, it is this framework that per se can be seen as a new form of globalised community that establishes its norms and rules to be respected by those who wish to make part of it, i.e. the "global heritage community". Such heritage community establishes its own processes that generate new definitions for something to be recognised as inheritance. This something can actually be almost anything that is justifiable within the present-day international doctrine. All depends on what a particular group is capable of justifying as such within the established framework.

In this process, the concepts of integrity and authenticity become crucial. Here, integrity is defined in reference to a particular theme or thematic framework, on the basis of which are identified all the elements or features that together justify the worth of the chosen theme. In this phase, therefore, the choice would be made by a group of people, and then justified for its worth. Consequently, especially in the World Heritage context, from an initial value hypothesis, there will be a research process that introduces a more precise justification of the potential heritage area and its components. This can be either in one particular site, and it can also be diffused as a serial nomination in different places, different countries, and even different continents. In this process, the initial value hypothesis is transformed into a set of signs that together define the significance of the area or areas concerned. The next step is to generate a learning process to produce the value judgement in society.

NOTES

[1] G.P. Bellori (1976), *Le vite de' pittori, scultori e architetti moderni*, Turin (original lecture in 1664).

[2] J.J. Winckelmann (1764), *Geschichte der Kunst des Altertums*, reprint, 1993, Darmstadt.

[3] F. Nietzsche, *Die fröhliche Wissenschaft*, 1882 (*The Gay Science*).

[4] A. Riegl (1903), *Moderne Denkmalkultus : Sein Wesen and seine Entstehung*, Zentral-Kommision für Kunst- und historische Denkmale, W. Braumüller, Germany.

[5] Henri Bergson (1907), *L'Évolution créatrice,* Presses Universitaires de France, Paris.

[6] C. Brandi (1963), *Teoria del restauro*, Roma; English edition: C. Brandi (2005), *Theory of Restoration*, Istituto Centrale per il Restauro, Nardini Editore, Firenze.

[7] M. Heidegger (1935/36), *Der Ursprung des Kunswerkes*, in: M. Heidegger (1980), *Holzwege*, Vittorio Klostermann, Frankfurt am Main.

[8] Dewey, J. (1934), *Art as Experience*, New York; quote from Brandi, C. (2005), *Theory of Restoration*, ICCROM, Rome, p. 48 (first published in Italian: *Teoria del Restauro,* in 1963).

[9] Brandi, 2005, p. 48.

[10] Brandi, 2005, p. 48.

[11] Brandi, 2005, p. 47.

[12] ICCROM, The International Centre for the Study of the Preservation and Restoration of Cultural Property, established by UNESCO at its General Conference in New Delhi in 1956.

[13] 'La Charte de Venice', 1964.

[14] *2015 Principles for the Conservation of Heritage Sites in China*, issued by ICOMOS China; approved by the State Administration of Cultural Heritage.

[15] ICCROM with the support of the Sheikh Al Qasimi of the Emirate of Sharjah has established ICCROM-Athar Regional Conservation Centre in Sharjah, in 2012, following several years of activities in capacity building and technical collaboration in the Arab Region.

[16] The notion of cultural landscape was adopted by the World Heritage Committee in 1992, and published in the *Operational Guidelines for the Implementation of the World Heritage Convention*, UNESCO, in 1994 (par. 36).

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Liisa Lindgren

from art deco to tubular steel – conservation of the original furniture of the parliament building as part of the renovation project

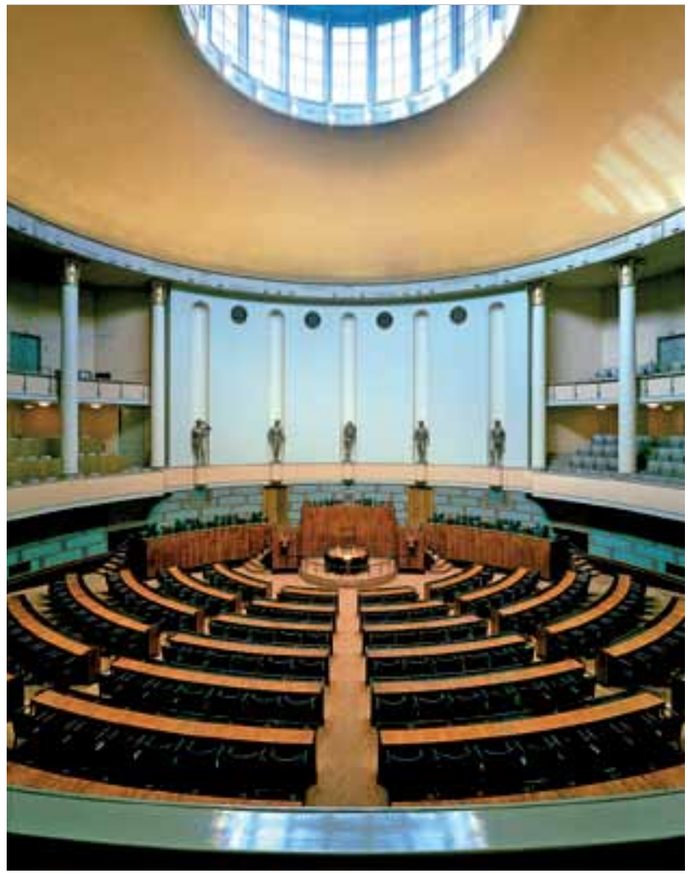
Keywords:
building protection
Parliament Building
renovation
Johan Sigfrid Sirén
(1889-1961), architect

ABSTRACT

The Parliament Building designed by J. S. Sirén and inaugurated in 1931 was viewed as the pinnacle of Finnish architecture at the time. The renovation project of the building that began in spring 2015 is scheduled for completion in 2017. Preserving this unique monument and its valuable original furniture and other furnishings are the great challenges of the renovation project.

The Parliament Building, the cubic granite fortress with its magnificent staircase and colonnade, towers over the surrounding buildings just as it symbolically towers over Finnish architectural history. Already at its completion it was considered the pinnacle of Finnish architecture, civil engineering and building services technology. The elaborate stone masonry showed the skilfulness of Finnish stone work. The building was also a flagship for Finnish arts and crafts and interior design, shaping the image of a young nation. The new Parliament Building was seen as a symbol of freedom and independence, fortifying the national self-esteem of a young state.

The austere outer architecture of the building hides various spaces and decorational entities where light, colour and even playful details have their place. A simplified form is creatively combined with the elegant opulence of colours and materials in the modern classicism of architect J. S. Sirén (1889-1961). The rectangular building with its symmetrical plan is constructed around the circular Plenary Hall. The marble staircases at the south and north ends lead from the foyer to the main floor of the building, the festive Hall of State. On the second floor we have the Plenary Hall with its domed ceiling, almost in its original state, and the elegant, urban café with its functionalist furniture. The main meeting rooms and offices for senior staff line the Speakers' Corridor and the Government's Corridor. Committee rooms are placed on the third and fourth floor. The most impressive room is the former Grand Committee room. The spaces originally reserved for MP's offices on the fifth and sixth floor nowadays house parliamentary groups and the media.



1. Plenary Hall. Photo: Simo Rista / Eduskunta.

The all-embracing principle of the interior architecture and decoration is hierarchically based on the status of each space. This is manifested in style and material choices, lighting and decorative motifs. Modernist functionalist elements have been fitted into a frame of stripped-down Nordic Classicism. The influence of Art Deco, inspired by Cubism and eastern exoticism, can be seen in ornamental details, furniture and textiles. Visual art, closely connected to the architecture, has a pivotal role in the building. As a result of the cooperation of leading designers the Parliament Building became a complete work of art, where every detail evokes the totality.

BUILDING PROTECTION

The Parliament Building was ratified in the city plan of December 28, 1977 as a protected building, where no additional building, reconstruction or change could be made to alter the façade, the roof or the interior, in order to maintain the building's cultural and architectural value and style. The Parliament Building is protected according to the statute of September 18, 1980 on the protection of state-owned, culturally and historically important buildings. No specific protection decrees were made at this time.

When the Parliament launched a restoration programme for its older buildings in 2006, the National Board of Antiquities considered that the protection should be extended and specified. There followed a joint process between representatives of the Parliament Building and the National Board of Antiquities. In 2008 the protection of all parliamentary buildings was specified to include the buildings completed in the 1950s and 1970s.

The general protection decrees state that the Parliament buildings and their courtyards should remain in the use for which they were intended and be maintained in accordance with their architectural, historical and cultural value. The reparations and changes must take into consideration the representative historical and architectural features and preserve the essential building history in its different phases. Where any renovations and changes are concerned the National Board of Antiquities, which has the power to allow minor exceptions to the protection decrees, must be consulted.

As a result of the dealings between the representatives of the Parliament Building and the National Board of Antiquities specific protection decrees for each parliamentary building were mapped out and in the plans of the buildings each protected area is marked with an appropriate level of protection.

MAINTENANCE OF THE INTERIOR, THE FURNITURE AND OTHER FURNISHINGS

When the protection of the Parliament Building was updated it was noted that no specific legislation offers the means to protect the valuable furniture and other furnishings in the buildings. A separate agreement was considered, but the National Board of Antiquities did not eventually consider it viable for legislative reasons. This does not mean, however, that the care for the original contents is treated with indifference. The preservation of its exceptional totality is due to the respect and care the Parliament Building has enjoyed from the beginning. It remains one of the most important artistic entities in Finnish architectural history.

It is known that architect J. S. Sirén was himself responsible for the first instructions concerning the maintenance of the furniture and the whole interior. He wrote five pages on cleaning the pieces of furniture and the surfaces. During the first decades he also strictly controlled all the maintenance and repairs. From 1952 onwards this was delegated to the county office of the National Board of Building. A full-time carpenter was hired for the Parliament Building and later a further carpenter. The workshop in the Parliament was responsible for the basic maintenance of the furniture, repair of the wooden parts, surface treatment, indeed everything but upholstery.

From the 1970s onwards the principles of preventive conservation have been applied in repair work. Protection needs have been observed with every project causing change, such as changes in the usage of the spaces or technical improvements, in consultation with the National Board of Antiquities. Architects Pitkänen-Laiho-Raunio has designed the changes in the interior since the 1970s, including the renovation at the beginning of the 1980s. With the renovations now ongoing the responsibility has been transferred to Helin & Co Architects. This renovation, scheduled to be completed in 2017, has adopted the principle of restoring original solutions where possible and showcasing the various stages of building.

THE ORIGINAL FURNITURE IN THE PARLIAMENT BUILDING

There are over 3,000 pieces of furniture left that were designed for the Parliament Building. The majority of them are still in use and in their original sites. Architect J. S. Sirén was personally responsible for the design of all the lighting fixtures and furniture for the main spaces, the Hall of State, the Plenary Room and the original Grand Committee Room. He chose talented contemporary professionals to design other spaces.

The style of the design and the materials, upholstery and surfaces chosen were dictated by the value hierarchy of the rooms. The most dignified spaces like the State Hall with its empire style

furniture in curly birch represent the highest style hierarchy. The Government's Meeting Room is graced by flame birch furniture in empire style, designed by Arttu Brummer. In the Committee Rooms Arvo Muroma's flame birch furniture emphasizes the responsibility of decision-making. The hardwood furniture in the Speaker's Room in 1920s Classicist style by Rafael Blomstedt reflects dignity, whereas the curly birch furniture in the Secretary General's Room has a more bourgeois Biedermeier style. In the Central Administration Offices Werner West's discreetly elegant flame birch furniture signifies the status of higher civil servants. The urban elegance of the café is reflected in Werner West's functionalist tubular steel furniture. Birger Hahl designed the Members of the Parliament workrooms using practical standard furniture. The woman MPs' sitting rooms were the result of the collaboration of Elsa Arokallio and textile artist Maija Kansanen. In the Diplomats' Room the flame birch furniture designed by Birger Hahl has original upholstery in luxurious fabric, the designer of which is unfortunately unknown. Otherwise, based on the fabric samples in the Parliament's historical building archive, it is known what types of fabrics famous contemporary textile designers designed for the Parliament Building.

RESTORATION OF THE FURNITURE AS PART OF THE RENOVATION

One of the guiding principles in the 1980s renovation was keeping the original furniture and placing it differently if required. The need for more pieces of furniture was met by making replicas of the old furniture, such as the ministerial chairs in the Government's Meeting Room. A new space, like the Speaker's salon was furnished with pieces from the Ombudsman's office and their replicas. The large book cabinets in the Committee Rooms were adjusted to better meet modern needs and new coffee tables were added in a style and material imitating the existing furniture in the rooms. To fulfil the ever-increasing need for more bookshelves and filing cabinets Architects Pitkänen-Laiho-Raunio designed new cabinets in a modern style that took into account the dimensions, materials and surface treatments of the old furniture.

2. Hall of State. Photo: Tiina Tuukkanen / Eduskunta.

Over the years, pieces of furniture that have been taken out of use have been donated to museums. The current renovation aims to keep the original furniture in use as much as possible. Pieces that have been transferred to other spaces are again collected together. Pieces of furniture that due to their poor condition have been in storage will be restored in order to be used again. The cabinets from the 1980s will also be restored and remain in use. Work on a placement plan for the furniture was begun in 2013 in cooperation with Helin & Co Architects.

The original, hand-woven upholstery fabrics were changed in the 1950s or 1960s being substituted with new, rather nondescript industrial fabrics. As part of the 1980s renovation, textile artist Irma Kukkasjärvi designed a large selection of refined upholstery fabrics that are reminiscent of the original textiles. In the current renovation it has been decided to honour Kukkasjärvi's valuable work and have a large selection of her upholstery fabrics woven from the original patterns, but with fewer colour alternatives. The restorers will then have these fabrics at their disposal. The small amounts to be woven caused problems, and some of the textiles are made in small companies which still possess old-style industrial machinery.

RENOVATION BACKGROUND WORK AND CONSERVATION PLAN

The first step in the restoration of the original furniture was to take an inventory and photograph all furniture designed for the Parliament Building in its building stage as well as the furniture designed in the 1970s and 1980s. This took place in 2009 to 2013. During the renovation in the 1980s a register of the furniture was created including all available information from the commission and purchase documents, such as the name of the designer, the manufacturer, the original placement and also information on the replicas. Based on this register and as a result of a thorough furniture inventory a furniture database was created and it is now updated regularly. The database has information on furniture types, materials, amounts and placements. Unfortunately, the information on repairs for earlier decades is incomplete.

3. The cafeteria. Photo: Tiina Tuukkanen / Eduskunta.

The conservation and repair plan for furniture was made in 2014. First, the goals and principles of the conservation were defined. The primary goal is to ensure the furniture is preserved. As remaining in use helps to secure this goal, the pieces should be durable and look presentable. This means repairing any damage. However, the original look of the furniture should be maintained and excessive repair avoided. Natural wear can show unless it differentiates the piece from the group. Both replicas and original pieces are repaired in the same way. One important goal of the conservation was that repair work should be done in Finland, as it was decided that pieces of furniture, which are part of the national heritage, should not be sent abroad.

Conservation need was defined by inventing and classifying the damage piece by piece. Every piece of furniture was marked with new, individual type and numeral markings as the 1980s registration system had become redundant.

The instructions for repair are listed according to conservation goals. The old repairs are corrected only if they are obtrusive. The materials chosen for repair and the repair methods should be determined so that they will not obstruct repair work later. This applies especially to glues and surface treatment materials. Different surface treatments applied over the decades present a particular challenge. However, they will not be corrected unnecessarily as every new treatment wears the surface of the furniture. All the worn upholstery fabrics and leather will be renewed with the exception of the Diplomats' Room. The bases and methods of upholstery for sofas and chairs are to be done using traditional working methods and high quality materials.

In summer 2014 a test repair project was carried out to test the repair instructions and to map the possibilities and danger factors of the conservation. The standard furniture in a Committee Counsel's office on the third floor of the Parliament Building was chosen for the pilot project. This type of office furniture, designed by Birger Hahl, is comprised of about 250 pieces in all, including desks, occasional tables, chairs, sofas and book cabinets. The material is oak and wood with oak veneer with polished nitrocellulose lacquer. The pieces of furniture in question also had different types of damage. The meticulous conservation executed by Lassi Koivunen raised various questions that needed to be dealt with. One problem is dealing with the variation in surface treatments made in different carpenter institutes and whether to standardize the surfaces or not.

THE CHALLENGES OF RENOVATION

Because of the vast number of pieces of furniture it was necessary to create rational repair packages, grouped and put together on the basis of, for example, particularly valuable pieces or technically demanding pieces. The starting points for contract packages were also upholstery groups or pieces in need of similar repair work, such as veneer repair or surface treatment. About thirty contract packages have been agreed upon in all. The Parliament working in temporary spaces during the renovation adds an extra challenge to the work, as part of the furniture is needed there. These pieces of furniture have to be repaired either in small numbers at any one time or during the summer and winter breaks of the Parliament. The next stage will be for each contractor to present a test sample of their work.

A great challenge for the supervision of the repair work is the need for work instructions to be completely unambiguous. Another challenge is presented by the fixed pieces of furniture that have to be repaired in situ, as taking them out of the building is either impossible or involves too many risk factors. Also, they have to be conserved in a dust-free environment with even temperature and humidity levels. The latter requirements apply to the whole renovation site.

The pilot project showed that value choices cannot be avoided in the repair process. The particularly valuable or technically demanding pieces of furniture require expert handling by a conservator. It is appropriate to keep to conservation methods and materials and surface treatments similar to the originals in the conservation work. Where pieces of furniture are in great numbers or are in need of extensive repair work, a wider margin in conservation work standards has to be accepted. Besides conservators, a larger group of professionals are included in the work, such as students in the field and upholstery specialists. The great amount of furniture and the decision to commission all the repair work in Finland led to these decisions.

The results of even the best conservation are not sustainable unless, with the help of conservators, we school the personnel responsible for the maintenance of the building and its contents. A maintenance guide manual for the interior, which has detailed instructions for the care of different pieces of furniture and their delicate surfaces, has to be drawn up before the Parliament returns to the building.

Miia Perkkiö

complexity and contradictions when preserving wooden architecture

Keywords:
conservation of historical buildings
restoration
preservation
ethics

ABSTRACT

The systematic and adequate maintenance of historical buildings is essential for their preservation. The same goes for monumental buildings – churches, palaces, archeological sites – and utilitarian buildings like schools, hospitals, factories selected for preservation and those for "architettura minore"[1] – the traditional edifices representing local craftsmanship and the use of local materials and techniques, architecture without architects, such as the wooden constructions found in Finland's countryside and towns. What happens when the maintenance is not sufficient, when it is necessary to apply conservation methods or even restoration to prevent further losses and deterioration, to ensure the preservation of the monument? Are restoration principles valid when treating wooden architecture?

THE PRINCIPLES DETERMINE THE ETHICS OF PRESERVATION

The restoration principles – the reversibility, physical and chemical compatibility and the durability of changes and additions, the differentiation of additions and finally the minimum action – all aim to guarantee the preservation of the material authenticity of the building. The ideology of the restoration principles, confirmed by professionals and by international conventions and agreements, is focused on conservation work more than on restoring by adding new elements or substituting missing or damaged parts. According to Professor Giovanni Carbonara (1942–), one of Italy's leading restoration experts: "It is easy to substitute and fulfill missing parts compared with conserving existing material" (Carbonara, 1999). The challenge in the case of wooden buildings is that the restoration principles have their origins in environments where constructions are mainly of stone or brick – materials that have a notably longer lifespan than wood.

For Cesare Brandi (1906–88) it was essential that the value of the opera, the result of a unique and creative process, was dependent on the originality of material. Therefore, the restoration was to be focused exclusively on the material, "*si restaura solo la materia*" (Brandi, 1977, p.7). Today it is unquestionable that the restoration process should always be focused on conserving the original material that enables maintaining the authenticity. Nevertheless, in most building restoration projects the conservation work tends to remain invisible, while restoration including renovation work, reconstructions and new parts draw the main attention. Furthermore, restoring buildings in a museum context differs in many aspects from restoring edifices still in use, the existence of which is partly dependent on their functionality. The former president of ICOMOS Michael Petzet (1933–) summarized it as follows:

> ln other words, for certain categories of monuments, conservation is the first and only measure! It is obvious for several reasons that this particularly applies to monuments that are to be seen in a museum-like context. (…) The "use-value" of many types of monuments demands repair or careful rehabilitation that goes beyond conservation work and thus aIso involves additional preservation methods which certainly include restoration and perhaps also renovation work. However, conservation always is and will remain the starting point for all deliberations in the field of preservation. (Petzet, 2004, s. 8)

In Seurasaari open air museum in Helsinki, where wooden constructions represent the vernacular building tradition in different regions of Finland, most of the buildings have no other function than being museum objects to be observed from in and outside. Still, without a doubt the visitors have to be taken into account when programming the buildings' restoration.

TO RESTORE OR TO CONSERVE – A TERMINOLOGICAL OR METHODOLOGICAL DILEMMA?

Even if removing a monument from its original site is generally out of question, buildings of Seurasaari wouldn't probably have survived in their original contexts. At this point we must analyze more in detail the restoration principles and their validity in the case of traditional wooden constructions transformed into museum objects.

For Seurasaari as well as for wooden constructions in general, one of the most common restoration operation is the repainting of facades which, in many cases, has a dual task: on the one hand, the paint is a decorative element reminding us of the ideals of certain periods, while on the other hand it protects the wooden paneling or timber construction itself. Mere conservation of the rest of the paint would signify the often impossible task of fixing existing – or mostly vanished – paintwork. At the same time, the significance of the paint itself disappears. Furthermore, the aesthetic and structural integrity of the building is in danger. Restoration principles appear to be at least partly inappropriate: the reversibility and the differentiation of changes are hardly verifiable – unless one uses a microscope!

Ultimately the most crucial issue is the research and documentation of the history of the painting and colors before deciding on the paints and techniques used for painting. It is just as important to take into account the significance of the site, and its architectural and historic values. Strictly speaking, from the point of view of methods used, the appropriate term would be 'restoration' rather than 'conservation'. Operations demand historical and aesthetical evaluation – the core of restoration ideology – highlighted for example by Brandi.

Another example of repetitive restoration work in Seurasaari is the renewal of roofs, the essential part of the building for guaranteeing the preservation of the entire construction. The lifespan of wooden roofing is limited: it simply cannot resist in harsh Finnish weather conditions for more than a few decades. Conserving a damaged or structurally insecure roof may be hazardous, putting the whole building at risk. Reconstructing a roof as it was, paying full respect to the original materials and craftsmanship, is in this case the only possibility. The focus is on restorative work rather than the conservation of original material.

Surprisingly, when observing the vertical constructions, the potential for conserving timber exists on a larger scale. It is often enough just to remove rotten or damaged wood and to replace it with similar material, using the original techniques. In fact replacing the decayed wood is a traditional procedure to repair timber constructions.[2]

It is inevitable that with the passing of time, original constructions and materials will disappear and will be substituted by new ones. The historic wooden structures are destined to be merely restored, rather than conserved. Ultimately for us, the question remains: can a historic wooden building be called authentic if the original materials have been replaced with new ones, even if the form and the details as well as the methods and techniques are identical to the original? Obviously the authenticity of wooden heritage requires maintaining the traditional craftsmanship, materials and original detailing. It requires also, that the focus should be on thorough research and documenting.

1. Niemelä Manor in Seurasaari. Photo: Miia Perkkiö.

NOTES

[1] *Architettura minore* (It.) is a definition that is commonly used today in the Mediterranean and especially in Italy, indicating often traditional housing in small villages and towns, and the urban structure formed by those buildings.

[2] The methods used during the 1970s and 80s, such as impregnation, enabling the original material to be maintained, are no longer used for ethical as well as ecological reasons.

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Sarah Staniforth

spirit of place: the golden thread that runs through the management of historic places

Keywords:
Significance
spirit of place
conservation

ABSTRACT

Each National Trust property has developed a spirit of place statement based on what is unique, distinctive and cherished about the place. This understanding of spirit of place, which draws on the statement of significance and insight into what visitors cherish about the place, guides all activities to improve the quality of everything from conservation to presentation and interpretation, and from marketing to commercial activities in the shops and tea rooms. It is the golden thread that runs through good property management ensuring that all actions respect and are appropriate for the character of a place. Spirit of place brings together expert understanding of places with the views of broad range of people who use the place. This paper will show how spirit of place is used to inform conservation practice.

INTRODUCTION

Significance and spirit of place have long been vital concepts in understanding and looking after places of historic interest and natural beauty. The 1931 Athens charter (League of Nations 1931), 1964 Venice charter (ICOMOS 1964) and 1979 Burra charter (Australia ICOMOS 1979) have informed and codified our conservation practice.

As conservation professionals, whether art or architectural historians, curators or conservators, we feel comfortable with identifying the key significances of historic places. These may include cultural, historical, architectural, artistic, archaeological, scientific, technological, and gardens, parks and landscapes significance. They occupy the realms of the real, they are authentic and can be defined using an evidence-based approach to research, and they are tangible and invariably relate to material culture.

Values-based approaches are also important and capture why places matter to people and how people react to places. The Burra charter (Australia ICOMOS 1979) responds to a values-based approach to places with intangible significance. Conservation work with landscape sites in Australia and the value and meaning of sacred Aboriginal places lead to an approach that went beyond the "expert" view of significance and recognised intangible significances of historic and natural places. It acknowledged that management of these places was most successful when the local community worked alongside conservation professionals.

In October 2008, at the ICOMOS international conference in Quebec, the following words on spirit of place were agreed: "*Spirit of place* refers to the unique, distinctive and cherished aspects of a place".

In classical Roman religion a *genius loci* was the protective spirit of place. In contemporary usage, *genius loci* usually refer to a place's distinctive atmosphere, or "spirit of place", rather than a guardian spirit.

Alexander Pope (1688-1744) made the *genius loci* an important principle in garden and landscape design with the following lines from Epistle IV, to Richard Boyle, Earl of Burlington:

> Consult the genius of the place in all;
> That tells the waters or to rise, or fall;
> Or helps th' ambitious hill the heav'ns to scale, Or scoops in circling theatres the vale; Calls in the country, catches opening glades, Joins willing woods, and varies shades from shades, Now breaks, or now directs, th' intending lines; Paints as you plant, and, as you work, designs.

Pope's verse laid the foundation for one of the most widely agreed principles of landscape architecture. This is the principle that landscape designs should *always* be adapted to the context in which they are located.

ARTEFACT CONSERVATION AND CONTEXT

Context is also vital when planning the conservation of artefacts in historic places. The decision-making process for the conservation of a collection in the historic place for which it has been acquired or created is fundamentally different from that of the conservation of an artefact in a museum or art gallery. In the latter, the object is considered in its own right. The level of conservation including: extent of cleaning of an object or removal of discoloured varnish and overpaint from a painting; the degree of restoration; the surface finish; will be agreed between the conservator and curator depending on the history of the object and its exhibition conditions.

In a historic place the conservation of artefacts is dependent on the context in which they are displayed. For example, in a room, the shininess and condition of gilding on the frames of paintings should not only be similar to each other but also to other gilding in a room. And the level of conservation of one type of artefact should take into account the level of conservation of all other types of artefact in the space. The result should be a harmonious whole in which the appearance of no object looks out of place with other objects in the space.

There is no place where the need for adaptation to context is more important than the Long Gallery at Hardwick. Here the paintings hang in front of a set of 16th century tapestries telling the story of Gideon and the Midianites (Fig. 1). Hardwick is sometimes referred to as the house with "more glass than walls" and the effect of daylight is apparent on the tapestries that are faded and discoloured with coal dust from the numerous open cast coalmines in the area. The tapestries have recently been conserved by washing to remove the coal dust and the numerous tears in the structure have been repaired. But nothing can be done to recover the faded colours. The paintings that hang in front of the tapestries have received minimal treatment: surface cleaning and consolidation. Removing discoloured varnish could reveal unfaded pigment colours that would stand out and detract from the most significant objects in the space, the Gideon tapestries.

CREATION OF SPIRIT OF PLACE STATEMENTS

The National Trust has recognised the importance of *genius loci* or spirit of place in underpinning not just landscape design, but all activities at properties in order to improve the quality of everything from conservation to presentation and interpretation, and from marketing

1. Hardwick, Long Gallery. Paintings are hung in front of the set of 16th century Gideon tapestries. Photo: National Trust

to commercial activities in the shops and tea rooms.

Spirit of place brings together expert understanding of places with the views of a broad range of people who use the place, it is a shared understanding of the enduring qualities that make a place special. It is an encapsulation of why a place is special to people based on what is unique, distinctive and cherished about a place.

It really matters in an organisation as large as the National Trust, where we have over 300 houses and gardens with a central as well as local management. There is a danger of a house style developing, characterised in the writings of our previous Chairman, Simon Jenkins, as "the dead hand of the National Trust". The manager of each property is given the responsibility of being the guardian of spirit of place, and ensuring that all actions are respectful of and appropriate for the character of the place.

SPIRIT OF PLACE AT CALKE ABBEY

The process of writing a spirit of place of statement starts with the statement of significance and audience insight. I will use Calke Abbey, a property that was taken on by the National Trust in 1985, as an example.

The statement of significance is written by professional conservation and curatorial staff, it is informed by extensive research and is updated on a regular basis when new research is carried out or circumstances change.

At Calke Abbey, the early 18th century house is presented as an example of a country house in 20th century decline. The contents and room arrangements are little changed since the 1880s and display layers of collecting by many generations of the Harpur-Crewe family. The family were directly connected with the place for nearly 400 years; remarkable for their characteristic of reclusiveness; a passion for horses and an absorbing fascination with natural history. The park is ancient and fragile, in part designated a National Nature Reserve and Site of Special Scientific Interest. In terms of archaeological significance – there is evidence of lime extraction and burning, brick making, pottery manufacture and transport, ridge and furrow agriculture, monastic settlement and attempts to landscape the park. The place is an oasis of peace and beauty but with the pressures of the world beyond its boundary constantly evident.

What people cherish about Calke Abbey can be captured in a number of simple ways, including the comment cards that visitors fill in, TripAdvisor, Facebook, visitor surveys and asking them what they like on chalk boards. Word clouds can help identify common themes.

The spirit of place statement for Calke Abbey is:

> Calke Abbey is, and always has been a hidden house, now preserved as a rare and remarkable survivor from a vanished era.
>
> Today, visitors wonder what lies ahead as the park reveals itself from the tunnel-like Lime Avenue into open parkland. Layers upon layers await discovery with something new to explore and uncover on each visit.
>
> Whispers and echoes of the Harpur Crewe family and estate life reverberate in the house and stable yards giving the place its uniqueness.
>
> Calke Abbey is an estate of contrasts: decaying boughs lie beneath ancient trees; the industrial remains of innovative garden technology and lime yards are surrounded by rare wildlife and colourful flower garden; the grandeur of the state bed sits amidst abandoned rooms with peeling paint and looming taxidermy; from the dark, crumbling atmosphere of the house, one steps into the fresh air and space of the pleasure grounds.
>
> It is "quirky, fusty, distressed; a place poised somewhere between gentle neglect and downright dereliction". In all its faded splendour it stands as a bleak reminder of and memorial to, the English country house estates that disappeared in their hundreds during the 20th century.

The phrase "a place poised somewhere between gentle neglect and downright dereliction" was first written when management of the estate was taken over in 1985 and has been very useful in directing the conservation work. It was the first place where the National Trust conserved as found rather than restoring to 18th century glories. This was a major undertaking as the whole house was riddled with dry rot, deathwatch beetle and other damp related problems. The roof had not been repaired since the 1920s and all of the structural timber, including roof timbers and window lintels had to be removed and replaced. The whole house was emptied of its large collection – the family has a reputation for not throwing anything away – the building conservation work was carried out and everything was put back where it had been recorded by photograph (Fig. 2).

The guiding principle for all conservation work was preserve as found. For the majority of the collection this meant stabilizing the object but changing its appearance as little as possible. Discoloured varnish was left on paintings. The only case in which it was removed was if consolidation of flaking paint was impossible through the varnish layer.

2. Calke Abbey, Sir Vauncey Harpur Crewe's Room. During the building conservation project the room was photographed, everything was removed and following the completion of the project replaced in the same position. Photo: National Trust.

SPIRIT OF PLACE AT KNOLE

Spirit of place has been vital in guiding the major project that is taking place at Knole, the Sackville house in Sevenoaks, Kent. Siobhan Barratt talked about this conservation project at the ICOM DEMHIST/ICOM-CC conference in Los Angeles three years ago (Barratt 2012). Knole is a medieval bishop's palace and a great Jacobean house in a historic setting, with remarkable collections and important historical associations. Particular aspects of significance which contribute to its outstanding overall heritage value are:

- the interest and significance of its architectural development
- the splendid quality and character of its interior decoration
- the range and quality of its collections, especially the 17th century royal Stuart furniture and the royal and family portraits
- the outstanding literary and artistic connections of the house
- the long continuity of ownership by the Sackville family
- the historic significance of the property in the development of early country-house tourism

In terms of statutory designations the house is identified as a Grade I listed building of special architectural or historic interest within a registered park and garden, the park also being designated as a Site of Special Scientific Interest.

The spirit of place statement is drawn from the writings of numerous authors from the 18th century to the present day. These include Virginia Woolf in *Orlando* and the historian Robert Sackville-West, the current Lord Sackville who lives at Knole, in his history of Knole, *Inheritance* published in 2010. But perhaps the most helpful word that we have used in the summary of Knole's spirit of place is "melancholy", which the diarist, Anne Rushout, wrote when she visited Knole on 10th July 1795.

> We rode over Knowle Park which is only a mile from Bradburne. The ground is beautiful and the trees extremely fine. We after went into the House which is extremely melancholy… the apartments are the most dismal I ever saw, though very costly.

In summary, the spirit of place of Knole can be described by the sentence: "Knole – a place of beauty – a place of melancholy".

It is this spirit that we use to guide the project that will more than double the spaces open to visitors by 2019. In addition to the thirteen furnished rooms that are currently open on the principal floor, a conservation studio will be built in the old barn, Eddy Sackville-West's 1930s apartment in the Gate House will be opened, and some of the attic spaces, including the Retainers Gallery above the Cartoon Gallery, one of the most atmospheric spaces at Knole, will be one of the four new visitor routes. Urgently needed conservation work will be carried out on the collection, whilst conservation heating is introduced into the showrooms, but the emphasis will be on stabilisation rather than restoration so that we do not lose the melancholy quality of Knole that is so characteristic of the place.

3. Knole, Venetian Ambassador's Bedroom. Any conservation treatment will seek to preserve "…a bloom like the bloom off a bowl of grapes and figs… Green and pinks, originally bright, now dusted and tarnished over". Photo: National Trust.

4. Waddesdon, Morning Room. The Morning Room with its display of Dutch Old Master paintings. Photo: John Bigelow Taylor © The National Trust, Waddesdon Manor

Knole, therefore, offers a unique opportunity to glimpse into the past by seeing objects in the settings for which they were intended, but also how conservation and repair has always strived to balance the effects of access. Most regard this as an essential part of the evocative atmosphere of Knole, imparting the spirit of place, which is as important to preserve as the physical collection. Vita Sackville West wrote of the Venetian Ambassadors bedroom, "It had a bloom like the bloom off a bowl of grapes and figs…Green and pinks, originally bright, now dusted and tarnished over" [Sackville-West, 1934] (Fig. 3).

SPIRIT OF PLACE AT WADDESDON MANORS

As a complete contrast to Calke Abbey and Knole, the level of conservation at Waddesdon Manor, the 19th century home of the Rothschild family in Buckinghamshire, England, is appropriate to that for the home of a wealthy family. The Rothschilds were the greatest collectors of the 19th century, seeking the highest quality of workmanship and with a keen sense of historical importance. The houses that they built, the interiors they created and the magnificent collections within them became known internationally as the "goût Rothschild". Waddesdon is one of the rare survivors of that splendour.

Baron Ferdinand de Rothschild started building Waddesdon Manor in 1874 to display his outstanding collection of art treasures. The highest quality 18th century French decorative arts are displayed alongside magnificent English portraits and Dutch Old Master paintings (Fig. 4), while outside is one of the finest Victorian gardens in Britain, famous for its parterre and ornate working aviary. Waddesdon's internationally famous collection has been formed principally by four members of the family: Baron Ferdinand (1839-1898) who built Waddesdon and created the interiors, his sister Alice (1847-1922), their cousin Edmond (1845-1934) and the present Lord Rothschild (b. 1936).

Today the building, grounds and collection are maintained to the same standards that have been practised since the 19th century. This applies to housekeeping and day-to-day care as well as to more major conservation treatments carried out in a conservator's studio.

In 1891, 24 indoor staff were recorded at Waddesdon, a modest figure for a house this size, but explained by the fact that it was the home of two unmarried people, Ferdinand and Alice. They included a steward, housekeeper, cook, kitchen, still room and scullery maids, eight housemaids, footmen, a porter, an attendant for the electric light, an odd job man, a hall boy and a needlewoman.

The excellent condition of the collection owes much to "Miss Alice's Rules" - the housekeeping standards introduced by Alice de Rothschild. She installed blinds and covers to limit light exposure and forbade unnecessary handling of objects. Even King Edward VII was told not to touch the furniture during one of his visits.

Today, a team of dedicated stewards and conservation cleaners care for the collection. Daily cleaning for presentation to visitors is supplemented with on-going environmental monitoring and maintenance. The team is responsible for winding the many clocks that are kept working in recognition that this is a house that is still lived in by the present Lord Rothschild and his family.

CONCLUSION

In conclusion, spirit of place statements are being written for all National Trust properties and will be crucial in ensuring that all actions are respectful of and appropriate for the character of each place. They could be described as the "brand" of each place, and although we have avoided using this word, as a shorthand, it has helped some of our colleagues with marketing and commercial backgrounds understand what their conservation and curatorial colleagues mean when they talk about the importance of spirit of place. Spirit of place brings together expert understanding of places with the views of the broad range of people who are involved and we believe applies in all places of significance and is the golden thread that runs through the management of historic places.

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articles

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Textile art and flame retardants – the United Nations case

Keywords:
artificial ageing
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spectrophotometry
tensile tests
textiles
wool

ABSTRACT

Since 2008, the United Nations building complex has been undergoing a restoration. The Economic and Social Council Chamber, ECOSOC, was furnished with a monumental woven curtain. The Swedish Government decided on a donation of a contemporary textile artwork for the U.N., to replace the earlier textiles damaged by flame retardants. Since earlier studies at the Swedish National Heritage Board had proved that flame retardants are harmful to cellulose material in the long run, their effects on wool were studied. Untreated woollen fabrics, as well as fabrics impregnated with flame retardants, were subjected to artificial ageing, tensile testing, pH and colour measurements. The evaluation of this investigation led to a well-informed choice of material and a maintenance plan for the ECOSOC. Furthermore, the Swedish National Heritage Board will not recommend flame retardants for works of art or interiors of cultural value in the future.

INTRODUCTION

Since 2008, the U.N. building complex in New York, built in 1952, has been undergoing a massive and much needed renovation. The three council chambers in the U.N. Conference building are a significant part of the Scandinavian heritage, with interiors designed by architects from Denmark, Norway and Sweden. The Economic and Social Council Chamber – ECOSOC – designed by Sven Markelius forms a landmark in Swedish design history. The highlight was the monumental curtain designed by Marianne Richter. In 1988, it was replaced by a velvet curtain with a printed pattern designed by Markelius – "Pythagoras". In 2010, the Swedish National Public Art Council and the Ministry for Foreign Affairs decided on a donation of a contemporary work of art for the United Nations, to replace these curtains. Conservators from the Swedish National Heritage Board (SNHB) took part in the planning, acting as advisors on the historical and artistic values of the ECOSOC as well as on the material quality and long-term stability of the new artwork by Swedish artist Ann Edholm.

Flame retardants can damage textile material, as well as the environment and human health, but have been deemed necessary in order to save lives and property from the outbreak of fire. Textiles are considered a risk in public buildings and laws and regulations for fire safety are becoming more demanding. However, it is well known that the original woven curtain of the ECOSOC was destroyed by a combination of flame retardants, sunlight and humid climate conditions (Finch, 1969).

The Security department of the U.N. Capital Master Plan called for the new artwork to be fire-safe. Modern textiles for interiors, such as curtains or upholstery material, treated with fire retardants are not expected to last longer than ten years, but the Swedish National Public Art Council asked for the new ECOSOC curtain to last for sixty years.

Flame retardants are harmful to cellulose textiles, according to a study performed at the SNHB (Bergstrand, 2013), where the two curtains from the ECOSOC and two other textile artworks were examined and some effects of four flame retardants were analysed. The study points to the complexity of the flame retardant issue. Flame retardants vary widely and are applied to materials with very different properties. (Hallgren, 2009). Many flame retardants are based on organic and inorganic salts that, in the long term, will make the material acidic. Cellulose fibres are very sensitive to acidity and environmental factors, such as light, humidity and temperature, accelerate the degradation process. Wool, a protein fibre, is not as sensitive to acidity as cotton. Although wool has inherent flame retardant properties, flame retardants are sometimes used for wool as an extra security measure. Since the new curtain was going to be made entirely of wool, it was decided to evaluate two commercial flame retardants for this material. The conclusions helped in establishing a maintenance plan for the U.N. curtain, but the main objective was to ensure that the intentions of the artist and the aesthetic values of the textile work are not obscured by the effects of flame retardants. However, the investigation did not aim at explaining why flame retardants influence wool in a harmful way. As mentioned above, flame retardants vary widely and explaining all the effects of all their components calls for a broader study.

1. Inauguration of the renovated ECOSOC in April 2013. Photo: Margareta Bergstrand.

Fabrics	Test Weave	Orange	Sand-coloured
Not treated	6.52	4.16	3.88
Apyrum	8.40	7.58	7.38
Secura	5.38	6.00	5.80
Fabrics aged 10 years			
Not treated	6.24	3.80	3.90
Apyrum	8.74	8.34	7.50
Secura	4.96	5.06	4.92
Fabrics aged 10 years, wet-cleaned			
Not treated	6.48	4.12	3.90
Apyrum	8.26	8.60	7.54
Secura	4.66	4.20	4.00
Fabrics aged 60 years			
Not treated	5.80	3.88	3.92
Apyrum	8.98	9.02	7.30
Secura	4.46	4.46	4.00

2. pH measurements. Mean of five.

SELECTION OF FABRICS AND FLAME RETARDANT TREATMENTS, PREPARATION, APPLICATION, METHODS AND TESTS

Based on the aforementioned study, two products representing different types of flame retardants were chosen for experimental work. *Apyrum R Bio-FF* is fairly new on the Swedish market. According to the marketing of the brand, it is not harmful to the environment. The main components are "citrate and acetate" with a pH of 7–8, according to the product data sheet. *Secura Anti-Flame FRT*, available on the Swedish market in 2012, contains mainly "modified ammonium phosphate", according to available information on the product. According to the data sheet, the product is not harmful to health or the environment and has a pH of 6.2.

Test samples were taken from fabrics intended for the new ECOSOC curtain. The orange felted wool "*Divina 3*" 4-end broken twill came from a range of colours offered by Kvadrat A/S, but the sand-coloured crêpe wool "*Topas 2*" was dyed to order at Kvadrat. As a reference test weave, an undyed tabby weave *Wool Adjacent Fabric* as per ISO 105-F01 from Testfabrics Inc. was chosen. Samples of the three fabrics were placed lying flat and sprayed with deionised water and 0.1% tenside (pH 6.5 to 7). After being thoroughly wetted, the fabrics were dried lying flat on the washing table. This set of fabrics was used as a control group.

The two flame retardants were applied to a second set of fabrics. The fabrics were placed lying flat and sprayed with flame retardants according to the recommendations made by the suppliers. The samples treated with Apyrum took a long time to dry and smelled strongly of vinegar. The Secura-treated samples dried in less time and what seemed to be salt crystals was observed on the surface of the fabric. All samples treated with flame retardants had an oily, unpleasant feel.

The samples were weighed and dimensional measurements were taken in warp and weft directions before and after application of the flame retardants and after the samples had dried.

pH was measured using a *Horiba B212 Twin pH meter* before and after applying flame retardants, accelerated ageing and wet-cleaning.

To make sure that the flame retardants were applied correctly, according to the supplier's instructions, a flammability test was made, using small samples approximately the size of 140 mm x 26 mm. The samples were tested hanging vertically and subjected to a gas burner using propane (C^3H^8) gas for 60 seconds. After the gas burner flame was extinguished, observations were made to see if the sample kept burning or forming coal. The test was modelled after the Swedish standard SIS 65 00 82.

3. The untreated orange fabric (specimens in the middle) showed a better flammability resistance than samples of the same fabric treated with flame retardants Apyrum (to the right) and Secura to the left. Note the moisture spots from Apyrum. Photo: Margareta Bergstrand.

NATURAL AND ACCELERATED AGEING, TENSILE TESTS AND COLOUR MEASUREMENTS

One series of samples was subjected to accelerated ageing for 10 years and another for 60 years. The accelerated ageing was performed using light ageing with a *430 watt Sol500 lamp from Hönle UV technology*. In addition, samples of the treated and not treated fabrics were exposed to natural daylight for one year. These samples were mounted with metal staples on a Coroplast® sheet and placed in a window facing north at the SNHB in Visby.

Breaking strength and elongation at break of fabrics were determined in principle according to SS-EN ISO 13934-2 using a *Shimadzu AutoGraph AGS-X tensile tester*. The sample specimens were prepared according to the Swedish standard SS-EN ISO 13934-1. The specimens were pre-conditioned according to the SS-EN ISO 139:2005. The samples were tested only in the warp direction.

Colour measurements were carried out using a *Konica-Minolta CM-2600d spectrophotometer with an 8mm aperture mask* before and after treatments with flame retardants and before and after accelerated ageing.

Samples from the 10-years accelerated ageing session were wet-cleaned using deionised water and 0.1% tenside, pH 6.5 to 7. Any colour change during the wet-cleaning was observed and recorded by a spectrophotometer.

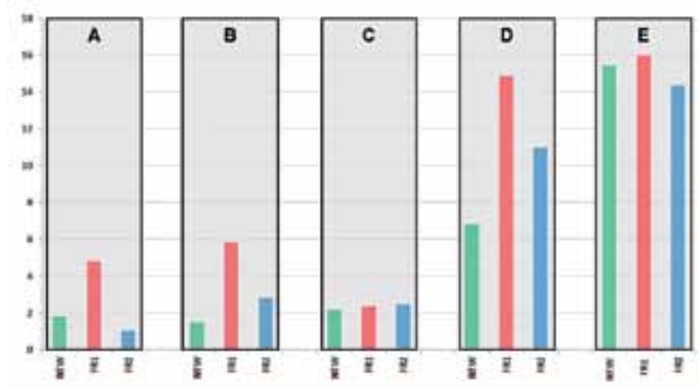
RESULTS

Weight increase between 9% and 74% was observed in the samples treated with Apyrum and between 9% and 23% with Secura.

As expected, shrinkage was observed after the application of water in both warp and weft directions in all samples. However, the flameproofed fabrics behaved differently. Apyrum made the orange fabric increase by 2% in the warp direction with no increase or shrinkage in the weft direction. The sand-coloured fabric increased by 3% in the warp direction and did not increase or shrink in the weft. The control test weave did not change in the warp direction, but increased by 1% in the weft direction. Secura made the orange fabric increase by 2% in the warp direction and shrink by 0.3% in the weft direction. The sand-coloured crepe shrunk in both the warp and weft directions by 2%. The control test weave did not change in the warp direction, but shrunk by 0.7% in the weft direction. Shrinkage after 10-years accelerated ageing after wet-cleaning was measured. After wet-cleaning, the shrinkage in the warp direction of the fabrics was most significant in the fabrics treated with flame retardants.

The pH values of the treated fabrics before and after treatment, as well as before and after accelerated ageing, are shown in figure 2. The pH of the control test weave after wetting in water was 6.30.

The flammability test showed no significant difference in the flammability of the treated and the untreated fabrics. The untreated orange fabric showed a better resistance to flammability than samples of the flameproofed fabric.



*4. Colour changes of the orange fabric directly after flameproofing (A), before and after accelerated ageing 10 (B), wet-cleaning (C) and 60 years (D). E = natural ageing 1 year. NTW=untreated, FR 1 = Apyrum, FR2 = Secura. dE*ab(D65) mean of 5 measurements. dE* values over or below 1 indicate a colour change visible to the human eye.*

Colour changes of the fabrics directly after flameproofing, before and after accelerated ageing, were measured and recorded. The 10-year aged samples were measured before and after wet-cleaning as well. See Fig. 2.

Other observations made, when wet-cleaning the orange fabric samples subjected to artificial ageing and treated with Apyrum and Secura, were that a dye component visibly leaked into the water. The sample treated with Secura emitted a strong smell of sulphur.

For further information on methods, materials, standards etc. see Bannerman et al. (2014).

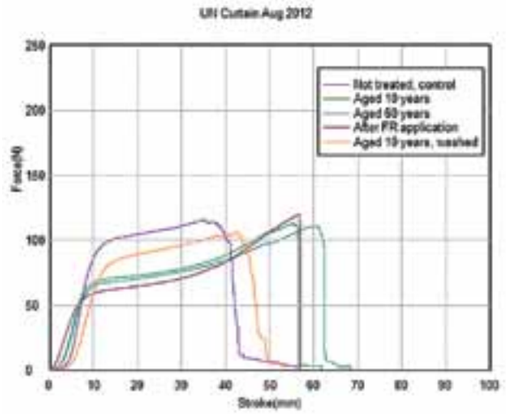
DISCUSSION

Water made all the investigated fabrics shrink by varying degrees. Contrary to this, flame retardants, although they contain a rather high amount of water, did not make the fabrics shrink, but made them stretch in the warp direction with a small increase in the weft direction, in some cases. Doreen Rockliff and Nancy Kerr (Rockliff & Kerr, 1984) made the same observation when investigating three flame retardants. They suggest that changes in dimension of the fabric are caused by the wetting action of the water. The presence of the fire retardant agents in the solution appears to reduce the shrinkage caused by water. Moreover, the flameproofed fabrics became very stiff, even after washing and after exposure to daylight. The oily feel of the treated fabrics also remained.

The flammability test performed at the SNHB showed no significant difference in the flammability between the treated fabrics and the untreated wool fabrics. Samples of the orange fabric even showed a better resistance to fire than samples of the same fabric treated with Apyrum and Secura. In a thesis from Luleå University of Technology, Marcus Lagerkvist investigated the properties of four flame retardant treatments, among them Apyrum and Secura (Lagerkvist, 2010). Apyrum does not provide the resistance to fire expected from a flame retardant, while Secura, on the other hand, provides better resistance to ignition. Although Lagerkvist's study was on upholstery fabrics, his findings correspond to our experiments performed in Visby. However, in our experiments, neither Apyrum nor Secura applied to wool performed better than untreated wool fabrics.

In 2012, a full-scale model of a section of the curtain made out of the two-wool fabrics intended for the ECOSOC curtain, and not treated with any flame retardant, was tested at the Southwest Research Institute, SwRI, San Antonio, Texas, USA, according to *ASTM E 84 – 12, Standard test method for surface burning characteristics of building material*. According to an evaluation of the test report from SwRI made by SP Fire Technology at SP Technical Research Institute of Sweden, the wool fabrics fulfil the requirements of class B, according to the 1968 Building Code of the city of New York. This strengthens the assumption that wool in general does not need flame retardants to add to its flame retardant properties.

5. Dye leaking from the naturally-aged Pythagoras printed velvet. Photo: Judith Bannerman



6. Change in tensile strength of the test weave after application of Apyrum FR1, after artificial ageing 10 and 60 years and after wet-cleaning.

Chemical analysis proved that Apyrum contains potassium and not only "citrate, acetate and water", as stated in the product data sheet (Bergstrand, 2013). Potassium content may explain the relatively high pH values of the solution. However, the pH does not sink to a more acidic level after accelerated ageing. A pH level as high as 9 may damage wool fibres. The fabrics treated with Secura and subjected to accelerated light ageing for 10 and 60 years became more acidic over time. Acidity may, in the long run, damage the fabric, even if wool is more resistant to acidity than cotton and linen. All the untreated fabrics show a slight change in pH to a more acidic level after accelerated ageing, 60 years more than 10 years.

Colour changes, even very small changes, on a textile artwork may affect the aesthetical appearance and alter the intended impact of the artwork. The application of Apyrum visibly changed the sand-coloured fabric from a very light brown colour to a greenish hue. On the other hand, the colour of the untreated fabric became lighter after exposure to light, but did not visibly change the colour tone as much as the fabrics treated with flame retardants. Both flame retardants turned the bright orange colour to a more dull orange hue. These colour changes could be visibly observed in the fabrics that were aged for 10 and 60 years as well as in those subjected to daylight for one year.

The leaking of the dye when wet-cleaning the samples may be a reaction to the lowered pH of the fabric, but is more likely due to the influence of the flame retardant on the reactive dye. Similar leaking was observed when wet-cleaning a piece of the velvet curtain that had been hanging in the ECOSOC in the U.N. headquarters in New York.

A previous study on the tensile strength of naturally-aged textiles (Bergstrand, 2013) showed, by looking at the breaking strength results, that flame retardant treatments weaken cellulose fibres. Protein fibres differ from cellulose fibres and evaluating tensile tests with wool is more complicated. By looking at only the breaking strength, it may, in some cases, seem that flame retardants make the material stronger. However, elongation at break results may point in another direction. There are indications that for wool, per cent elongation is a more sensitive indicator of change (Peacock, 1999). The tensile tests in this study all show significant changes in elongation at break, especially in the samples treated with flame retardants, aged 10 years and wet-cleaned.

It was observed that in some cases, dark spots formed around the staples on samples that were mounted with metal staples. In one case, the sample treated with Secura, the staple corroded after a very short time. Ammonium salts, especially ammonium chloride, corrodes metals. This discolours textiles, but may also be a threat to curtains that are often mounted with metal devices.

7. Samples exposed to natural light. Effects of Secura on test weave (to the left), orange and sand-coloured fabrics. Salt migration in the lower parts of the test weave and sand-coloured fabric. To the far left, brown discolouration on test weave treated with Apyrum. Photo: Margareta Bergstrand.

In addition, the sand-coloured fabric and the control weave treated with Secura showed signs of salt migration (see fig. 7). Salt migration has been observed in textiles treated with flame retardants, but has often been deemed the result of flooding or water damage. The salt migration appears in the lower parts of hanging textiles. It is possible that it is caused by the humidity in air, which, even under relatively normal indoor climate conditions, may release the salts in the flame retardants, thus forming spots and colour changes.

The salt crystals on the surface of fabrics treated with Secura remained after accelerated ageing and were not entirely removed in the wet-cleaning process. It is possible that the salt crystals would wear off from the surface under normal indoor use, influence of air currents from ventilation and from handling the textile, but these samples have been kept in protective plastic cases. However, many fire retardants do emit from the surface. In fact, many manufacturers recommend that the treatment is repeated after a couple of years.

CONCLUSIONS

The two investigated flame retardants show shortcomings from a conservation perspective as well as from an aesthetical view. They did not add to the flame resistant properties of the wool fabrics. Looking generally at tensile strength, Apyrum showed the least damage. However, it caused a significant and unacceptable change in colour. It also added weight and made the fabrics quite stiff, altering the drape. Secura altered the drape of the two fabrics, as well as changing the colour, and caused corrosion on metal. There were also signs of salt migration. Both flame retardants caused changes in pH values. These shortcomings may accelerate in a textile treated with any of these flame retardants, if installed in an indoor climate that may, at times, be as warm and humid as in the U.N. building. Shrinkage and colour-running, as well as loss of fibre strength when wet-cleaning, make cleaning and remedial conservation a challenge.

The Swedish National Art Council had asked for the curtain to be in good condition for at least 60 years, but as a result of this study, it appeared that neither Apyrum, nor Secura or any other flame retardants containing the same chemicals (that is phosphate, acetate or other organic and inorganic salts) could be considered for the new curtain for the ECOSOC, as they will reduce hanging life significantly. Furthermore, the evaluation of the flammability test performed at SwRI added to the recommendations that no flame retardant was required for the new artwork installed in ECOSOC.

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Fernando Caceres Jara

"The Reform Club" London: The grand British-Italian palazzo in Pall Mall

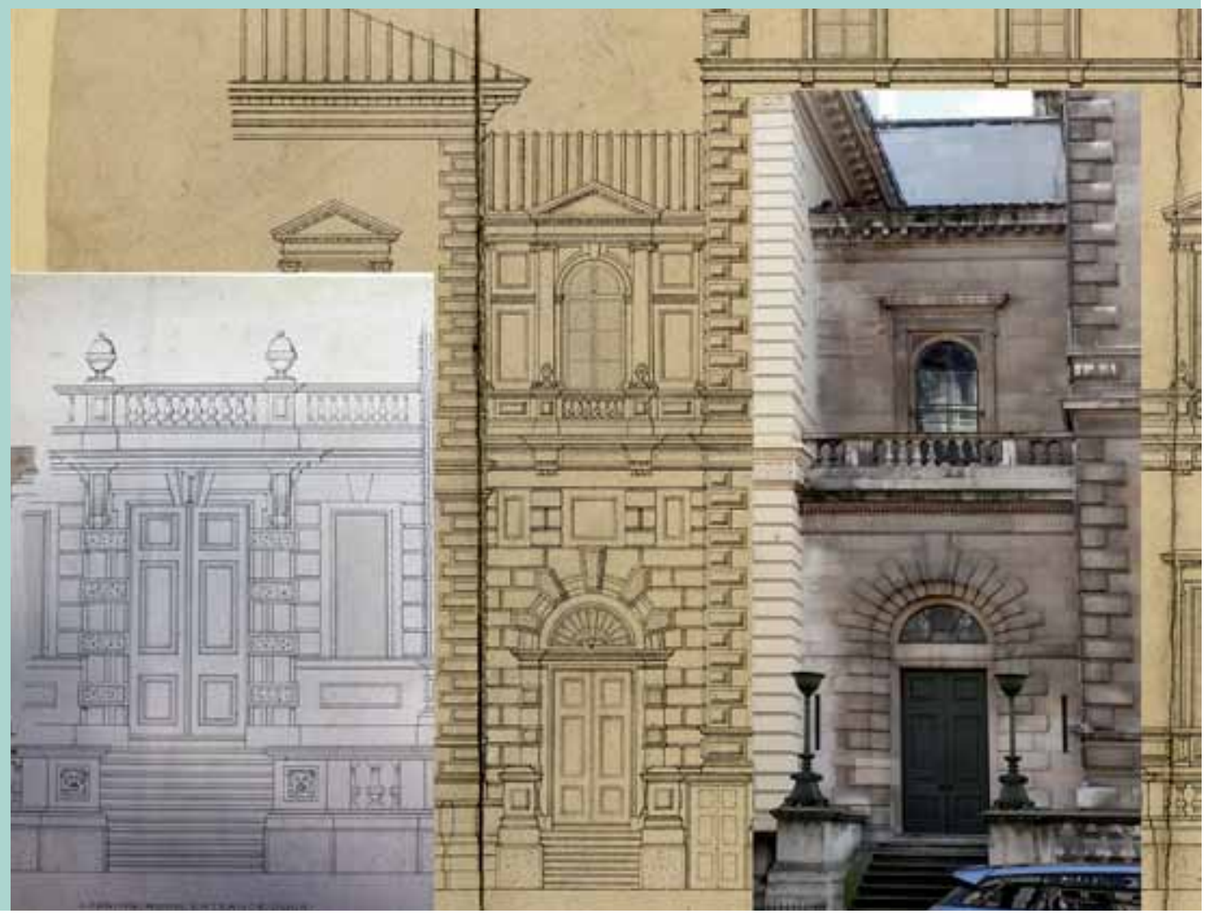
Keywords:
Gentleman's Club
conservation
Reform Club
Italianate palazzo

ABSTRACT

The Reform Club London is a remarkable specimen of British - Italian palazzo architecture with some unique architectural details found nowhere else. It was built by Charles Barry and is a representative building of one of the most iconic British institutions, *the Gentleman's Club*.

This article presents the architectural history of the Reform Club, a grade I listed building, since 1838 to the present. The coupling of technical and historic research has offered new insight into the design and development of the building. This has allowed for a close assessment of its structure, fabric and the development of a good conservation programme.

After a long and complex conservation programme, today's Reform Club stands as splendid as it was when it opened in 1841. Presented here are the results of the conservation of this unique historic interior to Barry's original scheme.



1. Exterior view of the Reform Club

INTRODUCTION

"The remoteness and privacy created by the Pall Mall elevation with its sober and unpretentious façade is mirrored by the delicate privacy of the Club rooms within" (Caceres 2012, p. 67).

The Reform Club and its architect Charles Barry have caught the interest of contemporaries and later observers alike. Whilst specific elements of the building and a variety of Barry's architectural concepts have received much public and scholarly attention, prior to this study, neither a comprehensive conservation study nor a modern building history of the Reform Club have been written, to my knowledge.

This account is divided into three sections:
I: analyses of the wider historical setting and this building's history from its design and commissioning in 1838 to its completion in 1841 and subsequent significant alterations;
II: contextualisation of the building from a technical architectural perspective;
III: addressing the conservation of its interiors and the explanation of the significance of the four-and-half-year conservation programme.

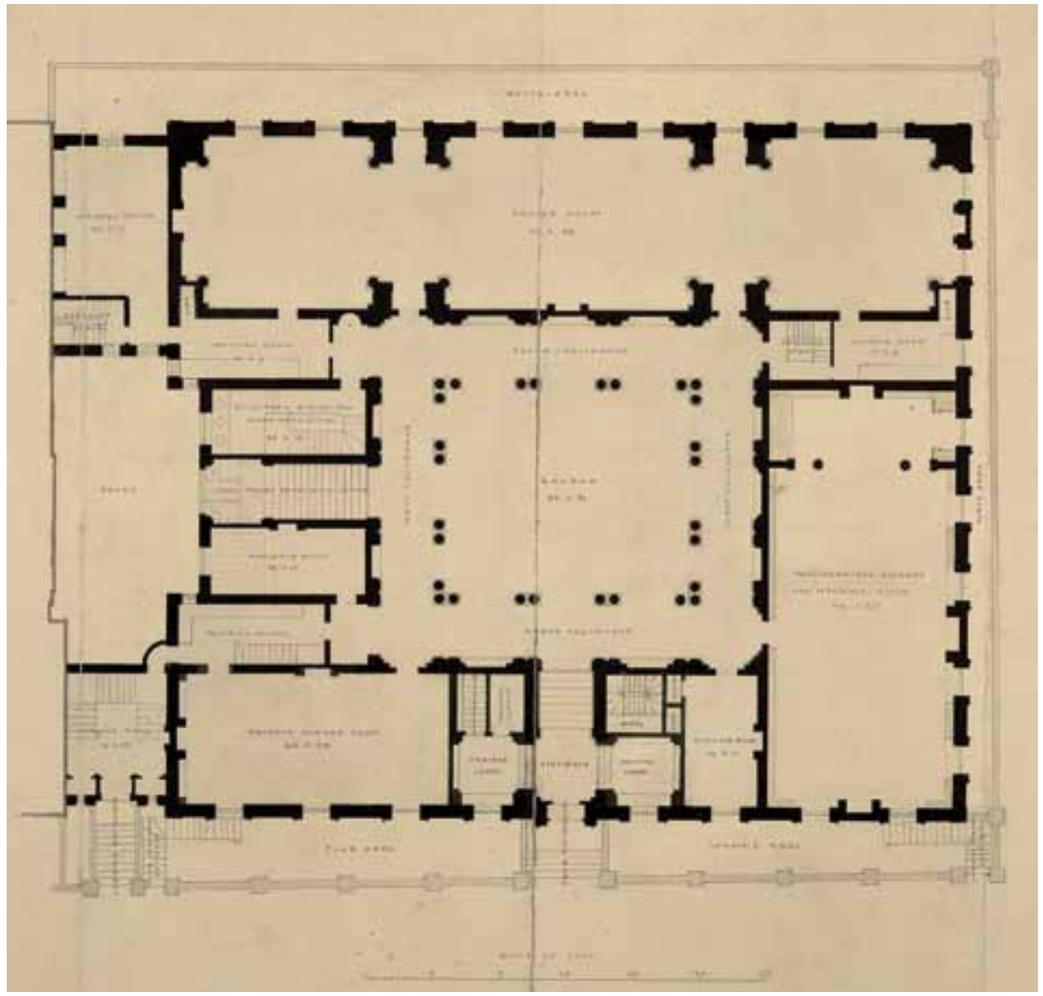
From the conservation perspective, it was important to understand the changes that the building has undergone over time. The interpretation of the different decorative schemes was based on the examination of accessible sources from 1838 to 2014 such as Barry's personal diary, illustrative materials, written descriptions in contemporary newspapers, magazines and the Reform Club's own archived material. As the Club remained open as usual during the Conservation, valuable information was gained by conversations with club members and maintenance staff.

In 2010, International Fine Art Conservation Studios (IFACS) Ltd Bristol carried out the conservation of the decorated surfaces. The conservation brief given by the Reform Club, Westminster City Council and English Heritage was re-discovering, preserving and re-presenting the original decorative surfaces to their authentic state.

THE REFORM CLUB

The Reform Club opened its doors on May 24th 1836 at Dysart House, 104 Pall Mall, London. Charles Barry was commissioned to build "a club house which should surpass all the others in size and magnificence" (*The Civil Engineer and Architect's Journal 1838*, p. 67), possibly referring to its rival, the Carlton Club, a fine classic building standing next door. Barry was allocated a budget of £37,500, equivalent to £1,653,750 today; the final bill came to £84,082 (£3,708,016). Barry delivered one of the most outstanding examples of British-Italianate architecture. The Reform Club can be seen as a continuation of the designs of both the Travellers' Club and the first drafts for the Manchester Athenaeum.

2. Interior view of the Reform Club: showing the glass dome ceiling and the tessellated floor.



3. The Reform Club's floor plan. Photo: RIBA Library Photographs Collection.

4. Barry's different approaches of the front door of the Reform Club. Photo: RIBA Library Photographs Collection.

A letter from June 1837 reads: "…in the design of the Club the height should also be such as to harmonise with the others…" (Rhodes, M.1837). The "others", refers to the Travellers', the Athenaeum and the Carlton Clubs. The letter also suggests that a space should be left between the buildings. Barry's response was to harmonize the façades of the buildings through the creation of a small building inspired by a roman village (Caceres 2012), so there are in fact four buildings at the south side of Pall Mall. This building separates the Reform Club from the Travellers', while articulating it with the rest. As such, Barry created an entirely Italianate block (Vonberg 2003). With this stroke of genius, he managed to get what he wanted – the visual sensation that the Club is a palazzo standing by itself. Barry's building magnificently blends into and becomes an innovative part of its surroundings on the Pall Mall. The overall impression is that of understatement, sober grandeur and well-balanced proportion.

Various publications have perpetuated the idea that Barry's inspiration for the Club came from Rome's Palazzo Farnese. Indeed, it is a popular idea that Barry was repeating Italian renaissance formulas in England. Yet, scholars point to the idea of English-Italianate, implying that Barry was looking to the English Classicism tradition, as much as to the original Florence and Roman examples. Professor David Watkin has noted that "the broad swirling curves of carved acanthus leaves in the great staircase of the Travellers' recalls the woodwork in Wren's city churches." (Watkin 1999, p. 56).

Although keeping strictly to the principle of "honesty" in architecture, Barry's wonderful transmutation of stylistic languages has succeeded in creating a true British-Italian palazzo for the British weather. Barry constantly looked back to his journal notes of the Great Tour (1817-20), as a way to legitimise architectural detailing and inspiration.

For the Club, Barry takes inspiration not only from the Farnese Palace, but also from other palaces that he saw during his Grand Tour. His observations contributed to the creation of his own palazzo-formula, in which there is a balance between practical requirements and artistic expressions (Stanley 1913). This formula is reflected in every detail of the building, such as the architectural detailing of the entrance doorway, which is considered to be inspired by the doorway at Palazzo Massimo allé Colonne, but it is not as simple as that (Crook 1973). Although he may have been familiar with

that palazzo, he did not visit it during his tour (Barry Jan/Feb 1820). Instead, Barry tried different door treatments, such as porch, columnar and pilasters, but none of them was satisfactory to maintain its sober and unpretentious façade. There is one sketch drawing of an unidentified doorway, which perfectly suits his design, from which Barry might have developed the classic door case of the Club. In respect to the strict symmetry of the façade, the doorway replaces the middle window, and instead of projecting, it is inset, less pronounced and simple in its design (Caceres 2012).

Barry went through a similar process in the design of the cornicione, which seems to have been inspired by the cornicione in the Palazzo Pandolfini. Like in the Pandolfini, the tiled roof recedes from the cornicione, but there the similarity ends. Barry was critical of the Palazzo Pandolfini, yet admiring of the cornice and the frieze, remarking the importance of proportions: "… the cornice and its frieze are immensely high and of bold projection, it appears to be proportioned to the height of the building" (Barry 1820). In the Club, Barry used these observations to build the frieze and the cornice immediately above the heads of the window architraves at the attic level. In an early proposal for the Club, Barry used a similar approach of lettering, proportions and detailing as the Pandolfine frieze. Later on, however, Barry changed the detailing of the frieze for a more emblematic approach, while keeping the right proportions of the ornamentations. Carved on the frieze-band are roses, thistles, shamrocks and leaves – elements of the British national flora.

Barry enhanced the grandeur of the building from the top with the *cornicione* and from the bottom by raising the entire clubhouse above the pavement. The decision to raise the floor may have been influenced by Reform Club member Joseph Gwilt (Gwilt 1826) or it might have been a clever choice that Barry used to elevate the status of the building from the large Carlton Club, while keeping within the height of the building restrictions.

The Carlton had the same spatial arrangement around the building as the Reform Club – to light the basement, but the entrance was at street level. To enter the Reform Club, visitors and club members must climb two sets of steps before arriving at the Grand Saloon; this is a difference from the conventional palazzo, where one can peak through the open door to the cortile. At the Reform Club, one has to raise one's eyes to see it.

The Grand Saloon occupies the centre of the building. A colonnade of twenty Corinthian scagliola columns elegantly frames the atrium, and the floor is paved with a tessellated pavement of British Victorian, Roman, Hellenistic and Pompeian hybrid design (Caceres 2012). It has been said that Barry rarely used something that had not been proven elsewhere (Olly 1985), yet, the glass dome of the Saloon proved the contrary, and the tessellated floor was a novelty, invented and patented in 1839 by Alfred Singer and Henry Peter. The floor of the Club is a unique historic piece, as it is the only surviving of its kind (Caceres 2012).

The atrium saloon is roofed by a two-story glass-domed Ferro-vitreous construction by Apsley Pellatt. The Club committee suggested covering the Italian cortile, and thus creating the Saloon; this suggestion was taken from C. R. Cockerell submission. Barry was familiar with the ceiling, Halle au Blé in Paris, which he saw during the first part of his tour, but he was critical of it (Barry 1820). In the corrected architectural drawing, Barry instead proposed a hipped glass roof, which he later adapted to the existing flattened dome.

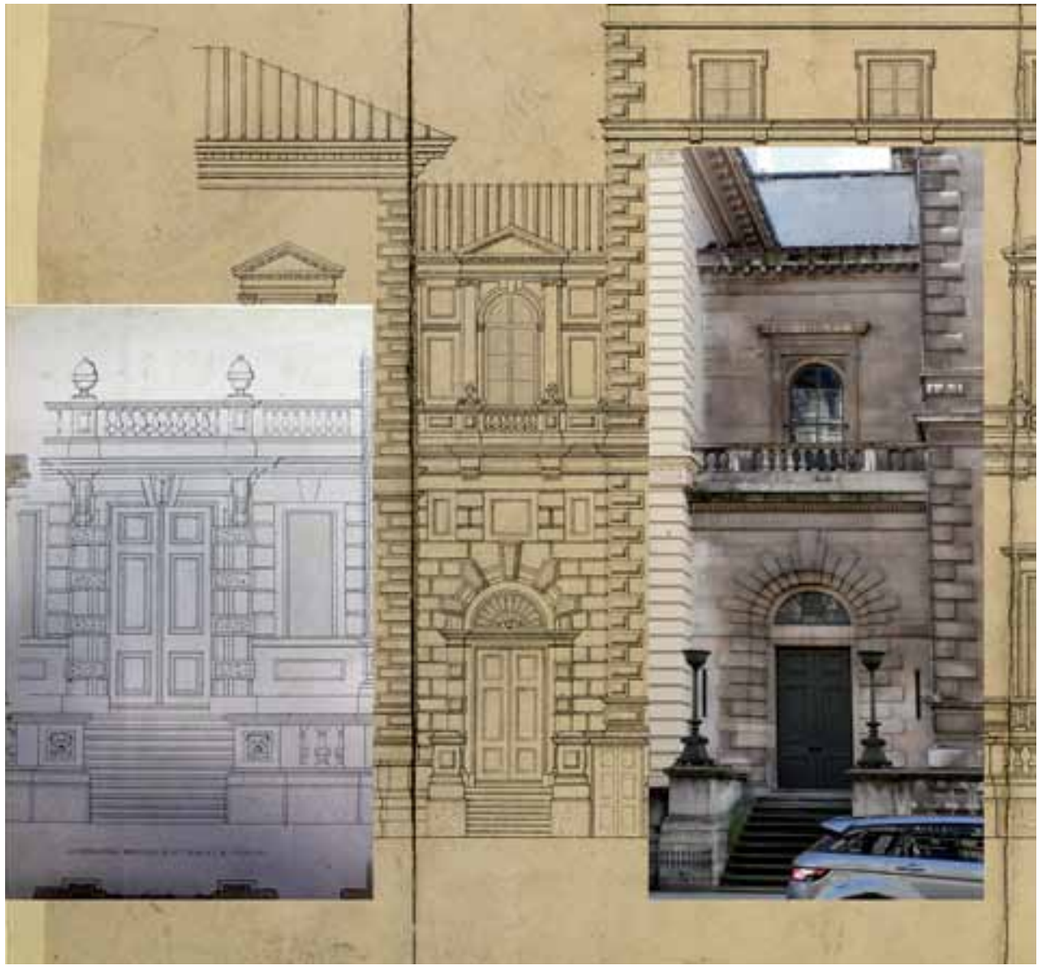
In his time, Barry was not free of critiques. In an article in the Buildings News, Barry was criticised for his choice of materials and finish of the Reform Club, as it would require constant re-decoration ("The Building News" 1869).

By 2009, this critique proved to be partially true; the interiors of the Club had suffered significant visual deterioration due to war damage, ingress of water, intermittent repairs of damaged areas, and repainting of some rooms.

In 1869, the Club commissioned the prominent interior decorator John G. Crace to survey the decorations in the building that seemed to be in a poor state (Crace 1869). The work was, however, delayed until 1878, when Edward Middleton Barry was appointed to undertake a general refurbishment, cleaning, decorative alterations and embellishments to the Library, the Saloon, the main staircase, the Coffee, Reading, Billiard, Smoking and Card Rooms.

As the historical documentation of previous repairs was scattered or non-existent, the aims of this research were to: document historical changes in the decoration and surfaces of the Reform; investigate the techniques and materials used in the original decorations; and to distinguish between the two main historic schemes, Charles and Edward Barry. The latter Barry reused some of his father's painting schemes and overlapped them with his own, for example, the coffers in the ceiling of the colonnade and the main dome in the Grand Saloon (Caceres 2012).

The rooms in the Club have barely changed use through time, hence, the basic layout and structure of the Clubhouse remains faithful to Barry's original concept. But unfortunately some rooms were transformed when upgrading the Club to modern times, for example the famous Soyer kitchen, probably designed in consultancy with the chef, the first of its kind, and the Conference Room, transformed into the Male Dressing Room, for which Barry



5. Drawing of the entrance Lodge of the Reform Club. Photo: RIBA Library Photographs Collection.

6. View of the Dome and details of the Cross revealing of the painted scheme of the Reform Club.

7. View of the Reform Club's Library before conservation

took inspiration from the Apodyterium in Pompeii (Caceres 2012).

The Grand Staircase was Barry's response to the suggestion from the building committee to roof the Saloon; in earlier drawings the staircase was shown in the north-west corner. Scholars have suggested that Barry shaped the Grand Staircase upon the model of the Papal Chancellery Palace (Crook 1973). However, the colours, the scagliola panels and the barrel vault ceiling are a reminder of the staircase at Villa Farnesina that Barry visited on his eight day sojourn in Rome. The enclosed Grand staircase rises in three flights, each turning left at the landing place. Originally, each landing had windows with painted screens, but in 1854, Barry replaced them with stained glass, designed by him, with the names and emblems of the different parts of the United Kingdom (Crook 1973). These were replaced after the Second World War with the mirrors that are still in situ.

A committee resolution of 1842 stated that no portraits of living members should be placed in the Club (Resolution, cited in Woodbridge 1978). That meant that the existing portraits are from different dates. The majority came a year after the death of the sitter. This explains the disparity of the attachments on the walls.

An uncontrolled environment contributed to the deterioration of the paintings. This was more accentuated in the paintings that were strongly glued to the wall. The extensive craquelure across the painting layers was produced by the movement of the plaster.

The large cracks and distortions were a historic problem; all the paintings were largely over-painted with dark colours that were probably a response to a change of taste or a quick solution to the deterioration of these. In addition, the darkening of the degraded varnish and the thick layers of dirt and surface grime resulted in a visual impression that was far from satisfactory.

To prevent further damage to the fragile canvases, it was decided that some paintings had to be treated on site, whilst others could be removed from the walls and sent to the studio for treatment. On site, the cracks of the plaster behind the canvases were stabilized with injections of a consolidant. In the studio, however, the canvases were treated and prepared for marouflage to a thin aluminium honeycomb panel.

The Library is considered to be one of the finest historical interiors in London. It started its life as a drawing room, decorated in a completely different manner, with Belgium white scagliola columns and gold and silver satin damask. In 1853, Barry was commissioned to convert the Drawing Room into a Library. He looked back to a formula that had proven successful at the library in the Travellers'.

The long plan is divided into three bays made by wooden tetrastyle of paired fluted columns and pilasters. The Library is a gallery of Corinthian columns, where windows or bookcases are placed in between. The decorative detailing of the Library is in Thessalian green and a Pompeian palette with rich ornaments. The capitals exhibit golden acanthus foliage, the cornice is decorated with fruit festoons. The ceiling is

adorned with small gold roses. The embellishment in the moulded ceiling is from 1841 and attributed to Charles Frederick Bielefeld (Caceres 2012).

The decorative techniques employed in the Library are comprised of brush-painted woodwork, moulded plaster-work, papier maché, gilding and glazing. The work was carried out by the interior decorator C. Schmidt (Caceres 2012).

On the 17th October 1940, a bomb completely destroyed the Carlton Club. In the Reform Club, the Library was the most damaged room. Losses of decorative moulded embellishments and the numerous impact damages to ornamentation and gilding are from this event. The ceiling in the west section of the Library was painted over in a thick brown colour, covering substantial paint loss, probably caused by the water used to control the fire, and subsequent leakage from the bathrooms above the Library, all contributed to the failure of the paint layer. The water filtering from the Library may have damaged the Coffee Room ceiling down below, which is a modern fitting. On the coving and the ceiling, serious flaked paint layers were present, as large leaves of paint were held *in situ* by the interlocking of other paint flakes.

Barry provided an innovative air ventilation system for the Club, which is actually still working. The circuit of hidden pipes behind the plaster, still heating and cooling the paint layer, and, as a result, constantly expanding and contracting, leading the paint to fail.

When mapping the areas of delamination, the relationship between the heating system and the paint damage was clear, which may have been accentuated by the harmful deposition of acidic sulphur dioxide, produced by the smoke from the open fires and from cigars.

8. Detail of the Reform Club's Library ceiling embellishment after conservation.

The most visual disfiguring element in the Library was the green over-paint on plinths. This colour was introduced in the 1960s and had been applied throughout, on several occasions, and in various shades and types. According to the Club's house decorator, the last layers were added approximately twelve years ago (Caceres 2012).

Cross-sectional paint analysis and cleaning tests exposed a complex glazed layering, giving the bronze effect finish (IFACS Ltd 2010). The stratigraphic structure of the paint shows Barry's 1853 colour scheme combines base colours with a series of layering toning glazes. The findings were supported by period descriptions presented in *The Builder*, which was also confirmed by Louis Fagan's early documentation (Fleetwood & Hesketh 1860; Fagan 1887).

On the passageway windows in front of the door entrances, "raising mirrors" were discovered during the conservation. This theatrical effect was to create an axial passage effect. The mirrors are placed between the floors, still waiting to be conserved.

Under the carpet, the floor is of oak boards, inlaid in various ways. Barry provided a custom-made carpet of Scotch manufacture, made in a single length, narrowed at the doors. The carpet had three different patterns and neutral colours, which was celebrated in publications of that period (Mead 1841). The carpet wore out at an early date and replaced with a different style. However, it was the view of the Club's Committee that to complete the conservation program, it was necessary to commission a new carpet in keeping with the spirit of the room.

During the conservation work, a diaper work with a central rose was discovered in the Smoking Room, similar to the work in the coving in the Library. This preferred architectural detail used by Barry was felt to be the right one for the design of the new carpet. The "scales" of the centre rose of the ceiling were mirrored in the centre part of the carpet, as well as the Reform Club's shields at the entrances (A Bianco 2014, pers.comm., 11 August).

Throughout its history, the Reform Club has magnificently managed to revitalise itself by using new technology. At its opening in 1841, the Club was lit by glittering cut glass chandeliers and Colza oil lamps. Other areas of the Club were lighted by gas, such as the entrance candelabra and the burner in Morning Room. By 1852, the whole Club was operating on gas. In 1890, the Club installed electric lighting. During the conservation work of 2010, a new computer lighting control system was installed without upsetting any historic surfaces (LightingServices 2014).

CONCLUSION

Given the nature of this project, with several trades working in the same space, it was necessary to create a precise conservation plan with an overall methodology to deal with the variety of architectural and historical elements. It was important to monitor the speed and progress of a collaborative workflow. A continuous consultation with Heritage bodies and the facilities manager was needed to ensure the standards and levels of conservation. The success of the project can be summarized by the following comment: "English Heritage is delighted with the scholarly programme of restoration and conservation work at the Reform and considers that its outstanding interiors are greatly enhanced by the lighting scheme adopted" (Reform Club 2013, p. 3).

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Giulia Chiostrini

The abduction of Helen: uncovering the technical features of a monumental embroidery hanging from the collection of the Metropolitan Museum of Art

Keywords:
monumental hanging
Chinese embroidery for export
gilt-paper wrapped threads
satin strips
painted areas
European pigments
coccoliths

ABSTRACT

This paper presents the results of the technical examination of a large-dimension seventeenth century embroidered Chinese hanging made for export (MMA 1979.282) and now in The Metropolitan Museum of Art's permanent collection. It discusses the different stages of the embroidery's production through a presentation of the technical details determined via visual examination and various scientific analyses. Fiber identification of the embroidery ground fabric was achieved with the use of a Polarized Light Microscope, which also identified the nature of the pigments analyzed by the staff of the Museum's Scientific Research Department. A Scanning Electron Microscope and Energy Dispersive Spectrometry (SEM-EDS), Transform Infrared Microspectrometry and Raman Microscopy (RM) were utilized by the Museum's scientists to further investigate the white ground pigment and other features. The overall goal of this paper is to demonstrate that this embroidery is an example of a monumental cultural-artistic exchange between the Western and Eastern worlds, not only from the iconographic, but also from the technical and material perspectives.

1. Obverse (left) and Reverse (right) The Abduction of Helen, from a set of the Story of Troy. Chinese embroidery for Portuguese market, irst half of the seventeenth century. Cotton, silk, gilt-paper wrapped threads, pigments. Photo: The Metropolitan Museum of Art, New York, Gift of Louis E. Seley, 1979 (1979.282).

INTRODUCTION

During the exhibition *Interwoven Globe: The Worldwide Textile Trade, 1500–1800*, held at The Metropolitan Museum of Art from September 2013 to January 2014, a large hanging, measuring 360 cm x 480 cm and depicting the abduction of Helen from the story of the Trojan War (MMA 1979.282), was prominently displayed in the first gallery. It was presented as an example of the monumental iconographic and ornamental exchange between the Eastern and Western traditions in the early seventeenth century.[1] (Fig. 1) Prior to this, in 2012, the Museum's Department of Textile Conservation conducted a complete examination of this work of art, followed by its conservation treatment and preparation for display. This overall visual examination revealed technical details of the Chinese embroidery, suggesting the intervention of European practices in the painted areas.

PRODUCTION HISTORY OF THE EMBROIDERY PANEL

COTTON GROUND FABRIC

A 2/1 cotton twill fabric was used as the ground fabric for the whole embroidery. Analysis of the fiber via polarized light microscope confirmed the use of cotton in both warp and weft threads. The undyed warp is made of two yarns plied in a Z-direction; the undyed weft is also made of two yarns plied in a Z-direction. The weave structure is still tight, demonstrating a count of 22 warp and 30 weft threads per centimeter. The background as a whole is an assemblage of 12 panels with the same weave structure and a number of further small pieces cut from the same cotton twill fabric. Each panel measures approximately 36 to 38 centimeters in width. They are joined together in a vertical direction along the selvedge, which is visible on the reverse of the textile. In order to document the reverse of the panel, a lining made of jute, which had been applied during a previous restoration treatment before the object entered the Museum's collection in 1979, was removed.

The main scene is embroidered on an assemblage of 10 panels cut to fit within the inner frame. It can be assumed that prior to the embroidery's execution, a same-scale drawing, similar to a tapestry cartoon, was given to the embroiderers as a guide. Each border on both sides is embroidered on one long panel, while the upper and lower borders are embroidered on small pieces of fabric joined together in a row. Because of the large dimensions of the piece, each panel was embroidered individually and then the piece was assembled as a whole. This technical observation is supported by the presence of silk stitches, which match the color of each particular area on the obverse of the piece. The stitches were applied to cover the joins between the different panels.

Narrow fabric strips placed along the four sides between the borders and the main scene show that the piece was altered after completion, suggesting that the dimensions of the whole

2. *This image shows the band in a plain weaving structure measuring about 10 centimeters. Both warp and weft are made of two Z-twist threads. The tightly woven structure counts 26 warp and 48 to 50 weft threads per centimeter. Photo: Giulia Chiostrini.*

3. *Detail of the earring realized with seed knot stitches and outlined by gilt-wrapped paper threads. Photo: Giulia Chiostrini.*

embroidery panel were adjusted and readjusted over time to fit differently-sized display spaces.

Further investigation of the cotton twill weave structure from its reverse shows an unexpected detail on the proper right corner of the piece. One border panel preserves a weft-faced woven band, which constitutes the beginning of the weaving on the loom. This band has a strip pattern alternating beige, brown and blue color weft threads. Following a few weft thread passages, the plain weave switches to a twill structure.[2] (Fig. 2)

The use of cotton fabric as the ground for a Chinese embroidery requires some consideration of the Chinese cotton industry that flourished in the seventeenth century. Given the dynamics of international trade in the early seventeenth century, India might be assumed to be the source for the cotton canvas under discussion. However, according to Riello, cotton textiles from domestic plants were widely produced in China from the twelfth century, when raw cotton was first introduced to the area. (Riello, 2013, p.68) By the thirteenth century, cotton was such a widely manufactured national commodity that China's new Mongol rulers established cotton textiles as a regular part of the national taxation system. By the time of the Yuan dynasty (1271–1368), cotton began to replace the longer-established hemp in weaving. (Compiler and Weiji, 1992, p.135)

While India was developing an international export trade in its cotton textiles, China was developing a sophisticated and widespread domestic trade in the same product. By the end of the Ming Dynasty (1368–1644), looms were set up in almost every household and cotton cloth was woven everywhere. Each Chinese region specialized in the production of various kinds of cotton textiles, from plain weave to more complex weaving structures. For example, the Songjiang region marketed more than twenty different varieties of cotton textiles, including the cotton twill for which the area's weavers led production. (Compiler and Weiji, 1992, p.449) By this period, Chinese cotton cloth was of such high quality that its trade was expanded to the European market. It became an important Chinese export commodity alongside silk and porcelain.

In short, this social-economic development in seventeenth-century China makes it likely that not only the embroidery, but also the cotton fabric it was placed on, were produced internally, meaning the original material makeup of this textile is entirely Chinese, though its subject is entirely European. *The Abduction of Helen* could have been independently commissioned by a wealthy European patron or purchased by merchants for sale at European fairs.[3] In either case, its entirely Western subject shows it was made for export.

EMBROIDERY TECHNIQUES AND MATERIALS

The Abduction of Helen panel has been embroidered using a variety of materials and techniques common to Chinese embroidery practices.[4] Gradations of dyed satin silk threads slightly plied in Z-twist fill large areas of the background. Applied in slanted directions, vividly dyed satin stitches in combination with short and long silk stitches modulate the shades and the movement of the human figures as well as defining architectural interiors on the proper right side of the panel. In this crowded composition, remarkably small details such as Helen's earrings are clearly depicted at the center of the main scene through the use of seed knots in yellow silk thread. (Fig. 3)

Abundant use of gilt-paper wrapped threads enhance other details, such as architectural elements and the phoenix feathers on the top border of the panel. (Fig. 4)

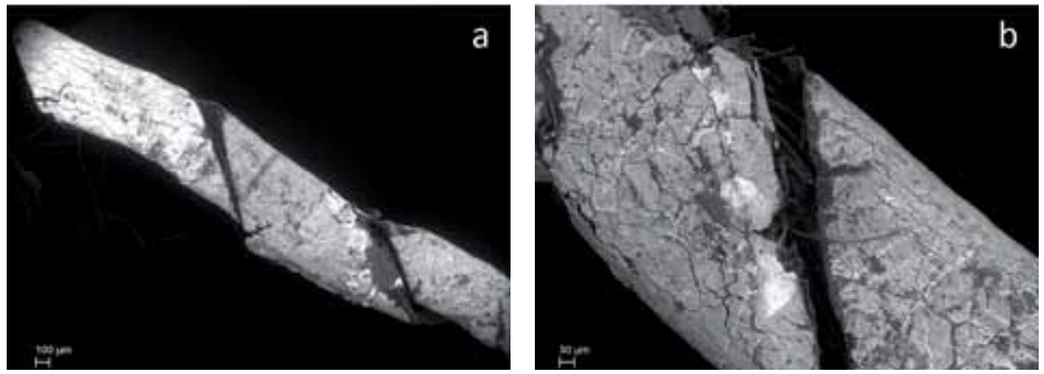
The analysis conducted by scientist Federico Caro of the Metropolitan Museum's Department of Scientific Research shows that the gilding is a binary gold-silver alloy, whose approximate composition is 88% gold and 12% silver. The thin layer of gold was applied via a paper previously prepared with a thin layer of kaolinite and finely divided iron oxides.[5] (Fig. 5)

These gilt-paper wrapped threads were an important element of the original appearance of the embroidery. Although the majority of the fragile gilt-paper has been lost, what remains today is evidence of the original luxury of this monumental hanging.

PAINTED FIGURES

An interesting component of this embroidery is revealed by analysis of the painted portions of its figures. A narrow

4. *The gilt-paper wrapped thread is couched down by a fine blue silk thread, while small rolls of paper are placed underneath the orange satin silk stitches to mold the curved form of each feather. Photo: Giulia Chiostrini.*



5. (left) (Magnification 30x) Backscattered electron image (BSE) of the thread; (right) (Magnification 120x) BSE image of the gilt-paper thread. Photo: Federico Caro.

white satin strip outlines the features of the human bodies in the hanging, including faces, arms, legs and feet painted directly on the cotton canvas. On closer inspection, it was apparent that the narrow strip was originally wider. Much of it is hidden by the surrounding embroidery silk stitches, which were applied on top of it to hold the fabric in place. This finding suggests that originally pieces of white satin fabric cut in the shape of human features were attached to the cotton canvas after being embroidered or painted with details such as the eyes, mouth, and nose. [6] However, at some unknown point, the satin was cut internally along the edges, lifted out, and its function was superseded by paint applied directly to the cotton canvas. Removing the entire shaped pieces of precious embroidered satin fabric would have been a waste of material and of the embroiderer's valuable time. It may therefore be suggested that the painted areas are not contemporary to the original embroidery's composition, but are later additions. (Fig. 6)

Why the replacement was made is not clear. Perhaps because of a change in taste, the original embroidered satin fabric was removed to allow the painting of the human features now visible, with their remarkably European character. [7] The painting is not executed with the same accuracy as the rest of the embroidery. In some areas, colors have been inexpertly brushed over the edges of the painted canvas, covering portions of the silk stitches and of the gilt-paper wrapped threads. This is at odds with the technical expertise shown elsewhere in the hanging and strengthens the hypothesis that the painted decorations represent an alteration of the original composition that took place in a different artistic practice.

Samples of the paint from the face of the Triton on the right border were analyzed. Among the resulting materials, pigments including calcium carbonate, lead white, and copper resinate were identified. Whole egg was determined to be the binder in the paint layer, while a protein binder was found in the white ground. The calcium carbonate used as the ground white pigment was a variety of natural chalk composed of microfossils known as coccoliths.[8] Natural chalk was widely used as a white pigment or ground in the European painting tradition, and its identification with coccoliths establishes its origins in the ubiquitous carbonate marine deposits of Europe.[9] All the materials identified by scientific analysis were commonly used in European art, including the copper resinate used as a green pigment. The latter does not have any documented history of use in Asia.

To sum up: the piece was certainly made in China with Chinese materials and using a Chinese embroidery technique. However, scientific analysis suggests that the material of the painting has its origins in Europe and was added at a later stage of the embroidery's lifetime, a stage that took place in a European cultural-artistic context. It could possibly be argued that this context could still have been geographically located in China, where a circle of European Jesuit painters had been present since the early sixteenth century. (Musillo, 2008, p.45–49) Skilled painters like Matteo Ricci in the sixteenth century and Giuseppe Castiglione in the eighteenth century executed their paintings in European styles and with European techniques. However, their paintings were achieved with local materials available in Asia (not the European pigments found in this hanging). In addition, there is no evidence that Jesuit painters ever worked commercially or for European markets.

6. (top) This human face shows a narrow white satin strip along its outline, while the facial features are painted directly on the cotton canvas. (bottom) (Magnification 60 x) Detail of a satin fabric fragment. Photo: Giulia Chiostrini.

7. Detail of Helen's dress pattern. Photo: Giulia Chiostrini.

PREVIOUS INTERVENTIONS

In some areas, where there has been a loss of embroidery, pigments were applied matching the original color of the silk stitches. These interventions were meant to restore the embroidery's aesthetic value. For example, blue-green pigments were used to replace the pattern of Helen's green dress in the center of the scene, where the lost gilt-paper wrapped threads were originally couched by green silk threads in regular rows. (Fig. 7)

Scientific investigations are currently underway to identify the nature of these pigments in order to compare them with those from the painted human features. The results of this analysis will help determine if both interventions are contemporary.

Later interventions are simpler to date and obviously intended as conservation treatments. While pigments were used to fill areas originally embroidered in the main scene, in the border, large areas of missing embroidered design were reintegrated with synthetic-dyed mercerized cotton threads. These are applied in a shoddy manner, intended to imitate the original silk embroidery stitches. The use of synthetic dyes means that this treatment could not be applied before the mid-nineteenth century, identifying another stage of development in the embroidery's lifetime. [10]

8. The reverse of the embroidery panel during the attachment of the backing support, while patches of various dimensions from previous restoration treatments were held in place. Photo: Giulia Chiostrini.

TREATMENT PROCEDURE

The overall aim of the treatment was to stabilize the embroidery and assure that the panel was strong enough to be displayed hanging vertically.

While the cotton ground fabric was in good condition, the embroidery original material was fragile; the loose gilt-paper wrapped threads and the small rolls of paper were stabilized by couching them in thin polyester thread through the cotton embroidery ground fabric.

Finally, the piece was supported for hanging according to the Department's standards for the conservation of large figurative textiles. The embroidery was opened on adjacent tables with its reverse up. Given the fragile condition of the material, including the cracked surface of the painted areas, a layer of 2.5 centimeter polyester batting was first placed on the working tables and covered by phototex paper sheets. This layer functioned as a cushion for the pressure applied on the embroidery's obverse during the conservation work. Four cotton sateen fabric straps 10 centimeters wide were vertically stitched to the embroidery's reverse to provide reinforcement during the hanging. A cotton sateen band 70 centimeters wide was also stitched along the top edge of the panel, while a plain cotton band 50 centimeters wide was stitched along the bottom edge to assure protection during the hanging of the piece in the gallery. (Fig. 8)

Pima cotton lining was finally applied. A band of Velcro sewn onto cotton webbing and attached through the lining on the top edge constituted the hanging system of this large embroidery panel.

CONCLUSIONS

In conclusion, the 2012 treatment described above now represents the last stage of development in this embroidery's lifetime, which began in seventeenth-century China. The influence of European cultural and aesthetic value dramatically affected this Chinese export embroidery's composition and eventually led to the partial replacement of the original material with a painted surface that contrasts with the luxurious and skilful embroidery.
Although further investigation, including an examination of the other two panels in the Museum's collection, is underway, this initial analysis of the smallest details of *The Abduction of Helen* reveals evidence of a monumental combination of Western and Eastern artistic practices.

NOTES

[1] According to Thomas Campbell, from the early fifteenth century, the story of Troy was one of the most popular subjects for monumental European tapestries. (Campbell, 2002, p.24–27) The panel examined in this article is part of a large set of seven hangings. The Museum owns two others in the set (MMA 50.97.2 and 51.152), while four more remain in European collections. Each panel depicts a scene in a narrative sequence, corresponding to the Western tapestry tradition. (Denney, 2012)

[2] From a technical perspective, the use of a twill weaving structure for such a large embroidery panel assures greater strength and flexibility during the textile's suspension.

[3] The second instance would explain the difficulty of finding an example of the armorial bearings depicted on the embroidery panel in any known European family's arms. (Denney, 2012)

[4] For a better description of the embroidery stitches common to Asian practice, see Mellot, 1988.
[5] The composition and structure of the gilt-paper thread was analyzed using SEM-EDS. See the examination report by Dr. Federico Caro, January 30, 2015.

[6] Fragments remain of a stiffening layer of paper underneath remnants of the satin fabric. This finding suggests that embroidery rather than painting was originally planned to fill in these details.

[7] It is interesting to note that the other two embroidery panels from the same set belonging to the Metropolitan show similar characteristics: human features are painted directly on a similar cotton ground fabric and outlined by a satin fabric strip. It is worth highlighting the Western character of these human features: long noses and a moustache on the panel under discussion and on panel MMA 50.97.2 and blue eyes and curled blonde hair on panel MMA 51.152. It should be remembered that from the early sixteenth century, patrons wished to be associated with the heroic or legendary figures depicted on the tapestries they purchased, and that artists therefore tried to make commissioned pieces resemble their future owners (or the owner's self-image). See Campbell, 2002, p.22–27.

[8] On its first examination by Polarized Light Microscope, this sample showed similarities to the morphology of calcium carbonate derived from ground oyster shell (*gofun*), the unique white pigment of Japanese painting. However, further investigation using Scanning Electron Microcopy (SEM) imaging clearly showed the presence of coccoliths as the main component of this natural chalk or calcium carbonate. For a better description of the variety and nature of the calcium carbonate used as white pigment, see Gettens, Fitzhugh and Feller, 1974, p.157–184.

[9] See the examination report by Dr. Elena Basso and Dr. Marco Leona, February 24th, 2015.

[10] The synthetic dye-making industry was founded in 1856 by the young chemist William Henry Perkin, who discovered the artificial dye mauveine.

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conservation challenges in the finnish jabal haroun project excavations in petra, jordan

Keywords:
interdisciplinary collaboration
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camp facilities
conservation

ABSTRACT

The Finnish Jabal Haroun Project is a comprehensive, multidisciplinary program of archaeological investigations in Petra, Jordan, directed by Prof. Jaakko Frösén, University of Helsinki, and sponsored by the Academy of Finland. The participants include archaeologists, conservators and cartographers from Finland, USA, Italy, and Sweden. The project studies the spatial and temporal human occupation in the area of Jabal Harûn throughout the ages, with special emphasis on the extent and nature of occupation at the site recognized as a Byzantine monastery.

Excavations of the area of the monastery, carried out between 1998 and 2013, led to the exposition of a significant pilgrimage centre dedicated to St. Aaron and dated to the 5th - early 8th centuries, built in local sandstone and limestone. The arid climate, the rapid change in temperature, and relative humidity on the site, as well as its elevation (1250 m above sea level), demanded particular care in the choice of the treatments and in their timing. The presence of conservators on site since the beginning of the excavations, their close collaboration with the archaeologists, and the frequent exchange of opinions has proven an extremely valuable and successful experience, essential in keeping interventions to the minimum level necessary to maintain the authenticity of the site. All the conservation work carried out during the excavation was accomplished while carefully considering the different collapses and reconstruction phases, since these are a significant characterization of the history of the complex.

The possibility of studying and monitoring the deterioration processes and the building materials, and the continuous coordination between archaeologists and conservators during the excavation has allowed for an effective collaboration during the fieldwork and in the following study phases, resulting in the preservation of the archaeological context, while operating on the environmental control through minimal intervention in order to preserve the authenticity of the site.

INTRODUCTION

The Finnish Jabal Haroun Project (FJHP) may be considered a successful example of collaboration and cooperation among experienced professionals with different qualifications, university students, and local people. Many archaeological projects propose the interdisciplinary approach along with the involvement of locals when excavating and restoring in foreign countries, following the requirements of the *International guidelines for funding and financial support* (Feilden & Jokilehto, 1998, p. 127-131). However, it is seldom easy to create the right atmosphere among the project's multidisciplinary team and local people, allowing open minded and flexible professional exchanges, which contribute to successful results in the field. Cultural differences, power struggles between different areas of study, and a lack of communication among the team's professionals may hinder the work and create problems that impede the correct progress of the fieldwork. Other factors that may contribute to a problematic interdisciplinary approach on an archaeological excavation may be: difficult living conditions, a hostile environment, and an inadequate organization of the fieldwork.

Although many international projects are planned correctly and are successful in attaining their goals, the human factor is not always considered beyond its professional aspect. The FJHP is one of those rare examples where careful planning of all the aspects, from the organization of the worksite, the selection of appropriate professionals, a good local team, and the comfort of living conditions, have made the endeavor of working on a very difficult and exhausting worksite pleasant and efficient. The project, in its many years of excavation seasons, has not always been "ideal" in that everything went smoothly and without difficulty. Personal and professional issues, as well as extreme climatic conditions, have sometimes led to difficult circumstances; nevertheless, the

1. The excavation site (in the centre) is located on a mountain plateau. The camp can be seen on the left. Photo: Susanna Eklund 2005.

2. The camp and dining area in front, toilet/shower stalls at the back. Photo: Anna Erving 2005.

3. Sleeping quarters. Photo: Anna Erving 2005.

general approach has been extremely positive. The mutual esteem shared among the different professionals and the respectful consideration of the local workmen, the dedication and conscientious enthusiasm of the students, the pleasantness and efficiency of the living quarters together with a positive attitude of all the team members has been key to solving both issues and day to day problems.

The FJHP is a comprehensive, multidisciplinary program of archaeological investigations directed by Prof. Jaakko Frösén, University of Helsinki, and sponsored by the Academy of Finland. The participants include archaeologists, conservators, and cartographers from Finland, USA, Italy, and Sweden. The project has been involved in the excavation of an Early Christian site located at Jabal Haroun (the mountain of the Prophet Aaron) ca. 5 km SW of Petra since 1998, and often referred to as the Biblical Mount Hôr by the early explorers of the area. The location of the Jabal Haroun complex is both spectacular and challenging. The site is located at 1250 m above sea level, with an access route accessible only by humans or donkeys. The provision of supplies and conservation material is thus particularly difficult. However, due to its location in proximity of Petra - the major cultural attraction in Jordan - its spectacular natural setting and the wildlife, Jabal Haroun area is gradually accorded more interest by tourists.

The Finnish project carried out 10 full field seasons between 1998 and 2013, which led to the exposition of a large part of a significant Byzantine monastery/pilgrimage centre dedicated to St. Aaron, existing between later 5th and the 9th/10th centuries (Fiema, 2008, p. 51).

CAMP AND EXCAVATION SITE

Although the site was located in a harsh environment at the top of an arid and windblown plateau, reachable only by foot or donkey, the living quarters were comfortable and the organization efficient. The team lodged under a Bedouin tent ca. 20 m long and 3 m wide, divided by a partition separating the male and female quarters. The beds were folding military camp beds, so that at the end of each season they could be disassembled and placed into storage. The toilet and shower facilities were located at about 15 m from the tent, consisting of a series of stalls made of lightweight glass-reinforced composite tube frames, on which heavy nylon fabric is attached to create partitions, and aluminum-coated nylon fabric for roofs. The toilets were Scandinavian style dry toilets with wooden seats inside the fabric stalls. The whole system could be mounted and dismantled in a day, so that no trace remained in between seasons.

Water was carried to the site by donkeys and used sparingly for all activities, from showers, to dishwashing, to conservation, and pottery washing. It was brought up in 25 l plastic containers and poured into two large tanks, one that serves the kitchen area and the other – the toilet area. The quantity of water for individual use was limited to 1,5 l per person per day and a 5 l shower per week. Bottled drinking water, which was not limited due to the high risk of dehydration, also came with the donkeys.

The kitchen facilities were located in a small stone building adjacent the tent.

Three local people were in charge of the cooking and dishwashing; the food was usually excellent, and the kitchen was kept very clean. At the end of each season, the kitchen became a storage area for beds, bathroom facilities, and excavation equipment. Carpets and small gazebo-like structures, built with the same materials as the bathroom stalls, covered the area in front of the tent. This space, furnished with tables and chairs, was used as a dining area as well as a communal area for studying and documentation. Small tents were used as office space, where computers used by the engineering students and cartographers were also available for reading email. Electricity was provided by two large solar panels, which were used to charge the computers and lamps for the evening.

The excavation site is located circa 30 m from the camp, thus very close to the living quarters. Work at the site was organized by assigning different trenches to students supervised by the senior archaeologists or former students. The chief archaeologist was in charge of the entire site and supervised all the trenches as well as the conservation work. The strict organization at the site, despite its rigid settings, allowed for swift and efficient work, often punctuated by dialogue and confrontation, an important requisite to work well as a team in which each element is an important and equal part of the whole.

CONSERVATION

The presence of a conservation team on an excavation site is not always regarded as necessary, as often conservation is considered the final step in the excavation process, to repair and secure the various structural and decorative elements for the final presentation. Yet, it is extremely important that a conservator be present on site during the excavation, as many elements may be altered, lost, or damaged, if not taken care of from the moment they are exposed. Since rapid chemical and physical reactions occur almost immediately after excavation, it is important that a qualified conservator is present on site to control further decay by slowing down the reaction of materials to environmental factors, providing a gradual exposure of the remains to their new condition. (Stanley Price, 1995, p.1-9)

During the FJHP's excavation seasons, a senior conservator from Rome, Italy, specialized in stone conservation, and two or more Finnish conservators (with different specializations) or conservation students composed the team of conservators. Most of the conservation work carried out during the excavation regarded the stabilization of the exposed architectural structures. First-aid treatment was performed on only the most important and fragile objects. The architectural elements to be treated were chosen according to their condition and the importance of their integrity within the site. Since the function of some of these structures was not yet clear to the archaeologists, it was decided to undertake only temporary and reversible repairs on the masonry and to consolidate the marble floors and what remained of the plaster fragments. (Danielli, 2008, p. 158-163)

Building techniques used at the site were carefully documented: the large sandstone blocks constituting the main walls of the buildings were cemented with a thin layer of mud mortar mixed with sand. During a later phase some walls were rebuilt or re-erected using a lime mortar mixed with sand. The different construction phases

4. Donkey with carrying crates. Photo: Anna Erving 2005.

5. Conservators covering the plastered altar with geotextile. Photo: Susanna Eklund 2005.

used different building techniques and materials, which had to be taken into consideration during the interventions. Due to the difficulty of ordering and transporting chemical products from abroad, preference was given to local materials (sand, clay, lime, and limestone) and traditional techniques.

ENVIRONMENTAL MONITORING AND WEATHERING ANALYSIS

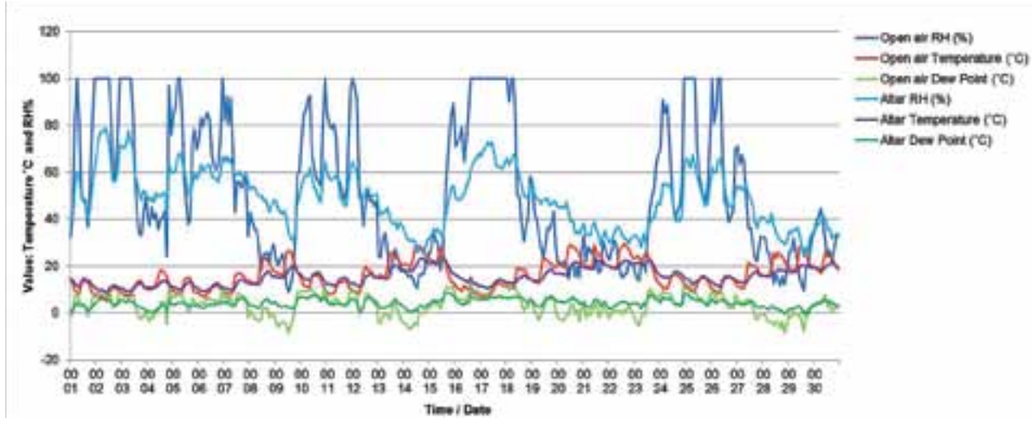
The importance of having a good team and an efficient worksite is that it allows people to concentrate on their work with an open and relaxed mind, open to confrontation. Thus, many subjects were discussed with other team members, allowing for a more in-depth research and the possibility of changing solutions on the site. The arid climate and the rapid change in temperature and relative humidity on the site, as well as its elevation (1250 m above sea level) demanded particular care in the choice of the treatments and in their timing. Traditional conservation procedures and proportions had to be slightly altered and carried out at particular hours of the day. Due to the elevated temperatures (up to 40-45 °C) at midday, all chemical treatments had to be minimal and applied during the late hours of the afternoon. Mortar repairs were applied under a protective shelter, which provided lower temperature and avoided direct sunlight. Metal finds and glass were packed immediately after excavation and kept dry with silica gel to prevent further corrosion.

The difficult climatic conditions also required long and short term monitoring of the site and the masonry. Building elements, such as plaster, stone and mortars, required different types of conservation treatments, which were calibrated following the monitoring phases from year to year. The prolonged periods of inactivity in between excavation seasons were used for the long term monitoring of the site and materials, while several short-term analyses were carried out during the work period on site. The study of the stone weathering was carried out by one of the junior conservators, and also represented the subject for her MA thesis (Eklund, 2008).

Environmental conditions influence not only the chemicals used for conservation, but also the weathering of the building materials at the site. Relative humidity (RH%) and temperature (°C) were first monitored briefly in 1999 with a Vaisala hand-held humidity and temperature meter, primarily to see what chemicals could be used for object conservation (Karakoski, 2001, p. 87). More extensive monitoring was conducted in 2005-2006 to observe the conditions to which the structures are exposed (Eklund, 2008). In September 2013, wind conditions were monitored briefly with a hand-held Skywatch Xplorer 2 anemo-thermometer with the purpose of examining the maximum wind speed values at the site (Putkonen, 2015).

A Hobo Microstation datalogger with two humidity and temperature sensors was used for the monitoring in 2005-2006. The logger and one sensor were placed in a plywood box sheltering a plastered altar and the other sensor was placed in open air, but sheltered from rain and direct sunlight. Climatic conditions vary annually; the data acquired was a sample of the conditions during the measurement period. Comparison of the data to long-term (1984-1998) values from the nearest Wadi Musa Weather Station indicated that the monitored 12 months were not extreme with regards to temperature and generally drier than average with regards to average relative humidity. The altar box proved successful in stabilizing the conditions inside by reducing extreme temperature and humidity variations. (Eklund, 2008, p. 55, 57).

6. The open air sensor of the Hobo datalogger. Photo: Susanna Eklund 2005.



7. April was a month of intense fluctuations. The altar box stabilized the interior conditions and reduced condensation.

Generally, the Middle Eastern year is divided into three seasons with summer extending from mid-June to mid-September, the cooler rainy season – from mid-October to mid-April, and the months in between constituting the transitional seasons (MacDonald, 2001, p. 595). On Jabal Haroun the highest recorded temperature was 35,70 ˚C in August and the lowest – 0,29˚C in February. September, March, and April were months of intense fluctuation between warm, dry periods and cooler, more humid periods. On a daily scale, the lowest temperatures usually occurred between 12am and 8am and the highest occurred between 12pm and 6pm. Dew and fog water are two important sources of moisture for stone weathering. Dew events on Jabal Haroun took place 1-12 days per month in January, February, March, April, and July, and the duration of the events varied from approximately 1 hour to 70 hours. During the longer events, clouds surrounded the mountain for several days, probably. (Eklund, 2008, p. 50-54, 57-58).

Strong winds can be observed regularly on Jabal Haroun, especially in the afternoons and evenings. Wind erosion takes place when strong winds carrying sand remove the outer surface of sandstone that has already disintegrated due to salt crystallization or other weathering processes (Barjous and Jaser, 1992, p. 27). Wind conditions have to be considered when planning possible shelters for the site. Wind measurements in September 2013 recorded that the average wind speed could reach up to 12 m/s with peak gusts being up to 17 m/s. The measurements were taken in open ground. (Putkonen, 2015).

Salt weathering is recognized to be a problem, especially in areas with large and frequent cycling of temperature and humidity or strong evaporation (Goudie and Viles, 1997, p. 89-90) such as Jabal Haroun. Salt samples were taken from locations displaying visible and large amounts of salt spikes and/or crystals. The different locations had been exposed for different lengths of time. The salt analysis showed that the structures contain a variety of salts and that potential salt combinations may include ones which have been found by earlier research to be very aggressive.

The climate measurements confirmed that the variation in temperature and humidity is large and frequent enough to enable severe damaging processes caused by salts, especially in stones whose lithological properties make them sensitive to salt weathering. (Eklund, 2008, p. 59-74, 80).

CONCLUSIONS

The work on Jabal Haroun has been a great challenge and a valuable experience in testing the local materials and their strength, and, with the help of long term monitoring of the site, it has given the conservators the possibility to improve the type of interventions with a better understanding of the climatic variations and the resistance of the materials as well as their proportion in the various treatments employed on the site. The many issues that originated during the work, the productive open discussions among the participants, and the respectful consideration given to the different building phases of the complex have allowed the preservation and protection of the authenticity of the site by employing minimum intervention techniques and constant monitoring. However, many issues still remain to be solved. At present, the archaeological remains are still exposed, and although a conservation plan and a shelter project have been developed for the final presentation, financial support for the final conservation or backfilling of the site has not yet been granted. Urgent intervention is needed in order not to forsake the work carried out in the past years. Although the difficulties involved in reaching Jabal Haroun would not allow for mass tourism as in the Petra centre, the archaeological remains should be protected and organized by a management plan that would ensure the proper final conservation and sheltering of the site.

The significance of this project cannot be underestimated, in terms of the historical and cultural ramifications, the scholarly value of the investigation, and its potential for the tourist development of the Petra area. The site also holds special religious significance. According to the Jewish, Christian, and Muslim traditions, the mountain is considered to be the place of burial of Moses' brother Aaron. The excavated complex provides a unique opportunity to fully study and interpret a complete monastic establishment in terms of its architecture, phases of development, daily life economy and activities, and its overall significance in the perspective of the rise of Christianity not only in Jordan, but also in the entire Middle East. The area associated with the major tradition of the Biblical narrative was already recognized as such in antiquity and accorded special importance in terms of pilgrimage traffic, the traces of which were already recognized in the archaeological fieldwork. Notably, the sanctity of the place continued to attract the pilgrimage traffic, whether Christian, Jewish, or Muslim, in the Medieval period as well and it continued in recent times.

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Pieta Greaves & Chris Fern

The Staffordshire hoard: a monumental Anglo-Saxon hoard

Keywords:
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ABSTRACT

The Staffordshire Hoard was discovered in 2009 by a metal detectorist; it is the most important and high-profile Anglo-Saxon archaeological discovery since Sutton Hoo.

The hoard is undergoing one of the largest artefact research programs in England, a programme which will continue for another three years. The team has been conserving and conducting scientific analyses on the finds at Birmingham Museum and Art Gallery and at the British Museum. The research programme also draws on many Anglo-Saxon experts from across the UK and Europe to place the hoard objects in the broadest possible social and political context.

This paper will seek to show how the programme has started delivering results in collaboration with multiple stakeholders, such as Historic England (formally English Heritage), Birmingham and Stoke City Councils, Anglo-Saxon academics, conservation and science specialists and the public at large.

INTRODUCTION

The Staffordshire hoard is a truly monumental treasure, being the largest find of Anglo-Saxon gold, garnet and silver metalwork ever made. Not since the discovery in 1939 of the Sutton Hoo ship-burial in Suffolk, has our understanding of 7th century England been so transformed (Bruce-Mitford,1975, 1978 and 1983). The hoard was found in July 2009 by a metal detectorist in the Parish of Hammerwich (Fig. 1), north of Birmingham. It had been scattered by ploughing, and if it was originally in a pit, no trace remained when the site was excavated shortly afterwards (Dean *et al*. 2010, p.144). Many hundreds of items are represented by it's over 3800 objects/ fragments, some 5 kg gold and around 1.5 kg silver.

Most objects are fittings from the hilts of bladed weapons, i.e. swords and seaxes (fighting knives), though there are also remains from at least one helmet and a small, but a significant group of overtly Christian objects. It is possible the material was accrued from battle loot over a period of decades (Fig. 2).

The 7th century was a crucial period in England's history that saw the formation of multiple regional kingdoms, still remembered today in the names of counties and modern organisations, including Kent, East Anglia, Mercia and Northumbria. At the same time, the pagan Anglo-Saxons were gradually converted to Christianity. Warfare between competing regions was frequent. Yet, out of this turbulent age came exceptional objects, as the hoard now above all testifies — echoing the vast riches described in the famous Anglo-Saxon poem *Beowulf.*

DISCOVERY AND ACQUISITION

The discovery of the Staffordshire Hoard made headline news around the world when it was announced in September 2009. It was clear the find had captured the public's attention in a way very few archaeological stories do. The initial public reaction to the acquisition process is worth outlining because it illustrates how powerful a response a historic find can generate, at both an international and regional level.

After the discovery (Fig. 3), the finder contacted the Portable Antiquities Scheme, who notified the Coroner, as required by English Law, who formally declared it to be "Treasure" (Lewis, 2010). Treasure cases are valued by an independent committee and a public institution wishing to acquire the items has a defined period of time to raise the purchase price (which is shared by the finder and the landowner). The hoard was valued at £3.285 million, making it the UK's largest ever treasure case to that point, and a significant fundraising challenge.

Birmingham Museums Trust (BMT) and the Potteries Museum & Art Gallery, Stoke-on-Trent (PMAG), on behalf of their respective city councils, decided to acquire the collection. Public demand played a significant role in this decision. Part of the hoard had been placed on display at Birmingham Museum and Art Gallery (BMAG) prior to the valu-

1. Hoard Location Map.
Photo: ©Birmingham Museums Trust'.

2. Hoard grouped together.
Photo: ©Birmingham Museums Trust'.

3. Hoard object before conservation. Photo: ©Birmingham Museums Trust'.

ation, and 42,000 people had visited in just 19 days. Comparing these numbers to planned exhibition visitor figures for 2010 would place the hoard fifth in daily figures for antiquities exhibitions worldwide that year- and the top UK attraction (Pes and Sharpe, 2011).

These exhibition figures strongly indicated the power of the collection to generate a direct response from the public. Visitors were drawn from both national and international sources, but overwhelmingly, they visited from the local West Midlands region, with individuals identifying a strong sense of local pride and "ownership" in the hoard (Cane, D., Cane, S. and Greaves, 2014). It was thus considered appropriate that the collection should remain within the region, rather than going to a national institution.

The decision to acquire the hoard by two separate museums reflected the specific circumstances of the find spot. The hoard was discovered inside the modern administrative county of Staffordshire, but only a few hundred metres outside the boundary of the metropolitan West Midlands area, which includes the city of Birmingham. The regional archaeological collecting museum for Staffordshire is the Potteries Museum & Art Gallery, Stoke-on-Trent, but the Portable Antiquities Scheme is based at Birmingham Museum and Art Gallery, which has a specialist conservation department. Both lie within the historic Anglo-Saxon Mercian region. Thus, public interest and sense of "ownership" crossed modern administrative boundaries and created a constituency of its own for the hoard from the start.

The extraordinary sum required to acquire the collection was raised in just three months, with substantial support from the National Heritage Memorial Fund and the Art Fund, and with the UK's largest ever public giving campaign (Leahy & Bland 2009).

ARCHAEOLOGICAL CONTEXT OF THE HOARD

The early 7th century was a period of turbulence and change, during which England's many regional kingdoms were locked in warfare, against a background of religious conversion (from paganism) to Christianity. In particular, the hoard will tell us about the formation, character and contacts at the time of the Anglo-Saxon kingdom of Mercia, within which territory it had been buried in, beside the old Roman Watling Street (a major route way in the period). But what Anglo-Saxon England's richest find actually signifies is a mystery. A concealed royal treasure or offering to pagan gods are just two suggestions (e.g. Behr 2010; Périn 2011).

Almost all the objects had been damaged before burial. For example, the sword fittings appear to have been crudely, but systematically, stripped from their weapons (the iron blades being excluded). The condition of the material is crucial to its interpretation. Other items, including Christian objects, seem possibly to have suffered iconoclastic damage. Nevertheless, whether by ritual or profane action, the overwhelming

impression is of a collection of bullion. The Mercian kingdom is a mysterious place: historical, archaeological and modern administrative quirks have combined to make it less "visible" to us than its neighbours. We know that by 655 AD, when King Penda was slain at the battle of Winwaed, Mercia was already an aggressive and expansionist military power that would come to dominate England in the centuries ahead. But the evidence for the formative period of this important Anglo-Saxon kingdom is sparse, and that is why the hoard is such an important and unique collection.

Although found in the Mercian heartland, it seems likely that most, if not all of the hoard, was likely made elsewhere in England in other Anglo-Saxon kingdoms. One or two of the artefacts may be from North Germany or Scandinavia. But all of the objects represent the elite strata of early medieval society and perhaps some of them would even have been worn by members of a royal household. The rarity and status of these objects would ensure that even in an illiterate society the wearer could be easily identified as a person of importance or power.

The few Christian pieces (Fig. 4) within the hoard shed light on a transitional period when Pagan traditions were coming to an end and Christian practice adopted.

The objects display decorative techniques of the highest quality, comparable to Sutton Hoo, many have no direct parallels either in the UK or Europe and their precise use or function is unclear. There are no iron and only a few copper alloy items within the hoard. The precious metal hilt fittings had been stripped from the swords and knives, and no blades remain. Many of the other items that might be expected to form part of a warrior's battle kit are missing from the collection. There are no horse fittings, and only three tiny buckles - nothing to parallel the great buckle from Sutton Hoo, and nowhere near the number of strap ends and buckle fastenings that 85 swords might suggest. There are no female dress fittings and accessories.

4. Great gold cross. Photo: ©Birmingham Museums Trust'.

5. Filigree hilt collar during conservation. Photo: ©Birmingham Museums Trust'.

THE ROLE OF THE CONSERVATION PROGRAMME

The narrative of discovery and engagement with the process of learning about the hoard is central to its appeal. Encouraging this aspect of public interest was identified as a priority by the owners early on, and the conservation programme was recognised as a key way to deliver this narrative within the wider programme.

In many cases, an initial spike of public interest in a find risks being dissipated whilst it disappears "behind closed doors" for a research programme, before emerging for display, often years later. In the case of the Staffordshire Hoard, the owners were committed to public display of the collection throughout the research and conservation process, at not one, but four venues.

BMT leads the conservation programme for the hoard because it has an established conservation department. The primary investigative conservation programme was conducted 2010-2013, and a second stage of conservation continues at the time of writing (Cool, 2011; Cane, S., 2010). Alongside cleaning as conserving the materials (Fig. 5), the team took a highly innovative, open and collegiate approach to conservation. It has successfully engaged both conservation professionals and public audiences, and has delivered an extraordinary range of activities over a short time period (Fig. 6), raising the conservation profile in the UK public domain and beyond (Cane, D., Cane, S. and Greaves, 2014).

A strong hoard presence was created on social media (Facebook, Twitter, Youtube) and via a dedicated website, to allow the public to follow the progress of the hoard conservation programme. Conservation plays a central role in creating a "behind the scenes" feeling of participation to the public output of the project, and delivering new and developing information about the collection. Wider engagement has been created through a programme of talks, studio tours, open days, written and video blogs were launched by the conservation team to create a supportive public community of interest.

The positive benefit of this social media approach was a large audience without many start-up costs and an existing audience already familiar with the platforms in use.

Further to the outreach programme, a collegiate conservation programme was also put into place. The aim of the collegiate conservation programme was to allow the project to be as inclusive as possible and to maintain the professional interest already generated by the discovery. Between 2010 and 2013, there were 14 professional, 27 student and 10 non-specialist placements participated in both the hands-on conservation programme and the public engagement programme. The placement programme proved very successful in attracting participants for the professional and student placements from Germany, Canada, Holland, Greece the USA as well as the UK.

6. Conservation in the museum galleries. Photo: ©Birmingham Museums Trust'.

The professional placement participants were able to experience working on the hoard objects while sharing their conservation experience with the Hoard team, the conservation students and the non-specialists, creating a vibrant learning environment where everyone could openly discuss ideas. The conservation students gained confidence in helping the non-specialists by using their knowledge to demonstrate such as how one handles tools, the ethics of conservation and how one approaches the treatment of an object, all under the guidance of member of the full-time team. Non-specialists came from the National Heritage Ironwork Group (NHIG). The NHIG students consisted of professional and trainee blacksmiths, who learnt about conservation on the micro scale, in comparison to the large objects and restoration techniques that they practice as part of their degree. Working under microscopes allowed an exchange of knowledge relating to treatment of metals, types of tools and the working of metals once again created an invigorating cross-disciplinary debate within different disciplines of the heritage sector. In particular often the discussion on restoration vs conservation and the line between the two.

All the placements participated in public tours, social media and on occasion were part of the team used in the filming of the conservation process for National Geographic, Time Team (an archaeological programme show on channel 4, UK), Country File (BBC) and local and national news teams.

COLLABORATIONS

The main funding collaboration was with National Geographic, which supported the conservation programme with £150,000, and with Historic England being a main partner and funder of research programme to a level of £400,000.

Partnerships have been established with the British Museum Department of Conservation and Scientific Research, where the hoard project has benefitted from the expertise of the conservation and research departments and the Centre de Recherche et de Restauration des Musées de la France (C2RMF) research laboratory at the Louvre through the EU funded CHARISMA programme. Both institutions hold important collections of comparable material to the hoard, these collaborations have facilitated the exchange of expertise and scientific data, and helped establish the conservation and research project in its wider context.

The conservation programme has also forged long-term academic partnerships with Birmingham University and Birmingham City University, relating to the use of scanning and digital technology to interpret the hoard. This cross-disciplinary dialogue is particularly important for a collection like the Staffordshire Hoard, where the debate about the manufacturing techniques and the objects' function is ongoing. Links with Anglo-Saxon re-enactors, such as the 7th-century specialists, Wulfheodenas, who make and use replica artefacts, likewise bring new perspectives to the collection and its conservation.

The wider project has also created a long-term partnership with local government organizations and historic sites across the region. Known as the Staffordshire Hoard Trail, the aim of the partnership is to generate longer-term social and economic benefits for the region by building on high levels of public interest in the find and the broader Mercian past of the area. The partnership brings together BMAG, PMAG, Lichfield Cathedral, Lichfield District Council, Tamworth Borough Council and Staffordshire County Council. Their vision is to position the region as the heartland of Anglo-Saxon England through the creation of a permanent visitor trail, with each location telling a different part of the Mercian story. This will be done through permanent galleries and local displays about the hoard, the Kingdom of Mercia, and the region's rich Anglo-Saxon heritage, to inspire local, national and international audiences. Continued public profile, largely created by the conservation outreach programme, is the key to the success of the trail.

CONCLUSION

The Staffordshire Hoard is undoubtedly a monumental collection with exceptional public draw. However, the strategy implemented by the owners and their partners to create a publicly engaged, inclusive and collegiate conservation programme can provide a broad model for heritage collections of many types. The model stems from the initial commitment to prioritize public interest by maintaining exhibitions and engaging a community of interest with the accompanying conservation programme. This approach has reaped huge benefits for the collection, the research programme and the discipline itself, due to the public facing.

The conservation and research that has already taken place has delivered astonishing results in understanding the collection and how it fits into our knowledge of the 7th century. But there is still much more to do: more stories, information and understanding that can be extracted from the collection. To take one example, the continued piecing together of the thousands of fragments of silver foil that form a helmet, has the potential to reveal a new corpus of data that informs us about wider aspects of Anglo-Saxon life – dress, weaponry, animals, beliefs, mythology, craft techniques, international influences, politics and even humour through their art. The hoard will never be "solved", but that is a positive thing, not a disadvantage. It is such a rich resource that new research will always be able to draw out new stories about the mysterious, but powerful Mercian Kingdom.

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HOARD WEB SITES

http://www.facebook.com/staffordshirehoard
http://twitter.com/staffshoard
http://www.youtube.com/BirminghamMAG
http://www.staffordshirehoard.org.uk

Conny Hansen & Kim Hou Alberdi & Birgitte Larsen

out of darkness - investigations of three large scale renaissance epitaphs

Keywords:
epitaph
polychromy
inventory
conservation
paint research
wood construction
carving technique

ABSTRACT

In 2014, the National Museum of Denmark carried out the conservation of seven 17th century epitaphs from the Cathedral of Elsinore, Denmark. The gigantic task was completed within 10 months; a monumental project that called for 16 conservators from four different material areas.

As the conservation progressed, a special group of three epitaphs was realized to be in extremely good condition, of very high quality and hardly ever touched. This woke our curiosity to examine them to gather knowledge on the technology and material usage, craftsmanship and workshops, especially Statius Otto (Rydbeck & Paulsson, 1915) and the "Oresunds group" (Norn, 1960) and the wealthy people who had commissioned these outstanding epitaphs for their eternal commemoration. The conservation left us with a wide range of samples, analytical photographs and multiple technological observations. The next step is to process the data to broaden our knowledge on first class craftsmanship of the 17th century.

1. *Dismounting Frederik Leiels epitaph, Elsinor Cathedral. After conservation. Photo: Roberto Fortuna, The Nationalmuseum*

2. *Frederik Leils epitaph in Elsinor Cathedral, after conservation. Photo: Roberto Fortuna, The Nationalmuseum*

INTRODUCTION

In 2014, the National Museum of Denmark carried out the conservation of seven epitaphs from the Cathedral of Sct. Olai in Elsinore, Denmark. The epitaphs' monumental sizes ranged between H. 8 m x W.5 m. and H.5 m. x W.3 m.

As the conservation progressed and the true state and appearance of three of the epitaphs was revealed, we realized that we were in the midst of a monumental treasure. The rareness of the epitaphs' pristine state was confirmed by conservator Karin Vestergaard Kristiansen, who was finishing her Ph.D. on the subject: "The colour history of Danish church furniture" (Kristiansen, 2014) recording the last 500 years changing color schemes in churches. She had noticed that only a few percent of 17th century polychromy is untouched and with great variation in quality, and made us aware of the obvious reason for further investigation of the Sct. Olai epitaphs.

The large scale epitaphs conduct outstanding craftsmanship carried out by a group of painters, joiners, turners and carvers - in literature nicknamed the "Oresund group", a group of skilled craftsmen producing inventory in north Zealand and south Sweden. We realized the unique possibility to gather knowledge on the manufacturing of high quality polychromy and woodwork of the early 17th Century.

It definitely became 10 months of intense conservation, treating the many different materials of the seven epitaphs. Restoring epitaphs of this scale, normally placed unapproachably high above the floor, demands great focus on extracting as much information as possible and gathering samples and recordings, when they were accessible. Quite a challenge when four other large scale epitaphs have to be treated within the same limited period of time.

DESCRIPTION OF AN EPITAPH

Epitaf(ium), commemorate inscription on a tomb or burial inscription about a person buried on site, often formed as a wall monument decorated with sculptures or paintings. In old times, the term was also used as a term for an elegy or the tombstone alone. (Natmus.dk)

THE DECEASED

The three epitaphs were commissioned by Elsinore's prominent people to serve the purpose of bringing the deceased and his family closer to God as "an ornamental beautification of the church in the honor of God ". It is obvious that the memorial works in this scale were only possible by the society´s upper class financing. Being a tax collector in Elsinore was a top position serving under King Frederik the 2nd.

The commissioners of the epitaphs were:
Tax collector David Hansen, dead 1599. Epitaph manufactured and placed in the church in 1599.

Tax collector Frederik Leil, dead 1601. Epitaph manufactured and placed in the church in 1601-1606.

Tax collector Hans Meier, dead 1602. Epitaph manufactured and placed in the church in 1602-1604.

SOUND DUES IN ELSINORE 1559

In 1559, the Danish kingdom consisted of Denmark, Norway and southern Sweden (Skåne, Halland and Blekinge), which meant full Danish control of these land areas and the sea in between. The Sound Due launched by king Erik of Pomerania (1382-1459) was exploited by the Danish crown for centuries and accumulated great wealth paid by the ships passing through Oresund. Due to the geographical advantage with the narrow strait, the tax payment office was situated in Elsinore, collecting the Sound Due from ships in transit to Sweden, Balticum, Finland, Russia and Germany. Not only the king profited from the wealth from the Sound Due, but also the officials, and Elsinore grew fast in population and in 1559, it was the second largest city in Denmark with a wealthy and powerful upper class. Therefore, the tax collectors had some of the most spectacular epitaphs commissioned to mark their position in the earthly life, formed in due respect to the church seeking an afterlife above.

CONSERVATION 2014

The overall purpose of the conservation was to clean and consolidate the polychromy of the epitaphs as well as to stabilize the wooden constructions and carvings.

Initially, archival investigations were made to determine previous treatments, but not much had been documented. Only minor repairs were mentioned in connection with the damage on the building or the redecoration of the interior. Documentation of the conservation and repair history of the inventory was not a practice in Denmark before 1908 (Mollerup, 1908), so only little archival information was recovered. Our curiosity for "the true condition" of the epitaphs grew as the main observations on the condition had been executed from the floor or from a ladder.

ORIGINALITY

Already during the dismounting of the epitaphs, it became obvious that the mounting was original and few parts had been dismounted at earlier stages. In the workshop, further investigations of paint layers and wooden constructions confirmed the originality of the epitaphs. Most surprisingly, 95% of their constructions had never been touched or treated during their 400 years! Only 5% on these epitaphs seem to have undergone minor repairs or retouchings, apparently all carried out as repairs due

3. *Elegantly decorated textiles on skillful carving. After conservation. Frederik Leils epitaph. Photo: Lise Johansson, The Nationalmuseum*

4. Woodstudies show that columns,angelwings and hang piece are made from the same wood. During conservation. Frederik Leils epitaph. Photo: Kim Hou Alberdi.
5. Skillful carving underlining facial details. Frederik Leils epitaph. After conservation. Photo: Roberto Fortuna.

to architectural damage in the immediate vicinity. In general, most Danish church inventory has been redecorated several times during the centuries, so the almost untouched state of the three Renaissance epitaphs reassured us on their rare condition and them as a source to knowledge of the period.

EXCLUSIVE RENAISSANCE EPITAPHS

After having worked our way down through centuries of thick layers of dirt, the first view of the well preserved and colourful 17th century polychromy surfaced.

The expression of the polychromy was extremely detailed, which was obvious on the figures that had many fine facial features and elegantly decorated textiles. (Fig. 3).The precise and elegant colouring of the details showed that the painting had been carried out by extremely skilled craftsmen.

The paint layers' binding media seems to be tempera, and the colour scheme appears bright and with contrast in black, red, light red, green, light green, blue, gold and silver. Generally, the black colour is arranged as a dark frame, with bright colouring painted on the various carvings as a special effect on minor details. The epitaphs' colour scheme closely follows the results gathered by Karin Vestergaard Kristiansen in her thesis..

METHOD

A general plan for collecting material to be analysed was made, and the polychromy, the wooden construction and the carvings were chosen as areas of special interest.

The main goals for the cabinet makers were to register tool marks, to detect the origin of the wood and its dating, as well as studying the construction, joinery

and carvings in general to get wiser in the field of early Renaissance inventory. (Fig. 4 & 5). Another area of interest was to look for similarities or deviations to test the claim of the involvement of the Oresunds group. The polychromy conservators divided the painted areas into the framework of the epitaphs and the central panel paintings. On all three epitaphs' framework, pigment samples that represented organic colours were taken manually, whereas all the inorganic colours were analysed by XRF diffraction. Complementary samples for cross sections were gathered to identify paint layer structures, their composition and working methods. As few samples as possible were collected from the panel paintings. This was supplemented with analytical photographical exposures carried out as x-ray and infrared recordings to document any underlinings, penti menti and painting techniques. (Fig. 6).

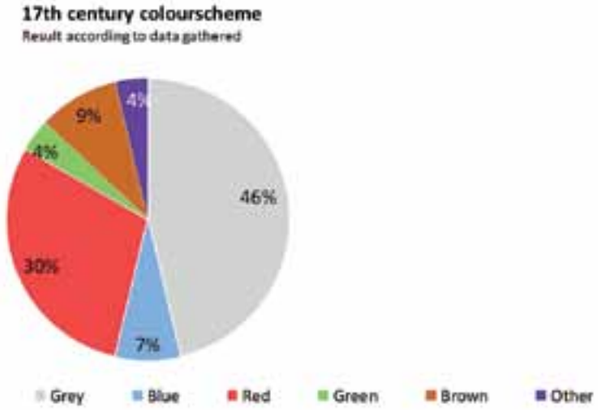
RESULTS

Our many observations during the conservation resulted in a versatile and complex picture of the Renaissance workshops and craftsmen who had manufactured the overwhelming high quality inventory within seven years.

The amount and level of details in all the epitaphs shows their skilfulness in carving methods, joinery as well as the painting techniques. Ornamental elaborations on all three epitaphs, that were only visible on close hold, were surprisingly overwhelming and extravagant in details. Painted areas decorated as feathers and subtle facial expressions with the outlining of eyes, mouth and hands were recorded, not to mention the variation of textiles that were carried out with high precision, elegantly following the carvings representing heavy brocades or light linen. The outstanding carvings of all the decorations and figures were elaborated and completed to make an impression of elegance and a finish that is rarely seen in this period in Denmark.

6. Paneau painting, Hans Meier, after conservation. After conservation. Photo: Roberto Fortuna.

7. Uncovered intarsia made by local workshop, David Hansen, After conservation. Photo: Lise Johansson.



8. Appearance frequency of five colours in the 17th century due to the material collected. Outlined in percentage related to the total amount of colour information. Kristiansen, Karin Vestergaard, (2014)Danish church interiors, research into colour change,and knowledge of colour history, material used from the Antiquari and Topografic archive at the Nationalmuseum of Denmark,p.217, (in Danish)

A decorative style with fine and typical intarsia represented in several churches on Zeeland was found on David Hansen's epitaph. (Fig. 7). This indicates that local craftsmen were also engaged in the manufacturing of the monumental epitaphs.

So far, we are at the start of a monumental journey into the investigation of the production of Renaissance inventories, which hopefully will reveal an understanding of the time, its craftsmanship and the way of working. The observations and material gathered gives us a picture of a group of very skilled craftsmen, who perhaps might have been engaged in royal context. But local craftsmen have also been involved, which was revealed by special carvings and decorative techniques comparable and duplicated on inventory in other churches on Zeeland. These and many other questions on materials and methodology will be followed up and attempted to answer in the upcoming research project.

CONCLUSION

Due to our many observations on the unique qualities of the epitaphs, we want to expand our knowledge on Renaissance polychromy and the technology of woodwork – a field where little has been documented on the craftsmanship as well as on the materials and methods. The next step is to outline a research project on a thorough analysis of the samples, data and information collected during the conservation. The polychromy will be analysed by colour samples, by analytical infrared and x-ray photos and by X-ray diffraction analysis of the inorganic pigments. The wood will be examined by dendrochronology and the constructions; methods of the joinery and carving techniques will be studied. The combined results will facilitate a profound understanding of the craftsmanship in the Renaissance.

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X-ray fluorescence (XRF) is the emission of characteristic fluorescent. X-rays from a material and is used, to identify inorganic pigments.

Anna Henningsson

discovering the meaning and the making of a baroque altarpiece during tunnelling work

Keywords:
documentation
baroque altarpiece
Burchard Precht
technical art history
forensic investigation
conservation management

ABSTRACT

This paper presents an investigative approach for a baroque altarpiece and how it is used as a primary investigation source. This artwork was originally designed for Uppsala Cathedral between 1725 and 1731. An extensive tunneling project under its current location led to the altarpiece being investigated for the very first time. The investigation was carried out leveraging a set of methods and complementing expert competencies. The interdisciplinary *in situ* examination revealed that it is a sophisticated modular system of wooden boxes locked with a wedge system. Treatments of the altar construction during the 20th century were repeatedly done without an understanding of and respect for the original construction scheme and baroque craftsmanship. Unfortunately, interdisciplinary investigations of building-related art in Sweden are still seldom carried out for informed conservation decisions. This reinforces that it is time to change the treatment-focused approaches in the Swedish conservation process and adapt an investigative and reflective approach.

1. Frontal view of the altarpiece in Gustaf Vasa church in 2007. Photo: Fokus GmbH Leipzig.

2. The concave-shaped ground form of the altarpiece. Photo: Fokus GmbH Leipzig.

INTRODUCTION

This paper elaborates on experiences from an interdisciplinary investigation of the altarpiece in Gustaf Vasa Church in Stockholm. The paper highlights an investigative approach using the materials and construction of an altarpiece as the primary investigation source. Beside this, the paper discusses specific management aspects in interdisciplinary investigations related to artefact studies and conservation.

The construction and materials used in Sweden's largest baroque altarpiece have been unknown for almost 280 years. During an extensive tunneling project under Gustaf Vasa church, the altarpiece was investigated for the first time ever. Unfortunately, little archive material was available and could not provide any facts about the construction and materials used in the altar over time. Beyond this, treatments on the altar have been undertaken during the 20th century, but no conservation reports were available. This limited state of documentation complicated the condition statement of the altarpiece as well as the risk assessment related to the tunneling work under the church.

As a result, an interdisciplinary team of conservators, engineers, art historians, wood craftsmen and vibration experts had to examine the altar *in situ* from the inside and outside.

The assignment was to identify, evaluate and, if needed, mitigate risks related to the altarpiece during the tunneling work. This was achieved by tracing how it was originally constructed, to which extent alterations have been carried out and how these have had an impact on its current state of preservation.

THE ALTARPIECE

The altarpiece is a three-dimensional free-standing construction, accessible from both the inside and the outside. The construction is substantially self-contained with a considerable size of approx. 15,5 x 10,0 x 4,5 meters. This structure also includes two sculpture groups, situated in front of the main construction.

The lowest architectural parts, base and the overlying predella are placed in a concave segment-shaped form, which contributes to the depth effect. The altarpiece is created through an interaction of different materials such as wood, stucco and paint. Together this conveys an image of perspective and illusionary effects.

The altar base is fronted with an altar table and above this is a stucco relief depicting the Last Supper. The columns and pilasters rest on the predella, framing the scene of the Crucifixion accompanied by Mary and John in the aedicula of the architecture. Behind the Crucifixion, directly on the choir wall, is a scene of Holy Jerusalem. The upper part of the altar depicts the Holy Spirit through a dove in a stucco cloud surrounded by putti and light rays.

This baroque artwork was originally designed for Uppsala Cathedral by the court sculptor Burchard Precht's workshop between 1725 and 1731 (Rossholm Lagerlöf, 2007, p.191). Around 1885, the altar was considered improper in the gothic Cathedral in Uppsala and was dismantled, followed by fifteen years of storage under bad circumstances in Nordiska Museet, Stockholm. In 1905, it finally got a new place in Stockholm in the neo-baroque church Gustaf Vasa. Its history of reception makes it even more significant. The altarpiece represents one of the most significant sacred baroque art works in Scandinavia.

METHODS

As no documentation and archival sources were available, a forensic [1] approach was applied, i.e., the altar material itself served as the primary source. This approach was necessary to understand the original construction scheme as well as the extent of and causes for alterations. The findings regarding the original construction were captured separately from later alterations. The execution process of the altar parts was traced through using endoscopes, site microscopes, ultra velocity measurements and multispectral imaging. Besides this, methods such as photogrammetry, stereo-photographing, calculation of weight, monitoring and movement measurements of the altar structure were used and played an important role for the outcome.

By leveraging dialogue and structured thinking methods, the findings could be set in a cause and effect relationship. This dialogue between the involved experts was based on convergence and divergence thinking (Thompson, Brajkovich 2003, p.98-99). The dialogues connected to this investigation involved different experts in the field of conservation as well as mechanical engineers and vibration experts.

NEW QUESTIONS – NEW THINKING

The construction scheme of the altarpiece is a complex system. A uniform and structured investigation is essential for efficiently capturing and critically interpreting findings. A pre-condition for this is to first depict the altar systematically from its different sides, angles and views through photo documentation with both a mid-format camera and a photometric camera. Based on this, an initial understanding of its shape and dimensions could be reached. Photographs and drawings became the base map for tracing and evaluating the construction, materials used and alterations.
For the assessment of risks, it is essential to have evidence-based facts regarding the altarpiece´s supporting system, attachment of the decorative features and their meaning. For risk mitigation, it was important to understand the causes of the current condition in relation to former treatments.

Usually, conservators become involved in interdisciplinary teams due to the need of remedial conservation. In this case, the aim was different – to ensure that the altarpiece maintains its current status through a preventive approach focusing on indirect measurements. A new way of thinking was needed for the conservators in the team. The project-integrated dialogues based on convergence and divergence thinking were a very important aspect to manage the team and the stakeholders in a relevant and efficient way.

THE CONSTRUCTION

WOOD CONSTRUCTION

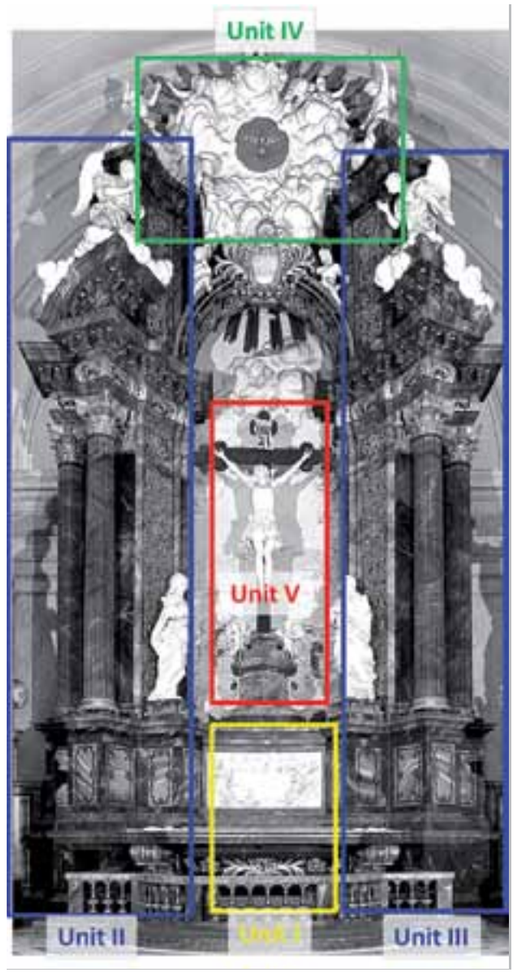
The altar consists of a system of units built up of modules. Each module consists of wooden boxes in a frame and filling system. Unit I is located in the middle of the base and predella, between unit II and III. Unit I carries the cross construction (unit V). This module is a frame construction in a vertical and a horizontal direction with an upper and lower section.

Unit II and III are the two main parts in the architecture, framing the scene of the Crucifixion as well as carrying the arch. These central units are self-contained and built-up in a concave shape by modules placed beside and above each other to reach the height of approx. 14 meters. The modules have probably been manufactured in a workshop and transported into the church. At the site, the modules were positioned and

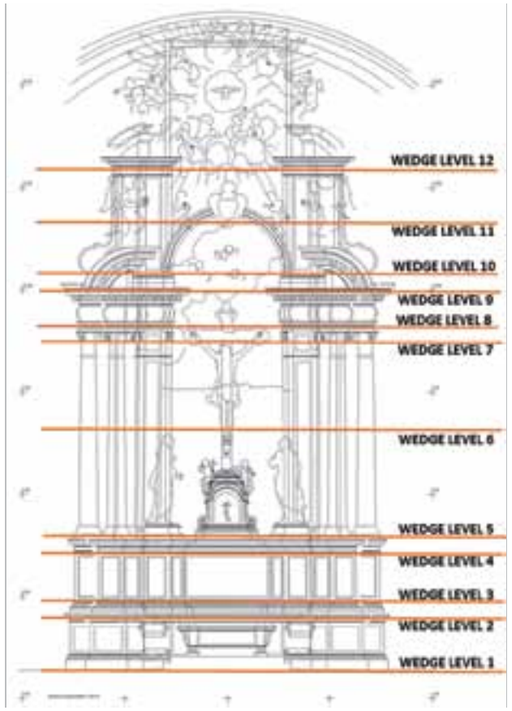
finally horizontally stabilized in a locking system through wedge units with a frame made of pine and wedges made of oak. According to the baroque tradition of craftsmanship, these locking systems with wedge units were originally located in the top and bottom of all modules.

Each of unit II and III in the altarpiece consists of seven wooden box modules (in height) locked together through 13 horizontal frame systems by a keyed mortise and tenon joint. Units II and III are aesthetically tied together by the arch, but without any real constructive function or unifying effect due to alterations in the original construction during the 20th century. The undertaken survey discovered a preserved locking construction of frames and wedges on 13 levels over the height of the altar units II and III. This means that there must have been seven levels of wooden modules in a vertical direction available to create the height of unit II and III. Further, this led to the need of about 38 box modules for these central units in the structure.

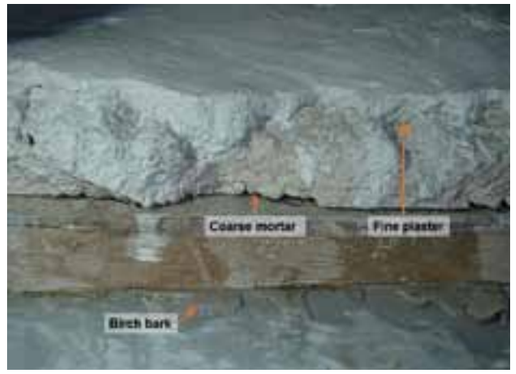
The upper part of the altarpiece, unit IV, is a cloud of stucco mounted on a wooden framing system. This unit is the only unit in the construction that is connected to the wall and carried by the masonry through four iron beams. The stucco cloud is applied by freehand modelling and built-up of different plaster layers to achieve its shape. The surface character of the putti figure in the cloud suggests that parts have been



3. The location of the five constructive units of the altar structure. Photo: Fokus GmbH Leipzig.



4. The location of the wedge levels in the modules. Photogrammetric drawing: Fokus GmbH Leipzig.



5. Layers of mortar, plaster and birch bark used in the creation of the stucco elements. Photo: Anna Henningsson.

6. Details of original preserved paint of a marble imitation on the back side of the altar. Photo: Anna Henningsson.

pre-cast in molds and then fitted into the cloud. After that, details were added by freehand modelling.

Unit V, the cross with a figure of Christ in stucco, is resting on unit I.

WOOD DETAILS

The four columns as well as their decorative features were created in a modular system. The column shaft is hollow and consists of six pieces, each with a height of 43 cm. The column shaft parts are fixed with four round wooden plates and secured with wooden dowels. Small modules are also used to create the capitals and bases of the columns. These carved parts are attached to the column shaft with wooden dowels. This investigation shows that one column with its decorative features consists of up to approximately sixty wooden parts manufactured by sawing, planing and carving.

STUCCO ELEMENTS

Stucco sculptures are attached and inserted into the wooden construction mainly by a vertical wooden stick that goes through the whole sculpture center and into the supporting system of modules. The cores of the sculptures are added to the vertical wooden stick in a horizontal direction using wood or metal reinforcements.

The figures are a combination of precast parts and freehand modelling (for example, the robes). Precast parts became integrated in the structure and completed by freehand modelling at site. An interesting finding in the sculpture construction is that between the wood construction and the stucco material, a layer of birch bark has been added. On this birch bark, a coarse mortar was applied to give shape to the figures and the cloud. A second fine plaster layer containing fine aggregates of sand was applied over the coarse mortar. The fine aggregates of this second plaster enable careful modeling of fine details such as hair and folds in the drapery.

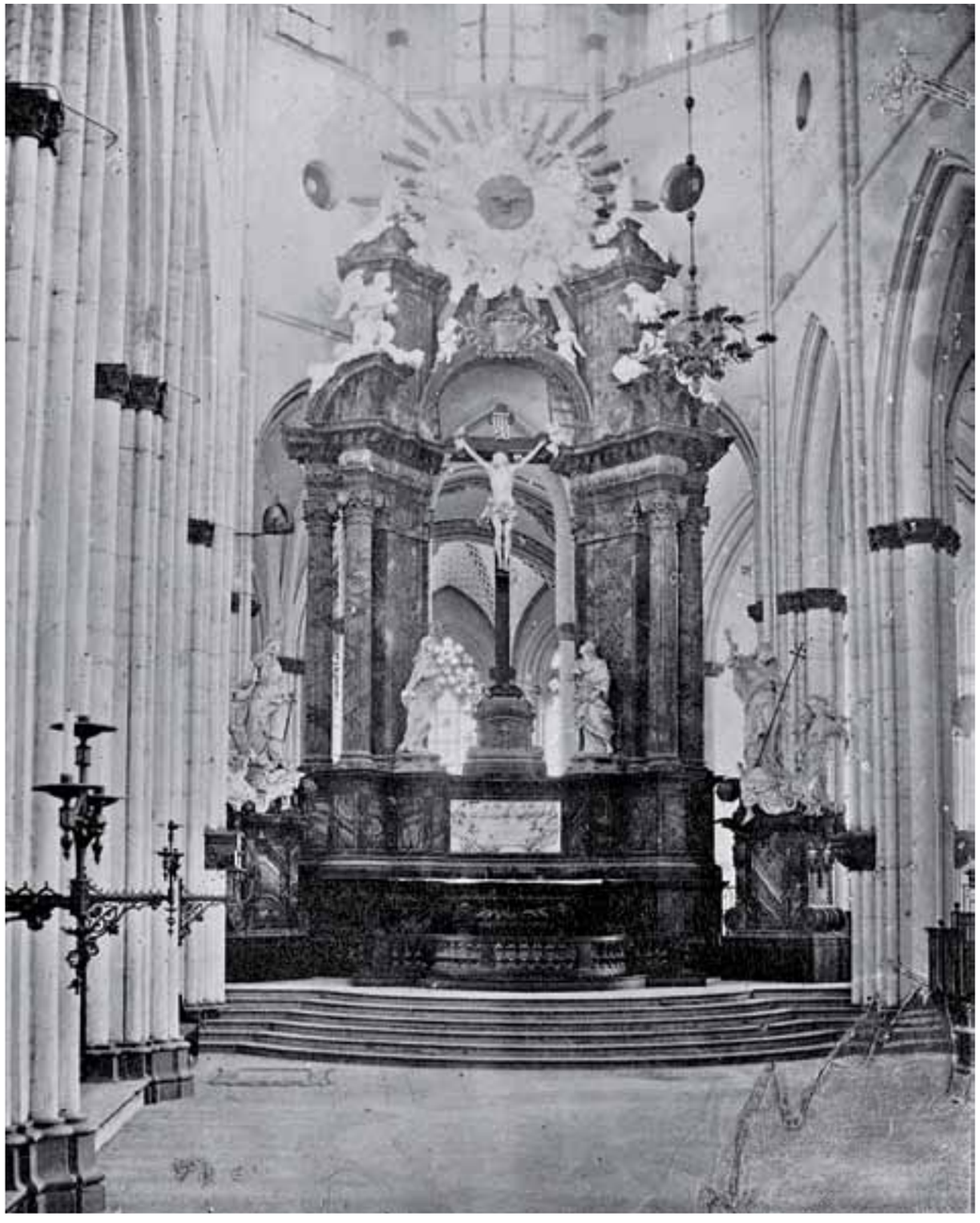
THE SURFACE

The wood is painted to imitate various types of stone in colours of red, brown, green and blue. Carved wooden ornaments are provided with layers of unidentified metal applications, this was in order to imitate metal and enhance lighting effects, as was highly desired at the time that the altarpiece was created. Most of the backside of the altarpiece has its original marble-imitating paint well preserved. Different layers of white surface treatments from different times cover the stucco in the altarpiece.

VISIBLE AND INVISIBLE ALTERATIONS BETWEEN 1885 AND 1975

The reconstruction in 1905 did not follow the sophisticated original baroque craftsmanship and lacked awareness regarding how the original construction added the modules to a static unit. Maintenance was carried out in a similar manner during the 20th century, i.e., without an understanding of the specificities in this 18th century construction. This caused additional alterations in the baroque construction, which further complicated the understanding of the original construction.

In order to evaluate how alterations have affected the stability, the object's cultural significance as well as to position the altarpiece in context of sacred art history, it was necessary to develop a deep understanding of baroque craftsmanship.



7. The altarpiece on its original location in Uppsala cathedral before 1885.
Photo: unknown photographer, from archive at National Heritage Board, Stockholm (ATA).

From the outside, only a few alterations to the altar are visible. The major alterations have been made inside the altar, which has impacted the whole construction. This has been ongoing for almost a hundred years. A visual comparison of archival photographs shows that the lowest part of the base, as well the uppers parts, the rays in the cloud, were sawn off in 1905, when it was realized that the altar was too high for the choir in Gustaf Vasa church. In Uppsala, the cross was positioned in line with the entablature. In the Gustaf Vasa church, it was shortened and given a lower position in the arch (compare fig. 1. and 7).

By observing the altar from the front, it is clear that the base has been lowered; this has extensive consequences for the structure. The first constructive frame sections of the lowest module box have been eliminated. In particular, the entire lower frame construction in the middle of the altar (Unit I) was affected.

A MISSING LOCK SYSTEM

The in situ examination revealed that the 20th century treatments did not use the original locking system of frames, wedge mortises and tenon joints. Instead, the wooden parts were nailed and screwed into bearing and dormant parts without any respect and understanding of the baroque construction. The initial survey in 2008 reveals that 93% of the locking wooden wedges were missing. Additionally, extensive parts of the frames in the modules were absent.

Moreover, unit I and its higher frame construction were originally integrated in the cross construction. Traces in the base of the cross indicate that it was integrated in the higher frame of unit I. However, in the 1970s, the cross beam was screwed into unit I without taking the advantages of the original constructive securing system into account. It is interesting that only forty years ago, the understanding of the benefits and values of the original structures was neglected and once again, treatments were made without respect to the original craftsmanship.

HIDDEN SOLUTION FOR MERGING UNITS

The original horizontal constructive connection between the two 14-meter-high units II and III is missing. The free-standing units II and III are not connected to the wall behind. The shortening of the vertical cross beam, followed by a re-positioning (lowering) of the entire cross, resulted in the original technical solution for merging unit II and III in a horizontal direction; thus, supporting the self-contained system being neglected.[2] Studies of photographs from the end of the 19th century indicate that a horizontal stabilization between these units was positioned behind the crossbeam of the cross. Further, the deviation in the frame-wedged system at level 8 and 9 indicates a possible former horizontal stabilization of the two units in conjunction with the cross.[3] Today, a wooden plank above the arch on the backside of the altar is aimed to replace the original horizontal connection between units II and III.

TRACING THOUGH MONITORING

The tunneling work under the church was accompanied by a two-year monitoring programme based on the initial investigation results. The monitoring was a combination of continuous measurements of vibrations and visual inspections. Monitoring is an opportunity for deeper understanding of the structure of historic artefacts and the causes of their deterioration: for example, the continuous measurements of vibrations over the years made it possible to correlate movements in the different altar units to specific alterations and patterns of deterioration in the structure and its surface.

DISCUSSION OF RESULTS

The in situ examination with the altarpiece itself as the primary source revealed that it is a sophisticated modular system of wooden boxes that gives it a shape of depth and perspective. A secure construction of these modules is reached through keyed mortise and tenon joints as the locking system.

The way alterations to the altarpiece have been carried out is a reflection of how it has been valued as art and historic crafts piece over the course of time. The rebuilding of the altar in 1905 was done without an understanding of or respect for the original construction scheme. In addition, this approach of treatments has been repeated during the three conservations carried out between 1935 and 1975. The examination that has been undertaken, followed by a multi-year monitoring programme has made it possible to trace how the altar components behave in their current environment. This could only be achieved through understanding its original purpose and the impacts of former treatments over time.

The undertaken investigation, which was performed by an interdisciplinary team, led to new facts that could not have been discovered if a team included only conservators. But what do we mean by an interdisciplinary approach and what is our understanding of it? Is it reached by adding conservation science to a project? A general definition of "interdisciplinary" is that it involves combining two or more approaches, ways of thinking or methods within a task or a project. The aim is to combine different disciplines to something new by crossing boundaries and thinking across them.

8. A wedge mortise and tenon joint (blue colour) on a frame of a module inside the altarpiece. Photo: Disent AB.

Combining experts with different perspectives requires a management approach focused on the artefact and its context. An interdisciplinary approach in conservation raises the question as to how and what to manage? A quick look back at conservation history shows us that the role of management can be more essential than we are aware of. Thus, merging different methods and perspectives to interdisciplinary work are opportunities and risks at the same time. This investigation was aware of this risk and integrated an elaboration on convergence and divergence thinking. The use of applied critical thinking methods turned out to be one of the most fruitful ways to reach the overall objective.

CONCLUSION AND OUTLOOK

In Sweden, interdisciplinary investigations of art in churches or profane buildings takes place very rarely in the conservation process. As a consequence, decisions for conservation are not taken based on facts. To preserve the cultural heritage, it is key that decisions are taken based on facts and that there is time to reflect on short- and long-term effects of possible treatments. Interdisciplinary investigations before conservation treatments of building-related art in Sweden are an underestimated resource for creating strategies for informed conservation decisions.

It is time to change the treatment focused approached in the Swedish conservation process regarding building-related art and adapt an investigative and reflective approach. This shift would allow us to understand values of material and intangible characteristics. This approach was already introduced in Sweden at the end of 1970s and presented at the Nordic Association of Conservators Congress 1981 held in Oslo (Tångeberg, 1981, p. 79-81). Unfortunately, the discussed approach is still not common practice in the Swedish conservation process. Reintroducing this approach would help us pass the culture heritage into the future in a sustainable and meaningful way.

ACKNOWLEDGEMENTS

All this new understanding of the altarpiece would not have been possible without the dedication and generosity of many people involved in the City Line project. Special thanks to my colleague Alexander Eckert, M.A in European Cultural Heritage, for a significant contribution that led to new facts as well as appreciation of this altarpiece. Thanks also to the governmental Swedish Transport Administration for funding this investigation as part of the City Line project.

NOTES

[1] Forensic methods and the collection of evidence are described by Almevik, 2012, p. 63; referring to Weaver, who introduced the forensic approaches for the build heritage.

[2] These parts of the altar construction still need supplementary examinations to make any final conclusion regarding the baroque manner to solve this constructive task.

[3] There is still a need for deeper investigation regarding the frames and wedged system in level 8 and 9 as well as on level 12 and 13. In these levels in the wedged system, the alterations have been very extensive over time and an extended examination of negative traces in the structure on this level is required to establish and finally verify this assumption.

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Karin Hermerén

from "monumental trash" to "monumental treasures"?

Keywords:
building-related
cultural heritage
ethics
legislation
management
public art
risk
value

ABSTRACT

The overarching purpose of this article is to augment the knowledge of the preconditions governing the management, supervision and conservation of public art by highlighting risks, such as differences between ethical decisions during the conservation process, investigating changes of ownership structure and resource requirements, and discussing the enforcement of legislation and valuation. Legislation reflects what people consider being worth preserving, thus what could be named a "treasure". The article focuses on the on-going change in valuation, from "monumental trash" to "monumental treasure", in building-related art. In order to determine what a monumental treasure really is, the methods and concepts of valuation of building-related art need to be developed, in the same way as has been done for old buildings and churches. Instead of letting chance alone decide what should be preserved, the discussion will hopefully facilitate building-related art to be preserved as monumental treasures.

INTRODUCTION

During the 1900s, major investments have been made in public building-related art in Sweden. Since the decision in 1937, in principle, 1% of building costs should be spent on art or artistic decoration. Thousands of works of art have been commissioned by the State, county councils and municipalities and form part of environments which, in various ways, tell of the ideas, currents of opinion and tendencies in forming the modern Swedish state. The antiquarian field has started to pay attention to the cultural heritage of industrial society, but building-related art is not yet subject to cultural heritage legislation.

From the viewpoint of art history, public art also affords specimens of eminent achievement in a continuous present; at the same time, as every period has its own dialogue and its own interaction between the work of art, the space it forms and the people by whom the place is frequented. And here we have another change, namely a transition of the work of art purchased, from being part of a milieu, something to be "used" – as decoration, definition, commentary – to being regarded as part of our heritage.

Building-related art is defined here as art created expressly for a particular place or adjoining a building or some other structure. Movable art, on the contrary, is not so firmly tied to its milieu and usually intended for circulation within public activities of various kinds, without the choice of venue being governed by the artist's intention. In the legal context, building-related art constitutes real property, which makes it part of the building in which it has been placed. This means that both ownership and responsibility for the management and conservation lies with the owner of the building, regardless who commissioned it. With a continuous change of ownership, with new owners who might wish for new solutions that might affect the artworks, together with the fact that art ages, several works of art by Sweden's foremost artists are at risk.

METHODOLOGY

The research project *Public Art – A Cultural Heritage* (Hermerén & Orrje 2014), sought to assess and identify the expertise and financial resources needed for the long-term care and preservation of public art commissioned by the state, county councils and municipalities and today owned by different parties, also private property companies. In order to address the overarching issues, case studies of 25 building-related works of art were chosen. The results have been presented elsewhere (Hermerén & Orrje 2012) and pointed out several shortcomings in the administration of building-related public art in public and private ownership. One conclusion was that heritage conservation authorities could play an important role in the long-term preservation of twentieth century public art by meeting the need for heritage conservation advice and supporting existing private and public owners of public art. Opportunities of financial support could help to preserve public art with the same degree of consideration as with historic art, and particularly in buildings which are threatened by demolition or which are subject to changes of ownership or function. Existing policy instruments, both statutory provisions such as the Heritage Conservation Act and systems of finding support, could be developed in order to meet actual needs. Existing registers on buildings could be extended to contain nationwide conspectus of the number and identities of public works of art and where they are located. Interaction and cooperation between national, regional and local supervisory authorities and also between heritage conservation agencies and the owners or administrators of these works of art is important to even out differences of management between different regions, property owners and supervisory authorities. It will also call attention to management and conservation efforts.
As legislation reflects what people consider being worth preserving, the methods and concepts of valuation of building-related art need to be developed in the same way as has been done for older buildings and churches. An on-going PhD project discusses ethics, legislation and valuation change (Hermerén 2015) and some of the questions concerning risks and ethics will be presented in this article.

RESULTS AND RISKS

There are various dimensions to the concept of risk: one concerns the probability that a certain event will occur; another concerns the evaluation of this event. If this turns out to be positive, one is speaking of an opportunity, if it is negative, one is speaking of damage or risk. Both of these dimensions can be graded. A further dimension involves factors which can contribute to increasing risk. But there is another type of risk, a different concept, for which the probability cannot be quantified. We know that an event can occur, but our knowledge is not such that we can assess the probability with which it may occur (called epistemic risk). Our knowledge about what we study is sometimes imprecise and fragmentary, and can therefore not be given in quantitative terms. This increases the uncertainty of the analysis, as the risk concerns the probability that a certain event (graded as negative) occurs, given that our knowledge has been elucidated.

IDENTIFYING RISK

One risk has already been mentioned, namely the change of ownership and of activities in a building, which could lead to changes that might affect the artworks.

Lack of supervision can also be a risk factor. In Sweden, historic settings are protected by law and both private and public owners can apply for governmental grants for the care and preservation of the historic cultural assets in their possession, but twentieth century public art is excluded from this heritage conservation funding. The (regulatory) authorities working within the area of cultural environment lack knowledge of public art, and differences also manifest on the view taken by the authorities on this art as cultural heritage. The amount of antiquarian expertise required is not clear. Methods do not exist to determine which artworks are exposed to the greatest risks, which artworks should be safeguarded in the long-term perspective, or how preference should be allotted. There are few channels of communication between the various actors within the area of cultural heritage supervision and between them and property owners.

Building-related art in a public setting is exposed to wear in various ways and there are several factors which contribute to an increasing risk of damage. The *climate* causes wear, etching and cracking by the actions of acid rain, cold and heat. *Handling* and contact with people produce wear, abrasion and scratching. Increasing *age* implies grime or alteration in the material. *Damage* and/or *theft* may mean graffiti, lost parts, or, in the worst case, a lost work of art. *Neglect*, such as vegetation close to, or on the artwork, which is not pruned or cut back, technical devices involving water or light which are not tended, or an artwork which is entirely forgotten. The physical environment of the work of art / its location, may undergo *change*. Examples can be found in the case of rebuilding or extensive renovations of the site. The work may have been *removed* from its original location for which it was designed. The work of art can even suffer *demolition*.

Obviously, these events can take place simultaneously, and they can influence each other. A neglected work of art is at greater risk to be spoiled by graffiti or other such damage than one which is well taken care of. An alteration of the site on which the work was originally placed may lead to its relocation, and so on.

ANALYSING RISKS

Risks can, obviously, occur at different frequency and lead to different consequences for a specific work of art. With the help of risk analysis risks are described and evaluated. By quantifying the risks of change in state and loss of value per unit time, the probability that an unwanted event will occur and its consequence, can be judged. The evaluation of the probability indicates how often the risks in question can be expected to occur under the given circumstances, and the frequency indicates the number of times the event is likely to occur in a given period of time.

In order to calculate the extent of risk, the risk factors have been quantified on a scale of 1 to 5; concerning how often an event occurs, indicating loss of value and the proportion of the collection which may be affected.

It is obviously important for these calculations that the factors are based on well-established knowledge. We may have limited knowledge of some of the variables, and in that case, it is difficult to calculate an exact measure of probability. For example, if a building is regularly renovated, the work of art and its environment may be altered. Renovation may enhance the presentation of the work of art and lead to the improvement of its supervision, but, on the other hand, it may cause damage or even destruction.

How the value and loss of value of a specific artwork is defined depends on a variety of factors, for instance, whose opinion is sought and in which context, or which categories are the basis of the valuation (uniqueness, economic value, etc.). The criteria should be specified and analysed because their choice determines the result to a high degree, which, in turn, establishes the basis on which various decisions are made, for instance, which works of art should be given priority to administrative considerations.

EVALUATION OF RISKS

There appeared to be some major risk factors to be considered in relation to the owner of the property and the management of the artworks connected to the building: 1) the lack of competence and resources concerning the knowledge of the work of art in question, knowledge of the laws and their implications concerning the administration of the artworks, practical measures (what is to be undertaken and how) and planning for long-term financial resources for management; 2) lack of experience, organisation and financial resources for the administration of art which was originally bought with public moneys; 3) infrequent contact with antiquarian expertise and/or regulatory authorities and 4) frequent changes of owner, manager and activities or tenants, where changes of owner implied a greater risk for the art works than changes of manager.

DISCUSSION ON ETHICS

The works of art are exposed to a number of risks in connection with management – not only risks connected with the placement and handling, but also such factors as the absence of ethical deliberations in connection with decisions taken during the conservation process, and inadequate knowledge of legal aspects, e.g. copyright. Building-related art can be adversely affected by changes of activity and by the renovation needs usually appearing in the surroundings every 20 or 30 years. Another risk factor may be a lack of understanding for (contemporary) art among owners and managers and also among supervisory agencies and "users" in the vicinity of the works of art.

In connection with the decision process concerning management issues, an ethical approach or ethical positions can be said to account for how the

management relates to different values (cf. Hermerén 2015, pp. 82–92). These can vary depending on time and place. The values determine what is chosen to be managed and what is not. Since different values weighs differently for the actors involved, so to speak, it is important to have proper knowledge of what is to be managed and to make a careful ethical analysis before deciding on what to do, when and how.

Decisions in connection with management have implications for which works of art are preserved, by what methods and with what materials, which items are to be kept for future generations and in what state they are to be preserved. These decisions rest on various values, which should be made clear in order to preserve and reinforce the legitimacy of an established decision-making process. Depending on how the works of art are looked upon and thus valuated, they are preserved differently.

Ethical decisions are based on considerations of several kinds. Firstly, an important starting point is available knowledge – in this case, the condition of the artworks, the artist's intentions, ownership, cost of conservation and restoration as well as applicable laws etc. Secondly, one also needs to recognise and clarify what different stakeholders want to achieve and avoid in the short and long term, that is, what values they have.

Knowledge can change. New knowledge may appear and things you thought you knew could prove to be incorrect. Uncertainties and knowledge gaps may also occur. The same thing is true about values and valuation, which are not static, but change over time. The valuations of different groups and actors do not necessarily coincide, but can pull in different directions and sometimes conflict with each other. Then, a ranking is needed – which values are more important than others. For these reasons, the ethical standpoints and analyses will be preliminary and may change if knowledge and values change. The decision-making becomes important: to preserve and strengthen the legitimacy, it is necessary to have an established decision-making process, where different sides and experts are heard.

Knowledge is, as stated, important to the decision-making process. But the object itself is not static, it changes with time both by material aging and various external events. Therefore, decision-making before conservation has to take changes into account, such as:

- the material has changed (pigments have darkened, varnish has yellowed)
- subsequent additions and changes (as conservation)
- damage

given that:

A) you know what it looked like when it was new,

B) you do not know what it looked like when it was new.

Is it relevant if the artist is known or unknown? Does an addition through conservation improve or impair the work of art? Does the addition have the artist's approval? Do we know if the artist would have approved of the measures taken by the conservator? How do the current/previous owners consider these measures? Are these questions relevant to the conservation process? And how do we know anything about the artist's intentions? Even if we do know the artistic intention, it is not certain that the expressed intentions are clarifying.

It is important to examine what we know for certain and what is uncertain, to see if there are any gaps. All information must be interpreted and put into context. Different kinds of risk assessment must be analysed on the decision about what should be done or not done. It is therefore important to make a careful analysis of the problem and to be clear. What is the problem? Is the problem clearly defined? Are several issues bundled together? Are we looking at symptoms rather than causes? Whose problems are they? Who benefits and who is put at a disadvantage by the decisions?

And what does this knowledge lead to? There is often more than one action possible. Therefore, it is also important to recognise the stakeholders (owners, managers, conservators and others) and the concerned parties (artist, owner, viewer, and others). What do the different stakeholders want – in the long term and the short term? Who is responsible for what and how much should be done in a given situation? Which interests are rational, and which other interests can exist (aesthetic, antiquarian, financial, political, technological, etc.)? How to identify these interests? Who is responsible for how (much) the object is to be preserved or restored in a given situation? Who sets the requirements? Can these requirements control the choice of preservation methods?

Do changes in the milieu surrounding a building-related artwork, commissioned for a certain location, change its value? Does this change affect the perception of the artwork?

The values or the value attached to the object influence the decision making process related to management. If historical value, for example, is given great importance, it could mean that all historical traces, or a historical process, is equally valuable. The result would be that preservation is carried out so that the lapse of history is shown as clearly as possible, maybe with minimal intervention. If one is forced to choose which part of history to be shown, knowledge is essential to determine which part of the story has the greatest value (if one can choose).

Ethics is not about laws and regulations, although some ethical issues must be formally regulated. And, conversely, neither laws nor what is generally regarded as ethical or unethical conduct are the same. It would, as an example, be considered unethical by a property owner to demolish a work of art for the reconstruction of the room where it exists, but there is no support in the Copyright Act that this is illegal.

The way in which a work of art is regarded and valued, and who is the beholder, decides how that work of art will be preserved and also what kind of (legal and financial) protection has to be used. If "building-related art" is regarded as a building or milieu, then there is the Planning and Building Act to fall back on, complete with building permit procedures and possibilities of protection through a detailed development plan. From a heritage perspective, we have the Environmental Code and the possibility of grants out of the heritage conservation appropriation. If a historical approach is adopted, there is the Heritage Conservation Act, which protects both historic buildings and historic churches. There is an established inspection procedure offering the chance of help towards conservation contingency expenses and also, in the case of historic churches, for conservation of movable art or furnishings. If the work of art is regarded as "art", it is divorced from its setting, with the Copyright Act as its sole safeguard, and in the event of infringement of artistic reputation or individuality, the issue has to be pursued by the artist or someone closely connected to them. There ought to be public, shared responsibility for art purchased with public money. Such art belongs to everybody and should be protected and valued accordingly. It is therefore proposed that existing legislation should be widened so as to also include public building-related art.

CONCLUSION AND SUMMARY

Many building-related works of art have gradually become part of our heritage in the same way as historic buildings. But as building-related art does not come within the domain of heritage conservation, it can be partly or wholly (sometimes imperceptibly) destroyed, quite regardless of whether it was paid for out of private or public funds and of the settings in which it is placed. In contrast to the safeguards of conservation, funding and application of laws, for example, to church buildings, there are no effective statutory safeguards or funding support system for the inspection and preservation or management of public art, a fact which becomes increasingly evident as works of art grow older and will need maintenance increasingly.

The methods and concepts of valuation of building-related art need to be developed in order to be used by both the property-owners and the cultural heritage authorities. This would help to improve future supervision and facilitate access to different kinds of resources, thus furthering the preservation of an important part of Sweden's cultural heritage.

Several case studies, work on long-term management and a coherent preservation strategy for building-related art, as well as the decision-making process connected with management, need to be analysed and studied in order to bring out any further problems into the open and contribute more knowledge and further conclusions. Further topics of enquiry and fields of development with a view to achieve better preservation in the administration of both building-related and movable art concern methods of risk assessment and methods of articulating (analysing and critically discussing) underlying ethics and values.

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Hilkka Hiiop & Helen Volber

demounting murals from their architectural environment – salvage or destruction?

Keywords:
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Elmar Kits

ABSTRACT

The Soviet period was a generous time for the development of monumental art in Estonia – large scale artworks were commissioned for many public buildings. After Estonia gained independence, many of these buildings and the artworks within them were either privatised, demolished or left to decay. The situation raised a question: could the artworks be preserved separate from their architectural embodiment?
The following article will discuss two such cases, where demounting of the artwork was the only option for saving the murals from the Soviet period: in 2010, from the building of Estonian Academy of Arts and from restaurant Tarvas in Tartu, before demolishing the building in 2014. The article will discuss the problems conservators and engineers faced in the process of demounting and dealing with the municipalities, and will consider how the guiding principles of conservation ethics can be followed in such cases.

1. Mural painting painted by Elmar Kits in Tartu's old department store (1965).

INTRODUCTION

The Soviet era created favourable conditions for the development of monumental art in Estonia: numerous works of art were commissioned in various techniques (fresco, mosaic, sgraffito) for the more presentable state buildings as well as for many public buildings. With the arrival of independence, however, the monumental art of that time often found itself in the way of the construction boom. Quantities of works of art that were located in those buildings were destroyed together with buildings that were no longer functional or in the process of providing such buildings with new functions. The reason for this was economic arguments on the one hand, but also the sensitive political background of the Soviet period on the other.

One characteristic of this transition period is an incapacity for sufficiently appreciating art born in the bosom of the Soviet era.

By now, we have sufficiently distanced ourselves from the ideological burden that encumbers the art of that time and we are ever more capable of appreciating works created during that period without interference from political memory. If only there were still works to be appreciated.

ELMAR KITS

Elmar Kits, whose works are among the most noteworthy examples of Estonian monumental art, is undeniably one of the most distinguished artists of Soviet Estonia. His sgraffito style mural painting located in Tartu's old department store was completed in 1965 and originally adorned the wall of the Tarvas restaurant.

This mural painting is one of the most remarkable examples both in Kits's own body of creative work as well as in the history of Estonian monumental art, and in a certain sense, it is also one of the works symbolising the artistic scene of that time. A recently published monograph on the history of Estonian monumental art describes it "a stylish mural painting was located on the end wall of Tartu's most distinguished restaurant of that time. Its pictorial rhythm corresponded to the columns that dominated the room. This work is perhaps the most successful of Elmar Kits's monumental paintings, since his other works have been too much like oil paintings, which is unnatural in monumental art. The Tarvas mural painting is monochromatic in style and harmonises in a jazzy way." (Saadoja et al., 2012, p. 80).

Elmar Kits was born as the son of a bricklayer in Tartu on 27 April 1913. He acquired an education in art at the Pallas Art School in Tartu in 1935-1939. Kits was among the best graduates of his class and already asserted himself in the Estonian art scene immediately after completing art school (Talvistu, 1994). Art critic Ants Juske has christened Kits Estonia's Picasso since like him, Kits's body of creative work also includes several different kinds of media, rebirths and extreme productivity.

During the Soviet occupation, Kits's realistic style of painting enabled him to quickly adapt to the new conditions. In 1947-1949, Kits worked at the Tartu State Institute of Art as head of the monumental painting faculty. He became a freelance artist in 1949, but before that, he painted Estonia's largest monumental painting together with artists Richard Sagrits and Evald Okas – the Estonia Theatre's ceiling painting in Tallinn. Kits fulfilled several commissions at that time - factories, executive committees, restaurants and hotels all asked for paintings from him. Even though Kits had to stand his ground at the beginning of the Soviet period against accusations that labelled his work formalist, his monumental paintings with their great degree of generalisation became very popular over time. While the treatment of art was initially restricted with great consistency in the Soviet Union, artists returned to progressive examples in the art of painting from the end of the 1950's onward, though initially, rather hesitantly. The distinctive feature of Estonian art of the 1960's and 1970's is the aspiration to work through the stages of development of modern art in a short time frame, while this same process took decades elsewhere (Kartna, 1972).

Kits's mural painting in sgraffito technique, that was located in the Tarvas restaurant in Tartu's old department store, occupies an important place in Kits's body of creative work. The work is important for several reasons – in addition to the artistic value of the mural painting, the Tarvas restaurant was an epochal institution in itself that became a sign that speaks of the history of a particular period in Estonia, its cultural space, and a certain opposition to the surrounding political situation.

COOPERATION ENSURES THE PRESERVATION OF ARTISTIC VALUE

This nearly 20 m² mural painting survived the change in the system of government, as well as the demise of the restaurant, and its death knell did not start to sound until the decision was made to demolish the building (Tarand, 2014, p. 8).

Nearly five years ago, discussions began concerning the Tartu Consumers' Cooperative plan to build a modern business centre on the site of the old department store. By that time, all that remained of the one-time renowned restaurant's authentic interior was Kits's mural painting.

2. Mural paintings in the demolished Estonian Academy of Arts building (2010). Photo by Hilkka Hiiop.

At the end of 2012, Tartu Consumers' Cooperative Investments held an architectural competition for finding the best architectural and urban construction solution for the entire city block. The competition conditions included the requirement to preserve the mural painting in the new building. Thereupon, an emotional discussion flared up in the press on whether and how this could succeed in a new complex that will not retain a single brick of the old building. Since in terms of construction technology, it proved to be impossible to preserve the wall or room bearing the painting in the course of the building's demolition, or such preservation would have become prohibitively costly; some of Tartu's opinion makers even voiced the position that the demolition of the amortised and architecturally worthless building should be brought to a halt. The mural painting by Kits is not subject to cultural heritage protection and for this reason, it was not possible to pressure the building's owner. The owners faced a choice: either to get rid of the work of art, that had proven to be a problem, by legal means or otherwise, and thus earn the long-term designation of being a barbarian, or to try to find a way and the necessary technology for preserving the mural painting and to move it to some other repository, either temporary or permanent (Tarand, 2014, p. 8).

The preservation of the authentic architectural framework is unquestionably the safest and most ethical way to preserve a work of art, but sometimes, this proves to be impossible. The choices are the destruction of the work of art together with the environment and context that surrounds it, or saving it by demounting it and transferring it to a new support. In the event that this proves to be the only possibility for preserving the work, moving the work is justified, even though such cases do not always come without further questions – what is the value of a work of art, if the authentic context surrounding it is destroyed?

A similar precedent was set in the course of the demolition of the Estonian Academy of Arts building in 2010, when the school's cultural heritage and conservation department successfully demounted the more valuable part of the mural paintings located in the building. Already from the beginning of the history of the building in the 1960's, the walls of the school had been used as training space for mural paintings. Many of those were made by artists who have by now taken up dignified places in the history of Estonian art and some of these works have become symbols of the Academy of Arts for several generations.

Throughout history, the demounting of murals as a technical solution has been a rather widespread means for preserving paintings. It is only the heritage philosophy of the latter half of the 20th century that has questioned this practice, claiming that in this way, the work loses its authentic (spatial) context. More, the opposite process accompanies contemporary conservational work: murals are once again brought out of museums into their original architectural environment and mounted on walls once again.

Since this kind of complicated and aggressive way of preservation had not been practiced before in Estonia, the walls of the Academy provided an excellent training ground for students of conservation. The work took place while the demolition of the building was already in progress. Some ten of the most valuable mural paintings were successfully removed from the walls over the course of a couple of days. In a way, this salvage operation created a more positive image for the much discussed, and criticised, demolition work of the Academy of Arts. Even national media channels reported on the work of the students. On the other hand, this was an excellent chance to play out the process of this technically pretentious method of preservation. Two layers of fabric were affixed to the paintings with strong adhesive made from animal products. After the adhesive had dried, the frescoes were removed in strips from the walls together with the support plaster and deposited in the repository.

BACK TO TARTU

At the end of May, 2013, the Tartu Municipal Government issued a permit for demolishing the buildings situated on the properties of the old department store under the condition that the 9 meter long and slightly more than 2.6 meter tall mural painting be first transferred and preserved. But how? The first plan worked out by engineers entailed cutting out the entire mural painting, its transportation and preservation as a complete monolith together with the silica brick wall supporting it. This was nevertheless considered technically too difficult to implement. The nearly ten metre wall alone would have weighed nearly 40 tonnes. A second plan worked out by conservators in cooperation with engineers relied purely on tradition and was based on methodology for transferring mural paintings that had been previously tried and proven, based on using adhesives of different solubility. In order to prevent damage to the surface layer of the painting, the plan was to demount the mural painting in sections. It took about three months to proceed from the concept to the beginning of work, during which time, the technique for removing the painting was fine-tuned. The possibility for error was out of the question!

DISTINCT FEATURES OF ELMAR KITS'S MURAL PAINTING

The mural executed by Kits is a painting in relief and can be referred to as sgraffito only due to its external similarity to classical sgraffito. Sgraffito is traditionally done on lime-based plasters, where the binder of the various coloured layers is calcium carbonate that is produced when wet lime comes into contact with carbon dioxide in the air (technically similar to the fresco technique). Even though the composition of the plaster and the binder of the pigments in Kits's mural have not been determined, it can be presumed on the basis of the observation that the relief was cut into the plaster containing cement and that different surfaces were coloured on plaster that was already dry. The binder of the paints appeared to originate from an unusual arsenal of the artist – it is a relatively strong paint surface resembling plastic that alludes to some sort of acrylate medium. Kits presumably used paints left over from the construction of the restaurant (this information is based on the assumption of the poet and artist Indrek Hirv, who participated in the making of the painting as a little boy. The acrylate nature of the painting layer of the mural boded well for the success of the demounting, even though this was an experimental and risky process. Even though previous work with the frescos at the Academy of Arts provided certain experience, the deep relief of the three-dimensional surface of Kits's mural painting made its removal considerably more complicated. A possibility had to be found for supporting each groove.

COVERING OF THE PAINTING WITH A PROPHYLACTIC ADHESIVE TEXTILE

The mechanical removal of panels of the painting from the wall could have been potentially very dangerous for the paintings' surface. Thus, the mural painting was pre-emptively covered by layers of protective fabric to prevent the cracking and crumbling of the plaster and damage to the pigment layer in the process of demounting.

Tentative experiments were carried out on the lower accessible area of the painting and it was determined that the test surface was resistant to synthetic adhesives. It was provisionally decided to use the synthetic adhesive Paraloid B 72 10% solution to protect the painting. In order to be certain that the adhesive could later be successfully removed, an approximately 20 cm x 20 cm test sheet was left on the surface. Some months later, this same protective sheet was successfully removed from the surface by lightly moistening it with acetone.

Unexpectedly, however, it was discovered that the monochromatic matte beige background colour in the upper portion of the painting reacted with acetone, leaving a whitish film on the surface. For this reason, it was decided to replace the synthetic adhesive with natural glue of animal origin, rabbit skin, which has been the traditional medium for applying protective layers. Its drawback is the use of large quantities of water on the painted surface, but tests on various areas of the artwork indicated that all the paints, including the beige background tone, that differed in nature from the overall material use, are resistant to water.

The advantage of natural adhesive is the harmlessness of the process (both prior to demounting and after remounting) to the persons carrying out the process – large amounts of synthetic materials often create major risks of health damage to those carrying out the work.

WORK PROCESS

First, a layer of gauze that could easily be stuffed into all the grooves of the painting in relief was applied to the surface of the painting using a water solution of approximately 20-25% rabbit-skin adhesive. This is extremely important in removing the base layer because every piece of plaster without a protective covering would most likely break off of the surface in the course of mechanical removal and would be lost. As a second layer, a stronger cotton

3. *Estonian Academy of Arts and Tartu Art College conservation students demounting the mural painting. Photo by Hilkka Hiiop.*
4. *Application of prophylactic adhesive fabric. Photo by Ülle Jukk.*

fabric was applied on top of the gauze adhered to the painting using the same adhesive to protect the entire surface of the painting as a uniform layer. Due to its stronger weave structure, it was impossible to adhere this fabric in every depression of relief, but the lower layer of gauze provided the primary mechanical protection for the layer of plaster.

DEMOUNTING OF THE MURAL PAINTING

In order to demount the mural painting, the edge strips, plaster panels, wall plaster and suspended ceiling panels were removed first to a sufficient extent to afford unrestricted access to the work and to prepare the places where the hooks for hanging the work were to be affixed. The scenes of the work were separated from one another using a circular cutter and the demounting began one by one, moving from right to left. A separate protective frame made of iron rods was constructed for each section. After the fixation of the frame, the panel with its protective layers of fabric was covered with an additional plastic film. A protective surface made of strong plywood was attached to the front side of the painting and the frame was hung on a hook that had been fixed to the ceiling. The gaps that ensued in the deep grooves of the relief between the plywood and the plastic film were in turn stiffened using stiffening foam, in order to prevent cracking in unsupported parts of the painting. After it dried, the plaster was sawed through using a cable cutting system as close as possible to the brick wall. Thereafter, the panels were lowered using hanging cables into a horizontal position and their back sides were covered with reinforcing netting and a mixture of adhesive and reinforcement, and after this dried, it was covered with an additional layer of plywood to complete its affixing (Hiiop & Jukk, 2014, pp. 66-68).

The uneven masonry and thickness of the base layer of plaster made the demounting of the panels complicated. Fortunately, there was little binder in the latter, which made it considerably easier to saw the sections apart. In the end, nine marked "suitcases" were left in the room, which could be easily stored in a suitable place. As a compromise decision, the owners of the building did not wish to find a new place for displaying this work of art in the new building. Instead, they ceremonially donated it to the Estonian National Museum repository at Raadi, in other words, to the Estonian state.

SUMMARY

The Tarvas restaurant environment, where Elmar Kits created his work of art in his day, disappeared from Tartu 15 years ago. The department store, in other words, its architectural embodiment, was demolished in 2014. The work itself, however, was successfully brought out of the debris. Well thought out methodology and close cooperation between conservators and engineers ensured the success of this experimental and risky work that was undertaken. The trust of the customer is also of no less importance.

This is all nevertheless only the first stage in preserving the work of art. There is still no physical environment where the works could be remounted in the case of either the Estonian Academy of Arts or Tartu's old department store. In technical terms, the success of these works can be spoken of only when the second stage is also seen through to completion, in other words, when the works are once again attached to the wall and displayed in their new environment.

The question of where and whether these works will find their place at all is perhaps even more complicated. Can these works of art be made to tell stories of the more major historical epochs, and if so, then how? One possibility is to simply mount the works on a portable base and to display them in a museum environment, as has been done for centuries in history. Another possibility is to leave the mural paintings stored and covered by protective layers for future generations, who can decide if this section of Estonian history merits being put on display. A third possibility is, hopefully, that a worthy architectural environment is found for these works in two environments that are also being reborn – in the Estonian National Museum at Raadi in Tartu and the new Estonian Academy of Arts building in Tallinn. Both institutions will be moving into new buildings from their historical locations during this decade, and mural paintings that are historical, yet nevertheless relate to their new architectural embodiments, would create that tiny bit of visually perceptible connection in both cases with the immediate past that has to be appreciated equally with others.

5. Mural partially covered by the second layer of fabric. Photo by Hilkka Hiiop.

6. Mural covered by layers of prophylactic fabric prior to demounting. Photo by Peeter Säre.

7. The demounting process. Photo by Ülle Jukk.

8. The demounting process. Photo by Ülle Jukk.

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Emma Hocker & Malin Sahlstedt

a conservator`s role in large-scale preservation research

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ABSTRACT

The discovery of acidic salt outbreaks on the surface of the seventeenth-century warship *Vasa* about fifteen years ago set in motion a series of international research projects to examine different aspects affecting the condition of *Vasa's* wood. Although focus initially centred on the surface outbreaks, further analyses showed that conditions in the interior regions were equally concerning. Here, there were high levels of other types of acids and timber strength was severely reduced. The threat to the wood strength has highlighted the inadequacies of the current support cradle, which has been in place since the 1960s, but is unable to prevent deformation of the hull. A new support system is now being planned. For the last twelve years, *Vasa* has been the focus of three comprehensive, international research initiatives. Over that time, museum conservators have gained valuable experience in dealing with large-scale projects. This paper summarizes the major results and highlights some of the lessons learned over that time.

1. The seventeenth-century warship, Vasa.

A SUMMARY OF THE RESEARCH

At 69 m long, 11 m wide and with masts reaching 33 m high, the seventeenth century warship *Vasa* is a monumental structure, equivalent to a 5-storey building, with a complex chemistry and conservation history.

One of the first large-scale structures impregnated with polyethylene glycol to prevent shrinkage and distortion, the ship has been on display in the *Vasa* Museum since 1990. Almost a decade later, the discovery of yellowish white salt precipitations on the wood surfaces, identified as a range of hydrated iron sulfate salts, set in motion a series of international research projects to examine the various factors affecting the chemical status of the wood. The first two projects, "Preserving Vasa" and "A Future for Vasa" focused on the chemical changes mainly in the surface of the wood, a problem potentially affecting the hundreds of objects and sculptures, which contain most of their cultural value (tool marks, pigments, etc.) in their surfaces. As research progressed, however, it was clear that the interior regions of the timbers were suffering from high levels of organic acids and iron, resulting in localized breakdown of the wood cellulose. Consequently, the focus of the latest research project "Support Vasa" has shifted to an examination of the mechanical properties of *Vasa's* wood and how best to support the hull in future.

The main culprit for the conditions in both the interior and exterior wood appears to be the presence of large amounts of iron corrosion products from the thousands of iron bolts originally inserted to hold the hull together. Methods have been developed to extract this iron using high performance iron chelators, such as DTPA, but for practical reasons such aqueous treatments can only be performed on relatively small objects that can be treated in tanks. Full-scale conservation of the hull by this method is not practically feasible. Instead, preventive measures, such as control of the relative humidity and temperature around the ship, are vital for the stability of both the chemical situation inside the wood, since moisture transport will be reduced, but also, for the mechanical stability of the three-dimensional structure. As PEG is hygroscopic, an uncontrolled climate will cause absorption and desorption of moisture, which will in turn affect the ship's weight, cause stress on joints and create movement and global and local deformation of the hull. In 2004, the museum's air conditioning system was upgraded and now maintains a remarkably stable climate of 53 +/- 2 % RH and 18 +/- 1.5 °C around the ship. No new salt outbreaks have been noticed and movements in the ship, as a result of climate fluctuations, have been largely eliminated. The remaining deformations and movements are mainly the result of the ship's own weight and insufficient support, but an unknown factor is still the gradual loss of wood strength in the interior regions of the timbers over time. So far, few feasible methods have been proposed for removing or neutralizing these threats and so, any new support structure will have to be over-dimensioned and flexible to deal with the future loss of wood strength.

As summarized by Elding (2010), the undertaken research has been broad, interdisciplinary and international in nature and has incorporated a range of new analytical methods along the way. Hundreds of core samples have been taken from the ship and wooden objects and often shared between groups, which has necessitated close coordination and cooperation between museum conservators and the research teams. Twelve years have now elapsed since the first research project was initiated in 2003; in that time, Vasa Museum conservators have gained valuable experience in managing large-scale, interdisciplinary projects. The following is a summary, from a conservator's perspective, of the lessons that have been learned.

THE PROJECT MODELS

In 2002, on the advice of one of the agencies funding the research, the museum sought proposals for study into the causes of the acidic salt outbreaks. Of eleven proposals, six were chosen to receive research funding for the project "Preserving Vasa" and a senior professor in chemistry was employed to coordinate the research, as such high level scientific competence was not available within the museum. Meetings were held twice a year for the teams to report on their work. Each sub-project was planned for an 18-month period and at the end of three years, an international team of senior scientists was gathered to evaluate the results and make recommendations for future study. This model worked well for the first project and was followed to a large extent in the subsequent project, "A Future for Vasa." In the current project, to design an improved system of support for the ship, the researchers are all based at one university department. The need for an external project coordinator is negated, since the team meets on a daily basis under the leadership of their professor, who is also the project director. Monthly meetings are held between museum staff and the project leader and every six months, the group presents their work to a group of external experts– the museum's Conservation Council, which provides critical oversight on the research. The Conservation Council has been in existence since the ship was raised in 1961, its members reflecting the expertise required for different preservation projects.

LESSONS LEARNED

Project management: With such complex, large-scale projects, clear project leadership is essential. Finding the right person for this demanding role is far

from easy. The ideal candidate needs to be someone with sufficient understanding of the respective research areas to be able to evaluate results and ask critical questions; someone who can be strict and take difficult and unpopular decisions (especially when research money is concerned), but also be non-partisan and neutral. Preferably, the project leader should come from the institution responsible for the cultural heritage resource, the receiver of knowledge, in order to keep the focus on the main goal of the project. Without this anchoring influence, it is easy for some projects to veer away from the main goal and prioritize their own research goals. It might be argued that project leadership should fall to the conservator, but since many funding agencies require that the project leader has received a doctorate, this rules out most practicing museum conservators, very few of which have PhD qualifications. An alternative to a project coordinator is an advisory board or evaluation committee of experts on different subjects, who meet regularly with the researchers to discuss the merits and direction of the work.

Openness and respect: A requirement for any large project is openness and a mutual respect for different disciplines, a courtesy easy to assume, but often forgotten in the heat of lively argument, especially where continued funding is at stake. A climate of trust and generosity should be encouraged, with respect for other areas of expertise and perspectives, especially in multi-disciplinary projects which combine natural sciences and humanities. Conflicts should be sorted immediately, as in our narrow field, it is likely that the respective parties will have to work together or need access to each other's results and experiences in the future.

Our recommendation is to arrange a kick-off meeting, where each project member presents their expertise and role in the project and the guiding principles governing their line of work. It has been our experience that the conservation field is relatively poorly understood within the scientific community and the idea of reversibility or re-treatability and minimum intervention are concepts alien to many natural scientists. The fact that cultural material is an irreplaceable source of knowledge, rather than an endless source of sample material, is often not appreciated, so a clear statement of these conservation principles at the start of the project will, hopefully, prevent wasted time and false assumptions. Since there is no guarantee that new project members joining part way through the research will receive this information, it might be preferable to state these roles and principles in a clearly worded project description, as part of an introduction package to the project.

Contracts: Many misunderstandings will be avoided by clearly written contracts– the more specific, the better. Intellectual property rights should be discussed at an early stage, but ownership of images, analytical data, use and return of samples and how this information should be shared between project participants should also be considered. Many large institutions will have their own legal advisors who will wish to oversee these aspects, but it is worth clarifying these questions in writing with smaller, less experienced institutions at the start of the project, in order to avoid surprises and misunderstandings later on. Often, different professions have different expectations about what entails intellectual property and how it may be used. Many researchers have to "publish or perish", so can be quite restrictive in sharing data, while others are very willing to share.

Sometimes, there can be a clash in policies between museums and universities. Our institution is a government authority and our records and archives legally lie in the public domain. In order to protect the academic rights of the researchers, we agreed to grant data discussed during research meetings a "working level" status, which meant it was not made available in our public archives for a period of twelve months, giving time for researchers to publish their results.

Universal Terminology: Beware that some terms have very different meanings, depending on who is speaking. Take the common preservation terms "degradation" or "poor condition." To a micro-biologist, the word "degradation" will imply fungal or bacterial causes, while to a structural engineer, it will mean weakened mechanical properties, or to a chemist, cleavage of the wood polymers. Often, the effects are the same, but one needs to bear in mind who is talking and the origin and history of the sample in question. Often, these are relative terms, and need to be more detailed, in order to understand what is meant on a molecular level. It is also useful in a multi-disciplined project to agree on the same units of measurement when conducting analyses, as this makes subsequent comparison of data much easier.

Sampling strategy: It is worth taking the time to formulate a well-considered sampling strategy that will give a representative picture of the whole object or site, but will also take into account local variations. The number and distribution of samples required should be clearly discussed in advance. This is potentially an area of tension, as the scientist needs to have statistically valid results, which may require taking many samples, preferably from the same area, but this creates a dilemma for the conservator in that, besides being damaging and unsightly, the removal of material in a load-bearing structure may cause points of weakness. Negotiation here is key. Be prepared to adapt the strategy over time, if necessary.

Before taking samples, extensive discussion with the person requesting samples is strongly recommended, so that both

2. A popular sampling site in the hold

parties understand the reason for sampling and what type of analysis is to be undertaken. Knowing which questions to ask will improve with experience. Currently, there are European guidelines on what should be considered when sampling cultural material (European Committee for Standardization EN16085 Conservation of Cultural property - Methodology for sampling from materials of cultural property - General rules). These were not available at the start of the *Vasa* research, but we were gratified to discover that we reached the same conclusions and recorded the same information as the guidelines now suggest. Without a thorough understanding of the sample's history or the purpose of the analysis, there is a risk that too broad – and perhaps false –conclusions may be drawn. A good knowledge of the material and its history can prevent wasted time. For example, in the *Vasa* research, it occasionally transpired that major conclusions on the hull structure were being based on samples taken from one of the many loose objects, which were conserved quite differently from the ship and with polyethylene glycol (PEG) of different molecular weight. Another example is the conclusions drawn about the strength of the load-bearing timbers based on a sample from a single block of wood. The block had been used to fill the gap between where the deck met the sides of the ship, between knees, and may already have been discarded by the ship-builders as unsuitable for bearing loads and instead used as a filler piece.

Sample numbering: When the *Vasa* project began, we used a numbering system which showed exactly from where on the ship the sample was taken. This was meaningful to us, but resulted in quite long, complex numbers. All too often the project teams would shorten this number in their tables and reports which resulted in much confusion, as the first part of the number was repeated over many samples. We soon changed to a simple ascending number series, which let us avoid these problems, but it also means that a sample's location is not immediately understood. Since hundreds of samples have been taken over the years, it is necessary to have access to the database when discussing research results. Participants should be encouraged to include sample numbers in reports and publications (in tables or as an appendix), so that results can be tracked and compared. In the case of core samples, it is also wise to ensure that the depth of a sample is clearly indicated. In *Vasa* material, there is a large difference in properties between surface and inner samples of wood, a difference which was only discovered thanks to careful documentation of core depths.

Sampling should be documented thoroughly and a samples' database is recommended, in order to keep track of and evaluate analytical results. This should preferably be done by the project owner. In the *Vasa* project, although participants were allowed to have access to the database, it was decided that only the conservators would be able to input data. This afforded some control over the information and ensured that the project groups reported their data through a single channel. If samples are shared, make sure everyone in the project is informed and this information is included in the database. This often caused problems in the *Vasa* project, as it was not always made clear whether the entire sample was passed on to another team or just a part of that sample. If samples are divided, it is wise to assign sub-numbers, which makes it easier to keep track of what is going on and to evaluate results. Consider whether samples from other sources, which are used as reference material, should be included in the database.

Analytical techniques: Be aware that different analytical techniques can yield different results and conclusions, based on the sensitivity of the instrument and the experience of the operator. Understand the principle of the analytical technique and discuss the relative benefits and limitations. Sometimes, in order to evaluate a conclusion, it helps to know all the steps that have led to it. Visits to the facilities, where analyses are being undertaken, are very beneficial in raising awareness of the techniques involved, how the sample is prepared and is also good for project morale.

Later in the *Vasa* project, there was a desire for each core sample to be tested for the same properties, for example, pH, iron and PEG contents, in order to get a better general picture of an extremely heterogenous material and to make meaningful comparisons. How realistic this goal is depends on the properties to be measured and whether the analyses can be repeated by each group using the same techniques. The downside is that depending on the type of analyses, an even larger sample may have to be taken, and the extra testing may result in increased costs and time.

Media strategy: Media interest can be a double-edged sword. In our experience, the media avidly picked up any reference to the *Vasa* ship, which sometimes proved hard to manage, especially as some of our project teams were from overseas. Although contracts with researchers requested that we be informed when articles were published, the actual dates of publication were harder to predict. On many occasions, we had to respond to reporters asking us for comments on an article we did not know had been published. On the other hand, media attention should be used to raise awareness among the general public about the value of preservation. In any case, if a media officer is not included in the project, a clear strategy of how to deal with the media should also be considered early on in the planning process.

CONCLUSIONS: THE ROLE OF THE CONSERVATOR

Armed with theoretical and practical training in both natural sciences and humanities, conservators are uniquely qualified to translate the scientific hard facts and raw data for use in a museum or cultural context. Our role in large multi-disciplinary projects is to remind researchers to relate the scientific questions to the cultural context. In many respects, we are the conscience of the cultural resource. This is not an easy task. Unlike the majority of scientific fields, our world is not black and white, but many shades of grey. We have to balance various aspects of the cultural historical or museum perspective with the available scientific facts. We may reject the most effective scientific treatment, if it is too damaging to the artefact, and instead, choose a less effective, but gentler solution. Or we may accept some loss of archaeological/cultural historical information, in order, for example, to extract iron from an object to improve its long-term survival. To do this effectively, we need to be articulate in explaining our decisions to others. We have the cultural resource as our first priority and our perspective is the long-term, rather than finding quick solutions and results.

The conservator is best placed to know and understand the material under study. The material is not just chemical, biological or physical, but is a medium for several different abstract values, including aesthetic, historic, scientific or social, which together make up its cultural significance. The material is an irreplaceable source of knowledge, which is especially true for archaeological material, for which there are few or no written records. Awareness of the conservation history is also important, as substances may have been added, or the original material changed through treatment, which may alter the physical and chemical properties of the original material. A natural scientist is not always used to working with such changed materials.

The conservator is also the receiver of the research results and is responsible for putting them into practice, providing feedback and suggesting improvements. Only with constructive cooperation between conservator and researcher can the field develop for the better. Safeguarding our cultural heritage is both a joint responsibility and a privilege.

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Laura Kauppinen & Heikki Häyhä

The circus horses are under the weather

Keywords:
pedagogy
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public art

ABSTRACT

"The Circus Horses are Under the Weather" is a story of a pedagogical conservation project in Kerava, Finland. The project was carried out in collaboration with the Kerava Art Museum, the Helsinki Metropolia University of Applied Sciences and the local community. The three main things in the project were to raise awareness of conservation and restoration, the art in a public space and foremost, to invite the local people to connect with their own local heritage. The project made the local people familiar with museum work and invited them to follow and participate in the process.

1. *The Circus Horses are Under the Weather -project gathered caretakers for five fiberglass horses of a Circus monument. White horse with Carla Vesto. Photo: Kerava Art Museum / Sirkushevoset sairastaa.*

INTRODUCTION

The Kerava Art Museum and the Helsinki Metropolia University of Applied Sciences launched together a pedagogical conservation project "The circus horses are under the weather" for a public sculpture, The Circus Monument, in Kerava, in 2013. The project aimed to do the conservation process in active co-operation with local community.

The conservation project was transparent and had participatory dimensions.The aim was to increase the public's appreciation of public works of art and to prevent further deterioration. The project aimed to encourage city dwellers from indifference to solicitude.

"The Circus Horses are under the weather" aimed to revive the participation of the community, which is strongly linked to the history of the monument. By sharing knowledge to develop attitudes, we aimed to strengthen the bond between the community and the public sculptures it owns. The project supported the community's identity, by telling the history of the monument to the new generations. It also respected the previous generation's efforts for the common good. The keys to the social inclusion were access, representation and participation.

The circus monument respects the Kerava based Grönroos-Sariola (afterwards Sariola) Circus. The fiberglass circus monument consists of five carousel horses on separate stands. The implementation of the monument was acquired by a public fundraising in 1977. The circus monument was designed to be a functional work of art, where the children can play. The circus monument is part of the city's self-image, it tells the history of the town, the urban development of the community, and the idea that art exists for the city dwellers.

The beloved sculpture was in its current state, however, only a hint of the past. What would be the ideal state of the monument was decided together with the community. The ideal state meaning, which physical state of an object is considered most desirable by its custodians (Appelbaum, 2007). We invited local community to join us as we went ahead with the process without a certain designated goal.

In 2014 a group of fiberglass horses were reintroduced to Kerava people in a big celebration. The homecoming pack had undergone a complete restoration, their past had been discovered and written down for future generations, and people´s memories of them had been passed on in numerous occasions.

KERAVA, FAIRGROUND AND A FEW HORSES

Kerava is a city in southern Finland, just 20 minutes away from Helsinki. It has been a city for only 90 years. The city really started developing when the first railway in Finland was built from Helsinki to the city of Hämeenlinna. The railway passed Kerava and soon the trains also started stopping there. The industry grew fast, due to Kerava's good location and accessibility. The town grew on brick, wood, rubber and metal industries, which gave work to the growing population. But the town also grew with the circus and the fairground as its curiosity.

In 1979 people of Kerava gathered to the city centre at the opening ceremony of the Circus Monument. A few years back, an enthusiastic prominent figure, Aune Laaksonen had had an idea to celebrate the history of Kerava with a new monument. The monument was to commemorate the Kerava- based circus and fairground family Grönroos-Sariola (afterwards Sariola), who started their business in 1888. The Sariola family made Kerava their home and stayed in town for the winter with their exotic animals and artists. Many of Kerava's beloved stories and legends were born with the family's colourful way of living.

Money for the monument was collected by local people in numerous events. A bank account was opened for donations. Nearly everyone pitched in one way or another. Even the materials for the horses were received by donation. The monument was designed by the Finnish sculptor Heikki Häiväoja and a theatre mask maker Antero Poppius. The intention was to make a functional piece of art that would allow the same kind of joy as riding a carousel does.

Five fiberglass horses were made in a mould taken from a 19th century carousel horse that once was the showstopper at Sariolas biggest carousel. The horses were given black, white, grey and brown colours that imitated the real horses. Placing of the monument changed the town's public space, for it was placed at the beginning of the main street blocking the cars and making it a promenade for the people.

In the opening speech people were encouraged to lift their children to ride the five horses, and so they did. The monument gathered the children and made the place so desirable that even children from other towns wanted to visit the spot. There were sometimes even queues for the most desired white horse.

TOO MANY GALLOPS LATER

Some thirty years later, after the days of glory seemed long gone, the circus horses were "under the weather". Legs and tails had gone missing, the horses were covered in tags and dirt and the once shiny paint was coming down. The horses obviously needed a good amount of love and care.
In 30 years, Kerava also had changed. Earlier the monument stood on a spot next to a lively promenade with shops. Now, the monument and its surroundings seemed deserted and the businesses seemed to have moved further down the street. The children's joy was nowhere to be found.

2. *The Circus Monument is an important piece of public art in Kerava city center. After a profound conservation project the monuments horses regained their shiny appearance. Photo: Kerava Art Museum.*

3. Thirty years in a public space leaves traces of encounters with people and outdoors. The Circus Monuments condition was very poor in winter 2013. Photo: Kerava Art Museum / Sirkushevoset sairastaa.

4. Veli-Matti Immonen and Eevi Kallio taking a sample of the material. Photo: Kerava Art Museum / Sirkushevoset sairastaa.

5. The monument has witnessed a lot of play and it has helped creating childhood memories for generations. Two-year-old Mika and his older brother, 6 year old and Juha ride the horses in 1982. Photo: Pirjo Seppälä / Kerava Art Museum / Sirkushevoset sairastaa.

TAKE CARE, INTERVENTION

In 2013, the Kerava Art Museum and the Helsinki Metropolia University of Applied Sciences launched a pedagogical conservation project to restore the horses. We wanted to share our journey of caretaking with the Kerava people. The aim was to raise awareness of the circus monument, to lift the curtain of the museum work and to allow people to participate in the future of their cherished monument.

We collaborated with a local elementary school, the Kerava Museum and the Urban Environment Unit of Kerava. A class of school children was at the core of our project. They were following the process from the beginning and working with the conservation students. They were also given classes on conservation and its aims, the history of the monument and the history of the fairground in Kerava. They also learned about sculpting in a workshop given by a Finnish sculptor Anne Meskanen-Barman. They collaborated in the making of condition reports and an exhibition held at the Kerava Art museum.

The children were given a task to spread the word about the project. They were expressing their thoughts and sharing their knowledge to us and to a wider audience through a blog. They also did a short film that was shown in every elementary school in Kerava.

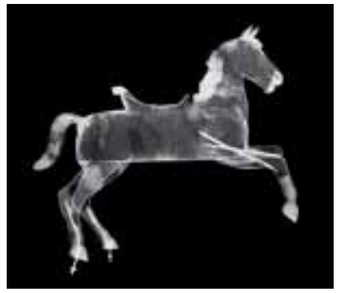
SHARING DOES COUNT

Alongside the children's project, we invited Kerava people to participate in different ways. We asked people to contribute to our project by sharing their memories and stories of the monument. By engaging people, we were able to look closer at the function and different meanings of the artwork.

The memories played a significant role in the process to understand the meaning of the monument, but they also helped us in sharing the importance of the monument back to the people. It wasn't the voice of museum workers or conservators saying why the monument should be taken care of, but by the people themselves. We needed the people to fall in love with their horses again, so that they would care for them in the future with us.

We shared our knowledge as we got further in our investigations and the aim was that people could be at the same page with us as the project went on. We used social media, a blog and a Facebook -site, as an information platform, but we also did a window exhibition for people who are not engaged in social media. The idea was to make the exhibition as accessible as possible.

We also made a few gift items: a temporary tattoo, a reflector and a magnet. With these items, people could take the horses and their tale with them from the museum gift shop and spread the "news". At the very end, we published a book that told the whole story of the process (Kuula, 2014). The book also widened the readers' perspective with the history of the original carousel horse and the history of the carousel as a form of amusement. People's memories and pictures were published in the book as part of the monument's history.



6. Poorly made iron armature was discovered in a radiograph. Photo: Metropolia University of Applied Sciences / Sirkushevoset sairastaa.
7. Noora Schroderus started taking care of the surface by removing over paintings. Photo: Noora and Kimmo Schroderus / Sirkushevoset sairastaa.
8. Local people gathered to welcome the horses back in June 2014. Photo: Kerava Art Museum / Sirkushevoset sairastaa.

By engaging people in the process we got them talking about the horses and sharing their thoughts and memories not only with us, but also among themselves. The local press also followed the project with enthusiasm, which helped us share the process. At the end, in June 2014, we organized a big celebration for the homecoming gallopers and made the day special for the local people.

LOOKING THROUGH THE SURFACE

The conservation process began with two types of studies: the materials and the significance of the monument. We needed to form a picture of its tangible and intangible elements. Only by combining these studies we found out what we had in our hands and what we should do with it.

As a starting point for the conservation project we used documentation made with the children, archival information from the Kerava Museum, interviews and memories from the community. The artist Heikki Häiväoja, age 84, was interviewed as well as the lady behind the monument – Aune Laaksonen, who passed away recently. Material analyses were made by the Metropolia, including cross sections, colour measurements and a radiograph of the whole horse.

The radiograph revealed that the iron armature inside the horse was poorly attached and corroded. It had to be renewed and strengthened. From the cross sections we learned that the horses were painted many times and the gelcoat layer on glassfibre was quite thin. The sculptors Heikki Häiväoja and Aarne Jämsä provided valuable information about the materials and construction of the monument. Both of them were interviewed by the conservation students.

FINDING THE BEST CARE POSSIBLE

The remedial conservation project seemed to be very demanding. The condition of the monument was poor. Structurally, the monument was not solid. Two horses were missing a front leg, one missing a tail, and all the horses were stained with dirt and graffiti. At some point we discussed about the possibility of making new horses by using the original mould because it seemed difficult to find a workshop which could carry out the demanding conservation-restoration work. Metropolia doesn't have a workshop suitable for glassfibre work. Finally, we were lucky to find two sculptors, Noora and Kimmo Schroderus, who had been working with glassfibre earlier. They have a fully-equipped workshop, with professional personal safety equipment.

Overpaintings were removed, rusty iron armature was partly replaced with stainless steel, new legs and tails were mended. The horses were painted with colours as close as possible to the original colours. Over the years, the horses had switched places like in a carousel. Now the set-up was restored back to the original.

Significance 2.0 analysis was used as a key to unlocking the meaning of the monument, and to study the intangible elements of it. Significance 2.0 was originally published in 2009 by the Collections Council of Australia (Russell and Winkworth, 2009). [1] Significance 2.0 is used to define the meanings and values of a cultural heritage item or collection through research and analysis, and by assessment against a standard set of criteria. The significance assessment is a collaborative and transparent process and it should take into account that the Circus monument may hold different meanings and values for different groups and individuals.

According to the consultations carried out in Kerava it seemed clear that through functionality the Circus Horses had made their way to the lives and memories of the Kerava people. They played significant role in the memories of the childhood in Kerava. According to the collected memories and conducted interviews, functionality was the most important value for the community. Functionality was then chosen as the ideal state of the monument. "Ideal state", a concept from art conservator Barbara Appelbaum (2007), is very useful in defining the realistic goal for the conservation-restoration process. "Ideal State" is always a real historical state, which includes the intention of the artist and the evidence of the use of the object and the traces of time. The aim is not to alter or improve the history, but to regain a chosen state of the object's lifespan.

The conservation-restoration process was planned to reach the goal of functionality and usability. In practice, the inner structure of the horses was strengthened, loose parts were attached in a reliable way, and the paint coating performed in the way that it can last wear and tear.

In this process we failed to deliver the ideal state of the monument because safety regulations seemed to be stronger than the experience of the people. A new pedestal, which makes climbing on a horse more difficult, was designed. The horses are strong enough to carry new riders, as the ideal state proposes and people are making up their own minds about safety. The local people keep on riding and allowing the children to ride the horses anyway.

CONCLUSIONS

What did we gain by engaging school children in our project? The children collaborated with the conservation students. They were our primary source of information about the horses from their childhood. They were also the ones who showed us how to ride the horses, and why some spots were more damaged than others. The children also collaborated significantly by helping us share information about the project. They did it from child to child.

By involving children we were forced to look closer at our ways of speech about conservation and public art. We also created new ways of working. For example, the documentation form developed with the children, will be used in the future to follow up the condition of the monument.

What did we gain by opening the process instead of just making it behind closed doors? We were able to show that conservation is a process that does not happen overnight and that it involves decisions. We wanted to show that both the tangible and intangible should be studied carefully before decisions are made. We were also able to share knowledge of the local history to a new public. The public got to learn how a community can change their own town by working together. From an idea of a person, to a monument that changed the urban planning of a town, this piece of art is quite convincing evidence of a community's power.

Perhaps most importantly, we gained the sense of engagement with the community. We were able to demonstrate that public space and, in this case, public art creates private memories and experiences that are beyond the creators' intentions; those experiences are of value. In our opinion people should have a stronger role in what is happening in their public space.

NOTES

[1] The Finnish Significance analysis was published in 2015 by the Finnish Museums Association.

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Suvi Leukumaavaara

raising awareness of remembrance – works of artists as part of invisible cultural heritage

Keywords:
cemeteries
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funerary art
grave monuments
outdoors sculpture
conservation-restoration
historical techniques
deterioration

ABSTRACT

The present study discusses invisible heritage in our cultural environment through cross-disciplinary research of historical grave markers. Cemeteries present a complex situation with many celebrated artists' works – and graves – deteriorating at cemeteries. Due to their nature and location, grave monuments are outdoors sculptures which are not considered works of art as such, and normally are not maintained as part of outdoors sculpture conservation. Due to their materials, many of these works are currently in a severe state of deterioration, at risk of disintegration. Since their maintenance is mostly the responsibility of private gravesite leaseholders, conservation of grave monuments is subject to permission. Studying deserted graves may require many kinds of background research. The preservation of these in many ways important historical monuments calls for expertise and would benefit from a collaboration of several fields, as well as new ways of looking into funerary art.

INTRODUCTION

Grave monuments often fall out of the category of outdoor sculpture or funerary art in public places, and their condition is usually not monitored as part of outdoor sculpture conservation carried out by, for example, city councils. This can create a contradictory situation, especially when works of art by the same artists can in many cases be found both at local cemeteries and in museum collections.

Presently, a large number of historical grave monuments across Finnish cemeteries are at risk of deterioration, or already in the process of falling into decay. The use of fragile materials, combinations of materials, environmental factors, a lack of maintenance and long-term exposure to changes in temperature and humidity have caused deterioration and disintegration of many grave markers. In Finland, there is no law strictly protecting these works. Whose responsibility is it then to care for these in many ways historically significant grave monuments?

The context of preserving can be considered from many perspectives: preserving the memory of a deceased person, preserving a unique work of art or preserving a surviving example of old graveyard culture. The latter can include preserving grave monuments crafted by a known mason or even examples mass-produced by local factories – both often collaborated with well-known artists and architects. In the context of preserving parts of artists' œuvres situated in cemeteries, it should be borne in mind, however, that "forgotten" graves can sometimes be the graves of the – still – celebrated artists themselves.

The majority of grave monuments and their condition is entirely at the responsibility of individual gravesite leaseholders. This means that, without permission, it is not allowed to take any action regarding e.g. the cleaning of a grave monument. In many cases, however, families have become extinguished, or, with the passing of generations, the families in question might not be aware of their ancestors and subsequent grave markers anymore. These gravesites have thus, from the point of view of congregations, become "inactive", and therefore – as has happened in many places during the past decades – many significant grave monuments have already been disposed of to make way for new gravesites.

With growing awareness of the importance of preserving cultural heritage, old grave monuments have started to get more attention. Due to their nature, they, however, belong to both visible and invisible cultural heritage and environment, especially with the distinction between public monuments and grave monuments. Changes in funerary culture and visiting cemeteries have also largely affected the situation as well as the deterioration of the said monuments. Naturally, artistic values are not the only justification or reason for preserving old grave monuments. Graves of many important people at their own time have, however, also been forgotten.

In Finland, funerary art as a discipline still remains rather under-researched, and in many places provides only limited locally-applicable tools for a comprehensive study on the subject. In 2013, the Finnish Cultural Foundation initiated a pilot project on studying and safeguarding significant grave monuments.[1] The scope of the project, not discussed in depth in this paper, has been to raise awareness of the importance of preserving historical gravestones and grave monuments in Finland by activating gravesite leaseholders and other interested parties and providing tools for concrete actions. The approach of the project has been cross-disciplinary, combining e.g. conservational, art historical and historical viewpoints.

METHODS OF THE PROJECT

During the past decades, several local inventories of cemeteries have been carried out. The scope of most of these inventories has been to document local grave monuments and/or transcribe their inscriptions. Few of these inventories have however documented or evaluated the materials or condition of the grave monuments or carried out further research on the deceased persons. Even fewer studies have concentrated on researching grave monument design and their production or studying the authorship of unattributed works at cemeteries.

Existing literature and data on Finnish cemeteries and funerary art is therefore still scarce, and there is a number of unresearched cemeteries across the country. Unattributed grave monuments often require both genealogical and different kinds of historical research. This research can be laborious and time consuming as it normally necessitates studying unedited primary sources. Therefore, it would be beneficial to combine different sub-categories of cemetery research and develop collaboration between interested parties, e.g. genealogical research (documenting inscriptions) and graveyard photographers (documenting old graves).

In the project, a cross-disciplinary approach was considered the most effective basis for research methods (documenting and evaluating the condition of grave monuments), serving both decision-making and further study. Grave monuments and their values have thus been considered combining art historical, cultural-historical, industrial historical, local historical and conservational viewpoints and approaches. Monuments have also been studied categorically, making inventories and mapping the graves e.g. by type, materials, or the symbolism in them. Another research pattern has been studying them by profession: graves of notable artists and architects, as well as the designers and executers of the grave monuments.

Attributions regarding authorship have at times been possible to be carried out on stylistic grounds via comparative study of monuments of the period in question. This type of study would typically be combined with researching the professional networks of the artists and the buried persons – artists and architects are known to have designed funerary art for serial production also. Attributing the designers of even mass-produced grave monuments can therefore add value and importance to preserving surviving examples of such memorials too. Documenting serially produced cultural heritage also has important industrial historical and local historical values.

During the inventory, observations regarding the overall condition of individual monuments and the rates of deterioration of the materials were carried out. The materials, techniques and deterioration rates of the monuments were studied comparatively. To increase cross-disciplinary knowledge, these observations have also been discussed with external experts in related fields of study. Examination and evaluation work at cemeteries is normally carried out through summertime fieldwork whereas archival and genealogical research can be carried out regardless of weather conditions. The scope of the project has been to combine the results of these two.

EXAMPLES OF DAMAGE

Grave markers can be divided into different categories. These can include e.g. upright gravestones, flat, horizontal gravestones, ledger (pillow) gravestones, pedestal monuments, dry stone monuments, mausoleums, sculptures and crosses. These have traditionally been made of wood, metal and stone. Grave monuments include both handcrafted and serially produced memorials, as well as artists' and architects' commissioned works, or works executed via design competitions. A grave monument can also be a combination of these.

Materials typically used for grave monuments in Finland are a) both local and imported types of natural stone, b) metals: wrought iron, cast iron, copper, c) mixtures of these, d) wood and other less permanent materials, of which e.g. old wooden crosses have mostly weathered away. Typical problems of grave monuments include the tilting of grave markers, instability or falling of headstones, cracking and deterioration of stone, deterioration of metal e.g. by rust and oxidation, deterioration by vegetation and biological growth. Damages are caused by different kinds of weathering (deterioration of materials *in situ*), which can be divided into three main types: physical, chemical and biological weathering.

Factors for weathering depend on the materials of the grave monuments, the location and the surroundings of the cemeteries and those of the monuments within cemeteries (e.g. proximity to coast, linked with salt weathering). While most damage is caused by fatigue and erosion of materials and environmental changes, long-term neglect is crucial for these historical monuments. Gaps in the maintenance and upkeep intensify deterioration, particularly concerning sensitive materials.

1. *The c. 1910's art nouveau style grave monument has started to tilt and the joints in the structure have started to open.*
2. *The early 20th-century grave monument of the Edelfelt family, made of soapstone (by Armas Lindgren).*

3. Dry stone wall type of grave monument at the final stages before collapsing.
4. Crack caused by freeze-thaw, exposing the dowel used in 'blind pinning'.

PHYSICAL WEATHERING

Physical weathering is a process caused by the effects of changing temperatures on rocks. Tilting, falling and collapsing of different types of grave markers is currently a major problem at many cemeteries. The tilting of an upright memorial with a base stone or a monolith normally depends on the quality of its foundation, the materials used and the stability of the supporting soil; it is sensitive to movements *caused by ground frost* (frost heaving). In some cases, the weight of the monument might also be an accelerating factor. The age of the grave monument does not normally coincide with the tilting, as can be noticed in many 19th-century memorials, for example.

Grave markers consisting of two pieces, a headstone and a base, have typically been joined together by "blind pinning", i.e. placing hidden metal dowels in between the two elements. With time, these metal dowels have started to rust, which eventually causes the grave monument to topple over usually causing breakage; depending on the surroundings and the distance to other monuments. The process of rusting is further aggravated by the combination of freeze-thaws, long-term presence of humidity and snow blankets.

A freeze-thaw occurs when water that seeps into cracks or joints in the gravestones, in dropping temperatures, expands as ice. Repeated freezing and thawing weakens the rock and the gravestone might eventually split – dowels used for the "blind pinning" can often be seen through the cracking of the gravestone. Freeze-thaw and the fatigue of the metal of the dowels is a crucial combination for many grave monuments that a proximity to sea and/or long winters might further provoke. This kind of damage can be observed throughout cemeteries. The fact that structurally speaking this is the most common type of grave monument increases the concern to localise the monuments most at risk.

In the early 20th century, grave monuments imitating a rustic stone wall were popular in Finland. These often u-shaped massive monuments, often executed by commission and designed by the most important architects of the time, were made using the dry stone building method, constructed from quaderblocks (blocks of stone) without using mortar to bind them together. About a century later, the stability of this type of grave monuments has started to suffer. Some quaderblocks have now started to move within the structure and the walls have started to incline, which has in some cases even resulted in the collapsing of an entire monument.

CHEMICAL WEATHERING

A comparison of grave markers from different periods of time indicates how different stone materials react under changing atmospheric conditions, climate and pollution. Chemical weathering and decomposition of gravestones is due to reactions that occur between the environment and the various minerals in the stone material. The deterioration of individual rock species varies depending on their properties.

Factors affecting weathering are the porosity of grave monument materials, the position of the monument (horizontal or upright) and the level of their maintenance and upkeep. Whereas horizontal pillow gravestones hold water in puddles for longer than vertical stones, upright headstones have often weathered to equal extent, the porosity of the rock species being the decisive factor.

Materials used for grave monuments in Finland include both local and imported types of natural stone such as granite, diorite, gneiss, marble, soapstone,

5. Exposed copper dowel.

6. Many cracks on a marble grave monument due to freeze-thaw and corrosion of the dowel.

7. Lichen and sugaring on a 19th-century grave monument (by Robert Stigell).

8. Sugaring of the inscription of the marble grave monument of Aurora Karamzin (by Ville Vallgren).

9. & 10. Details of lichen and changes in colour on Aurora Karamzin's grave monument, possibly due to an earlier laser cleaning (2 photos)

sandstone and limestone. Igneous stones (such as granite and diorite) usually have a lower porosity than metamorphic (marble, soapstone and gneiss) or sedimentary stones (limestone and sandstone).

A means for monitoring the weathering of gravestones could, for example, be examining the edges of the carved or sandblasted inscriptions of the grave monuments. When weathering advances, the edges begin to soften and round, affecting the legibility of the lettering. Depending on the depth of the carved letters, further degradation can cause disintegration of the lettering that, eventually, becomes indistinguishable or even disappears.

Marble in particular is a material susceptive to atmospheric staining. The surface of marble grave monuments has often blackened by depositions and black crusts. Due to its scarce suitability for outdoors use in Finnish climate, the overall condition of many marble-containing grave monuments is poor. Marble weathers under rainwater by carbonation, causing for instance rounding of the edges of lettering and details of sculptures. In the final and most advanced stage of the deterioration through extensive sugaring (loosening of the surface crystals) and erosion, these features on a marble monument can be lost.

11. Gravestone of architect Usko Nyström (by Alvar Aalto).

12. Lichen on the grave monument of Albert Edelfelt (by Eliel Saarinen).

13. Lichen on early 20th-century soapstone grave monument (by Gesellius, Lindgren, Saarinen).

14. Grave monument of Gunnar Berndtson (by Eliel Saarinen and Robert Stigell).

15. Grave of Alexandra Gripenberg (by Emil Wikström).

16. Grave of Magnus von Wright (by Walter Runeberg).

BIOLOGICAL WEATHERING

Grave monuments have proved to be useful in monitoring weathering rates and changes in air pollution. During the project, observations regarding vegetation on grave monuments were discussed with researchers, e.g. in the field of biology. The growth, disappearance and reappearance of different types of lichens on grave monuments indicate changes in the level of pollution around city cemeteries.

Trees planted on (or in proximity of) graves during the past centuries have caused damage to many grave monuments. Falling tree branches may damage or even break them, as was witnessed during the research project. The pressure of plant roots growing under or in the cracks of a grave monument can be substantial, causing cracking, tilting, falling or even breaking of the grave monument. The environment under the trees is usually very moist, causing the chemical and biological weathering to take place faster. The attachment of lichens – such as algae, fungi growth and moss – on the surface of a grave monument indicates a regular supply of moisture. In large cemeteries, it is possible to notice that the grave monuments have different kinds of lichens and moss growing on them, depending on the surrounding trees.

Plant roots, rhizoids and lichens produce acids, which cause slow decomposing of some minerals on the surface of the gravestones. Inscriptions and epitaphs on more porous rock species are sensitive to the attack of leafy foliose lichen and moss, as long term neglect allows the rhizoids to penetrate the surface of the stone. For the grave markers, a more fre quent surface cleaning would be a safer option, rather than cleaning the monument once in a decade, (or more rarely) as the removal of lichen and moss at an advanced stage is likely to cause damage to the surface, particularly in case of details and lettering on sensitive materials.

Apart from damages regarding the surface of the grave monuments, some of the “inactive” graves present another problem: overgrowing. Graves not covered by annual leaseholder fees are typically not maintained, or, depending on the stipulations of the contracts, the maintenance might be limited to certain aspects of the gravesite. The microcosmos of an overgrown gravesite is also subject to eventually cause further problems affecting the conditions and the stability of the grave monument itself.

METALS

In the 19th century, iron crosses became popular at cemeteries. With production costs dropping with industrialisation, decorative wrought-iron crosses, hammered or forged into shape, started to be replaced by those made of cast-iron (iron made in a mould). Mass production of iron crosses in Finland reached its peak in the 1860s. Apart from crosses with elaborate iconography, iron fences, iron benches and other ornamentics belonging to the cemetery culture were also produced.

Crosses and fences were normally given a protective paint layer. Old photographs of grave monuments have indicated that even copper decorations have been painted. Due to gaps in maintenance and the lack of a protecting coat of paint, the original material has often been exposed. Reactions in metal often stain grave monuments, particularly in cases of monuments with bronze reliefs incorporated on the surface of a stone monument. In many places, the lack of a protective paint layer has caused severe corrosion to the materials, affecting the structural integrity of the grave monuments. These parts in advanced stage of rusting may already be beyond the point of rescue.

Wrought-iron and chiselling metal can nowadays almost be considered a lost art, with only a handful of craftsmen mastering the technique. Works of art nouveau era ciseleurs (such as Eric O. W. Ehrström) at cemeteries are in a fragile state. Therefore, it would be important for the cemetery culture and conservator-restorers to maintain the knowledge of this tradition and to familiarise themselves with these metal-working techniques via exchange of practise and experience, in order to be able to preserve and work on these often unique grave monuments.

17. Ornate art nouveau gate at advanced stage of rusting, showing handicraft and mixture of materials.

CONCLUSIONS AND FURTHER STUDY

Based on the examinations carried out during the cemetery research project, physical weathering of stone and the rusting of metal are the most seriously affecting phenomena regarding historical grave monuments. Physical weathering has started to alter the stability of early 20th-century stone monuments and some of them have already collapsed. Due to the hidden structure ("blind pinning" using metal dowels) of a common type of upright gravestones, the stage of the rusting process of the dowels is not always visible, presenting an increasing risk as headstones may unexpectedly fall.

The research indicates that grave monuments currently most in need of conservation-restoration are not necessarily the oldest, such as the early 19th-century Empire style grave monuments, but rather the early 20th-century graves. This is particularly evident in the case of architect-designed, massive art nouveau style monuments, mostly constructed using the dry stone wall technique (constructed without using mortar).

Historical grave monuments made of metal, on the other hand, would require urgent action, as they may in places be in an extremely fragile condition – approaching the final stage of deterioration due to oxidation caused by a long-term lack of protective paint layer. Preservation and/or documentation of the surviving examples of ornate wrought-iron and chiselled copper and further study on the role of artists and architects in designing grave monuments is crucial for the cemetery culture and different aspects of historical preservation. More attention should be drawn to invisible cultural heritage and more conservator-restorers specialising in outdoor sculpture, grave monuments in particular, are needed. The prestige of artists does not always coincide with the condition or imposingness of their graves. A famous painter's simple grave might be overgrown with weed, while across the town, people queue to see and buy reproductions of the same artist's works in the collections of museums – where also scale models, sketches and architectural drawings of grave monuments are kept in optimal conditions. Invisible cultural environment has become something considered self-evident, even though during the research project, it has also been noticed that some badly-weathered grave monuments have recently been cleaned and appropriately restored.

While raising awareness of the importance of preserving historical grave monuments is crucial, it would call for contributions and inputs from outside of the actual gravesite leaseholders also. Apart from further research, a change in the cemetery culture and new ways of considering funerary art should be introduced, enhancing collaboration between different conservation-restoration areas, historians, genealogists, biologists and individual enthusiasts of the subject. New ways of celebrating artists could also be introduced – not only by celebrating the individual artists by jubilee exhibitions and, e.g., commemorative stamps, but rather by reviving an old custom that has become less and less common: by visiting their graves as part of these occasions.

18. Deteriorated iron of an early 20th-century grave monument (by Herman Gesellius and Eric O. W. Ehrström).

NOTES

[1] Initiative for the project came from art historian Petja Hovinheimo (1975–2013), fund officer of the Uusimaa Regional Fund of the Finnish Cultural Foundation, in collaboration with a steering group comprising of experts from different sectors regarding cemeteries, study of funerary art and preservation of cultural heritage in Finland.

Katja Luoma & Teemu Kajaste & Elina Järvelä & Hanne Mannerheimo

conservation of scagliola columns at finnish national library

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ABSTRACT

Scagliola is glossy artificial marble made of coloured gypsum and animal glue. Its surface is also highly sensitive to wrong cleaning methods. These may lead to a matt finish, but also, repairing surfaces without causing additional stains is a challenge. The Finnish National Library is one of the most significant sights in Finland representing scagliola craftsmanship. Our conservation team had the opportunity to carry out pioneering ground work in the Library´s scagliola conservation. Current research-based literature has practically no references of scagliola conservation methods. The thorough cleaning tests of our team resulted in an efficient formula based on Marseille soap, and the material analyses produced new information about the use of dyes in scagliola instead of dry pigments.

1. Interior of The North Hall. Conservator Teemu Kajaste working with the scagliola repairs.

INTRODUCTION

The main building of the Finnish National Library was designed by Carl Ludvig Engel and the construction work started in 1828. The construction was finished in 1840, after Engel´s death. The library´s first extension was the rotunda. It was built by architect Gustav Nyström in 1906. These two designs form the main building of the present-day Finnish National Library. Gustav Nyström wanted to be faithful to Engels´ original drawing. The interiors have been stunningly well preserved and is without a doubt one of the most beautiful interiors of neoclassical Helsinki. One of the most important elements of the interior is the line of beautiful glossy scagliola columns.

The planning of the National Library´s conservation work started in 2013 with cleaning tests. In the beginning of the project all columns had multiple types of damage, stains and dirt. The damage had been mostly caused by the building subsidence and minor vandalism but also by using wrong cleaning methods. The previous cleaning tests were made with a refining method. This produced a matt finish surface to be later treated with wax. Our team started planning tests in order to avoid any new materials. Also the layer of the actual scagliola may be very thin on some parts and refining could lead to non-reversible blank areas.

The scagliola technique originated in the ancient world. It was rediscovered in the Renaissance and became very popular during Baroque and Rococo (Harrison 2013). It had its golden era during the Regency (in Finland Empire style). There seems to be some cultural diversity in the polishing materials used, but in Finland the high gloss of scagliola was achieved using animal glue, not wax. This makes the surface fragile to water contact.

First we wanted to be certain that the high gloss of the surface wasn´t obtained by using wax. The original technique does not necessarily include wax. Scagliola is a polished plaster, which consists of gypsum, animal glue and natural pigments. The polishing is done by the activation of the adhesive with the polishing stone. The glue tends to harden the plaster, and give gloss to the surface. According to some references, scagliola surface have been treated with oiling or waxing after the polishing (Harrison 2013). Using soap in the polishing process is also possible.

Since there was no research-based information of previous restorations, it could have been possible that the columns were previously cleaned and that the current glossy surface was obtained with a layer of wax. Before taking action with the cleaning tests some material analysis had to be carried out.

MATERIAL ANALYSES

Material analyses were carried out by Hanne Mannerheimo. In order to detect the wax on the surfaces of the columns altogether, 12 samples were collected from the columns in each hall. The samples were diluted in acetone. After 24 hours of dilution, the remains of acetone that should have contained wax - if present were collected and left to evaporate. Afterwards the FTIR-ATR-spectras were run from the remains. No wax was detected from the samples with this analysis method.

Particular attention was paid to the pigments of the dome hall columns. The veins in the scagliola columns were moulded with bright blue pigment, which gave the impression of eminence on otherwise white columns. They were also distinctly faded in the brighter side of the hall. Pigment analyses proved that the pigment used was organic indigo mixed with gypsum. Using a dye as a colorant is a new discovery and explains the fading. The analyses methods were optical microscopying in visible light, portable EDXRF, XRD and wet-chemistry.

CLEANING

Cleaning tests started from the Cupola Hall. The white columns were the most unforgiving place to start the cleaning tests. Our team was assigned to find the most efficient way of cleaning the columns, while at the same time maintaining the patina and the feeling of old surface. We were also to find ways of consolidating and patching scagliola material that seemed to miss research-based studies of successful conservation. The conservation team was to be selected based on the tests.

The dirt on the columns consisted mostly of soot and grease left by fingers making the surface look matt. The columns also had a range of other stains: paint drops caused during the renovations of other building parts such as the panel ceilings and stains caused by floor washing water and students´ drawings.

The cleaning tests started with simple dry cleaning methods that seemed to work for the dust and some soot. It was obvious that to some degree the dirt had integrated itself into the glossy surface. Dry cleaning was still a good way to prevent the dirt from impregnating deeper, while we still studied possible wet cleaning methods.

Scagliola is mostly a calcium carbonate and the use of any acid cleaning solutions was out of the question. Any wet treatment should be alkaline and it should not include large amounts of water since scagliola is vulnerable to water ingress. The best cleaning result was obtained by real saliva, but obviously, the large scale of the cleaning area would prove to be technically difficult. After testing several cleaning solutions,

2. Cleaned area at the Cupola Hall column.

3. After cleaning one of the railings needed to be removed. Area shows the difference between cleaned and untouched scagliola.

it became clear that Marseille soap (pH 10) would be the most effective substance for the cleaning. The only problem was that its use also required also water. We were also concerned that the pH would be too alkaline. Since turpentine did not have any effect on the surface, we decided to try mixing Marseille soap with turpentine.

The mixture of Marseille soap and turpentine is not easy to achieve without certain method. Using turpentine made the use of water acceptable since turpentine oils seem to lock water molecules inside and won´t let them affect the surface of scagliola. Turpentine also lowered the pH in a more favourable way. The pH of Marseille soap and turpentine mixture is 8,5, which is still relatively alkaline. The emulsion was used with cotton swabs until the cotton stayed clean. After this treatment, the soap residue was washed away with cloths containing pure turpentine and dried. This emulsion proved to be effective. It removes all soot and grease while maintaining the surface patina. It also revives the original gloss to the surface, but does not make it look like new or too glossy.

The method was also tested under microscope to make sure it would not impregnate to the surface. The cross-section of the scagliola shows how the porosity diminishes to the surface where the upper layer turns almost glass like. The soap emulsion or even turpentine doesn´t impregnate through unbroken surface. Any residues of the soap can be seen in side light and remove by repeating the turpentine treatment.

After finding the cleaning method for the general cleaning we were able to use saliva for the most difficult stains. For the paint stains, the use of weak ammonium and for some thick paint layers, MP Eko paint stripper was found to be effective and still not damaging to the surface.

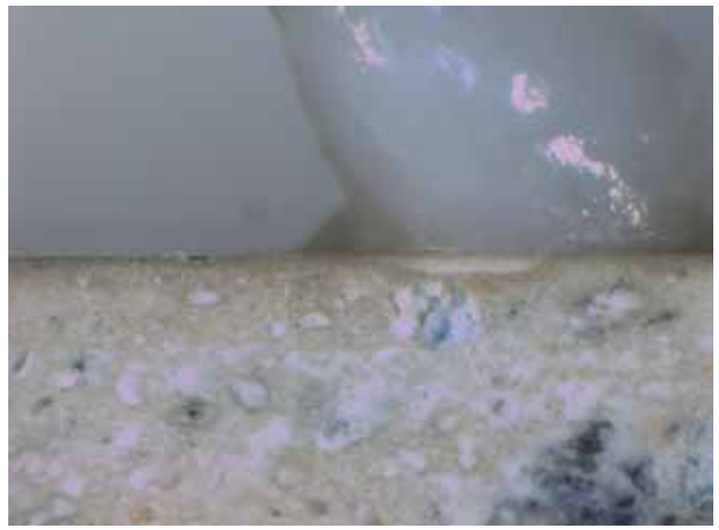
PATCHING AND INJECTIONS

The columns had several types of damage. Due to the subsidence of the building and the "living" wooden structures, there were cracks and missing areas on the columns. Parts of the scagliola were loose from the base and needed injecting. Small scratches and impact marks needed patching.

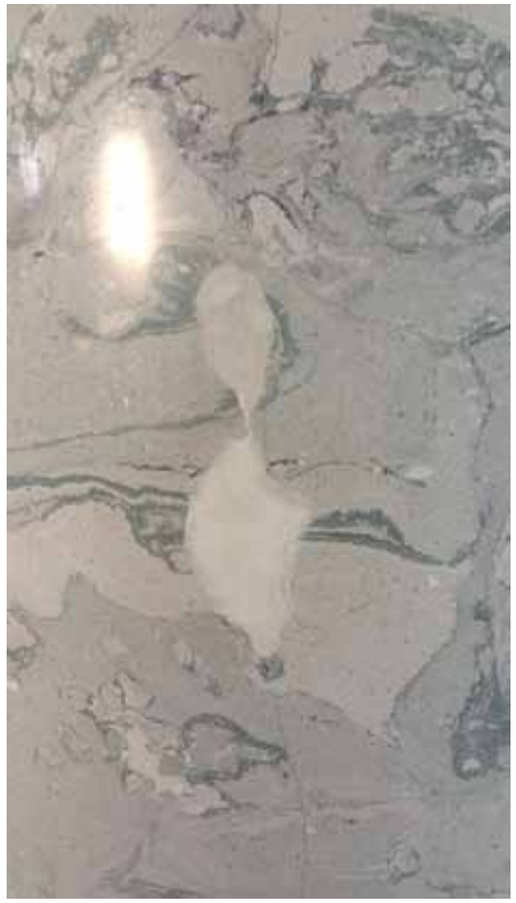
INJECTIONS

It is possible to attach loose scagliola parts to its original place. The basic start for the injection repairs is to find the injection material that works with the scagliola and the base plaster. At the National Library, the base of the columns is made of grey gypsum, which besides gypsum also consists of carbon waste. The base plaster has been cut down to the shape of the column.

The most natural choice for repairing with injections is to use the same materials as the original ones. The adhesion in injection is obtained by animal glue. Bigger gaps between the base plaster and scagliola may require filling material that consists of gypsum and glue. Adding gypsum to the injection material reduces the filling material´s shrinkage. One of the



4. Cross-section of the North Hall scagliola with soap emulsion on top. Polished surface makes the top layer of gypsum glassy and turpentine or soap doesn´t impregnate to the structure. (40X).



5. Missing area before patching.

6. Missing area after patching with Modostuc and watercolours.

main issues in fixing the damages is keeping the moisture out of the old scagliola.

Attaching with injections may need drilling injection holes or removing the loose parts of scagliola. If removing parts is possible, the injection can be made without any further damage from the sides of the loose part. This also gives an opportunity to observe the injection and the amount of filling.

Before starting the injections, the surface of the scagliola has to be cleaned properly. The cleaning presented here gives the old scagliola surface some resistance against moisture. It also lowers the risk of migrating dirt.

PATCHING WITH SCAGLIOLA TECHNIQUE

Missing areas of scagliola can be reconstructed with the old scagliola technique. First, the base of the damaged and missing area has to be carved to matching shapes. If the repair area is very deep, the base is first filled with gypsum plaster to achieve equal depth for the base. The correct depth is important to achieve, so that the scagliolas are compatible and the hardening process is possible. The reconstruction plaster is mixed on a sheet of glass. The blend of gypsum, glue and pigments is added to the wetted base of the repair area. The amount of moisture has to be minimized, so that the old scagliola surface does not receive damage. First the surface is rubbed down with the rasp tool and pumice stones. The holes on the scagliola are filled with creamy putty, which is made of a stronger animal glue and gypsum powder. The polishing is done with animal glue and fine wet sanding papers. Final polishing is done with polishing stones.

PATCHING WITH PVA PUTTY

The columns also had lots of small holes and cracks that needed patching with something dryer than gypsum. The filling material should contain as little water as possible to avoid any staining. Due to having earlier experience with Modostuc®, we started testing its usefulness with scagliola. Modostuc is a putty based on PVA formulation (Manufactures data: Vinyversatic resin PVA 1,5-3% weight dryness). This putty is very dense compared to other fillers and has little to no shrinkage. Modostuc will adhere to most clean surfaces such as paintings and wooden artefacts. It is also quite "dry" and the containing moisture evaporates quite quickly. The benefit is to have less staining compared to products with more water content. Modostuc proved to be worth using. It can be coloured with watercolours as well as with powder pigments, without losing any of its features. To see the final colour, it can be left to dry and be revived again with a small amount of water. Its surface can be retouched with water colours to make veins, if needed. It can also be polished with a metal spatula or polishing stone (agate) to achieve the needed gloss without any wax. Most importantly, it can be removed and if necessary, the patch can easily be renewed.

DISCUSSION

There is very little research material about the cleaning of scagliola. Conservation database articles do not give practical results for the problem. Nevertheless, scagliola is widely used in all kinds of artefacts throughout the centuries. Survived original surfaces are at risk of wrong conservation methods. The most usual solution for cleaning is unfortunately refining the surface and adding wax to regain the gloss. This method is also easy for patching solutions, but it changes the essence of scagliola and ruins the patina.
There are still some unresolved questions regarding loose scagliola material. Is it possible to stop the migration of dirt with moisture? Surface cleaning does not solve the issue of discolouring residues migrating from the base materials.

CONCLUSION AND SUMMARY

To find successful cleaning and patching methods our team was required to carry out several tests and thorough material research. The project in the National Library has produced an efficient way of cleaning a very impure original scagliola surface without refining. The method has proved to be efficient, even with other objects. New patching materials make repairing easier without bringing on the wax.

ACKNOWLEDGEMENTS

We would like to thank the Tikkurila department of Metropolia University for the possibility to use laboratory facilities.

NOTES

Equipment used in material analyses:

EDXRF analyses were conducted with portable EDXRF X-MET 7500 -spectrometer from Oxford Instruments. Elements of the columns were detected with Soil mode using Light elements analyses (LEAP) calibration.

FTIR-ATR were conducted in MID-IR range (4000-530nm), equipment was PerkinElmers Spectrum 100 FT-IR Spectrometer with Universal ATR Sampling accessory.

X-ray diffraction analyses were conducted with (XRD) Philips PW3020 goniometer with X´Pert PW3710 MPD equipment.

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cleaning and housekeeping guidelines at the national property board of sweden

Keywords:
housekeeping
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ABSTRACT

The National Property Board of Sweden (SFV) was facing challenges of wear and tear and inadequate cleaning procedures that had become evident at properties in their care. With seminars specifically on preventive conservation and written housekeeping guidelines, SFV took steps to address the issues. This paper describes the process and evaluates the methodology with questionnaires and SFV staff interviews.

1, 2 & 3. Ornäsloftet, Löfsta bruk and the Chinese Pavilion at Drottningholm were some of the SFV properties visited during the process of writing the housekeeping guidelines. Photos: Lisa Nilsen.

INTRODUCTION

The Swedish State Property Board/ Statens fastighetsverk (SFV) is the owner, administrator and main caretaker of approximately 2 300 properties, which are collectively owned by the Swedish people. Included are palaces and royal parks, theatres and museums, Swedish embassies, residencies and institutions throughout the world. There are 300 listed historical buildings, many of which still very much in use, for example, the offices of the Foreign Ministry, an 18th century palace, and the 19th century Stockholm Opera. Commissioned by the Swedish Government, SFV has a duty to make their part of the built cultural heritage available and accessible to the Swedish public.

Leases and contracts are drawn up between tenants and SFV, provisos regarding the use and certain maintenance being dictated by SFV. Tenants could be, for example, government offices, foundations, theatres, museums and other organisations. For properties of cultural significance, these contracts are prepared thoroughly, sometimes with detailed attachments. SFV procures and pays for maintenance of all architectural finishes, i.e., walls, floors, windows and architectural features such as balustrades. If the tenant wishes to change or in any way affect architectural finishes, SFV must give approval.

Cleaning the properties is never included in the lease. Cleaning staff are therefore usually hired by the tenant, which often means contracting a cleaning firm with little or no knowledge of the sensitivity of historic interiors. This makes it difficult for SFV to control the daily cleaning activities in their properties. The risks are clear – floors could be destroyed by inadequate cleaning methods and decorative details could be damaged. Another concern is how the buildings are used. Various activities, such as press conferences, filming, weddings and corporative events, are risk factors for many of the interiors.

At the end of the 1990s, housekeepers and property managers became more and more concerned about signs of wear and tear of the interiors, which resulted from incorrect cleaning procedures and use of the buildings. They contacted heritage experts at SFV, who decided it was time to address the issue. The following questions were posed:

1. How can SFV work more on prevention rather than repair of historic interiors?
2. How can SFV encourage tenants to take better care of historic interiors?

Three strategies were chosen – first, a series of seminars with SFV property managers to highlight the wear and tear factors that could be mitigated without large costs, to provide information about what questions to ask when letting the properties and when tendering cleaning services and other on site work. The second factor was to write guidelines for property managers, custodians,

4. Historic interiors and modern use are often combined in SFV properties, as this conference room at the 17th century Ryning Palace, today home of the Swedish Labour Court. Photo: Alexandru Babos/SFV.

housekeepers and cleaners. The third way forward would be to incorporate the written guidelines in the discussions between SFV and tenants.

SEMINARS

In 2006, SFV engaged a conservator specialising in preventive conservation to conduct a one day seminar for property managers and custodians. The first part of the seminar focused on presenting reoccurring situations that may lead to deterioration such as wear and tear, light damage, pest infestation, etc. Low cost and practical solutions were presented. The second part of the seminar was conducted at a SFV property where the group walked round and discussed issues such as cleaning, choice of materials, renovation, etc. Good feedback from participants prompted SFV to continue with the 'wear and tear seminars', as they became known. In the following years, SFV hosted several such seminars, both within and outside Stockholm.

After the first seminar, it had become clear that written guidelines on these matters would be necessary. At a seminar in 2009, around 20 property managers, cleaners and custodians were invited to give advice on the written guidelines. The desired outcome was the need for something concrete, a text that could be attached to a contract or a lease for tenants, subcontractors, external cleaning companies and catering firms. There was also a wish for the guidelines to be easy to read in comprehensible Swedish and pictures to go with the text.

PILOT WITH CLEANERS AND VISITS TO PROPERTIES

The same preventive conservator, who led the wear and tear seminars, was contracted to write the guidelines. Before starting, two pilot seminars were set up with the cleaning staff at the Foreign Ministry, a city palace dating from the end of the 18th century. Because of strict security requirements, cleaning is not subcontracted and cleaning staff are permanently employed by the Government Offices. During the seminars, cleaners and conservators discussed what topics needed to be part of the guidelines. The conservator joined one of the cleaners for her round in the historic interiors, in order to study the daily challenges. There were several interesting observations. For example, an external company watered and took care of the plants. Cleaning staff often observed

5. Signs of wear and tear from dragging furniture were sometimes testimony of incorrect use. Photo: Lisa Nilsen.

that water was spilled and that pots were not always waterproof, resulting in damage to floors. However, complaints from cleaning staff regarding these facts seemed to lead nowhere.

The preventive conservator also met catering staff, who prepared lunch and/or coffee for foreign delegations and other guests at the Ministry. It became evident that too few people were engaged in putting out tables and chairs; in fact, only one person was the norm. This resulted in marks and scratches all over the floors from extensive dragging of tables and chairs. There were also several glass rings on historic tables and dents in the floors, presumably from stiletto heels.

In addition, the preventive conservator visited different types of SFV properties and talked to property managers, housekeepers, custodians and cleaning staff to create a picture of what was needed.

HOUSEKEEPING GUIDELINES

An investigation of the existing literature on cleaning historic interiors was necessary. The magnificent *Manual of Housekeeping* (2006), published by the National Trust, was of course exemplary, with chapters on everything from how to clean floors to preventing pests. However, almost 1000 pages long, heavy and written in English, it could hardly be used for SFV purposes. There were several publications in Swedish on preventive conservation for museums, but hardly anything appropriate for the SFV audience. Exceptions were a shorter publication on cleaning in historic houses (Arnö-Berg, 1996) and a special feature issue of the journal Byggnadsvård, where conservators and other experts wrote about the history of cleaning and housekeeping and gave advice (Arnö-Berg, Kårsnäs, Tunander, 1998). However, SFV needed very specific instructions in order to address the issues staff and tenants were facing on a daily basis.

Another conservator, specialising in cleaning historic surfaces, was contracted to write the chapter about floors. During writing, an additional factor was considered, namely that many cleaners in Sweden do not have Swedish as their first language. The authors therefore made an effort to eliminate words that were perhaps specific for conservation. Another very important task was to explain how to do things in detail. For example, an instruction such as "use water very sparingly when mopping the

6. At one property, discussions between SFV and cleaning staff resulted in SFV extracting particular information from the guidelines to create specific cleaning rounds. The image shows cleaner Carina Lindström with the extracted information laminated and ready to use in the cleaning cart. Photo: Charlotte Dahn-Günther/SFV.

floor" had to be explained; in this case, that the floor mop should be wrung out at least three times.

The housekeeping guidelines were divided into chapters, such as 'Chandeliers', 'Gilded surfaces', 'Events', 'Mould', 'Candlewax', 'Chewing gum and sticky tape' and several more. The most extensive chapter, 'Floors', was divided into several subchapters, describing how to clean and maintain different kinds of floor types. The introduction, written by the SFV project manager, described the intended use, for example, for distribution among staff and tenants and use in the tendering processes with external contractors and/or suppliers. Every chapter was illustrated with photos, either to identify different kinds of material, e.g., floors, to show typical interiors, to illustrate good examples and also to identify bad ones.

LAUNCH

After a trial period at selected properties, the guidelines were revised by a core working group. Finally, in 2011, with the title *Care instructions for sensitive environments* (in Swedish: *Skötselanvisningar för känsliga miljöer*), they were launched on the internal SFV website and presented by the project manager at staff meetings and property events and listed in newsletters. The project manager also toured the country, visiting all the SFV administrative districts. She estimates that 90% of the property managers were contacted, which was important – they were to be ambassadors for spreading information about the guidelines. The reception was very enthusiastic and both the project manager and the authors received many positive comments, for example, about the choice of topics, the down-to-earth approach and the ease of use. In 2012, the guidelines were put on the external website for anyone to download and use.
After some time, SFV decided to survey whether the guidelines were of use. Were they known among new staff? Did they reach the users? Were measures followed up by SFV staff? A questionnaire was sent out in December 2014 to 126 members of staff: property managers, custodians and others working in related fields. With 69 respondents, the percentage of responses was 54 %.

RESULTS – QUESTIONNAIRE AND INTERVIEWS

The questionnaire clearly showed that the guidelines were well known among a majority of the respondents (84%). Of those, only 28% had read them completely, however 64% had read parts of them. 9% had not read them at all. Only two respondents who had worked at SFV for five years or more had never heard about the guidelines.

Among property managers, key persons in distributing the guidelines, only six respondents had not heard about them. Four of those had worked at SFV for 1-2 years.
When asked which sections had been of most use, the chapter on floors was mentioned most often, followed by cleaning in general and events.

A majority of the respondents who knew about the guidelines (60%) took an active part in distributing them by different methods: printing them and giving them to tenants, attaching them to contracts/leases or selecting relevant chapters and distributing and/or attaching them to contracts/leases. In a few cases, the guidelines were distributed directly to cleaning firms and in one case acted as a basis for a cleaning tendering process.

When it came to monitoring whether the tenants and their subcontractors actually do abide by the guidelines, only 40% of those distributing the guidelines, had procedures in place to follow up the use. The most common method was regular meetings with the tenants and the second most common method was special follow-up meetings with the tenant.
Ten respondents had very thorough approaches to monitoring use; they walked through the property with the tenant, checking if proper cleaning procedures were in place.
The final question on the questionnaire addressed the need for additional information in the guidelines. Only three respondents replied with suggestions: graffiti removal, wall washing and more on cleaning textiles.

The questionnaire was followed up with telephone interviews with some of the property managers and custodians who had volunteered to be contacted. Eight people were interviewed who had all said that they distributed the guidelines to tenants or to cleaning firms. Five questions were posed:
- How did tenants react to the guidelines?
- Do you think they are being read?
- Can you see any improvements?
- Have mistakes been corrected by meetings?
- Can you be sure the information reaches the person actually doing the cleaning?

The response from tenants had overall been very positive. They liked the fact that the guidelines were very practical and written specifically for them. At one property, the housekeeper had learned them more or less by heart and everybody now goes to her for advice. In some instances, both internal cleaning staff and external cleaning firms reacted suspiciously, believing that cleaning was their job and that special instructions were unnecessary. However, after initial meetings and/or a walk-through of the premises, looking at the sensitivity of the interiors, the importance of the guidelines became clear.

As for actual improvements, replies were more vague. “Less water use” and “better knowledge of cleaning products” were the only concrete examples. However, a sense of confidence was mentioned, as well as better planning for certain activities and/or events. One of the property managers put it thus: “We now have something concrete to show the tenants; the guidelines work like a reference book. The tenants feel that the guidelines are adapted for them”. At another property, the practicality of the guidelines (and training at the seminar) had made the housekeeper much more confident in dealing with historic interiors and less afraid in carrying out certain cleaning measures.

One thing that became clear in the interviews was the difference between in-house cleaning staff/housekeepers and external cleaning firms. Three of the interviewees brought up the matter, saying how hard it was to make external cleaning companies follow instructions. One custodian manages two 19th century buildings of similar use, where one property had in-house cleaning staff and the other – an external cleaning company. According to him, there is a visible sense of duty and responsibility with in-house staff during cleaning inspections. Not only is the cleaning better, i.e., surfaces are cleaner, but there is a deeper sense of care and respect for the finishes. Another interviewee who managed properties with permanent cleaning staff was very satisfied with the results and the guidelines had been used to design specific cleaning rounds (see Figure 6).

As for other external entrepreneurs, for example, sub-contractors during restoration work and events, the guidelines did not seem to reach very far. When asked, the interviewees mentioned only a few occasions when they had been used, for example, by external catering companies, who needed advice on sensitive interiors, and, in some instances, for good communication with sub-contractors. It was mentioned that it is not very realistic to have joiners, electricians and carpenters reading text before starting work, even if it is part of the contract – the information must be explained to them by someone on site. One of the property managers always gave a tour for sub-contractors, telling them about the history and uniqueness of the place. This was always a good investment of time, she said. It increased awareness and perhaps gave a sense of pride. Another property manager gave an example of when the guidelines *should* have been used, but were not: a tenant hired an external firm to clean a chandelier; the sub-contractor in question used too much water and caused a power failure.

A public relations officer at SFV, who had responded that she would distribute the guidelines, was the ninth interviewee. When writing newsletters to tenants, she would add information from the guidelines to make the text more interesting. For example, in the autumn newsletter, she would study the chapter on autumn cleaning/putting the house to bed, extract information and put the information in her own words in the newsletter. For Christmas, she would do the same thing with information on candle wax and how to manage naked outdoor candles which were very typical for the season.

DISCUSSION

The challenge of preventive conservation is the difficulty of making cost-benefit analyses. If more focus was put on minimising damage from wear and tear, how would it be possible to estimate financial gain? How much is spent each year on pest control, renovation and repairs that might be saved if preventive conservation were to play a more substantial part in the daily running of SFV properties?

In the UK, conservators and scientists at the National Trust and English Heritage have estimated costs for preventive conservation and cleaning (Lloyd et al., 2007). However, the conditions in our case are different. Firstly, the drawing-up of boundaries between SFV and its tenants involves more stakeholders and secondly, only a few of the properties are historic houses/museums, but are used on a daily basis as places of work.

Another challenge for SFV is to make sure that the tenants are really following the guidelines. Cleaning companies that compete on the market are cutting prices and the competition is extremely fierce. Many public organisations have halved their cleaning budget in recent years (Henriksson, 2015) – a definitive sign that supply is bigger than demand and that quality risks being second to quantity. When tendering for cleaning services, the customer has to be extremely well versed in the tendering process and must also put resources into following up the services provided. Otherwise, the customer risks asking for quality but buying quantity when it comes to historic interiors.

CONCLUSION AND SUMMARY

The ‘wear and tear seminars’ and housekeeping guidelines were created by SFV as a response to demands by property managers and tenants. The original questions posed by SFV, such as whether it is possible to address prevention rather than repair and whether SFV can influence tenants to take better care of historic interiors, have been revisited and the answer must be “yes”. Seminars, meetings and housekeeping guidelines have given property managers and custodians a concrete and useful tool in negotiations with tenants.

There is, of course, still a lot of work to do in this field. A big challenge seems to be external cleaning companies, where SFV itself very seldom is involved in the tendering process. Another challenge is to reach event companies and sub contractors working for the tenants in SFV properties.

Every year, SFV invests large sums of money in restoration and renovation of historic properties. If it is possible to reduce costs by improving daily maintenance and reducing wear and tear during events and building work, there will be significant gains. At present, there is no clear indication that money has indeed been saved because of the guidelines, as there is no easy way to make such estimation.

Finally, SFV will need to address how to reach new property managers with information about the guidelines and how they can be used in relation with tenants and sub-contractors. Interviews with property managers clearly showed that personal contact, discussions and follow-up meetings with tenants were crucial and led to constructive results.

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Tone Marie Olstad

conservation of church interiors guided by the budget – are principles at stake?

Keywords:
conservation
ecclesiastical art
stave church
distemper paint

ABSTRACT

The challenge of doing conservation work within a limited budget is the main issue of the paper, which is based on NIKU's experience from working in 12 Stave churches within the Stave Church Preservation Programme. Kvernes Stavechurch is introduced, the decisions and the work carried out are briefly described, and the result of the work is discussed.

INTRODUCTION

In 2001, the Directorate for Cultural Heritage in Norway initiated a programme to restore the 28 remaining stave churches. These monumental treasures, one of them a UNESCO World Heritage Site, are Norway's most important contribution to world architecture and represent our foremost contribution to international construction history. The Stave Church Preservation Programme will be completed in 2015.

Stave churches are named after the supporting staves in the construction of the walls. These are placed in the corners and at other important connecting points in the churches. The stave churches that have been preserved to date are by no means identical. They are of different types, built by different kinds of craftsmen, with differing levels of ambition and at different times during the period between the 12th and 15th century (Jensenius 2015).

According to the Directorate, the aim of the programme is "to restore all the stave churches in the country" to enable the preservation of this important cultural heritage for the future. Conservation of the interior and the ecclesiastical art objects is a part of the programme. Another aim is that "the restoration and preservation of the churches should lead to more visits, and show the cultural and historical values that they represent" (Riksantikvaren, 2015, Riksantikvaren, 2014). Collected information and documentation produced during the work within the programme is supposed to constitute a base for further research, and possibly be used to reconstruct what is now lost in the churches.

The financial frame of the programme is about 130 M Norwegian kroner (15-16 M euro, 10.02.2015). According to the leader of the Programme, about 25 M Norwegian kroner is spent on conservation of ecclesiastical art and decorative paintings in the interiors. 25 M Norwegian kroner allows about one annual work year per treated church on average. The calculated work year includes travel and other expenses, so the actual working hours in each church are less than a work year.

The aim for the conservation work in each stave church is to treat selected objects and parts of the interior so that the whole church is in good condition when the conservators leave the building.

The aim of this paper is to describe and discuss the conservation work in one of the twelve churches in which NIKU has worked for the programme. The intention of the paper is not to criticise the Directorate, but to reflect upon the situation for the object, the conservation principles (Ecco, 2015) and the stakeholders when the budget is a dominant decision criteria for the scope of the conservation work.

THE INTERIOR OF THE STAVE CHURCHES -A VISIBLE TIMELINE THROUGH HISTORY

The stave churches have been adjusted to the society's changing demand through the ages. The reformation of the Church, officially in 1536, led to rearrangements in the interior space; pews and pulpits were added, and the chancel was often opened up towards the nave. Change in ownership might be the background for the alterations seen in the churches in the 17th century. An act established in 1851, which stated that the church should seat three tenths of the parish population, caused both demolition of several stave churches, and the rebuilding and enlarging of those that were kept. The remaining stave churches were often transformed into Neo-Gothic churches; galleries were added, larger windows replaced the smaller secondary 17th or 18th century windows, the interiors and exteriors were cladded and painted. During the last part of the 19th century and the first part of the 20th century, several of the modernised stave churches were restored and reconstructed to how they were assumed to have looked like originally or in the 17th century.

The minimum furnishing to be found in a Lutheran Norwegian stave church included pews and a pulpit, an altar with an altarpiece and a baptismal font. However, a significant number of the stave churches have richly decorated interiors and are adorned with canvas paintings, epitaphs with carved and painted frames as well as mediaeval polychrome wooden sculptures. Nineteen of the stave churches are decorated in the interior with distemper decorative paint. A few of the decorative paintings are mediaeval; several date from the 17th century and some from the 18th century (Olstad & Kaun 2011).

KVERNES STAVE CHURCH – AN INTRODUCTION

Kvernes Stave Church, dated to the first half of the 14th century, is located on the west coast of Norway and is a single-nave church of the so-called "Møre"-type. It is owned by the Society for the Preservation of Ancient Norwegian Monuments. The church was rebuilt and changes were made in the interior in 1630s, 1670, 1776, and again in 1810, to add a tower. It is one of the biggest stave churches in the country, 16 m long and 7.5 m wide, and can seat 200 persons (Kunsthistorie 2014).

The 1630s rebuilding and redecorating of the church dominates both the exterior and the interior today. The walls and the ceiling in the nave, as well as the baptistery in the western end of the nave, are totally covered with decorative distemper paintings. On the southwest wall, there is a small decorated gallery for the priest's family, and an epitaph (1630s) describing the work done in the 1630s hangs on the north wall.

1. The interior of Kvernes Stave church towards the screen and the chancel. Photo: NIKU 2011©NIKU.

The screen between the nave and the chancel is made up of a dado under a row of turned balusters carrying horizontal mouldings in two levels. King Christian VI's carved and painted monogram is centrally placed over the opening into the chancel. Carved and painted coats of arms are on each side of the monogram. On top of the screen and over the monogram is a polychrome crucifix (probably from 1630s). There is an opening between the screen and the southern wall, where a stair leads from the chancel to the carved and painted pulpit (1630s).

The walls and the ceiling in the chancel are decorated with distemper paintings (1630s). The quite fragmentary figurative scenes from the Old and New Testament on the walls are of high quality and one-of-a-kind among decorative distemper paint in Norwegian churches. Renaissance influenced decorative paint covers the ceiling. A huge, carved and painted polychrome epitaph (1671) dominates the northern wall. A wooden painted altar carries an altarpiece with the corpus of a late mediaeval triptych built into a carved and painted altarpiece in 1695.

KVERNES STAVE CHURCH - THE CONSERVATION PROCESS

An assessment of the condition of the church interior was done in March 2011 (Olstad 2011). Based on the assessment of the estimated cost for the work, the budget and work plan was adjusted to the sum allocated for conservation work in the church by the Directorate. The work was divided over three years and in four subprojects: three periods of field work in the church, and some objects sent to be treated in NIKU's conservation studio in Oslo.

In total, 3,204 hours were spent on the work, including the assessment, travel preparatory work, the work done in the conservation studio and documentation. 1,486 hours of the total was spent on conservation work in the church. The conservation work was executed by trained conservators with different experience and backgrounds.

Consolidation of loose paint and surface cleaning was the main aim for the work. Diagnostic examinations of the objects [1] were generally restricted to what was necessary to be able to perform the consolidation. Restoration [2] was not included in the budget.

All the above listed objects were cleaned of surface dirt and consolidated. Discolorations in the distemper paint were partially removed as a part of the consolidation process. The consolidation methods were chosen in accordance with the needs: local consolidation using a synthetic or natural consolidation medium, or overall consolidation using a natural consolidant. Only well-established methods were used. Retouching was not done on the objects treated in the church, but retouching tests were made in some areas. On the objects treated at the conservation workshop, the most disturbing losses were retouched. Documentation - photo and reports - was carried out by the conservators.

2. The chancel with the altar and altarpiece, and the fragmented distemper paintings on the walls. Photo: NIKU 2011©NIKU.

OBJECT	Treated in situ	Treated at NIKU in Oslo
Epitaph in the chancel (1671)		X
The altarpiece: corpus from a late mediaeval triptych built into a 1695 altarpiece	X	
Two coats of arms on the screen (1630s)		X
King Christian VI monogram on the screen (1730s?). NIKU had planned that King Christian VI monogram on the screen should be treated in the workshop due to its bad condition and seemingly odd paint technique. The church owner and the Directorate decided that it should be treated in situ.	X	
Decorative distemper paint in the chancel; ceiling and walls (1630s)	X	
Four carved ornaments on the pews (1630s)	X	
The Pulpit (1630s)	X	
The King's coat of arm by the pulpit (1730s)		X
Wooden polychrome turned and carved candlestick, (17th century?)		X
Distemper decorative paint in the nave, ceiling and walls (1630s)	X	
The crucifix on top of the screen (1630s?)	X	

Table: Inventory in Kvernes stave church. Treated in situ or at NIKUs conservation studio in Oslo

SOME THOUGHTS ABOUT THE CONSERVATION

Conservation within a limited budget is a question of value for money. The conservator needs to be good at deciding the "type and extent of treatment needed" [1]. And even if a plan is made beforehand for the work in situ, there will always be new decisions to make while the work in the church goes on. The conservator often has this frustrating feeling of wanting to do more than is possible in the given situation. The three examples below are quite typical for the treatment process in such a project.

THE DISTEMPER PAINT IN THE CHANCEL

The distemper paint in the chancel had been painted over with a lime wash probably in the 19th century. Due to several water leakages and ordinary use of the church room, the paintings were probably already very damaged when they were whitewashed. The lime wash was removed in the 1960s and 70s before the distemper paint was consolidated with soluble nylon, which was sprayed on. (Information about the treatment in the Directorate's church-archive, Oslo). Damage caused by scalpel when the whitewash was removed, and remaining dots of lime wash scattered over the surface add to the difficulty of reading the paintings on the wall. In addition, lime wash is still kept on small parts of the wall, and on the reverse of some of the beams in the ceiling. The conservation method used on the distemper paint in 2011-2012 worked well for thin layers

of paint, and reconsolidating the paint which earlier had been consolidated with soluble nylon did not appear to be a problem.

The project group spent many hours, however, trying to find an efficient method for consolidating the paint where the whitewash remained and thus made the paint layer thicker. We did not manage to find an optimum method. The methods tested seemed to give good immediate results, but there were areas with loose paint when we checked the year after. On one hand, more time should have been allowed for further testing. On the other, would more tests give a solution to the conservation problem?

The solution, as we saw it, would be to remove the remaining whitewash as the thickness of the layer was the problem. This was not possible to do within the financial frame of the project. Thus, we decided to consolidate using the best method we had found, knowing that some of the paint would not be fixed. Ethically, this was not an easy decision to make.[3]

As the readability of the motifs was an issue for us; we made tests for removing the remaining scattered small dots of lime wash, which were all over the surface, and for retouching. The dots could be removed from an area of 0.024m² in one hour. Cleaning the decorated surface on the walls in the chancel would take more than 2,000 hours. Even if we were to do that, it would have been difficult to justify spending so many hours on a painting in such a fragmented state.

Retouching an area of 0.12cm² took about one hour, depending on the number of colours. Retouching was the fastest way to a better readability of the paintings, but the ~500 hours that would have been required would not have been added to the project. Retouching would imply covering a huge part of the wall with added paint - did we really want that? The unretouched painting has authentic value, and future consolidation of the decorative paintings is made easier when they are left without retouching.

Our alternative, and a more realistic, proposal to help the visitors understand the painting on the wall was to make a guide – a leaflet with photos of each of the motifs placed in the same way as on the walls, and with an explanation of each motif. Minor digital reconstructions might have been done on the photos to help the understanding of the motives. Making the guide would add to the conservation budget, but not as much as cleaning or retouching. This proposal has not been accepted, neither by the owner, nor the Directorate, even if one of the aims of the Stave Church Preservation Programme is that "the restoration and preservation of the churches should lead to more visits, and show the cultural and historical values that they represent" (Riksantikvaren, 2014). Kvernes stave church is a museum church with more than 10,000 visitors each year (May-September). Today, only one of the figurative motifs in the chancel is pointed out and explained by the guides. The whole painted story is not communicated and not possible to read without help. During our fieldwork, we observed that the visitors do not see the motives on the chancel walls before they are pointed out and explained to them. Communicating the paintings in the chancel would make the visitors understand the artistic value of the paintings, add to their experience of the interior and the respect for the church.

THE ALTARPIECE

A conservation treatment procedure for an object treated in the conservation studio often differs from a comparable conservation procedure in situ. Simply deciding to transport the object seems to implicitly give value to the object, and more attention is often given to the object in the studio. In Kvernes stave church, the owner, in particular, but also the Directorate wanted as few of the objects taken out of the church as possible. The main argument for deciding what should be treated in the conservation studio was, therefore, the objects' condition. Objects in a very bad state or with damage that was difficult to treat in the church were transported to Oslo. The aesthetic or historic value of the objects was not assessed when deciding what to treat where.

Mediaeval art objects in Norway are traditionally classified as the most important part of the art in the churches. The central part of the altarpiece in Kvernes stave church is said to have been made in Lübeck, Germany in the late 15th century (Engelstad 1936). The condition assessment in March 2011 judged the central mediaeval part to be in better condition than the rest of the altarpiece. It was concluded that the altarpiece's condition justified its treatment in the church and that demounting, transport and change of climate could be avoided. We were unsure about that decision when we started to work on the altarpiece and discovered that the condition of the mediaeval part was worse than anticipated. The central part, at least, would probably have benefitted from being treated in the studio. The hours allocated for the altarpiece were spent on understanding how to treat the various surfaces and on the consolidation which was carried out in the church. There was no possibility of removing unwanted residues that had been left on the surface, or restoring the damage on the surface from the previous treatment.[3] Thus, the consolidation done in 2011-2012 was an addition to the former treatment. Fortunately, only local consolidation was needed. There was no time for a thorough examination to gain new knowledge about the altarpiece, and added information was mainly collected outside billable hours in the project. Finding out about the variation in use of metals, the applied relief brocades,

3. The Kiss of Judas – the easiest readable motif among the remnants of the paintings on the chancel walls. Photo: NIKU 2011©NIKU

4. Detail from the Virgin and Child with Saint Anne sculpture in the corpus in the altarpiece. The sculptures have detailed surfaces and two kinds of golden metal. A lot of information is still to be researched in this and other objects in the church. Photo: NIKU 2011©NIKU4.3 The distemper decorative paint in the nave.

the paint structure, the faded colours and other secrets of the altarpiece is left to future conservators. Hopefully, the condition of the altarpiece in the future will provide the possibility of finding the answers to the questions we had.

The distemper paintings in the nave are a dominant element of the interior. The fact that they had never been consolidated before NIKU worked in the church, and that they might be the original 1630s painting adds to their importance. Very little of more than 2,600m² of distemper paint in the stave churches is untreated (Olstad & Kaun 2011). We allowed some time to examine them, but without being able to conclude whether the distemper paint was the original paint from the 1630s, or if it is partly retouched or repainted later. The main type of damage was deterioration of the binding media and loss of pigment in various grades. It was a challenge to define the areas that really needed to be consolidated, as it was an aim to consolidate as little as possible. We would not do what we refer to as 'remedial preventive conservation': Consolidate to secure the paint because the degradation would continue without a conservator working in the church for many years.

The consolidation made a small change in how the colours of the paint were perceived. This was also caused by the fact that the colour of the wood was altered during conservation. We had to choose between not consolidating and keeping the appearance or consolidating and changing the appearance. This made us very restrictive when we decided what to consolidate. Our main concern was whether we had been too restrictive when deciding what to treat, and the paint would wear off in the near future due to the lack of binding media? Hopefully, the decisions we made were so that future conservators will thank us for the minimum intervention and for not doing remedial preventive conservation.

CONCLUSIONS

Every day, work in a conservation project with a limited budget is a balance between maintaining conservation principles and getting the work done. Working in situ for a defined period and within a strict timeframe is efficient, but also causes stress, especially for the project leader. A group of conservators are at work for a short period, and the time has to be spent on getting the work done and concurrently allocating time for necessary discussions. Every decision regarding work on the objects must be discussed and justified. It is most efficient when in situ work is divided into several periods. This gives the possibility of rearranging the workplan, and discussing problems with the owner, the Directorate or other conservators.No matter how cold, tired and stressed the conservator in the church is, treating the objects in the optimum way under the given conditions is the conservators' responsibility as well as documenting the choices made during the conservation process to the future conservator.

NOTES

[1] Ecco professional guidelines, I. Definition of the Conservator-Restorer: "Diagnostic examination consists of the identification, the determination of the composition and the assessment of the condition of cultural heritage; the identification, nature and extent of alterations; the evaluation of the causes of deterioration and the determination of the type and extent of treatment needed." http://www.ecco-eu.org/about-e.c.c.o./professional-guidelines.html Accessed 16.02.15.

[2] See: EN 15898. Conservation of cultural property - Main general terms and definitions; 3.3.1.Conservation and 3.3.7 Restoration.

[3] The altarpiece was demounted and treated in the period 1967-1973.

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Seurasaari open-air museum and conservation of the museum building collection

Keywords:
building conservation
preventive conservation
preservation
technical conservation
restoration

ABSTRACT

The Seurasaari Open-Air Museum was established in 1909, when the first group of 13 buildings, the Niemelä tenant farm from Central Finland, was relocated to Seurasaari. Today, the open-air museum includes 89 separate buildings acquired comprehensively throughout Finland for the collection. The buildings represent various social classes and typical examples of wood architecture from the 17th to the 20th centuries.

A four-member building conservation working group works with the Seurasaari museum buildings all year long. The work is based on an in-depth understanding of the history of the buildings, the traditional materials and building techniques as well as following the international principles of conservation and museum work. The tools required for preserving the buildings are research, preventive conservation, technical conservation and restoration.

The building conservation work of the Restoration Services unit of the Finnish National Board of Antiquities has national importance. The aim is to produce information on how to improve the prerequisites of preserving monuments in challenging conditions and to study the behaviour of materials as well as to test and develop different kinds of new methods for the preservation of materials.

1. An overall image of Seurasaari

INTRODUCTION

The open-air museum was founded by Professor Axel Olai Heikel, archaeologist and ethnologist. Scandinavian examples, such as Skansen in Stockholm and Bygdøy in Oslo, served as inspirations for the new kind of museum. However, Seurasaari is not only a museum; it is also a recreation area and nature reserve visited by approximately 700,000 people every year. Even though the museum buildings are only open during the summer, the island of Seurasaari itself is open to all citizens throughout the year. This presents certain challenges for conservation and museum work.

All of the buildings in the open-air museum are translocated, i.e. they have been moved there; in their time, the buildings have even been slightly undervalued compared to protected buildings that have been preserved in situ. The collection of museum buildings includes the Karuna Church (1688) from Taivassalo on the southern coast of Finland, the Kahiluoto Manor House (1790) from Southwest Finland, and the Antti farmstead from Western Finland (early 19th century). The smallest individual museum building is the tiny Nili outbuilding from Lapland, built on top of a tall tree stump, while the most exotic one is the large log house Pertinotsa from Karelia, an area lost to Russia in the Second World War.

The museum buildings are not dead monuments, despite being removed from their original locations. They continue to have an active communicative ability in the museum and they produce a range of reflections of the past, the present and the values of each era.

A MUSEUM BUILDING IS A MUSEUM ARTEFACT

The buildings in the Seurasaari Open-Air Museum are classified as artefacts, but they are exhibited in challenging natural conditions. Compared to museum artefacts kept in controlled conditions, buildings require constant intensive maintenance to ensure their preservation. All of the buildings in the open-air museum are unheated and constructed out of wood. The changing weather conditions create their own special challenges for the preservation and maintenance of the collection. The building, itself a museum artefact, should also be an exhibition space, which is in conflict with the need to preserve it. The relationship between people and buildings in different eras plays an interesting and evocative part in the open-air museum. The buildings inspire emotions and questions as well as interpretations of beauty, the authenticity of materials as well as traditional handicraft know-how from the perspectives of experts and lay persons with different kinds of backgrounds. At their best, the well-tended open-air museum area and the museum buildings that are maintained through conservation are a national example on the maintenance of a built cultural environment.

BUILDING CONSERVATION IN SEURASAARI AND CHANGING PRINCIPLES

Over the years, the principles of the conservation and maintenance of museum buildings have changed in Seurasaari as well. The questions of conservation and restoration have been contemplated for roughly 100 years. During a certain period of time, the aim was to preserve the buildings in their original condition mainly by using various chemicals, and the materials used for repairs were largely produced industrially, which resulted in a loss of the marks of craftsmanship from the materials; the traditional know-how of repairs and construction also began to disappear.

2. The Niemelä tenant farm at its original location in Konginkangas, Central Finland.

3. The Niemelä tenant farm after being moved to Seurasaari, where it is a part of the collection of museum buildings.

4. Kahiluoto Manor House at its original location in Taivassalo in Southwest Finland, ca. 1880.
5. Kahiluoto Manor House in the Seurasaari Open-Air Museum. The porch was removed in 1940 because the intention at the time was to present the original appearance of the building in the 1790s.
6. Kahiluoto Manor House in Seurasaari in 2012, after extensive conservation.

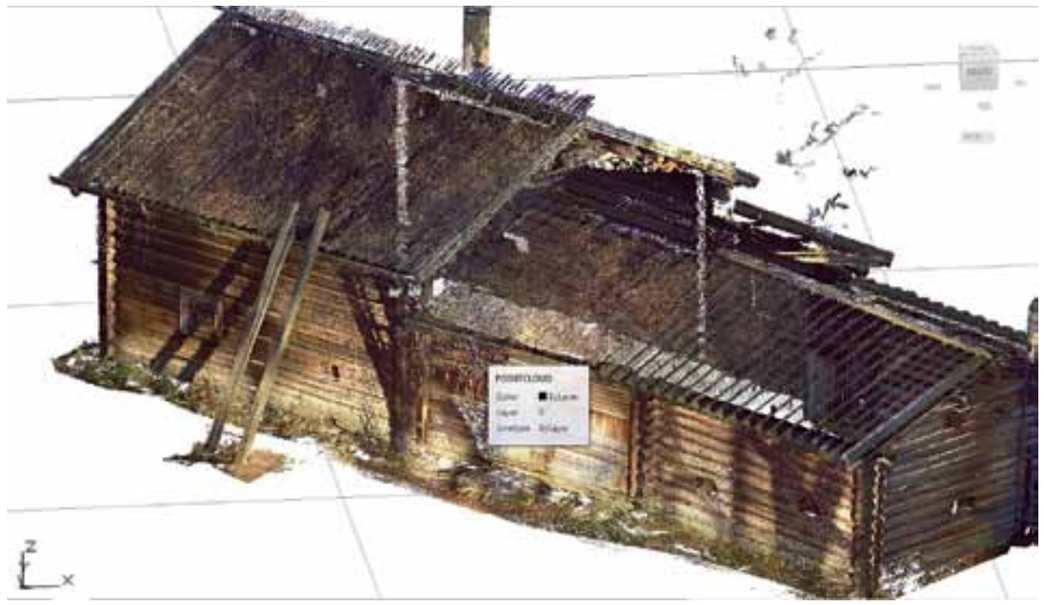
Different kinds of repairs were made; as a result, even the appearance of the buildings might sometimes change. In the mid-20th century, the aim was to emphasise the first stage of the buildings' appearance. However, it was later acknowledged that the only right way to preserve and maintain buildings is to do it in a manner characteristic of each period and preserve traditions, primarily attempting to influence the conditions surrounding the building.

Today, layers from different periods are preserved while conserving buildings, if possible. Old, well-functioning repairs and materials are preserved as reminders of past philosophies and principles of conservation and restoration. The aim is to influence the welfare and preservation of the building comprehensively by measures that prevent damage. Preventative conservation measures are mainly focused on the immediate surroundings of the building and also monitoring the conditions and other risk factors inside the building.

The aim is to conserve and restore structures where taking action is necessary, by using similar methods and materials as those used in the original structures and the building's original area. Therefore, building conservation uses techniques that have in principle remained almost the same for centuries. At the same time, the goal is to preserve intangible cultural heritage along with the tangible, meaning, traditional expertise in wood construction as well as old working methods and ways of acquiring materials.

TRADITIONAL AND MODERN

Comprehensive documentation is a part of maintaining museum buildings. For museum buildings, traditional research of history and collecting information is made possible by the Finnish National Archives Service and the photographs and documents found in the Finnish National Board of Antiquities' archives. In connection with more extensive conservation and restoration work on the buildings, information on their construction and repair history is always studied and completed.



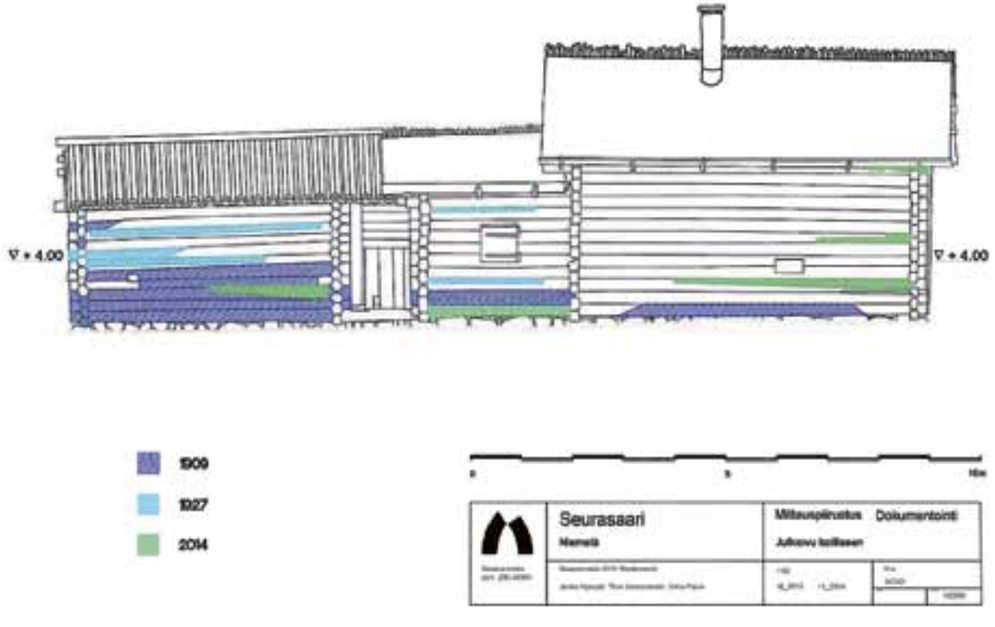
7. Material obtained by laser scanning on the main building of the Niemelä tenant farm

Identifying authentic structural elements among the previous conservation treatments is not always simple, and it requires field research, in addition to knowledge of the history of repairs. Cooperation with students has already been utilised in extensive background research and damage surveys for years, and many conservators and restorers have completed their thesis on the buildings in Seurasaari. The aim is to bring all new information gathered on the museum buildings publicly available through the Board's archives.

Modern technology is also utilised in structural research and documentation. The goal is to use 3D laser scanning to create up-to-date drawings of all buildings with the help of the National Board of Antiquities' documentation working group. Dimensionally accurate damage surveys are carried out and marked as a base for the scanned materials using CAD software.

Materials research is also used to accumulate information on the museum buildings. The possibilities offered by the analysis equipment in researching pigments and binders are used in the study of interiors in particular. The National Board of Antiquities' own selection of equipment covers handheld X-ray fluorescence and infrared spectroscopes as well as microscopy. If necessary, analyses are also ordered from partners. Log frames have been studied comprehensively using dendrochronology, and new methods are being developed for studying rot damage to log structures using an X-ray machine and a resistograph. In addition to studying buildings, the working group tests and studies surfaces created by using different kinds of natural materials and surface treatments. There are several test fields in challenging conditions in Seurasaari for both metal surface treatments and tarring as well as exterior painting. In fact, all of the 89 buildings also act as a large test laboratory that provides information on the durability of various materials and wooden structures.

Modern tools and technology are also used in technical conservation in addition to the traditional tools and methods. Different kinds of power tools, as well as modern construction methods, when applicable, help with conserving the museum buildings. For example, the foundations of the buildings in Seurasaari's loamy soil have been stabilised with bored piles. The Conservation Centre has its own carpentry shop and woodworking machines to help with working the materials, but all of the wood replaced in the buildings is always finished by hand.



8. Dimensionally accurate documentation on the log repairs in the Niemelä tenant farm

9. Modern and traditional tools meet in the Niemelä.

In addition to the modern power tools, craftsmanship and the traditional use of wood as a material are preserved. Some of the wood used is selected from the forest one trunk at a time, and particular attention is paid to the high quality of the materials. All felled timber must also be processed further into suitable construction materials, using traditional production methods such as splitting, sawing and hewing. After this, the material must be dried and stored in the old way. In addition to the construction techniques and materials, when preserving expertise in traditional construction in a conservation project, the aim is to preserve the shape of the original structure, as well as the marks of craftsmanship, if structural elements need to be replaced with new material. In that case, the tools should also match the originals.

The journey of wood from the forest to a building is a long, challenging and time-consuming process. For example, old pine trees suitable for use as church roof shingles are usually already protected. In addition, efficient modern forestry makes it difficult to find types of wood traditionally used for construction, when stunted, suppressed trees suitable for weight beams used on a birch-bark roof, fencing and fence ties are cleared out of a managed forest. In procuring wood, the National Board of Antiquities cooperates with the state forest owner organisations with their vast forest properties, but timber is also purchased from private forest owners and small sawmills.

Because personnel resources for building maintenance are small, conservation and restoration services are also purchased from private experts. The work in Seurasaari also includes construction management projects, where knowledge of the legislation on competitive tendering and the ability to monitor the implementation of contracts are necessary.

10. Sawing planks by traditional methods.

11. Handicraft days in Seurasaari.

CONCLUSIONS

The information accumulated at the Seurasaari Building Conservation Centre is distributed for public use in a variety of ways. Each conservation project generates conservation reports for the archives, which are freely available for everyone to read. The restoration services and the building conservation working group of the National Board of Antiquities organise seminars whenever possible, and in addition, demonstrations are arranged annually in the museum area. Information is also disseminated via cooperation with experts and the educational institutions in the field. Visitors are received at the Conservation Centre, and they are told about the maintenance of the museum buildings from the points of view of building conservation and restoration. In addition, the working group aims to create information boards on current conservation projects in the museum area. Today, social media is also a part of the maintenance of museum buildings, in addition to the traditional media. Photographs and information on the good care of buildings are shared on the Seurasaari building conservation Facebook page.

Building conservation aims to find ways to inspire, preserve and develop national continuity in maintaining traditional craftsmanship and create practical examples of good repair methods that promote preservation. Another important perspective is sustainable development; its principles are consistent with the goals of conservation. Together with other experts working with cultural heritage, conservators create a dialogue between values, museums, artefacts and people, which allows museum visitors and all citizens to form an easily comprehensible image of the connections between the past and the present.

Historical wooden and log buildings are an important part of the global cultural heritage. Their number is constantly and alarmingly decreasing, and the traditional construction know-how is disappearing. The number of experts specialised in the conservation and repair of wooden buildings is also decreasing because the training programmes that specialise in the subject are being closed down and the older generation of experts are retiring. Because of this, the appreciation of wooden buildings is increasing, as is that of conservators and restorers. It also seems that the appreciation of open-air museums is on the rise. Once, threatened buildings were collected there; now, they have been classified as monuments are protected as museum artefacts and maintained professionally. The over 100-year-old Seurasaari Open-Air Museum has claimed its place as one of the most important tourist attractions in Helsinki, the capital of Finland. The museum buildings have also been confirmed as strategically important properties owned by the state of Finland, which means that their preservation and maintenance is secure, at least for the time being.

Nanna Kymäläinen

ida`s storehouse: a case study on pigments and paint binders on the folk buildings in seurasaari

Keywords:
building conservation
analytical research methods
tar paint
FTIR

ABSTRACT

Ida's storehouse, the youngest of the group of buildings belonging to the Niemelä tenant farm in the Seurasaari Open-Air Museum, was conserved and restored in 2014–2015. For the restoration painting, the paint surfaces on the storehouse's door and window structures were analysed to identify the pigments and binders used. Several layers of paint and three different types of paint surfaces were found on the door panelling. Some of the paint layers are presumably a result of maintenance painting during the time the building has been at the museum. However, there is only one layer of paint on the frames, linings and door edges, which is therefore likely to be the paint surface from the time before the building was relocated to Seurasaari. The aim was to confirm the binder used in the paint of this layer in particular, because identifying it had not been possible during preliminary studies. In addition to simple dissolution tests, the research methods used included microscopy as well as X-ray fluorescence and infrared spectroscopy. Based on the studies, tar paint was prepared for the restoration painting of the door, and white industrially-produced linseed oil paint was selected for the decorative parts in accordance with the previous maintenance painting. The frames, linings and door edges that were in good condition were not painted. The aim of the research was to confirm the used pigments and binders in order to collect information for the historic documentation and the upcoming restoration painting work. In addition to protecting the wood, the paint surface of Ida's storehouse also has architectural and historical importance in the Niemelä group of buildings.

INTRODUCTION

The Niemelä tenant farm, the first of the building groups relocated to Seurasaari, has been the main focus of the Seurasaari building conservation team for the past three years. The oldest of the buildings date back to the latter half of the 18th century and Ida's storehouse, the youngest of the group of buildings and the object of the research presented here, dates back to 1856. The buildings of the Niemelä tenant farm are log buildings without a facing, and the only painted surfaces on the buildings can be found in Ida's storehouse. The storehouse's door, frame structures and the window above the door have been painted. The painted details of the storehouse are already visible in the black and white photographs taken in Konginkangas before the buildings were dismantled and relocated to Seurasaari. In the photographs, the door is two-coloured: the broad panels are dark and the edge bevels are white. Similarly, the window is painted with two colours, but the linings and the frame of both the door and the window are the same single dark shade as the door panels.

When the project started, the paint surface of the door had worn off almost completely on the outside, the same as that of the window, but the inside linings and the paint on the edges of the door were relatively well-preserved. In connection with project planning, a question of the repair history and the materials used in the paint surfaces arose, since the intention was to maintenance paint the door and the window as part of the restoration. The aim was to find out what binders and pigments had been used in the remaining paint fragments. There are regular entries on the repairs made to the buildings in Seurasaari dating back to the earliest times at the museum, but the information is often general. There may be more information about larger repairs, but regular maintenance painting has not necessarily been recorded separately. For Ida's storehouse, there are no records of painting at all.

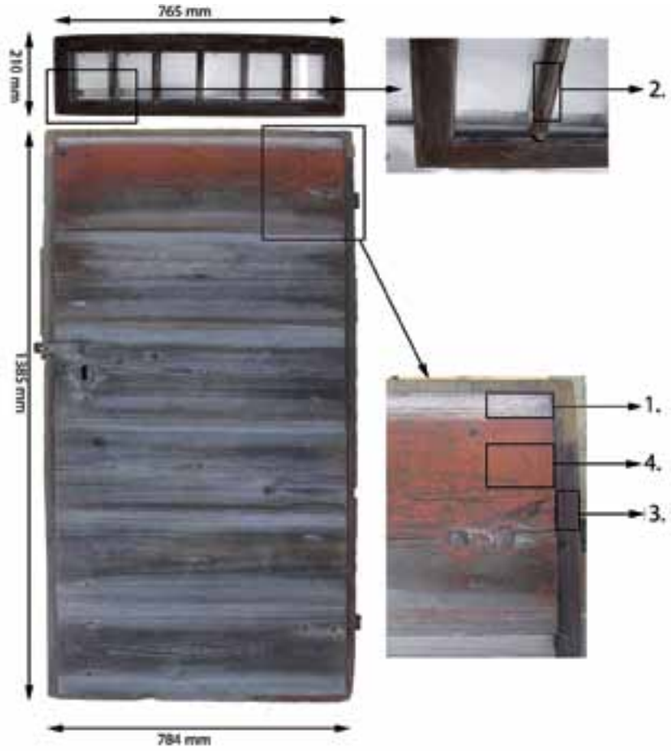
INITIAL SITUATION

The paint on the door is worn, but the paint layers on the upper part of the door and the edges protected by the frame can still be studied. Elsewhere, remnants of the paint surface remain mainly in the cracks and the splits in the wooden surface. Until now, the paint surfaces have been considered to be red ochre paint, as in the horizontal panelling on the door, but the paint surface on the door edges and the linings are visibly different from the panels. Based on visual observation, it can be assumed that there are three different kinds of paint on the door: red ochre paint on the horizontal panelling, dark brownish red translucent paint on the edges and the frame and white opaque oil paint on the profiles.

At least two different shades of red can be detected in the paint layers of the horizontal panelling, and the paint surfaces are presumably maintenance painting from the building's time at the museum. However, there seems to be

1. Ida's storehouse in Konginkangas before the relocation to Seurasaari. The storehouse in the image is on the left. Image by the National Board of Antiquities.

2: Ida's storehouse before conservation and restoration.



3. Points examined

1.

2.

3.

4.

5.

4. Microscopic images of the measurement points:

Photos from up to down:
measurement 1. White and red paint layers on door panelling,
measurement 2. White paint on window framing,
measurement 3. Smooth, even layer of deep red paint on door´s edge,
measurement 4. Several bright red earth paint layers on door panelling,
measurement 5. Deep red on door framing matches the paint layers on door´s edge and lining.

only one layer of paint on the frames, linings and the edges of the door. The binder in the paint of this layer in particular was interesting, because the type of paint could not be determined in the preliminary studies.

METHODS

The aim of the study was to verify which pigments and binders had been used in painting. In addition to simple dissolution tests and microscopy, X-ray fluorescence measurement (XRF) for measuring elements and Fourier transform infrared spectroscopy (FTIR) for measuring the movement of molecular bonds were selected as the research methods. The thin, dark, reddish brown paint surface on the edges (measurement 3), the brighter red paint surface on the horizontal panelling (measurement 4) and the white decorative strip (measurement 1) on the door as well as the white (measurement 2) and red paint surfaces on the window were studied. Both the window and door frames were studied on site in the storehouse. The lining that was removed due to conservation (measurement 5) was studied at the workshop, and it was found that the appearance of its paint surface matches the paint surface on the frame and the door edges.

The initial studies were carried out at Seurasaari directly on the building's surface, but more precise analyses were carried out in an external laboratory. Because the paint surfaces were badly worn, it was not possible to gain full certainty of the paint layers and how many times painting was done. A clearer result of the paint layers could be gained by preparing cross-section moulds of the paint samples for microscopy, but even in this case, the sample itself is very important: when only fragments of the uniform paint surface remain, it is not possible to be completely certain that all layers are included in the sample. However, an attempt was made to select the points examined among places that had remained as intact as possible, and small microsamples for elementary and binder analyses were also taken from these points. In addition, a sample of the white paint surface was taken for a later cross-section analysis.

Both XRF and FTIR measurements can also be taken directly from the surface of the structure using handheld instruments instead of taking microsamples. The measurements of Ida's storehouse were taken in the winter, which meant that the restrictions on the temperatures in which the measuring instruments can be used prevented research in the field.

XRF ELEMENTARY ANALYSIS

Elementary analyses were carried out by using the handheld X-ray fluorescence analyser (XRF) X-MET7500 by Oxford Instruments. The analyser identifies elements from magnesium onwards, which means that the lightest elements, such as organic substances containing carbon, cannot be identified. There is a separate table on the measurement results, which lists the elements with the largest concentrations or otherwise important elements found on the sample. The unit of concentration in the table is ppm (parts per million). Because the method has different limits of detection and identification for different elements; the significant concentrations for elements vary to an extent. It can be said that when studying the composition of pigments, 10,000–100,000 ppm is a significant concentration and 1,000–10,000 ppm is a moderate amount. In some cases, even smaller concentrations of an element can be significant.

The high concentration of chlorine in all of the paint samples, as well as the arsenic in the door frame, may indicate impregnants used earlier to protect the wooden parts. Some of the concentration of lead may also be due to impregnants. Because the XRF analysis was carried out in a laboratory, it was not possible to take a reference measurement of the unpainted surface of the building to verify the presence of impregnants.

The Niemelä tenant farm. Summary of XRF measurements of Ida's storehouses door 13.1.2015

	ppm																		
	Pb	**Cl**	**Fe**	**Ba**	**Ti**	**S**	**Si**	**V**	**Sr**	**Ca**	**Tl**	**Zr**	**Rb**	**Zn**	**Se**	**Au**	**Th**	**Mo**	**As**
measurement 1.	**390903**	**149116**	**94718**	**59211**	**23022**	20368	15947	13230	7286	5397	3314	1088	710	650	574				
measurement 2.	**484744**	**197931**	**84089**	**20919**	**3188**				2476		2933	1274	1062		803				
measurement 3.	**35816**	**210489**	**306603**				**68592**		1874	36456			2298			4067	3644	2373	
measurement 4.	24359	**447839**	**296841**													2449			
measurement 5.	**85231**	**74677**	**456102**				**25355**			15481	1064								4435

5. Table of XRF measurements

WHITE

Measurements 1 and 2:
Samples of white paint, door and window

There are mainly only small fragments of paint left; however, there is a larger amount of white on the top edge of the door that has been protected from weather. The remaining paint fragments are relatively thick, and a study with a microscope reveals a thin red layer under the white layer. Unfortunately, the definition of the digital microscope is not sufficient to show whether the lowest layer matches the darker reddish brown paint on the edges of the door.

A cross-section sample of the paint surface has not been prepared, but it can be assumed that there is more than one layer of white paint. The samples contained lead, iron, barium and titanium as elements significant to pigment research. Despite cleaning, remnants of red paint remained on top of the white paint surface, and it is also visible on the microscopic image under the white layer, meaning that it is the origin of the iron in the sample.

Before the 1930s, white oil paint was mainly manufactured out of white lead, and its use in exterior paint continued to be popular until the 1950s, along with titanium and zinc white (Takala, 2003). Based on the period of construction and the archive photograph (see Image 1), the first layer of paint would therefore be white lead. In addition to lead, a significant amount of titanium and barium was found in the paint sample, which means that if there is more than one layer of white paint, the other layers can be considered to be from the period at the museum. According to master painter J. Järvelä, the first titanium whites used contained titanium dioxide and barium sulphate. After the Second World War, barium sulphate was replaced by dolomite (calcium carbonate), which the studied sample did not contain (Järvelä: 1956). On the other hand, barium sulphate has also been used as a filler in white lead since the 19th century, so the element can also be connected to white lead. In any case, there is less titanium in the sample than lead and barium; therefore, it can be assumed that the layers of paint that have now been studied were painted the last time in the period between the 1930s and the Second World War. The use of titanium became more common in the early 1930s, but it was still relatively expensive as a pure raw material (Takala, 2003). The repair information does not include any mention of painting done on the door during its time at the museum.

REDDISH BROWN

Measurements 3 and 5,
door edge and lining

The reddish brown paint layer is thin and translucent, and no more than one layer of paint could be discovered on the surfaces studied according to the research methods. The studied samples were identical in regard to their main elements, and they contained iron, lead and silicon as elements significant to pigment research.

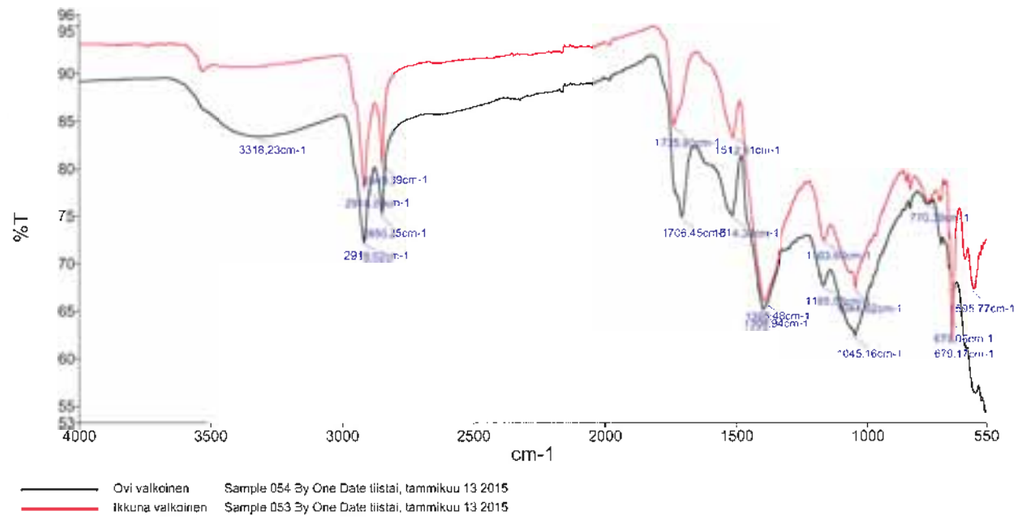
The iron contained in the sample indicates iron earth pigments, which are often colloquially called red ochre. This refers to red iron oxide ($Fe_2O_3 \cdot H_2O$) or hematite (Fe_2O_3). The iron earth pigments can be either mined directly from the ground or derived from yellow ochre by calcination. Currently, there are also synthetic iron oxides on the market. Because the colour of the paint surface is brownish rather than a clear iron oxide red, its silicon content indicates that in addition to iron oxide, it could also contain burnt sienna ($FeO(OH)$) or $Fe_2O_3 \cdot Al_2O_3 \cdot SiO_2\ 2H_2O$). Of red pigments, red lead contains lead, but the shade of the paint surface does not match the bright orange colour of red lead and when studied under a microscope, the paint surface does not show the pigment particles typical to red lead (Eastaugh et al: 2008).

RED

Measurement 4:
Door panel

Under visual observation, several layers can be distinguished on the paint surface of the door panel, with a bright red as the topmost layer. The brighter red paint layer is assumed to date from the time at the museum and to have been painted with red ochre paint. The appearance of the paint surface differs from that of the door edges, frame and linings.

The aim was to take a sample of the surface layer only. The result of the measurement differs from the reddish brown sample in that the only main element it contains is iron. The high lead and chlorine content is explained by the impregnants used, as in the other samples. Therefore, the red colour on the door panel is red iron oxide or hematite, because red lead would turn the hue too orange.



6. FTIR spectrum of the white paint samples from the door and the window.

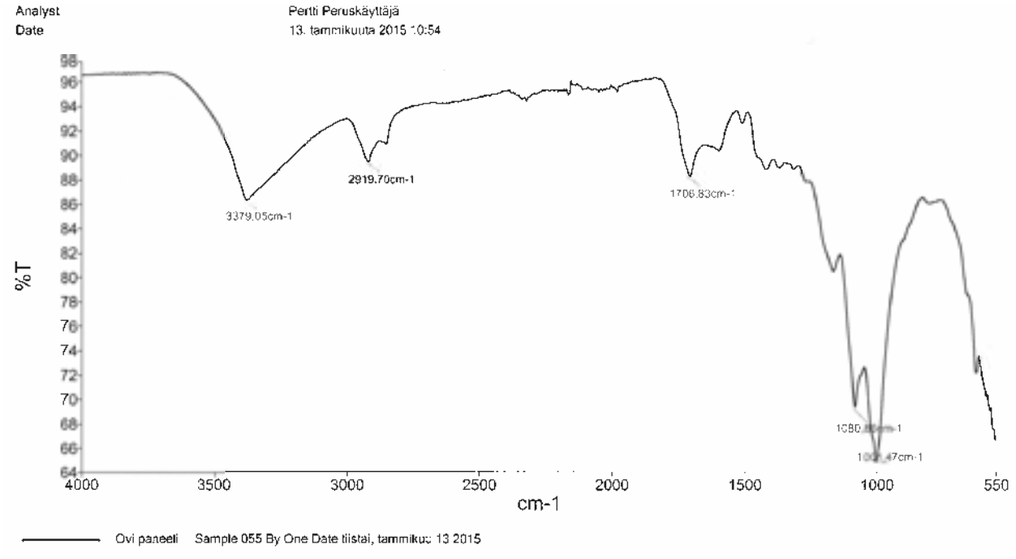
BINDER ANALYSIS USING INFRARED SPECTROSCOPY (FTIR)

Infrared spectroscopy (FTIR) is well-suited for identifying organic binders. FTIR (Fourier transform infrared) spectroscopy is based on molecules absorbing IR radiation and vibrating at certain frequencies, which are characteristic to each compound. The absorptions show up as spikes on the IR spectrum (Derric et al.: 1999). Based on the preliminary studies, certain assumptions on the paints' binder compositions existed, but the lack of reference curves for certain binder types presents challenges for precise identification. Therefore, the results of the analysis are not 100% certain, but they can be used to exclude certain types of paint. All of the example spectrum values can be found in the Getty Conservation Institute's publication Infrared Spectroscopy in Conservation Science (Derric et al. 1999).

The IR spectrum was run for paint samples 1 (white paint on the door), 2 (white paint on the window), 4 (red paint on the door) and 5 (lining). White paint samples 1 and 2 were assumed to match. None of the studied samples showed the stepped spikes around wave number 1,500 cm-1 that are typical of proteins.

Based on samples 1 and 2, it can be stated that the samples contain an oil of some kind, because of the sharp spikes of hydrocarbon bonds, typical of the bond types found in oils between 3,000 and 2,800 cm-1, as well as the spike indicating a carbonyl group in the area of 1,740–1,750 cm-1, which are clearly visible in the reference spectrum. The small third spike in the area of 3,020 cm-1 that separates oils from waxes is almost completely unnoticeable and indicates that the oil has dried out extensively. Certain spikes indicating pure linseed oil do not match the samples perfectly, but the characteristic "maple leaf figure" in the area of 1,103–1,240 cm-1 can be seen. Knowing the time of painting, the used oil binder has most likely been linseed oil, varnish or a fat of animal origin. However, this area of C-O bonds is clearly different from the corresponding area in sample 5, and the solubility of the white paint indicates that it was manufactured with drying oil.

In sample 4 (door panel), a wide spike typical of carbohydrates can be seen in the area of 3,300 cm-1. Because there was no reference spectrum available for red ochre paint, the sample was compared to the spectrum of wheat starch found in the analyser's reference library. Typically, rye or wheat flour has been used in cooking red ochre paint and, therefore, it was assumed that the chemical compositions of binders with starch content would correspond to each other enough to determine the type of paint being studied.



7. FTIR spectrum of the paint sample from the door panel.

Sample 5 (lining) was the most interesting of the studied samples. The paint surface, which seems original, has cracked, but it has not become chalky. When the surface is lightly wiped dry, no noticeable pigment particles come loose. Instead, cotton wool dampened with saliva does dissolve a reasonable amount of paint. The paint also dissolves notably easily in denatured ethanol. The most dissolution occurs in sodium hydroxide, and when a drop of $NaOH_3$ is applied to the paint surface, the colour of the paint film becomes lighter and clear dissolution can be observed on the surface. Oil paint should only dissolve at such extent in sodium hydroxide, but on the other hand, the surface does not seem to be red ochre paint either. Because the time of the storehouse's construction is known, and the door was already painted before the relocation to Seurasaari based on historical photographs, one possible alternative type of paint is tar paint.

For this sample too, the lack of references was a problem; therefore, the paint sample was compared to the spectrum of pure pit tar as well as an industrially manufactured linseed oil glaze. However, it is known that tar paints may also have contained tar piss (the first fraction of tar obtained from a tar pit) or pitch oil, as well as lard or other animal fat or linseed oil, and occasionally also a resin of some kind, which makes the paint a complex object of interpretation (Kaila, 2000).

The studied spectrum has a strong double spike (preceded by a small additional spike) in the area of 2,930–2,850 cm-1, which matches the spectrum of pit tar. However, the spikes in the studied sample were deeper, and some of the intensity may well be due to other fats contained in the sample. Of the spectra of the sample and the tar, a sharp spike indicating carbonyl groups in the area of 1,715–1,695 cm-1, typical of wood-based resins, could also be seen. In addition, the sample includes a small, low spike in the area of 720/730 cm-1, which indicates that the sample contains a natural wax. The wax could come from a resin added to the paint, for example.

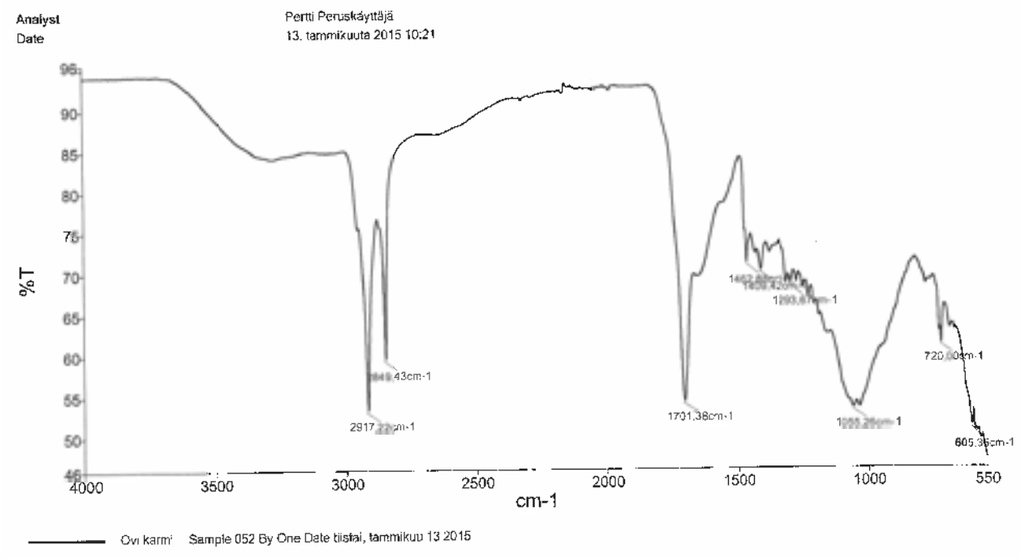
A significant difference to the pure tar used as a reference is the wide, deep spike in the sample in the area of 1,055 cm-1. The spike indicates C-O bonds in the carbon chain; linseed oil would produce a clear pattern resembling a maple leaf formed by several spikes in this area. However, the sample shows a clear, single side spike and, therefore, another fat must be involved. In addition, the paint is easily soluble, which indicates a substance other than linseed oil, which dries well by oxidation. There were no appropriate reference spectra available for lard or train oil, but knowing the background of the site, the use of fat of animal origin is very likely.

RESTORATION PAINTING

As far as possible, the restoration painting was carried out using pigments in accordance with the analysis. The use of white lead as a pigment in restoration sites must be considered carefully. It was decided to use industrially produced linseed oil paint for the white details of the door, because there is no special reason to use white lead at the site. The reddish brown paint on the door panels and the window frame was mixed by the conservators according to a tar paint recipe that has been found to work in the conditions at Seurasaari. The paint contains pit tar, linseed oil varnish, turpentine and paint pigment. In accordance with the research results, the pigments used were red iron oxide and burnt sienna. The paint was tinted to match the paint surfaces on the frame and the lining that were left intact, taking the effect of the weather-damaged wood surface on the shade into account. The research results aroused curiosity in the usability of tar paint and their durability in general, and a test field for samples painted with paint manufactured according to different tar paint recipes was created in connection with the restoration. A paint manufactured with lard in accordance with the research results is also included in the test field.

CONCLUSION

Good and successful materials research requires background research and certainty in interpreting the results. Knowledge of the substances typical of the construction method, the period and their use, as well as the aging of the materials, is necessary. The more information there is on the building's history and the repairs made in the building, the more reliably can the resulting research information be included as part of the repair history. The building's history at the museum presents its own challenges for materials research. The conservation methods and trends in the museum sector have varied over the decades, and the use of various toxic chemicals in building conservation was common until the late 20th century. When using different kinds of analytical research methods, the effect of previous chemical treatments on the research results must be taken into account. Interpreting the results of analytical research also presents its own challenges. For example, comparison with known reference spectra is key in interpreting FTIR spectra. However, there may not be reliable references available for the materials used in traditional paints and, therefore, the interpretation of research results is rarely completely unambiguous. When studying historical materials, the ageing of substances that can be seen in the spectrum must also be taken into account, as it creates further difficulties for comparing the researched spectra with the references.



8. FTIR-spectrum of the paint sample from the lining

For Ida's storehouse, the analysis of binders in the paint samples confirmed the assumptions on the three different types of paint. The top layer of the door panels was painted with a red ochre paint containing starch, the white parts were painted with oil paint and the linings, frames and edges of the door were painted with tar paint. The identification of tar paint in particular proved to be difficult, because there are several known paint recipes from the period being studied. In addition to tar or tar-based substances, the recipes often also use an oil or a fat as well as resins. The more unusual paint materials used in the recipes, such as pitch oil or tar piss, could not be found in the analyser's reference library, so the identification was made using the spectrum of pure pit tar and the spectrum values of known resins of wooden origin found in literature. Complete certainty was not reached for the oil contained in the paint, because its spectrum did not completely match linseed oil's, and a reference spectrum of an animal fat was not available. Therefore, the original recipe may well have been a mixture of pigment, lard and tar or tar piss.

Elementary analysis provided additional information on the used pigments and assistance in dating the paint surfaces. In addition to a different binder, the pigment composition of the paint on the door panels differed from the pigments on the door edges and frame structures. The paint on the panels was pure iron oxide red ochre paint, while the reddish brown tar paint used to paint the edges and the frame structures included burnt sienna in addition to the iron oxide. It is likely that the maintenance painting of the door during its time at the museum was only focused on the panelling; the frames and linings, as well as the protected door edges, have kept their original paint.

The oil in the white paint differs from the spectrum of the oil in the tar paint, which supports the assumption that the tar paint contains a fat of animal origin. The analysis of the white paint remnants also showed that the linseed oil binder was extensively aged, which means that the door has not been maintenance painted in the last few decades. In addition, large amounts of chlorine were found in all samples during elementary analysis as well as arsenic on the door frame. It can be assumed that the substances are from impregnants used to protect the wooden parts. The amounts of lead measured were relatively high, and some of the concentration may come from impregnants.

Even though there has been a large amount of research on the buildings of the Niemelä tenant farm, the study of folk buildings is often connected to ethnology, while less attention is paid to building research. In particular, research supporting conservation is still needed, and not even a century of museum history has been enough to exhaustively document and study the Niemelä building group. On the other hand, research methods and equipment also continue to develop, and the equipment used now makes it possible to carry out research that could not even be dreamed of fifty years ago.

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9. Ida's storehouse after conservation and restoration.

Erkka Pajula

case study: conserving the roof of the Niemelä tenant farm in Seurasaari

Keywords:
birch-bark roof
weighting spar
building conservation
building restoration

INTRODUCTION

The main building of the Niemelä tenant farm consists of a chimneyless cabin, a dairy room, a smoke sauna and a porch that connects them to each other. The oldest part of the building is a smoke sauna from the 18th century, built out of round logs, which Lasse Heikinpoika Turpeinen, the founder of the tenant farm, received upon leaving the main farm in the 1770s. The chimneyless cabin and the dairy room were built in 1844 to replace an earlier, smaller chimneyless cabin. The wall structures of the porch that functions as a passageway may date from the time when the tenant farm was first established. The roof of the chimneyless cabin is a birch-bark roof with support railing that represents an East Finnish type.

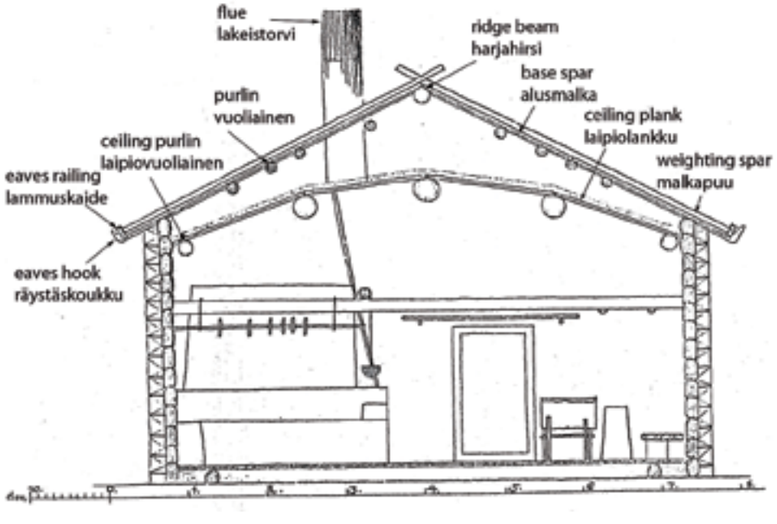
The conservation of the birch-bark roof of the main building was a part of a conservation project covering the whole farmstead that started in 2012. The conservation and restoration measures in the main building were focused on its base floor, log walls, roof structures and the flue on the roof. The work on the main building was done from 28 October 2013 to 10 December 2014, along with the other work of the Seurasaari building conservation working group. In addition to the permanent working group, two trainees participated in the work. The restoration of the chimneyless cabin's roof began during the winter of 2014, while the building was surrounded by scaffolding and weather protection; the topmost logs in the side walls were also restored at that time.

With the help of the briefly recorded history of repairs, archive photographs and field research on the site, the materials used in previous conservation measures were dated and separated from the authentic structural elements of the building. Care was taken to try to save materials used in previous conservation measures, if they caused no aesthetic harm and did not provide disinformation about architecture and history, and if they were still technically functional.

ROOF RESTORATION - STARTING POINT

The weighting spars were badly rotted and a large amount of humus had collected on the roof. The building is surrounded by a large number of trees, whose leaves and needles fall on the roof; the resulting layer of humus keeps the weighting spars moist and speeds up their rotting process. The only leak in the roof was at the base of the flue. Previous measures on the roof had been taken in 1980, after which the roof structure was as follows: purlins, base spars, a single layer of birch bark, horizontal roof boarding, hardboard, bitumen felt, birch bark and weighting spars. The hardboard, bitumen felt and birch bark date back to 1980, but the other parts date presumably from 1971, when the roof was replaced, according to the repair history. Samples were taken of the bitumen felt to be tested for harmful substances.

The roof boarding at the eaves was partially rotten. The hardboard had become waterlogged and rotten at the lower and gable eaves. The roof boarding had also sustained localised insect damage; however, the damage was no longer active.



1. Names of the roof structures.

2. Roof layers under restoration.

The battens had been attached to the purlins by nails, so that their lower end did not touch the eaves railing, but left a gap of approximately 25 mm instead. The base slats had been installed on the roof by alternating butt and top ends at the eaves. The top ends had been left approximately 100 mm above the eaves railing. The weight beams had been slightly thinned at the ridge joint, where they were also nailed together, so that they were not leaning on the eaves railing, either. Neither weighting spars, nor base spars had been carved sharp at the bottom end.

The eaves railing is made of two consecutive planks, which have been attached by nailing them together at the vertical lapped joint. The surface of the planks visible to the outside has been hewn with an axe. The rot damage was minor enough that only one plank had to be replaced. Of the root hooks supporting the eaves, three on the southwest side were so badly rotted that they had to be replaced.

Both roof planes have four purlins. Some of the purlin ends had rotted. The damage was sustained when the roof either didn't cover the end of the purlin completely, or when water ran along the bark at the gable to the end of the purlin. The northwest gable had five purlins in need of repair; the rot damage in one of the purlins reached all the way to the log wall. At the southeast gable, the upper surface of four purlins and the ends of the last layer of logs on both side walls required repairs.

The ceiling boarding is slanted in four angles. It consists of planks hewn with an axe laid on top of the ceiling beams. Two of the ceiling joists contained rot damage that required action. The "mould fungus" discovered in the ceiling in 1980 had softened up the wood and made it into an environment suitable for wood pest insects such as *Hadrobregmus confusus* or *Hadrobregmus pertinax*. All of the ceiling planks contained some level of damage. The damage was mainly caused by *Hadrobregmus confusus* and located on the top surface of the planks. The bottom ends of the outermost boards on the plane had sustained more damage. It had been worsened by the roofing felt, which had been passed over the outermost ceiling purlin down to the wall logs, thereby weakening the ventilation of the bottom ends of the ceiling planks.

3. Laying the birch bark.

ROOF RESTORATION – METHODS

The layers of roof-covering sheeting were removed from the eaves up to the first purlin when the wall log repairs made it necessary. Roof-covering sheeting was removed from the gable eaves down to the gable walls, due to purlin repairs. Some of the base spars and the boards on top of them were reused. The new and the reinstalled spars were sharpened at the bottom end and installed against the support railing. The rotten sheathing boards were replaced by 125 x 22 mm spruce boards. Near the eaves, a single layer of birch bark was laid between the base spars and the boards. The partially removed bitumen felt and hardboard were replaced by Tyvek® Pro microfibre fabric, which is a vapour-permeable roof-covering sheeting material. A strip of Tyvek ® Pro was also added on the roof ridge on top of the felt layers, because there were holes in some areas of the felt on the ridge.

Three eaves hooks were replaced on the southwestern roof plane. Only one of the boards of the eaves railing on the northeastern side was replaced. The new board for the eaves railing is pine, hewn with an axe on every side. The surface of the new wood materials used for restoration was always hewn with an axe, and the use of nails to attach things was avoided.

The birch-bark roof with weighting spars was constructed in the traditional way, regardless of the modern underlayers. Four layers of birch bark were laid, progressing from the northwestern to the southeastern end. The lowest layer of birch bark on the eaves was laid with the white side up, going approximately 25 mm over the edge to form a short drip moulding. Approximately, every fourth piece of bark was laid horizontally. The section of bark that goes approximately 150 mm over the edge of the gable eaves curls into a drip moulding that prevents water from entering the structures. The spruce weight spars were sharpened at both ends, and the section at the roof ridge was thinned down by carving with an axe. At the gables, the outermost weight spars were attached to each other with a 400 mm long and 20 mm thick ridge dowel carved out of juniper.

SUMMARY

The birch bark and weight spars on the roof of the chimneyless cabin were installed using traditional methods. The axe-hewn weight beams are held by the support railing at the bottom end; no nails were used in attaching them. The materials in the hidden lower layers of the roof remained as historical layers in the structure, exemplifying conservation measures in the 1900s. The Tyvek ® Pro microfibre fabric has been introduced in test use on a few birch bark roofs in Seurasaari to protect against possible leaks in the roofing. However, birch bark functions as the actual waterproof layer at the sites. The microfibre fabric replaces the previously used bitumen felt, which has been extremely harmful to wooden structures when it has leaked. However, no final results exist regarding the suitability of microfibre fabric for these artefacts.

Removing the trees around the buildings would extend the life of both birch-bark and other types of wooden roofing. Roofs can be cleaned using a leaf blower, for example, but removing all leaves and needles from birch-bark roofs in particular is challenging and time-consuming.

Nina Robbins & Päivi Ukkonen

museological value assessment protecting artworks from disposal – a large-scale case from hyvinkää

Keywords:
museology
large-scale conservation
value assessment

ABSTRACT

In cases of large-scale conservation, the commission's funding and timeframe both play significant roles in the overall process. In order to be able to make heritologically sound decisions, it is vital to implement museological value assessment before any conservation procedures are undertaken.

INTRODUCTION

This paper introduces a case of conservation involving four large-scale paintings that belong to the collection of the Hyvinkää Art Museum. The focal point of the paper is to emphasize how proper museological value assessments can save artworks from being improperly disposed of.

CASE

The paintings were painted by Jalmari Ruokokoski (1886-1936) and a group of local painters in 1914. They were originally made as wall paintings for the Arena movie theatre in Hyvinkää. Their themes depict exotic landscapes, animals and people from far-away countries. These works were intended as entertainment for the audience during intermissions. Regular movie theatre operations ended in the Arena building in 1985, thus putting an end to the paintings' original context. In April 1990, all of the large sheets were cut from the theatre walls and stored in a temporary storage in the old Hyvinkää wool factory (Wanha Villatehdas, 1892-1993) premises that contained various spaces for museum functions, as well as artistic workshops. The paintings have been consuming storage resources ever since. This temporary storage suffered some fire damage in the September 2003 fire, although the paintings survived, despite their poor condition.

The paintings were painted with sturdy oil paint mixtures on strong screening paper. After cutting the paintings from their original context in 1989, the size of an individual sheet was approximately 530 x 320 cm. All of the sheets were extremely dirty, had several two-to-three meter tears and were full of marks, indicating sometimes less-than-successful previous repairs. Some of the paint layers were discoloured due to exposure to corrosive dirt, but were otherwise well-attached to the supports.

The Hyvinkää Art Museum made efforts to conserve the paintings in the 1990s. But only after the wool factory fire in 2003, and upon the building of a new city hall in 2010-2012 on the wool factory premises, did the issue become relevant again. The new city hall was to be built on the wool factory premises, using the old building structure as the basis for the new architecture. The Arena movie theatre paintings were to be placed in the conference rooms on the first floor.

The paintings were given a second chance, but from a conservation point of view, the relevant question was now raised: How could the dignity of the paintings be preserved in a situation where the original context of the theatre no longer existed, the resources for any conservation efforts were quite limited, the temporary conservation workshop was in reality an ordinary storage facility, the timeline for the needed conservation work was determined by outside factors and players and the individual display rooms in the new city hall would not fit the large size (530 x 320 cm) of the given works? It seemed that some kind of compromise had to be reached.

MUSEOLOGICAL VALUE ASSESSMENT

In general, value assessment of a collection is a natural companion to collection management (Knell, 1994, 2004; Appelbaum, 2007; Davies, 2011). It sets a concrete foundation for determining

2. The effect of corrosive dirt. Photo: Nina Robbins

1. Before conservation, 2012. Photo: Annina Hokkanen

which artworks are of critical importance to a museum and its identity. In 2012, a dissertation survey was conducted involving all Finnish art museums; in this survey, museum personnel were also asked about such values. It became clear that there are three types of value assessments active in Finnish art museums: art historical, pragmatic and museological (Robbins, 2014).

Artistic and art historical assessments are naturally important and have their background in disciplines such as history and philosophy. As an example of pragmatic value assessments, one can point to the rescue plan for or insurance value of any given artwork. The problem with art historical and pragmatic value assessments is that they do not necessarily cover the entire collection and are to some extent determined by outside factors and players. They are important in their own right, but are not considered comprehensive from a collection management point of view; their scope is seen as somewhat narrower.

When value assessment is museologically oriented, it recognizes the wider range of issues that are crucial, both to collection management in particular and to sustainable heritology in general. Heritology, as a term, views our cultural heritage from quite a wide perspective. This means that all so-called memory organizations, i.e. museums, archives and libraries, belong to the field of heritology. The term is closely connected to the idea of *the Great Museum*. This is a concept launched by British museologist Kenneth Hudson (1916-1999). The core idea behind the concept of *the Great Museum* is that the world around us is understood as a network of the past, present and future. The museum as an institution is seen only as one part of this network: *"What is important is not what is in the museum, but the power of its collections and displays to increase and enrich people's understanding of the world outside and around them, of the Great Museum."* (Hudson, 1993, p. 55) The idea of the Great Museum is all about selection. Being selected as heritologically interesting creates the starting point for the museum value to accumulate (Kinanen, 2009, p. 174; Vilkuna, 2010, p. 344).

Eventually, the function of a museum is to make the world around us understand what is heritologically significant. In this work, museological value assessment helps museum professionals in their decision-making processes. This became clear in the 2012 survey answers, where museum personnel were given an opportunity to freely choose values that best fit their museum and its collection. Five values emerged from the material as the most important ones in Finnish art museums: *artistic, aesthetic, local, museum and research* (Robbins, 2014). All of these values indicate the necessity of implementing a museological value assessment when dealing with collection management. They form the background for a wider discussion that is guided by museum personnel and not by outside factors and players. In the core of the discussion, themes such as these emerge:

- Which items pass the artwork threshold?
- Which items are significant to our identity?
- How do we divide our resources and time?

In addition to clarifying the decision process, museological value assessment comprehensively takes the entire spectrum of collection management into account, from acquisition to disposal, when determining any long-term decisions affecting a museum's collection. It also addresses the need for both philosophical and practical approaches. It functions as a bridge between philosophical issues, such as good vs. bad art, and pragmatic issues such as the monetary-oriented values of art.

3. Turning the paintings. Photo: Annina Hokkanen

4. Backing paper and edge support. Photo: Nina Robbins

Museological value assessment will leave an indelible mark on a collection's history and it is clearly all about making choices between the significant and the non-significant. It is precisely to the question of selection that collection-oriented museological value assessment is seeking solid answers for. This task is a close companion to the Australian *Significance 2.0* method, which is a value assessment method that aims to form a unified statement of significance regarding any given culturally important phenomenon. Before any written statements are produced, a thorough study needs to take place. Such a study will help to understand the phenomenon from all possible vantage points and will eventually aid in forming intelligent decisions concerning the phenomenon in question.

Four criteria are used when forming a *Statement of Significance*:

- Historical significance
- Artistic or aesthetic significance
- Scientific potential
- Social and spiritual significance

(Russell & Winkworth, 2009, p. 10; van Mensch & Meijer-van Mensch, 2011, p. 28-29)

In addition, four comparative criteria are used to evaluate the level of significance:

- Provenance
- Rarity
- Condition
- Power of Expression

(Russell & Winkworth, 2009, p. 10; van Mensch & Meijer-van Mensch, 2011, p. 28-29)

The method has been recently adopted by several museums in Europe, especially in Britain and Holland (van Mensch & Meijer-van Mensch, 2011, p. 28-29). Finnish museums have adapted the model to suit their purposes and the Finnish *Merkitysanalyysimenetelmä* (Häyhä & Jantunen & Paaskoski, 2015) has been tested, for example, in the Finnish Forest Museum Lusto. In the Finnish model documentation, value assessments and analyses of significance are both important. It is also essential to gather information from all parties involved before any final analysis is undertaken.

The 2012 research on Finnish art museums showed that museums have a lot of information, practical knowledge and tools regarding value assessments, especially museological value assessments. They have the know-how to separate the significant from the less significant. It was time to mediate this information, to put it to good use. The Hyvinkää case was an example of this.

In order for the compromise in the Hyvinkää case to be well thought of and managed, a museological value assessment had to take place. Before starting any conservation procedures with the large-scale paintings in question, a meeting was held in Hyvinkää with the conservators and museum staff, in order to determine the value class for these large-scale artworks. They were clearly seen as significant to the people of Hyvinkää; their strong connection to the city's local history was thus established. Their art historical value was seen as important, but it was noticed that since their original function was as "wall papering" in a movie theatre, the artist had not exercised the utmost accuracy in his brush strokes. Also, their value as rare examples of old and exotic small-town movie theatre enhancements was noted.

A museological value assessment was composed, based on all available information and having a strong knowledge of the fact that if the sheets were not be displayed in the new city hall, they would not get a chance to be conserved or displayed – ever.

5. Attaching the ready paintings to the wall. Photo: Nina Robbins

7. Detail after conservation. Photo: Nina Robbins

CONSERVATION PROCEDURES OF MANAGED COMPROMISE

As stated before, a compromise had to be reached in order to save these artworks. The first decision, before any procedures were implemented, was to test the paint and support surfaces, in order to determine how vulnerable they were to handling. This was valuable information and had a direct impact as to the time needed for conservation. Both the surface and the support were very sturdy, except some areas of decay; it was thus determined that no separate scaffolding structure on top of the paintings was needed. Large sheets of thick cardboard were set on top of the painting, which offered a safe enough working surface.

Secondly, a firm decision regarding the cutting of the original paintings had to be made. It was determined from early on that the paintings would not fit their new location in their current size, and approximately 20-30 cm from one end of each painting had to be cut. The exact cutting points were decided together with the conservators and museum staff in order to preserve as much of the art works' integrity as possible. Luckily, no significant information was lost. One has to also keep in mind that the paintings had already been cut at some point in history and were not actually their original size when this conservation process was undertaken.

After these decisions were made, a relatively quick way of cleaning had to be found. After testing with different-sized tools, the paintings were cleaned using soft disposable cleaning cloths and 1.5% triammonium citrate in water. Cleaning cloths were safe to use and also made the cleaning quicker than would have been the case were cotton swabs used instead. In addition, all vulnerable areas were treated with special care, using small cotton swabs. The non-soluble surface dirt and over-paint were removed mechanically.

After the surface cleaning, the paintings were turned over, in order to treat their backsides. For this, the surface had to be cleaned, the long tears and holes had to be repaired and a new backing support had to be attached. The turning process involved several people and the paintings were first rolled before turned. The backside was cleaned with a soft brush and vacuum, the long tears were repaired with wheat starch and Japanese Kozo paper. The *Kozo* sheets were also material for the backing support of the paintings. Finally, linen border supports were attached to secure the edges. This was a necessary procedure, since the paintings were to be screwed directly from their edges to the walls of the city hall's conference rooms.

Once the cleaning and structural treatments were done, it was time to make decisions about the paint surface; these decisions had to also fit the given deadline. It was decided to leave signs of some of the old surface repairs and neat rows of nail holes as marks of history on the surface of the paintings. Larger damaged areas were treated with glue, containing filling and watercolours. Due to the time pressure, it was decided that after the initial surface treatment, the surface was to be monitored in the future, with any further signs of decay to be treated accordingly. In the end, the paintings were rolled into their new place, and the relevant information panels were attached to the walls.

IN CONCLUSION

It has been said that conservators are in the business of preserving our cultural heritage. During the conservation process, the conservators involved had to cut the original surface of the paintings and walk on top of the paintings. They had to make decisions as to the level of surface treatment and give advice as to how to attach the paintings directly on the walls with screws. These sentences

6. After conservation. Photo: Nina Robbins

hardly echo the demand set in the first sentence. Earlier on in this paper, the issue of selection was mentioned. In this case, conservators and the museum staff had to exercise severe selection, in order to preserve locally significant art works for the future citizens of Hyvinkää. Museological value assessment had to be tested in practice, in order to save the large-scale paintings from storage and to bring them into public visibility. The conservation process was a good eye-opener for seeing the possibilities of our cultural heritage within the context of real-world pressures, involving local city politics. The outcome was nevertheless a managed compromise. Even though the original context of the art works was lost, the paintings are now nonetheless visible in a public space.

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Will Shank

Keith Haring`s monumental outdoor murals: collaborative efforts in Pisa and in Paris

Keywords:
murals
contemporary art conservation
Keith Haring

ABSTRACT

Two monumental murals painted by American artist Keith Haring (1958-1990) were recently preserved by a team of preservation experts, working with the owners of the buildings on which the murals are painted, as well as outside consultants. The murals are an untitled work painted at a children's hospital in Paris, 1987, and Tuttomondo, 1989, in Pisa. The paper reveals the challenges in understanding the materials used by the artist and the architectural supports upon which he painted, and the process of identifying the most appropriate parties to undertake analyses of those materials before treatment could commence. The conservation of other Haring murals will be considered in the context of the two that are the focus of this study. The Haring murals are considered within the larger context of international approaches to the conservation of contemporary paintings upon exterior walls, which remains the brave new frontier of painting conservation.

INTRODUCTION

American artist Keith Haring (1958-1990) was the superstar of international pop art, whose meteoric rise in the 1980s, after dropping out of New York's School of Visual Arts, came to an abrupt end with his death from AIDS at age 31. His simple and bold designs, which are immediately recognizable and easy to reproduce, may be dismissed as simplistic. But Haring was an important and unique voice for a young generation and, in many ways, the heir to his friend and collaborator Andy Warhol. With his colorful animated figures, he entered the art world through the back door of popular appeal. In spite of his success and his fame, he remained an outsider in the art world, committed to populism.

Among the many works created during his short career were a series of interior and exterior mural paintings. Those who observed him at work were stunned by his consistent energy, speed and assurance, with virtually no preliminary sketches or plans, even on his enormous murals. The Keith Haring Foundation numbers his extant painted walls at eighteen, and of those, seven are painted on outdoor architectural surfaces. This number of surviving wall paintings represents approximately one third of the original number of murals, the majority of which have been painted over, otherwise altered or destroyed. [1]

While many of Haring's large-scale paintings were intended to be temporary, due to varying circumstances of their creation, it is clear that some of them were not. In the artist's own words, some of his larger murals were considered "permanent," [2] as opposed to a wall painting created for a temporary exhibition, for instance.

The task of making decisions about the welfare of the "permanent" Haring murals has been addressed in a number of different manners in the locales where his public outdoor paintings are located. The author was part of the decision-making team in the case of two important Haring murals; this paper focuses on the history of recent preservation efforts directed toward those two works, while incorporating information about other related conservation scenarios, in the case of other painted walls by Haring.

The perspective that I bring to this story comes from my role as the Co-Creator and Co-Chair (with Dr. Timothy Drescher of Berkeley, California) of Rescue Public Murals, a programme by Heritage Preservation in Washington.

Our approach to the misunderstood specialty of the conservation of contemporary murals focuses on the importance of collaboration. Our experience in assessing the needs of the disappearing public murals of the United States is that many different approaches to their preservation may be acceptable, and sometimes the solution lies outside the ethics of the profession of traditional painting conservation. What is of paramount importance is that all stakeholders in the welfare of the painting have a voice, and that the most reliable sources of information available, be they artistic, historic, social or technical, be applied to the preservation effort. [3]

Haring restored at least one of his own murals. In the case of *Crack is Wack*, 1986, Haring's anti-drug message painted on a wall on an abandoned handball court in Harlem, the artist himself intervened when his work was vandalized shortly after the mural was completed. Haring's text *Crack Is Wack* was changed by a vandal to "Crack Is It," the opposite of Haring's intended message. After the city obliterated the negative message, they invited Haring to paint it again and to create an additional mural on the other side of the freestanding wall. [4] The second design was substantially different from the original. (The paint layers of the mural subsequently deteriorated rather quickly, and "Crack Is Wack" was repainted completely - at least once - in 2007).

1. *Keith Haring with "Crack is Wack," New York, 1986. Photo: Tseng Kwong Chi, copyright Keith Haring Foundation and Muna Tseng Dance Projects, Inc.*

2. *Keith Haring, Mural at the Collingwood Technical School, 1984, when new. Photo: Tseng Kwong Chi, copyright Keith Haring Foundation and Muna Tseng Dance Projects, Inc.*

3. *Keith Haring, Tuttomondo, 1989, photographed in 2011. Photo: Will Shank*

Haring's first major public wall painting, the Houston Street and Bowery Mural of 1982, in Manhattan, painted with fluorescent paints on a cement handball court, has had a rich posthumous life, as it did not survive long in its original state. Since 2008, the "Keith Haring Tribute Wall" has been a sought-after destination for street artists who compete for the privilege of painting over Haring's early work.

The Keith Haring Foundation, which was created by the artist himself in 1989 before his death the following year, has the preservation of Haring's artistic legacy as an important part of its mission, [5] including his murals. It has approached the preservation of a number of mural projects more in the manner of the traditional creation - or repainting - of mural paintings, rather than applying to the task the frequently more cautious and measured intervention of a conservation team. As recently as 2013, a collaborative Haring mural in Philadelphia called We the Youth, which was created in 1987 by teenagers from Philadelphia and New York (Brandywine Workshop and CityKids, respectively) under Haring's supervision, was restored by artists from the Mural Arts Program of Philadelphia [6] with the support of the Foundation.

In Melbourne, Haring's only public work in Australia, an untitled mural from 1984, on the wall of the former Collingwood Technical School, was the subject of a heated debate for several years before it was finally restored in 2013. Its deteriorated state had embarrassed and distressed the communities who lived with and/or took pride in the Haring mural, and various vocal factions had offered to return it to its original splendor.

This story of passionate conflicts over a preservation project underlines the power of Haring's legacy, and the influence that his work continues to exert upon those who live in its shadow.

PISA

When the altered state of Haring's last outdoor mural, *Tuttomondo*, located on the exterior wall of the church of Sant'Antonio dell'Abate in Pisa, came to the attention of the author and his colleagues, its originally vibrant palette had become severely subdued.

There was, at that time (2011), some shared concern about its welfare, based on the chromatic changes that were obvious to anyone who knew the mural when it was new. Painted by the artist with five assistants over the course of four days in June of 1989 as a sort of street performance that was the main event of Haring's *Progetto Italia*, the mural encompasses an encyclopedia of the artist's most familiar imagery, including the crawling baby, a mother and child, and the suggestion of the triumph of

4. Keith Haring painting Tuttomondo in 1989. Photo: Tseng Kwong Chi, copyright Keith Haring Foundation and Muna Tseng Dance Projects, Inc.

5. Cleaning of Tuttomondo with an agar gel, 2011-12. Photo:Will Shank.

Good over Evil, in the form of a snake being cut by scissors, among the many shimmering human, animal and android figures.

Tuttomondo had been intended, according to the artist, to last for "hundreds of years." [7] But after only twenty-two years, the colors of the figures were significantly muted, and the white passages of the negative space of the background had grayed. The overall effect was a neutralization of the *chiaroscuro*, to the detriment of the image.

The conservation effort came together as a series of fortuitous coincidences of timing. When Antonio Rava and I first became aware of the state of *Tuttomondo*, and we were preparing a presentation to the city officials of Pisa in order to undertake a conservation study, we learned that a group of our colleagues were already planning an assessment of the mural. COPAC (Conservazione Preventiva dell'Arte Contemporanea) [8] was studying several important works throughout Tuscany, *Tuttomondo* among them, as part of a preventive conservation investigation focused on contemporary art.

Generous funding for the treatment was subsequently identified, thanks to the Friends of Heritage Preservation in Los Angeles, and of the Keith Haring Foundation in New York. The liaison between the conservation team, the COPAC study and the Comune was Dr. Perla Colombini, noted chemist at the University of Pisa. The science team, which included the Institute of Applied Physics in Florence, and the science department of Scuola Normale Superiore of Pisa provided invaluable data about the paints, as well as quantifying the changes in the appearance of the mural as the conservators began to test various methods to revive Haring's palette.

Indispensible was the input of the people who had created and prepared the wall on which Haring painted. The Caporol team wisely created a homogenous surface over the irregular wall of the church for the artist to paint upon by using an "overcoat" (*capotto*) system of polystyrene panels adhered to the wall, reinforced with a fiberglass web, and smoothed out evenly with a white priming layer. After test panels were provided to Haring for his approval of the texture, Caparol acrylic emulsion paints were chosen and mixed in the manufacturer's headquarters outside Pisa. The painting then began from a movable scaffolding, with Haring first creating a beautiful black line painting on the white surface, then returning with a team of assistants to fill in the colors of the figures. The entire art "happening" lasted four days in June of 1989. (Caparol saved the test panels and Haring's paint brushes as souvenirs; these were proudly shown to the conservation team during our visit to the paint headquarters.)

The decision to create this homogenous and durable substrate undoubtedly gave *Tuttomondo* a longer life than it would have had, had the paint been applied directly to the uneven surface of the church wall. It did create problems of its own, however. The graying of the image turned out to be a visual effect of a veil of calcium carbonate that had washed over the surface during two decades of rainy weather that dislodged a chalky element from the white background plaster layer. After much testing of cleaning alternatives, the team decided to use a gel made of agar, a natural polysaccharide, which effectively peeled away the surface deposits. The process was labor-intensive, taking place over the course of several months in 2011 and 2012.

As an aid for the officials of the Comune, a group of art historians from the University of Pisa were kept apprised of the progress and the success of the treatment as it progressed. Thus, neither the conservation team nor the COPAC group were working in a vacuum, and the officials at city hall, whose expertise lies outside the field of art conservation, benefited from the advice of local and national authorities about the work of the conservation team. The visual state of the mural was appreciably improved by the treatment.

The success of the cleaning was ensured by the application of a water-repellent protective coating, whose purpose is to halt the dislodging of original material that had accumulated over his paint layer during the course of two decades.

Whether or not all of the stakeholders of the welfare of *Tuttomondo* were in complete harmony during the decision-making progress, the system of checks and balances worked well, and it ultimately served the best interests of the artwork. The mayor of Pisa and the staff of the Comune had been understandably concerned that they were doing the right thing for this unique monument in a city not known for its contemporary art holdings. Their interest in the success of the conservation project was made obvious through the ongoing support of the administration not only in providing access to the mural by financing the costs of the treatment, but also by incorporating the mural into a larger urbanization project. Since the completion of the conservation project, the Piazzetta Keith Haring has been beautified by the addition of a children's playground and enlarged with an increased viewing area for the mural .

PARIS

When the Keith Haring Foundation was alerted in 2011 about imminent physical changes that were about to take place at the Hopital Necker des Enfants Malades in Paris, Executive Director Julia Gruen included a conservator in the initial meetings with the hospital staff. The purpose of the rendezvous was to address the future of a mural painted by Haring in 1987 on an exterior wall of a cylindrical tower that holds an emergency stairway, attached to the pediatric surgery building.

The artist chose the wall in order to give a gift to the city, while he was in Paris for an exhibition of young American artists at the Centre Pompidou. The cheerful mural, freed from the polemic of much of Haring's work, is intended to lift the spirits of those who view it, many of whom are sick children or their loved ones. It features crawling babies on the north side, a pregnant woman bisected by the vertical windows of the tower on the west side, and joyful adult figures on the south side. (The fourth, east side, is attached to a building by a series of bridges.) At a great height, he created a harmonious whole out of eleven diverse figures, which, as was his custom, were painted without preliminary sketches. He worked *pro bono* and without a contract. [9] Suspended in an open cage from a crane with his boyfriend Juan Rivera during three chilly days in April,

6. Tuttomondo after treatment (with the exception of the portion still behind glass), April 2012. Photo: Luciano Marras

Haring applied the four fields of color (yellow, blue, red, and green) in two coats, then the black lines of the figures.

The mural did not age well. By the time of the first conservation assessment in 2012, serious condition problems had become evident, mostly in the thick black lines that were painted either directly into the concrete substrate, or over the primary color fields that had been applied first. In the meantime, the hospital was implementing its plans to renovate, an enterprise so vast that it was the second largest construction site in France at the time. [10] Central to the plan for the new configuration of the hospital was the idea of featuring the Haring tower as the centerpiece of its newly configured gardens. The stairwell upon which it was painted would be detached from the pediatric surgery center, slated for demolition, and would become a freestanding "totem".

But what to do about the deteriorating mural itself? In 2006, Haring's Paris gallerist Jerome de Noirmont had learned of the plans to destroy the tower during the planned hospital renovation, and he convinced architect Philippe Gazeau to integrate the work into the reconfigured campus of the Hopital Necker. [11] As the saving of the mural approached reality, he became the leading force behind funding the preservation effort. In an exemplary gesture of generosity, Mr. de Noirmont not only financed the initial conservation assessment of the mural, but also collaborated with Sotheby's Paris auction house to stage a 2013 art sale whose proceeds would benefit the conservation of the Haring work. Sotheby's itself received no commission on the sales at the charity auction. The author of this paper provided a description in the auction catalog of the special resources required for the conservation of such a major work of contemporary art, especially one of the scale of the Necker Hospital mural.

The hospital, whose important mission is focused far away from the worlds of contemporary art and of conservation, has provided valuable support for the complex conservation effort. This effort has been spearheaded by Mme. Florence Mahé-Dombis, who has served as liaison between the art world and the needs of the children's hospital.

The somewhat shocking phenomenon of the extreme separation of the paint from its architectural support was not an easy matter to solve; it could not simply be scraped off and repainted by an artist in imitation of Haring.

As the first close examinations of the mural and the tower on which it was painted began, it was clear that various types of preservation expertise would be

7. Keith Haring and Juan Rivera painting the Necker Hospital Mural, 1987. Photo: Tseng Kwong Chi, copyright Keith Haring Foundation and Muna Tseng Dance Projects, Inc.

8. Keith Haring, detail of the south side of the mural at the Hopital Necker des Enfants Malades, 2012. Photo: Jean-Philippe Humbert, Courtesy Galerie Jerome de Noirmont, Paris

called for. By the end of 2011, the project had attracted the attention of two Parisian colleagues who generously offered their expertise toward answering questions about the materials of the hospital tower and the Haring mural.

Nathalie Balcar, a specialist in contemporary art at the Centre de recherche et de restauration des musées de France (C2RMF) at Versailles, contributed her expertise to the project, as the national conservation center had already done a 2006 study of the painting itself, as well as related research of vinyl paints that exhibited poor durability on a concrete support. The Laboratoire de Recherche des Monuments Historiques (LRMH) joined the effort to study the tower in the person of Elisabeth Marie-Victoire, whose expertise is concrete.

By early 2012, the two experts had agreed to share their respective findings in an effort to provide as much salient information about the composition of the mural and the tower as possible; as the hospital is a historic monument, this path was smoothed considerably. The concrete study was submitted to the hospital in July of 2012, based on their sampling and analysis, which had begun earlier that year. The following year, an analytical study was completed by Ms. Balcar of C2RMF, in which the components of the paints were identified. Happily, with all of this pertinent technical information gathered, the April 2013 Sotheby's charity auction put the conservation effort on firm financial footing.

Preliminary consolidation of the peeling black paint began as Phase One in 2014, before demolition was to begin in the vicinity of the tower, and Phase Two of treatment is now being planned as of the moment of writing. Recently, the director of the MAP laboratory of the Centre National de la Recherche Scientifique (CNRS) [12] began preliminary talks with the conservation team and the hospital. The participation of the MAP laboratory will, literally, add another dimension to this complex undertaking.

CONCLUSION

As Keith Haring painted in a frenzy in the 1980s, making his mark on the history of art and pop culture, it is unlikely that he could have envisioned the efforts that would be made in the future in order to help ease his outdoor works into posterity. The reality is that his use of a variety of paints whose longevity had not had a chance to be tested upon walls that were not always adequately prepared has created monumental preservation challenges. Monumental efforts can be required in order to save them when they are endangered.

NOTES

[1] Keith Haring Foundation website, and from correspondence with staff at the KHF, 3 February 2015.

[2] For instance, Haring's interview in the video by Roberto Burchielli, "Progetto Italia Keith Haring" regarding *Tuttomondo*, 1990; and Haring's description of the Collingwood mural in Melbourne as "a permanent site," in John Gruen, *Keith Haring, The Authorized Biography*, p. 113.

[3] See the Rescue Public Murals web pages at the Heritage Preservation website: www.heritagepreservation.org.

[4] Israel, M. (2014) Keith Haring's 'Crack is Wack:' NYC's Most Famous Mural?" *HuffPost Arts & Culture.* [http://www.huffingtonpost.com/matthew-israel/keith-haring-crack-is-wack-mural_b_5651871.html].

[5] From the Foundation's home page: "The Keith Haring Foundation perpetuates Haring's artistic and philanthropic legacy through the preservation and circulation of his artwork and archives…"

[6] Mural Arts Program website pages (2013) e.g. [http://muralarts.org/collections/projects/we-youth-restoration];and Newberry, L. (2013) [http://muralarts.org/about/press/keith-haring-mural-restored-philadelphia].

[7] Interview with the artist, in the Roberto Burchielli video, "Haring a Pisa."

[8] See the website for COPAC: http://copac.sns.it/en_about.

[9] Personal correspondence with Haring's former Paris gallerist Daniel Templon, 21 December 2011.

[10] Julia Gruen, Executive Director of the Keith Haring Foundation, in Sotheby's auction catalog "Vente Caritative pour la Restauration de la Peinture Murale de KEITH HARING de l'Hopital Necker-Enfants Malades," Paris 17 Avril 2013, page 7.

[11] Jerome de Noirmont, in Sotheby's auction catalog, "Vente Caritative pour la Restauration de la Peinture Murale de KEITH HARING de l'Hopital Necker-Enfants Malades," Paris 17 Avril 2013, page 11.

[12] MAP (Modèles et simulations pour l'Architecture, l'urbanisme et le Paysage) is a research unit of the French National Center for Scientific Research and the Ministry of Culture.

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Douwtje van der Meulen

monumental theatre sceneries: big groups big problems?

Keywords:
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ABSTRACT

The article is an analysis of the collaboration and decision-making processes encountered in the international summer school on the conservation of Fredrikshald theatre sceneries. After an introduction of the theatre and its sceneries, the article looks at the challenges and advantages of dealing with a project involving international partners. Topics discussed are organisation, communication, student and lecturer collaboration and dealing with unexpected problems, in this case, hazardous pigments containing arsenic and lead. The article concludes that projects that involve big groups can create big problems in certain cases, but with the right approach (and a bit of luck), these problems can be overcome.

INTRODUCTION

Teaching staff in Conservation Studies at the University of Oslo (UiO) initiated an international summer school in 2012 to accommodate professional and educational demands for conservation training (Document of Pavia, 1997; ENCoRE Document, 2014; Seymour, 2014). The theatre sceneries owned by Halden Historical Collections formed the perfect set of monumental objects for large student groups to work on. Partnerships were formed with the conservation programs of the Universities of Cologne and Amsterdam, as well as with theatre researchers at the Ibsen Centre in Oslo (UiO). This meant that at times, over 30 people were involved in the project in one way or another.

Communication and decision-making can be a tricky process in such large groups. The more people are involved, the more diverse opinions need to be considered and allowed to compete (Venditti and McLean, 2015, section 1.5). But do big groups mean big problems? This article will address the collaboration and decision-making in the Halden project on different levels.

THE THEATRE AND ITS SCENERIES

Fredrikshalds Theatre opened in March 1838 and it is the only completely preserved Baroque theatre with a slanting stage and perspective scenery in Norway (Fig. 1). The theatre is unique, as it was a bourgeois rather than a royal theatre, like many others in Europe. It also represents the transition from baroque to modern times. The theatre went from oil and gas lamps to electric light, from single flats to closed decorations and from sceneries for the perspective stage to sceneries for a small and wide stage. Both interior and exterior are largely preserved in their original state, as the owners were relatively poor and could not finance big changes or buy new sceneries. In the 1970s, the theatre was threatened with demolition, but thanks to the efforts of Vidar Parmer, former curator for Halden Historical Collections, it was saved and since 1988, it has been owned by Halden Historical Collections. Preserved along with the theatre were the theatre sceneries dating from 1838 to early 1900s, covering a total of 500 m². At present, the majority of them are stored in the basement of the theatre in unsatisfactory conditions.

Theatres in the 18th and 19th century had a standard limited set of sceneries. According to the assessment of fire insurance from 1838 and an inventory list from 1840, by the end of 1838, the theatre owned a drop curtain and at least three perspective sceneries: "The wood", "The street", and ""The room" (Parmer, 1988, p.20). Because of its appealing colour palette, the scenery of "The wood", was chosen as the first one to be conserved by the project (Fig. 2). Today, the scenery consists of three pairs of two-fold wings (350 x 200 cm), four cloud borders (60 x 800 cm), two single trees, and a backdrop (400 x 800 cm). Initially, the wings consisted of five pairs of single flats, which, when in use, were directly nailed to the poles at either side of the scene. Parmer (1988, p.21) mentions that according to a newspaper article the motive was a spruce wood until 1897 when it was changed into a deciduous wood. In 1916, the ten single flats were converted into five freestanding folding frames. A new double flat completed the three pairs of double flats (Parmer, 1988, p.21). The old canvas and, to some extent, the frames were re-used. The technique is glue- or oil-bound matt paint on canvas, in mainly greens, yellows and red-browns. Theatre painter Rudolf Krog was responsible for the drastic changes and he also painted a new backdrop and four borders (Parmer, 1988, p.21). The two single trees date from 1838 (Parmer, 1988, p. 21). It is uncertain whether Krog's backdrop still exists. The backdrop that has been used with the woods is a landscape most likely painted by Gustav Gjøs in around 1848 (Parmer, 1988, p.25). It is this backdrop that is currently being conserved.

Halden Historical Collections recognised the theatre's national and possibly international value and gathered the necessary funds to convert a mission house near the theatre into a functioning storage, complete with a reconstructed sloping stage. The original idea was to create an open-storage, where the public can see one of the theatre sceneries on display. After many years of neglect, these objects needed to be conserved and stabilized before they could go on display. This is where the international summer school came in.

ORGANISATION AND COMMUNICATION

Conservation Studies at the Department of Archaeology, Conservation and History (UiO) leads the summer school project. This entails fundraising, being the central contact between all parties, practical organisation, developing online teaching material, running the projects blog and writing reports. Lecturers at the Universities of Amsterdam and Cologne are responsible for the design of the documentation system and are taking the lead in the development of the conservation treatment and the testing of methods and materials. Each of the education programs selects its own students (Bachelor and Master level) for the summer school. All parties are involved in setting up the program for the two week on-site course and taking part in teaching. The museum in Halden provides the monumental and unique objects to work on as well as work and lunch facilities. Furthermore, a member of staff is dedicated to the project to assist with solving practical problems on-site, organising tours of the theatre as well as contacting local historical organisations and the media. Museum

1. The interior of the theatre with a modern scenery of the street painted in the 1980's.

2. The backdrop and wings of "The wood" under conservation.

personnel also take part in discussions where the point of view of the museum is important for treatments. Finally, the Ibsen Centre advises on the use, meaning and context of the objects.

One of the challenges of this project is maintaining a good flow in the communication and organisation of the project. Successful project management and communication is about being in touch with all parties and keeping everybody informed, understanding the issues in the team as well as the issues of the owner. Much depends on the project leader being present, visible and engaged with everyone. Due to all education programmes having different schedules, all lecturers having a heavy workload and in addition being geographically spread, the communication has not been as efficient as wished for. To improve communication, the video-conferencing program Adobe Connect was taken on. This tool has the advantage over e-mails in that decisions can be made there and then, which eliminates waiting time for answers/responses. However, video-conferencing is not effective when conservation treatment decisions need to be made. Here, direct consultation with the object is a must, and this requires plenty of time to find a suitable date for all parties to be present. To avoid this problem in the future, all treatment decisions for the next session are made by the end of the summer school, with all parties present.

Another complication is the change of directors at Halden Historical Collection. To continue the collaboration, it requires establishing a new relationship with each director: who does what, what the expectations are and who is responsible for paying for which part of the project. As every conservator knows, the future use of the objects determines to a certain extent the conservation treatment. The aim of the first director was that all scenery parts would be stored in the new storage and one particular set would be on display at the reconstructed stage for the public to see, functioning effectively as an open-storage. Precisely how the objects would be stored and the requirements for fastenings were unknown. The second director thought of moving the sceneries to the newly finished storage of Østfold museums, of which Halden Historical Collections is a part, displaying one of the sets in its original context, the old theatre, during summer, when there is no activity in the theatre. In each of these scenarios, the amount of handling and transport involved will be different, which influences the treatment of the objects. The ideas of the third director are still not known at the moment of writing. The conservation line taken for the moment is to stabilize the objects, so they tolerate being moved, and at the same time, to respect the integrity of the objects as much as possible.

EDUCATIONAL OPPORTUNITIES

Within the conservation profession, it is recognized that students need the opportunity to learn professional skills and commonly, this is achieved through internships. Another way of providing this experience is by means of intensive on-site projects supervised by lecturers/ tutors. Besides dealing with treatment of objects in a real-world context, these projects offer potential learning benefits of group work, such as interpersonal skills, team working and communication. However, educational literature points out that assigning group work is no guarantee that these goals will be achieved. In fact, group projects can backfire badly when they are not designed, supervised and assessed in a way that promotes meaningful teamwork and deep collaboration (Van Rheede van Oudtshoorn and Hay, 2004, p.139).The pedagogical approach of the project is that of blended learning. The course has a detailed program with a range of different learning-activities, allowing the opportunity for both individual as well as collaborative learning. The emphasis is on transformative learning by means of interactive knowledge exchange and active use of collaborative dialogue. It also stresses the importance of the relation between theory and practice.

The course starts with a theoretical e-learning part providing lectures on historical background and completed work, a reading list of conservation articles relating to issues encountered with the sceneries and a presentation of the documentation system used on-site. This information is offered to the students via UiO's learning platform Fronter, with the aim to acquaint students with the project before coming on-site. However, it is problematic to get foreign students registered in Fronter for courses that run outside regular term times, resulting in students gaining very late access or no access at all to course material. In the future, a free online file-transferring platform will be used to avoid these problems.

The second part of the course is an intensive two-week program taking place in Halden. Here, the focus is on gaining hands-on experience, getting insight into conservation decision-making and practicing communicating conservation. To complete as much as possible in two weeks, the members of the diverse student group need to get acquainted with each other very quickly. To achieve this, students have a 1.5 hour session of trust-building and ice-breaking exercises on the first day of the summer school with a dramatist from the National Theatre in Oslo. On-site, students work in three diverse groups (ca. 6 students each) of mixed education level (BA/ MA), nationality and conservation discipline (Fig. 3). In 2014, students came from Cologne, Amsterdam, Sweden and Norway and from the disciplines of painting, objects, metal, paper and interior design. Small group treatment exercises are alternated with large group activities such as

3. Students having a group discussion.

a tour around the theatre to learn about the context, lectures from the theatre historian and discussions about treatment with or without the owner present. In addition, the acquired knowledge is communicated by writing a blogpost, organizing an open day where members of local historic societies are invited for a tour of the old theatre followed by a presentation and demonstration of the ongoing conservation work by students and speaking to journalists.

The evaluations of the course show that students are very pleased with the programme and find it very fruitful to work in diverse international groups. They especially appreciate the large content of practical work, which allows for applying knowledge gained in an academic environment to a real world conservation project and getting acquainted with real problems. They learn a lot in a short time, not only from the lecturers, but especially from each other. Their different backgrounds, both different education establishment and discipline, encourages the exchange of ideas and conservation knowledge. For a number of students, it was an added bonus to have a chance to work with the profession in the English language. Writing the blogposts, giving presentations and informing the public at the open day, as well as talking to journalists, are all seen as a good way to practice communication, and to give students the feeling that the project gets attention and that they are part of a worthwhile project.

UNPREDICTABLE PROBLEMS

It is not only students that benefit from this collaboration effort; the project also provides opportunities to lecturers. For example, working with partner institutions means a broader expertise base, leading to interesting professional discussions and resulting in well-evaluated conservation solutions. The project offers new insight in conservation issues and teaching methodologies that also can be used in on-campus courses and improves the overall quality of teaching. However, on-site projects can also introduce unpredictable problems that need resolving. In the case of the Halden summer school, this came in the form of poisonous pigments. The use of dangerous substances on cultural heritage objects is a well-known fact and can be dealt with. However, these large objects could potentially contain large amounts of hazardous substances and, in addition, those exposed to the danger would be students. This could only be resolved through investigating the extent of the problem and whether exposure on some level was acceptable.

Analysis with portable X-ray fluorescence (pXRF) taken during the investigation and documentation of the wings and backdrop in summer 2012, revealed the clear presence of copper (Cu), lead (Pb) and arsenic (As), though their source was unclear. The museum was informed and in the first instance, the partners agreed that staff from UiO would investigate the source of these hazardous elements. The pXRF measurements and analyses of cotton-wool buds with the colorimetric Merckoquant Arsenic test of two samples of a range of pigments clearly showed high amounts of arsenic for the light green colour and none or negligible amounts in the other colours. This was confirmed by analysis of scrapings with Scanning Electron

4. Magnhild with a personal air sampler. The sampler (a) is positioned as near to the breathing zone as possible, the air pump (b) is positioned at the back with a belt to allow freedom of movement. The insert shows the filter holder in the sampler.

Microscopy with Energy-dispersive X-ray (SEM/EDX) undertaken in Cologne. Based on the mint-green colour and the date of the paintings, the poisonous pigment was identified as most likely to be Emerald Green, which was later confirmed via Raman analysis. According to research scientists Katrien Keune and Paul Boon, arsenic in degrading arsenic containing pigments in oil paints can migrate (Keune and Boon, 2011, p.1), and on the request from Amsterdam this was checked through pXRF measurements from an area covered with paint and just outside on the wooden frame. The pXRF readings indicated that no migration of arsenic had taken place. The lead stemmed most likely from the yellow or white colour.

Emerald green (also known as imperial green, Veronese green, Schweinfurt green) is a copper(II) acetoarsenite ($Cu(CH_3COO)_2 \cdot 3Cu(AsO_2)_2$ that started to be used as a commercial pigment in 1814 (Fiedler and Bayard, 1997, p.119). For reasons of toxicity, the pigment was used less and less by the end of the nineteenth century, but did not disappear as an artist colour until the 1960s (Gettens and Stout, 1966, p.113; Fiedler and Bayard, 1997, p.219-225; Zieske, 1995). Emerald green is readily decomposed by acids and by warm alkalis and is blackened by heat. In moist environments, mould can convert the arsenic into arsine gas (AsH_3), which is very poisonous on inhalation (Gettens and Stout, 1966, p.113).

After the results became known, an intense discussion between the parties followed. Inhalation formed the largest threat, but as long as the pigment was bound, it was safe to work with the objects. The Norwegian lecturers, having investigated the objects recently, evaluated the pigments to be bound, albeit loosely, and considered it safe to work with the objects, if gloves were worn and possibly safety masks. The lecturers from Cologne had not seen the objects at the time, and the lecturer from Amsterdam had noticed pigments on the hands of one of the students during the summer school; cleaning tests had shown pigments to rub off on polyurethane sponges. They requested that further research into the extent of the danger was undertaken. As there was no time to provide hard data before the start of the summer school, it was decided to cancel the project for June 2013. This meant also that funding received from Erasmus Intensive Programmes had to be returned.

New funding was received from the Department of Archaeology, Conservation and History (UiO) to undertake a systematic mapping of the presence of hazardous pigments and measurement of the exposure to lead and arsenic for participants working on the objects. To assist with the analysis, conservation scientist Hartmut Kutzke (Cultural History Museum, University of Oslo) and painting conservator Magnhild Aasen (National Gallery, Oslo) were engaged for the project. The health and safety section at the University of Oslo had difficulty to find an institution that could undertake exposure measurements and with the help of University of Amsterdam, an occupational hygienist, Mariette de Graaf, was hired. In collaboration, the type of tests to be taken was decided upon. The tests consisted of sampling by tape lifts on the back of canvas and the surface underneath the object, as well as pXRF, sponge sampling and scrapings of all colours of two wings and the backdrop and four cross-sections.

In addition, air samples were collected with a personal air sampler (PAS) to measure inhalation exposures of arsenic and lead. A worst-case scenario was created by causing more vibrations when handling the objects than commonly can be expected. The activities performed during the air sampling consisted of conservation activities that students would perform during the summer school. All activities that could possibly lead to exposure of contaminated air were undertaken by the person carrying the personal air sampler (Fig. 4). The fitting of the equipment, calibration and change of filters were performed by the occupational hygienist. She also kept a diary of the time that each activity took. Measurements were taken over six hours, equal to one working day. The air samples were analysed by RPS, an independent advice and engineer bureau for environment and security questions in Breda, Netherlands. De Graaf's final report concluded that it was safe to work on the objects without masks, but the participants were required to wear gloves and wash hands before eating and drinking. The second summer school took place with funding from Erasmus Intensive Programmes in 2014.

CONCLUSION

Organising projects involving a diverse group of people with different functions and tasks will always lead to unpredictable problems. The incident with the poisonous pigments could easily have been the end of the project. However, trust in the project from all parties involved, created during a very successful first season and enthusiastic student reports, as well as respect for the view of others, willingness to collaborate and taking the appropriate steps meant that this problem was solved. In general, the better prepared one is and the more open the communication, the easier it is to deal with the unknown. When working on international projects, allowing extra time for communication and organisation is a huge advantage. So, big groups big problems? Yes, in some cases, but with the right approach (and a bit of luck), these problems can be overcome.

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Marleena Vihakara

barcoding everything – managing inventory condition survey and move of two historical collections in the national library of finland

Keywords:
moving collections
workflow
barcode
agile
inventory
condition survey

ABSTRACT

The restoration and conservation of the main building of the National Library of Finland took place in 2013. This project was preceded by moving the collections to relocated storage areas. Two collections with high historical value and importance required a detailed move plan designed by a conservator. Moving these two collections that comprise an initially estimated 13 000 –15 000 items all together gave an opportunity to execute the inventory and the individual condition assessment survey alongside packing and relocating. The successful implementation of the project in a very tight time frame was enabled by the excellent cooperation of a small team barcoding every item, an agile inventory and a condition survey system and a customized workflow.

1. The oldest part of the General Collection in the 3rd floor of the Cupola Hall. Image by Sanna Järvinen@Kansalliskirjasto

INTRODUCTION

A collection move gives a unique opportunity for comprehensive checking and inspection of the collection. As each individual library item will anyhow go through handling when being moved from its original place to the new location, it is very adequate, advantageous and timesaving to simultaneously carry out the procedures important for the collection's management and care: inventory, individual condition assessment survey and surface cleaning, prior to packing and moving collection items.

Inventory is an important collection management tool that gives information about the physical content of the collections. It provides details of inaccurate and incomplete records, uncatalogued items and items that are on loan, missing or have been relocated. Individual identifiers in the form of optical machine-readable representations of data such as barcodes or QR-codes or any other form of automatic identification and data-capture (AIDC) technologies like RFID and magnetic stripes make it possible to handle a large amount of data collecting and management when linked to a database or a library catalogue. In moving library collections, an individual identifier is not only necessary when carrying out inventory, but is also an important tool for tracking the item.

An individual item condition assessment survey gives more detailed information about the condition of the collection than a condition assessment survey that is based on sampling. It allows one to precisely determine the collection problems, thus helping define detailed conservation, preservation and digitisation needs of the collections.

The main building of the National Library of Finland, *Engel*, has been under renovation and conservation since late 2013. The work is scheduled to be finished by the end of 2015. Prior to the renovation, all the collections in *Engel* were moved to allocated storage places. Among these were two collections with historical significance and value: the Monrepos Library collection and the oldest part of the General Collection.

To manage the complex job of moving these two big historical collections with thousands of individual library items made of versatile material and techniques, differing in size and condition, careful designing and a detailed plan was needed. The first step was to determine the necessary and suitable processes and to create an efficient workflow while optimizing the restricted resources within the 3 month time. This starting point had an impact on the need to design an agile method where two processes in the workflow were combined – the inventory and condition assessment survey. This system required barcoding everything; not only every single library item within the collections, but also the different inventory and condition assessment fields in the system. The software was further developed during the project and the result was something that can be used as a collection management tool in the Library in the future as well.

2. Identified bindings in the Monrepos collection

THE MONREPOS LIBRARY COLLECTION

The Monrepos Library collection was collected by Ludwig Heinrich von Nicolay (1737-1820), a German writer and a court officer in St Petersburg, and his son, diplomat Paul von Nicolay (1777-1866), who both lived in the Monrepos manor house in Vyborg, Finland. In 1916, During World War I, the collection was donated to the Helsinki University and was stored in the University Library that has been the National Library of Finland since 2006. The collection consists of mainly 18th century bindings, but also includes material from the 15th to the 19th century (Havu, 2006). Most of the

bindings are series of publications even in size and binding style. The volumes are full leather or half, one quarter or three quarter leather bindings with paper covers. Some books are full silk or parchment bindings.

The majority of the Monrepos Library collection was stored in two rooms on the second floor of *Engel*. A part of the batch, mainly the folio-sized books, has been stored in the Library's underground safe storage, *The Cave*, for the past 15 years. The Monrepos Rooms form a separate space from the other collection halls and reading rooms in *Engel* and only have access via a staircase. The bindings in the rooms were stored in 32 book cabinets forming the volume of 275 shelf meters. Around 3000 of the bindings had been catalogued, but the real amount of the bindings before the inventory was estimated to be approximately 7000-8000.

The most commonly appearing damages within the Monrepos Library Collection are insect damage, leather spue and stains of moisture or water damage that had been followed by mould. The insect damage was assumed to be from the time when the collection was still housed in Monrepos manor house. Leather spue, causing a white and sticky surface to the leather bound books, had formed after the books had been treated with the British Museum's leather dressing in the 1970's (Sallas, 2004). The leather dressing had prevented red rot from appearing, but the sticky covers adhered easily to the adjacent books, hence causing more damage. The collection had been affected by water and moisture on its previous storage location, before it was housed in the Monrepos Rooms. It had then gone through rescue and conservation work, but parts of it still suffered from inactive mould damage. Other problems frequently present were surface dirt and foxing, along with chemical and mechanical damage to the text block. The overall condition of the collection was assumed to be moderate and although the Monrepos Rooms were not environmentally controlled, the surrounding conditions appeared to be reasonably stable.

THE OLDEST PART OF THE GENERAL COLLECTION

The oldest part of the General collection was housed on the third floor of the Cupola Hall in *Engel*. It originates from the time when the main University moved to Helsinki in 1828, after the great fire of Turku in 1827. The great fire destroyed most of Turku, including the Turku University Library and its collection of 40 000 bindings. Only around 800 bindings, that were on loan at the time, remained and most of the archives survived.

The new University Library building in Helsinki designed by the architect Carl Ludvig Engel (1778-1840) was finished and put to use in 1845. When the Library was opened, the Public Collection of the Senate was housed on the third floor of the Cupola Hall. This cirka 6000 binding collection consists of items gathered together from all around Finland after the great fire of Turku, donations by the Russian government and the library of Matthias Calonius (1738-1817), a Finnish procurator. The collection grew during the decades from donations and Legal Deposit Act items (Pärssinen, 2005).

The collection had been housed in the original open pine cabinets called *armaario* since 1845; the first book that was placed on the first shelf of the first cabinet had remained in its place until the collection move took place in spring 2013. The cabinets on the 3rd floor of the Cupola Hall are numbered from one (1) to 33 and nearly every cabinet has eight (8) shelves. Every book placed on the shelves during the years had a location reference number written inside its back cover, which was also used as the collection reference number. The volume of the collection on the 3rd floor of the Cupola Hall is 350 shelf meters and the amount of catalogued items was 8000. The real amount of bindings was estimated to be over 10 000.

The collection consists of bindings from the 17th century up to the 20th century, varying in style, material, size, structure and condition. The bindings before the 17th century had previously been moved to the Rare Collections. There are full leather bindings, half and quarter leather bindings with paper covers, textile and parchment-bound books, case bindings with textile covers, paper bindings, leaflets and single sheet material in the collection.

The condition of the items on the 3rd floor of the Cupola Hall seemed to be from fair to poor. Heavy surface dirt was apparent. Many of the leather bindings suffered from red rot, a deterioration of the vegetable tanned leather, causing the leather to lose its strength and turn into a red powdery substance. Mechanical damage on covers, spine and binding was common: tears on the spine and joints, missing spine pieces, scratches to and losses of the cover material, along with the expansion and contraction of the parchment, causing the cover boards to bend. A closer look at the bindings also revealed deterioration to text blocks: heavy surface dirt, chemical damage caused by the printing ink or in some cases corrosion of iron-gall ink, acidity of the paper and foxing, just to name a few.

The Cupola Hall is a beautiful, but not a collection-friendly space. The book cabinets and shelves made of pine were of standard size and in places too shallow for the bindings. Some shelves were too packed and removing items from them easily caused damage to the bindings. The Cupola Hall is not environmentally controlled and has had high fluctuations in temperature and relative humidity all year round. As it is located right by the main entrance, the airflow brings in outdoor air with dust and pollution. As a consequence of the ceiling window, the 3rd floor collection had been under the influence of high levels of natural light and direct sunshine for nearly 200 years. All these surrounding environmental factors speeded up different degradation processes of the collection.

3. Inventory slip for a General collection item

PLANNING THE COLLECTION MOVE

The plan for moving the collections was implemented following the British Library's *Packing and moving library and archive collections* hand-out (Bendix, 2005). In addition, international projects, such as moving collections in St. Catherine Monastery Library in Sinai (Bendix, Velios, 2011), provided inspiration and useful and important information on how to create an efficient workflow for moving large collections, use barcodes and to pack and track library items during the move.

The plan was further customized to suit the *Engel*'s historical collections by observing different aspects that would affect the workflow and the risks they would involve. The collection's location in the building, as well as the condition of the bindings, determined how the items would be moved to the new storage location safely yet efficiently. Also, the volume of each collection was measured and the commonly appearing damages on both collections were mapped to define the fields for the condition assessment survey form. Surface cleaning methods and tools were tested to suit the material. The time used to perform particular work processes was measured and different ways to run the processes were assessed. Regardless, the work process underwent further testing and development during the actual project to make it more efficient.

THE PROCESSES AND THE WORKFLOW

The processes in the workflow were inventory, the individual condition assessment survey, and surface cleaning of the items followed by packing and transporting them to the underground safe storage area – *The Cave*. These stages were divided between the operators: a conservator, a conservation trainee, a Special Collection's librarian and two part-time library assistants. The key person behind everything was the information system specialist who transformed the ideas into working tools.

The inventory consisted of three parts: identification of the item, taking a reference picture and feeding the data to the electronic database.

For the inventory, an inventory slip with an individual identifier, a barcode, was created. Barcodes are convenient to generate, as the internet is full of barcode

4. Reference imaging of the General collection items

generators and barcode fonts are easy to download to any computer. Barcodes have been used in the library's cataloguing system already, hence optical barcode readers were readily available.

Two types of inventory slips were produced. First, the library catalogue information of the items was converted from Voyager into an Excel spreadsheet. From the Excel, an inventory slip with a barcode, collection reference number (signum), bibliographic id number and bibliographic information (title, author, date) was printed. Secondly, 'empty' inventory slips with KKM-codes, a particularly defined barcode space for the project, were printed. In these slips, the collection reference and volume numbers were written by hand during the inventory.

A reference image of the title page with bibliographic information was taken with the inventory slip. The barcode connected the image with the inventory/condition survey information collected on the item. These images will be linked onto Finna, a search service entity that provides free access to material from Finnish museums, libraries and archives. Images for the conservation documentation were also taken in a similar way.

With the aim to create an efficient and agile workflow, the inventory and condition survey were combined together. The software was created with the Access database management system.

In practice, scanning the inventory slip with an existing catalogue barcode automatically filled in the fields of title, collection reference number and bibliographic id number. In addition, the inventory part included fields like "missing", "on loan", "relocated" and "metadata error". For the uncatalogued items, the KKM-barcode was scanned, yet a cataloguing reference and a volume number was typed in by hand.

When the condition survey format was designed, the purpose was first to categorize condition surveyed items only by the recommended action, i.e. no action needed (OK), protection needed or needing conservation. However, it was felt necessary to collect more data in order to pinpoint the problems of the collections more precisely. The condition survey was divided into three different groups: "Description", "Damages" and "Recommended action". "Description" included fields for the binding type, style and cover material. In "Damages", the fields were listed according to the ones most commonly appearing in each collection. It had a general part and two subgroups: damages in "binding" and "in text block". The "Recommended action" had the fields "monitoring", "protection/housing", "binding repair", "conservation" and "digitization". Items that did not need any action were marked as "OK". The degree of damage and condition, good-moderate-poor, was determined by the recommended action, i.e., a binding that has damages, but needs monitoring or no action is in good condition, a binding that has damages and needs either protection or binding repair is in moderate condition, and a binding that has damage and needs conservation is in poor condition. The electronic inventory/condition survey form also had an open field for writing notes.

5. Scanning the inventory slip of a Monrepos item

The inventory/condition survey was done using different techniques for each collection. Each condition survey field was changed to a barcode form. For the condition survey of the Monrepos Library items the inventory slip had an "OK" barcode as a default. Some of the "Damage" and "Recommended action" fields were combined together, i.e., "leather spue+protection" or "mould damage+conservation" which was found practical to speed up the survey process. The different condition survey barcodes were printed as stickers that were adhered onto the inventory slip during the survey. If a binding had a damage, a barcode sticker was adhered on top of the "OK". The slip was folded in two to prevent contact between the stickers and the item. In the end, all the inventory/condition survey barcodes were scanned into the database. This system enabled entering inventory/condition survey information of 400-700 items per day.

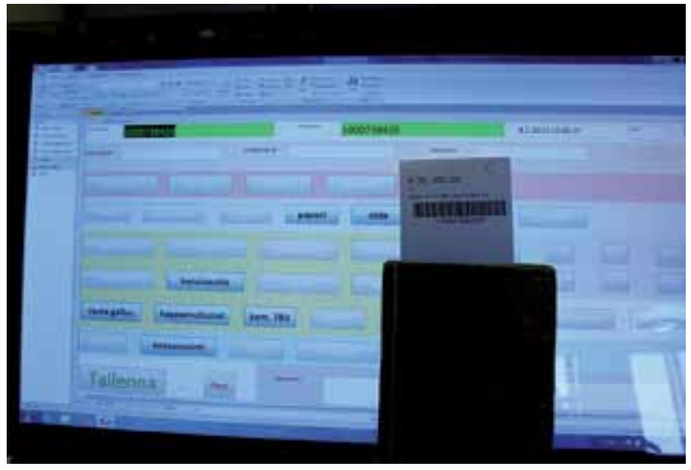
While working with the Monrepos collection, it became obvious that the barcode sticker system would not be feasible for the items on the 3rd floor of the Cupola Hall. As the amount of fields in the "Damages" part increased with the Cupola Hall collection, the inventory/condition survey system was customized yet again. This time, an investment was made to bring in a new tool: a touch screen for the computer. The inventory/condition survey fields were filled either by selecting and scanning the barcode from a printed list or by selecting them from the form on the touch screen. Using the touch screen felt like a jump from the past century to the next; this method made it possible to manage the inventory/condition survey of up to 1000 items per day.

The new storage location for the collections was in the Library's underground space, *The Cave*, that is an environmentally controlled area with temperature measuring +18 °C +/- 1 °C and 45% +/- 5% with relative humidity. The Monrepos Library Collection that had no other exit other than a staircase was moved using crates. The oldest part of the General Collection was moved from the 3rd floor of the Cupola Hall using book trolleys, as the inventory/condition survey was done outside the collection space and there was an elevator connection to *the Cave*.

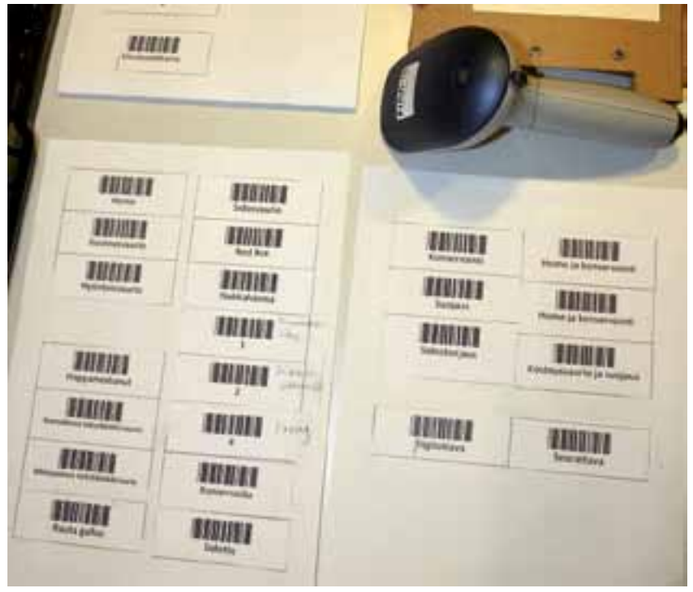
For both collections, precise calculations were done to evaluate how many crates and trolleys would be needed daily to have the logistics running fluently.

IMPLEMENTING THE PLAN AND THE SYSTEM

All the work stages of the project had been designed so that they could all be run separately from each other. The work started in the Monrepos Library collection. The areas of responsibility were divided between the operators. The conservator and the conservation trainee performed a wide array of processes would perform a wide array of processes: identification, surface cleaning, reference photographing, condition survey, inventory/condition survey data input and packing. The librarian concentrated mainly on the identification and helped with the reference photographing two part-time library assistants did the reference photographing and took care of the packing and unpacking of items. The shifting of the book crates was done by an external company and the book trolleys by the library assistants.



6. Inventory/condition survey form on a touch screen used for the oldest part of the General collection



7. Different condition survey fields barcoded

The work began with item identification, i.e. giving each item a correct inventory slip, or by surface cleaning, which was done using a Museum Vac® with vulcanized rubber wrapped around the hose or conservation microfiber cloth. During these processes, some items were already pre-surveyed and given a colour-coded slip to indicate certain damage. All mould affected items were isolated from the collection immediately for cleaning and were treated during 2013-15 by the Library's Conservation unit. The workflow was completed in the Conservation unit after mould-removal.

The responsibility areas were divided the same way as in the Cupola Hall, although the conservator focused mainly on identification and inventory/condition survey, the conservation trainee on identification and surface cleaning, the librarian on the identification and the part-time assistants were running the reference photographing and logistics. As the volume of the collection was high, certain restrictions were made to the process. The reference photographing was done to all items dating before 1800, but not to the 19th and 20th century, unless they were uncatalogued or had a cataloguing or metadata fault. All the folio-sized bindings, around 300 pieces, were very heavy, hence time consuming to handle. In consequence, they were identified, but then sent to the Conservation Unit to have the other work stages finished later on. The items in need of urgent conservation were separated ad hoc after the inventory/condition survey. The move of the collection items to The Cave was done day-to-day.

RESULTS OF THE INVENTORY/ CONDITION SURVEY

The total amount of the bindings of both collections was 21 637, over 6000 more than initially estimated. The inventory of the Monrepos gave the result that the collection includes 9433 items. Over 6000 items were uncatalogued and given a KKM-barcode. The main condition problems with the collection were damages to covers and binding (857), moisture damage (509) and leather spue (443). 245 bindings were mold damaged.10% of the collection needs an action taken, mainly protection/housing (445) and conservation (356). The overall condition of the collection was moderate.

The inventory of the oldest part of the General Collection gave the result of

12 204 bindings. It revealed cataloguing problems; hundreds of items had multiple barcodes and meta data faults. The result of the condition survey was that nearly half of the bindings from 17th to 19th century are suffering from damages. 31,5% of the items will need further action taken, mainly protective housing (2027) binding repair (671) and conservation.

CONCLUSIONS AND DISCUSSION

Library collection moves provide a great opportunity to carry out important collection management tasks, such as inventory and condition assessment surveys, and improve the condition of a collection. Nonetheless, these tasks can easily become challenging to execute, as they involve handling thousands of library items that vary in style, material, size and condition in a very tight time frame with a limited work force and other resources.

The move plan for two historical collections in the National Library of Finland was based on the goal to execute the desired work stages in as agile and efficient way as possible, but without compromising item safety. This objective was accomplished by identifying items with an individual barcode that was essential in collecting and handling information in a high volume and forming software that collected both the inventory and condition survey data simultaneously. This joint inventory and the individual condition assessment survey collected key information on the items without going into too much detail. The efficiency of data collection was improved by barcoding each field in electronic form and by using technical utilities such as a barcode scanner and a touch screen. The item identification and giving the inventory slip was the most time consuming part of the work while carrying out the inventory and the condition survey was the most time efficient. The inventory/condition survey system enabled data collection of up to 1000 items daily.

Several modifications in the workflow, software and database were needed before and during the project to find optimal efficiency and an agile way to work and collect data. A customised move plan, joining together the expertise of a conservator and an information system specialist in order to create the inventory/condition survey system and software and the skills, adaptability and hard work of the operators during the project were all fundamental to successfully complete the move of the historical collections of *Engel*.

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8. Work in process in the Cupola Hall

9. Work in process in the Monrepos collection

posters

Lotti Benjaminson

restoration of a monumental tapestry in gothenburg concert hall

ABSTRACT

This poster describes a traditional restoration/conservation cleaning and support of a large, 60 m2 tapestry. As the tapestry is in good condition, the treatment itself is not unusual. It is unique due its size which affects planning with respect to facilities, logistics and equipment. In order to clean the object, it was necessary to build a temporary pool containing a plastic grid to support the textile while it was being washed and cleaned. Following cleaning, an important part of the conservation was to support the tapestry, so that it could be hung, raised and lowered with minimal risk of damage to the textile.

1. Taking down the tapestry was challenging. Photo: Västarvet.

Keywords:
tapestry
washing
wet vacuuming
sleeve mounting
support

POSTER

Studio Västsvensk Konservering - Västarvet has many years of experience working with large tapestries. This poster presents the conservation of a 60 m2 tapestry, "*Melodies in the square*". The tapestry needed cleaning, a new mounting system and protection against light.

The tapestry (935 x 630 cm, 120 kg), one of the largest and finest in Sweden, was specifically made for the foyer of the Gothenburg concert hall when it was built in 1936. It was designed by Sven "X-et" Erixson and woven using traditional tapestry techniques by Handarbetets Vänner, led by the textile artist Barbro Nilsson. In its current location it is exposed to the damaging effects of daylight from adjacent windows and soiling from pollutants.

The conservation work described in this poster is both ordinary and extraordinary at the same time. The object's size is challenging, particularly with respect to handling, management and organization of facilities and equipment.

The high-quality tapestry is in good condition. It was originally supported with closely-spaced, vertically sewn cords made of flax at the back. Along the upper edge, there was narrow webbing with straps for hanging the tapestry on a pine rod, attached to the wall with iron consoles. The tapestry was previously washed in 1985 and received its current mount at that time. That mount is now inadequate for its purpose.

The tapestry has faded and is dirty, especially the upper part. The mounting does not support the textile adequately, producing fractures that can be seen in the upper part of the textile. Despite the support of the flax cords on the back, the tapestry has lengthened by 15 cm from when it was washed in 1985. The tapestry is not completely flat, with slight evident waves as it hangs.

A suitable facility was found with sufficiently large areas, hot water, drainage and equipment for drying. A pool was built using wooden beams and tarpaulins with a plastic grid inside the pool to support the tapestry.

Berol 784, an anionic/non-ionic detergent (1 ml/l water) was used for the wet cleaning. The tapestry was cleaned on the front side using soft rollers before it was turned and the back side washed with a fresh washing solution. Afterwards, the tapestry was rinsed by spraying it 4 times. After each washing and rinsing the tapestry was vacuumed from the back. It was left to air dry before it was stretched.

The new mount will consist of a fabric sleeve, a light-weight metal rod and a sewn support fabric that covers a quarter of the tapestry. The rod and tapestry will then be hung on a movable beam that will allow it to be raised and lowered.

With these conservation and preventive actions, including improved air purification filters and recommendations to reduce exposure to ambient light, it should be at least 50 years before the tapestry needs to be washed again. The movable beam will also make it much easier to regularly vacuum the tapestry.

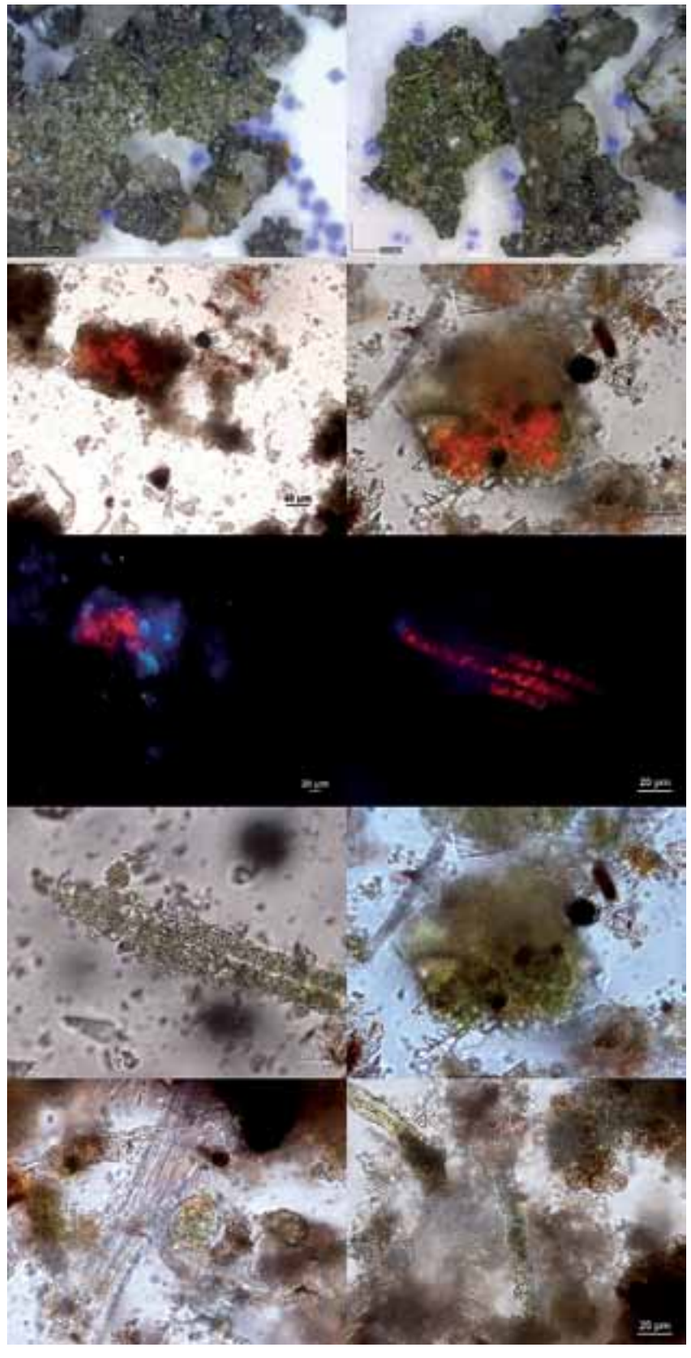
2. Washing the tapestry. Photo: Västarvet.
3. Vacuuming the tapestry between washings. Photo: Västarvet.

Elisabetta Bosetti & Ilaria Saccani & Matteo Montanari

proposal for the restoration of the exterior architectural decoration

'Architectonic Commentaries' (1979-1981) by the Danish Artist Bjørn Nørgaard at the Gladsaxe Main Library, Gladsaxe Municipality

1. The columns in the skylight.



2. Digital microscope images of the samples.

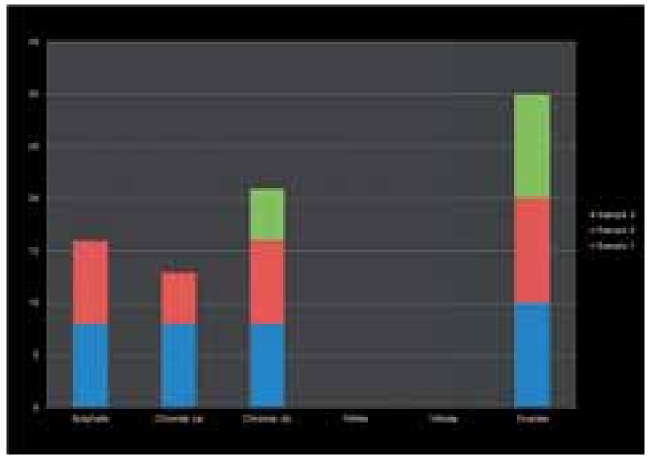
INTRODUCTION

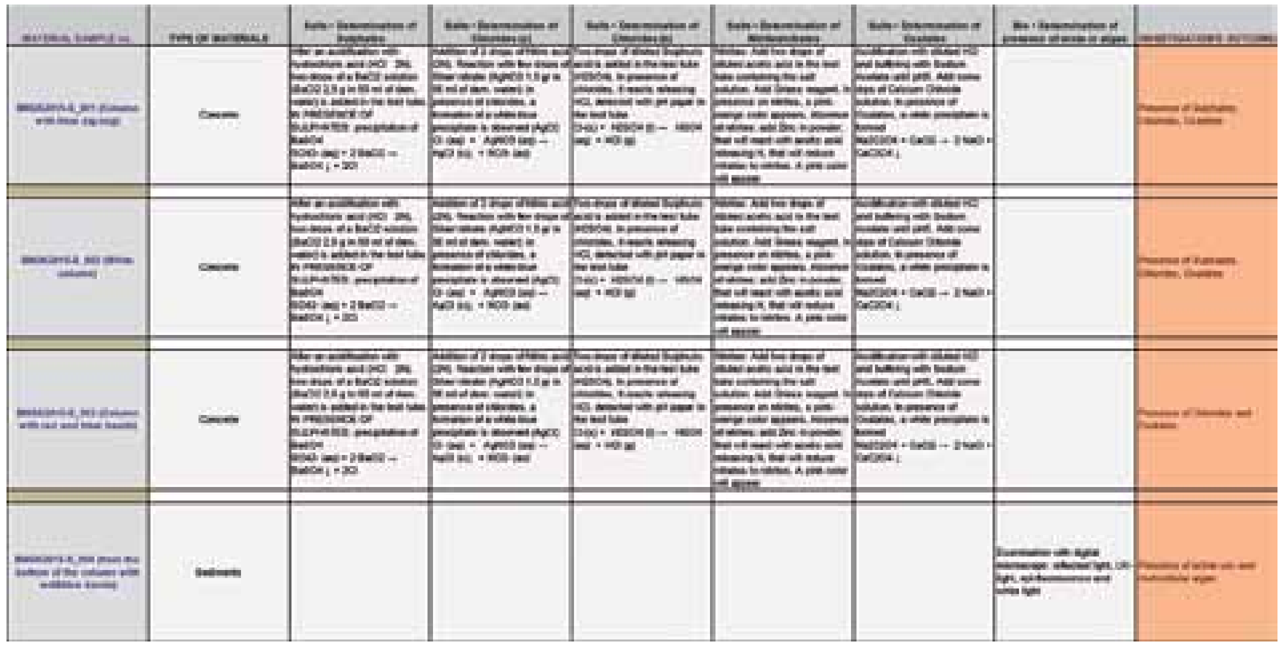
The present paper focuses on the proposal of a conservation treatment and future preservation of exterior elements belonging to the artwork "*Architectonic Commentaries*" by Danish artist Bjørn Nørgaard. The artwork, made between 1979 and 1981, is a complex artwork that consists of several elements distributed inside and outside the Main Library in Gladsaxe municipality. These elements are identified as the most vulnerable part in terms of degradation of the artwork. The study has been conducted in collaboration with biologist Professor Matteo Montanari.

The inspiration for this article has come from an American study conducted by Professor Richard Wolbers (University of Delaware) and his research group. It is about the formulation of a specific waterborne and water-removable coating for art in exterior, particularly for acrylic surfaces in urban environments.

METHOD

Since the object of the study consists of a large number of elements and of a wide variety of materials, the painted concrete columns have been selected as the parts of the monument that need a more urgent conservation treatment. Throughout the discussion between conservator-restorers and conservation scientists on the results from optical and chemical analyses, an *ad hoc* surface treatment has been suggested.





MATERIAL SAMPLE nr.	TYPE OF MATERIALS	Salts - Determination of Sulphates	Salts - Determination of Chlorides (a)	Salts - Determination of Chlorides (b)	Salts - Determination of Nitrites/Nitrates	Salts - Determination of Oxalates	Bio - Determination of presence of moulds or algae	INVESTIGATIONS' OUTCOME
[illegible]	Concrete	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	Concrete	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	Concrete	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	Sediments						[illegible]	[illegible]

3. Results of the analysis.

RESULTS

The first assumption about the nature of the paint layer pointed at alkyd. Subsequently, a written conversation with the artist clarified that the paint is an acrylic paint manufactured in Denmark and applied directly with a brush on the bare surface; the columns are a ready-made concrete mixed with plastic fibres and with a reinforcement of Tentor steel inside.

The first optical inspection revealed the presence of dirt particles and presumably algal growth.

This was confirmed by examinations of samples from deposits at the bottom of the columns with a digital microscope, where uni- and multicellular algae have been detected. With epi-fluorescence, the red light revealed that the algae are in growth.

Through simple micro chemical tests, the presence of salts in samples from three columns has been detected.

TREATMENT PROPOSAL

- Mechanical removal of the biological attach with small brushes and micro-vacuum systems.
- Since the biodeteriogens are active, application of BIOTIN R (IPBC Iodopropynyl butylcarbamate and OIT N-octyl isothiazolinone) in low percentage (3-5 % in hydrocarbon solvent). In this phase, water should be avoided in order to minimize the effect of migration of high soluble salts (e.g. Chloride).
- Extraction of salts with demineralized water in cellulose or paper pulp.
- Cleaning the bare concrete parts with demineralized water with 5% solution of ammonium bicarbonate in clay. Local cleaning with a pH 6 buffer solution (Citric Acid buffer) with conductivity of 6mS/cm for acrylic surfaces (slight chelating action).
- Application of a protector (es. Solution of N-butyl-1,2-benzisothiazolin-3-one in White Spirit).
- Test for the application of water-borne and water re-swellable coating: Acrylic film former (VSR-50) + PEOX+ ASE-60 thickener.

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Torben Holst & Anders Ekstroem Loekkegaard

Zinc sculptures in Denmark – restoration techniques and materials

The first zinc sculptures made in Denmark were cast in 1842 for the facade of St. Ansgar's Church in central Copenhagen (Fig. 1). The seven sculptures were cast very poorly, as no Danes at the time had mastered the right zinc casting method. During restoration in the early 1990's, the sculptures were demounted and new internal supporting frames had to be constructed from iron, in order to replace the original frames, which had become too corroded to be repaired. The sculptures at St. Ansgar's Church are now painted green to resemble bronze statues. Although old oil paintings showing the church façade confirm that the statues were painted green when erected originally, no original traces of paint have been found on the statues.

Frederik's Church in Copenhagen is also decorated with zinc sculptures. On the balustrade of the church, 25 meters over the ground are 18 sculptures of saints and patriarchs, each of which is 3 meters high. These sculptures form the biggest single collection of zinc sculptures in Northern Europe. They were created in the first half of the 1880's by ten Danish sculptors and cast at four foundries situated in Copenhagen. Each sculpture was cast in many smaller parts from simple sand moulds and assembled by soldering with tin-lead solder. This method was developed by Moritz Geiss in the 1830's in Germany for zinc casting. Zinc has a very high linear coefficient of thermal expansion that makes it unsuitable for casting bigger parts, as is done in traditional techniques such as cire perdue.

1. The facade of St. Ansgar's Church.

The eighteen zinc sculptures were restored at the Sculpture Workshop of the National Museum from 2003 to 2009 (Fig. 2). In addition to the sculptures twenty four zinc vases, each of which are 3 meters high and placed ten meters above, are also being restored at the Sculpture Workshop.

Nearly all Danish zinc sculptures have been cast between 1840 and 1920, and nearly all of them have originally been painted in order to assemble limestone, marble or bronze. Analysis suggests that the paint used at the time was oil paint. Tests show that it has a low affinity for the zinc surface and peels off after only a few years. The type of paint which we use today is an acrylic paint system specially developed to protect zinc galvanized steel constructions. The new colour is often chosen from the colours found in the analysis of the original paint layers combined with those used to match the colours of stone (Fig. 3.).

A similar case is ten zinc sculptures from Rosenborg Castle in Copenhagen. The restoration has been taking place in steps since 2009 and the last four sculptures were remounted on the castle tower in April 2015. In addition, the Sculpture Workshop is restoring some zinc sculptures to be erected as part of a large group of sculptures placed in the Baroque Garden of Frederiksborg Castle in Hilleroed, and some zinc statues and fountains from Oslo in Norway. The many projects restoring zinc sculptures have required the conservators in the Sculpture Workshop to develop special restoration techniques and the use of new acrylic paints.

2. The balustrade of Frederik's Church.

3. A scene from the paint workshop.

Susanne Kaun

The atom in the universe

Restoration of the Monumental Artwork by Per Krohg in the Entrance Hall of the Physicians Building at the University of Oslo

ABSTRACT

In the Physicians building at the University of Oslo, a monumental piece of art covers three walls of the entrance hall. The integrated artwork is made of a combination of stained-glass and fresco with glass inlays. It was realized by the artist Per Krohg with help of a stained-glass artist in 1938. Restoration work performed in 2014/2015 involved conservators (from NIKU), a glazier, a blacksmith, a decoration painter, an asbestos rehabilitation company and other craftsmen. The conservator from NIKU played an important role as a consultant during the rehabilitation work of the ceiling.

The Physicians Building at the University of Oslo is a wonderful example of Functionalist architecture in Oslo, built between 1932 and 1934. The entrance hall is a spacious room that provides a spectacular view of Oslo and the fjord. The centre part is a 13 meter high cube, which is decorated on three sides with monumental artwork made as a combination of stained-glass and fresco with glass inlays. The artwork covers an area of about 260 m2. The famous artist and member of the artist group frescobrødrene (fresco brothers) Per Krohg realized the monumental artwork with help of the stained-glass artist Borgar Hauglid in 1938 (Ormestad, n.d.). The building and some of the interiors, including the entrance hall, are listed.

1. The Entrance hall in the Physicians building at the University in Oslo towards north with the motif of the earth and life, part of the monumental artwork by Per Krohg, before restoration. Photo: NIKU/Kaun 2014

Based on architectural paint research by NIKU in 2012, the entrance hall and stairways were painted in the original colour scheme. The restoration of the monumental artwork was carried out in 2014/2015, involving conservators (from NIKU), glaziers, a blacksmith, a decoration painter, an asbestos rehabilitation company and other craftsmen. The restoration and rehabilitation work was planned to last about 2 months, but the discovery of an original asbestos ceiling made it a more time consuming and complex project.

The integrated artwork consists of three connected motives: 1) the universe, 2) the earth and life and 3) research. Each motif extends an entire wall, including both mural parts and windows, which make the artwork so special. The sun light, the source of all life, binds those motives together, leading sun beams from wall to wall (Ormestad, n.d.).

Restoration of the fresco parts of the artwork encompassed cleaning of the surface, rendering repairs, the restoration of lost and loosened glass pieces and retouching. The stained glass windows were secured from the inside with plastic foil, and the glass was cleaned. The movable steel window frames will be repaired by a blacksmith in autumn 2015. During the restoration work, it turned out that the ceiling above the artwork was covered with asbestos, which resulted in a comprehensive asbestos rehabilitation and a new ceiling covering with acoustic plaster. The new ceiling covering was painted in the original colour. The conservator from NIKU played an important role as a consultant during the rehabilitation work of the ceiling.

Keywords:
functionalism
wall painting
fresco
glass art
restoration
asbestos
acoustic plaster

2. During the restoration of the fresco parts of the artwork "The Atom of the Universe" by Per Krohg in the Entrance hall in the Physicians building at the University in Oslo. Photo: NIKU/Kaun 2014

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Daiga Levalde & Liesma Markova

restored and reconstructed historical wallpaper – result of common work

Previous Villa "Bangert", Kuldiga and Stock Exchange Building in Riga

1. Wallpaper fragments.

"Architectural Investigations Group" is a bureau, dealing with investigation and design of historical buildings, carrying out separate phases or the whole range of works, including supervision of reconstruction or restoration process in different objects. In two such cases during construction works initial wallpaper was found behind dismantled constructions, determining changes in the design, original finish being more important.

A small wallpaper fragment has survived behind the stove in villa "Bangert" in Kuldiga. Pieces of wallpaper were taken down only after the stove was dismantled. A few ornamental fragments – oblique dark claret coloured stripes with stylized lily flowers, distinctively arched framing and, possibly, lion's paws, did not hint at the composition. Coat of arms with a lion, alternately collocated with oblique fascias seemed to be a possible pattern. Interest was enlarged by the fact, that the floor in this room was painted in the same way – stripes with rhythmical depiction of the lilies of the same character.

Modelling of the pattern using the discovered fragments continued, nevertheless the composition still was not clear. Assuming it had heraldic elements, paws meant the lion should be on the coat of arms. The paws are usually turned one way, the head - another way. Such composition seemed reliable, but still an idea and assumption. Information on the existence of an analogue in Latvia or Europe could not be acquired from other wallpaper investigators.

We tried different search possibilities, involving other specialists as well. "Tician" LTD employees, which retail interior textiles in Latvia, were going to the Paris interior exhibition. They were given a scanned fragment of this wallpaper, hoping somebody could identify it. In two weeks a message from US " TRUSTWORTH STUDIO" David E.Berman arrived. It seemed that museum "The historic New England archive" had a sample of such a wallpaper. This definitely was ours!

Search for the possible wallpaper producer continued. Wallpaper on the paper appropriate for the original sample was ordered from the German enterprise "LUTZ J.WALTER, ATELIER FUR HISTORISHE PAPIERTAPETEN", which was specializing on the historical wallpaper production using both authentic and modern technique and equipment. Cooperation with this enterprise occurred beforehand reconstructing the Exchange building.

Thanks to the help of the construction firm "ReRe" it was possible to go to Germany to coordinate all nuances of the production on-site. Now renovated wallpaper decorates Kuldiga District Museum exposition, showing previous owner's the Bangert family home interiors. As a result, after renewing floor decorative painting and wallpaper, a study has an interesting and unusual start of the 20th century living environment interior. We are grateful for its completion to specialists of different branches and simply interested persons.

The second building, where wallpaper by the same German enterprise was used, is a former Riga Exchange. Fragments of two types of historical wallpaper were found during reconstruction works. One was a large Jugendstyle wallpaper column with full pattern – chestnut foliage with red blossom wreaths on green background and a decorative border with acanthus leaves. New wallpaper was made as a copy of the original, using historical technology.

Second wallpaper was found in the ceiling backfill. Pattern was put together from many pieces: gray background with golden line accentuating arabesque twine with a griffon depiction already existing in the interior ornamentation. Copies were produced using modern technology. A difference in expenses for two technologies allowed to show two authentic historical evidences.

2. Reconstructed wallpaper and decorative floor painting.

3. Fragment of the original wallpaper.

Hanne Mannerheimo & Ulla Knuutinen & Arja Sorri & Heli Ketomäki

conservation material research project of 19th century decorative interior paintings in the house of the estates and arppeanum, helsinki, finland

Keywords:
decorative
indoor paintings
materials research
EDXRF-, FTIR-,
Raman-Spectroscopy
SEM-EDS
NMR

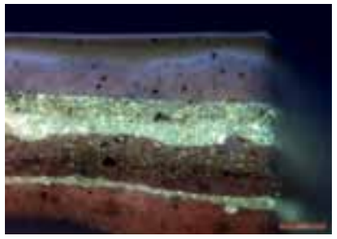
The goal of this materials research project is to study the problems behind the deterioration process of the wall paintings in Arppeanum's staircase and in the ceiling paintings of the House of the Estates. Both buildings were painted in the late 19th century by the well-known Finnish decorative painter Salomo Wuorio. The House of the Estates was designed as the Finland´s first parliament building by the architect Gustav Nyström in 1888-90. Arppeanum was designed by the architect C.A. Edelfelt in 1869 for the chemistry laboratory and for the museum of the University of Helsinki (Fig. 1 and 2). These buildings have been renovated during the 20th century and the decorative walls and ceiling paintings were also restored and consolidated.

1. The marble imitation wall paintings in the staircase of Arppeanum.

2. The ceiling paintings in the House of the Estates.

In both buildings, the paint layers are seriously flaking and detaching from the primer layers. Since 2005, the paintings of the House of the Estates have been consolidated after 3-5 years. Arppeanum's staircase paintings were treated with consolidants 10 years ago. The conservators who have been responsible for the paintings were concerned about the short reattachment cycle and severe condition of the paintings. That is why the urgent question of the feasibility of chosen consolidation materials arose. Furthermore, original materials and undocumented renovation materials of the paintings needed investigation.

The materials studies started in January 2014. They will be carried out using a multi- analytical approach, cooperating with research institutes and universities. Table 1 shows the protocol of the material research process. It includes both preliminary and further analyses. The preliminary studies started with *in situ* analyses of paintings with a portable EDXRF (Energy Dispersive X-ray Fluorescence), in order to collect data of elements of the wall paintings. The data revealed elements of inorganic pigments, plasters, fillers, etc. These analyses were performed in co-operation with Metropolia University of Applied Sciences (Fig. 3). Because some areas of the paintings are suffering color changes, VIS (Visible light spectroscopy) measurements were made in selected areas. Furthermore, the preliminary studies included magnifying cross section samples under VIS and UV light



3. Elemental studies with portable EDXRF spectroscopy conducted to the ceiling paintings of the House of the Estates.
4. Cross-section of the paint layers in paintings of Arppeanum´s staircase photographed in UV light.

using a microscope. These analyses gave valuable information on the structure of paint layers (Fig. 4). In many areas, more paint layers were found than was expected. Preliminary studies will be completed with collecting the data of RH/T (relative humidity/ temperature).

After the preliminary studies, micro-samples will be analyzed further by micro-FTIR, in order to characterize organic binders in paint layers and verify original materials, possible renovation materials and consolidation agents. These analyses are made in co-operation with analytical laboratory of Tikkurila Ltd. and materials research laboratory of the National Museum of Denmark. Inorganic materials like pigments, plasters and fillers and their chemical composition will be analyzed further by Raman spectroscopy and SEM EDS (Scanning Electron Microscopy Energy Dispersive Spectroscopy) in Spain, in co-operation with the University of Basque Country. The last step of further research contains NMR (Nuclear Magnetic Resonance) spectroscopy analyses of organic binders in Greece, at the University of Crete. With the NMR, it is possible to identify detailed chemical compositions of binders and investigate their degradation processes.

This is the first time in Finland when advantaged material studies of indoor paintings will be carried out. Results of the project will be published after completing all analyses.

ACKNOWLEDGEMENTS

Authorities would like to thank Senate Properties for funding and co-operation and the National Board of Antiquates requesting the studies.

2014				2015		
winter	spring	summer	fall	winter	spring	summer
PRELIMINARY STUDIES (in situ) AND MICRO-SAMPLING *VIS (Visible light) measurements, pH measurements and XRF (X -ray fluorescense) analyses to study elements of inorganic materials like pigments, plasters, fillers from the surfaces of the painting, RH/T Monitoring* Methods: OM (Optical microscopy) with VIS and UV light, VIS (Visible light spectroscopy), pH measurements, EDXRF (Energy Dispersive X-ray Fluorescense) Spectroscopy, Dataloggers for RH/T monitoring Co-operation: Metropolia University of Applied Sciences, Finland						
		FURTHER RESEARCH 1. Organic Binders with FTIR *Identifying the binders and consolidation mediums present in the paint layers* Methods: micro -FT-IR (Fourier Transform Infrared Spectroscopy) Co-operation: Tikkurila Ltd., Laboratory Technology, Finland , and National Museum of Denmark, Environmental Archaeology and Materials Science, Denmark				
		FURTHER RESEARCH 2. Inorganic pigments, plasters with Raman and SEM *Identifying the pigments and aggregates present in the paint layers* Methods: Micro- Raman Spectroscopy and SEM-EDS (Scanning Electron Microscopy- Energy Dispersive Spectroscopy) Co-operation:University of Basque Country, Department of Analytical Chemistry, Spain				
		FURTHER RESEARCH 3. Organic Binders with NMR *Identifying organic binders and their degradation products* Methods: NMR (Nuclear Magnetic Resonance) Spektroscopy Co-operation:University of Crete, Department of Chemistry, NMR laboratory, Greece				

Table 1.

Juris Pavlovs & Ieva Rozentale

restoration of the hunting tower within the remte estate park

Address: Estate park, Remte civil parish, Brocēnu district, Latvia
The Remte estate park with its unique architecture is an architectural monument of national significance.
Object: Hunting Tower
Dating: circa 1850
Architect of the building:
Johan Georg Adam Berlitz
Materials: brick wall, stone wall, tufa of the Amata (river in Latvia), plastering
Size: h= 9,4m; d=5,5m
Restoration work was started on 01.08.2014 and was completed on 12.12.2014.

1. Tower before restoration.
Photo: Juris Pavlovs.

2. Tower after restoration.
Photo: Juris Pavlovs.

In 1850, the Hunting Tower was built concurrently with the extension of the new palace. Historically, the tower was used as a recreation place after hunting or bathing in the canal.

The 1960s. According to locals, emergency repairs to the Hunting Tower were made in the 1960s, during which, the roof was replaced, electricity was installed (later removed), interior plastering was repaired, cracks in the façade were filled, windows and doors were replaced.

The insides of the walls and ceilings have been regularly repainted. Otherwise, nothing else is known about previous repairs.

The Hunting Tower was constructed in neo-gothic forms on an artificially made elevation. Its layout is a circle, and the tower has two storeys. The façade is divided into three parts. The foundation part is made up of boulders and above it is a decorative frieze of three layers of bricks. The middle part of the tower is covered with tufa masonry, divided by ledges from bricks laid endways. The upper part of the tower is made of brickwork with small pointed circular arches. On the first floor, there is a passable room with exits to the South and North; the room has a vaulted ceiling with diagonally arranged ribs. The wall finish is painted plaster and the floor is covered with sand. The second floor room has a wooden door and three wooden double glass windows. The ceiling of the room is a smooth vault, separated by a cornice from the wall plane; the walls are smoothly plastered and painted up. The floor is poured with the cement mortar. The tower has a tin roof, topped with a decorative spire.

WORK CARRIED OUT DURING THE RESTORATION OF THE TOWER

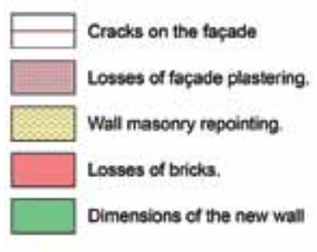
Improvement of the tower's surroundings.

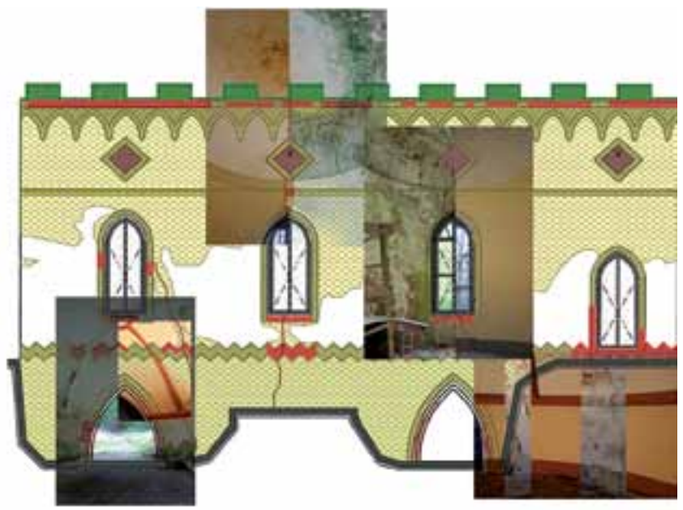
Restoration of the façade:
- Dry and wet cleaning of the surfaces.
- Surface fixation, renewal of the losses in tufa and bricks.
- Masonry repointing.
- Glazing of renewed pointing.

Roof reconstruction:
- Removal of the damaged roof constructions.
- Making of new roof constructions.
- Covering the roof with new tin.

Restoration of interior premises:
- Mechanical and chemical cleaning of walls and ceilings.
- Filling of wall cracks.
- Wall and ceiling plaster restoration.
- Renewal of paint on walls and ceiling.
- Cleaning and conservation of the cupola decorative painting.
- Replacement of windows and doors.

Repairs of the tower's supporting walls:
- Cracks in the façade
- Losses of façade plastering.
- Wall masonry repointing.
- Losses of bricks.
- Dimensions of the new wall

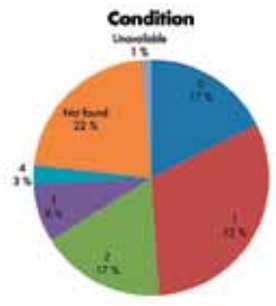




3. Restoration graph view.
Photo: Juris Pavlovs.

Ane Marte Ringstad

collection management for artworks in state institutions in norway located throughout the country; controlled centrally and executed locally



1. Statistics Condition. Figure: Ane Marte Ringstad.

Public Art Norway (KORO) is the Norwegian government's professional body for art in public spaces and the country's largest art producer. The collection of contemporary art managed by KORO is therefore placed in a great variety of state institutions and reaches a wide audience. KORO endeavours to ensure that the works are managed effectively. For art projects made for state institutions, KORO has the overall responsibility for management of the collections' preservation. The daily, practical and financial responsibility lies with the various user agencies, where the art resides. As the state institutions, the artworks are located throughout the country. The collection is made up of about 900 art projects with over 7000 artworks.

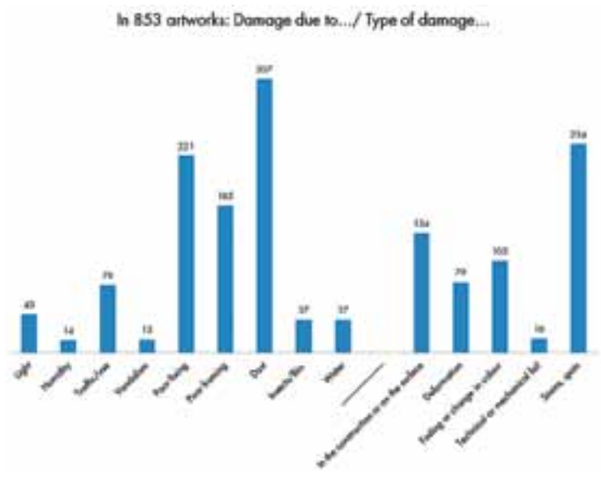
The local user agencies are responsible for reporting to the collection management department centrally in KORO. From 2011 to 2013, KORO conducted a registration project for a random selection (c. 10 %) of the collection, to inspect the condition, placement, ownership and safety of the artworks. The result (Fig. 1) shows that 17% of the collection is in good condition (0). 32% of the collection is in an acceptable condition, but the artworks need better fixing, framing or other improvements (1). 17% of the collection needs qualified repairs or treatments by a conservator, the artists themselves or others (2). 8% need emergency measures for preservation (3) and 3% are in such poor condition that they should be considered removed (4). 22% of the artworks were not found for different reasons and 1% was not available for inspection during the project. Few of the problems were previously reported to KORO.

KORO's collection of contemporary art is in a non-museum setting and in constant use, which presents particular challenges for preservation. Still, several issues with poor condition (Fig. 2) can be corrected by improving the circumstances surrounding the art. Where the placing of the artworks was carefully considered and there have been no later changes, the artworks are mostly in good condition, independent of age and materials.

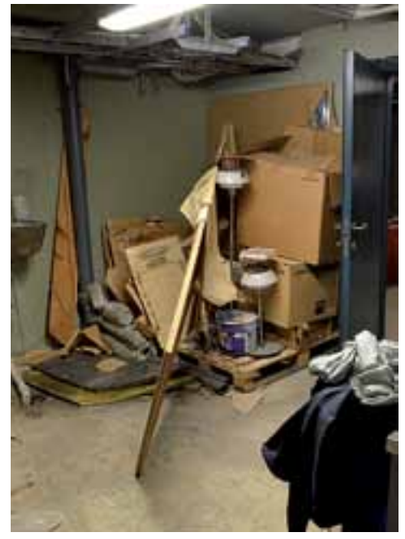
Critical points identified are the change of institutions' ownership, moving, building constructions and renovation. The artworks are often damaged or lost with temporary storage in the institutions (Fig. 3). The user agencies need to get advice from the collection management department in KORO with handling and logistics, specifically in these situations.

The preservation of art has not been a prioritized task in the state institutions. The responsibility is often placed with employees that have a special interest for art and not with a position in the institution. We see a need for more knowledge, best practices and better communication between the local user agencies and KORO. The local administration is aware of the changes in condition, placing, ownership or safety of the artworks first and they should therefore be trained in observation, documentation and reporting.

The outcome of the project is an online report system that the user agencies send in every year. Conservators will sort the material and prioritize future work for preservation and conservation within the collection. Instructions and guidelines for the most common problems identified will be posted on KORO's website. The registered problems will also be a basis for courses held in preservation centrally by the administration in the coming years. This will hopefully strengthen the user agencies ownership to the collection and give a stronger feeling of responsibility. These experiences are also useful in the preventive conservation for future art projects.



2. Statistics Damage. Figure: Ane Marte Ringstad.



3. Temporary Storage. Photo: Ane Marte Ringstad.

Dr. Kaori Taguchi

using the existing to create the yet-to-be: preservation and reactivation of inujima

Keywords:
Inujima
art festival
public art
contemporary art
restoration
preservation
performance art

Inujima is an extremely small island in the Seto Inland Sea. It takes about an hour to go round the island, and there are about 70 people living there in 40 households. The island once was a thriving port at the centre of sea lanes and served as a strategically located base and hideout for pirates. Beginning in 2001, the island festival was established for the first time, and it attracted new attention as a hub for contemporary art in Japan.

This presentation re-examines cultural artefacts found on Inujima from two perspectives. One is related to a former copper refinery, frozen in time, that contains 'strong memory'. The other is the houses, which slowly move through time and contain 'soft memory'. The object which holds strong memory narrates a history of national economy or the technology of modern civilization. The other object with soft memory narrates a private and familial history.

1. Inujima, 2004.

It was in 1909 that Kinya Sakamoto, a tycoon from Okayama, established a copper refinery in the eastern part of Inujima. This was during the Meiji era (1868-1912), when factories were being built all over Japan under the slogan 'Fukok-kyohe', that is 'Enrich the country, strengthen the military'. The refinery occupied about 100,000 square meters, and there were six brick chimneys and a thermal power station. However, as the price of copper took a nosedive due to inflation in the Taisho era, the refinery was forced to close after just ten years. Ash exhaust from the refinery's chimneys badly damaged the flora of the island, and it had the appearance of a 'dead island' for the next several decades. Two events have led to the revival of the island. The first factor is the post-war planting of Japanese green alder, which is resistant to ash. This has allowed for the re-greening of the island. The second is the arrival of artists and other creative minds, who have used the former refinery as part of their work. For instance, the refinery's old-fashioned chimneys and unpainted walls have been used effectively as a location for TV programmes and films. In addition, the staging of an open-air play by a famous theatre troupe in 2002, which increased popular recognition of the island, helped the island's revival as an 'island of art' in a significant way. This presentation focuses on this open-air play, 'Kankara', a Japanese term that means a traditional drum for Kabuki or an empty can, to examine the ways in which the former refinery, with its overwhelmingly strong memory, has transformed itself into a site where art is created and performed.

As mentioned above, the presentation also touches on other cultural artefacts with 'soft memory', in other words, a project to protect cultural artefacts. This project is intended to preserve the island's landscape for the future, by transforming uninhabited residences in the island villages into art galleries. The project, carried out in 2013, conceptualised the route to visit these houses, ending at the sea, as 'a journey' with six exhibitions: 'the birth of life', 'the stamp of memory', 'transformation', 'celebration', 'messages from history' and 'communication between meditation and light'. The presentation examines the ways in which each art piece is related to the island's history and confers new value to the island while, moving along with the flow of time.

2. Inujima 'Art House Project', Yanahi, Yukinori., Sejima, kazuyo., Hasegawa, Yuko.

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Heli Tuksam

exposing hidden treasures – mural conservation training at tartu art college

Keywords:
conservation teaching
TAC
Kiltsi manor
wall paintings

3. The landscape paintings in the south tower after restoration. Photo: Toomas Aasmaa.

Tartu Art College (TAC) provides conservation and restoration training in Estonia at the applied higher education level. TAC educates restorers in the fields of wall paintings and interiors, furniture, sculpture and leather arts. The Painting and Wall Paintings Restoration curriculum at TAC was developed to meet the regional need that emerged. After Estonia became independent, efforts to recognize the cultural heritage and to preserve the nation's historical memory evolved. At the end of the Soviet period, restoration work was mostly carried out by Polish and Russian restorers working in Estonia. National training in the field did not exist; Estonian restorers had learned their craft in Leningrad. The national changes at the beginning of the 1990s were accompanied by new developments in education. Tartu Art School began to innovate with restoration training in the specialty of furniture, followed by training in the restoration of wall paintings and in interior design. In 1994, an agreement between the Finnish and the Estonian education ministries provided for the launch of a program to educate restoration teachers. In the last twenty years, TAC has continued to contribute to the development of restoration and conservation education in Estonia, providing much internship that takes place in a real working environment. The Painting Department's participation in the restoration of different historically valuable objects has been an important part of the preservation of Estonian cultural heritage. The list of restoration projects includes more than thirty objects in Tartu and eighteen different manor houses in Estonia.

1. Mythical figures. Photo: Heli Tuksam.

2. Paintings in the south tower before restoration. Photo: Heli Tuksam.

One stately example is the Kiltsi manor, where restoration work was carried out from 2008 through 2010. The dignified history of the Kiltsi manor dates back to the fourteenth century. The manor house is built on old fortress walls. The most famous owner of the manor was the well-known explorer Adam Johann von Krusenstern. In 1790, when the owner of the manor was Hermann Johann von Benckendorf, the building received a noble, early classic look. The unique wall paintings found there inspired the taking of that period as the basis for the whole interior design. The main aim of the conservation of the wall paintings was to uncover and preserve the original paintings as much as possible and to create an aesthetic space of whole. The restoration and conservation works were complicated because the damage was rather extensive, as all the surfaces were covered with many layers of paint from the Soviet period.

During the process, the original paint was revealed mechanically, using a scalpel. The damage was removed using lime plaster. The aim was to use materials as similar as possible to the original; therefore, the colors used were based on the casein glue and pigments. As a result, an outstanding interior with motifs from the antiquity period, mythical figures and symbolic space was extensively restored. (Fig. 3)

The result of the restoration work is an outstanding entity: two salons within the south tower, where the motifs inspired by the antiquity cover the whole wall surface. The salon's wall paintings with mythical figures and the south tower with its set of motifs, inspired by the Garden of Eden, are among the earliest examples of their kind in the region. (Fig. 1, Fig. 2)

Conclusion: the best training for conservators is a course of study which combines theory and skills with practical experience. TAC aims to provide courses with rich academic and vocational content, which will enable students to fully develop their expertise and reach their full potential.

CV`S

Kim Hou Alberdi

Kim Hou Alberdi has been working at the National Museum of Denmark in the department of conservation since 2007. He earned his master's degree from the Royal Danish Academy of Fine Arts, School of Conservation in 2013. His final thesis concerned strainers from the 18th century: their historical information, degradation and ageing. Kim Hou Alberdi is also a cabinet maker.

Lotti Benjaminson

Lotti Benjaminson earned her BA degree from the University of Gothenburg (Sweden) in 1990, specialising in textile conservation. She has been working at Västarvet-Studio Västsvensk Konservering (SVK) since 1992. As a textile conservator Benjaminson focuses on church textiles, public art and museum objects. Her experience in preventive conservation includes investigative work, inspections of individual objects as well as entire collections and the development of management plans.

Margareta Bergstrand

Margareta Bergstrand has an MFA degree in Textile Art and Design from the University College of Arts, Crafts and Design in Stockholm. She also has a BA degree from Uppsala University and has studied textile conservation at the University of Gothenburg. Bergstrand does consulting in textiles: art, design, conservation and colour. Previously she held the position of Senior Conservator at the Swedish National Heritage Board.

Elisabetta Bosetti

Elisabetta Bosetti has a diploma in painting and fresco restoration from the regional School of Conservation ENAIP in Brescia, Italy. She has studied History of Art at Copenhagen University, Denmark. Elisabetta Bosetti has led restoration projects on important monuments and work of art belonging to the Danish cultural and artistic heritage. Her background includes working at major Danish museums as well as at private and public conservation studios. Her main area of interest is the ethical approach to the preservation of cultural heritage.

Fernando Caceres Jara

Fernando Caceres is a conservator of easel painting and architecture. He graduated from Courtauld Institute, London and from the Architectural Association School of architecture (AA), London. His areas of expertise are the conservation of large format easel and panel paintings, conservation of polychrome objects, historic painting techniques and the recreation of historic architectural painted schemes.

Giulia Chiostrini

Giulia Chiostrini graduated from the Universita' degli Studi di Firenze, Italy, in 2001 with a degree in Restoration and Conservation of Ancient Textiles. She has been Associate Conservator in the Department of Textile Conservation at The Metropolitan Museum of Art since 2010. Prior to this, she held a two-year Andrew W. Mellon Fellowship, during which she focused on conservation techniques of medieval tapestry. She is currently the liaison conservator for all textiles from the Robert Lehman collection.

Christina Danielli

Christina Danielli has been working as a freelance conservator since 1996. After earning a degree in Art History she has attended a three-year course in painting conservation. Since 2000 she has mostly been working on archaeological conservation in Rome and in the Middle East. At present she is the Lead Conservator for the TWLCRM (Temple of the Winged Lions) Project in Petra and for several conservation projects in Rome.

Susanna Eklund

Susanna Eklund graduated as a building conservator from Seinäjoki Polytechnic in 2001 and as an archaeologist from the University of Helsinki in 2008. Her Master's Thesis for the University of Helsinki dealt with stone weathering in the Jabal Haroun archaeological site. Susanna Eklund has mostly worked on popularising cultural heritage via digital media and local heritage work. At the moment she is working as a Service planner for the Library Network Services at the National Library of Finland.

Chris Fern

Chris Fern has degrees from the Universities of Nottingham and York, and he is a research associate of the University of York, and a Fellow of the Society of Antiquaries of London. Fern has been leading research on the Staffordshire Hoard since April 2011. He is an expert on the art, artefacts and funerary archaeology of the early Anglo-Saxon period. Previously he has published on the famous cemetery of Sutton Hoo.

Pieta Greaves

Pieta Greaves trained as a conservator at Cardiff University after a career as an Archaeologist and became an accredited member of Icon in 2001. Greaves has been the Staffordshire Hoard Conservation Coordinator since January 2013. Her tasks include overseeing the hoard conservation programme as well as public outreach. Previous to this, she worked in Scotland on some of the most internationally significant archaeological material recovered in recent times.

Conny Hansen

Conny Hansen has been working at the National Museum of Denmark in the department of conservation since 1993. She earned her bachelor's degree in 1990 and her master's degree in 2007 from the Royal Danish Academy of Fine Arts, School of Conservation Her master's thesis concerned alternative paint stripping methods regarding work on the altar in Keldby church.

Elisa Heikkilä

Elisa Heikkilä studied at the University of Gothenburg, Institute of Conservation in Sweden and graduated as a Bachelor in 1997 and Master in 2002. Her final thesis was: Soapstone – use, characteristics, conservation and Consolidation of concrete. Currently she works as a conservator at the National Board of Antiquities in the Department of Monuments and Sites in Helsinki. Previously she has worked in various projects and museums in Finland and abroad.

Anna Henningsson

Anna Henningson earned her degree in conservation from the Cologne Institute of Conservation Sciences at the University of Applied Science in Cologne, Germany in 2003. Until 2010 she ran a conservation practice in Sweden specialising in investigation and conservation of wall paintings, stucco and stone. In 2010 she founded Disent AB, an interdisciplinary company working with heritage science. She is currently working as a heritage science expert on technical art examination of immovable art in historic buildings with a special interest in sacred art. In addition she is Sweden´s representative for the ICOMOS International Committee on Wall Paintings.

Karin Hermerén

Karin Hermerén has BA degrees in Conservation and History of Art and is currently a PhD student in Conservation at the University of Gothenburg. Prior to this she has worked as an expert advisor at the Swedish Public Art Agency, the National Heritage Board of Sweden, the Maritime Museum and the Vasa Museum. She has worked as a conservator-restorer at the Museum of Helsingborg for nearly two decades and as a teacher at the Universities of Lund and Gothenburg since 1986. She has also run a studio for painting conservation since 1991, Konserveringsateljé syd AB.

Hilkka Hiiop

Hilkka Hiiop PhD is conservation specialist at the Art Museum of Estonia and an assistant professor at the Estonian Academy of Art, Department of Conservation. Her PhD thesis regarded the conservation management of contemporary art. She has worked as a conservator of mural paintings in Rome, supervised a number of conservation and technical investigation projects in Estonia, curated exhibitions on topics of conservation and technical art history.

Emma Hocker

Emma Hocker studied Archaeological Conservation at the Institute of Archaeology, London, and earned an MSc degree in Historic Buildings Preservation from Texas A&M University, USA. She has worked on a number of international shipwreck projects and is currently conservator at the Vasa Museum, Stockholm, Sweden.

Torben Holst

Torben Holst is Cand. Scient. Cons. He has worked at the National Museum of Denmark in the department of Conservation from 1988 to present. He is specialized in metals conservation such as weapons, large scale objects and sculptures.

Heikki Häyhä

Heikki Häyhä has been working as a lecturer in the degree programme in conservation at the Helsinki Metropolia University of Applied Sciences since 1998, and as a senior lecturer since 2008. He has an MA degree in conservation from the University of Gothenburg and a BA degree in object conservation from Espoo-Vantaa Polytechnic. Heikki Häyhä has teaching experience from various institutes abroad.

Jukka Jokilehto

Jukka Jokilehto graduated as an architect and a city planner from the Polytechnic University of Helsinki and later earned his PhD from the University of York (UK). Jokilehto worked in Finland as an architect and an urban planner before he was employed at ICCROM as the Director in Architectural Conservation in 1972-1998 and as the Assistant Director General in 1995-1998. He has been a Special Advisor to Director-General of ICCROM since 2007. At ICOMOS Jokilehto was appointed President of International Training Committee, CIF in 1993-2002 and World Heritage Advisor in 2000-2006 and was appointed Honorary Member of ICOMOS in 2014. Jokilehto has also an extensive career as a consultant and lecturer in architectural and urban conservation, as well as a professor. At present he is the Honorary Visiting Professor at the University of York (UK) and the Extraordinary Professor at the University of Nova Gorica (Slovenia), where he was appointed Full Professor in 2015.

Elina Järvelä

Elina Järvelä graduated from the EVTEK University of Applied Sciences, Institute of Art and Design in 2006. She worked as a freelance conservator until 2012 when she started a cooperative conservation and restoration business with her colleagues. Järvelä has also completed degrees in restoration and painting. Järvelä has particular interest in conservation of wood, plaster, gypsum marble, wallpapers, ceiling paintings and wall paintings.

Teemu Kajaste

Teemu Kajaste graduated from the EVTEK University of Applied Sciences, Institute of Art and Design in 2000. He has worked as a freelancer for several employers. Kajaste started a cooperative conservation and restoration business with his colleagues in 2012. Kajaste is specialised in lime mortars, clay mortars and gypsum. He has long experience in conserving mortar based structures and fireplaces.

Susanne Kaun

Susanne Kaun is a conservator specialised in murals and architectural polychromes. She graduated from the University of Applied Science Potsdam (Germany) in the field of conservation and restoration of wall paintings and polychrome architectural surfaces in 2003. She has been working at the Norwegian Institute for Cultural Heritage Research (NIKU) since 2009. Before this she worked as a freelancer.

Laura Kauppinen

Laura Kauppinen has been working as a curator of education at the Kerava Art Museum since 2011. Prior to that she has had wide experience in working with the public in museums. For instance in 2003-2006 she worked as an educator and a coordinator for the culture project Generaattori. Kauppinen has an MA degree in Art Education from the University of Jyväskylä, 2009.

Heli Ketomäki

Heli Ketomäki from Kuustie&Sorri Ltd. is a conservator-restorer specialised in building conservation and paint research in buildings and interiors.

Ulla Knuutinen

Ulla Knuutinen from Kuustie&Sorri Ltd. is a PhD and a docent of Organic Chemistry at the University of Helsinki. She is also a docent of Conservation and Cultural Heritage Material Research at the University of Jyväskylä, Finland.

Nanna Kymäläinen

Nanna Kymäläinen is a Bachelor of Culture and Arts (Conservation) specialised in historical interiors. She works as a building conservator for the Finnish National board of Antiquities at the Seurasaari Open-Air Museum. She has previously worked for the Urajärvi manor museum conservation project during 2009–2013 and as a partner at the co-operative Osuuskunta Konservointi ja Restaurointi Kollaasi during 2014.

Birgitte Larsen

Birgitte Larsen has been working at the National Museum of Denmark in the department of conservation since 1989. She earned her BA degree in History and Art History from the University of Copenhagen in 2004. Birgitte Larsen is a cabinet maker and has done research on 17th century Danish cabinetry.

Suvi Leukumaavaara

Suvi Leukumaavaara is a Finnish independent researcher with background in conservation-restoration and art history. She is specialised in art conservation, medieval art and art nouveau architecture, and has carried out university level postgraduate studies in Finland, Italy and the UK. She has over 15 years' international experience in conservation-restoration from international museums, research and EU projects and as a former committee member of the European Confederation of Conservators-Restorers' Organisations E.C.C.O.

Daiga Levalde

Daiga Levalde has a diploma in architecture from Riga Technical University in Latvia. She has worked as an architect at the Architectural Investigation Group since 1993, and as the chief of the Architectural Investigation Group since 1999. Levalde has worked in research, fixation, documentation and preservation in reconstruction and interior projects as well as in restoration supervising.

Liisa Lindgren

Liisa Lindgren is a specialist in Finnish sculpture of the 19th and 20th centuries. She has published several studies on modern Finnish sculpture and art criticism and a broad selection of popular articles on sculpture and contemporary art. Her doctoral dissertation, approved in 1996 at the University of Helsinki, concerned tradition and modernity in Finnish sculpture of the 1940s and 1950s. Lindgren is a docent at Helsinki and Turku Universities and has worked as a head curator of collections at the Museum of Contemporary Art in Helsinki, as a senior researcher and an acting director of the Central Art Archives of the National Gallery and as an acting director of the Sinebrychoff Art Museum. Since 2005 Lindgren has worked as a senior curator at the Parliament of Finland.

Anders Ekstroem Loekkegaard

Anders Ekstroem Loekkegaard is Cand. Scient. Cons. He has worked at the National Museum of Denmark in the department of Conservation from 2007 to present. Previously he worked at the Museum Kroppedal from 1998 to 2007 as the head of Conservation Department. He is specialised in metals conservation such as archaeological finds, sculptures and fountains.

Katja Luoma

Katja Luoma graduated from the EVTEK University of Applied Sciences, Institute of Art and Design in 2001. She worked as a freelance conservator for twelve years before starting a cooperative conservation and restoration firm with her colleagues in 2012. Luoma has experience in painted building surfaces but also in different base materials. She earned her Masters degree in Conservation in 2008.

Hanne Mannerheimo

Hanne Mannerheimo from Kuustie&Sorri Ltd. and Aalto University is a conservator-researcher specialised in the materials analyses of cultural heritage. She is doing her doctoral dissertation for Aalto-University in the department of Civil and Structural Engineering. Her topic concerns the preservation and material studies of the indoor paintings in 19th century buildings in Finland.

Liesma Markova

Liesma Markova has a diploma in architecture from Riga Technical University in Latvia. She has worked as an architect at the Architectural Investigation Group since 1993. Markova works in research, fixation, documentation, preservation and restoration supervising in interior projects. Previously she has worked as an architect and supervisor e.g. at the Institute of Restoration.

Matteo Montanari

Matteo Montanari is a PhD biologist specialised in Plant Pathology. He works as a freelance researcher and leads the Biores Srl laboratory for the research on Biology applied to conservation. In 2011 he became the scientific coordinator and project manager at CESMAR7, Centre for the Study of Materials for Conservation, and he teaches at the Academy of Fine Arts in Bologna. Montanari´s main fields of research are the study and characterization of biodeteriogens and the development of materials and methods for the control of biological growth on artworks, in particular on paper.

Lisa Nilsen

Lisa Nilsen is a preventive conservator and a graduate of the Institute of conservation in Gothenburg. She has worked at several museums in Oslo, Norway and later with the National Trust for Scotland in Glasgow and in London at Historic Royal Palaces. She now lives in Stockholm, working part-time for the National Heritage Board and also as a freelancer teaching and giving courses in preventive conservation.

Catharina Nordenstedt

Catharina Nordenstedt is an architect and an interior designer. Having worked for 20 years in the private sector, she joined the Swedish Property Board 14 years ago, where she works on the interior decoration of official residences and as project manager for conservation and restoration. The projects often deal with cleaning and restoration of an existing interior where modern technology and wiring is required.

Tone Marie Olstad

Tone Marie Olstad earned her paintings conservator diploma in 1985 and worked at the Directorate for Cultural Heritage in Norway (Riksantikvaren) and at the Museum of Cultural History at the University of Oslo until 1994. Since then she has worked as a painting conservator/researcher at the Norwegian Institute of Cultural Heritage Research, NIKU. Polychrome sculpture, church art and interiors, distemper decorative paintings and climate in churches are some of her main work areas. From 2004 to 2006, on leave from NIKU, she was the head of the Conservation Department at the Museum of Cultural History at the University of Oslo.

Erkka Pajula

Erkka Pajula is a Bachelor of Culture and Arts, a Building Conservator and a carpenter artisan. He is specialised in the restoration of wood constructions. Since 2011 he has been working as a conservator for the Finnish National board of Antiquities at the Seurasaari open air-museum. Previously he worked as a building restoration entrepreneur.

Juris Pavlovs

Juris Pavlovs has studied restoration at Riga Building College in Latvia. He has been working on several restoration and renovation projects in Latvia and also in Norway. Previously, he has done restoration for example on the hunting tower at the park of Remte castle. Since 2015, he has been working on the interior restoration of the A. Nevsky orthodox church in Riga. Pavlovs is also a member of the board of the Latvian Society of Restorers.

Miia Perkkiö

Miia Perkkiö is an architect and a Doctor of Science, Technology, from the University of Oulu. She has studied architecture at the IUAV University of Venice and restoration at the La Sapienza University of Rome. Currently she works as a Chief Intendant of Restoration Services at the Finnish National Board of Antiquities. Perkkiö has also given many lectures and published several international academic papers on architecture, restoration and preservation of monuments and sites. She has had a number of non-executive roles in e.g. ICOMOS Finland.

Jani Puhakka

Jani Puhakka has an MA in Culture and Arts (Conservation). Since 2008 he has been working as a building conservator for the Finnish National Board of Antiquities at the Seurasaari Open-air museum.

Ane Marte Ringstad

Ane Marte Ringstad earned her Master's degree in object conservation at the University of Oslo in 2006. Since then, she has worked as a conservator for the Norwegian Museum of Science and Technology, Vest-Agder-museet and Studio Västsvensk Konservering. Since 2011, she has been working at KORO/Public Art Norway.

Nina Robbins

Nina Robbins has Master's degrees in Art History and Art Conservation. She is a PhD candidate in Museology at the University of Jyväskylä, Faculty of Humanities.

Ieva Rozentale

Ieva Rozentale has studied restoration at the Art Academy of Latvia and she has a Bachelor's degree in graphic design. She has been working at the building company RERE Meistari since 2013, doing restoration at the Latvian National Museum of Art and at the Ministry of Culture. Rozentale´s skills include, for example, monumental painting conservation, restoration and decorative painting.

Ilaria Saccani

Ilaria Saccani has a degree in Conservation of canvas paintings and a Master´s degree in Science applied to Conservation from the University of Parma. Currently she works as a researcher at CESMAR7, Centre for the Study of materials for Conservation, where one of her main fields of research is cleaning materials and methods. She is deeply interested in chemistry applied to conservation as a tool for a better comprehension of deterioration processes.

Malin Sahlstedt

Malin Sahlstedt studied Conservation of Cultural Property at Gothenburg University, and earned a MSc degree in Archaeological Science from Stockholm University. She is currently a conservator at the Vasa Museum, Stockholm, Sweden, having previously worked in archaeological and research projects at the National Heritage Board, Stockholm.

Will Shank

Will Shank studied art history and art conservation at the Villa Schifanoia in Florence and subsequently earned his master's' degrees from the Institute of Fine Arts of New York University, and Harvard University Museums. He worked at the San Francisco Museum of Modern Art (SFMOMA) from 1985 to 1999 and was head of conservation there for a decade. He co-founded Rescue Public Murals, a program of Heritage Preservation (Washington, DC) in 2006. Mr. Shank works internationally in collections care, specialising in modern and contemporary paintings, from his base in Barcelona.

Arja Sorri

Arja Sorri is a conservator-restorer specialised in building conservation and paint research in buildings and interiors. Sorri is the co-owner of Kuustie&Sorri Ltd. which provides conservation and restoration services throughout the whole of Finland.

Sarah Staniforth

Sarah Staniforth has degrees in chemistry and conservation from Oxford University and the Courtauld Institute of Art, London. She worked at the scientific department of the National Gallery from 1980-1985 and joined the National Trust in 1985 as an Adviser on Paintings Conservation and Environmental Control. From then on she has worked as the Head Conservator and Historic Properties Director, and in 2011-2014 as the Museums and Collections Director at the National Trust. She has a number of non-executive roles e.g. in IIC and ICOM. Sarah Staniforth has written and lectured extensively on preventive conservation for collections in museums and historic houses. Staniforth was made a Commander of the Order of the British Empire (CBE) in the Queen's New Year's Honours 2015 and received the Plowden Medal in August 2015.

Kaori Taguchi

Kaori Taguchi studied at Kyoto University and earned her PhD in History of Arts and Cultural Studies in the Theory of Restoration in 2014. She has also studied at the Università Internazionale dell'Arte Firenze in Florence, Italy. Taguchi has worked as a lecturer both in Italy and Japan and for instance as a Special fellow at the Tohoku University of Art and Design/Japan Society for the Promotion of Science since 2014. Taguchi has published an extensive selection of books, journals and translations in the field of preservation.

Heli Tuksam

Heli Tuksam is a painter and a pedagog. She earned her MA degree in Cultural Research from the Institute of Theology of the Estorian Evangelical Lutheran Church. She is currently working at Tartu Art College as the head of the Department of Paintings. Over the years she has worked as a conservator and a mentor in numerous conservation and restoration projects in a wide selection of public buildings and manor houses.

Päivi Ukkonen

Päivi Ukkonen is a paper conservator with a long career at the Finnish National Gallery. Currently she is the Senior Lecturer of Paper conservation in the degree programme of conservation at the Helsinki University of Applied Sciences.

Douwtje van der Meulen

Douwtje van der Meulen has MA degrees in Museum Studies from the University of Leicester, England and Mediterranean Archaeology from the University of Groningen, Netherlands. She also has a BSc in Archaeological Conservation and Material Science from University College London, England. Currently van der Meulen works as a Course coordinator and as a University Lecturer in Conservation at the Institute for Archaeology, Conservation and History, at the University of Oslo. From 2009 to 2012 she worked as the Leader of the Department.

Marleena Vihakara

Marleena Vihakara studied Paper Conservation at the Camberwell College of Arts in London. After graduating in 2001 she worked as a Preservation Assistant at the Library of London School of Economics and Political Science. Ms Vihakara has been employed by the National Library of Finland since 2003 and has also worked for the National Museum of Finland. She is currently an MA student in Museology and works as a project conservator at The National Gallery of Finland.

Helen Volber

Helen Volber, MA, is a conservator at the Art Museum of Estonia. Her interests lie mainly in the conservation of contemporary art and she has also been actively involved in projects concerning investigations of historical interiors.

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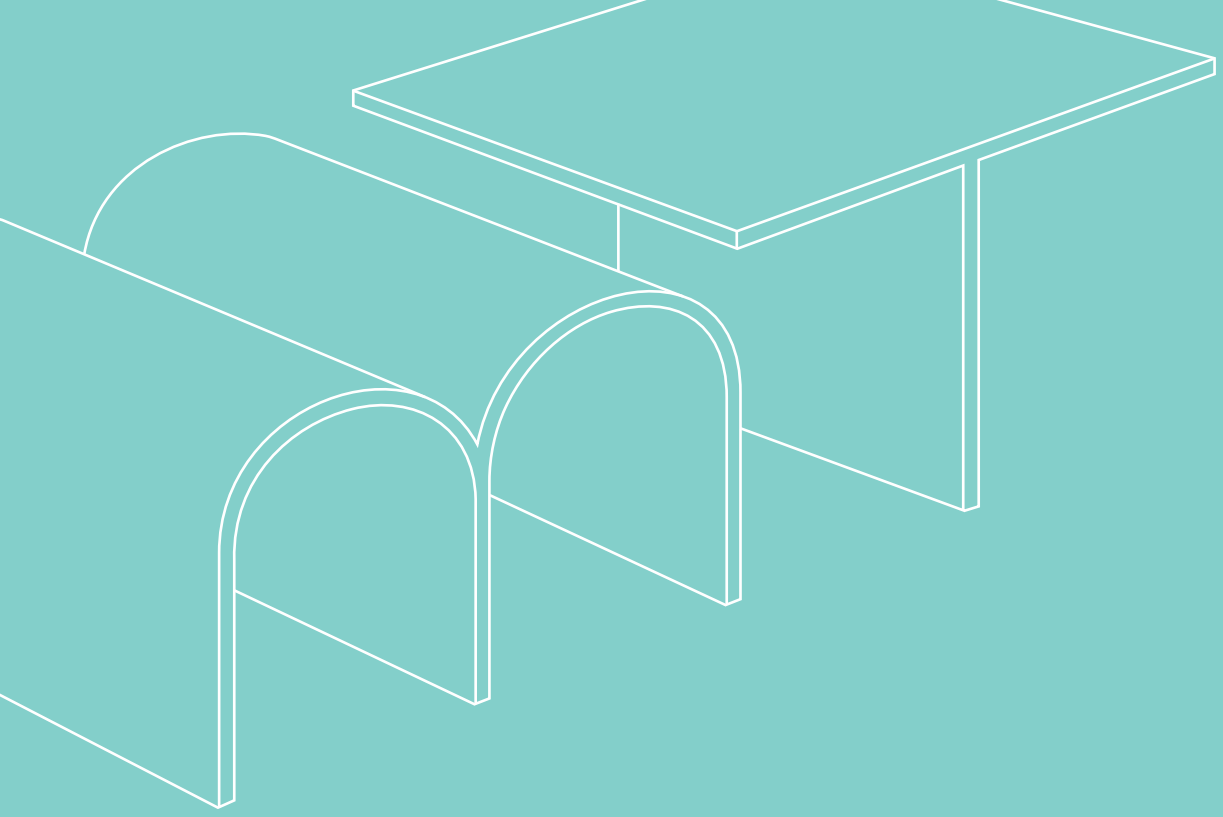

Monumental Treasures

The Finnish section of Nordic Association of Conservators,
IIC Nordic Group (Nordiska konservatorförbundet rf
Pohjoismainen konservaattoriliitto ry) organized
the XX NKF Congress, Monumental Treasures
Preservation and Conservation in Helsinki, Finland
at the National Museum of Finland on 21–23 October 2015.

This publication presents articles that are based
upon the presentations at the congress. Texts discuss
conservations topics from varying perspectives in the field
of conservation of monumental objects and ensembles.

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POHJOISMAINEN
KONSERVAATTORI–
LIITTO
SUOMI

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