



Experts Meeting

Cleaning of Wooden Gilded Surfaces

An Experts Meeting Organized
by the Getty Conservation Institute,
March 12–14, 2018

Stéphanie Auffret and Sydney Beall Nikolaus



Cleaning of Wooden Gilded Surfaces

An experts meeting organized by the
Getty Conservation Institute, March 12–14, 2018

Stéphanie Auffret and Sydney Beall Nikolaus

THE GETTY CONSERVATION INSTITUTE
LOS ANGELES

© 2019 J. Paul Getty Trust

The Getty Conservation Institute
1200 Getty Center Drive, Suite 700
Los Angeles, CA 90049-1684
United States
Telephone 310 440-7325
Fax 310 440-7702
E-mail gciweb@getty.edu
www.getty.edu/conservation

ISBN: 978-1-937433-71-0

The Getty Conservation Institute (GCI) works internationally to advance conservation practice in the visual arts—broadly interpreted to include objects, collections, architecture, and sites. The Institute serves the conservation community through scientific research, education and training, field projects, and the dissemination of information. In all its endeavors, the GCI creates and delivers knowledge that contributes to the conservation of the world's cultural heritage.

Front cover: Gilded wooden ornament with an aged, soiled surface. Photo: Stéphanie Auffret © J. Paul Getty Trust

Contents

Acknowledgements	4
Introduction	5
Considerations on the Field of Preservation of Wooden Gilded Surfaces	9
Education	17
Cleaning Systems for Wooden Gilded Surfaces	23
Major Issues and Challenges	23
Materials and Techniques Used by Conservators to Clean Gilded Surfaces	24
Applying the Modular Cleaning Program to Wooden Gilded Surfaces: What Can We Learn, and Where Do We Go from Here?	24
Evaluation of Wooden Gilded Surfaces and Effects of Cleaning Systems	27
Next Steps: Avenues for Action	29
References and Digital Resources	31
Appendix 1: Experts Meeting Participants	32
Appendix 2: List of Getty Staff Present at the Meeting	36

Acknowledgments

This publication is the result of a collaborative effort, and the authors would like to gratefully acknowledge the following contributions: first, our deepest appreciation to the experts meeting participants who generously shared their time and knowledge about the preservation of wooden gilded surfaces around the globe, and provided comments and additional information for refining this manuscript.

Within the Getty Conservation Institute (GCI), we would like to express gratitude to Kathleen Dardes, Head, Collections, for supporting this initiative and providing the needed resources to facilitate this experts meeting; to Tom Learner, Head, Science, for providing members of his team to take part in the discussions; to Annabelle Sbarbatti for all her behind-the-scenes organization work; and to Michael Schilling and Douglas MacLennan in the Science department for their time and contributions. Within the J. Paul Getty Museum, we would like to thank Charissa Bremer David, Davide Gasparotto, and Gene Karraker, as well as volunteer Silvia Ottolini, for their participation in specific sessions and tours of the collections, which allowed for rich discussions. Countless thanks go to the GCI's Publications team, Cynthia Godlewski, Chelsea Bingham, and Megan DiNoia, for skillfully shepherding the manuscript through the publication process; Sheila Berg for copy editing; Gary Hespenheide for design; and Angela Escobar and Anna Zagorski for dissemination; and to Gilles Auffret for photo documenting the meeting.

Introduction

From March 12 to 14, 2018, the Getty Conservation Institute (GCI) held an experts meeting at the Getty Center to discuss issues related to the cleaning of wooden gilded surfaces. Twelve invited participants came from the United States, Brazil, Australia, France, Spain, and the United Kingdom. They were joined by Getty staff from the Conservation Institute and the Museum, bringing to the discussion additional colleagues from the United States and Italy. The participants were selected to offer different international perspectives and to represent diverse and complementary professional backgrounds in the field of wooden gilded surfaces conservation and cleaning systems developed for sensitive surfaces, as well as conservation science.

FIGURE 1

Meeting participants, left to right: Davide Gasparotto (Getty Museum), Marie Dubost (Atelier de la Feuille d'Or, France), Silvia Ottolini (Getty Museum), Sydney Beall Nikolaus (Yale at the time of the meeting, currently Williamsburg), Leticia Ordonez Goded (Arcas Restauración, Spain), Judy Wetherhall (Knoll House at the time of the meeting, currently freelance), Luiz Souza (Federal University of Minas Gerais, Brazil), Stéphanie Auffret (GCI), Nathalie Balcar (C2RMF, France), Margaret Sawicki (AGNSW, Australia), Peggy Olley (PMA), Mary McGinn (PAFA), Gene Karraker (Getty Museum), Stéphanie Courtier (C2RMF, France), Zoe Allen (V&A, UK), Chris Stavroudis (private practice, USA).

Photo Gilles Auffret © J. Paul Getty Trust



The meeting was organized as part of the first phase of a project, initiated by the GCI Collections Department, on cleaning approaches for wooden gilded surfaces, with the aim of addressing the need for specialized training in this field. Wooden gilded surfaces are found on a wide range of artifacts and settings, from collections objects in museums or private homes to architectural elements integrated into buildings such as churches and palaces. These complex, multilayered surfaces were created using various techniques applied to artifacts of different scales, representing a wide range of challenges when a cleaning treatment is needed. Since gilded surfaces are typically fragile and highly sensitive to polar cleaning systems and abrasion, they can become damaged or lost during cleaning

campaigns. Several factors that contribute to the challenges encountered in the treatment of these surfaces were identified at the start of the project, as follows:

- No consensus on ethical considerations and goals of cleaning these decorative surfaces.
- Lack of understanding of the value of preserving original and aged wooden gilded surfaces by the various stakeholders involved.
- Insufficient understanding of original gilded surfaces by many conservators.
- Scarcity of specialized training in the treatment of these surfaces in academic programs. These surfaces are often treated by conservators from allied specialties (paintings, furniture, etc.) who might not fully understand them, or they are treated by craft-trained professionals who understand gilded surfaces but may not have the scientific background required to fully grasp newly developed cleaning systems.
- Unfamiliarity with advanced cleaning options developed in other specialties, such as modern painted surfaces, that can be applied to gilded wooden surfaces.

The GCI project aims to address these various factors through a variety of avenues, such as professional meetings, research into cleaning systems targeted at wooden gilded surfaces, reference materials, and a training course offered internationally. The project draws on former research carried out by the GCI and partners from other institutions on the cleaning of acrylic painted surfaces, which though different in nature are also sensitive to water-based cleaning systems. By applying the effective cleaning materials and application methods used for these surfaces to gilded wood, this project hopes to develop methodical cleaning protocols for gilded surfaces, which will support the field by providing workshops and reference materials.

The main goal of the March 2018 experts meeting was to discuss the preservation of wooden gilded surfaces globally, with a focus on cleaning, by addressing the following topics:

- Who are the various stakeholders involved in the preservation of wooden gilded surfaces? What is the impact of their opinion, and who makes the final decision regarding treatment? Can there be more efficient dialogue between all those involved, including the conservator, and if so, how?
- What is the level of knowledge of the materials and techniques used to create and restore wooden gilded surfaces throughout time and in different countries among professionals in charge of their preservation?
- What are the educational offerings available in various countries in the field of gilded surfaces in terms of undergraduate and graduate educational programs and professional development opportunities for practicing conservators? What specific needs could be addressed through a GCI course for professional development? What kinds of reference materials would be helpful?
- What approaches are taken to cleaning wooden gilded surfaces considering both ethical and practical perspectives?
- What methods are used to examine gilded surfaces and assess the effects of cleaning?

During the first day of the meeting, the participants gave presentations addressing the above questions with regard to their own backgrounds and experience and the practices in their countries. On the second day, curators from the Getty Museum joined the group to

FIGURE 2

Participants looking at a gilded frame at the Getty Center, Museum East Pavilion, Gallery E202. *The Return from War: Mars Disarmed by Venus* by Peter Paul Rubens.

Photo Gilles Auffret © J. Paul Getty Trust



discuss the ethical considerations of conservation treatments and dialogue between different stakeholders involved in the decision-making process. This was followed by a tour in the museum's galleries to look at gilded surfaces as a group. In the afternoon, a half-day discussion focused on specific cleaning methods available to treat the sensitive gilded wooden surfaces. The last day of the meeting began with presentations by conservation scientists and group discussions on the scientific methods used to study gilded wooden surfaces and control the effects of cleaning systems. The meeting concluded in the afternoon with group discussions on the next steps to be taken, including strategies to answer identified training needs in the form of workshops and reference materials.

This report is organized in four main sections: considerations on the field of preservation of gilded surfaces; education; cleaning systems for wooden gilded surfaces; and evaluation of wooden gilded surfaces and effects of cleaning systems. It concludes with a summary of the next steps that may be pursued. Some topics overlap, especially in the first two sections, and some aspects are more developed for one country than another, which is only a reflection of the evolution of the conversation over three days of exchanges, with individuals contributing to specific topics in more depth than others. Different levels of information are especially evident with regard to educational offerings and preservation policies in countries where such policies have recently evolved and where the preservation of wooden gilded surfaces may be especially affected. Some of the participants provided updated information after the meeting, which is reflected in this report.

Considerations on the Field of Preservation of Wooden Gilded Surfaces

One of the benefits of having an international group around the table was the realization that while some issues can vary greatly from one part of the world to another, we all face similar problems related to the preservation of wooden gilded surfaces. Among the differences that were raised are the very nature of the surfaces as well as the context in which they exist; context encompasses setting, culture, preservation policies, and the stakeholders involved.

Wooden gilded surfaces can be found on small objects, frames, and furniture, as well as on large-scale artifacts such as altarpieces and architectural elements in castles or churches. With regard to the latter, their scale in itself is of course a major consideration in conservation treatment approaches and cost, and the context in which they are found may have an impact of whether or not they are recognized as worthy of preservation. In Brazil, for instance, hundreds of churches are entirely decorated with metal leaf and polychromy or even japanning. Unfortunately, these surfaces are often poorly understood in terms of their original materials, techniques, and aged surface appearance. And too often they have been repainted using inappropriate materials. It is important to understand the motivations of such past restoration campaigns: they were initiated for the most part by priests in order to give the community a sense of renewal through fresh-looking painted surfaces, especially during sacred festivities.

In order to preserve such surfaces globally, it is necessary to identify and understand the various stakeholders involved in their care, the impact of their voices, and the preservation policies of a given country. The preservation policies of Brazil exemplify these arguments and are quite unusual, as outlined in an article by Luiz Souza (Souza 2014 et al.). For example, churches play a major role in their own preservation. Unfortunate previous restorations of churches in which the buildings' interiors were entirely repainted, at the cost of losing original surfaces because of the lack of guidance from qualified professionals, have given way to a positive development in recent preservation policies: archbishops can now organize knowledgeable internal teams to protect Brazil's churches. In addition, the unique legal framework of Brazil's State Prosecution Office allows a community to publicly defend a building or artifact of historical importance before the State Attorney, which can provide legal protection. This policy underscores the importance of educating a broad audience on the values of preservation and the protection of cultural heritage. In the public sector of Brazil, the Federal Institute for Cultural Heritage is responsible for approving all conservation projects for world cultural heritage (other Latin American countries have similar institutions). One major issue, however, is the lack of trained conservators in the Federal Institute for Cultural Heritage to discuss the level of treatment interventions to be undertaken. There are numerous architects in the Federal Institute but few conservators who specialize in interiors or altarpieces with painted and gilded surfaces. In addition, conservators in the public system are now retiring and there are not enough trained young conservators to replace them.

Brazil's preservation policies are illustrated in the following scenario. A priest can initiate a conservation project for a church and raise the necessary funds from the community. The actual treatment for the project is determined by the Federal Institute for Cultural Heritage, whose personnel are mostly architects, not conservators. However, if the community does not agree with the direction of the project, community members can go before the State Prosecution Office to publicly defend the rights of the church and intervene on its behalf.

In Italy, preservation policies have also seen progress in terms of legislation and their application, with some aspects resonating with the situation in Brazil. Italy still has effective laws that were enacted after World War I to regulate administrative proceedings on cultural heritage. Major legislation was created in 1939 by Minister Giuseppe Bottai, and after World War II, in 1947, article 9, on the preservation and protection of cultural heritage, was added to the Constitution of the Italian Republic. The Ministry of Culture has regional and provincial offices with different fields of competence, called Soprintendenze, led by art historians for mural paintings, sculptures, decorative arts, panel and canvas paintings (in museums, churches, and even private properties); by architects for historic civic and private buildings and churches; and by archaeologists for archaeological materials in museums and sites in many of its twenty regions. Their duty is to protect, catalog, study, and preserve the Italian cultural heritage in public and private museums, churches, historical buildings, and landscapes. Most Soprintendenza and national museums have conservators on site whose main responsibility, in addition to evaluating projects and carrying out conservation treatments, is to help curators control conservation treatments assigned to private conservators. This is an efficient system. Until twenty years ago, the heads of these offices (Soprintendenti) were provided by the government with suitable financial support and curators were competent to make decisions about conservation treatments in collaboration with private conservators, with varying results, of course, depending on both parties' competency and diligence. Changes occurred at the beginning of the twenty-first century under the government of Silvio Berlusconi, during which, for financial reasons, the system weakened and architects, art historians, curators, and conservators experienced diminished authority. Furthermore, after many employees retired, no new people were hired. In 2014 and 2016, the new minister, Dario Franceschini, separated the thirty most important Italian museums from the Soprintendenze and hired new directors for them. These museums had high visibility and were given consistent funding, but offices of the Soprintendenze in cities and provincial areas suffered a great reduction in resources and staff. New heads of provincial offices are almost always architects, as in Brazil, though some art historians are still in charge. This change has affected the preservation of the cultural heritage. While in museums conservation treatments are still carefully controlled by curators, cultural heritage scattered in churches and elsewhere is less controlled than it was in the past, mainly due to the lack of specialized staff in the Soprintendenze. Of major interest in the scope of this report is the fact that the least controlled areas are mural paintings and decorated architectural surfaces because the work is not assigned directly to conservators but to construction companies that can choose and hire conservators freely, frequently selecting the less expensive and potentially less competent option.

Despite these financial difficulties and the lack of officers, Italy still has a strong cultural heritage preservation law and a widespread network of government offices in charge of the protection of its heritage. But correct procedures, accurate control, and results depend on the knowledge and goodwill of individual officers.

Important points about academic training and professional accreditation systems were addressed during the meeting. Despite being related to education, some points are outlined in this section because they are tightly linked to preservation policies and treatment deci-

sions. In several countries, practicing conservators without an academic degree are allowed to work for cultural institutions, often within the framework of varied systems of accreditation, creating different challenges.

In Italy until 2006, several different options were available to those wishing to become art conservators and thus be involved in work on national cultural heritage:

- National schools: Istituto Superiore per la Conservazione e il Restauro (formerly Istituto per la Conservazione e il Restauro [ICR]) and Istituto Centrale per il Restauro e la Conservazione del Patrimonio Archivistico e Librario (ICRCPAL) in Rome; the Opificio delle Pietre Dure (OPD) in Florence
- Regional schools: among them, the most important are the Scuola Regionale per la Valorizzazione dei Beni Culturali in Botticino (Brescia) and the Centro Conservazione e Restauro Venaria Reale in Turin (a joint venture between a private foundation and public administrations);
- Accademie di Belle Arti;
- Private schools;
- Training and practice with private conservators.

The programs offered by these schools were not uniformly coordinated, so that students were trained in different ways and with different degrees of knowledge and experience.

In 2009 and 2011, the Italian government approved a new law that outlined specific criteria and degrees of quality for the training of art conservators through a five-year program. Only the schools and the universities that are able to meet these standards are now allowed to graduate art conservators.

But the most important goal was achieved in Italy at the end of 2018. After almost seventeen years, thanks to national recognition of the professional status of art conservators, a comprehensive list was created that records all accredited conservators allowed to treat works of art that are part of the national cultural heritage, within defined fields of specialization (painting on panel and on canvas, wooden sculptures and polychrome wooden surfaces, mural paintings and decorated architectural surfaces, stones and mosaics, musical instruments, etc.). To obtain this status conservators have to demonstrate that they have worked for at least eight years for public museums and institutions, or obtained at least a three-year academic degree plus five years of documented work in public museums and institutions, or received a five-year academic degree. With the achievement of this long-sought goal of credentialing art conservators in Italy the government was able to hire more than eighty conservators to fill the many vacant positions in museums and Soprintendenze at the end of 2018. At the same time, new art historians, archaeologists, and architects were hired as well.

The situation in other European countries was discussed. In 2002, France passed a law making it mandatory for conservators to either have a master's degree from a recognized conservation program or be accredited in order to work on cultural heritage in public collections. The degree can be obtained through a standard five-year program or through a system of equivalence, Validation des Acquis de l'Experience (VAE), which is offered through a university. Accreditation is available to practicing conservators who were working for institutions before the 2002 law. Nevertheless, in practice, the conservation staff of many public institutions still include practitioners who are not accredited and do not have a conservation degree. Some of these practitioners are trained craftspeople such as cabinetmakers who create new furniture for their institutions in addition to performing restoration treatments. Meeting participants pointed out that regrettably many original surfaces in historic buildings, many of them in use, such as the Elysée and the Assemblée Nationale,

had been repainted with nonreversible materials during restoration campaigns. These historic buildings are under the control of the Mobilier National or the Monuments Historiques, where there is very little supervision by trained conservators. Although there are many traditionally trained conservators in France who do not have degrees, many are sensitive to the value of preserving aged decorative surfaces and demonstrate interest in additional training opportunities offered in professional development programs such as workshops and conferences. Though wooden gilded surfaces have always suffered from neglect, they seem to be receiving more attention lately, as exemplified by recent studies carried out by students from graduate programs or conservators at the Centre de Recherche et de Restauration des Musées de France (C2RMF), as well as in the recent creation of a gilding group within the French Section of the International Institute for Conservation (SFIC). The technical knowledge of craftspeople was discussed at the meeting, and the group emphasized that it remains invaluable to understand traditional materials and techniques and that this technical knowledge should not be overlooked by academically trained conservators. Only the combination of academic and craft training can provide the necessary background to fully understand and treat works of cultural heritage. Another point to be noted, specifically with regard to the French system, is that there are very few institutional positions for conservators, resulting in a large number of private conservators working for both private clients and museums. Private conservators who work for museums have to submit treatment requests for proposals (RFP), either alone or as a group, to stakeholders in order to proceed with conservation treatments.

As previously stated, several countries have laws and accreditation systems that allow practicing conservators without an academic degree to work for cultural institutions. However, some countries, for example, Spain, fear that under such professional accreditation systems experienced practitioners may not be allowed to work for museums. In the United States, recent attempts to develop an accreditation system through the American Institute of Conservation (AIC) received great resistance from some practitioners within the conservation community and eventually failed to be implemented.

In public institutions in Spain, the law dictates that curators are responsible for treatment decisions. However, this law varies in actual practice, depending on the circumstances and the institutions involved. In cultural heritage institutes, there is a multidisciplinary team, including a curator, a chemist, and a conservator, that usually reaches a consensus with regard to conservation treatments. The dialogue between curator and conservator in most cases is efficient; curators respect the conservator's opinion as a specialist in the subject, and vice versa. In private institutions, typically conservators decide on their own treatments while curators tend to undertake a managerial role.

In the United Kingdom, there is a framework for accreditation through the Institute of Conservation (ICON). Accreditation requires five years of practice after graduation and is a stringent process. While it is seen as a career development step and is often required or desirable for conservation job applications, it is not mandatory and is not yet the norm. Many reputable and experienced individuals without accreditation work for heritage institutions. There is always a risk that conservators with or without accreditation will not have the correct experience and skills required for certain jobs.

Control over the protection of cultural heritage varies greatly from one organization to another, and protocols and procedures are reviewed and updated frequently. There are numerous organizations that care for cultural heritage: cathedrals, churches, museums, the National Trust, the Royal Collection, English Heritage & Historic England, and Historic Royal Palaces. The scope of this project does not allow for an account of the control mechanisms each organization has in place when commissioning conservation treatment

of objects in their collections. However, most organizations have stringent rules and aspire to adhere to ICON's Code of Professional Standards. For example, the Church of England maintains its own heritage protection system under an ecclesiastical exemption that is an equivalent to the secular listed building system. For Anglican parish churches, it is the faculty system, and for cathedrals it is the Care of Cathedrals Measure. Before conservation can be undertaken, the relevant permissions need to be obtained. For churches, if the object is an item of special historic, architectural, archaeological, or artistic interest, legal permission needs to be obtained from the chancellor (judge) of a diocese. As part of the faculty process, a number of bodies are consulted for advice, including the Diocesan Advisory Committee (DAC), the Church Buildings Council (CBC), Historic England, and relevant amenity societies. The Church Buildings Council draws on advice from its six conservation committees and a fabric repairs committee, consisting of fifty-four experts with a deep and wide range of experience in the heritage sector. Conservation proposals are used by parishes to help them gain the necessary permissions. Permissions for work are generally requested by the parish (church warden, Parochial Church Council, or vicar). Different regulations apply to cathedrals. They are legally required to record objects of architectural, archaeological, artistic, or historical interest in an inventory. They must apply to the cathedral's Fabric Advisory Committee for permission to undertake work on such objects. Several cathedrals have conservation or works departments, comprising traditional heritage skills such as stonemasonry and stained glass.

In museums in the United Kingdom, such as the Victoria and Albert Museum (V&A) in London, treatment decisions are made after efficient dialogue between the curator, conservator, and conservation scientist. At the V&A, treatments range from minimal intervention to stabilize the object to more in-depth treatments for objects on long-term display, and all treatments are guided by the V&A Conservation Department's Ethics Checklist. Decisions can depend on the exhibition context and are often tightly linked to display setting; it is about the story to be told, the interpretation to be made of a given object in a given context. For example, an object with previous campaigns of restoration—even those of historical significance—could have these restorations removed to bring it to a state closer to its original appearance, so that it will fit its display setting. The same object could be treated in a more conservative way in a different context with a different story to tell. In rare instances, two different stories can be told, as in the following example shared during the meeting, where two stools from a pair, with layers of overgilding, were treated in two ways: one was left intact; the other was brought back to its original gilded scheme and original upholstery. Such an approach underscores the value of interpretation rooms in museums where an object can be presented outside of any context, and if that object is left in an "untouched" state, the room itself reveals to the public what happened to that object. The group discussed the idea of having small exhibitions present such objects, in both restored and untouched states, together with digital reconstructions showing what they may have looked like originally based on scientific studies of their materials and surface stratigraphy.

While comparing preservation policies and practices in different countries, participants of the meeting noted how interesting it was that in the United Kingdom, where the government is not in charge of preservation, there is still a lot of control over what is being done, whereas in Brazil and to some extent in Italy and France, where the government takes full responsibility, there is very little control over treatment decisions.

In Australia, treatment decisions for gilded surfaces are mostly determined by conservators of gilded wood and frames; however, for larger treatments, decisions such as the level of cleaning tend to be made in consultation with the relevant curatorial staff. Although

curators might initiate the treatment process in the context of an upcoming exhibition or loan, gilding conservators are usually responsible for identifying objects requiring treatment in the collection, which is undertaken when time permits. Treatment proposals are discussed with relevant stakeholders and time lines are established. The dialogue between various stakeholders is effective, practical, and invaluable for maintaining good working relationships within the organization. Regarding the treatment, there is very little input from curators, who rely on conservators.

In museums and cultural institutions in the United States, there is typically efficient dialogue between conservators and curators about conservation treatments. A curator's level of input can vary greatly from one institution to another. For instance, some institutions may only have a curator of paintings with limited knowledge or appreciation of frames, while in another institution there may be a furniture curator with strong interest in decorative surfaces.

Another factor that influences decision making is the source of funding. This idea was illustrated at the meeting in the example of the treatment of a seat in a large French institution. A modern printed cotton, although inconsistent with the historic seat frame, was selected for the upholstery at the request of the *mécène* (patron) financing the treatment. Unfortunately, financial factors often influence conservation treatments. Another important point of influence was discussed during the meeting: the shift away from the collection toward the public. Concerns were raised that institutions often give priority to attracting and pleasing the public rather than to the preservation of collections. The group discussed the shared impression that in some instances curators are losing authority to marketing, which is linked to the source of funding, such as government versus private benefactors.

In addition, some institutions like the V&A devote much of their resources to public programs and do not have enough conservators on staff to meet all the conservation needs of their own collections. This results in little time for research or in-depth treatments. These institutions sometimes rely on bringing in contract staff. It is not always possible to find the level of experience required for short contracts. In these instances, the institutions may ask contract staff to carry out minor treatments in order to allow their own staff to focus on more in-depth projects. Outside companies are occasionally employed, particularly for large treatments such as period rooms. For all external contracts, companies must adhere to specifications drawn up by the institution. This can have an adverse effect on the decorative arts, including wooden gilded surfaces, which are typically considered of less importance and value than the fine arts.

Indeed, a major concern among all participants at the meeting is the gap in recognizing the value of preserving the decorative arts at the same level as the fine arts. One participant gave the example of a treatment campaign in a French church where two different conservation teams were hired: one for decorative painting led by a craft-trained conservator and another for figurative paintings led by an academically trained paintings conservator. Differences in ethical considerations were obvious: the team discussed every detail of the figurative paintings but devoted very little discussion to the decorative surfaces. Despite having been able to reveal an aged, potentially original gilded surface, it was decided to regild it. In this case, the decision was made by a committee that consisted of people from administrative entities with no curator present. The group then discussed similar situations in which curators were present in committees but did not have the necessary material knowledge of the object to fully understand it and make informed treatment decisions. The group discussed the fact that there is often more interest in the appearance than in the materiality of a decorative surface. All participants agreed on the crucial need for conserva-

tors to raise awareness of and promote appreciation for the materiality of such surfaces. The conservator's practical experience can inform a broad audience about manufacture techniques and materials, anticipate aging behaviors, and guide sensitive and justified formulations of treatment options in proposals. But of equal importance is the ability of a conservator to efficiently communicate options to his or her interlocutor, especially when too many stakeholders are involved. Often decision makers argue that the public would not see the difference between, for example, bronze paint and the real surface, which may not be true. In any case, this type of thinking calls for the need to educate the public instead of deciding for them what they want to see and what they are able to appreciate. We ended this discussion feeling empowered that we can, as individuals, make a huge difference through outreach, education, and the engagement of stakeholders and communities.

Education

During the first day of presentations, all participants discussed the level of knowledge of wooden gilded surfaces by various stakeholders involved in their preservation, as well as the educational offerings in their countries related to the preservation of these surfaces. Educational needs were assessed, as much for conservators as for a cross-disciplinary audience.

On a broad level, all participants agreed that there was a need to increase the knowledge of historic styles, techniques, and materials used to create gilded wooden objects, including frames. This knowledge is necessary to be able to correctly interpret these surfaces and to make informed treatment decisions. This concerns conservators and anyone else involved in making decisions related to the treatment and preservation of gilded surfaces.

In terms of educational opportunities in the conservation of wooden gilded surfaces, it became evident that there was a lack of specialized training available internationally. It was emphasized by the group that it is difficult to specialize in “decorative surfaces,” and when specialized training is provided, it is not offered broadly but on an individual basis and is driven by a student’s particular interest. For instance, a student in paintings or furniture conservation could decide to work on a few gilded object projects, but very rarely could they fully specialize in decorative surfaces. Could this inability to specialize in decorative surfaces be related to the lacking recognition and diminished value of preserving decorative surfaces that was discussed earlier? Feelings of enthusiasm and a desire for change were voiced during the meeting and encouraged the participants to address additional needs in education. It was recognized, however, that it can be very challenging to incorporate new courses in graduate programs, highlighting the need for specialized learning opportunities outside of graduate school.

Summarized below are highlights from the participants’ presentations on their countries’ educational focus on wooden gilded surfaces and available training opportunities.

In Australia, the conservation of wooden gilded surfaces is a narrow field of specialization, due to the limited presence of such objects in the country. Polychrome sculptures, icons, and gilded furniture are considered rare items in Australian collections; therefore, specialists in gilded objects conservation focus mostly on the conservation of picture frames. Conservators outside the gilding or frames conservation departments have varied knowledge of wooden gilded surfaces, depending on their educational backgrounds. Those who obtained a conservation degree in Europe in specializations such as paintings or polychrome sculptures would have generally sound knowledge of the conservation of wooden gilded surfaces. In contrast, conservators who are trained in Australia and who specialize in paintings or objects in that country would have limited knowledge in the area of wooden gilded surfaces, often based on conservation textbooks (Rivers and Umney 2003); if needed, they request guidance from the gilding/frames conservation staff.

The conservation of wooden gilded surfaces and gilding methods are not included in the curricula of existing conservation courses in Australia, while frame conservation is marginally covered. Australia offers two conservation programs, a graduate program in Melbourne and an undergraduate program in Canberra. Australian conservation students who are interested in the field of gilded wood can ask for an internship at one of the several frames conservation centers (Art Gallery of New South Wales, National Gallery of Victoria, Queensland Art Gallery of Modern Art, Artlab). Unfortunately, the duration of the internship, which is included in the conservation curriculum at Australian universities, is limited to only three weeks per course period, which is inadequate for proper training as well as for preparing the future conservator to apply for a frames conservator position. In the past, any gaps in specialized skills in Australia were usually filled by conservators who were trained overseas; however, with limited funds available, allocated mostly for specific projects, it is unlikely that institutions will pursue the complicated endeavor of organizing work visas for overseas conservators for short-term employment. Short-term courses on gilding techniques or gilding conservation are organized in Australia occasionally but on an ad hoc basis. Short-term courses on surface cleaning have been offered several times in Australia over the past thirty years, but none has been related specifically to gilded surfaces. Hence, there is a strong need for conservation students and emerging conservators in gilding conservation to receive training in cleaning systems for gilded surfaces on wooden supports. Further, the lack of appropriate tutorial materials for gilding conservation may lead interested students and emerging conservators to feel lost in their attempts to progress in this field. There is a need to compose comprehensive bibliographies and guidelines on gilded surfaces conservation, which would help emerging conservators progress in this field. In addition, conservators in other specializations, such as objects or paintings conservation, who might require an understanding of the different types of gilding systems, including toning layers, and the specific cleaning approaches that apply to them would also benefit from such guidelines and materials.

Insufficient financial support for cultural institutions was raised as a limiting factor in the development of narrow fields such as gilded objects conservation in Australia. With the growing trend in the field of conservation to minimize intervention and treatment in favor of preventive conservation, it also seems inevitable that young conservators will not be as skilled in the wide range of technical skills known to the older generation of conservators. The need for close collaboration between educational and cultural institutions in Australia was brought up during the meeting as an essential component to provide appropriate conservation training for future conservators. Training opportunities could be offered through regularly scheduled workshops, seminars, and symposiums or through the introduction of flexible curricula to allow conservation students the opportunity to conduct their research or thesis studies at recognized conservation laboratories. In Europe, the cooperation between historic and cultural institutions, which exists nationally and internationally, allows for a helpful exchange of shared expertise and experience between conservators across institutions. Such a model could also benefit Australia.

In the United Kingdom, there is no dedicated specialized training in the conservation of gilded wood: the area is included in broader conservation studies that incorporate other disciplines. Many of today's experts are the products of an educational system that is now unfortunately declining. In recent years, several relevant courses have closed down, including the Royal College of Art /Victoria and Albert Museum (RCA V&A) program and conservation courses at London Metropolitan (London College of Furniture) and Buckingham University in High Wycombe. The main conservation courses include the following:

- The City & Guilds of London Art School: BA in conservation, 3 years; MA in conservation, 1 year
- West Dean College: Conservation Studies, postgraduate diplomas, and MA in Furniture and Related Objects Conservation, 1 year each
- Lincoln University: BA and MA in Conservation of Cultural Heritage, 3 years and 1 year
- University College London (UCL): MSc in Conservation for Archaeology and Museums, 3 years including the completion of an MA in Principles of Conservation

The above does not reflect all the educational offerings in the United Kingdom. Furthermore, these courses are in constant flux as regards content. The extent to which gilding is covered in each course varies.

Students come from a variety of educational and practical backgrounds. These courses do not require a certain level of practical experience before enrolling (unlike some of the European courses, for which a certain level of practical experience is a prerequisite for admission)

The gilding aspects of each course differ. At City & Guilds, for example, students learn about the historic materials and techniques of gilding and produce sample boards with associated techniques in the first year. Investigative methods and the treatment of these surfaces are covered in the second half of the course. Cleaning methods taught relate to decorative surfaces generally and not always specifically to gilded surfaces. Nevertheless, it was reported that some gilding-specific final-year research projects carried out by City & Guilds students were of a high level. Generally, the teaching of cleaning on these courses comes from paintings conservation research, hence the need to study these methods specifically in relation to gilded surfaces. As teachers change, the content of what is taught also changes. It was felt that any future established cleaning methodology for gilded surfaces needs to be written into a curriculum that remains the same from year to year regardless of changes in staff.

The level of related knowledge of individual professionals was recognized as extremely high, with experts in science and theory of cleaning; conservators; craftspeople with years of experience; and art historians. This U.K.-based group of experts is in fact very international as many of them began their training abroad. However, the knowledge is somewhat disjointed, and there is often difficulty combining theoretical and practical knowledge. The chemistry of cleaning involves one set of skills, but practical experience is needed to use cleaning solutions effectively; the luxury of combining all knowledge strands is not always an option. Developing an ability to recognize original surfaces and gaining knowledge of historic gilding trends comes with experience, and decisions ideally need to be made in consultation with a variety of colleagues. There must be an awareness of the limits of one's knowledge and acceptance that one may not be the right person to carry out the work and that it is often necessary to seek out individuals with the right experience. This is an important point with wooden gilded surfaces, which are often in the care of furniture or paintings conservators whose knowledge in gilding techniques and materials may be limited.

Another concern, shared by several participants, was the feeling that there is a decline of craftsmanship in training. One participant's experience working with recent graduates has led her to observe that the level of practical knowledge and understanding of gilded surfaces has diminished, with more academic theoretical knowledge than manual dexterity and skills. Globally, it seems that craftsmanship counts for less, while collection care is most important. Conservation degree courses, while still of the same length, include further

elements at the expense of time-consuming manual skills and practice. These remarks again point to the need for future practitioners to understand how surfaces are made in order to be able to treat them.

Moreover, there are fewer conservation positions in the public sector, resulting in more conservators being drawn to the private sector but with varied levels of competency. Consequently, there is a fundamental need for private conservators to hone practical skills, which may in turn drive a demand for such training. There are too few opportunities in the United Kingdom for continuing professional development. There are some renowned long and short courses at West Dean that deliver core practical skills, but in general elsewhere there is more attention to collection care training. Specialty groups of the Institute of Conservation (ICON), such as the Gilding and Decorative Surfaces Group, offer practical day courses, sometimes only demonstrations, but anything directly gilding related is quite rare.

FIGURE 3
Participants engaged in a conversation during the meeting.
Photo Gilles Auffret © J. Paul Getty Trust



In France, traditional gilding techniques can still be learned through apprenticeships, but there is no formal training in the conservation of gilded surfaces in graduate programs. As seen in other countries like the United States, any form of gilding specialization would be offered on an individual basis at a student's request, with limited opportunities available. French participants described the current educational offerings available in France.

- An apprenticeship, between an apprentice and a workshop/studio for two years, delivers a Certificat d'Aptitude Professionnel (CAP) (offered in Paris, Revel, Strasbourg and Marseille), which takes place in a Centre de Formation d'Apprentissage (CFA). Apprenticeships used to be three years long but were reduced to two years four years ago. These are short-term training opportunities focused on how to make new objects; they do not include conservation content.
- Academic training opportunities (five-year master's degree): the Institut National du Patrimoine (INP) offers eight specialties: painting, sculpture, furniture, textiles, ceramics, metal, paper, and photography. Students choose an object from an institution or a museum for their master's thesis at the end of their fourth year.

There is no gilding major, so interested students must ask to specialize in gilded surfaces during their fifth year and try to find an object in an affiliated institution. As of today, only five graduates from the INP have studied gilding. Once again, this indicates insufficient recognition of gilding as a field of study; it is seen only as an additional step of a finishing process instead of a fully developed specialty. The five above-mentioned students came to the C2RMF to do an internship and now work in the private sector. One student gained training at the V&A through an internship. The second program in France to offer a master's degree is hosted by the University Paris I Panthéon Sorbonne: the Master Conservation Restauration des Biens Culturels (CRBC), formerly known as Master des Sciences et Techniques (MST), which offers several specialties but not gilded surfaces. The Ecole supérieure d'art d'Avignon and the Ecole supérieure des Beaux-Arts de Tours also train conservators in the respective specialties of paintings and sculpture conservation.

In Spain, wooden gilded surfaces predominate, with numerous large-scale examples of gilding such as altarpieces and related architectural elements. As one would expect, conservators in Spain have a strong understanding of gilded surfaces as they are prevalent in altarpieces, panel paintings, and sculptures. However, curators, who are trained as art historians or architects, do not have the same level of knowledge due to insufficient academic training on artists' techniques and materials, except when curators are also conservators. In the specialty of furniture, knowledge of materials and techniques is rather low due to the lack of academic studies in this discipline. There is no master's degree in furniture conservation in Spain.

In terms of educational offerings in Spain, the conservation of gilded surfaces is never offered as a specific subject. Summarized below are the existing conservation training opportunities.

- At Fine Arts Faculties, gilding is not taught as a specific subject but rather as part of the conservation of panel paintings, polychrome sculpture, and altarpieces. These faculties offer a four-year degree in conservation and restoration of cultural heritage, plus one year to attain a master's degree.
- Superior Schools offer a four-year degree in conservation and restoration of cultural objects, plus one year to attain a master's degree.
- Short-term training courses are offered by some of these educational institutions or cultural heritage institutes. The courses are taught by specialists such as Paolo Cremonesi and focus on general cleaning systems. They occur about every two years.
- Private workshops and professional associations occasionally organize short-term courses and conferences.

Future learning opportunities in Spain could be offered to conservation professionals and students in the form of specific seminars and workshops, or they could be included as a specific subject of study in conservation programs at Superior Schools and Faculties. This knowledge could also be shared in publications. The Spanish participant at the meeting stated that her colleagues in Spain expressed great interest in having training on this specific topic.

Brazil's cultural patrimony also includes numerous large-scale examples of wooden gilded and polychrome surfaces, especially in its hundreds of churches. For instance, the well-known city of Ouro Preto alone counts over twenty-seven churches with such surfaces. As discussed in the first section of this report, the preservation of these surfaces faces

constant challenges. Some conservators have good knowledge of materials and techniques used to create these surfaces, but academic training in preserving them is unfortunately quite limited. Three new conservation training courses in Brazil, all at the undergraduate level, are offered at the Federal University of Minas Gerais (UFMG; CECOR), the Federal University of Rio de Janeiro, and the Federal University of Pelotas (UFPEL), in the south of Brazil. These university courses represent an important investment in producing qualified academic conservation professionals, as well as the future of Brazilian conservation research, services, and training. Of the three courses, CECOR has been active the longest and has experience working with churches and the state. Already in 1989, a gilding course organized with the Getty was held at UFMG; since that time, training efforts have been expanded. Because of the need to refresh and train professionals already working with the National Institute for Cultural Properties, UFMG and UFPEL have worked together in a training workshop specifically designed for the institute's professionals. It was clear that few if any institute technicians had the necessary knowledge about gilding, and they needed help and specific information to carry out responsibilities. This experience has opened up new possibilities for partnerships and specific training of the institute's professionals. Unfortunately, it is common practice in Brazil for these professionals to have nonpermanent positions in their original institutions, so the group of university teachers and researchers remains as the reference for continuity in dealing with long-term perspectives. In addition, although efforts to achieve recognition of conservation as a professional discipline are under way, it will be some years before this is accomplished and protocols and regulations are established for conservation practice and intervention.

The following points were discussed with regard to training in Brazil.

- The need to train the new generation of teachers, including hands-on training. A decrease in practical training in academic programs also seems to be a concern.
- The development of gilding practice training sessions and didactic teaching tools.
- The development of interaction between graduate and undergraduate research and teaching programs. As mentioned above, conservation programs in Brazil are offered only at the undergraduate level, and they have a duration of four years. However, some graduate programs in the arts have developed courses open to students from other majors and are willing to accept conservators. At present these programs are trying to find a balance between research and arts and to combine efforts that would benefit conservation students.
- The development of new cleaning methods specifically for wooden gilded surfaces.

In the United States, the four graduate programs in conservation do not offer decorative surfaces as a specialty, and it is challenging to develop a major in decorative surfaces. The Winterthur/University of Delaware Program in Art Conservation (WUDPAC) once offered a major in decorative surfaces but only for a few years. Cleaning systems for a broad range of surfaces are part of U.S. curricula, especially at WUDPAC, where innovative cleaning systems were developed. It was agreed during the meeting that basic training in gilding should be incorporated in the graduate program curriculum. There could be a stronger focus in graduate schools on how to approach the cleaning of these surfaces. Testing for solubility to determine the appropriate cleaning approach is a good place to start, but it is not sufficient. A broader understanding of gilding materials and techniques would better inform treatment decisions for wooden gilded surfaces. Regardless of conservators' specialties, at some point in their careers they will have to deal with a gilded surface; therefore, they should have the basic knowledge to understand these surfaces and talk about them.

Cleaning Systems for Wooden Gilded Surfaces

Major Issues and Challenges

The group addressed several important issues that affect the cleaning of gilded surfaces. Cleaning gilded surfaces is not a straightforward process: treatment decisions can be difficult, and cleaning goals are not the same for everyone. Targeted materials such as heavy soiling or bronze overpaint may be reduced or removed, depending on the nature of the surface. Previous restorations or other campaigns of gilding may be partially or completely removed as well, although these actions raise questions of how far to go during cleaning and whether in such cases the term “cleaning” still applies.

One of the biggest challenges in cleaning gilded surfaces as stated by the participants is that knowledge of surface interpretation is lacking among conservators, especially among recent graduates. Even for skilled gilding conservators, oil and water gilding techniques can be challenging to identify, especially when aged coatings or additional materials are present. These materials, which may consist of dust, dirt, animal glue, an artificial patina, or a coating of varnish, wax, paint, bronze powder, lime “Terre de pipe,” or gesso, can obstruct our understanding of the gilded surface in terms of its sensitivities and condition. Since the nature of what conservators are dealing with is not always clear, cleaning gilded surfaces can be a risky undertaking. Over the course of individual presentations and discussions, the group identified several problems commonly encountered during the cleaning process.

- Solubility issues and the dangers of undercutting original material such as water-soluble dirt on top of water-soluble gesso in water gilding or bronze powder paint on top of oil gilding.
- Presence of wax-resin coatings, shellac, or oil-resin varnishes, which can further complicate the removal of dirt and overpaint.
- Original toning layers, such as varnish-based colored glazes or matting animal glue. Matting glue layers in particular, which are often ephemeral, hard to characterize, and highly deteriorated, are easily removed by water-based cleaning. The ethical question was raised whether or not conservators should try to preserve this highly sensitive matting glue layer during a treatment, since it can easily be mistaken for grime.
- Inability to clean evenly due to selective restoration treatments, applied at different times, or different finishing techniques applied during manufacture. Previously cleaned surfaces may be more sensitive in some areas than others, and burnished water-gilt areas might clean differently from unburnished areas.
- Thinness of the metal leaf, which makes the material highly susceptible to loss or abrasion from cleaning materials such as cotton swabs.

The group emphasized numerous times during the meeting that before conservators design a cleaning system for a gilded surface, they must understand the nature of the surface in their care and clearly identify what they are aiming to remove.

Materials and Techniques Used by Conservators to Clean Gilded Surfaces

The participants discussed a range of cleaning techniques and cleaning systems they were familiar with, which included traditional methods such as solvent cleaning and mechanical removal using scalpels or organic tools. While discussing specific treatments, the participants discussed some of their typical materials and preferred cleaning methods to remove intractable dirt, as well as various nonoriginal coatings and bronze overpaints, from both water- and oil-gilded surfaces.

- Solvent cleaning using free solvents, applied with cotton swabs
- Aqueous cleaning: adjustment of pH, with the addition of chelators
- Gelled systems: Carbopol and Ethomeen-based solvent gels, aqueous systems such as Xanthan and Pemulen gels or emulsions (water in oil or oil in water), silicone emulsions made with silicone polymers, and Agar Agar gels
- Poultices used in combination with swabs in aqueous or solvent cleaning
- Laser cleaning, used alone or in combination with gel cleaning. This method was suggested for cleaning heavily soiled yet fragile gilded surfaces. The pros and cons of various laser systems were discussed, including the Lynton compact phoenix Q-switch Nd:Yag 1064 nm LASER system and the Er:YAG 2940 nm laser system.
- Dry cleaning methods such as cosmetic sponges. It was mentioned that cosmetic sponges might cause surface abrasion. One study at a U.S. institution analytically identified gold residue on cosmetic sponges after cleaning.
- Mechanical cleaning using scalpels or organic materials, such as thorns (from barberry and pyracantha shrubs) mounted in pin vises, or wooden tools. This method was discussed as a possible option for removing bronze paint on top of original water gilding. Spatulas made of bone, ivory, and tortoiseshell were also discussed as possible organic materials for working with multiple layers of gilding due to their hard but sufficiently soft edges that may reduce damage to early layers of gilding while removing nonoriginal layers.

Applying the Modular Cleaning Program to Wooden Gilded Surfaces: What Can We Learn, and Where Do We Go from Here?

On the second day of the meeting, the group participated in a theoretical discussion and demonstration-based cleaning session for gilded surfaces using the Modular Cleaning Program (MCP). The MCP, developed by Chris Stavroudis, is both a database and a methodological approach to cleaning with aqueous, solvent, or solvent gel-based cleaning systems (Stavroudis 2017). Chris presented the MCP to the group with a focus on using controlled aqueous cleaning systems to remove dirt or bronze powder paint from gilded surfaces without affecting the gold or the substrate. Although aqueous cleaning systems

often work well to remove water-soluble dirt or grime, they can be perilous in conservation practice as they can easily undercut the metal leaf by affecting gesso substrates or water-sensitive layers. As discussed in the session, conservators can control aqueous cleaning methods by adjusting the pH and conductivity of the water; adding agents like chelators, surfactants, or gelling agents; and dispersing them into water-in-oil emulsions using, for instance, silicone-based polymeric emulsion stabilizers. Several of the modifications that were discussed are explained below.

- Buffering materials help to maintain the pH of an aqueous cleaning solution and may be important for solubilizing certain materials and not others. To avoid solubilizing an organic material, such as an original matting layer of glue, it was suggested that acid groups be kept on the surface by maintaining the cleaning solution acidic. In a general sense, this would allow the use of water on an otherwise water-sensitive surface like water gilding. It was suggested that for cleaning water gilding, it may be beneficial to buffer the aqueous solution specifically to the isoelectric point of the glue, because it is the only point at which the glue would not be soluble in water. To remove organic materials such as glue layers or surface grime, it was suggested that the aqueous solution have a higher pH than the acid groups on the surface.
- Common chelators such as citric acid, ethylenediaminetetraacetic acid (EDTA), and diethylenetriaminepentaacetic acid (DTPA) might be considered safe for gilding as they interact with metallic ions, not metals. Aqueous solutions containing a chelator may help to release intractable dirt by targeting magnesium and calcium ions on an oxidized surface and may also remove some corrosion products.
- Pemulen and xanthan gum are possible gelling agents for adjusted water systems. As polymeric emulsion stabilizers, they can gel aqueous solutions and are compatible with a variety of solvents (including xylene, mineral spirits, and benzyl alcohol) to form oil-in-water emulsions. Although Pemulen and xanthan gum were not suggested for use on water-sensitive surfaces, they might be good options for cleaning oil-gilded surfaces.
- Silicone-based polymeric emulsion stabilizers such as Shin-Etsu KSG-350Z (KSG) or Velvessil Plus can be mixed with any polar solvent (water, acetone, ethanol, benzyl alcohol, etc.) to form water-in-oil emulsions. Since these materials allow water to be delivered to a water-sensitive surface, they might be a good option for cleaning water-gilded surfaces.

To facilitate the discussion by providing examples of practical applications, gilded frames containing various levels of soiling and nonoriginal coatings were available. Throughout the session, Chris and the participants discussed various cleaning approaches that could be designed for these specific situations. Though the format and length of the session did not permit developing a methodical cleaning protocol for these surfaces, the discussion brought up some interesting ideas and rich exchanges between participants. From the various cleaning scenarios discussed, the group evaluated the nature of the gilded surface and its stability, evaluated coatings on top of the gold leaf, and established what they would wish to remove during cleaning. They discussed protocols for solubility tests for removing surface dirt and bronze paint, starting with the least polar cleaning system before advancing to more polar systems.

The participants also shared their personal experiences in formulating cleaning systems and discussed the benefits of slowly unpacking nonoriginal coatings or materials

during cleaning. It was recommended that conservators conduct cleaning tests in many different locations because the surface may not clean evenly due to selective past treatment or different techniques applied during manufacture, such as a matting layer of glue or selective burnishing.

The group praised the benefits of assessing the limitations of those systems under the microscope. It was mentioned that by purposefully going too far with a small cleaning test—such as damaging some gold leaf in the process of removing intractable dirt—the conservator can better understand how to protect the surface by amending the cleaning system to safely allow more contact time. For example, if an aqueous system works well to remove dirt on a water-sensitive surface but damages the gold in the process, the conservator might put that system into a silicone KSG gel to have greater control of the water and avoid damage.

Evaluation of Wooden Gilded Surfaces and the Effects of Cleaning Systems

On the third day of the meeting, presentations and discussions addressed analytical tools and techniques used by conservation scientists and conservators to study gilded surfaces and the effects of cleaning systems. Colleagues from the GCI Science Department joined the discussions: Michael Schilling, senior scientist and head of materials characterization research, and Douglas MacLennan, research lab associate.

Analytical methods for analyzing gilded surfaces were presented by Nathalie Balcar, conservation scientist at the Centre de Recherche et de Restauration des Musées de France (C2RMF), and Luiz Souza, conservation scientist and head of the Laboratório de Ciencia da Conservação (LACICOR) in Belo Horizonte, Brazil. Through individual presentations and discussions, the group identified several techniques used by conservators and scientists for gilding documentation and analysis:

- Photography of the gilded surface being analyzed, front and back, when possible.
- Observation of the gilded surface under the microscope and under UV fluorescence (using an ultraviolet light source) to prepare for sampling.
- Cross-section sampling under a microscope and processing. It was recommended that the person taking the sample should check under both reflected visible and UV light to verify that the sample contains all the coatings and layers seen at the sample site. Macro photography of the sample, front and back, was also encouraged, as well as documentation of the sampling site before and after sampling.
- Analysis of the cross section using the following techniques:
 - Reflected visible and UV fluorescence microscopy using reactive fluorochrome stains for marking proteins, lipids/oils, or carbohydrates. Chemical spot tests were presented as a useful and low-cost alternative for characterizing possible binders in the sample. Chemicals such as Amido Black for proteins and Lugol's Iodine for starch were discussed.
 - Portable Fourier Transform Infrared Spectroscopy (FTIR) with a Reflectance Probe (such as Attenuated Total Reflectance [ATR]), placed on top of the sampling site, was presented as a useful technique for studying organic layers in the sample and for monitoring the cleaning process. While discussing the benefits of mapping the surface of a sample with FTIR-ATR, it was suggested that by introducing a fluorochrome tracer into a cleaning system conservators might be able to observe if their cleaning system undercuts the metal leaf and migrates into the ground. However, it was mentioned that some gels have inherent fluorescence, which would make this assessment difficult with gel cleaning systems.

- Scanning Electron Microscopy–Energy Dispersive X-Ray Spectroscopy (SEM-EDX) was discussed as a useful technique for characterizing the metal leaf in terms of its elemental composition and/or number of gilded sequences and layers containing inorganic clay or pigments.
- Spatially resolved X-ray Fluorescence (XRF) analysis to characterize gold leaf alloys was also discussed. Although XRF can be useful for non-destructive elemental analysis of gilded surfaces, recent attempts to characterize gold alloys using this technique revealed numerous challenges and inherent pitfalls.
 - Several issues were raised in making (semi-)quantifications of extremely thin layers of gold leaf. One has to take into account the numerous overlaps of gold leaf present on a gilded surface, which will give higher intensities of gold and copper compared to the actual leaf. If multiple layers of gold leaf or shell gold are present, XRF of the surface will produce unwanted matrix effects and secondary excitations.
 - Poor silver excitation was identified as an inherent problem with using spatially resolved XRF systems having a rhodium tube and polycapillary focusing optics.
 - Three-dimensional (3D) gilded surfaces were described as very difficult to examine with XRF since the object's geometry interferes with perceived intensities of gold and copper. It was mentioned that XRF would be a difficult technique to determine what is present and what is being removed on the surface of a 3D object during treatment.

The group participated in an open discussion about assessing cleaning methods and efficiency. Methods of analysis, ranging from low tech to high tech, were further explored, and all participants shared helpful strategies and techniques learned from their professional experiences.

Cross-section microscopy is a low-tech approach to the analysis of gilded surfaces and can help guide cleaning tests. Conservators can use their cross section as a road map for cleaning complex surfaces. It was recommended that conservators take comparative cross sections during the cleaning process, which would better inform the safety and efficacy of the cleaning system. Several participants emphasized the importance of also taking macro photographs using the microscope to allow visual evaluation of the effects of a cleaning system on the surface.

While discussing cleaning assessments, the group asked about possible gold leaf abrasion from common cleaning materials, such as cotton swabs and cosmetic sponges. It was suggested that conservators might examine their cleaning swabs under the microscope under UV fluorescence, or use XRF to look for trace gold that might have been removed during cleaning. The group discussed numerous ways conservators can reduce abrasion if gold leaf is detected. For example, it was recommended to avoid rubbing and rolling with a cotton swab; instead, the cleaning system should be applied with a brush and dabbed with a swab to remove. It is important as well to invest in good-quality cotton. Atomic Force Microscopy (AFM), which can visualize nearly molecular change on the surface, was also considered as a useful analytical method for assessing abrasion during cleaning. Although questions were raised about possible scale issues with AFM, it was referenced as a technique for studying the effects of surfactants on acrylic paints and could be applied to gilded surfaces.

Next Steps: Avenues for Action

On the last day of the meeting, the group discussed the next steps to be taken in light of the specific challenges and needs identified over the three days of the experts meeting. These include the following:

- The development of specialized training in the conservation of wooden gilded surfaces for conservators, from graduate programs to practicing conservators. The GCI is planning to develop a course with modular contents to address differences in needs, such as the nature and scale of gilded surfaces to be preserved, the academic backgrounds of practitioners, and the professional environment. The results of a survey sent by the GCI to the conservation community internationally will help assess the backgrounds, work environments, approaches, and needs of practicing conservators of wooden gilded surfaces (as of March 2019, the GCI collected over 150 responses).

In order to develop such a course, the GCI will be conducting research on the cleaning of gilded surfaces, which includes the development of approaches to carry out comparative cleaning studies specifically for wooden gilded surfaces. Ideas were shared during the meeting for preparing, testing, and analyzing mock-ups based on the MCP system. By testing mock-ups, difficult cleaning scenarios, such as removing dirt and grime from a thin and fragile layer of glue over water gilding, could be reproduced and assessed without complications from unknown materials. Removing bronze paint from oil gilding was also identified as a major challenge. It was also discussed that real objects should be thoroughly analyzed and tested along with the mock-ups because the cleaning tests would better inform each other. All cleaning tests would be documented and recorded in a table with standardized photographs.

- The development of reference materials, to be used as part of a course and made available to a broader audience in the form of a series of online publications. These may include guidelines on techniques and materials used in the manufacture and treatment of wooden gilded surfaces, documentation and assessment guidelines, cleaning methodology guidelines, and a comprehensive bibliography and glossary.
- The development of strategies to address educational needs beyond the field of conservation:
 - Communities. In countries like Brazil, communities can take charge of the preservation of *their* cultural heritage; they can initiate a legal campaign to protect this heritage if they are able to recognize its historical significance and cultural value. In any country, an educated community can make an enormous difference by recognizing and advocating for the preservation of decorative sur-

faces. The group discussed various ways to reach out to communities and will continue to exchange ideas on that topic.

- Museum visitors (both in person and online). Museums could design small exhibitions that present a degraded object along with a digital reconstruction of what it may have looked like originally, based on scientific study of its materials and surface stratigraphy. Didactic materials could explain the value of preserving an object in this condition as well as show various treatment approaches depending on the story to be told.
- Antique dealers. Although dealers often want a painting's gilded frame to look highly presentable, even sometimes in "brand-new" condition, this is not always the case. It was suggested during the meeting that the commercial sector should be targeted in our effort to raise awareness of the importance of preserving historic surfaces. Both the appreciation and the understanding of frames have improved over the past twenty years, and with it, there is more sensitivity and concern to the treatment of the gilded surface. Some large museums have frames conservators, but since many smaller ones do not, frame treatments are often outsourced to restorers who might regild them. It would be welcome if this GCI initiative would address this situation in the field.

* * *

The progress of this multiyear project will be regularly shared on the GCI website as well as in presentations at conferences. Meeting participants agreed to stay in close contact as the project develops. The GCI would like to warmly thank all the participants who generously contributed their time and expertise in this meeting and beyond.

References

- Rivers, Shayne, and Nick Umney. 2003. *Conservation of Furniture*. Oxford: Elsevier Butterworth-Heinemann.
- Souza, Luiz A. C., Y. F. Gonçalves, A. F. B. dos Santos, and Z .C. Tobias. 2014. "Legal Status of Cultural Heritage Protection in Brazil: The Role of the State Prosecution Office. Building a Strong Society through Conservation." In *ICOM-CC 17th Triennial Conference Preprints, Melbourne, 15–19 September 2014*, ed. J. Bridgland, art. 0803. Paris: International Council of Museums.
- Stavroudis, Christopher. 2017. "Gels: Evolution in Practice." In *Gels in the Conservation of Art*, ed. L. V. Angelova, B. Ormsby, J. H. Townsend, and R. Wolbers, 209–17. London: Archetype.

Digital Resources

- National Portrait Gallery bibliography on frames (U.K.): www.npg.org.uk/research/programmes/the-art-of-the-picture-frame.php.
- Frames blog (U.K.): <https://theframeblog.com/>.
- International multilingual dictionary, which requires users to register (free): www.imd.pk.edu.pl/?lang=en&page=main.
- Project on gilded wood conducted in Portugal, with resources available in Portuguese and English: www.gilt-teller.uevora.pt/.
- GCI past project on the conservation of polychromed wooden altarpieces (2000-2007), with publication, glossary and bibliography including information related to gilded wood: http://www.getty.edu/conservation/our_projects/field_projects/polychrome/index.html

Appendix 1:

Experts Meeting Participants

Zoe Allen

Zoe Allen first joined the V&A in 2000 to work on gilt wooden objects for the British Galleries and returned to the V&A in 2003 to work as Senior Gilded Furniture and Frames Conservator. She has been head of the Furniture Conservation Studio since 2015. Before joining the V&A full time, she worked as a conservator for both public institutions, such as English Heritage, and private conservation practices, carrying out projects at the Royal Academy, St Paul's Cathedral, and Somerset House. Allen has published articles on her work and in 2009 jointly published with Christine Powell the book, *Italian Renaissance Frames at the V&A: A Technical Study*. After receiving a first degree in French literature, Allen studied conservation at the City & Guilds of London Art School. Her training covered the conservation of objects made from wood, stone, and other sculptural materials; gilding; and decorative surfaces. She held internships at the National Institute for Restoration, Croatia; the Royal Collection, London; and the Museum of London.

Nathalie Balcar

Nathalie Balcar is an analytical chemist at the Centre de Recherche et de Restauration des Musées de France (C2RMF) in Paris. She assists conservators and improves knowledge of cultural heritage through cross-section studies and identification of pigments. She specializes in the characterization of organic materials, either natural or synthetic (binders, varnishes and adhesives), by various chromatographic techniques. Balcar holds an MS in analytical chemistry from the University of Paris 6–Pierre and Marie Curie. She began working in the cultural heritage field in 1996. In 2003 she updated the analyses of synthetic materials at C2RMF, and since 2008 she has focused her activities on analyses of plastics objects and materials in modern and contemporary art.

Sydney Beall Nikolaus

Sydney Beall Nikolaus is a post-graduate fellow in paintings conservation at the Colonial Williamsburg Foundation where she has been treating 18th- and early 19th-century American paintings. Before coming to Williamsburg, she spent two years at the Yale University Art Gallery where she focused on the technical research and conservation treatments of two Italian 15th-century *cassone* painted by Paolo Uccello (1397–1475). She earned an MS from the Winterthur/University of Delaware Program in Art Conservation in 2016, after receiving her BFA summa cum laude and Phi Beta Kappa from Virginia Tech in 2011. She has previous conservation experience from various institutions, including the Rijksmuseum, Amsterdam; the Freer Gallery of Art, Washington, DC; the Colonial Williamsburg Foundation, Virginia; and the Shelburne Museum, Vermont.

Stéphanie Courtier

Stéphanie Courtier is a conservator specializing in wooden gilded surfaces. She has worked at the Centre de Recherche et de Restauration des Musées de France (C2RMF) in Paris since 1996, after working in private workshops in Paris. She holds a CAP of Doreur-Ornemaniste from the École de la Bonne Graine in Paris. In her current position, she evaluates and treats gilded objects from French museums such as the Musée des Arts Décoratifs, the Musée du Louvre, the Châteaux de Versailles, and Fontainebleau. She recently established and is currently chairing the gilding group of the French Section of the International Institute of Conservation (SFIC).

Marie Dubost

Marie Dubost is a private conservator of gilded and painted wood with over twenty-five years of experience. She is accredited to treat objects from the collections of French museums. Manager of the Atelier de la Feuille d'Or since 1992, she now works with her husband, Florent Dubost, a furniture conservator, which allows them to offer a broader perspective of treatment, in terms of both structural issues and painted and gilded decorations. Dubost has traditional training as an ornamental gilder while being very knowledgeable about conservation techniques through professional training related to this area. She is a lecturer at the Institut National du Patrimoine (INP) in Paris in the painting, sculpture, furniture, and fine art sections, where she teaches traditional gilding techniques. She has worked on many objects and architectural elements from the collections of the Louvre Museum, the National Domain of the Castles of Versailles and Trianon, the Central Union of Decorative Arts, the Petit Palais, the Orsay Museum, the Museum Nissim de Camondo, the Eugène Delacroix Museum, the Fine Arts Museum and the Museum Magnin of Dijon, the Museum of Fine Arts of Angers, the Departmental Museum of Ancient and Contemporary Art of Epinal, the Museum of Picardy in Amiens, and the Condé Museum in Chantilly.

Mary McGinn

Mary McGinn received a BFA in painting and drawing from the Pennsylvania State University. After a decade of working as a picture framer and a technician in a cell physiology research lab, Mary returned to school to earn an MS in art conservation from Winterthur/University of Delaware (WUDPAC), with a paintings specialty. Two years of postgraduate work included a Kress Fellowship at the Pennsylvania Academy of the Fine Arts, focused on a survey and remedial treatment of frames, and an NEA Internship at the Baltimore Museum of Art. McGinn started a private conservation practice in the Philadelphia area, which she maintained for twelve years, working with a variety of public institutions, private clients, and dealers on paintings, frames, and painted objects. From 2006 to 2014, she was the paintings conservator at Winterthur Museum and adjunct associate professor at WUDPAC. Since 2015, she has been Conservator of Paintings at the Pennsylvania Academy of the Fine Arts, managing the conservation activities for the museum's permanent collection of 3,000 paintings, 10,000 works on paper, and 400 objects.

Peggy Olley

Peggy Olley is Associate Conservator of Furniture and Woodwork at the Philadelphia Museum of Art, where she has worked since 2006. She graduated from the Winterthur/University of Delaware Program in Art Conservation in 2005 with a specialization in painted and decorative surfaces. Her focus is the analysis and treatment of a range of decorative surfaces from the museum's diverse collection.

Leticia Ordoñez Goded

Leticia Ordoñez Goded is a furniture conservator with a PhD in art history from the Madrid Complutense University, with a specialization in historical furniture gilding techniques and wood finishes. She has developed her practice as a private conservator since 1985 in Arcas Restauración (Madrid) working for public and private institutions. She is a member of the Spanish group of the IIC (GEIIC), has been coordinator of the Decorative Arts Group since 2011, and has been a member of the scientific committees of various GEIIC Congresses. She has published works on furniture conservation, historic gilding techniques, and wood finishes in Spain and Italy. On the same subjects, she has lectured at conferences as well as coordinated, directed, and participated in courses and seminars in Spain, Italy, and Peru.

Malgorzata "Margaret" Sawicki

Malgorzata "Margaret" Sawicki was trained in gilded and polychrome objects conservation (PKZ, Warsaw, Poland) before moving to Australia and taking the position as head of frames conservation at the Art Gallery of New South Wales, Sydney. She studied the preservation of architectural heritage at Nicolaus Copernicus University, Torun, Poland (1978–81), and received a master of applied science degree in materials conservation, with distinction (2000), and a PhD for research on nontraditional gilding techniques as a substitute for the traditional matte water-gilding technique in compensation of

losses in gilded surfaces (2009), both from Western Sydney University, Sydney, Australia. In addition to research on materials and methods related to the conservation of gilded surfaces, her research interests include metallic paints and metal soaps formation in gold imitation finishes on wood. Sawicki was honored by the Australian Institute for the Conservation of Cultural Material (AICCM) with the Conservator of the Year award (1999) and with the Certificate of Appreciation for Outstanding Research in the Field of Materials Conservation (2009). She was a founder and first convenor of the AICCM Gilded Objects Conservation Special Interest Group, 1996–2001, and coordinator of the ICOM-CC Wood, Furniture, and Lacquer Working Group, 2008–14. For nearly thirty years she has been lecturing, conducting courses, and publishing on gilding conservation in Australia and overseas. Sawicki is also a Professional Member of AICCM, a member of ICOM-CC, and a recent nominee for an IIC Fellowship.

Luiz Souza

Luiz Souza holds an MSc in chemistry, with experimental work developed at the Institut Royal du Patrimoine Artistique (IRPA), in Brussels (1986–87), where his work focused on stone degradation and conservation techniques. The experimental work for his PhD in chemistry was performed under a Research Fellowship at the Scientific Department of the Getty Conservation Institute (1992–94). Since 1989 Souza has taught and conducted research at the Center for Conservation and Restoration of Cultural Movable Properties (CECOR), a pioneer institution, in Brazil, dealing with conservation training, research, and specialized conservation science services, established at the School of Fine Arts of the Federal University of Minas Gerais, in Belo Horizonte. During the period 1990–2000, Souza was director of CECOR. From 2000 to 2004, he was the graduate program coordinator at the School of Fine Arts and in 2009–13 director of the school. He was a member of the ICOM-CC Directory Board for three terms and a member of the Council of ICCROM. In Brazil he was head of LACICOR, the Conservation Science Laboratory, at the School of Fine Arts of the Federal University of Minas Gerais. From February 2014 to January 2015, Souza was a postdoctoral fellow at the Centro di Eccellenza SMAArt (Scientific Methodologies Applied to Archaeology and Art), a CNR–University of Perugia initiative, with a grant from the Brazilian government agency CAPES.

Chris Stavroudis

Chris Stavroudis is a private paintings conservator in Los Angeles. He developed the Modular Cleaning Program in 2002 as an offshoot of the work of Richard Wolbers and the Gels Cleaning Project at the Getty Conservation Institute. The Modular Cleaning Program is both an approach to cleaning and a FileMaker Pro database. He has codified the scientific basis of aqueous cleaning and solvent theories into the logic of the computer database. The program models aqueous chemistry at a given pH, reflects an ad hoc theory of solvent gel formulation, and makes calculations in Hansen solubility space as it guides the conservator in the preparation of test cleaning solutions. Stavroudis's collaboration with Richard Wolbers began when he was a workshop assistant in the August 1990 class, "Workshop on New Methods in the Cleaning of Paintings," sponsored by the GCI. To date, the MCP workshop has been offered in the United States (Cleveland, Chicago, twice in New York, and Skaneateles), Canada (Montreal), the Netherlands (The Hague, Maastricht), and Brazil (Rio de Janeiro). He received undergraduate degrees in chemistry and art history from the University of Arizona and a master's degree from the Winterthur/University of Delaware program in art conservation in 1983.

Judy Wetherall

After her graduation in conservation from Brighton and the City and Guilds of London Art School, studying in Italy and Germany, Wetherall established her reputation working on gilding, japanning, polychrome, and period paint. She is a Churchill Fellow and 2015 winner of the Lord Balfour of Burleigh Award for Excellence in Craftsmanship. She is passionate about her work, and her infectious enthusiasm has led her to teach in many institutions. Her portfolio is impressive and includes work for the National Trust, English Heritage, Royal Collections, the Globe Theater, Churches and Cathedrals, the Guildhall Art Gallery, and numerous private clients and most recently the new National Trust conservation studio at Knole, Kent.

Stéphanie Auffret, GCI Moderator

Before coming to the GCI, Stéphanie Auffret was a furniture conservator at the Winterthur Museum and an assistant professor in the Winterthur/University of Delaware Program in Art Conservation. She received both a PhD and an MA in art history from the University of Paris Sorbonne–Paris IV and an MA in art conservation from the University of Paris 1 Panthéon-Sorbonne. She has worked as a furniture conservator at the Museum of Fine Arts in Boston, at the Metropolitan Museum of Art in New York as a Mellon Fellow, and at Historic New England as a Kress Fellow, as well as at private conservation studios in France. As a project specialist in the Collections Department of the Getty Conservation Institute, Auffret manages several projects, including “Cleaning of Wooden Gilded Surfaces,” “Cleaning of Acrylic Painted Surfaces,” and “Recent Advances in Characterizing Asian Lacquer.” These projects all include a strong educational component targeting the conservation field internationally, through the development of training opportunities as well as dissemination of knowledge. This experts meeting and its report are a component of the “Cleaning of Wooden Gilded Surfaces” project.

Appendix 2: List of Getty Staff Present at the Meeting

Stéphanie Auffret, Project Specialist, GCI (organizer and moderator)
Charissa Bremer David, Curator of Sculpture and Decorative Arts, J. Paul Getty Museum
Davide Gasparotto, Senior Curator, Head of Paintings Department, J. Paul Getty Museum
Gene Karraker, Associate Conservator of Frames, J. Paul Getty Museum
Douglas MacLennan, Research Laboratory Associate, GCI
Silvia Ottolini, Painting Conservator and volunteer, J. Paul Getty Museum
Michael Schilling, Senior Scientist, Head of Materials Characterization Research, GCI



The Getty Conservation Institute