

President's Letter

Tricia O'Regan

Happy New Year, WAAC members!

Our incredible multi-term outgoing president, Sue Ann Chui, has officially passed the baton, or in this case, binder, to me, and I am excited to begin planning our next meeting in September.

November's meeting at the Getty drew WAAC's biggest attendance ever, and it was wonderful to spend three days in that bright L.A. sun networking, socializing, and learning from colleagues.

The talks were inspiring, reminding me once again of how essential it is to attend professional meetings. I come away reinvigorated for my work. I especially value the exposure to an

array of subjects at WAAC, as learning from those in other material specialties is useful to my work on paintings.

I want to give big thanks to the outgoing WAAC board members: president Sue Anne Chui, secretary Michelle Sullivan, webmaster Jennifer McGlinchey Sexton, and members-at-large, Tish Brewster and Rowan Gieger. Thank you for all the time you have put into the organization these past few years. Without these efforts, WAAC could not exist.

Welcome to our new vice-president, Geneva Griswold, secretary Colleen O'Shea, and MAL's, Kent Severson and Sophie Hunter.

So, on to September 15th to 18th, 2020!

We will be meeting on the shores of Fallen Leaf Lake, at Stanford Sierra Conference Center, better known as "Stanford Camp." It will be a return to a retreat (vacation!) setting, with time set aside to take advantage of the recreational activities that are part of any camp stay.

Details will follow in the next newsletter, and we will get the meeting website up as soon as possible. In the meantime, consider what talk you will be submitting! Some themes I favor include innovative treatment solutions, installation challenges and ingenious problem-solving, technical art history, new analytical techniques, and one of a kind treatments that you need to share. As you can tell, I'm all over the map! What I want are great talks, so push yourself and your colleagues into submitting. WAAC presentations are low-key and low-pressure, so it's a perfect place to give a professional talk to a friendly group.

Cheers,

Patricia O'Regan

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Alaska

Helen Alten and the Haines Sheldon Museum have been using digitized materials in programs and on Facebook, promoting the continuing digitization of collection materials. Archivist **Sara Delengova** is organizing the Alaska Indian Arts (AIA) materials to complete their finding aid. The work includes flattening maps using humidity chambers, organizing and sleeving photographs, and rehousing papers. The AIA archives records the resurgence of Haines' Native arts during the second half of the 20th century. Helen has been fundraising for a building expansion to include an environmentally sustainable HVAC and an elevator to improve disability access to the building.

Ellen Carrlee assisted in the preparation of *Women of Vision* at the Alaska State Museum, exhibiting women artists to recognize the 100th anniversary of women's suffrage. In December, she coordinated the return of a historic kayak to the Yup'ik community of Scammon Bay in western Alaska. She is also co-authoring an article in the upcoming issue of the *Alaska Journal of Anthropology* with Tlingit weaver **Anna Brown Ehlers** addressing a case study in indigenous authority for treatment decisions regarding a Chilkat robe.

In January, paper conservator **Jennifer Sexton McGlinchey** returned to Alaska to treat a complex oversized work on paper by Haida artist Donald Varnell recently acquired by the Alaska State Museum.

Nicole Peters will be finishing up her work in New Mexico and returning to Alaska in April 2020. Nicole visited the UAF Museum of the North in December for a preliminary site visit where she worked with archaeology collection manager **Scott Shirar** to prepare for an upcoming Save America's Treasures grant project. The project involves the rehousing and conservation of objects excavated from 13 sites along the Kobuk River during the 1940s. While in Fairbanks, Nicole also met with UAF ethnology senior collections manager Angela Linn to begin preparation for an upcoming NEH HRCC foundation-grant involving an indigenous watercraft workshop series and the conservation treatment of indigenous watercraft and related materials within the museum's collection.

At the end of September, **Sarah Owens** opened the 12th North American Textile Conservation Conference (NATCC) in Ottawa-Gatineau. She presented about the *Material Traditions* programs run by the Smithsonian Arctic Studies Center and the Anchorage Museum, since 2013, which provides a space for indigenous Alaskan artists to recover traditional skills in working with native materials. The presentation was well received, with other institutions expressing a desire to formulate similar programs. In addition, the conference was a special occasion as it marked 20 years since the first NATCC meeting in 1997, in Ottawa.

In recent months Sarah has been preparing objects for the current exhibition *Snow Flyers*, which celebrates the ways we recreate and travel on snow and showcases how Northern ingenuity has for centuries inspired people to adapt winter gear, equipment, and machinery for survival, sport, and transportation.

In November, **Monica Shah** presented at the WAAC annual meeting in Los Angeles about the major Anchorage-based earthquake in 2018, reviewing the response and lessons learned from the disaster. Since it had been many years since Monica attended a WAAC meeting, it was great to see friends and colleagues, and meet new ones. Sarah and Monica are now working on objects for installation in the Art of the North galleries and for an upcoming exhibit, *Aperture*.

In January, Sarah will be visiting Fairbanks as a recently appointed Museums Alaska board director. Museums Alaska is an institution representing more than 60 cultural institutions with members as far north as Barrow and as far south as Ketchikan in Alaska, and Sarah is grateful for the opportunity to support the organization and

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EDITOR

Carolyn Tallent

newsletter@waac-us.org

REGIONAL NEWS

Geneva Griswold
vp@waac-us.org

HEALTH & SAFETY

Chris Stavroudis

ARTICLES YOU MAY HAVE MISSED

Susanne Friend

COPY EDITOR Wendy Partridge

Photocopying

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Internet

Articles and most columns from past issues of WAAC Newsletter are available on-line at the WAAC website, a part of CoOL (Conservation OnLine) <http://cool.conservation-us.org/waac/>.

Deadline

Contributions for the May Newsletter should be received by the Editor before **April 2, 2020**.

Western Association for Art Conservation

The Western Association for Art Conservation (formerly, the Western Association of Art Conservators), also known as WAAC, was founded in 1974 to bring together conservators practicing in the western United States to exchange ideas, information, and regional news, and to discuss national and international matters of common interest.

PRESIDENT

Tricia O'Regan
president@waac-us.org

VICE PRESIDENT

Geneva Griswold

SECRETARY

General Information
New Memberships
Publication Orders
Colleen O'Shea
secretary@waac-us.org

TREASURER

Payments
Chris Stavroudis
om.com

MEMBERSHIP SECRETARY

Change of Address
Chris Stavroudis
membership@waac-us.org

MEMBERS AT LARGE

Anne Getts
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Justin Johnson

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Early Call for Annual Meeting Talks

We are now accepting proposals for talks to be presented at the 46th Annual Meeting.

Stanford Sierra Conference Center

Lake Tahoe/Fallen Leaf Lake, CA

September 15-18, 2020

We are seeking new and thought-provoking papers in all areas of conservation and related fields. In the best WAAC tradition, a wide range of presentations are eligible for consideration. We are particularly interested in papers that push the boundaries and challenge the profession to re/consider roles, responsibilities, techniques, and ideas. Since the meeting will take place in the Sierras, papers that highlight the art and history of the area and Northern California are particularly welcome.

Please keep in mind that individual presentations will be 20 minutes in length. However, suggestions for multi-session panels, incorporating multiple speakers, will also be welcomed. Emerging professionals are highly encouraged to participate!

Please submit an abstract no later than May 1, 2020

Proposals and questions can be submitted directly to:

Patricia O'Regan
president@waac-us.org

Regional News, continued

museums in Alaska in a greater capacity. Sarah and Monica successfully received a grant from Museums Alaska Collections Management Fund, one of three funds established at Museums Alaska to benefit museums, cultural centers, and individuals in the sector. The grant will support the costs for a graduate student in conservation to participate in a community-focused conservation internship. The internship will run through the summer months (June to August) of 2020 and will be based in the Conservation Lab at the Anchorage Museum. A key aspect of the internship is that it will be community-focused, and collaboration will be a key element modeled. During the internship, Sarah and Monica and the intern, will travel to Quinhagak for a collaborative preservation exchange at the Nunalleq Cultural and Archaeology Center. In addition, they will bring collections to examine and provide training to staff at the culture center.

Regional reporter:
Ellen Carrlee

Arizona

Nancy Odegaard taught a material characterization short course for graduate students at Winterthur Museum for University of Delaware Department of Art Conservation in November. Her article "Pesticide Contamination and Archaeological Collections: Contextual Information for Preparing a Pesticide History" was recently published in *Advances in Archaeological Practice* 7(3): 292-301.

Regional News, continued

Amy Molnar was hired in August as the new Lab Coordinator at ASM. She has been working on condition reports and treatments for an upcoming loan and was involved in work related to a repatriation.

Marilen Pool has finished up the Archaeological Perishables Project and is now moving onto the conservation of Cradleboards Project with **Susie Moreno**. Susie was interviewed and filmed for Spotlight on the Arts program, which aired in December. She also gave a presentation about conservation to students at San Miguel Catholic high school in Tucson. ASM conservators have collectively been working on the condition survey, treatment, and rehousing of 200 Hopi baskets as part of a large donation and the move and packing of Kalinga and Polynesian basketry in preparation for renovations.

Nancy, Marilen, Susie, and Gina presented at the Care and Conservation Techniques for Woven Hats and other Headdresses ATALM conference in Temecula, CA in October. **Gina Watkinson** also presented Photographic Documentation for Museum Collections Part 1&2 at ATALM. Nancy, Gina, and Amy attended the WAAC conference, and Nancy and Gina presented "Collaboration: Considering the Degradation of Polypropylene Products for Use with Collections."

Marilen Pool is finishing up course work for her PhD at the University of Arizona and will be preparing for comprehensive exams over the next several months. During the holidays she resumed conservation work for the Tucson Museum of Art on a variety of ceramic and mixed media pieces.

Alex Lim and Nancy are again organizing a conservation tour to Sonora this January. The group will visit several Spanish colonial missions in Northern Sonora. Alex will be teaching a materials conservation class in spring 2020 at the College of Architecture, Planning, and Landscape Architecture of the University of Arizona.

Last but not least, there is a call for abstract for Terra 2021, 13th World Congress on Earthen Architectural Heritage, due March 1st, 2020.

Luke Addington continued research and treatment of an ancient Egyptian wooden coffin. He will present the project at the 2020 AIC annual meeting. He completed treatment of a large suite of furniture from the Old Santa Fe Trail Building, NM for the Western Archaeological and Conservation Center, developed treatment techniques for Bouille marquetry and safe removal of catalyzed lacquer at the American School of French Marquetry, and continued researching photo degradation of dyes used in marquetry furniture.

Regional reporter:
Gina Watkinson

Hawaii

The Honolulu Museum of Art and the Hawaii State Art Museum have been keeping **Rie** and **Larry Pace** busy along with numerous private and corporate clients. Rie and Larry spent a few days on the Big Island doing an initial examination of the interior of the St. Benedict Roman Catholic Church (a.k.a. The Painted Church) as the first step to developing a long term, multi-stage conservation of the painted interior walls and ceiling.

At the University of Hawaii-Manoa Library, paper conservator **Liane Naauao** assisted with the condition assessment and packing preparation of 50 items from various library collections that were loaned to the National Museum of Japanese History for their *Hawaii: 150 Years of Japanese Migration and Histories of Dream Islands* exhibit (29 October - 26 December 2019). Select items were treated in the paper conservation laboratory, including two oversized maps from the Romanzo Adams Social Research Laboratory (RASRL) collection. Liane continues to work on additional RASRL maps, architectural drawings from the Ossipoff & Snyder Collection, and rare maps of Hawaii. In addition, **Megan McInnis** recently joined the library's preservation department as preventive conservation specialist.

Last Fall, Liane flew to Maui to present a general overview on care and handling of archival material to staff from several institutions located in Maui County. Her session covered collections handling, storage options, and preventive conservation measures for archival collections, and was held as part of a collection care workshop sponsored by the Association of Hawaii Archivists.

Kent Severson at Shangri La Museum of Islamic Art, Culture and Design continues to reassess, rearrange, and redesign collection storage; with very limited space, it feels like a never-ending game of Tetris. Transformative work in textile storage was accomplished with help from **Ann Svenson**, consulting conservator.

The museum team at Shangri La continues to work on the conversion of the Damascus Room (a painted 19th-c. interior) into a gallery featuring the art of Qajar Iran. In addition to prepping objects, Kent worked with **Thor Minnick** to modify vitrines, making them suitable for display of glass and other delicate materials.

Working with **Leslee Michelsen**, curator, **Jeremy Pang**, collections and galleries coordinator and **Kristin Remington**, digital assets manager, the team produced a fine temporary exhibition of Indonesian masks from Shangri La's collection: *Out of the Shadows: The Performing Arts of Java and Bali*. In November, Kent Severson also made a short return visit to Iraq, to consult with the staff on the ground conducting recovery operations at the ancient site of Nimrud.

Regional reporter:
D. Thor Minnick

Los Angeles

After an eleven-month contract at the Shangri La Museum for Islamic Art, Culture, and Design in Honolulu, Hawaii and a several month adventure in Austin, Texas, **Ann Svenson** is relocating from San Francisco to Los Angeles. 5 Oaks

Regional News, continued

Textile Conservation will be based in downtown Los Angeles.

Happy New year from UCLA library preservation department! They have had a busy end of 2019, with many extra exhibit responsibilities as UCLA prepares to celebrate its centennial this year.

Fortunately, they are lucky to have **Nicole Alvarado** working with them as a third year intern from the Buffalo program, as well as their Kress conservation fellow **Michelle C. Smith**. Nicole is currently completing a major treatment on the 16th-century UCLA copy of the *Hutter Bible*, which will need major textblock stabilization and resewing before the wooden boards are stabilized and re-attached. Michelle has been stabilizing two heavily damaged mid-19th-century imperial Chinese documents, and is preparing to do a technical study on the library's four heavily illustrated Nuremberg carnival (Schembart) manuscripts produced in the 16th – 17th century.

Preprogram conservation assistant **Stephanie Geller** has been working on stabilizing framed art for hanging in the new framed storage racks in the Library, as well as stabilizing a couple 20th-century scrapbooks for research use. **Devin Mattlin**, collections conservation assistant, has been spending time monitoring the light levels as well as the temperature and RH in the UCLA music library, gathering information to assist with a preservation environments class taught by **Ellen Pearlstein**.

Collections conservator **Wil Lin** has been coming up with color printed dust jackets for books missing their spines at the Robinson Gardens Mansion library. These dust jackets cover missing or heavily damaged degraded spine leather in a house library. Together the jackets create a visual infill allowing visitors to the historic home to focus on the effect of the original library instead of the missing book spines.

Yasmin Dessem, Allie Whalen, and Chloe Patton, UCLA library AV preservation specialists worked with the Mazer Lesbian Archives as part of the WAAC “Angels” project this year,

organizing WAAC volunteers as they assisted the archive with identification and housing of AV materials. Allie and Yasmin continue to work with the Arcadia funded Endangered Archives Project, primarily focusing on Cuban AV materials, and may be traveling to Havana again in the next few months. They are all excited to welcome the new head of UCLA Library special collections **Athena Jackson!**

Antiquities Conservation at the Getty Villa had a busy fall. They welcomed their 2019/20 graduate intern **Almoatz-Bellah Elshahawi** in September. “Moatz,” a graduate in archaeological conservation at the Faculty of Archaeology Cairo University, was working at the Conservation Center of the Grand Egyptian Museum (GEM-CC) before coming to the Villa. They are very happy to have him in the department.

Susan Lansing-Maish is conducting a technical study of ancient gold fiber textiles together with curator **Mary Louise Hart**, and GCI scientists **Monica Ganio** and **Douglas MacLennan**. Last October, she presented this research at the VII Purpureae Vestes International Symposium: *Redefining Textile Handcraft, Structures, Tools, and Production Processes*, in Granada, Spain.

Jeff Maish attended the 9th interim meeting of the ICOM-CC metals working group in Switzerland last September, as part of his ongoing research on ancient metals. He also traveled to Tbilisi, Georgia to continue studies on bronze finds from the Vani archaeological site and to review several objects for loan.

Also in September, **Susanne Gänsicke** taught a six-day seminar on the conservation of ancient and historic metals in the Central-Asian Museum Conservators Training Program in Tashkent, Uzbekistan. This course, offering intense classes each September over a period of three years, is co-organized by the Oriental Institute/ University of Chicago and the State Museum for the History of Uzbekistan, and is funded by the State Department and US embassy in Tashkent.

Jessica Arista has been immersed in the study of Etruscan artifacts in preparation for a catalogue being written by curator **Claire Lyons**. The technical study of this material will be contributed to the online catalogue.

After the deinstallation of the exhibition: *Buried by Vesuvius, Treasures from the Villa dei Papiri* at the Getty Villa, **Erik Risser** escorted the ancient bronze sculpture of the *Drunken Satyr* that came on loan for treatment and display from the National Archeological Museum in Naples, and assisted with its reinstallation. Erik spent an extensive amount of time conserving and conducting technical research of this exceptional object excavated from the Villa dei Papiri in the 18th century. The exhibition included artifacts, some of which had only recently been discovered at Herculaneum, and **Marie Svoboda** had the opportunity to investigate and study the traces of ancient pigments remaining on their surfaces.

The decorative arts and sculpture conservation department at the Getty Museum welcomed **Karen Bishop**, a recent graduate of the Patricia H. and Richard E. Garman Art conservation department at the State University of New York College at Buffalo. Karen has been working with **Arlen Heginbotham** to clean an 18th-century Georges Jacob armchair, which will be featured in an upcoming exhibition that showcases its original paint, varnish, and upholstery (*Silk and Swan Feathers: A Luxurious 18th-Century Armchair*). Karen has also been working on the maintenance of the Stark Collection and will soon begin treatment of a pair of Boulle pedestals.

Julie Wolfe has been working with a team at the Getty to install Hanwell wireless dataloggers throughout the Getty Museum and integrate the data as part of an upgrade of the Center's HVAC system. The entire department has also begun conducting technical studies of the French sculpture in the collection in preparation for an upcoming online catalogue.

As part of this project, **Madeline Corona** has been utilizing 3D scanning to investigate the complex history of *Python Killing a Gnu*, a 19th-century plaster and wax model by Antoine-Louis Barye, and to compare the sculpture with related bronzes.

Regional News, continued

Arlen Heginbotham organized an XRF Round Table Meeting February 11-12 at the Getty. Seventeen scientists and conservators from major museums and universities in seven countries came to the Getty to participate in the Round Table Meeting hosted by the Decorative Arts and Sculpture Conservation Department. The topic of the meeting was the future of collaborative research on bronze art and artifacts using X-ray fluorescence spectroscopy. Participants discussed ways to improve data sharing between institutions, how to coordinate future collaborative research programs, as well as the application of machine learning and artificial intelligence to authentication and technical study of bronzes. The group identified concrete near-term goals and established an on-line workspace to facilitate continuing collaboration.

Margaret Herrick Library conservator **Dawn Jaros** gave a talk at the Materials in Motion conference in Manchester England about the conservation and preservation of the *Thief and Cobbler*. The collection, which the library acquired in 2016, contains animation drawings and cels, as well as complex moveable backgrounds from the film, which is also known as *Arabian Nights*.

In December, Dawn traveled to Hyderabad, India to present on paper conservation at the 5th annual Film preservation conference hosted by the Film Heritage Preservation and International Federation of Film Archives. The conference attendees came from India, Nepal, Bhutan, Bangladesh, Sri Lanka, and Afghanistan.

At the Natural History Museum of Los Angeles County, **Tania Collas** and **Marina Gibbons** are working on a new exhibition opening this summer that will celebrate the centennial of women's suffrage. The conservators have also been documenting and treating artifacts from the films of Mary Pickford and Douglas Fairbanks for a special exhibition during the inaugural "Newhallywood" silent film festival from February 14-16.

Among these early Hollywood treasures, Tania treated the mask worn in *The Iron Mask* (1929), which is actually made

from paper board. Marina also recently completed the treatment of a cloth of gold dress from Mary Pickford's *Rosita* (1923). This costume has never been publicly exhibited before, and will be on display in the museum's *Becoming Los Angeles* exhibition from mid-May until fall 2020.

Chris Stavroudis had an exceptionally busy (and fun) fall. He offered MCP workshops in London (for ICON) and Paris (for Centre Pompidou), back to LA, Florence (for Opificio delle Pietre Dure), back to LA and the WAAC meeting, Paris for two workshops (Institut National du Patrimoine), back to LA, and the Winterthur/University of Delaware Program in Art Conservation (one day lecture for first years, four days with second year students). He is embarrassed about the size of his carbon foot print.

Artcare Conservation is excited to announce their new Los Angeles studio located south of downtown. They are thrilled to be working with LA director, paintings conservator **Blanka Kielb**, and to welcome her to the Artcare family.

Carolyn Tallent worked on the usual interesting range of paintings in private practice. They included a 1973 Judy Chicago piece which needed only minor cleaning, a Jules Pascin that been grossly overpainted in heavy oil in a previous treatment, and a large Man Ray painting with a warped stretcher. The most nerve-wracking was a lovely early small Georgia O'Keefe with significant cupping of the paint, probably caused by the metal edging O'Keefe liked to put on some of her paintings. She found the extensive correspondence between the artist and Caroline Keck, published in *Color and Conservation 2006*, to be a great reference.

Zebala and Partners recently completed the conservation of the Medical Sciences mural by renowned artist Hugo Ballin for the Los Angeles County Arts Commission. The mural includes three archways containing three painted domes with two gilded half domes on either end and is located in the vestibule entryway of LA+USC Medical Center. It was completed in 1932 and originally created for Los Angeles General Hospital. The mural is uniquely different from other

murals by Ballin in that it was painted directly on plaster using both a fresco and secco technique. The mural was in fair to poor condition overall and had small pin size losses throughout, likely due to old moisture damage and salt efflorescence. The majority of the gold leaf and specific paint colors were actively flaking and the entire mural was covered in a layer of dirt and grime.

Zebala & Partners were also featured on the front page of the Los Angeles Times after completing the conservation of the 1969 mural by Heinz Rosien located in the main archway of the Los Angeles Memorial Coliseum. If you were at the WAAC conference you heard all about it!

Regional reporter:
Virginia Rasmussen

New Mexico

M. Susan Barger has retired and stepped from her position as coordinator for Connecting to Collections Care. She will still be available for selective consulting for smaller museums and archives.

The NMSU museum conservation program moved to a new museum conservation laboratory in the fabulous new *Devasthali Hall*, which also houses the art department.

The NMSU University Art Museum (formerly the University Art Gallery) moved to Devasthali Hall, an expansive contemporary arts facility. For the first time in the history of NMSU, the museum will house not only the main exhibition area but also two permanent collection gallery spaces and a study room, which will allow visitors to request, view, and research the almost 2,000 19th-century *retablos* (the largest known collection of 19th-century Mexican devotional paintings in the US) and nearly 1,800 remarkable contemporary and modern works.

They celebrated the building's official opening on February 28, 2020, with the exhibition *Labor: Motherhood & Art in 2020*, featuring the work of artists

Regional News, continued

Tracey Baran, María Berrío, Patty Chang, Lenka Clayton, Amy Cutler, Joey Fauerso, Tierney Gearon, Kate Gilmore, Jessica Jackson Hutchins, Las Hermanas Iglesias, Mary Kelly, Justine Kurland, Marilyn Minter, Laurel Nakadate, Hương Ngô & H`ông- Ân Trương, Yoko Ono, Catherine Opie, Laurie Simmons, Wendy Red Star, and Mickalene Thomas.

The NMSU Art Museum director, **Marisa Sage**, has co-curated this exhibition with the New York-based artist and mother **Laurel Nakadate**. The show addresses various experiences of mothering and motherhood, and the ways the mother and childbearing have been perceived and portrayed, both historically and in current popular culture. This exhibition includes as well *retablos* and *ex-votos* representing motherhood from NMSU University Art Museum collection. The *retablo* exhibition was curated by art conservator and director of the museum conservation program **Silvia Marinas-Feliner**.

NMSU museum conservation students **Samantha Corral** and **Paris Bowers** were awarded the Candis Stern Scholarship. The scholarship made it possible for them to attend the 47th annual AIC conference. The Candis Stern Scholarship is dedicated to helping students for their work in the museum conservation program directed by **Silvia Marinas-Feliner**.

The Museums of New Mexico Conservation Unit is excited to welcome **Madeleine Neiman** as the new objects conservator. Madeleine comes to New Mexico from the American Museum of Natural History in New York, where she was working as part of their Northwest Coast gallery renovation team.

The New Mexico conservation community recently said farewell to Director of Conservation, **Mark MacKenzie**, who retired this past fall and has returned to Canada.

In project news, under an IMLS grant to conserve sub-sections of the collections at the Museum of Indian Arts and Culture, **Landis Smith** has organized a collaborative project with Native communities. Conservator **Nicole**

Peters was brought on to the project for a year to treat collections and participate in collaborative work. Highlights of this project include working with **Manny Wheeler**, director of the Navajo Nation Museum, to bring silver collections to a Navajo Chapter House for discussions with over 20 elders about how they would like to see their cultural heritage presented.

In addition, Nicole and Pueblo potter **Erik Fender** collaborated on the treatment of a San Ildefonso pottery jar, which involved the construction of a delicate fluted rim fill and inpainting of the design, executed by Erik.

Nicole and Landis presented about their recent work in a panel discussion at the 2019 WAAC conference at the Getty Center. Nicole recently completed her third term as a conservation monitor for the FAIC C2CC online community forum.

Regional reporter:
Silvia Marinas-Feliner

Pacific Northwest

Jamie Hascall spent most of 2019 building mounts for the recently opened Burke Museum, including mounts for hanging a 37 foot Kwakwaka'wakw dugout canoe and a Chuuk Island outrigger canoe. In 2020, he is giving monthly mount making instructional workshops, currently scheduled through May at Jamie's studio in Seattle. Information and registration are available at <https://mountmakingfocus.com/events/>

The Royal BC Museum (RBCM) is very excited to announce the successful recruitment of objects conservator **Megan Doxsey-Whitfield** to the team. She is tasked with setting up a new program of wet archaeological materials treatment, something long overdue. She is also taking over responsibility for the preservation of the outdoor structures, including historic houses and totem poles.

The Royal BC Museum is also thrilled to have **Katie McEvoy** return in a roll that supports exhibitions work.

In fact, all of the conservators have been heavily involved with loans and exhibits work, with returning travelers, permanent gallery changes, and most recently, the massive take down of the Museums Partner blockbuster showcasing Maya culture past and present. Already in the works are preparations for the upcoming Orcas exhibition that will travel for up to 10 years.

Meanwhile, RBCM hopes that funding will be secured later this year for the RBCM "modernization project," enabling them to move forward on a new collections and research facility. To that end, in December RBCM welcomed **Irene Karsten** from the Canadian Conservation Institute to do a facility assessment aimed at identifying opportunities for improvement to collection housing and exhibition.

This fall at the Portland Art Museum (PAM) **Samantha Springer** has been occupied with a wide variety of projects. She has continued working with **Jeannie Kenmotsu**, PAM's interim curator of Asian Art, and partners at PSU's PNWCSC, **Tami Clare**, **Lyndsay Kissell**, and **Trine Quady**, on the study of red colorants used on prints by Suzuki Harunobu, an 18th-century Japanese printmaker. They are looking forward to compiling the results in the coming months.

Tying up projects from this summer, Samantha enjoyed putting out a podcast episode about the repainting of Lichtenstein's Brushstrokes. You can find PAM's podcast and the episode at portlandartmuseum.org/podcast.

This fall was particularly full of loan preparations and exhibition installation activity; from Impressionist paintings going to nearby Tacoma to contemporary works going to Ohio and Los Angeles and the installation of the Hank Willis Thomas retrospective there was little time for treatment. If you didn't catch the Thomas show in Portland, you can see it at Crystal Bridges or in Cincinnati.

Regional News, continued

Finally, in the spring, Samantha is looking to hire a part-time conservation technician and an assistant conservator of paper, each for a two-year term. The positions will be funded through a donation by a private foundation. Look for job postings soon.

With the recent reopening of the Seattle Asian Art Museum (SAAM), every member of the conservation team has been engaged throughout this past fall and winter with SAAM exhibition installations and continuing work on the extensive storage upgrades. They are very thankful for support work from many colleagues in reopening SAAM, and gratified to see the museum open again starting February 7-8.

Geneva Griswold finished treatments for artworks to be displayed in the re-opening, as did **Elizabeth Brown**, namely the Do Ho Suh *Some/One* (2001) sculpture. **Dorothy Cheng** cleaned and treated a pair of wrought iron gates by Samuel Yellin in SAAM's Garden Court.

Kathy Francis, of Francis Textile Conservation in Massachusetts, cleaned and treated a 19th-century Ainu robe that is returning to Seattle soon, to be exhibited in a future SAAM rotation.

The new conservation center for Asian paintings has just been completed, made possible thanks to a generous grant from the Andrew W. Mellon Foundation. The upgrade work for storage at SAAM, thanks to an IMLS Museums for America grant, will continue for several more months, and is making steady progress under **Marta Pinto-Llorca** and **Nicholas Dorman**'s direction.

They are grateful for the continuing support of the Sumitomo Foundation in the renewal of the grant for the treatment of a Japanese 14th-century hanging scroll in SAM's collection, titled *Amida Nijugobosatsu Raigo-zu*. The treatment will be completed by **Tomokatsu Kawazu** of Studio Sogendo.

Nicholas Dorman attended the Conserving Canvas Symposium, hosted by the Institute for the Preservation of Cultural Heritage at Yale University

this past October. In early November, he participated in the microfading testing group that met prior to the WAAC annual meeting at the Getty Center, Los Angeles.

Corine Landrieu has been busy this fall and early winter, working on the consolidation of a set of 10 fiberglass painted panels for the King County library system, cleaning a series of ceramic sculptures, and cleaning a set of fire damaged plaster sculptures, with the help of **Sarah Melching** and intern **Jennifer Beetem**. She has also been repairing a mask from New Britain and is now starting the treatment of four 1st century BC Roman lamp stands.

Regional reporter:
Corine Landrieu

Rocky Mountain Region

The Denver Art Museum team has completed the installation of its two monumental Haida poles, marking the beginning of art installations for a redesigned and reinstalled Northwest Coast and Alaska Native gallery. The reimagined space will be among the first art galleries to reopen to the public in the initial phase of the renovated Martin Building on June 6, 2020.

The 22- and 29-foot poles, originally from the Kaigani Haida village of Sukkwan, Alaska were featured in the 1939 Golden Gate International Exposition. The larger of the two is called the Land Otter Pole and tells the story of a man who narrowly escaped capture by land otters after his canoe capsized. This pole was carved by **Dwight Wallace** in 1870.

The museum collaborated with descendants of the Wallace family in November 2019 to celebrate the placement of the poles in their new locations, which will enable museum visitors to walk around the poles and see carvings from all sides. The pole raising included singing, dancing, and storytelling. Engineering support to install the massive poles was provided by **Demiurge LLC** in collaboration with DAM conservation

staff. Since their installation, cleaning, consolidation, and fills of the poles were undertaken by **Gina Laurin** and **Spencer Alred**.

In addition to the Northwest Coast and Alaska Native gallery, conservators have been collectively working to prepare a range of objects for the new Architecture and Design galleries along with the inaugural special exhibition, *ReVisión: Art in the Americas* – a selection of nearly 180 objects from the museum's ancient American and Latin American art collections, that will tell a visually compelling narrative about the formation of the Americas from 100 B.C. to today.

In December, staff moved into a brand new, purpose-built conservation laboratory, replete with a span of north facing windows, as well as dedicated spaces for office work, photography and analysis, and mount making. As part of the renovation, PreView, a space dedicated to textile art and fashion conservation received many upgrades. Both areas will be instrumental in keeping apace with a robust program!

The Conservation and Technical Studies department (formerly "Conservation") is pleased to welcome **Spencer Alred**, associate mountmaker, **Marina Hays**, Andrew W. Mellon Foundation fellow in textile conservation, **Yasuko Ogino**, part time in paintings conservation, and **Anna Piwowar**, Conservation Assistant.

At the Denver Museum of Nature & Science, conservators **Jude Southward** and **Jessica Fletcher**, assisted by conservation technician **Kathryn Reusch** and numerous volunteers (thank you!) continue conservation work on the IMLS-MFA American Ethnology Collection (AEC) treatment grant, where they have treated baskets, toys and games, and leather artifacts with beads and quills.

Lab personnel wish a fond farewell to **Megan Salas**, a third year intern in the UCLA/Getty Master's Program in the Conservation of Archaeological and Ethnographic Materials. She spent fall 2019 with DMNS working on the AEC grant. They welcome to the lab **Fran**

Regional News, continued

Lucero (trained at the Centre for Textile Conservation in Glasgow, Scotland) who is volunteering at the museum to stabilize textiles in the anthropology collection.

EverGreene Architectural Arts recently completed work on the Storm Lobby at the El Capitan Theater in Los Angeles, CA. They are currently working on the plaster and decorative painting at the Apple Tower Theater in Los Angeles, which includes the ceiling of the main ticketing concourse.

Teresa Knutson recently completed a dress for the Kansas Museum of History which was worn by a woman in Kansas the first time she voted in a national election. The sleeves of the wool dress had been sewn to an interior bodice of silk which had deteriorated, so it was reconstructed so the dress could be displayed in an exhibit about the 19th amendment. In addition, she is repairing three Navajo rugs and mounting a mid-nineteenth-century sampler for private clients.

Regional reporter:
Julie Parker

San Diego

The Balboa Art Conservation Center (BACC) is pleased to announce that **Sara Bisi** was hired in November 2019 as associate conservator of Paper. Bisi will be responsible for the conservation, care, and treatment of a wide variety of works on paper and paper artifacts. Bisi will also guide purchases of new equipment for paper conservation made possible by the Andrew W. Mellon Foundation's Comprehensive Organizational Health Initiative Grant.

Bisi has previously worked with the Yale Center for British Art, Harvard Art Museums, Williamstown Art Conservation Center, and the Northeast Document Conservation Center and has also owned and operated a paper and photograph conservation studio. Her post-graduate work included a position

as a research associate at the Yale Center for British Art and as the Craigen W. Bowen Fellow in paper conservation at the Straus Center for Conservation and Technical Studies, Harvard University. Bisi holds a master of arts degree in art conservation with advanced study in paper conservation from SUNY Buffalo State College, and a bachelor of arts degree in art history (with chemistry and studio arts minors) from Saint Joseph College, West Hartford, Connecticut.

In September, 2019, **Frances Prichett** participated in Hiromi Paper's Washi Tour of hand-papermakers in Japan, which was fascinating, beautiful, and well-organized. During the seven-day tour, which began and ended in Kyoto, participants travelled to a number of remote mountain villages in different prefectures, mainly in southwestern Japan, to visit hand-papermakers of Washi paper, a maker of "su-keta" (traditional Japanese paper making screens and molds), and the studio of a conservator of Japanese scrolls and screens. Some of the papermakers visited have been designated National Living Treasures by the Japanese government.

In October 2019, Frances participated in the two-day gels in paper conservation workshop at the Getty Research Institute, organized by Michelle Sullivan, associate paper conservator at the J. Paul Getty Museum.

Regional reporter:
Frances Prichett

San Francisco Bay Area

Debra Evans, head of paper conservation at the Fine Arts Museums of San Francisco, retired in early December 2019 after thirty-seven years of dedication to the institution. The extent of her contributions to art conservation over forty-five years is breathtaking and truly embodies the ideals of our field.

Allison Brewer has accepted the position of assistant paper conservator at the Fine

Arts Museums of San Francisco. **Victoria Binder** has accepted the position of head of paper conservation at the Fine Arts Museums of San Francisco.

As part of strategic planning this summer the museums' new director, Tom Campbell, created a position of Director of Conservation, and appointed **Jane Williams** to this role.

The objects conservation lab collaborated with NYC conservator **John Saunders** to replace the missing sword and decorative reins on Anna Hyatt Huntington's Joan of Arc sculpture at the Legion of Honor, using the Riverside Park cast as a model.

The lab is delighted to have **Emily Rezes** with them as a third year intern from the UCLA/Getty graduate program. They will be very sad to see conservator **Anya Dani** return to Okinawa at the end of the month. While on sabbatical in the Bay Area, she has been researching and treating a Mayan limestone relief at the Fine Arts Museums. She has also been working with the Stanford University Archaeology Collections to preserve a Native Californian basket and help them improve their conservation practices.

Céline Chrétien has been working on Claes Oldenburg's *Ice Bag - Scale B* and its mechanical and electrical issues with assistance from local artist **Kal Spelletich** and **Jeff Sanders**, fabrication supervisor for the series of 25 Ice Bags - scale B for Gemini G.E.L. in the 70s, and information sharing with colleagues at the National Gallery of Australia, Portland Art Museum, and the Whitney Museum.

Colleen O'Shea is delighted to partner with Northwestern University's Center for Scientific Studies in the Arts to characterize efflorescence on a wax over plaster sculpture by the Italian artist Medardo Rosso and to learn more about the use of paraffin wax as an artist's material. She is also looking forward to attending FAIC's Wood Identification workshop at the end of February.

Jena Hirschbein has been part of the museum's team assessing and planning upgrades for collections stored off-site.

Regional News, continued

In textiles conservation, **Jennifer Nieling** wraps up her contract as a costume-mounting assistant in April, after 18 months of invaluable assistance - thank you Jennifer! Mellon Fellow in textile conservation **Laura Garcia Vedrenne** is embarking on an in-depth research and treatment project, examining a pair of Callot Soeurs dresses from the museums' permanent collection.

Jonathan Fisher recently completed the conservation/restoration of six stained glass doors, crafted by Narcissus Quagliata, part of a collection in a private residence. Also completed in 2019, was the restoration of a Bufano sculpture for the California Academy of Science. Current projects include folk art from Mexico as well as sculpture from Thailand and Indonesia.

Regional reporter:
Alisa Eagleston-Cieslewicz

Texas

The Harry Ransom Center Preservation and Conservation Division announces that their head of photograph conservation, **Diana Diaz Cañas**, will be moving to New York City in February for a position in the photograph conservation department at the Metropolitan Museum of Art. Good luck and best wishes, Diana!

Mark van Gelder recently completed conservation treatments for 3 portraits displayed in the Texas Governor's Mansion — the portraits of Governor Richard Coke (1829—1896), his wife Mary Horne Coke, and of Stephen F. Austin (1793—1836).

Treatment of the Stephen F. Austin portrait was particularly rewarding in that unframing of the painting, combined with technical photography, revealed fingerprints in an apparently original varnish layer and the background paint, a previously unknown artist's signature (of Louis Eyth), an inscription, *From Original, Painted in Mexico. A.D. 1833.*, and a colorman's canvas stamp, for *F.*

Call for Papers International Mountmakers Forum

The Getty Museum is pleased to announce that they will be hosting the next International Mountmakers Forum conference - November, 10-12, 2020.

The International Mountmakers Forum is a non-profit organization supporting the mountmaking community. Objectives of this conference include fostering communication, promoting best practices, and disseminating current information regarding the profession.

We invite authors to submit an abstract of no more than 250 words for the following formats:

Full length papers (20 min.)
Short talks (10 min.)
Posters

Please submit all abstracts to:
IMF2020@getty.edu

Registration fee: \$125
Conference registration: Spring, 2020
Deadline for submission: May 8th, 2020
Notification of acceptance: May 22nd, 2020
Deadline for final paper submission: September 30th, 2020

Conference information can be found at: [_https://www.mountmakersforum.net/workshops-conferences](https://www.mountmakersforum.net/workshops-conferences)

For any inquiries regarding the conference, please contact: IMF2020@getty.edu

W. DEVOE & CO., New York. Eyth's biographical information notes that in 1873 he was commissioned by the state of Texas to paint such a copy, providing a probable date for the painting.

On November 15th, Mark received a Special Recognition Award at the 59th Annual Preservation Austin Merit Awards, for his multi-year restoration of the 1933 ceiling mural in the Austin History Center's loggia. He closed out 2019 with a treatment for the recently damaged portrait of Rebecca Fisher (the "Mother of Texas") for the Texas State Capitol collection.

Regional Reporter:
Ken Grant

WAAC Publications

Handling Guide for Anthropology Collections

Straightforward text is paired with humorous illustrations in 41 pages of "do's and don'ts" of collection handling. *A Guide to Handling Anthropological Museum Collections* was written by Arizona State Museum conservator Nancy Odegaard and illustrated by conservation technician Grace Katterman. This manual was designed to be used by researchers, docents, volunteers, visitors, students, staff or others who have not received formal training in the handling of museum artifacts. Paperbound and printed on acid-free stock.

Price: \$10.00

(\$8.00 copy for orders >10 copies)

Back Issues of WAAC Newsletter

Back numbers of the *Newsletter* are available. Issues Vol.1 - Vol.14, #3 (Sept. 1992) are \$5/copy. Issues Vol.15 - Vol.29, #3 (Sept. 1997) are \$10/copy. Issues Vol.30 (Jan. 2008) and after are \$15/copy. A 20% discount will be given to libraries seeking to obtain back issues to complete a "run" and for purchases of ten copies or more of an issue.

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Accelerated Aging Study of Papers Treated with Citrate Solutions

by Madison Brockman

Abstract

Stain reduction with citrate solutions is becoming more commonplace in paper conservation, accentuating the need for basic studies on its various effects on paper. A multimodal accelerated aging study was undertaken at the Los Angeles County Museum of Art's Conservation Center to assess the long-term effects of exposing paper to citrate solutions. A Whatman filter paper and sized antique rag paper were tested with a 1% sodium citrate solution by overall immersion, immersion with rinsing, and local application with rinsing. Aging rates were predicted with microfading testing and samples were aged under UVA light, gallery lighting conditions, and in a thermal aging oven.

In all aging experiments, the citrate-treated samples were found to age at approximately the same rate as untreated samples, and all samples were much less light sensitive than the Blue Wool 4 standard. These results indicate that citrate solutions appear to have no deleterious effects on paper over time.

Introduction

As observed by Antoinette Dwan in her 2015 WAAC article, "staining in paper is varied and complicated."¹ However, over the past five years of experimentation, a singular tool has emerged: citrate solutions.

Citrates have recently gained traction in paper conservation as a cost effective and successful treatment option for stain reduction. However, there are few previous studies² on the effects these reagents can have on paper. More studies are needed to determine the long-term safety of citrate solution treatments.

This study began in early 2019 at the Los Angeles County Museum of Art under the guidance of LACMA assistant scientist Laura Maccarelli. There the author began testing the aging properties of papers treated with citrate solutions during her third year internship as a graduate fellow of the Winterthur/ University of Delaware Program.

Essential Citrate Chemistry

Citrate anions can be found in pre-made salt forms like ammonium citrate (di- or tribasic) or sodium citrate (tribasic). Conservators can also make their own solution

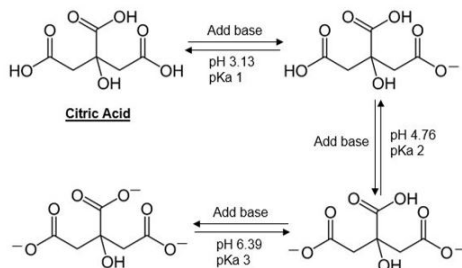


Fig. 1. Molecular structure of citric acid and its three ionization constants (pKa). (Image adapted from https://en.wikipedia.org/wiki/Citric_acid)

with citric acid and the appropriate base (e.g. ammonium or sodium hydroxide), as detailed in Chris Stavroudis' 2015 WAAC article.³ When fully ionized, citrates have three binding locations with which to chelate metals and degradation products (fig. 1). The exact mechanism by which this improved cleaning of organic discoloration occurs is unknown, and the field would benefit from further study into this topic.

Methodology

In order to provide a more complete picture of how citrate-treated papers might age in different environmental conditions, samples were aged in three separate experiments:

- UV illumination
- Gallery (UV filtered) illumination
- Thermal aging oven

Colorimetric analysis was used to measure the rate of change during each experiment.

Sample preparation

Two test papers were selected:

- Whatman Type 1 filter paper (W)
- Sized antique rag paper (A)

Strips (1cm x 4cm) of these papers were treated with 1% w/v sodium citrate solution (adjusted to pH 7 with citric acid) in the following ways:

- Control (C)
- Overall bathing (30 min.), no rinsing (O)
- Overall bathing (30 min.) and rinsing (15 min.) with filtered water (R)
- Local swab application with swab rinse (L)

Colorimetric Analysis

Before any aging experiments began, the colorimetric values of each paper and Blue Wool sample were measured using a portable Minolta Cm-2600d spectrometer and OnColor software (v.5.5.5.3 QC). Measurements were taken at the end of each trial period, and at the completion of each experiment.

Microfade Testing

The control samples were analyzed with microfading testing to predict the rates of change for the all treatment variations of the Whatman and antique papers. The microfading testing was carried out with a Newport FSQ-KG2 heat-absorbing filter in the light path.

The tests were run for 30 minutes, with spectra collected every 10 seconds. To determine the sensitivities of the samples, the curves obtained were compared to those of the ISO Blue Wool standards.⁴

Accelerated Aging Study of Papers Treated with Citrate Solutions, continued

UVA and Gallery Light Experiment

An example of a sample set for the two illumination sources is pictured in figure 2. A card of Blue Wool standards was included; only Blue Wools 1-4 were monitored as 5-8 do not change at a high rate.

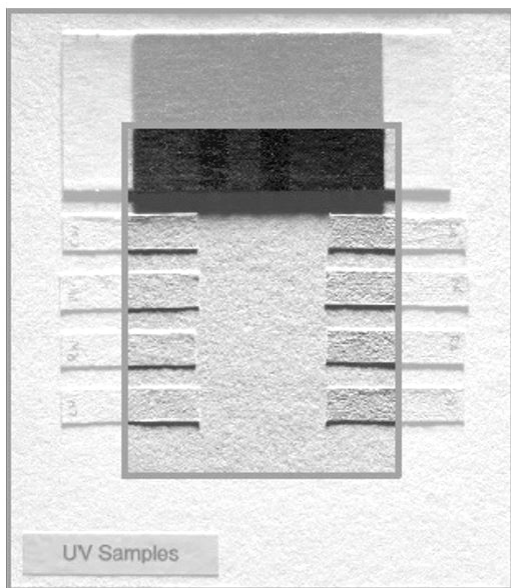


Fig. 2. Schematic of sample set for UV aging (in raking light) indicating how the window mat covers half of the samples. Sample sets for both light aging experiments include Whatman filter paper, antique rag paper, and Blue Wool standards. (Photo: Yosi Pozeilov)

The sample sets included the Blue Wool standards (BW), 4 strips of Whatman filter paper (W), and 4 strips of antique paper (A). Those 4 strips represent one of the citrate application methods: control (C), overall immersion (O), overall immersion with rinsing (R), and local swab application (L). During the experiments, half of each paper sample strip was covered (CV) and the other half was exposed (EX) by a window mat to block the illumination source (fig. 2).

Thus the combinations for light aging are:

BW1	blue wool 1
BW2	blue wool 2
BW3	blue wool 3
BW4	blue wool 4
CW	control Whatman
CA	control antique
OW	overall immersion Whatman
OA	overall immersion antique
RW	overall immersion w/ rinsing Whatman
RA	overall immersion w/ rinsing antique
LW	local swabbing Whatman
LA	local swabbing antique

further designated CV for covered or EX for exposed.

The UV fluorescence analysis cabinet at LACMA uses a Spectroline Model CL 150 light source from Spectronics Corporation that falls in the UVA/B range of 280-400 nm. The samples were exposed to UV radiation for a total of 1203 hours in 16 trials of increasing exposure time.

The gallery light used for the light box is a GE 940Lumen HIR Plus XL 53W 120V (HIR™ Plus XL Halogen Lamp, PAR38). The samples were exposed for 317 hours, until it was apparent that the samples were aging very similarly to those in the UV aging experiment and further aging would not be necessary.

Thermal Aging Experiment

The eight samples aged in the oven had the same W/A and C/O/R/L permutations, without the covered or exposed variations, as the samples are not subjected to light. Rather, the sample strips of paper were clipped to a rack in the Weiss WKL 34/+10 oven, and aged at 80° C and 50% RH for 844 hours in 5 trials of increasing time intervals.

Results

Results from the microfade testing indicated that citrate-treated papers changed at approximately the same rate as their untreated counterparts, and all samples had little color change overall (fig. 3). Interestingly, any citrate treated samples seem to age at a slightly slower rate than the untreated samples, although perhaps not enough to indicate any significant mitigation of color change. This pattern continued through the three different aging experiments.

After 70,000 minutes (116 hours) of UV aging, there was a very slight color change in the Whatman samples, with ΔE values around 1 (fig. 4). This change was not visible to the human eye. There is a more pronounced color change in the antique samples, although these also changed at roughly the same rate (fig. 5). After 70,000 minutes of aging, the ΔE values for the antique samples fall roughly between 5.5 and 7.5. All samples are significantly less light sensitive than Blue Wool 4, which has a ΔE of 18.65.

Gallery light aging produced very similar results. After 70,000 minutes (116 hours), the ΔE values of the Whatman samples are close to 1, while the ΔE values for the antique samples hover around 2. At the end of the experiment, at 19,020 minutes (317 hours), the ΔE values for the Whatman samples range from 1-2 and those for the antique samples remain near 3. For comparison, the ΔE of the Blue Wool 2 at the end of the experiment was just over 8.

Thermal aging caused samples to change in a manner consistent with UV and gallery light aging as well. After 5,000 minutes (83 hours), the ΔE values for the Whatman samples fell between approximately 2 to 3, with the control closer to 3 and the overall immersion sample slightly below 2. The ΔE values for the antique samples had a greater range and fell between 6-12, with the control closer to 12 and the overall immersion sample slightly greater than 6.

Accelerated Aging Study of Papers Treated with Citrate Solutions, continued

Discussion

Overall, citrate stain reduction solutions appear to be safe for papers. This experiment was designed using “normal conditions” for a citrate stain reduction protocol; the species and concentration the author typically chooses for a treatment. Extrapolations might be made to the performance of ammonium citrate solutions, or to higher or lower concentrations. The effects of such solutions on various modern papers are also yet to be formally assessed.

All three aging experiments indicate that citrate-treated samples age at approximately the same rate as their untreated counterparts. Any reduction in rate of aging may be the result of citrate ions left in the paper support, as the length of bathing does not directly correlate with aging performance (ex. overall immersion at 30 minutes ages better than overall immersion for 30 minutes with 15 minutes of rinsing). The author welcomes ideas on this topic.

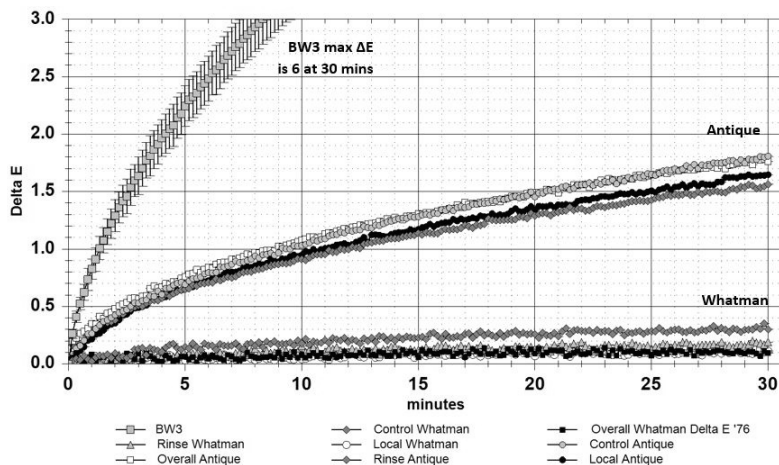


Fig. 3. MFT results showing the ΔE values for the Blue Wool 3 standard, the Whatman samples, and the antique samples

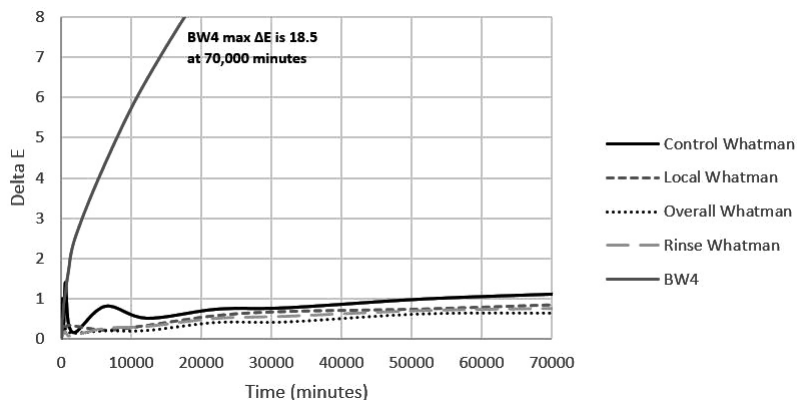


Fig. 4. ΔE values for UV aging of Whatman samples and Blue Wool 4 standard

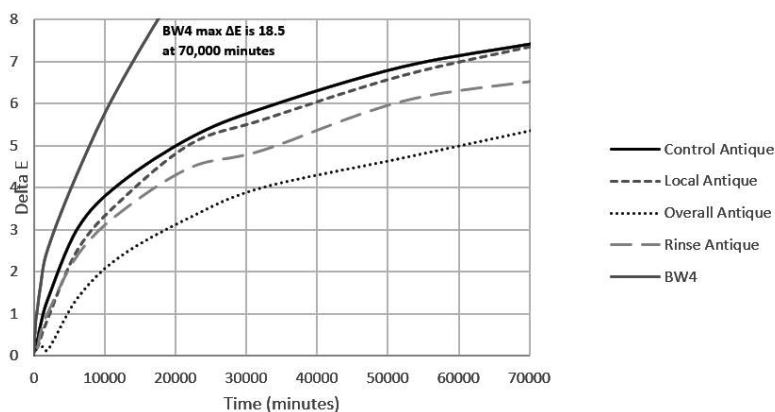


Fig. 5. ΔE values UVA aging of antique samples and Blue Wool 4 standard

Future research topics include instrumentation not immediately available at the LACMA labs: tensile strength, degree of polymerization, etc. This study focused on colorimetric evaluation, yet mechanical analysis would paint a different picture on the health of the paper supports after accelerated aging as well. Again, the author encourages others in the field to continue researching this topic and contribute to our collective body of knowledge.

Conclusions

The results of the microfade testing and the three accelerated aging experiments show that citrate solutions do not appear to cause any deleterious effects to paper supports over time. Paper samples, regardless of fiber composition or treatment with the citrate solution, appear to age at the same rates and are overall much less prone to change than the Blue Wool standards we rely on for indicating light sensitivity. In conclusion, citrate solutions, when used in normal conditions, appear to be safe for continued use in paper conservation treatments.

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Acknowledgements

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Annual Meeting Abstracts

The 2019 WAAC Annual Meeting was held November 6 - 8, at The Getty Center, Los Angeles

The papers from the meeting are listed below along with summaries prepared by the speakers.

Keynote Presentation

The Wise Museum Leader

Melody Kanschat

Empowering arts professionals for over 40 years, the Getty Leadership Institute at Claremont Graduate University boasts over 1800 alumni from all over the world. Executive Director, Melody Kanschat, will share information about recent trends in the museum sector, developing yourself as a leader, and effectively leading change in your own practice and the institutions you serve. Melody brings her experience as the former President of the Los Angeles County Museum of Art and her 30+ years as a sailor together as example of ways you can enrich yourself, your field, and your institution through practice.

The Making of a Museum: Modern Materials Tell the Story of Hollywood History

Sophie du Bois Hunter

The Academy Museum of Motion Pictures, opening in Los Angeles next year, celebrates the artistry and craftsmanship of filmmaking and its place in Los Angeles history. It is the first film museum of its kind in the city, exhibiting a wide panorama of technological and historical items related to the art and science of film. One could argue that the artistry and innovation involved in film making have been equally as important to moving the cultural needle as many of the most celebrated fine artists of past centuries.

The process of filmmaking, in fact, involves the work of skilled craftsmen and artists who draw on the traditions of fine

art, but then realize their achievements in a mass culture realm, often working with contemporary materials that are as transient as the films in which they're exhibited.

Thus, as a part of gearing up to open, the museum has been working with conservators and film industry specialists across the board to learn how best to preserve these unique, often fragile, collections composed of modern materials, in pursuit of celebrating the wide sweep of film history.

The goal of this presentation is to introduce the Academy Museum to the WAAC conservation community and to discuss its unique collections in the context of conservation and preservation. Some of the most challenging treatments will be discussed, including the conservation of items made of polyurethane foam, plasticine modelling clay, pot metals, and polystyrene, as well as restoration projects that have been particularly unique, involving the collaboration of conservators across the state and film industry special effects artists, to develop the most appropriate, sometimes unorthodox, treatment plans.

As much of the art world is moving away from traditional materials and towards installation and interactive-based forms, it is the Academy Museum's hope that they will be able to contribute to the conversation about evolving museum practices and cutting-edge conservation topics regarding the treatment and preservation of modern materials.

Treatment of the "Mystery" Mural at the Los Angeles Coliseum

Suzanne Morris and Aneta Zebala

The faded and water damaged mural inside the central arch of the Los Angeles Memorial Coliseum had been forgotten and was a mystery until Dean Gordon, a high school student, uncovered its history in 2017.

In 2019, Zebala & Partners were hired to treat the mural as part of USC's renovation of the Coliseum. The mural's location, 45 feet from the ground in a virtual wind tunnel and surrounded

by construction, was not an ideal environment for conservation. The mural, painted in oil with a possible addition of another medium, and gold leaf was in poor condition overall. Faulty plumbing caused water infiltration and extensive structural and surface damage to the bottom third of the mural.

The following conditions were observed during the initial examination: cement loss, spalling, and delamination, cracks, corroded rebar, rust staining of painted surface, salt efflorescence, the detachment & disfigurement of paint and gold leaf. The paint layer was powdery on contact due to the binding medium failure. Treatment included cleaning, cement and rebar repair, recreation of missing design elements, re-gilding large areas, and repainting with Beek mineral paints. This paper discusses the lost and found history of the mural in a National and Californian Historic Landmark, the methods and materials used in its treatment, and the challenges of working on site.

Preservation of Comic Arts - Report from Comic Con

Christina Bean, Abigail Duckor, Sophie du Bois Hunter, and Anna Lagana

The comic world comes to life with illustrated comic books, action figures, memorabilia, movie props, and costumes. These physical objects are powerful storytelling tools, and they allow a collector to engage with their passion. They are also an extremely lucrative business as comic books alone generated \$1.095 billion dollars in sales in 2018.

Classic comics and memorabilia are also sold at prices that rival the art world. Ensuring the preservation of these objects from destruction has also become big business; but there is a surprising disconnect from the conservation and preservation world that traditionally inhabits arts spaces.

A panel presentation by 4 conservators at the 50 year anniversary of the San Diego Comic Con attempted to create a bridge between these two worlds. Our goals were to educate on what conservation is, what is happening scientifically to the objects, and how to engage with

preservation suppliers to get good quality storage products. The information was welcomed and well received across the board – though there was some confusion as to the finer points of long term storage. We also learned a lot about the decision making of collectors and creators as well. We will discuss all that we have learned as well as our hopes for future collaboration projects across these two realms.

A Collaborative Celebration of Community History

Mostyn Gale

The “discovery” of a historic clock in the Santa Barbara (California) county courthouse led to a remarkable collaboration amongst diverse professionals to create a new space for community celebration all centered on a historic, dynamic object in desperate need of conservation.

A horological conservator meets with an educator in 2010 to “show off” his love for a Seth Thomas tower clock that had been keeping time for the city since it was installed in 1929. This “chance” meeting sparked a collaboration with the county architect (responsible for preservation of all county historic buildings), a horological museum professional, a self-educated inventor, a local philanthropist, an artist, and other craftspeople to create an attractive space for the public to learn, be inspired, and appreciate our history.

The 1929 tower clock (which was limping along) was repaired and restored to its full capacity, ringing bells that had never been rung. The walls were surrounded by a 70 ft. mural depicting the history of time and timekeeping, and the ceiling was decorated with five miles of fiber-optic “heavens.” A plywood wall to the stairwell previously blocked the view of the clock. The plywood was replaced with glass, providing a two storied view of the restored clock and bells.

A Southern California gem, this project was winner of the National Association of Watch and Clock Collectors' craft contest for Best Public Clock Restoration in 2012. It also won the Santa

Barbara Beautiful Award for Historic Revitalization in 2013 and was awarded the California Governor's award for Historic Preservation in 2015.

Conservation of Mary Corse White Light Paintings

Linnaea E. Saunders

Since the mid 1960s, the Los Angeles based artist Mary Corse has been creating a large body of work that explores the boundaries of light, space, abstract painting, and object. Her work includes both large and small-scale canvases, large-scale ceramic work, and light boxes that defy gravity and visible sources of illumination. The focus of this paper will be an introduction to Corse's work and a discussion of the conservator's role in treatment and care of the canvas paintings.

Prior to 2016, the majority of “restoration” of Corse's work fell to the artist herself or her longtime assistant. With increased national and international recognition of her work, Corse's gallery representation has recognized the importance of a conservator's perspective and input in the treatment, handling and installation of pieces, and discussions with the artist about troubleshooting materials and application methods.

In this role, the conservator is collaborating with the artist, the artist's assistant, preparators, and gallery stakeholders. One aspect of this work is treatment of historical works that have been removed from their stretchers and rolled, resulting in unique treatment concerns. This ongoing work has been a challenging and rewarding experience that has caused the conservator to reconsider her role and responsibility in the ongoing legacy of this (and other) artist(s).

Mounting Barkcloth with Rare Earth Magnets: The Compression and Fiber Resiliency Answer

Gwen Spicer

The use of magnets to mount barkcloth is common, yet details of the specific techniques used have not been adequately documented. An investigation of

magnetic systems globally was made and found that while all current systems use ‘point fasteners’ on the surface of the cloth, this is where the similarities end. The unresolved question for mounting barkcloth is the potential for compression. Compression is a significant issue for art works on paper, especially when magnets are located on the face. How are barkcloth and paper similar or different?

While researching various materials frequently placed together and used within a magnetic mounting system, otherwise known as ‘the gap,’ some interesting ancillary results were found. Materials are typically selected for their archival value, which includes their long-term stability. Over time, a set of preferred materials became well established; these encompass both natural and synthetic materials, woven and non-woven alike. The phrase ‘like with like’ is often used when materials are selected. This long-held philosophy should be reexamined. Compression relates to an object's ability to regain shape once a force is applied, one aspect of its resiliency. It appears that barkcloth is less likely to experience compression than does paper, although both media are cellulosic.

Cellulose is rated a low resilience fiber, when compared to proteins and polyester. These materials most likely have different compression potentials due to the different ways in which paper and barkcloth are prepared. This and other surface phenomena will be discussed. The investigation will briefly summarize why the ‘point fastener’ system appears to be favored over ‘large area pressure.’

Characterization of Rust Stains on Beaded Hide Garments

Beth Knight, Edward P. Vicenzi, and Thomas Lam

Cut steel beads are sometimes used as design accents on beaded brain tanned hide garments from Native American Plains tribes dating to the late 19th to early 20th centuries. The sinew thread used to secure these beads is generally robust, but sinew stained by rusting beads is often weakened and breaks, resulting in bead loss.

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Rust is a combination of iron oxides that can vary in composition and removal mechanisms depending on its formation. There has been little research into characterizing rust stains on historic textiles and costumes, especially leather and hide where iron stains complex with the proteins. Mellon Fellowship research undertaken at the National Museum of the American Indian aimed to characterize rust staining on beaded hide garments and explore stain reduction treatment methods for sinew and brain tanned hide.

Beads, stained hide, and stained sinew were analyzed by Ed Vicenzi and Thomas Lam of the Museum Conservation Institute using scanning electron microscopy and energy dispersive x-ray spectrometry (SEM-EDS) to characterize the iron oxides. Goethite, akaganeite, and ferric chloride were identified. The iron (III) ions of these corrosion products are pernicious and insoluble. Hydroxybenzyl ethylenediamine (HBED) is an effective iron (III) chelator used in the medical field, but its expense has limited its broad use in conservation.

Other iron (III) chelators derived from medical applications may be useful in conservation, especially small lipophilic chelators that can easily penetrate proteinaceous materials. Pyridoxal isonicotinoyl hydrazone (PIH) is a medically effective iron (III) chelator that can be synthesized for less cost than HBED. The chelating capabilities of PIH and HBED are compared for treating rust stained sinew and hide with the ultimate goal of aiding in the prevention of losses caused by rust stains.

Conserving Weathering Steel Sculpture

Rowan Geiger, Sarah Johnson, and Christine Haynes

Weathering steel became a popular material for outdoor sculptures in part due to its protective layer of compact corrosion. Instead of preventing corrosion, weathering steel corrodes naturally and immediately, forming a compact rust layer that is relatively protective. However, environmental factors such as pooling water, acidic

bird droppings, and biogrowth can cause rapid-forming localized corrosion that jeopardizes this compact corrosion layer. Additionally, graffiti, scratches, and burnish marks can easily mar the surface.

Current methods of localized conservation treatments lead to irregularities in the surface, rarely producing desirable results for minimalist sculptures. This presentation will explore procedures for examination and conservation of outdoor weathering steel sculptures during the time of manufacture, during installation planning and implementation, and during its continued preservation maintenance. Themes will include how to collaborate with artists, manufacturers, installation crews, and clients in addition to providing tangible treatment options.

XRF Training for Conservators: Reconsidering the Learning Process

Lynn Lee, Karen Trentelman, Aniko Bezur, and Maggi Loubser

X-ray fluorescence (XRF) spectroscopy, as a non-invasive, in situ technique, is frequently used as the first, if not the only, analytical tool applied in the study of materials comprising works of art. XRF analysis and interpretation are not always straightforward for complex objects, however, in many institutions the responsibility for operating the instrument and interpreting the results frequently falls to non-specialists.

Teaching XRF to non-specialists, whose background in science may vary, requires an approach that incorporates hands-on application, highlighting the challenges specific to cultural heritage objects. In addition, for those who might not use XRF regularly, periodic refresher training may be needed. The Getty Conservation Institute, in collaboration with the Yale Institute for the Preservation of Cultural Heritage, have created a unique teaching approach designed specifically for conservators utilizing XRF for the study of works of art.

The students are taught using an engaged, project-based methodology. The use of mock-ups designed to simulate real world

challenges, lectures on fundamentals and how they are applied to specific examples observed in cultural heritage materials, and the application of skills to real objects are the bedrock of the methodology. Since many students bring with them specialized knowledge of the objects' history and condition, an important part of the teaching program is to empower the students to utilize their expertise to identify the questions that can be specifically answered by XRF for a fuller understanding of the objects.

On a Roll: Drawings beyond the Frame

Jan Burandt

Oversized drawings are becoming more commonplace in museum collections and they present challenges for storage, framing, installation, and treatment. Every drawing of large scale requires coordinated teamwork at every step between conservation and the preparatory team.

This paper will discuss encounters with recently installed drawings from 10–30' in width - including practical solutions used to adapt artist-specified methods of installation. Works by John Cage, Trisha Brown, and Siah Armajani will be discussed. Complications encountered include preservation of intentionally distressed paper surfaces and grappling with a 222" translucent polyester film substrate.

Community Resilience: Reflections of a Shaky Day

Monica Shah and Sarah Owens

On the morning of November 30, 2018, a 7.1 magnitude earthquake was centered 10 miles north of Anchorage. The Anchorage Museum suffered damage to both the building and collections. Along with facilities and exhibition staff, collections staff worked diligently to reopen the museum to the public. It was an important event to show the resiliency of our community and provided a place of welcome for those dealing with many uncertainties during the aftermath. For the first few months, staff were focused

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on response. Now, with more than nine months since the event, museum staff are able to reflect and analyze the response, precautions, and changes implemented. This paper will present an analysis of precautions taken and how those mitigated additional damage – from emergency plan and procedures, to storage and exhibition mounts.

Preserving Harald Szeemann's 1974 Exhibition, *Grandfather: A Pioneer Like Us*

Melissa Huddleston

In 1974, trailblazing Swiss curator Harald Szeemann curated an exhibition about his late grandfather, a beautician by trade. Staged in the curator's own apartment, the exhibition was composed of over fifteen hundred objects, including family documents, photographs, artworks, clothing, household items, and a dazzling array of hair styling accoutrements dating to the 1920s and 30s.

The project was not only a personal homage to his ancestor, but also a self-reflexive examination of conventions of value, meaning, and the agency of the curator. When the Getty Research Institute acquired the Harald Szeemann Archive in 2011, numerous objects from *Grandfather, A Pioneer Like Us* were rediscovered within the archive. When the GRI embarked on a Szeemann retrospective titled *Museum of Obsessions*, which opened in 2017, it was decided to reconstruct the 1974 exhibition as part of it.

The exhibition process is by nature collaborative, and this was highlighted in *Grandfather, A Pioneer Like Us* – both because of the complex amalgam of materials included and because of its character of historical reconstruction. Curators and conservators worked in close collaboration conducting extensive analysis of photo documentation from the original exhibition and research into Szeemann's practice in order to establish methodologies for an accurate reconstruction.

After years of use or neglect, many of the original items were severely damaged, stained, or even vandalized. The overall

goal was for the items to appear as they did in the 1974 exhibition, and not in overly good condition. Hence, establishing appropriate levels of treatment for each individual object was an especially challenging balancing act.

Collaboration between conservators from different disciplines and conservation scientists was also crucial to the success of the project due to the huge variety of materials in the exhibition. This included early celluloid plastics, casein plastics, bone, tortoise shell, fur, leather, textiles, dyes, a variety of woods, antique glass, hair, reverse glass paintings, gilded frames, taxidermy, oil paintings, printed ephemera, photographs, shells, silver, copper alloys, porcelain, ceramics, wax, plaster, and paper mâché.

Finally, the practical challenges of safely installing the objects were many-fold and only could have been met through extensive collaboration between conservators, mount makers, and preparators as well as specialists outside of the field (including prop artists, a wig maker, and a taxidermist). After a five venue world tour, the exhibition will return to Los Angeles in September. Looking forward, new challenges in terms of storage and longterm care will need to be addressed.

A Culturally Collaborative Model for Conservation Decisions

Landis Smith and Nicole Peters

Using a culturally collaborative model, an IMLS-funded project to conserve historic collections at the Museum of Indian Arts and Culture (MIAC) is underway. Pueblo potters, Navajo jewelers, and Apache basket weavers are in discussion with conservators and curators regarding accurate documentation of materials, technologies, and use as well as culturally appropriate treatment and care.

The proximity of Santa Fe to Native communities facilitates ongoing relationships and exchange, with multiple planned and impromptu visits in the museum, in Native communities, and elsewhere. Collaborative conservation decisions about the methods and extent of treatment (or no treatment) offer a

more solid and holistic rationale for the decisions made. Case studies will illustrate the collaborative process employed in this project.

Conservation Review: Incorporating Conservators into the Acquisition of Commissioned Public Art

Adam Fah and Janae Huber

The Washington State Arts Commission (ArtsWA) is responsible for one of the largest public art collections in the nation. The nearly 5,000 artworks that make up the State Art Collection are permanently sited in K-12 schools, colleges, universities, and state agencies spanning Washington's 71,000 square miles.

In 2010, to get a better handle on future conservation needs, our collections team created a series of tools that address materials, fabrication techniques, and placement during the artwork proposal phase. These tools—Conservation Consultation, Conservation Review, and a supplementary text titled the Materials and Fabrication Handbook—support artists in creating durable artworks for highly active public environments. They were adapted from an in-house review process created by our colleague Tin Ly, conservation manager (retired) for Broward County Public Art and Design in Florida. Conservation consultation and reviews have been integral to ArtsWA's acquisition of more than 200 artworks over the past decade.

The first artwork was acquired for Washington's State Art Collection in 1975. The collection grew to around 4,000 objects before the state invested in dedicated collection care staff, hiring a part-time collections manager in 2000. In 2005, the collections manager position became full-time, and ArtsWA limited its purchases of small, portable works in favor of site-specific commissions with a minimum budget of \$30,000. This resulted in an average of 35 artworks acquired annually, down from 166 per year. In 2007, a part-time conservation technician, the first on staff with materials and fabrication experience, was hired, and the program procured an off-the-

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shelf museum collections management database system to track artworks.

By 2008, the collections team (1 collections manager + 1/2 conservation technician) had identified many works built with inappropriate or incompatible materials, inherent vice, poor fabrication techniques, or that were inappropriately sited. These artworks demanded a significant amount of the department's limited resources and made it difficult to address the larger backlog of the collection's needs. With support from program leadership, the collections department incorporated Conservation Consultation, Conservation Review, and the Materials and Fabrication Handbook into all artwork proposal phases to reduce long-term costs and eliminate unnecessary future repairs. For more information: <https://www.arts.wa.gov/public-art/>

Collaboration: Considering the Degradation of Polypropylene Products for Use with Collections

Dr. Nancy Odegaard, Gina Watkinson, Dr. Kelly Simmons-Potter, Dr. B. G. Potter, Jr., Frances Willberg, and Emma Potter

In recent years the ASM conservation lab has noticed the deterioration of polypropylene used as: shelf foam in collections storage; repurposed conference bags; coverings for historic furniture and costumes, vehicles, and art; photographic slide holders and films.

We began to investigate the wider use of polypropylene-based products recommended for use in museums and wondered about its suitability. We teamed up with faculty and students in the University of Arizona Materials Science & Engineering Department to focus on accelerated aging to learn more about degradation of a suite of polypropylene materials as a result of exposure to heat, humidity, and solar irradiation. A chamber calibrated for testing solar panels in southern Arizona was employed to create an annual outdoor exposure. Our fundamental questions were:

1. Can we determine how long it takes for materials to degrade? 2. How can we measure or quantify the process of polypropylene material decomposition (yellowing, deteriorating, becoming brittle)? 3. Can one tell if a polypropylene material is about to decompose? This presentation will share the preliminary findings:

Samples: Our polypropylene degradation test suite was comprised of samples taken from an open-cell expanded foam (shelf liner), a green fabric (conference bag), a white coated fabric (grocery tote), a thin transparent film (photographic negative holder and film sheet), and a thick translucent sheet (archival folder).

The samples were evaluated and documented prior to and during the aging process. Evaluation and documentation included photography to monitor changes in the visual appearance of the samples, measurements of sample weight and mass, analysis using Fourier Transform Infrared spectroscopy (FTIR), testing with UV-Visible transmittance, examination of surface deterioration with optical microscopy, and assessment of brittleness by bend radius of curvature.

Accelerated aging took place in an environmental chamber (EC) for exposure to temperature, humidity, and irradiance typical of Tucson, AZ over an extended period. The samples were periodically extracted from the EC and examined using the range of measurement techniques, before they were replaced in the EC for further aging.

Mayan Stela: Packing and Transportation Studies

Rita Gomez and Vincent Beltran

In February 2017, the packing team at the JPGM was presented with the task to transport a 960 lb. 97.5" high Mayan limestone with clay, *Stela with Queen Ix Mutal Ahaw*, from the de Young Museum for exhibition at two venues. The challenge was to construct an interior crate to keep the object rigid, maintain even pressure with regard to its delicate surface, and mitigate the highest percentage of events from external

shock and vibration to the object during transport.

A scanned 3-dimensional image of the object, reverse engineered to create a negative contoured foam support was incorporated. Using accelerometers positioned at various locations, shock and vibration during transit were then compared for the truck, the packing crate, and the object mount to assess the performance of the system.

The Artistic Practice of Alfred Mitchell: San Diego's Favorite Painter

Morgan Wylder

Alfred Mitchell (1888-1972) may be San Diego's most widely recognized 20th-century plein-air painter. Initially trained at the Pennsylvania Academy of Fine Arts, Mitchell spent most of his life as a painter and painting educator in the San Diego area, eventually becoming known as the "Dean of San Diego County artists." Over his lifetime, his work evolved from more traditional, *alla prima* "Impressionist"-like technique to a more minimalist, sparse aesthetic.

This talk will discuss the examination of artworks, personal journals and letters, and extant art supplies of Alfred Mitchell in context to his own life and evolution, other San Diego artists, and early 20th-century painting movements in general. The San Diego History Center's collection of Mitchell's paintings, art supplies, custom-made paint boxes and French easels, and personal letters and journals provide great insight into the artist and his practice.

In addition, Balboa Art Conservation Center has treated over 30 Mitchell paintings, providing detailed examination notes about his use of varnish, re-use of substrates, etc. Paintings from the San Diego History Center and other private collectors and member institutions have been examined with microscopy, UV light, infrared reflectography, and XRF to aid in the understanding of their construction and materials. Mitchell's work is compelling because many of his works are more than simple,

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decorative pseudo-Impressionist pieces we might associate with California plein-air. Well aware of international and national artistic movements of his time, Mitchell intentionally created moments of experimentation, improvisation, and even humor in his works, all the while also documenting the changing landscape of Southern California over his lifetime.

His painting materials and techniques reflect his story: a firm foundation in Academic training in concert with the less stringent, freer painting aesthetics of the California artistic climate. He used a combination of local materials, some he himself made, and special-ordered European paints and mediums. He was a talented draughtsman, and yet also enjoyed allowing for instances of spontaneous abstraction, loose brushwork, and bright, right-out-of-the-paint-tube colors in his work. The story of Mitchell's painting practice is not only important to the academic understanding and conservation of his works, but also because his practice extended so far beyond himself, with his many students, collaborators, and friends in Southern California.

Comparison of Chinese Painting and Western Paper Conservation Techniques

Grace Jan

For several decades, traditional Chinese painting conservation has been part of the broad field of art conservation in the United States. However, conservation professionals trained in the West are typically unfamiliar with the background, educational training, and practices of Chinese painting conservation. The Andrew W. Mellon Foundation has been working with US museums to address this disconnect, foster training, and strengthen Chinese painting conservation across established institutions on the West and East Coasts and in the Midwest. My background and training in both Chinese painting and Western paper conservation provides a perspective on both traditions. As a result, as a participant in this initiative, I am motivated to engage conservators across these traditions and increase the profile of Chinese painting conservation in the US.

During the conservation of a 20th-century, Qing Dynasty ancestor portrait painted with ink and color on paper, a specific question arose: What treatment approaches would be taken by Western paper conservators or those without expertise in Chinese paper-based objects and might these approaches and techniques be useful or appropriate for Chinese works.

Chinese paintings have unique laminate structures composed of multiple layers of paper supporting a painted primary support with silk or paper borders constructed to achieve a flat and balanced structure that can withstand repeated handling. This painting was in poor condition, with severe creases that made it difficult to unroll flat and exhibit without extensive treatment. Following treatment using traditional Chinese and East Asian mounting techniques, it was decided that this painting would not be returned to its previous rolled format, but remounted and stored flat. This format shares properties with two-dimensional paper-based objects familiar to most Western conservators.

In order to compare and contrast treatment approaches, I surveyed several Western paper conservators about the techniques they would apply to this painting. They would normally refer this painting to a specialist, but they were able to evaluate it through photographs, providing novel ideas and treatment approaches.

This talk will present the traditional Chinese approach used to treat this painting, and Western-based treatment proposals from my colleagues. My examination of different approaches, techniques, and materials will expand our knowledge of treatment techniques across disciplinary fields, and assess if and when a combination of traditional Chinese and Western approaches is appropriate.

This talk will discuss Chinese conservation approaches and how Chinese and Western approaches can be leveraged to advance conservation practices in the US. More broadly, this exploration of approaches aims to expose Chinese art conservation to the larger community of conservators,

increase the dialogue between cultures, and contribute to its integration into art conservation.

Collaborative Paper and Photo Conservation at the University of Washington

Claire Kenny

In December 2016, the University of Washington was awarded a grant by the Andrew W. Mellon Foundation to support a new Collaborative Paper and Photograph Conservation project and hire a jointly appointed Conservator for Paper and Photographs to conserve collections at both the Henry Art Gallery and UW Libraries.

This three-year, 50/50 joint appointment is designed to advance the development of shared conservation services on the UW campus and bring together staff expertise at both institutions to explore and develop substantive collaborations. This presentation will share what we have learned thus far and describe some of the ways in which this collaboration gives rise to greater support of our diverse collections, exhibitions, and communities.

Update on the Gladzor Gospels at UCLA Library: Planning for a Collaborative Rebinding

Consuela (Chela) Metzger and Nora Avetyan

Back in 2001 Getty Museum manuscripts conservator Nancy Turner gave a talk at WAAC on the extraordinary medieval Armenian manuscript *The Gladzor Gospels*, currently held at the UCLA Library Special Collections. Nancy covered the complex history of this manuscript, the conservation treatments she carried out when more than forty Gladzor leaves were exhibited at the Getty Museum, and the considerations for rebinding the leaves once the manuscript returned to UCLA.

In 2019, we are finally moving the rebinding conversations forward at UCLA Library, and it is time to look closely at what a rebinding is, how modern book conservation in the western

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world has framed the act of rebinding, and what collaborative rebinding plans might work for a book that is part of an active faith tradition. The rebinding work is still in the planning stages, and I invite the WAAC community to share their ideas. The thinking behind this rebinding effort will be shared from the perspective of a book conservator and from the perspective of a librarian who is also active in the Armenian Community of Los Angeles.

Let's Stick Together! Group Consolidation Projects at the Huntington

Kristi Westberg

In 2016 Debora D. Mayer and Alan Puglia gave a talk at the AIC annual meeting titled, "The Challenge of Scale: Treatment of 160 Illuminated Manuscripts for Exhibition." For the last three years the Preservation team at The Huntington have used their framework to carry out group consolidation projects on medieval manuscripts.

During our most recent project we were faced with areas with silver leaf as well as powdery green and blue pigments. This led us to work together to figure out the best setup, settings, and concentrations for the application of non-aqueous aerosol consolidants. While this research and testing is ongoing, this presentation aims to share what we have learned so far and invite WAAC members to share and discuss other techniques for consolidating similarly moisture sensitive materials.

The Conservation Curiosities of Clyfford Still

Pam Skiles and James Squires

This presentation will share a number of examples of conservation issues with the paintings of Clyfford Still. Still was an originator and leader of Abstract Expressionism, however, he severed ties with the New York art world in 1951, near the zenith of the artistic movement. He retreated to rural Maryland where he finished out his career.

During his life, he created over 1,100 paintings and 2,700 works on paper, most of which were kept in the artist's possession and were never exhibited. The establishment of the Clyfford Still Museum in Denver, Colorado in 2011 has begun to affect change and make his artwork increasingly accessible. In addition to expanded viewership, it has allowed the conservation staff to begin examining, studying, and analyzing a uniquely intact body of work.

Many of the condition issues seen in the collection stem from the artist's working method and also pose challenges to interpreting artist's intent. Other intriguing issues have unknown origins and are the focus of ongoing research. Additionally, conservation activities must take into account developing curatorial scholarship, determine acceptable aging characteristics for little known abstract works of art, and the role the conservator plays in the interpretation and presentation of these artworks.

Photogrammetric Imaging as a Tool for the Condition Recording of Outdoor Public Murals

Samantha Emmanuel and Kiernan Graves

Condition recording is one of the fundamental aspects of documentation for conservation interventions. Graphically annotated images are a useful tool for mapping and understanding patterns of deterioration. They serve as a record for treatment and are useful for monitoring the condition of an artwork over time. However, graphic documentation (GraDoc) can be problematic, as it requires the creation of accurate basemaps; methods of recording data are subjective, imprecise, and subject to human error; and, the type and severity of condition phenomena is open to interpretation.

An improvement to this type of GraDoc has been the addition of Visual or Illustrated Glossaries, in order to reduce misinterpretation and improve consistency of condition vocabulary. Still, this approach is time-consuming and often not within the scope of work.

Nevertheless, accurate and detailed condition reporting for large murals is paramount, as conditions manifest on a micro-scale and can vary considerably across an artwork. Additionally, it also informs treatment and maintenance decisions.

The Market Street Railway mural is a much beloved community mural in the Mission District of San Francisco, painted by local muralist Mona Caron in 2003-2004. After 13 years in an unmitigated exterior environment, ongoing deterioration and damage were visible across the entire surface of the mural.

The most pervasive issues were widespread cracking, severe flaking/tearing, complete loss of the acrylic paint layers, extensive fading, and graffiti. Previous condition surveys had graphically notated conditions onto an image of the mural captured soon after completion. However, this method presented difficulties in recording phenomena to scale and recording the severity of conditions in three dimensions.

The primary aim was to obtain a current image of Market Street Railway to use as a basemap. Another objective was to create an accurate record of condition to be used for monitoring and maintenance after completion of the conservation treatment.

To resolve these issues, the decision was made to create a high resolution basemap using close-range photogrammetry. A series of overlapping high resolution images of the mural was captured, and using structure-from-motion photogrammetric processing (Agisoft Photoscan) the output was a high-resolution digital orthophoto—a color corrected, rectified, uniform-scale image.

After processing, the orthophoto revealed/documented precisely the extent and severity of the condition of the entire mural in the image. These images were used as basemaps to graphically map select condition issues of the entire surface and record conservation treatments.

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Photogrammetric imaging allowed the capture of a three-dimensional surface in a two-dimensional format, reproducing in high resolution both the pictorial image and the irregular surface topography without distortion. This is advantageous for conservators working on large architectural surfaces with limited access and project time constraints. The resulting orthophotos allow for full condition assessments of the surface and greater accuracy in mapping condition. Furthermore, the image capture/processing methodology is reproducible, where in addition to providing a visual record of condition before and after treatment, the process can be repeated so that change can be monitored over time.

A New Method for the Identification of Wood by Chemical Analysis

Arlen Heginbotham, Madeline Corona, Jessica Chasen, and Michael R. Schilling
Wood species identification is important in cultural heritage research because it provides essential information about the materials and techniques used by artists to create objects of art, provides clues to historians about trade routes, and guides conservators in the selection of suitable replacements for damaged pieces of wooden objects. Examination of anatomical features in thin cross sections is the established method for identifying wood genus and/or species, and practitioners have access to well established databases to aid in their efforts.

However, not all species can be differentiated by this method (for instance, pine, ebony, and rosewood are problematic), and it takes much time and practice to develop the required expertise. An alternative to wood anatomy is chemotaxonomy, in which wood species are identified on the basis of compounds originating from secondary metabolites that are unique to each species. Recent studies have focused on identifying a particular wood species (such as *Dalbergia*) to provide diagnostic support for the Convention on International Trade in Endangered

Species (CITES), but none address the larger goal of developing a viable chemotaxonomic alternative to wood anatomy.

This paper presents a novel method (nicknamed MOXI; MOlecular Xylem Identification) for conducting wood identification based on chemical analysis using thermal desorption pyrolysis gas chromatography/mass spectrometry (TD-Py-GC/MS) to analyze volatile fractions and thermal decomposition products from finely divided wood samples. This method has several advantages over traditional anatomical identification including a significantly reduced sample size (0.3 mg of powder vs. more than 40 mg for traditional thin anatomical sections) and increased ease of sampling. The method also shows promise for successfully discriminating between species that are not separable by anatomical methods.

The use of an established analytical technique that is widely found in conservation science laboratories should make this method readily accessible to many researchers in the cultural heritage sector. The use of user-friendly and commercially available software for the evaluation of the GC/MS data also makes it possible to develop a reference database that can be easily shared and referenced by collaborating researchers. In a preliminary study, two reference specimens of each of 62 wood species commonly found in decorative arts collections were analyzed with the optimized TD-GC/MS method.

The resulting chromatograms and integrated mass spectra were compiled in a reference library. The method was validated by analyzing samples taken from 17th – 19th century objects within the J. Paul Getty Museum collection and comparing the results to identifications made through traditional anatomical study. All of the samples were correctly identified through the combined use of software called F-Search (from Frontier Laboratories, a program originally developed for polymer identification) and specific comparison of distinctive phytochemical compounds identified by the analysis.

Is Quantitative XRF of Historic Copper Alloys Possible?

Arlen Heginbotham

Energy dispersive X-ray fluorescence spectroscopy (ED-XRF) is a method of elemental analysis that has numerous advantages for the study of cultural heritage materials. It is rapid, nondestructive, and capable of simultaneous multi-element analysis. In the last 15 to 20 years, miniaturization and mass production have made the technique widely available to the scientific and conservation laboratories of many arts and heritage institutions.

Although the generation of an XRF spectrum is a straightforward undertaking, the conversion of an XRF spectrum to an accurate quantitative estimate of elemental composition is an extremely challenging undertaking.

As a result, the collaborative study of large classes of objects is hindered by poor interlaboratory reproducibility. This flash talk addresses the collaborative application of XRF to the study of historic copper alloy artifacts with a particular focus on French gilt bronzes of the seventeenth through twenty-first centuries. The results of an early interlaboratory round robin study are presented to demonstrate that without the benefit of a well-designed, shared, calibration protocol, interlaboratory reproducibility for XRF analysis of historic copper alloys can be expected to be dismal.

A detailed calibration protocol has been developed, relying on a new set of certified reference standards and the use of freely available open-source software for spectral analysis. A second interlaboratory study, using a wide variety of instruments in use by cultural heritage institutions, demonstrates the dramatic improvements in reproducibility that may be expected by following the protocol.

Finally, the potential benefits of collaborative study using the proposed protocol are highlighted by applying machine learning techniques to a large reference dataset of French gilt bronze

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compositional data acquired using five different ED-XRF instruments over a ten-year period. The machine learning analysis outperforms more traditional statistical methods in providing an estimate of the date of manufacture for undated French gilt bronzes with a well-defined confidence interval.

The Use of Agar for the Superficial Cleaning of Water-Gilded Wooden Objects

Sophie Kirkpartrick, Cécile de Boulard, Marianne Decroly, and Paolo Cremonesi

Agar is a rigid polysaccharide gel that has been introduced in conservation cleaning treatments through the intermediary of Richard Wolbers in the early 2000s. Since then, different researchers have studied the use of agar in the field of conservation of painting on canvas, wood panels, wall paintings, plaster sculptures, marble sculptures, terracotta, graphic documents, and textiles.

All these studies have shown the interest of agar for the cleaning of works of art. It appears that this natural product would be one of the safest ways to deliver moisture on water-sensitive surfaces. Actually, the dispersion rate of agar can be tailored to the treatment by adjusting the concentration of the solution. In addition, agar acts as a molecular sponge, it solubilizes the impurities and holds those materials within its gel matrix.

Through my master's degree thesis, we wanted to expand our knowledge of the agar by studying its use for cleaning aqueous gilding on three dimensional wooden objects. This kind of substrate constitutes a particular cleaning problem because it is made of extremely water-sensitive materials. Whereas, it turns out that water is often an indispensable tool for the removal of dirt layers. Moreover, the sensitivity of the gilding to friction and abrasion makes any mechanical action necessary for cleaning difficult.

My master's degree thesis is divided into three parts. The first is a theoretical study which provided better understanding of the different parameters that influence the

action of agar. These parameters are the composition of agar, the concentration of the gel, and the method of application. Then, on the basis of the theoretical study, an experimental study was carried out to determine the appropriate conditions for an agar gel to be effective as a cleaning agent on a dirty gilding placed on a three-dimensional wooden substrate. Finally, the cleaning of a gilded wood frame was carried out using agar gels, according to the results obtained in the experimental phase.

Cleaning a Fresco Secco with Gellan Gum - A Case Study

Bianca Garcia

Mother and Son, a fresco secco by Jean Charlot, was treated at the Balboa Art Conservation Center (BACC). There was a heavy layer of grime embedded in the paint layer and support, obscuring the true tonality of the composition and darkening stress cracks throughout.

Due to the porous nature of the support, using an aqueous solution delivered by the traditional swab method was considered problematic as the cleaning solution might drive the grime further into the support. Mechanical action was also considered a risk factor since the paint layer had aggregates prone to cleaving off.

Both of these issues led to the idea of surface cleaning with rigid gels. Low-Acyl Gellan Gum was selected due to its ability to poultice grime and how readily it conformed to the textured surface. Due to a concern for tidelines, it was decided to cast the gel in one single sheet that covered the entirety of the painted surface, measuring 23 1/2" x 27 1/2". While a successful treatment, it was not without its challenges, and there is room for improvement and further perfecting of the technique.

Preliminary Investigation into Nanotechnology for Textile Application

Staphany Cheng and Laura Maccarelli

This talk will present research on the application of two different Nanorestore Gels® on textile substrates and discuss how the results of the experiments

Terra 2021 World Congress on Earthen Architectural Heritage

Announcing Terra 2021, 13th World Congress on Earthen Architectural Heritage - **Looking Back, Moving Forward: Advances in Conservation**, June 8-11, 2021, Santa Fe, New Mexico.

The Getty Conservation Institute, in collaboration with the National Park Service, Vanishing Treasures Program and University of Pennsylvania, Stuart Weitzman School of Design is organizing this 4 day conference that will address conservation management and care of earthen architectural heritage around the world and in the southwest.

500 - 600 specialists are expected to attend from all parts of the world with significant architectural heritage. The call for abstracts has been extended until April 1, 2020. More information about Terra 2021 and the call for abstracts can be found at terra2021.org. We hope to see you in Santa Fe for Terra 2021.

informed the treatment proposed for a water damaged, 19th-century applique thangka. Successful applications of Nanorestore Gels® have been published for the treatment of works on canvas, works on paper, wall paintings, stone sculptures, and waterlogged wood. However, limited experimentation has occurred for applications on textile objects.

Nanorestore Gel® Peggy 6, a hydrogel based on poly (vinyl alcohol) network, and Nanorestore Gel® Medium Water Retention, (MWR, formerly known as "Max Dry"), a chemical hydrogel based on a pHEMA/PVP semi-interpenetrated network, were evaluated. Three fibre types and three application durations were tested. The extent and rate of water movement was quantified for each of the gels on each fibre type. Digital microscopy, FTIR, and UV photography were utilized to determine if either gel left detectable residue when applied to the textile substrate.

Both gels displayed different properties and interacted differently across the three fibre types, suggesting that each of the gels is suited to specific fibre types. The gels were tested further for potential application on different thangka components.

Conserving Canvas Symposium

The Conserving Canvas Symposium was held October 14 - 17, 2019, at Yale University in New Haven. It was sponsored by the Getty Foundation with support also provided by the Avangrid Foundation. Just under 400 conservators and conservation scientists attended from around the world.

Because this conference was very significant, the first to address the many topics of the conservation of canvas since the 1974 Conference on Comparative Lining Techniques in Greenwich, there was more information than just one reviewer could cover. Therefore, seven reviewers were commissioned to cover one session each. The subject matter of each session varied, and thus the way it is reviewed.

Session 1. History, Principles, and Theory

Chair: Ian McClure

The opening session of the Conserving Canvas Symposium, as the title suggests, reviewed the history, principles, and theory of structural painting conservation in a variety of conservation communities around the world.

Stephen Hackney opened with the keynote address titled "Understanding Structure, Changing Practice." He began by acknowledging what became a touchstone in the Yale conference, the 1974 Conference on Comparative Lining Techniques in Greenwich.

Until Greenwich, there was little published on these topics, and the conference made clear the need for further research. Many avenues of inquiry grew out of this call to action as well as a stepping back from intensive treatments as a community. Hackney identified other aspects that happened contemporaneously and led to a decrease in linings, in particular, needing to be carried out. Bolstering collections care practices like better crate design and handling, as well as improved environmental conditions in museums fed into this sea change. Hackney also identified areas of still needed research, such as the role of acidic materials and the possibilities of canvas deacidification.

Following the keynote was a paper on recent research at the Canadian Conservation Institute given by Eric Hagan. He delved into "Applied Mechanics and the Structural Treatment of Paintings on Canvas" which in part shared results of the CCI Lining Project. First giving us a review of the mechanics of artist's paints and then how their visco-elastic nature relates to time, Hagan then discussed how these criteria can be manipulated in conservation treatments. Both acrylic and oil paints were examined in these studies.

The next several talks focused on the history of structural paintings conservation in several different countries. First, Mikkel Scharf discussed "To Treat or Not to Treat: That

is the Question," which reviewed the history of structural conservation in Denmark. Scharff reviewed the education of conservators at the School of Conservation in Copenhagen with examples of the methodology of teaching of glue-paste linings, wax resin linings, and the introduction of the suction and vacuum hot tables. He outlined the change from empirical learning to the shift of a science-based education and identified the shift to minimal interventions. Scharff also highlighted the need for more research into current practices and using this moment to review developments of the last several decades.

Next was a comparative paper of the lining practices at the Courtauld Institute and Royal Museums Greenwich titled "Lining at the Courtauld Institute and Greenwich: Past and Present" by Maureen Cross, Sarah Maisey, Clare Richardson, and Camille Polownik. The two institutions have developed a research project that compares the use of a variety of lining adhesives, fabrics, and methods. Each had a shared ethos and had been early adopters of new methods and materials, but had different purposes, i.e. research versus exhibiting institutions. Each had been heavily influenced by the Greenwich conference as well.

A wide variety of materials and methods were outlined for each institution. Case studies were also presented which identified successful treatments and what made them a "success" was outlined. For example, whether the lining was still fully intact with little to no delamination was examined, but also aesthetic evaluations were considered, such as weave interference, staining of the ground layer, or flattened or moated impasto.

An interesting point was noted with a case study of a painting that was lined with high pressure, resulting in weave interference, but was considered a success in its day because it addressed the cupping paint layer. However, today it would likely not be seen as such and a different approach would be taken. Lastly, future areas of research, as it pertained to these two institutions, were also identified.

From England the focus traveled to Italy with Angela Cerasuolo's presentation on "The Lining of Paintings on Canvas in Naples." She discussed the historical investigations into lining paintings that were undertaken over the last 20 years at the Museo e Real Bosco di Capodimonte. Both the paintings themselves and documents relating to the treatments were evaluated. Two conferences in 1999 and 2007 discussed this research and detailed historical methods and materials from as early as the 18th century. This interestingly included a multi-generational family who lined paintings, considered a separate activity from restoration. Cerasuolo also detailed the practice of transferring paintings to new and historic canvases. The 20th-century techniques of Andrea De Mata were also discussed.

Closing out the first session was Anastasia Yurovetskaya presenting on the "Structural Conservation of Canvases in Russia from 1960s Until the Present: Evolution of Methods

Conserving Canvas Symposium, continued

and Approaches." Yurovetskaya discussed the history of Russian conservation practices from the early decades in isolation from the rest of the conservation global community and how this affected change in the Russian conservation practices. After this dynamic period, Russian conservators began to reevaluate the newer, less invasive techniques along with the historical ones. Access to appropriate conservation materials as well as to assuring their quality also provided challenges for conservators. Yurovetskaya also discussed current practices in Russia which dovetailed with a poster presented at the conference.

Pam Skiles

Session 2. Present Practice

Chair: Cynthia Schwartz

During the first of the afternoon presentations, Paul Ackroyd of The National Gallery in London delivered a crystalline account of the conservation history and recent treatment of Anthony van Dyck's *Equestrian Portrait of Charles I of 1637-8*.

This is a monumental canvas painting (at 3.7m high and 3m wide), described by the presenter as representing "a potted history of lining at the Gallery."

Just over a decade after the painting of this commanding portrait, the king was executed and the painting was among those that were sold by the Commonwealth to defray costs of civil war conflict and royal household debt. In the first half century of its existence, the *Equestrian Portrait* was rolled and transported many times, traveling as far as Munich and eventually to Blenheim Palace in England in 1706, where it remained until the National Gallery acquired it in 1885. In World War II, it is said that the painting was evacuated in a crate known as "the elephant."

The remarkable historical record of conservation treatment at the Gallery provided important information, which would inform the planning process for the recent conservation intervention.

The conservators understood that the original twill canvas was already lined when it entered the collection and that two glue-paste linings were applied in rapid succession upon acquisition. Degradation of these nineteenth-century linings necessitated further structural treatment by Arthur Lucas in 1952. The account of this treatment was interesting, since it described not only the steps and materials of conservation but also Lucas thinking on his feet as he dealt with buckling that arose during the wax-resin relining process.

Ultimately, this relining failed to achieve sufficient melting and even distribution of the wax-resin adhesive, and the painting was left with distortions and compromised support for the canvas and paint layers. While the size, materials, and history of the portrait likely made these earlier

interventions essential for its preservation, they also left the painting with a legacy of general and acute deformations, abraded canvas, and passages of paint loss and disfiguration.

Next, Ackroyd turned to the current Getty initiative project, which assembled a team of conservators from diverse museums to consider a new treatment plan for the painting. The presentation shared the process of documenting the existing structural anomalies and their mapping on a Melinex template, which permitted the team to locate deformations on the verso during treatment. Turning the portrait face down, they removed it from the stretcher and freed it from the old lining canvas, mechanically removing the uneven wax-resin adhesive. Once old restoration materials had been removed, the team repaired splits and tears, consolidated abraded canvas, and filled losses on the reverse. With the removal of non-original materials, fewer distortions remained, and these were further reduced by moisture treatment of the back, section by section.

It was now necessary to turn the painting. Since the unlined canvas remained fragile, it was turned by attaching a temporary strip lining to the surface of the facing. To do this, a stretcher, fitted with a polycarbonate panel was placed on the back of the painting, and the strip lining was fastened to the stretcher. A second polycarbonate panel was slid beneath the face of the painting and attached to the stretcher, and the whole sandwich was then carefully inverted to present the face of the painting. The facing and temporary lining were then removed, and holes and losses to the paint were addressed before the next stage of work. In a separate work area, the team prepared the lining canvas, a single piece of linen with double warp and weft threads. This was pre-stretched and deacidified.

Because of the painting's history and structural requirements, Lascaux Heat-Seal Adhesive 375 was selected as the new lining adhesive. The back of the lining canvas was sized with a dilute mixture of the adhesive, and both sides were sanded. Six coats of less dilute Lascaux 375 were applied to the front side of the canvas, lessening textile weave and establishing an even bed of lining adhesive. Since the painting was larger than the low-pressure table heat source, an envelope system was planned. This was consistent with the early envelope designs described by the Courtauld Institute presenters at Greenwich in 1974, with modifications in the air- evacuation system, for which the presenter expressed thanks to Jos van Och.

Knowing the painting's conservation history, the team anticipated the risk of deformations arising upon partial heating of the canvas during relining, allowing them to minimize some risks and to react to problems as the treatment proceeded.

Once the painting and lining canvas were sealed in the envelope and once the required vacuum pressure was achieved, the temperature of the table was set at 70°C, treating local deformations with spatulas once

Conserving Canvas Symposium, continued

45°C had been reached (the temperature was measured using thermocouples along the edges of the painting). Supplementary warmth sources and insulation, including domestic heated blankets, foil sheets, and fan heaters, were deployed to reduce the temperature differential between the areas being treated and the rest of the painting, with the overhanging portion being supported on adjustable props.

Once the adhesive temperature reached 68°C, the envelope was repositioned to heat the rest of the painting. As slight deformations arose during the process, the team responded by managing the proximity of the painting to the heat source using the adjustable props and by creating an air gap above the table with strips of polyethylene foam. Following lining, the painting was removed from the heat source to cool under pressure, and they determined that a successful bond and even lining had been accomplished.

This presentation gave a beautifully clear explication of a conservation treatment, the process by which the team studied and evaluated the physical character of the painting, and the way that they anticipated the needs and behavior of the painting during each stage of the project.

The second presentation of the afternoon, from the Stichting Restauratie Atelier Limburg (SRAL) was given by Joanna Strombek and Kate Seymour and co-conceived by Jos van Och, who could not be present, but who has refined this technique over the past several decades.

Their paper, "De-Mystifying Mist Lining" described their approach to this technique, which originated in methods presented by Vishwa Mehra at Greenwich in 1974. During the summer of 2019, the SRAL studios welcomed an international team of 16 conservators to study mist lining as part of the Getty Conserving Canvas initiative. This presentation, along with the workshop, a separate workshop in Russia in early 2019, and a handbook and video that will be released soon, forms part of an effort to share this technique more widely. While acknowledging in the presentation and questions, that this is just one of numerous structural conservation techniques that the SRAL students encounter- they expressed their hope that the faces of those conservators in the slides and video represent "the next generation of mist liners."

The presentation commenced with the rhetorical question "why do we still line?" followed by the recognition that is it sometimes just unavoidable where original materials are excessively compromised. At SRAL, when lining is considered necessary, the conservators strive to minimize potential adverse impact by identifying the specific needs of each painting, finding "individual solutions to individual problems." They aim to appropriately pre-treat the painting, then to deploy lining methods that gently support the painting while changing it as little as possible. Importantly, they also work to manage clients' expectations so they do not expect the painting to emerge from treatment "as flat as a board."

To reduce deformations prior to lining, the studio deploys various tensioning systems, from strip or edge linings to point attachment strips and clamps, typically together with moisture treatments. They sometimes use tape strips and paper tensioning systems over low friction films and emphasize that their approach is generally quite low tech and low cost.

For structural repairs prior to lining, the SRAL conservators use thread-by-thread tear repair techniques and local reinforcement with woven or non-woven textiles. Where the canvas is differentially or excessively degraded, they may consolidate fibers or apply weak protein or cellulose ether sizing, and they sometimes use deacidification solutions. Tensioning a painting on a frame during this work permits both sides to be monitored at any time.

While the elimination of heat is often considered to be a benefit of mist lining, the controlled use of warmth at relatively low temperatures, via heating elements or heat pads set below 40°C, may be useful in the preparatory treatment for the reduction of deformations and during consolidation.

As the painting is being studied and pre-treated, the optimal textile is selected for the lining. Their preference is for open woven, non-stiff canvases of natural and synthetic yarn. Occasionally, the needs of a particular painting require stiffer fabrics such as polyester sailcloth (they often use Claessens Belgian linen canvases and Trevira CS polyester fabrics). An interleaf of Hollytex may also be included between the lining and the original.

The lining canvas is typically stretched onto a working loom, attaching it in a specific sequence so that tension accumulates incrementally and evenly. The canvas is sanded to enhance the nap, and acrylic dispersion adhesive (pH adjusted Plextol K360 and D498, 70:30) is then sprayed onto the canvas with an HVLP spray gun. The number of coats of adhesive depends on the particular needs of the painting, and the edges of the lining canvas are masked to prevent adhesive build-up here.

The lining envelope is constructed with two thicknesses of HDPE plastic sheeting. The thicker sheet is usually stretched onto the working frame or onto a flat surface. Fabric may be included over this sheet to aid the evacuation of the air in conjunction with a perimeter of fabric-covered perforated pipes, connecting to the vacuum tubing and pump.

The lining canvas is placed in the envelope with the adhesive side face-up, followed by the painting and the upper, thinner, plastic sheet, before moderate vacuum pressure is applied. This procedure is typically rehearsed in a dry run prior to activation of the adhesive, to check that the envelope functions well.

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If necessary, the envelope may be constructed so that it is moveable, and the clear sheeting allows the conservator to see the painting during the treatment.

The choice of solvent depends on the desired swelling of the adhesive and the condition of the original painting, and typical solvents include ethanol, mineral spirits or xylene, or combinations thereof. The solvent is introduced into the package on a piece of cheesecloth the size of the painting, which is folded and rolled up. The solvent, usually approximately 60ml/m² is injected into the roll, which is then unrolled and placed below the lining canvas before the envelope is assembled and the air is extracted.

The package is typically left intact, under moderate vacuum pressure of approximately 150-200 millibars (which I think is 2.17 psi to 2.9 psi), for an hour and twenty minutes, the pressure and duration being adjusted depending on the sensitivity of the particular painting.

In cases where a varnish is to be preserved, a solvent can be selected to activate the lining adhesive without disrupting the varnish on the surface of the painting.

At the conclusion of the talk, Kate Seymour described how the process is applicable for a range of paintings and can be tailored to work for old masters or modern works with impasto. A study resource, in the form of deaccessioned canvases and older materials allows the team to test both lining and pre-treatment processes and to evaluate their performance, including the important de-lining process which is a major measure of the suitability of such treatments. These tests lead the team to believe that the procedure successfully achieves a nap bond which enables the lining to be readily and cleanly peeled away if necessary in the future.

Matteo Rossi Doria is recognized internationally for his practical approach and deep knowledge of conservation methods rooted in traditional practice. His terrific curiosity has nevertheless meant that he has developed a remarkably open viewpoint. In this presentation, he acknowledged the merits of traditional methods and discussed how he has sought to identify precisely what it is that lasts well in a good treatment. At the same time, and particularly in his engagement with the thinking of Vishwa Mehra, he is also an advocate for the thoughtful consideration of non-traditional techniques.

In "Linking Past and Future: 40 Years a Liner in Italy," Matteo accounted for the genesis of his approach, saying that the circumstances of the Italian work environment required him to develop an approach that would be "simple, sustainable, and flexible," and to eschew dogmatic, over-complicated, or secretive practice.

During decades of work, the presenter has treated and observed the condition of thousands of paintings. In some

cases, removal of linings was extremely difficult or the old restoration seemed to have fostered mold growth or infestation. In many instances, however, old linings were expertly applied and well preserved. They protected the paintings effectively, and both the lining canvas and adhesive remain readily removable.

Matteo demonstrated this, by showing a slide of a 1776 lining, by Giovanni Principe, which remains securely attached to the painting and, when viewed in raking light, reveals no deformations whatsoever. Principe's father in law, Domenico Michelini, established a dynasty of lining "engineers" that lasted for centuries and lined some of the most important paintings in Rome's churches and museums. These treatments included Caravaggios at the Villa Borghese whose linings, according to the presenter, remain in very good condition. The material choices and application methods of these linings and wooden backings, evidently contributed to the continued preservation and good re-treatability of many of these paintings.

Although, as Westby Percival-Prescott wrote in the foreword to the 2003 Greenwich publication, alternative methods and materials, such as the exploration of PVA adhesives, had been adopted at a relatively early date in Rome, the paintings that Matteo encountered throughout his career predominantly reflected Rome's established conservation tradition. It was in this context, that Matteo entered Rome's ICCROM library to consult the accounts of the Greenwich conference, a study that would lead to him eventually meeting Vishwa Mehra and Gustav Berger "the humanist and the engineer."

This appetite for research and data, particularly with regard to water-based adhesives, continues through his studio work and collaboration with ICOM CC materials working group to undertake scientific examination of components of glue-paste lining materials (as described in a poster at this meeting, outlining the tested performance of different types of canvas and adhesive).

In response to his observations, Matteo has assessed and adjusted the material components of his practice, allowing him to manage stiffness and relative flexibility of adhesive films and fabrics, to reduce reactivity potential in the lined painting, and give support tailored to the particular needs of each lined work. It also helps him to minimize potentially adverse effects of treatment on the fabric of the painting. Over the years, Matteo has come to prefer open-weave canvas of different densities.

He confessed that it was a more involved process (and took a lot of cooking) to come up with a preferred basic paste mixture. Traditional paste combinations incorporating a filler (flour), adhesive (usually animal glue), and a plasticizer are widespread across Europe and elsewhere, but there has been a relative paucity of scientific study of these adhesive mixtures in comparison with industrial products.

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The physical and working properties of glue paste mixtures is the subject of the working group's investigations. To this end pastes, with different flours and combinations of constituents, were prepared, aged, and tested to characterize the softness, stiffness, gel strength, adhesive strength, re-solubility, etc.

Through these studies, the team determined that the most suitable starch/protein content was achieved by combining one higher and one lower gluten content flour, yielding a somewhat stiffer and less RH fluctuation-responsive paste. This is combined with animal skin glue, in a much lower concentration than traditional recipes, along with acrylic dispersion, Plextol B500. This replacement of protein glue with the acrylic dispersion enhances flexibility in the film and reduces wetting of the painting. It is tackier from the outset, speeds up drying, and diminishes the risk of biodeterioration, while remaining readily reversible.

Matteo also sometimes pre-treats deformations prior to lining using a metal tensioning frame. This step can effect a reduction in the pressure and temperature levels needed for the overall lining process, and this flexible tool can also be used to control the tension of the canvas during lining.

He then went on to describe his lining processes which include using both hot and low pressure tables in the studio and hand irons, set at a relatively low temperature of 45-50°C when working on site. In addition to working with glue-paste and dispersion adhesives, the presenter also uses Beva 371, sprayed onto a lining canvas for water-sensitive paintings and oversized temperas, including 19 oversized cartoons from the Barberini collection that were treated this way.

At the end of his presentation, Matteo concluded by showing an example of a delicate, centuries-old, unlined canvas with a strip lining and lamented the difficulty of removing the strip lining. As an alternative, he suggested the idea of developing a "soft lining" with very low adhesion, while still providing support and protection for the painting.

In their presentation, "Customised Methodologies Developed For Large Format Paintings," Barbara Lavorini and Luigi Orata described the relining of a 30m² painting by Alessandro Allori. The painting had developed serious structural problems after enduring a hostile display environment and spending decades in storage on a folded stretcher. Its condition was further damaged during the Florence floods.

Theirs was an account of a specific treatment but they, too, began by stating that they deploy different methods for different situations, quoting Sergio Taiti and Umberto Baldini's words from the Greenwich conference; "it must and will be for the painting itself to impose a careful choice between the various methods and materials." Here, the presenters went further, to state that treatment decisions are the outcome of a thorough preliminary study of the painting

and evaluation of the various treatment options. They also stated that their guiding principle is "minimal intervention" and shared their specific articulation of that term whereby "minimum" pertains directly to the needs of a specific painting, but it must be enough to solve fundamental problems, slow down degradation, and delay the need for further treatment in the near future.

The painting had been lined with glue paste in the early 20thc. and had then been repaired with patchy impregnation of wax resin around seams after the flood. It also had many holes and tears, huge deformations, passages of cleaving paint, and mold damage. The challenge for the conservators would be to find a way to treat these problem conditions while preserving the broadest range of possible future conservation interventions. The surface character, a lean and matte oil color, was an important factor. The conservators carried out extensive consolidant tests to identify one that would secure the paint without adjusting the surface finish.

As they embarked on the search, the conservators studied the materials and condition of the painting closely, measuring the surface pH, measuring the polymerization degree of the cellulose in the canvas, and testing the strength of yarns of the canvas. These comprehensive tests informed their decision as to whether and how to reline the painting.

The team determined that their preferred consolidant was Aquazol 500 in acetone, followed by a second application using a more dilute solution of Aquazol in acetone and water. After the removal of mold and surface dirt, old retouching and fills, a Kozo tissue facing was applied with extra fine rabbit skin glue. The painting was de-lined, by separating the old lining with the aid of polystyrene rollers, and then removing adhesive residues mechanically and with agarose gels.

Once the painting was free of old restoration materials, they repaired tears, re-sewed seam splits, added a polyester/BEVA 371 film strip lining, and reduced deformations using repeated humidification and tensioning.

The lining adhesive, applied with a spray gun to the lining canvas, was a mixture of Plextol B500 and Plextol D360. The lining was carried out in a vacuum envelope of silicone mylar, with the painting face down over a fabric cushioning layer and with the lining canvas positioned above the original in the envelope. The thermoplastic adhesive was then activated using a moveable plastic pool enclosing water at the required temperature (70C). The 1m² pool was left in place for ten minutes before moving on to the next area. After lining, the painting was stretched onto a new expandable stretcher before going on display at the Medici Chapel in Florence.

The treatment of one the Boston Public Library's Puvis de Chavannes murals was the subject of the next presentation

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by Gianfranco Pocobene. The paintings were commissioned by the library and are the only mural cycle by Puvis outside France. When they arrived in Boston in 1896, the canvas paintings of the mural cycle were adhered directly to the wall with a lead white in linseed oil adhesive but, by 2014, it was determined that the paintings were endangered. Significant portions had since become detached owing to infiltration of water and soluble salts within the wall, and large pieces of loose plaster were also pushing against the back of the paintings.

In 2016, *Philosophy*, was removed from the wall and conserved. The treatment was the subject of this presentation. This was a challenging process, in part because of the display conditions, but also as a result of the delicacy and brittleness of Puvis' very lean and thin paint and ground layers. Treatment commenced with facing of the painting using Kozo paper and an emulsion of Golden MSA UVLS varnish with mineral spirits and water. This was followed by a structural facing support of strips of linen added with the same adhesive strengthened with BEVA gel. The painting was removed from the wall with a modified slate ripper and mallet- anchoring the linen facing to a wooden support structure as they moved up the painting.

Once free from the wall, the extent of water infiltration could be assessed, and it was determined that the paintings should be attached to a separate panel and not returned directly to the wall following conservation. An aluminum panel was selected as the preferred support option. For the lining, the back of the painting was prepared with dilute, warm BEVA 371. A Belgian linen interleaf was stretched onto a frame and prepared with a coat of dilute PVA, followed by a coat of warm BEVA 371. This canvas was then tacked to the back of the painting with a hand iron before adding a further coat of BEVA 371 to the back of the interleaf. The aluminum support panel was also given a coat of the same adhesive. Next, the painting was turned so that the canvas facing could be removed, while leaving the paper facing in place.

For the lining, the heat source was a temperature-controlled silicone rubber heated sheet. The painting was to be placed under vacuum pressure in an envelope and heated in sections, using insulation sheets to retain warmth in the treated area. Unfortunately, despite the extensive preparations, new deformations arose during the heating of the initial section, and the conservators were forced to stop the treatment. Upon investigation, it was determined that the aluminum skins of the support panel had expanded and delaminated from the structure upon heating.

The conservators' challenge now became the removal of the 4ft section of the painting that had been partially marouflaged to the failed panel. To effect a safe reversal, they determined that the painting would have to be rolled carefully away from the solid support. This was achieved by re-heating the painting and rolling it away from the

damaged panel on a large curved form (described as being like a section of a 12ft. diameter Sonotube). As the painting released from the support, the adhesive cooled, causing stringing, which significantly increased resistance, and the adhesive strings therefore had to be cut during the process.

Once the painting had been successfully removed from the faulty panel, the conservators had an opportunity to reflect on the challenges and to consider modifications to the treatment plan.

Working with the panel manufacturer, they determined that the weak part of the panel had been the attachment at the edges and joins of the panel. They identified an epoxy resin adhesive that would tolerate temperatures around 80°C and replaced the poplar and Medex seam and edge supports with aluminum internal supports. In addition to this, the major seam was supported by a 3 inch honeycomb Hexcel plate, all of which measures rendered the panel stiffer and more stable. The manufacturer also made mock-ups of the new configuration and tested them before the new panel was used on the painting.

The challenges that Gianfranco and his team had faced when trying to overcome the strong adhesive bond during the treatment reversal also prompted them to reconsider the use of BEVA 371 for the new treatment. They therefore produced their own version, using the dry BEVA 371 resin mix, dissolving it according to the manufacturer's guidelines and adding varying percentage portions of their own selections of microcrystalline wax. Through these tests, they were able to produce an adhesive that would adhere at a lower temperature (below 60°C between the panel and interleaf and below 54.4°C on the surface of the painting). These combinations were then studio tested on mock-ups, and a mixture with 10% added paraffin wax was selected as the optimal adhesive for this application.

Finally, following the comprehensive tests and production of the new panel, the painting was successfully re-lined, maintaining a surface temperature of 54.4C in the envelope during lining. It was then filled, inpainted, and returned to display at the library. Beyond the positive outcome of the treatment, the conservators should be commended for working through the challenges they encountered and for sharing the re-engineered panel and adhesive solutions with the professional community.

Julia Brandt of the Bayerisches Landesamt fuer Denkmalpflege described the conservation treatment of a damaged nineteenth-century painting by Engelbert Zimmermann from the small community of Wasserburg am Inn. The painting, approximately 2m in height, had been stored for decades in the unconditioned environment of the attic of the city museum. In 2012, the covers protecting the painting were removed as part of an inventory, and it was discovered that the painting had developed a large tear that had rolled over and set into a fixed deformation.

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A conservator had evaluated the painting and turned it on its side so gravity would assist the preservation process, and Julia Brandt was engaged through the Technische Universitaet Muenchen to assist with the treatment.

Upon examination, the canvas was determined to have an uneven plain weave, with threads being considerably thicker in one direction than the other. Unusually, the artist had also sized the canvas with a generous application of mastic prior to painting.

The inherent unevenness of the structure and the weakness of the canvas imposed limits on how fast and how far the treatment could proceed and meant that the deformations could only be pulled out of the canvas in one direction (presumably in-line with the thicker threads) with the help of gentle warming and tensioning. These limitations prompted open dialogue with the client so that the expectations of the conservation treatment remained realistic.

In this case, the degradation of the canvas rendered conventional tear mending impractical because of the advanced brittleness of the resin-soaked threads. The decision was made to line the painting, but it needed to remain visually consistent with the other paintings in the group. Also, the adhesives for the tear support and lining should be able to tolerate warm temperatures in the storage attic. They wanted to avoid disturbing the resin in the painting, so needed to avoid alcohol in the lining and other adhesives, and they wanted to be able to remove the lining in future without compromising the tear repairs.

To these complex ends, they repaired the tear with Stabiltex polyester and Plexigum PQ 611. For the lining, a linen canvas was selected and an adhesive adapted from the SRAL mixture was prepared (Plextol D540 and Dispersion K360, in a ratio of 7 parts to 3 parts, flocked onto the lining canvas).

Since the painting had never been removed from the stretcher, but a good portion of the edge had become detached, it was possible to feed the lining beneath the original and attach it to the stretcher without removing the remaining tacks. The lining and canvas were bonded with warm spatulas and irons, and, beyond the structurally important top of the painting, which was firmly anchored to the stretcher, the intent elsewhere was to achieve a moderate level of support while tolerating slight undulations across the surface.

Following the conservation treatment, the owners were sufficiently pleased with the outcome that the painting went on display instead of back into storage. The conservator noted the incomplete adhesion between the lining and the Stabiltex tear repairs but overall, the treatment was considered a successful and moderate intervention to support and slow degradation of this painting.

In the final presentation of the afternoon session, Elke Oberthaler spoke about structural issues in relation to paintings in the Kunsthistorisches Museum collections in Vienna. The gallery and the collection, distributed across numerous satellite venues in addition to the main museum, was founded in the seventeenth century, when Archduke Leopold Wilhelm transferred his collection to Vienna. The newest museum site is the central storage facility, into which approximately 2000 paintings and 800 frames were moved in 2011.

The move and preparatory work which preceded it allowed the museum's conservators to observe the condition and storage situation of many paintings and to review old temporary treatments that had long since ceased to be temporary, including provisional wrapping and facings. The presenter warned young conservators about the risk of returning faced paintings back into storage (she had faced one of the paintings early in her career).

Another issue of concern during the move was how to reduce risks from pests as works were transferred to the new building. Bread beetles were found to have infested some paintings, apparently feeding on adhesive in the widespread starch paste linings. Paintings going into the new storage were therefore fumigated to prevent infestation in the new facility. Storage is monitored with traps and attractant lights and they have an anoxic chamber. The last line of defense is an army of minute parasitoid fairy wasps, which destroy the eggs of the target pest.

The collection move and recent conservation projects also provided an excellent opportunity to study the linings on the paintings, many of which remain in good condition. An example of such a lining on a prominent painting is the canvas that had been attached to the back of Titian's *Ecce Homo*, which was signed and dated 1774 by a Mr. Hickel. Such linings were typically executed using a coarse and open-weave canvas, and they have generally performed well to this day, typically only requiring intervention near the edges.

One of the examination and treatment examples presented in the talk was a painting by Salvator Rosa with one of the starchy linings that are so attractive to insects. The edges of the painting were very frayed and when the painting was removed from the stretcher for conservation, widespread evidence of infestation was discovered. This painting had a densely woven lining canvas and a thick and glue-rich lining paste layer.

The conservators considered the removal but determined that the original canvas had been sanded and was not in sufficiently good condition for the removal of the existing lining. Around the edges, the lining was peeled back and the adhesive was removed with agarose gel. The edges were then strip lined, using Lascaux 498HV to adhere the new edges to the painting and then folding and adhering the lining edge back over the new strip lining.

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For a decorative painting by Johann Franz Greippel from the president's office at the Hofburg, a similar lining was observed to that on the Rosa. In this instance there was no pest infestation, but the painting were poorly tensioned and required on-site attention to tears and other condition problems. Again, the lining was retained and the tears was repaired by lifting a patch of the lining, mending the tear with sturgeon glue and BEVA 371 film bridges before sewing the lining back together and injecting starch to readhere the lining.

In Vienna, linings today are done with a veneer press instead of irons, allowing the process to take place without heating the painting. In this practice, a faced and newly lined painting is placed into the press and placed under pressure. The felt and fabric cushions around the painting are changed regularly to promote drying at the desired rate.

The next case concerned the recent treatment of an unlined seventeenth-century still life by Gottfried Libalt, from the *Kunstkammer* collection. Requested for display because it depicts a bust of Archduke Leopold Wilhelm, the unlined painting had been reformatted at some time by folding the left and the right sides over and by the addition of several strips of canvas- all of which make its unlined condition all the more remarkable. The painting also had many deformations and an overall length of tears that added up to 5m.

To gain a clearer understanding of the original format of the painting, the conservators examined the structure of the painting carefully and also checked it against the Archduke's 1659 inventory of the collection, which gives accurate descriptions and dimensions of the paintings. Although the canvas was torn in a number of places, the conservators considered it strong enough for them to treat by mending the tears and adding inserts. Distortions were reduced with weights in a humidity chamber, and the repairs were made using starch paste and sturgeon glue. To recover the original format, in addition to revealing the original sides, the non-original addition at the top of the painting was folded over a modified, rounded upper stretcher bar. The treatment successfully honored the integrity of the original materials while gently providing the necessary level of support for responsible display.

The afternoon session was distinguished by an extraordinary diversity of cases and treatment techniques in a rich spectrum of traditions and approaches. Perhaps one of the great benefits of the meeting was the candid sharing of considerable quantities of specific information about the processes and what was successful and what was not in given situations.

The afternoon ended, appropriately, with Matteo Rossi Doria calling for the type of flexible approach that will allow a conservator to be nimble and to deploy treatment measures from more than one tradition "...but you have to get rid of these strict rules. Also, try to forget strong words- "never," "ever," "always," etc."

Nick Dorman

Session 3. Open Questions and Research

Chair: Mikkel Scharff

The second day of the conference began with "Open Questions and Research." The methods for tackling those open questions varied considerably from presentation to presentation, but what became clear over the course of the morning was that the speakers were going far beyond a "more research is needed" conclusion that ends many a conservation talk.

The speakers all focused on tackling the overwhelming number of variables needed to understand complex composite objects such as painted canvases attached to adhesive coated, woven fabrics. In this session (as in the ones that preceded and followed), as a treating conservator I appreciated the emphasis on treatment and the respect given to the empirical knowledge that comes from performing treatments.

The wide-angle views in this session were provided by Christina Young of the training program at the University of Glasgow and Matthew Cushman of the Winterthur Museum and University of Delaware. Young began the session with the appropriately titled "Complexity of Canvas." After outlining many factors that can contribute to the behavior of painted woven fabric (fiber type, yarn characteristics, weaving and finishing processes, tensioning, the addition of subsequent layers, and environmental conditions) she proposed ways to determine which factors were the most practically important for solving treatment problems.

To determine how a canvas will behave during a treatment or to understand what has happened as a result of a past treatment, conservators can perform experiments on mockups. To understand canvas behavior, we can also look at the modeling from industry, in this case the research coming out of polymer mechanics and the smart fabrics fields. (A brief google search on the uses of "smart textiles" astonished me the way 3-D printing did a decade ago!)

Finally, conservators can examine empirical evidence from treatments with epidemiological studies across a collections. (Terrific examples of which were presentations by Elke Oberthaler on the history of lining at the *Kunsthistorisches Museum* in Vienna and Nicola Costaras' history of canvas conservation at the Victoria and Albert in London). Young ended her talk with suggestions for future research directions, including the manufacture of specific fabrics for artists and conservators and the creation of simple studio techniques to assess treatments.

The example from Young's presentation that I particularly enjoyed as a resident of Northeast Ohio was that of the Caravaggio *Crucifixion of Saint Andrew* at the Cleveland Museum of Art whose original size had been explored with a mockup. If we do not understand canvas complexity, we can misinterpret the evidence. Young explained that a

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master weaver had produced a huckaback canvas sample similar to the Caravaggio support. It was then determined that when stretched, this unusual weave type was more stable than plain weave canvas and therefore less prone to cusping.

In “Historical Terminology and Current Classifications of Structural Treatment of Paintings on Fabric Support,” Matthew Cushman pointed out that since the Greenwich lining conference (which produced a handbook of terms), terminology to describe the structural treatment of paintings had become inconsistent. He argued that this had implications for describing what painting conservators do and for evaluating success, and he made two ambitious proposals.

The first was the formation of a working group to update and formalize current and historical treatment terminology of materials, processes, and intent. Cushman argued that the focus should be broad and not prioritize traditions from the English speaking world. The second proposal was to find a method to disseminate information about actual conservation practice, and he suggested the periodic publication of treatment work in institutions and private practices summarizing methods and highlighting successes and failures.

The next three presentations were more specific than the first two, focusing on a new technique to determine canvas strength, the institutional history of wax resin linings at the Smithsonian Museum of American Art, and the history of Spanish glue-paste linings.

“A Novel Technique for the Determination of the Strength of Canvas and its Correlation with the Degree of Cellulose Polymerization” by Theresa Bräunig, Anna von Reden, Dirk A. Lichtblau, and Christoph Herm came out of recent research from the conservation training program at the Academy of Fine Arts in Dresden. The technique could be an example of what Christina Young had in mind when she proposed simple studio methods to aid treatment considerations. The paper also underscored the level of scientific research coming out of the European conservation training programs, something we saw repeatedly during the symposium.

According to Bräunig, the only analytical method for estimating the state of preservation of canvas was capillary viscosimetry, used to determine the degree of canvas polymerization. However, no test existed to relate a degree of polymerization value to a canvas’ mechanical properties until now. Bräunig and team adapted a testing method from the paper industry to test the tensile strength of a single yarn. They were able to get reproducible results from a range of artificially aged and historic canvases.

They then used capillary viscosimetry on the same yarns and were able to show a direct correlation between the

degree of polymerization and the yarn strength. The new technique is considerably faster and easier to perform than capillary viscosimetry and requires very small sample size. The result of this painstaking research, of course, is that the new test can be performed quickly with a sample from an actual painting to help guide treatment choices.

Amber Kerr, chief conservator at the Smithsonian Museum of American Art, presented ongoing research into wax resin linings at American Art. The co-authors of the talk were Gwen Manthey and Keara Teeter. The research began when it was noticed that a number of the wax resin linings were beginning to fail. Especially alarming was delamination of lined paintings that had traveled extensively or had been on view for extended periods. These paintings had been allowed to travel and remain on exhibit because their linings made them appear stable, impervious to environmental changes and buffered from mechanical stresses.

Kerr and her team set about studying the types of wax resin linings performed since the establishment of the conservation department in 1965 by examining treatment records, conservation notebooks, and oral histories. With this information they created a database of historic wax resin recipes and application methods, allowing mockups to be made for study and testing. The hope is that the mockups can be used to anticipate which types of linings, under which conditions, will be prone to which type of stresses and therefore can provide collection care guidelines for the wax lined paintings.

Julia Betancor and Ana Calvo presented “‘Gacha’ Lining Treatment Viability: the Spanish and European Glue-Paste Adhesive Used since the 17th Century.” Their co-researchers were Ana Macarrón and Rita Gil Macarrón, and all four are connected to the Universidad Complutense in Madrid. In Spain, as in Italy, there were many variations on a lining recipe whose ingredients were wheat or rye flour, animal skin glue, water, and possibly some additives to improve working properties. Until the middle of the 20th century, most linings in Spain were gacha, and the technique is still used on occasion today.

According to the speakers, these linings have held up well. Their research involved finding or extrapolating historical recipes from archival records, manuscripts, invoices, and the lined paintings themselves. As in the previous presentation, the information was used to create a database and make mockups of different recipes on both open and closed-weave linen canvases.

Unlike at the Smithsonian, however, the aims of the project were broader. One was to record Spanish lining techniques across three centuries. A second was to determine if differences in the strength of adhesion or susceptibility to bio-deterioration could be accounted for by particular recipes. A final goal was to promote gacha linings as a viable practice, especially on the grounds of the materials’ sustainability, affordability, and lack of toxicity. It was also

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argued that these traditional materials were more compatible with traditional European painting materials.

One of the great strengths of the conference was allowing plenty of time for discussion after each session. With so many experienced paintings conservators from around the world attending, the discussions were informed, informative, and thought provoking. They were also respectful. Depending on an audience member's experience, different threads may have stood out. I did not know, for example, that wax resin adhesives were made up in bulk and then could be reheated multiple times until a batch was used up, with implications for the adhesive's strength.

There was a lively discussion on the merits of and issues with both glue paste and synthetic adhesive linings. A question was asked about open-weave canvases used in glue paste linings, and Mikkel Scharff referred the audience to a poster by NYU conservation student Emma Kimmel on the traditional use of open-weave canvases in Rome. Kimmel found these fabrics to be more flexible and less responsive to environmental changes because they held less glue.

Gianfranco Pocobene wondered if the water in glue paste could disrupt paintings with chalk grounds, making them appear overcleaned. Amber Kerr worried about the proprietary nature of BEVA and the difficulty of reversing BEVA linings.

Christina Young pointed out that it was simplistic to split adhesives into "natural" and "synthetic" categories, favoring one over the other simply on this basis rather than evaluating them on their properties. Having had on occasion discussions about the inherent goodness of "natural" materials with conservation students trained abroad, I was happy to hear Young's clear commentary.

As the world continues to change in response to the global climate and environmental crises, I think that Matthew Cushman's comments at the end of his presentation on the need to consider the environmental impact of material and treatment choices will also become increasingly relevant.

Wendy Partridge

Session 4 Research Continued and Case Studies

Chair: Christina Young

Tuesday afternoon proved to be a particularly interesting session. Jim Coddington presented a survey tracking the history of suction tables early in the afternoon. The talk was interesting and provided not only historic information on the evolution of the suction table and resulting "minimal interventive" treatments that grew in popularity with them, but also provided fantastic historic images.

Following on Jim's paper, Cecil Krarup Anderson's paper focused specifically on Vishwa Mehra's development of

his lining approach. This paper was detailed, specifically dissecting Mehra's reasons for why certain choices were made in the development of his lining techniques. This paper was placed well in the conference as it presented a historical account of choice making and shifting opinions falling under the historic umbrella of minimal intervention. As with Jim's paper, this presentation provided detailed information and good historic images.

In an interesting contrast to the two papers preceding, Lynne Harrison presented on a recent glue-paste relining treatment done at the National Gallery, London on a portrait by Artemisia Gentileschi. This lining was done by hand, with an iron, as opposed to a hot or cold table, using a historic glue-paste lining technique.

The choice to do this technique by hand was briefly discussed, posing an interesting question regarding how treatment choices are made; whether based on the technician's skill and knowledge, available equipment, or best practice at the time of treatment. Several of the tables mentioned by Jim in his paper remain at the National Gallery, London which was mentioned in the Q&A session.

An especially interesting talk followed the coffee break. This talk was given by Kathryn S. Tarleton and Charlotte Hamlin and described the treatment of the history and fabric of the New Bedford Whaling Museum's 1300 foot long *Grand Panorama of a Whaling Voyage*. This talk was presented by a textile conservator which brought in a unique perspective on the issue of structural treatment of canvas paintings. This project was collaborative between textile and paintings conservators. It drove in the basic point that canvas is a textile and working with our textile conservation colleagues can be greatly beneficial in developing treatments, especially for complex objects such as this one.

Cynthia Schwarz followed this by presenting on the treatment of another large painting, a 12-foot round ceiling painting by Edwin Austin Abbey. Cynthia and the team at the Yale University Art Galleries developed creative and innovative solutions for dealing with such a large work of art. The treatment was clever and the results were beautiful.

The last two papers presented treatments of historically important but uniquely challenging collections. The first paper presented by Emilie Desbarax described the difficulties she encountered when presented with a collection of modern African paintings from the Royal Museum for Central Africa in Belgium. This paper posed larger questions of intervention on paintings produced with materials that have their own inherent vices and historic condition issues, such as damage due to travel or other unique reasons.

Claudia Garza's paper following Emilie's presentation, was a personal favorite. Her focus was on the treatment of a

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collection of 18th-century canvas paintings of New Spain. This paper tracked the history of the actual canvas used as support for the group of paintings the team treated. Canvas stamps and other marks were traced and revealed the fabric to have been used as storage sacks on ships, prior to being repurposed as canvas supports for painting.

Tuesday afternoon proved to be a fabulous session at the conference. The first part of the afternoon session focused on tracing the history of modern treatment tools and their influence on treatments used today. Many of the talks focused on choice making and innovations building on historic techniques and creative solutions for challenging projects. The second part of the session really brought everything back to the canvas itself, its historic context, and life as a textile.

Laura Hartman

Session 5. The Adhesives Question

Chair: Stefan Michalski

The morning of the third day of the conference turned our attention to "The Adhesives Question," chaired by Stefan Michalski. There were four presenters on topics that gave us insight into nanocellulose which is being tested as a possible consolidant for canvas, the aging of current synthetic lining adhesives, and new ways of getting familiar adhesives efficiently and effectively to where we want them whether it is to join thread to thread or to join larger surface areas. This grouping of presentations covered a lot of data, mechanical terminology, interpretation, and discussions of ongoing and future avenues of research. It is fair to say that given the complexity of the variables and the need for the practitioner, like myself, to put the time into comprehending these topics, I will not be able to fully convey the material to you in any depth. Many of these presenters already appear in published literature with further publication planned, therefore I encourage you to search their work out individually to learn more.

Adeline Lenotte's 2014 study, "The Reversibility of Synthetic Linings: Peeling Tests" was carried out at the Coatings Research Institute in Belgium. Her study builds upon earlier tests conducted by Cecile du Boulard in 1999. Boulard conducted peel tests on synthetic adhesives Plextol B500 and Lascaux 360 HV. Lenotte's study both returned to Boulard's 15-year-old samples as well as expanded the adhesive study with a look at Lascaux 498 HV and BEVA 371 film. As peel tests are only useful in comparison to one another Lenotte modeled her sample preparation and testing on du Boulard's earlier work.

Lenotte prepared and tested samples as follows. Three were based on Plextol B500, with one mixed in xylene and sealed while wet, one thickened with methylcellulose and reactivated with xylene, and another thickened with methylcellulose and reactivated with heptane and acetone. The Lascaux 498 HV samples were reactivated with xylene

or a mix of heptane and acetone. The BEVA 371 film samples were heat set on a low suction table at 65°C and 70°C, and the Lascaux 360 HV samples were heat sealed at 45°C. Samples were tested with a tensiometer at 15 days and three months. The angle of the peel test was 180°, the speed was 2mm per minute, and the distance was 8mm.

Lenotte's results were presented in charts that indicated what type of rupture occurred and if there had been adhesive residues left behind or fibers broken. The resulting bonds were graded for 15 days, 3 months, 3 years, and where the older samples were available 15 years. The bonds were graded from too low, low, minimum, moderate, intermediate, suitable, high, and too high. Publication of this data would allow a more proper analysis of the results, but the general trend appeared to be that most of these synthetic adhesives were increasing in bond strength as they aged such that many of them were considered too strong upon aging.

This in turn made the audience of practitioners somewhat anxious to point out that the reversal of a lining is typically not done with force alone but aided with heat or solvent, a fact that Lenotte was well aware of. This age-old conflict between models of study and practice is a good reminder that these studies provide us with information that we continually need to contextualize and juggle alongside other factors as we try to do a risk analysis. Other general conclusions of Lenotte included a recommendation that mist-linings be considered to reduce the amount of adhesive applied, the use of Plextol B500 and Lascaux 498 should be reconsidered for producing bonds that were too high, and that BEVA 371 film was the adhesive considered the most acceptable in the study.

Mona Konietzny presented her work with collaborators Karolina Soppa and Ursula Haller in a paper called "Reliable Adhesives in New Shape: Canvas Bonding with Self-Supporting Adhesive Meshes." The author's work was based in Bern Switzerland at the University of Applied Sciences with the aid of adhesive company APM Technica AG and the Dresden University of Fine Arts. The adhesives employed in the study included methylcellulose, sturgeon glue, and butyl methacrylate all cast out into thin adhesive meshes whose cell openings were honeycomb in shape, and whose cast film was about 0.25mm thick and weighed about 30g/m² dry. These dry films could then be easily cut into shape and inserted between layers in the painting structure, for example between a historic lining and the original support, to then be reactivated so that a discontinuous adhesive bridge could be made.

Konietzny reviewed the protocol under development for producing adhesive meshes using a silicone mold onto which the adhesive is applied with a spatula, excess is scraped off, and the glue is allowed to dry so that the dried mesh can be lifted off the mold with tweezers. She then went on to present some case studies that illustrated the activation methods for situations in which the adhesive

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mesh was readily accessible and for those in which the adhesive mesh was inserted between layers to be bonded and as a direct result was not easily accessible.

The example of an accessible activation was demonstrated with a strip lining using a non-woven synthetic support as the strip lining. The adhesive mesh was set down onto the strip lining support and misted with water from a sprayer and allowed to absorb the moisture. The strips were then set in place along the tacking edge and weighted to dry. Alternatives for application of the solvent or water could be a brush or an even finer mist with a nebulizer for example. Once the adhesive mesh was inserted into the structure of the painting and as a result not accessible, then non-woven capillary supports were used placed under the adhesive mesh and the solvent wicked in from the side. After the adhesive was activated, the capillary fabric had to be pulled out and the area weighted while drying. Here a separation in an old lining, at a turnover edge, was shown as an example.

The benefits of such adhesive meshes were reviewed. These included amongst other things a uniform distribution of adhesive without the solvent or water accompanying low concentration glue solutions, less penetration of the adhesive into the structure, increased permeability given the discontinuous nature of the honeycomb mesh, and due to its rigidity in its dry state a greater ease in application into narrow gaps allowing the conservator an easier application process. Future avenues of research will focus on creating a reliable method for producing the meshes, producing larger meshes, developing additional activation methods, and studying both the bond strength and long-term behaviors of these meshes.

Hanna Flock presented her PhD work on adhesives for thread by thread tear repair methods alongside technical lecturer Petra Demuth, both from the Department of Restoration and Conservation of Paintings, Sculpture, and Modern Art at the Cologne Institute of Conservation Sciences. Flock and Demuth's paper was titled "Thread by Thread Tear Mending Method: New Insights into the Choice of Adhesives and Their Application." Many of us, over the years have taken workshops on thread by thread tear repair, an approach pioneered by Winifried Heiber, but it is good to be reminded that research and refinement continues.

Flock began her presentation with a review of what made a good adhesive for this type of repair including amongst other characteristics the ability to arrive at a minimal amount during application, good optical properties, mechanical balance with the fabric's properties, a high Tg around 40-60°C, moderate to high viscosity, ability to reopen the join, neutral pH, and compatibility with other materials. She reviewed past studies published in 2010 and 2011 of adhesives that included a wide variety of synthetics like EVA and PVAc dispersions and epoxies alongside sturgeon glue.

Flock then turned to current work in which the focus is on those adhesives that in the ensuing years had proved to be the most successful. Four adhesives mixtures were presented including: Lineco, a pH neutral EVA dispersion, mixed with 5% cellulose ether gel Methocel A4C; Mowilith DHS S1, a PVAc dispersion, with the addition of 5% Methocel A4C; sturgeon glue at 20% mixed 1:1 with a solution of 13% precooked wheat starch paste; and finally sturgeon glue at 25% mixed with cellulose fibers Arbocel BBW 40 in a 20:1 ratio.

These adhesive mixtures were tested in four configurations including butt join, butt join with bridging threads, overlapping joins, and overlapping joins with intermingled threads. Samples of joined canvas strips were then tested by applying a uniaxial force and the maximum tensile force for each glue mixture in all four join configurations, with the exception of the sturgeon glue with the Arbocel which was only tested in butt joins, was represented in a bar graph.

Of interest to the researchers was a difficulty in reproducing the bond strength results that contributed to a scattering of the data. It was concluded that this was inherent in the technique given the various formation of the joins, the penetration of the glue, and the individual structure. They cautioned that both the worst case and the best-case outcomes for maximum tensile force should be considered in the decision-making process.

Amongst the preliminary findings of the research, which will be published, BEVA 371 and Evacon-R were found most suitable for bridging threads. For overlapping joins with intermingled threads the Mowilith and Lineco glue solutions were stronger than the sturgeon glue and wheat starch paste, although it should be understood that greater strength may not be the goal. And finally, for creating a strong butt join sturgeon glue with cellulose fiber was the best but that the length of the fiber provided was vitally important. Too long (300µ) or too short (40µ) did not produce the best results but rather the intermediate lengths.

The presentation finished with the introduction of a new tool that developed alongside the research to aid in the application of many of these adhesives that gel quickly when not warmed, making the process of the thread by thread tear repair a finicky task. The "Winnie" as it has been christened in honor of Heiber, is a small unit that holds and gently warms an insulin-sized syringe of warmed glue, keeping it fluid to the point of contact with the threads being joined.

It is sold by Star Tec Products in Germany. It can be purchased as a kit with a small hot needle, several alternative tips, and a unit that controls the heat. Theoretically the manufacturer suggests that both the Winnie and the needle can be heated from the same unit with a splitter, but this appeared to give less control in practice and the needle seemed to get too hot. The Winnie does keep the glue workable if one takes the time to do some practicing. I am told that an illustrated guide to using the Winnie is in the plans.

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The final talk addressed in this review was actually the first talk of the morning but it seemed best to end this summary by taking a look at new horizons in the field of adhesives for canvas paintings. “Nanocellulose in Painting Conservation: The Introduction of New Materials for Canvas Consolidation and a Novel Multiscale Approach for their Assessment” was presented by Alexandra Bridarolli with her team of collaborators including Marianne Odlyha, Oleksandr Nechyporchuk, Krister Holmber, Marta Oriola, Cristina Ruiz-Recasens, Manfred Anders, Aurélie Chevalier, Romain Bordes, and Laurent Bozec.

Bridarolli began by reviewing how the Greenwich lining conference in 1974 set the stage for looking for alternatives to lining and presented nanocellulose as a material that when used as a consolidant showed “promising mechanical, optical, and barrier properties.” To understand their potential Bridarolli laid out four steps in a process of assessment. The first was to understand the impact of humidity on the materials of canvas paintings, highlighting their viscoelastic nature. The second was to describe the properties of commonly used consolidants. The third was to introduce the newly developed nanocellulosic materials while the fourth was to test the materials on both artificially aged cotton canvas and then on some actual paintings.

The nanocelluloses introduced ranged in their method of production and their morphology. They were studied both individually, as part of a composite solutions, and employed in a “multi-layered particle structure.” These new materials were judged on their appearance, their ability to consolidate or reinforce, their response to humidity, and their stability upon aging. The canvases were studied both before and after consolidation treatments with a variety of surface imaging and tensile testing as well as dynamic mechanical analysis with cycling relative humidity.

To get a better idea of the results of the assessment thus far I suggest that you refer to the readily available publications online for a more complete and a more rigorous discussion. Some general advantages of these materials noted included the overall low weight of the consolidants added to the original structure and the provision of reinforcement to the canvas that was maintained after accelerated aging. While the concerns ranged from the amount of water that some of the nanocelluloses required for application and an observation that some of them increased the reactivity of the canvas to humidity.

As these materials present the ability to be finely tuned by functionalization and have a built in affinity to the canvases being treated, the researchers hold up the possibility that these materials could help us overcome the shortcomings of our traditional lining adhesives. They could perhaps even lead to structural treatments that would help reinforce weakened canvases without the addition of a secondary support.

Finally, in summing up this session I would be remiss if I did not mention the energy in the room as this group of presenters gathered on the stage for the discussion. Given the larger societal discussions of gender parity and representation in fields well beyond conservation, it was empowering to see the female panel.

The Greenwich Lining Conference of 1974 so frequently invoked in the Conserving Canvas conference included 23 papers with 2 women and 22 men listed as authors. Conserving Canvas had roughly 43 presentations with approximately 88 authors listed, 60 of whom were women. While it took 30 years to see the Greenwich Lining Conference in print, I hope for the sake of this research that we will see the results of all this hard work sooner than that so it can inform our collective decision making.

Heather Galloway

Session 6. Interventions and Collections

Chair: Elke Oberthaler

Jill and Rob Proctor started the session with the evolution of minimal interventions they have adopted and adapted over the years to correct canvas issues. Particular attention was given to tear mends and building upon the thread by thread repair technique pioneered by Winifried Heiber. Details included: the use of a suction platen for mending, consolidation, and correcting distortions; gentle heat provided by a reptile mat; temporary removal of a stretcher bar to access and repair damage; and attaching twill tape to a watch glass in order to maneuver and provide pressure on the reverse of a canvas. Nuanced decisions were explained regarding the reinforcement and modification of original supports, rigid inserts, and padded backing boards. Custom solutions were devised for specific needs.

Emily Mulvihill et al also focused primarily on adaptation and additional reinforcements to tear repairs based upon the Heiber technique, designed to withstand the fluctuating environments of private collections. The challenges presented by large contemporary works painted on cotton duck were a particular focus. These modifications included weaving in Gore-Tex sutures across the break, padded backing boards, Japanese tissue reinforcement, and applying acupuncture needles to the reverse of a tear mend.

Renate Poggendorf outlined the history of structural interventions and the lack thereof in two 19th-c collections in Munich. Most of these works are unlined and have held up quite well over the years. The conclusion presented was these works have aged very slowly and that less treatment has proven to be a better approach and has left much original information and intention well preserved.

Claire Gerin –Pierre et al presented the complex history of a large group of 17th-c paintings at Versailles. Extreme fluctuation of environmental conditions had resulted in

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a long history of linings and transfers. The presentation explored the analysis of historical transfer techniques and also modern approaches to complete transfers, using synthetic materials such as nonwoven polyesters and Plextol acrylic dispersion adhesive.

Chiara Merucci delivered a presentation which examined the history of colla pasta lining at the National Gallery Rome. Her conclusions and recommendations included the following; older unlined paintings should be preserved in that state. Older linings (18th-c) should also be preserved for the information they contain. The Barberini Collection includes some failed linings which can also be important to study to better understand why some old linings fail. Examining the early history of the National Gallery collection shows a history of minimal interventions in the late 19th-c, including patches, tear repairs, and edge lining.

Dominique Martos-Leviv et al shared the impact of a major flood on relined and transferred paintings from the museum in Montargis, France. After analyzing the range of materials and restoration treatments involved, different protocols were established to re-stretch, stabilize, clean, and conserve this collection and the range of materials used in previous restorations. Particular attention was given to dealing with an older transferred painting with a water sensitive ground layer.

Anil Dwivedi spoke about the challenges of retreating a large group of paintings in a museum in Rajasthan, India. Lack of climate control and previous treatments using unstable materials has had a deleterious effect. Water damage, insect infestation, and bat droppings had seriously compromised the condition of these paintings. A survey of the environment and past treatments led to extensive retreatment and recommendations for archival storage and display.

Mark Lewis

Session 7. Modern and Contemporary

Chair: Jim Coddington

This conference was not for the faint of heart. It was a deluge of information spanning historic lining and conservation techniques to contemporary materials.

"The Use of Digital Imaging Techniques to Monitor Changes in Canvas Paintings as a Result of Lining and Deterioration" by Dale Kronkright. Dale always presents a lot of content, and this talk was no exception. Dale outlined the use of several imaging techniques, the most notable and perhaps unfamiliar to conservators are UV luminescence and transmitted IR. These techniques have the ability to monitor crack proliferation within the paint layers and the presence of salts perhaps before eruption. Dale also described laser doppler vibrometry, a technique that has been used to detect vibrations of paintings within crates.

"Structural Repair of Contemporary Paintings" by Mary Gridley. What I found most fascinating about this talk was Mary's discussion about how the marketplace and seeing contemporary art as an investment commodity has informed treatments. Since the artwork is seen as an investment, there is a tension between authenticity and intervention. At times treatments by living artist are seen as financially preferable as they seem more authentic to the market place.

Mary chronicled her career conserving contemporary art stating that in the beginning treatments for contemporary art did not differ from traditional treatments such as wax linings but the influence of new materials and especially the marketplace has caused treatments to evolve. She also stated that she has found that repairing cracks in contemporary paintings on cotton duck with acrylic grounds (and sometimes acrylic paint) can be successful because the materials remain more pliable than linen and rabbit skin glue.

"Differences in Conservation Approaches between Korean and Western Traditions" by Yujin Kim. This talk was a fascinating description of the preparation steps used to make a Korean support. Mulberry paper is applied on a stretcher in many layers and creates a drum like surface. I think this technique should be explored for stretcher inserts.

"Wax Extraction Traction on a George Braque Still Life" By Desirae Dijkama and Bradley Epley. This talk described the reversal of a wax resin lining and the experiments conducted to determine the best method for wax extraction. The original lining was performed in 1961. As the lining process created a very dull waxy surface on the painting, it was decided to remove the lining and extract as much as the wax as possible.

A wide range of methods and materials on samples of linen were impregnated with a wax resin mixture similar to the original. The heat and pressure during extraction, solvent mixture, and application of solvent were all tested. Samples were weighed before and after extraction trials to determine the success of each method. There was a maximum weight loss of 30-35% after extraction indicating a significant amount of wax was removed from successful samples.

The solvents used were Shellsol OMS and xylenes applied with Evolon CR (which was very effective at wicking the wax away from painting). After extraction the painting only lost 14% of weight (but the samples were unpainted and did not have the weight of the paint layers figured in). The quantifiable methods for wax removal developed by this team will be really useful moving forward, and I would recommend contacting the authors or reading the published paper prior to embarking on any wax extraction projects.

"Local Treatment of Cupped Cracks in Contemporary Paintings and their Appearance After 20 Years" Mary Piper Hough and Stefan Michalski. This paper described research on several tear and crack repair

Articles You May Have Missed

techniques at CCI. The sample paintings of cotton duck with acrylic ground and lead/zinc oil paint were all cut to have uniform tears. Several types materials and methods were used to repair the tears including epoxy infused threads, stainless steel pins, and BEVA. Some of the samples were keyed out and others were allowed to age under slacker conditions. After 20 years the samples that looked the best were the cracks mended with stainless steel pins that had not been keyed out indicating that tighter paintings can aggravate surface deformations associated with local repairs.

Nina Roth Wells

And finally (as if the preceding weren't enough) some general thoughts.

It needs to be said that the organizers did an excellent job. They had originally expected about 150 participants. When the number became 380 (with people from every continent except Antarctica) they managed to find a comfortable and convenient larger location, and kept the price to \$125. All of the sessions and tours went smoothly, in all a real accomplishment.

The moratorium on lining may have meant that far fewer linings were done in museums, however the many conservators in private practice who regularly encounter paintings with severe structural damage continued to perform them. The result has been the development and adaptation of effective and sometimes elegant techniques to do linings that are consistent with minimal treatment standards.

The development of the suction table as a tool that allows for control and versatility in treatments cannot be overemphasized.

During the discussion of the various glue paste lining methods, the issue of exposure to water was linked to the possibility that water may initiate the lead soap formation cycle. This needs further investigation.

A number of surveys of large, sometimes very large collections, to determine what linings have survived well, were described. This information could provide another level of significance if the storage / housing / environmental conditions of the paintings were correlated with the condition information. In the coming decades, as the resources to support conservation are eroded by necessary responses to climate change, knowing what survives in less than optimal conditions will be important.

And in that same vein, just as Greenwich marked a change in how lining was considered, this may be the time that criteria for minimal treatment be re-considered, due to the increasing uncertainties of climate change.

Carolyn Tallent

“In a Conservation Triumph, a 15th-Century Tapestry Highlights the Age of Chivalry,” *The Art Newspaper*, 10/30/2019

French conservators spent a year stabilising and reweaving the Tournament Tapestry of Frederick the Wise (from around 1490) before it traveled to the Metropolitan Museum of Art in New York.

Lent by the Musée des Beaux-Arts de Valenciennes in France, the tapestry figures prominently in *The Last Knight: The Art, Armor and Ambition of Maximilian I* at New York's Metropolitan Museum of Art, an exhibition billed as the most comprehensive loan show of European arms and armour in decades.

That the tapestry was able to travel was a triumph for French conservators, who spent a year restoring the work in Aubusson, France, starting in April 2018. Over the centuries the tapestry had become grimy and structurally degraded. Its silk threads were particularly damaged, its metal threads were tarnished and the borders were worn, including a galloon, or braided strip, that was not original to the tapestry.

The tapestry had undergone restoration numerous times; reweaving in some areas was rough and visually distracting, although this did not affect the work's overall structural integrity. Some seams had weakened and the work was held together chiefly by its lining.

Conservators removed the lining, allowing them to see the original dyes more clearly. They also removed the hanging system and the non-original galloon before reweaving the borders. Considerable stitching was needed to stabilise the tapestry and a new lining was added to the back. The tapestry underwent a vacuum cleaning because it was considered too fragile for a wet treatment.

“Australian Innovation Adds New Sheen to Old Masters,” *CSIRO*, 10/30/2019

Masterpieces by Rembrandt and van Dyck housed at the National Gallery of Victoria have been restored to their former glory and protected for years to come thanks to a special resin developed by Australia's national science agency, CSIRO.

The new varnish resin is the result of a collaboration between Australia's oldest and most visited gallery, the National Gallery of Victoria (NGV) and CSIRO. The product has now been commercialised by Melbourne chemical manufacturer Boron Molecular, a former CSIRO spin-out.

The synthetic resin, called MS3, is the latest generation of a synthetic varnish that was designed specifically for conservation and cultural heritage applications. After extensive testing at the NGV, the resin will now be trialed by conservators working in several of the world's major art institutions.

CSIRO's Leader of Materials for Energy and the Environment, Dr Deborah Lau, said using the emerging technology of 'flow chemistry' allowed the team to develop the resin in a safer, cleaner, more efficient way than traditional chemical manufacturing. This in turn delivered improved colour, chemical stability, and consistency between batches.

Carl Villis, Senior Conservator of Paintings at the NGV, said that MS3 has been warmly received by the international paintings conservation profession because an earlier and much loved version, known as MS2A, had gone out of production in 2015.

“Mural By Depression-Era Master Artist Resurrected From The Trash To Hang In Stamford 50 Years Later,” *CBS News*, 11/05/2019

Stamford is a city where there’s always something new going up. Usually glassy and modern. Usually, not always.

The newest addition to the lobby of the Tully Health Center was created in 1934 and nearly destroyed in 1970. A mural by Depression-era master James Daugherty now hangs about a tenth of a mile from its original home at Stamford High School.

It’s one of seven murals that dominated the old music room, until a renovation 49 years ago. Construction workers cut the canvases up into 30 pieces, and threw them into a dumpster. Frank Bowne, who was a student at Stamford High School, found them and brought them home. Bowne gave the canvases to an art expert, triggering an ownership battle.

Daugherty is held in high regard. The murals are worth more than \$1 million. Some were sold to private parties. Stamford got one and sent it to Cleveland for restoration by experts at ICA Art Conservation. From a trash pile, to a place of pride — on display after nearly 50 years for generations to enjoy.

14 Ships’ Figureheads Weighing Over 20 Tons Arrive at UK’s Newest Museum, The Box,” *History News Network*, 11/07/2019

In what is the most ambitious sculpture conservation project currently taking place in the UK, 14 monumental 19th century naval figureheads have been saved from decay. From spring 2020, these icons of Britain’s maritime history will be on public display at The Box in Plymouth.

Three specialist conservation teams in London, Devon, and Cornwall, led by Orbis Conservation, have spent over two years restoring the 14 wooden figureheads to their former glory, after years of water damage led to rot and decay. One of the most badly damaged of the figureheads was HMS Topaz, a three-quarter-length female bust carved in 1858, whose ship was responsible for removing two of the Easter Island statues that are now in the British Museum.

Sonic Tomography scanning - a method designed for measuring decay cavities within living trees - enabled conservators to assess the internal

condition of the timber of each figure head. In most cases it showed such severe internal degradation that the figureheads had to be carefully and systematically deconstructed, revealing timber so damaged that it resembled saturated compost, only retaining its structural integrity at the very outer carved surface.

Each independent section then had to undergo controlled drying, in order to minimize warping and shrinkage of the timber, in large purpose-built humidity chambers.

Once the structural integrity of each sculpture was restored, one of the challenges was how to faithfully replicate the original colour scheme of each individual sculpture. The conservation team did cross section paint analysis, as they had been painted over many times. They were also able to track down a set of 1912 full colour cigarette cards featuring the navy’s most famous figureheads from the previous century.

Conservators made up a palette of colours inspired by the cigarette cards that was then used to restore each of the 14 figureheads when they came to be repainted.

“Thanks To a Doodle, Experts Now Say Unattributed Painting is by Botticelli,” *The Art Newspaper*, 11/15/2019

An unattributed painting in Cardiff is now believed to be a work by the Italian master Sandro Botticelli and his workshop, following conservation and deeper research into its provenance.

The Madonna and Child (1480s) was considered a copy before the art historian Bendor Grosvenor and the conservator Simon Gillespie examined the work as part of the BBC Four series *Lost Masterpieces*. Key to the findings was a doodle of a male’s face, which was concluded as being ‘indicative’ of the artist’s hand.

At some point in its past, the work is thought to have been overpainted, with the addition of an arched background that was potentially added to mask the fact that the painting was once part of a larger work.

The work will now be on display at the museum in Cardiff and it is expected that continued research will shed further light on its history. Gillespie says that by raising awareness, he hopes that the *Lost Masterpieces* series will also address

“the separation between conservation and the rest of art world—[conservators] give so much information for those that sell, display and enjoy these works, but our role is often hidden away”.

“Conservators to Restore Michelangelo’s Florence Pietà in Full View of Visitors,” *The Art Newspaper*, 11/22/2019

Experts are poised to begin the restoration of Michelangelo’s marble Pietà at Florence’s Museo dell’Opera del Duomo in full view of the public.

The sculptural group, on which Michelangelo worked from 1547 to 1555, when he was about to turn 80, depicts Jesus Christ after his descent from the cross, supported by the Virgin Mary, Mary Magdalene and an aged Nicodemus, who bears a resemblance to the artist himself.

Michelangelo famously destroyed parts of the sculpture and left it unfinished out of frustration with his progress and the quality of the marble. Over the centuries, the work has accumulated dirt and candle wax and undergone interventions in which iron rods were inserted to repair breakages.

“The dirt is the first issue,” says Timothy Verdon, the director of the Museo dell’Opera del Duomo. “As far as we can judge, it has never had an in-depth cleaning.” The stains from candle wax will also be addressed, he says, along with traces of discolouration that resulted when a cast was made of the work in the late 19th century. Some of the discolouration may be related to the quality of the marble, however.

Verdon said that according to Michelangelo’s contemporaries, the artist intended for the Pietà to be installed in the chapel where he would be buried, but ultimately abandoned it. Michelangelo gave the damaged work to a servant who had it restored and then sold it. Then it changed hands several times, eventually arriving in Florence in 1674. It resided in a series of churches before it was transferred to the Museo dell’Opera del Duomo in 1981.

“Restoration of 1970s East German Artwork Marks Key Moment in Battle to Assert Artistic Merit,” *The Guardian*, 11/03/2019

Its sweeping multicolour panorama set off against a grey ravine of prefab high-rises, Josep Renau’s mural in Moscow Square in Erfurt used to have a mission to turn heads and inspire. Made

of 70,000 glass mosaic tiles, the Spanish artist's work shows two gigantic hands, one clutching a sliced apple, the other what looks like a Salvador Dalí rendering of a jellied Rubik's cube.

Its title, in the utopian jargon still favoured in socialist East Germany when the mural was conceived in 1976: *Man's Relation to Nature and Technology*. When the culture centre that lent the artwork its facade went bankrupt after the end of the cold war, the mural was disassembled and packed away into storage. But as of this week, Renau's work is back in all its pixelated glory, with 500 replacement tiles made of artisanal Italian glass being fixed to a concrete structure that sets it apart from what is now a shopping centre.

Completed just in time for the 30th anniversary of the fall of the Berlin Wall, the fact that the majority of the €800,000 restoration costs were shouldered by a western German building association marks a significant moment in the long and embittered battle over the status of the East's cultural heritage in a reunified Germany.

Each previous anniversary of the collapse of the German Democratic Republic (GDR) has been marked by ill-tempered debates about the inclusion or lack of East German artists in the reunified country's galleries. The *Bilderstreit* ("picture quarrel") started in 1999 over an exhibition in Weimar, which seemed to symbolically equate the artists of the East with those working under the patronage of the Nazi regime.

Many of the murals that adorned civic buildings in East Germany have been actively discarded or allowed to fall into disrepair. The return of the Erfurt mural, however, speaks of a new pragmatism in the treatment of artworks from the East German regime.

"1930s-Era Murals Found Under Painted Hallways at SF Art Institute,"
NBC Bay Area, 12/12/2019

The plain white walls in the hallway of the venerable San Francisco Art Institute tightly clutched their secret for more than eight decades — buried beneath a dozen layers of paint. But a new effort to turn back the decades and peel away the paint has bared one of those secrets — a fully intact 1930s fresco painted by Frederick Olmsted Jr.

The fresco is one of a half dozen murals painted on the lower walls

of the 140-year-old institution, and later painted over. Olmsted's fresco depicts a group of workers toiling in a marble factory. The tower of the school's Russian Hill campus is visible in the mural's top corner — its perspective drawing from the nearby industrial neighborhood that would later become touristy Fisherman's Wharf.

"I think it's an important memorial to a period when San Francisco really was a working class city," said SFAI Facilities Manager Heather Hickman Holland. It was Holland who first noticed the strange lines on the stark white hallway walls which she initially thought were cobwebs.

As architectural conservator Molly Lambert and her team began peeling away the paint, the faces of 1930s workers began to emerge from their long slumber. The uncovering of the mural comes at a time when San Francisco's School Board recently voted to cover a controversial mural at George Washington High School. The board had originally voted to paint over the mural but then decided to simply cover it.

"The Painstaking Task of Making a 200-Year-Old Sculpture Look Almost Like New,"
Washington Post, 12/14/2019

Robert Price was in a corner of the National Gallery of Art's East Sculpture Hall last week breaking one of the cardinal rules of museums. He was touching the art.

Perched on a stool under a bright spotlight, Price leaned into a 200-year-old marble sculpture carved by Frenchman Jean-Pierre-Antoine Tassaert, using a cotton swab to remove decades of grime from its base. For the next 15 months, Price will be working in the skylighted hall, cleaning and restoring a half-dozen French sculptures while simultaneously offering visitors a peek into a critical but largely unseen aspect of museum work: conservation.

To encourage visitors to stop and watch, the museum has set up two monitors on the periphery of the cordoned-off area where Price will work. He began last week by dusting and vacuuming the surface and photo documenting its condition. The next step is to clean it with the pH-adjusted water that will remove dirt without damaging the stone. The bulk of the time will be spent improving earlier restorations.

There are other reasons to work on the sculptures in the gallery. The works are large and heavy, so moving them is difficult and accommodating them in the

lab is tricky.

Price said working in the gallery allows him to compare his progress to the other works on view, which is a plus. Conservators like to treat a work in the same light that it is displayed under, he added. They can re-create the gallery light in the lab, he said, but it's never exact.

"Ghent Altarpiece: Latest Phase of Restoration Unmasks the Humanised Face of The Lamb Of God,"
The Art Newspaper, 12/18/2019

Restoring the Ghent Altarpiece may well exceed the years it took for Flemish brothers Jan and Hubert Van Eyck to create their wondrously detailed 12-panel masterpiece, from the mid-1420s to 1432.

Since October 2012, Belgium's Royal Institute for Cultural Heritage (KIK-IRPA) has led a transformative €2.2m altarpiece conservation project in full view of the public, within a specially constructed laboratory at Ghent's Museum of Fine Arts.

Marking the end of the project's second phase, the five lower interior panels—including the central Adoration of the Mystic Lamb—will return to their home in St Bavo's Cathedral on 24 January after a three-year treatment. The eight outer panels, restored during a first phase from 2012 to 2016, will come back to the museum in February, as exceptional loans for an exhibition in honour of Ghent's "Year of Van Eyck".

The altarpiece has been an iconographical puzzle for generations of art historians, its mystery compounded by the lack of archival information on the Van Eyck brothers.

Despite the wealth of prior research conducted on the altarpiece, it was only during the KIK-IRPA restoration that scientists made an astonishing discovery: beneath the layers of yellowed and cloudy varnish, around 70% of the outer panels was obscured by 16th-century overpainting.

Analysis confirmed the overpainting could be removed without damaging the original because an earlier layer of varnish "was acting as a buffer between the two", says Hélène Dubois, head of the restoration project.

These 16th-century additions had covered around half of the panel featuring the sacrificial lamb, the symbol of Christ. Removing a blue hill on the horizon, for instance, revealed a trio of miniature buildings in the style of Medieval Ghent.

AYMHM, continued

Most surprising of all was the lamb's humanised face, which emerged beneath its more animal 16th-century appearance. The challenge was to reveal the quality of the Van Eycks' original work "without erasing every single mark of time", Dubois says. Pending further funding, KIK-IRPA aims to publish new research in 2020 that addresses the long debate over the altarpiece's authorship.

"New Lab Helps Support Conservation Work at Denver Art Museum," CBS Denver, 12/27/2109

The new Martin Conservation Lab opened one month ago allowing staff to improve their work on paintings and other objects in the collection of the Denver Art Museum.

In addition to new resources and facilities available to staff, the lab features north facing windows that will provide a uniform spectrum of light year-round. "It really reflects the function and the intention of what it is we are trying to accomplish in terms of exhibition and long term preservation of the Denver Art Museum's collection," said Sarah Melching, the Silber Director of Conservation.

The Martin Conservation Lab supports the Conservation and Technical Studies Department and the specializations they will focus on including modern, contemporary and traditional objects. Not only is the lab larger with new equipment, it also includes a separate room for photo documentation and analytical equipment.

"Uffizi Panel Quits Over Loan of Raphael," ANSA, 02/25/2020

The scientific committee at the Uffizi resigned en masse Tuesday in protest at the Florence gallery's loan of a Raphael work to an unprecedented Rome show marking the 500th anniversary of the Renaissance master's death.

The panel said it had worked for months to draw up a list of works that should never be moved from the Florentine gallery, and the portrait of Pope Leo X was one of them. The famed portrait was specially restored for the show in the capital by the experts at Florence's restoration works Opificio delle Pietre Dure.

In a letter to the bodies that appointed them, including the education ministry and Florence city council, Donata Levi, Tomaso Montanari, Fabrizio Moretti and Claudio Pizzorusso said the Leo X

portrait should never leave Florence. They said that Uffizi director Eike Schmidt had approved their decision on December 9 last year banning the transfer of the work. Schmidt responded Tuesday by saying that the Leo X was "indispensable" to the Rome show.

The portrait will be one of the centrepieces of the show, called simply Raphael, at the Scuderie del Quirinale from March 5 to June 2.

"Today we learned from the press," the four experts said, "that the painting is already in the Rome exhibition space. "We think that keeping us busy for months drafting lists which are then ignored undermines the very existence of the committee. "We think that the mass resignation of the scientific committee of Italy's most important museum makes a rethink inevitable, and a redefinition of the role of the scientific committees in the management of autonomous museums".

"Notre Dame Enters a New and High-Risk Phase in its Restoration," The Art Newspaper, 12/30/2019

The restoration of the cathedral of Notre Dame in Paris, which was badly damaged by fire on 15 April, has entered a new and delicate phase. This involves removing a vast and heavy scaffolding structure at roof level that became fused by the intense heat.

It had been erected before the fire in order to carry out restoration work on the 19th-century roof spire, whose dramatic collapse was seen on screens around the world.

The removal of the scaffolding requires three levels of steel beams to be positioned around its exterior to form a stabilising "belt". Once this operation is complete, the same firm that built the scaffolding will start to dismantle it, using telescopic crawler cranes that will allow roped technicians to descend into the forest of pipes and gradually cut them away after having coated them with a protective layer to avoid spreading the pollution caused by the melting of the lead roof.

Work is expected to be complete next April. No decision has been taken so far over how to rebuild the roof. A reconstruction according to traditional techniques is clearly possible as the skills and materials (essentially, tall oak trees) are available in France.

As the previous roof proved effective and resilient—it survived 800

Jobs

Museums of New Mexico

Chief Conservator (open to all specialties)

The Museum Resources Division (MRD) for the State of New Mexico is seeking to fill its Chief Conservator position.

Located within the New Mexico Department of Cultural Affairs, MRD is comprised of skilled museum specialists that serve multiple New Mexico state-run museums and historic sites. MRD includes conservators, designers, woodworkers, mount makers, preparators, writers, editors, and educators. MRD provides services to the Museum of International Folk Art, New Mexico History Museum/Palace of the Governors, New Mexico Museum of Art, Museum of Indian Arts and Culture, and seven state historic sites.

Reporting to the Director of New Mexico's Museum Resources Division, the Chief Conservator manages the organization's conservation program. They act as an advocate for conservation and preservation within MRD and the institutions they serve; create policies and procedures on preservation issues including recommendations pertaining to exhibitions, storage, loan and acquisitions of collections; direct project workflows within the conservation lab; develop conservation and collection care priorities; draft grant proposals to fund special projects; perform conservation treatments and carry out research.

Salary: \$20.23 - \$35.21 Hourly or \$42,088 - \$73,233 Annually. Generous benefits.

Candidates must apply through New Mexico's State Office of Personnel website: spo.state.nm.us The job is listed as: Chief Conservator (DCA #4568) / Job ID 111078. This position is open until filled, with the first consideration given to applications received by April 17, 2020.

For questions about the application process please reach out to the MRD Division Director, David Rohr, at 505-476-1137 or david.rohr@state.nm.us.

years—this seems the most desirable solution as it would also fully respect internationally accepted conservation principles, with the addition of modern fire-monitoring and prevention technologies.