PROGRAM & ABSTRACTS

# CONSERVATION
## REACTIVE & PROACTIVE



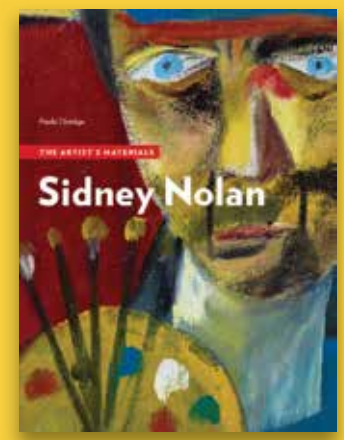

american institute for conservation

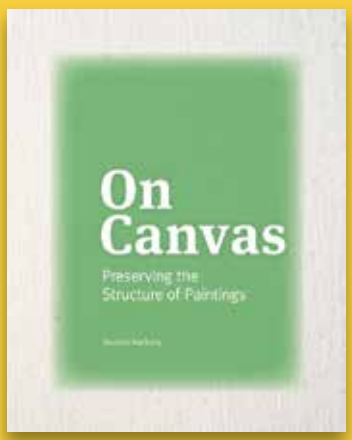
**Preserving Cultural Heritage**

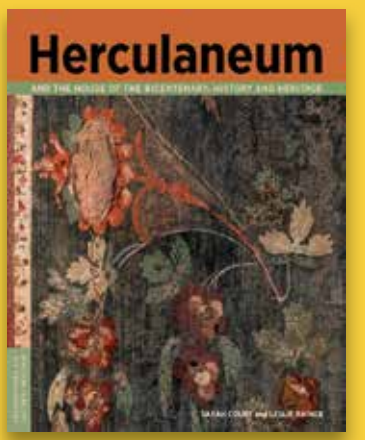
**48th Annual Meeting**
**Summer 2020**

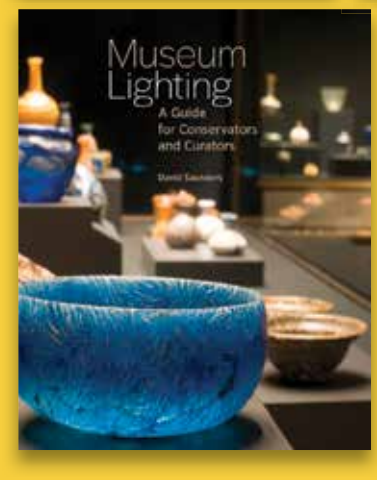
Getty

# NEW & NOTABLE

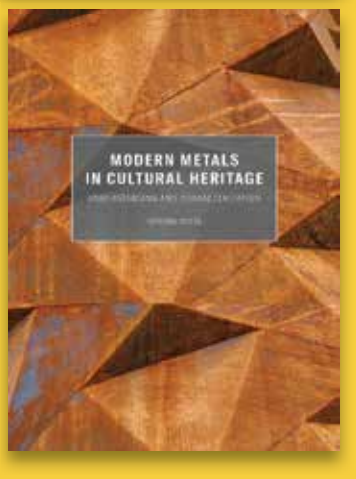







**Sidney Nolan**
The Artist's Materials

*Paula Dredge*

"Paula Dredge's exhaustive technical analysis of the work of one of Australia's greatest and most complex painters, Sidney Nolan, . . . is essential reading to anyone curious to see how a particular alchemy works to make an artist's imagery unforgettable."
—Barry Pearce, Emeritus Curator of Australian Art at the Art Gallery of New South Wales

**Museum Lighting**
A Guide for Conservators and Curators

*David Saunders*

This indispensable guide to museum lighting provides practical information to assist curators, conservators, and other museum professionals.

**On Canvas**
Preserving the Structure of Paintings

*Stephen Hackney*

"Great resource that reads like a page turner. Highly informative, complete, well written and lucid. A must for conservators."
—Jaap Boon, Research Director, JAAP Enterprise for Art Scientific Studies

**Values in Heritage Management**
Emerging Approaches and Research Directions

*Edited by Erica Avrami, Susan Macdonald, Randall Mason, and David Myers*

"Featuring distinguished authors steeped in the theory and practice of heritage conservation, this book effectively captures the 21st century shift in notions of heritage value."
—Christina Cameron,Université de Montréal

**Herculaneum and the House of the Bicentenary**
History and Heritage

*Sarah Court and Leslie Rainer*

"This beautifully presented book by Court and Rainer illustrates the cultural value of the ancient town of Herculaneum while at the same time shining a light on the challenges and triumphs of the archaeologists and conservators who work to preserve it."
—Dr. Joanne Berry, Associate Professor, Department of Classics, Ancient History & Egyptology, Swansea University

**Modern Metals in Cultural Heritage**
Understanding and Characterization

*Virginia Costa*

This practical guide provides artists, conservators, curators, and other heritage professionals with tools for understanding, evaluating, and approaching the care and treatment of modern metals.

**Getty Publications**
getty.edu/publications

american institute for conservation

**Preserving Cultural Heritage**

# CONSERVATION REACTIVE & PROACTIVE

## ACCESSING THE VIRTUAL MEETING

The quickest way to access the meeting is to visit https://learning.culturalheritage.org/my-dashboard and log in using the button in the upper right corner. You should be redirected back to the Learning Community. Select Learning Dashboard in the menu on the right column. In your Dashboard, click on the Virtual Meeting or your workshop title to access the programming.

If you are looking for a specific program, search for the date and title of the session first, then click that heading to expand the section and view talks. Click on a talk title to read the full abstract and join the session (or view the archive) by selecting the view or join button.

During a live session, you can join the chat and ask questions of the authors.

## VIEW AN ARCHIVED SESSION

Log in as directed above. Search for the date and title of the session, then click that heading to expand the section and view talks. Click on the talk title, then select the View Archived Recording button.

## TIPS IF YOU HAVE TROUBLE

- Make sure you are viewing using Chrome (preferred), Safari, or Edge.
- Close other programs that use the internet, such as email, other browsers, or streaming services (music or podcasts, etc.). Connect to the internet with an ethernet cable rather than via WiFi, if possible.
- Use a dictation program to follow along, or use the author's script if provided.
- If you have trouble viewing or hearing a session, refresh your browser, or leave the meeting, clear your cookies and cache, then rejoin.
- Try listening with headphones.
- Watch the recorded session if there were issues.

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*The AIC Virtual Annual Meeting is hosted by the American Institute for Conservation; 727 15th St NW, Suite 500, Washington, DC 20005; www.culturalheritage.org; info@culturalheritage.org*

# PEOPLE

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## 2020 PROGRAM COMMITTEES

***Opening and Concurrent General Sessions:*** M. Susan Barger, Joy Bloser, J.P. Brown, Elise Effmann Clifford, Suzanne Davis*, Molly Gleeson, Christine Haynes, Kate Moomaw, Adam Novak, Mareike Opeña, Corina Rogge

***Specialty & Interest Sessions***

**Architecture:** Lacey Bubnash, Rebekah Kreiger, Helen Thomas-Haney*

**Book and Paper:** Saira Haqqi, Andrea Knowlton, Deborah LaCamera, Cher Schneider, Eliza Spaulding

**Collection Care:** Rachael Perkins Arenstein*, Claire Curran, Lisa Elkin, Lisa Goldberg, Becky Kaczkowski, Dawn Kimbrel, Samantha Snell

**Contemporary Art:** J. Luca Ackerman, Kate Moomaw, Giuliana Moretto, Delia Müller-Wüsten

**Electronic Media:** Amy Brost, Kristin MacDonough, Alexandra Nichols*

**Objects:** Jessie Arista, Megan Emery, Fran Ritchie*

**Paintings:** Margarita Berg, Mary Catherine Betz, Jen Munch, Erin Stephenson*

**Photographic Materials:** Heather Brown, Katie Sanderson*, Fernanda Valverde

**Private Practice:** Emily Philips

**Research & Technical Studies:** Gregory Bailey, Matthew Clarke*, Federica Pozzi

**Sustainability:** Annabelle Camp, Christine Oricchio, Christine Romano*, Roxy Sperber

**Textiles:** Julia Carlson*, Ann Frisina, Allison McCloskey

**Wooden Artifacts:** Lisa Ackerman, Rian Deurenberg-Wilkinson, Carola Schueller*, Christine Storti

**Poster Editors:** Suzanne Davis*, Fletcher Durant, Laura Hartmann, Caitlin Richeson, Joan Walker
**Chair*

## AIC & FAIC STAFF

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# WELCOME

Instead of standing before a packed hotel ballroom, I am delighted to virtually welcome a larger and more international audience to three months of sessions, business meetings, topical discussions, and more as we open the 48th Annual Meeting of the American Institute for Conservation.

I am writing from my home in New York City. Sheltering in place has led me to reflect that I am on the land of the Lenape and the Wappinger People. And, that the AIC office in Washington, DC, is on the lands of the Piscataway Convoy Tribe, Piscataway Indian Nation, the Nacotchtank People, and other Chesapeake Indigenous Tribes. Because it is the AIC's mission is to preserve everyone's cultural history, it is right to recognize those who came before us.

Eerily, the current COVID-19 pandemic coincides perfectly with the theme of our meeting **Conservation: Reactive and Proactive.** In the planning stages, the theme was meant to address the many ways that conservators have had to change the focus of their activities and acquire new skills in response to shifting trends in the cultural heritage sector. Two examples include the growing emphasis on preventive conservation and the popularity of interpretive and interactive exhibitions that are not as reliant upon multiple original works.

During at a time of prolonged closure and staff absences, conservators are applying the principles of preventive conservation in order to safeguard collections, as well as virtually unveiling their in-depth technical interpretation of works that have special meaning and significance for an excluded public eager for personal connection.

Closer to home, the COVID-19 pandemic has forced a reckoning not only with what objects the American people find to be of most interest, but, more critically, what they hold to be most dear. While sheltering in place, the familiar—a handmade quilt or family photograph—becomes precious and, thereby, deserving of preservation. This is truly an opportune time to plant and nurture a pervasive spirit of preservation among Americans.

We will witness how conservation professionals are drawing from a wide skill set to respond to these challenges in creative and productive ways.

## THANK YOUS!

I would like to thank the over 50 companies and organizations that signed up to be part of the 2020 Exhibit Hall in Salt Lake City. An important part of this virtual meeting, our exhibitors will be giving presentations during most of the virtual meeting sessions and posting to the Annual Meeting Community. Be sure to visit the Virtual Meeting attendee pages to view the exhibitor profiles.

I would like to thank a group of dedicated volunteers—Suzanne Davis, Rachael Arenstein, Christine Haynes, Sarah Reidell, and Carolyn Hays—for serving on the Virtual Meeting Task Force. They assisted us in taking the idea of a virtual meeting and turning it into a reality. Of course, success is also dependent upon the many committees, session moderators, presenters, and the AIC staff for their tireless work and collaboration in creating an entirely new online experience.

Finally, let us not forget the many AIC members in the Salt Lake City area who put together an assortment of receptions and tours that were meant to inform and delight us. We are looking ahead to 2024 when we can experience all that Salt Lake City has to offer.

Enjoy, learn, and be safe!

I am honored to serve all AIC members,

*—Peggy*

Margaret (Peggy) Holben Ellis, AIC President

# Art X-Ray Inspection

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## Product

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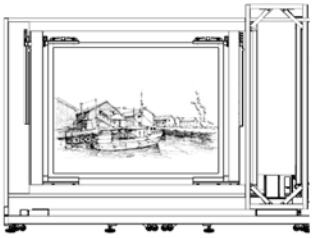

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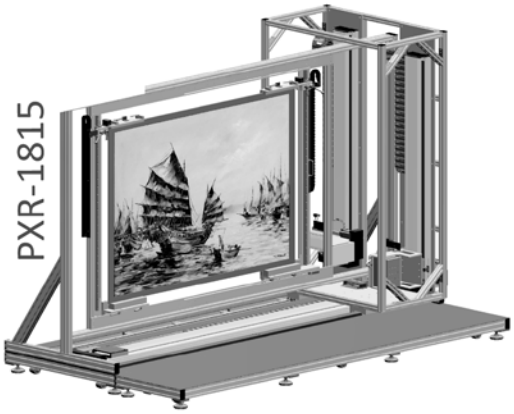


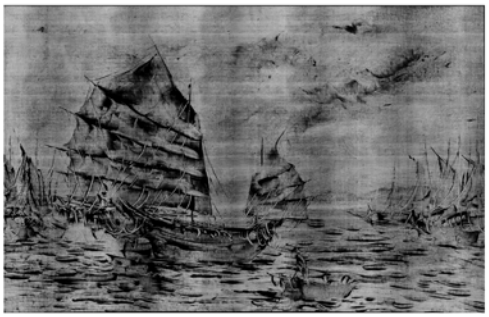

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# CONGRATULATIONS TO AIC'S 2020 AWARD RECIPIENTS!

*Please join us as we celebrate our award recipients in a Zoom presentation on July 29 at 4:00 p.m. ET*

## DAVID MAGOON-UNIVERSITY PRODUCTS CONSERVATION ADVOCACY AWARD

**M. Susan Barger, PhD,** Consultant for Small Museums and Archives, will receive the David Magoon-University Products Conservation Advocacy Award, which honors conservation professionals who have advanced the field of conservation and furthered the cause of conservation through substantial efforts in outreach and advocacy.

## PUBLICATION AWARD

**Gwen Spicer,** Conservator in private practice and author of *Magnetic Mounting Systems for Museums & Cultural Institutions*, will receive the Publication Award for excellence in a book on conservation.

## HONORARY MEMBERSHIP

**Debra Evans,** retired Paper Conservator at the Fine Arts Museums of San Francisco, will receive Honorary Membership for her outstanding contributions to the conservation profession.

## RUTHERFORD JOHN GETTENS AWARD

**Karen Pavelka,** Senior Lecturer for preventive conservation in the School of Information at The University of Texas at Austin, will receive the Rutherford John Gettens Award for outstanding service to the organization.

## ALLIED PROFESSIONALS AWARD

**Samuel Anderson,** Principal of Samuel Anderson Architects, will receive the Allied Professionals Award, recognizing his work and contributions as a professional in another field to the advancement of the conservation profession.

## SHELDON & CAROLINE KECK AWARD

**Joyce Hill Stoner, PhD,** the Edward F. and Elizabeth Goodman Rosenberg Professor of Material Culture at the University of Delaware (UD), Director of Preservation Studies Doctoral Program at UD, and Paintings Conservator at the Winterthur/UD Program in Art Conservation, will receive the Sheldon & Caroline Keck Award for excellence in the education and training of conservation professionals.

## ROSS MERRILL AWARD

**The Bell Museum,** Minnesota's state museum of natural history, will receive the Ross Merrill Award for Outstanding Commitment to the Preservation and Care of Collections.

Find more information about our awards at www.culturalheritage.org/awards.


**THANKS TO OUR FUNDERS FOR THEIR SUPPORT OF AIC ANNUAL MEETING ACTIVITIES**

The Samuel H. Kress Foundation

Tru Vue

AIC Specialty Groups: ASG, BPG, CIPP, EMG, OSG, PMG, PSG, RATS, TSG, WAG & individual donors to the FAIC George Stout Fund, in support of student participation.

Getty Conservation Institute for its support of "Facilitating Decision-making Through Analysis of Temperature and Relative Humidity Data."

FAIC and the University of Delaware's Department of Art Conservation, in honor of Bruno Pouliot, for support of the "Making the Ask" workshop.

# SESSIONS BY MONTH

## MAY

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|---|---|---|---|---|---|---|
| 17 | 18 | 19 | 20 | 21<br>• Keynote Address and Opening General | 22 | 23 |
| 24 | 25 | 26 | 27<br>• ECPN Information & Town Hall Session | 28<br>• Plastic Challenges in Cultural and Ecological Preservation Session 1 | 29 | 30 |
| 31 | | | | | | |

## JUNE

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|---|---|---|---|---|---|---|
| | 1<br>• Documenting Web-based Art Workshop begins | 2 | 3 | 4<br>• XRF Boot Camp Lite Workshop begins | 5 | 6 |
| 7 | 8<br>• Research and Technical Studies & Collections Care Session 1 | 9<br>• Photographic Materials Session 1 | 10<br>• Measuring and Mitigating Pollution in Showcases Workshop begins | 11<br>• Electronic Media Session 1: Digital Preservation | 12 | 13 |
| 14 | 15<br>• Paintings Session 1<br>• Architecture & Objects Historic House Session: Part 1 | 16<br>• Preventive Care Collections Storage | 17<br>• Objects Session 1<br>• Intro to Digital Preservation and Storage Workshop begins | 18<br>• Wooden Artifacts Session 1 | 19 | 20 |
| 21 | 22<br>• Research and Technical Studies Session 1 | 23<br>• JAIC: Scholarly Writing for Conservation<br>• Architecture Session 1 | 24<br>• Electronic Media Session 2: Hardware<br>• Facilitating Decision-making Workshop begins | 25<br>• Plastic Challenges in Cultural and Ecological Preservation Session 2 | 26<br>• Making the Ask Workshop begins | 27 |
| 28 | 29<br>• Book and Paper Session 1<br>• Book and Paper Group Business Meeting | 30<br>• Book and Paper Session 2 | | | | |



Join the conversation by using **#AICmtg20** to tag your social media posts!

# JULY

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|---|---|---|---|---|---|---|
| | | | 1 | 2<br>• Paintings Session 2 | 3 | 4 |
| 5 | 6 | 7<br>• Objects Session 2 | 8<br>• Electronic Media Session 3: Digital Preservation/ Storage | 9<br>• Public Conservation Labs: Reactive or Proactive | 10<br>• Photographic Materials Group Business Meeting | 11 |
| 12 | 13<br>• Book and Paper Session 3<br>• Book and Paper & Photographic Materials Tips | 14<br>• Book and Paper Session 4<br>• Electronic Media Session 4: Web Software | 15<br>• Photographic Materials Session 2 | 16<br>• Concurrent Session: External Forces in Contemporary Art Conservation Session 1 | 17 | 18 |
| 19 | 20<br>• Electronic Media/ Contemporary Art Joint Session<br>• EMG Business Meeting | 21<br>• Poster Session<br>• Untold Stories | 22<br>• Photographic Materials Session 2 | 23<br>• Research & Technical Studies Session 2<br>• RATS Business Meeting | 24 | 25 |
| 26 | 27<br>• Concurrent Session: External Forces in Contemporary Art Conservation Session 2 | 28<br>• Architecture Session 2 | 29<br>• Education and Stakeholder-Engaged Practice: Session 1<br>• Awards Presentation | 30<br>• Textiles and Wooden Artifacts Session | 31<br>• A Failure Shared is Not a Failure: Learning from Our Mistakes | |

# AUGUST

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|---|---|---|---|---|---|---|
| | | | | | | 1 |
| 2 | 3<br>• Textiles Session 1 | 4<br>• Book and Paper Session 5: Library Collections Conservation Discussion Group | 5<br>• Collections Care: Current Standards for Storage Materials<br>• Intro to Digital Pres. Workshop begins | 6<br>• Architecture & Objects Historic House Session: Part 2 | 7<br>• TSG Business Meeting | 8 |
| 9 | 10<br>• Wooden Artifacts 2<br>• Electronic Media 5: Caring for Time-based Media in Institutions | 11<br>• Book and Paper: AP Discussion Group<br>• Textiles Session 2 | 12<br>• Collections Care - Big Data | 13<br>• Objects Session 3<br>• OSG Business Meeting<br>• Facilitating Decisions Workshop begins | 14<br>• XRF Boot Camp Lite Workshop | 15 |
| 16 | 17<br>• Reacting to Hazardous Collections<br>• Documenting Web-based Art Workshop begins | 18<br>• Proactive Collections Care for Smaller Institutions | 19<br>• Paintings Session 3 | 20<br>• Research & Technical Studies, Collection Care, & Contemporary Art Joint Session | 21 | 22 |
| 23 | 24<br>• Sustainability | 25<br>• Proactive Digital Methods | 26 | 27<br>• Photographic Materials Session 3 | 28<br>• Making the Ask Workshop | 29 |
| 30 | 31<br>• Collections Care: Emergency Response Session | 1 *(September)*<br>• General Session: Public Conservation Labs | | | | |

# WORKSHOPS

## VIRTUAL ANNUAL MEETING WORKSHOPS

Six workshops were transitioned to a virtual format to accompany the 2020 Virtual Annual Meeting. Round 1 were scheduled primarily in June, and Round 2 of each workshop were scheduled for August.

Learn more at www.culturalheritage.org/events/annual-meeting/current-meeting/workshops.

### INTRODUCTION TO DIGITAL PRESERVATION AND STORAGE

*Amy Brost, Jonathan Farbowitz, Tawnya Keller, Alexandra Nichols, Mike Thuman*

- Details: $99 registration fee; maximum 30 participants
- Round 1 Live Session Dates: June 17, 18, and 19
- Round 2 Live Session Dates: August 5, 6, and 7

### MAKING THE ASK: DEVELOPING NEGOTIATION TACTICS IN THE FIELD OF CONSERVATION

*Ariel O'Connor, Caitlin Richeson*

- Details: $19 registration fee; maximum 50 participants
- Round 1 Live Session Date: June 26
- Round 2 Live Session Date: August 28

### MEASURING AND MITIGATING POLLUTION IN SHOWCASES

*David Thickett*

- Details: $99 registration fee; maximum 25 participants
- Round 1 Live Session Dates: June 10, 11, and 12
- Round 2 Live Session Dates: August 11, 18, and 25

### NOW YOU SEE IT, NOW YOU DON'T: DOCUMENTING WEB-BASED ART

*Patricia Falco, Sarah Haylett, Christopher King*

- Details: $99 registration fee; maximum 15 participants
- Round 1 Live Session Dates: June 1, 3, and 5
- Round 2 Live Session Dates: August 17, 19, and 21

### XRF BOOT CAMP LITE

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

- Details: $45 registration fee; maximum 50 participants
- Round 1 Live Session Date: June 4
- Round 2 Live Session Date: August 14

### FACILITATING DECISION-MAKING THROUGH ANALYSIS OF TEMPERATURE AND RELATIVE HUMIDITY DATA

*Vincent Beltran, Annelies Cosaert, Jeremy Linden*

- Details: $99 registration fee; maximum 35 participants
- Round 1 Live Session Dates: June 24, July 1, and 8
- Round 2 Live Session Dates: August 13, 20, and 28

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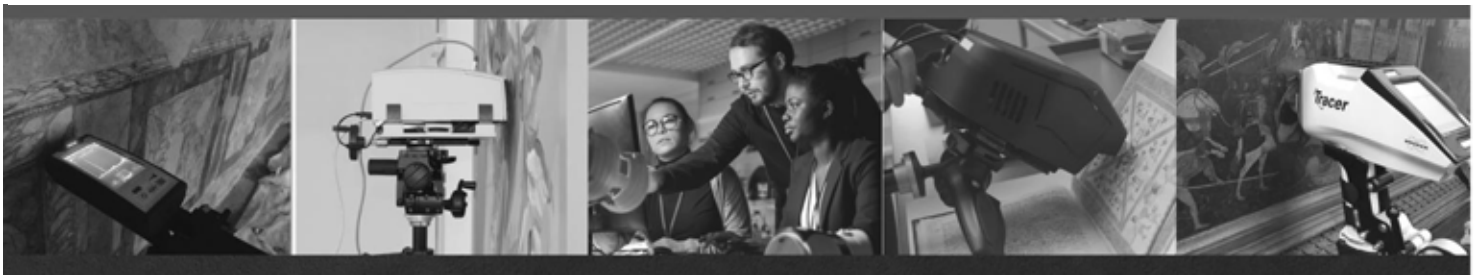


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# MAY / JUNE SESSIONS

*ALL SESSIONS TAKE PLACE BETWEEN 1:00-3:00 P.M. EASTERN TIME UNLESS OTHERWISE NOTED. ABSTRACTS BEGIN ON PAGE 34.*

## Keynote Address and Opening General

### THURSDAY, MAY 21

Keynote Address: NEH Chairman Jon Parrish Peede

No More "Behind the Scenes": How Word Choice Matters in Presenting Collection Stewardship / Rebecca Fifield

Navigating Change Through the Practices of Care / Pip Laurenson

Considerations for the Future of African Collections / Dana Moffett

Something Has to Give: Reworking Science Curriculum in Conservation Training / Chris McGlinchey

Delivering Values: Always in All Ways / Robert Waller and Catharine Hawks

## ECPN Information & Town Hall Session

### WEDNESDAY, MAY 27

ECPN recent and upcoming initiatives, how to get involved, and concerns about impacts from COVID-19 for the ECPN community / ECPN Officers and Ellen Pearlstein

## Plastic Challenges in Cultural and Ecological Preservation

### THURSDAY, MAY 28

Preserving Plastics in the Collection at the Harvard Art Museums / Susan Costello

Plastics You Know: The Plastics Identification Tool and Collection Surveys / Carien van Aubel and Olivia van Rooijen

Examining Plastics in a Historic House Museum through the collections of the Walter and Ise Gropius House of Lincoln, Massachusetts / Megan Mary Creamer

## Research and Technical Studies & Collections Care Session 1

### MONDAY, JUNE 8

Examining commercially available sorbents to understand and maximize the mitigation of volatile organic compounds / Kelli Stoneburne

New Guidelines for the Desiccated Storage of Archaeological Metal Artifacts / Nicola Emmerson

Exhibitor Meet & Greet: G.C. Laser Systems, Inc.

A Case Study in Establishing and Maintaining Elevated RH Levels in Microclimate Casework / Laura Resch

## Photographic Materials Session 1

### TUESDAY, JUNE 9

Technical Analysis of William Henry Fox Talbot's The Pencil of Nature / Colette Hardman-Peavy

The Conservation of the Ernest J. Bellocq Glass Plate Negative Collection at The Metropolitan Museum of Art / Elsa Thyss

What do cigarette filters and photographic films have in common? Cellulose acetate: Durable in the streets, volatile in the sheets / Ida Rebecca Ahmad

## Electronic Media Session 1 - Digital Preservation

### THURSDAY, JUNE 11

The First Stewards: Digital Preservation in Artist-run Platforms and Galleries / Colin Post

Exhibitor Meet & Greet: SmallCorp

New Objects of Conservation - Web-based art and web-based records / Christopher King

Conservation in the Contemporary Art Market / Ben Fino-Radin

## Paintings Session 1

### MONDAY, JUNE 15

Honoring a Legacy: the technical study, digital reconstruction, and conservation treatment of Margareta Haverman's A Vase of Flowers / Gerrit Albertson

Exhibitor Meet & Greet: Carestream

Alfredo Volpi and Hélio Oiticica: anachronistic materials that made the modern / Corina Rogge

Exhibitor Meet & Greet: Opus Instruments

If the Curves Match The Color Will: Color Match Magic / Ulysses Jackson

## Architecture And Objects Historic House Session

### MONDAY, JUNE 15

Preservation in Paradise: Working with the Collection at Shangri La / Kent Severson

Exhibitor Meet and Greet: Zarbeco

Tenements, Tourists, and Treatments: Managing Visitor Impact at the Lower East Side Tenement Museum / Stephanie Hoagland

Preventive and Proactive Conservation at the Gilded Age Mansions of Newport, Rhode Island / Patricia Miller

## Preventive Care Collections Storage

### TUESDAY, JUNE 16

Preventive Conservation: Collection Storage / Rachael Perkins Arenstein

Exhibitor Meet and Greet: Spacesaver

## Objects Session 1

### WEDNESDAY, JUNE 17

Conservation in Action: Japanese Buddhist Sculpture in a New Light / Linsly Boyer

Exhibitor Meet & Greet: Bruker

At the Core of the Problem: A new method used to clean the bores of USS Monitor's XI-Inch Dahlgren Shell Guns / Erik Farrell

Exhibitor Meet & Greet: Carestream

It Gets Complicated: the treatment of Zayamaca #4 By Alvin Loving / LaStarsha McGarity

## Wooden Artifacts Session 1

### THURSDAY, JUNE 18

A new Furniture and Frame Conservation Lab at the MFA, Boston / Gordon Hanlon

Menthol and detachable paper fills: a new approach for loss compensation in gilding conservation / Yuqi Chock

Through the Fire and Flames: Conservation and analysis of a polychrome wood Madonna and Child / Mari Hagemeyer

# ANTI-REFLECTIVE ACRYLIC AND GLASS SOLUTIONS

For Protection & Display of Cultural Heritage and Fine Art Collections

Funerary papri on display in *The Tomb* exhibition. © of National Museums Scotland.

The reframed *Adoration of the Magi* in situ, Exeter College Chapel, University of Oxford. Image: Studio8

Installation view, *Arts of Korea*, Brooklyn Museum, on view beginning September 15, 2017. (Photo: Brooklyn Museum)

Installation view, *Revoliutsiia! Demonstratsiia! Soviet Art Put to the Test*, on view Oct 29, 2017 – Jan 15, 2018, Art Institute of Chicago. Courtesy of the Art Institute of Chicago.

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# JUNE / JULY SESSIONS

*ALL SESSIONS TAKE PLACE BETWEEN 1:00-3:00 P.M. EASTERN TIME UNLESS OTHERWISE NOTED. ABSTRACTS BEGIN ON PAGE 34.*

## Research and Technical Studies Session 1

**MONDAY, JUNE 22**

**Polymeric Treasure: Evaluating the Composition of Civil War Era Rubber Objects from the USS Monitor** / Molly McGath

**Exhibitor Meet & Greet: Bruker**

**A Closer Look at School of Rembrandt's Portrait of a Young Man in an Armchair at the Memorial Art Gallery** / Fiona Beckett

**Archaeological Plant Fiber Identification through DNA Extraction and Sequence Match** / Runying Chen

## JAIC Session

**TUESDAY, JUNE 23**

**Scholarly Writing for Conservation**
(11:00am - 1:00pm)

## Architecture Session 1

**TUESDAY, JUNE 23**

**Maintaining Modernism: Acoustical Plaster at the Walter Gropius House** / Edward FitzGerald

**Exhibitor Meet & Greet: G.C. Laser Systems**

**Conservation Consumption: Measuring the Gains and Losses of Building Restoration** / Xsusha Flandro

**The Reality of Architecture as a Conserved Object** / David Overholt

## Electronic Media Session 2 - Hardware

**WEDNESDAY, JUNE 24**

**From repair to prepare, concepts for the preservation of picture tubes in video art** / Jochen Saueracker

**Jim Campbell: Caring for Custom Hardware in Time-based Media** / Shu-Wen Lin

## Plastic Challenges in Cultural and Ecological Preservation - Session 2

**THURSDAY, JUNE 25**

**Fashion's Plastic Problem: Preventive Conservation for Synthetic Materials** / Kaelyn Garcia and Marina Hays

**Conserving Vintage Dior: Investigating New Methods for Cleaning Deteriorating Patent Leather** / Natalya Swanson

**The Conservation of Turning Point, Philip Johnson's Monumental Outdoor GRP Sculpture** / Claire Curran and Julie Reilly

## Book and Paper Session 1

**MONDAY, JUNE 29**

**Thinking Beyond the Frame** / Victoria Binder and Allison Brewer

**Exhibitor Meet & Greet: Tru Vue**

**Laid Bare: Preserving our Nation's History in view of the public at the National Park Service** / Angela Campbell

**Exhibitor Meet & Greet: Foster + Freeman**

**Varnished Artworks Created By Children During Art Therapy Sessions: Legal and Material Considerations** / Laura McCann and Chantal Stein

## Book and Paper Group Business Meeting

**MONDAY, JUNE 29**

**Book and Paper Group Business Meeting**
(3:30pm –5:15pm)

## Book and Paper Session 2

**TUESDAY, JUNE 30**

**Hair Today and (Not) Gone Tomorrow: The Conservation of a 19th Century Hair Album** / Mary French

**Restoration, Rebinding, Conservation: Changes in Collections Care over 275 years at the APS Library** / Renee Wolcotttt

**Exhibitor Meet & Greet: Bruker**

**Arsenic and Old Bookcloth: the Safe Handling, Storage, and Treatment of Potentially Toxic Victorian-Era Cloth-Case Publisher's Bindings** / Melissa Tedone and Rosie Grayburn

**Audrey Amiss, artist and patient: preserving her legacy** / Stefania Signorello

## Paintings Session 2

**THURSDAY, JULY 2**

**Identification and Removal of Disfiguring Zinc Oxalates from the Surface of a Frank Benson Portrait** / Christine Gostowski and Gregory Dale Smith

**Exhibitor Meet & Greet: Carestream**

**Max Beckmann's Karneval: A Record of Turmoil and Evolving Philosophies** / Rita Berg and Joyce Tsai

**Exhibitor Meet & Greet: Getty Publications/GCI**

**Nanogels: An Investigation into Nanotechnologies for the Cleaning of a Painting by Ernst Ludwig Kirchner** / Caroline Hoover and Laura Maccarelli

## Objects Session 2

**TUESDAY, JULY 7**

**Her Majesty's Portable Museum; A 19th Century box of specimens from the animal, mineral, and vegetable worlds** / Tom Braun

**Respecting the Service** / Respecting the Surface: Treatment of the copper alloy USS Utah ship's bell and the development of treatment procedures for historic metal surfaces in the Naval History and Heritage Command
Conservation Branch / Karl Knauer

**Poultice Desalination Using Buffered Rigid Gel with Ion Exchange Resin** / Jessica Abel and Brittany Dinneen

**Exhibitor Meet & Greet: Zarbeco**

## Electronic Media Session 3 - Digital Preservation/Storage

**WEDNESDAY, JULY 8**

**A Cross-Departmental Collaboration to Improve Digital Storage at The Metropolitan Museum of Art** / Alexandra Nichols

**Building a Storage System for Digital Art Objects at MoMA: The First Decade** / Amy Brost

**Developing the Digital Preservation Handbook for Video Games and Digital Archives at The Strong Strong National Museum of Play** / Hillary Ellis

## Public Conservation Labs: Reactive or Proactive

**THURSDAY, JULY 9**

**The Art Doctor is In: How the Lunder Conservation Center Broke the 4th Wall** / Laura Hoffman and Amber Kerr

**Surviving the Seven-year Itch: Reflections from Conservators on Display at the Penn Museum** / Lynn Grant and Molly Gleeson

**Exhibitor Meet & Greet: SmallCorp**

**Conservation on Permanent Display: The W. Brooks and Wanda Y. Fortune History Lab at the Indiana Historical Society** / Stephanie Gowler, Ramona Duncan-Huse, and Kathy Lechuga

**Exhibitor Meet & Greet: Barnett Technical Services**

## Photographic Materials Group Business Meeting

**FRIDAY, JULY 10**

**Photographic Materials Group Business Meeting**

# JULY SESSIONS

*ALL SESSIONS TAKE PLACE BETWEEN 1:00-3:00 P.M. EASTERN TIME UNLESS OTHERWISE NOTED. ABSTRACTS BEGIN ON PAGE 34.*

## Book and Paper Session 3

### MONDAY, JULY 13

The Gentling Collection: Establishing a Treatment Protocol for Multi-Layered Works on Transparent Paper / Diane Knauf and Jodie Utter

Shiny, Lined, and Brown: Building Conservation Context for Harry Jander's Document Restorations / Sarah Norris and Kathryn Boodle

Exhibitor Meet & Greet: Bruker

Indian Oleographs: Technical Analysis and Modern Treatment Methods / Emily Müller

The Read Muraqqa' Leaves - Disbound Persian and Indian Album Leaves at the Morgan Library & Museum / Bonnie Hearn

## Book and Paper & Photographic Materials Tips Session

### MONDAY, JULY 13

Book and Paper & Photographic Materials Tips Session (3:30pm – 5:00pm)

## Book and Paper Session 4

### TUESDAY, JULY 14

PAPER – It's More Than That: A Syntax for Excruciatingly Thorough Descriptions / Jan Burandt

Exhibitor Meet & Greet: Zarbeco

Handle with Care: Treatment, Care and Prevention as applied to East Asian Scrolls / Yi-Hsia Hsiao

Exhibitor Meet & Greet: Foster + Freeman

Sustainability with Regards to Intangible Culture: How the Increasing Scarcity of Craftspeople Impacts the Traditional Remounting of a 12th century Japanese Buddhist Painting on Silk at the Cleveland Museum of Art / Sara Ribbans

## Electronic Media Session 4 - Web Software

### TUESDAY, JULY 14

El cuarto del Quenepón: Collaborative and Cross-Disciplinary Approaches in the Preservation of Time-based Media on the Web / Amye McCarther, Caroline Gil, Danielle Calle, and Claire Fox

"Self-documenting" Mode for Data and Software-based Installations / Diego Mellado Martínez and Francesca Franco

Conservation of a Software-Based Sound Installation: MoMA's Restaging of David Tudor & Composers Inside Electronics Rainforest V (Variation 1), or Rainforest in the field / Caroline Gil

## Photographic Materials Session 2

### WEDNESDAY, JULY 15

Strengthening the Preservation of Photographic Materials in Latin America: celebrating 30 years of APOYOnline / Beatriz Haspo and Amparo Rueda

Fifteen Years of Teamwork: Teaching Photograph Conservation in Central and Eastern Europe / Monique Fischer

Past, Present, and Future of the Collaborative Workshops in Photograph Conservation / Margaret Wessling and Nora Kennedy

## Concurrent General Session: External Forces in Contemporary Art Conservation Session 1

### THURSDAY, JULY 16

Exposing Deterioration and Gradual Conservation Treatment of Works by Gustav Metzger as a Way of Broadening Modes of Understanding Reception and Conservation of Contemporary Art / Mirosław Wachowiak

Fugitive Gestures: Contemporary Art Conservation and the Obsolescence of Practice / Helia Marcal

Hans Haacke, News: A Case Study on Migration and Cross-Institutional Collaboration for a Conceptual Software Based Artwork / Mark Hellar and Daniel Finn

## Electronic Media/Contemporary Art Joint Session

### MONDAY, JULY 20

Perfect Sound Forever: Addressing Intermittent Functionality in the Permanent Installations of Max Neuhaus / Meaghan Perry and Sarah Thompson

Developing the Joan Jonas Knowledge Base - An Open Access Digital Resource / Glenn Wharton, Deena Engel, and Barbara Clausen

Examination and Assessment of AI in Contemporary Artworks: Is It Possible to Preserve the Algorithm? / Julia Betancor, Daniel Finn, and Ana Mata

## Electronic Media Group Business Meeting

### MONDAY, JULY 20

Electronic Media Group Business Meeting (3:15pm – 4:30pm)

## Poster Session

### TUESDAY, JULY 21

Poster Session / See page 75 and www.culturalheritage.org/2020postersession

## Untold Stories

### TUESDAY, JULY 21

Untold Stories (3:30pm – 5:30pm)

## AIC Paintings Specialty Group Business Meeting

### WEDNESDAY, JULY 22

AIC Paintings Specialty Group Business Meeting (1:00pm – 2:00pm)

## Research and Technical Studies Session 2

### THURSDAY, JULY 23

Comparing DART Analysis to Traditional Wood Anatomy for the Identification of West African Woods: Research at the Smithsonian National Museum of African Art and Museum Conservation Institute / Julia Campbell-Such, G. Asher Newsome, and Cady Lancaster

Exhibitor Meet & Greet: Opus Instruments

Evaluation of Angle-Resolved x-Ray Fluorescence for Stratigraphy Elucidation in Paintings / Antonio Martinez-Collazo, Cristyan Quiñones-Garcia, Gabriel Martinez-Gonzales, and Danielle Chavis

Exhibitor Meet & Greet: Getty Publications/GCI

Digital Simulations: Terminology and Ethical Use / Becca Goodman

Research & Technical Studies (RATS) Member Business Meeting

## Research and Technical Studies Business Meeting

### THURSDAY, JULY 23

Research and Technical Studies Group Business Meeting (3:30pm – 4:30pm)

## Concurrent General Session: External Forces in Contemporary Art Conservation Session 2

### MONDAY, JULY 27

The Conservation of an Outdoor Public Artwork in an Aquatic Zone: a Highly Interventive Approach and Limited Options / Stéphanie Gagné

The Long Road to Minimalist Intervention: Installing Richard Serra's First Public Work in a Public Street / Raina Chao and Hugh Shockey

Conserving the Uncollectible: Caring for Land Art and Earth Installations / Rosa Lowinger and Christina Varvi

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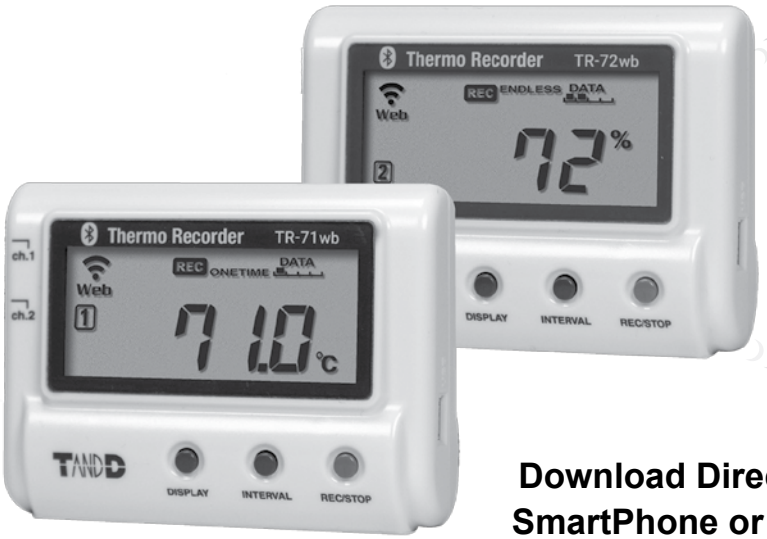


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# JULY / AUGUST SESSIONS

*ALL SESSIONS TAKE PLACE BETWEEN 1:00-3:00 P.M. EASTERN TIME UNLESS OTHERWISE NOTED. ABSTRACTS BEGIN ON PAGE 34.*

## Architecture Session 2

**TUESDAY, JULY 28**

An Uplifting Story: Re-supporting the Gun Turret of *USS Monitor* / Will Hoffman

Exhibitor Meet & Greet: Getty Publications/GCI

An Exploration of Consolidants for Ancient Egyptian Limestone / Nina Owczarek, Anna O'Neill, and Molly Gleeson

Early Reinforced Concrete Construction in the United States / Mayank Patel and David Wessel

## Education and Stakeholder-Engaged Practice: Session 1

**WEDNESDAY, JULY 29**

All in the Family: Bringing Conservation to Early Learning / Ellen Chase, Matthew Lasnoski, and Laura Hoffman

Outreach and Education Through Collections Care: A Case Study with Central High School in Philadelphia / Melissa King, Joelle Wickens, and Andrea Keefe

Treating Tuskegee's Dioramas: A Perspective on Inclusive and Collaborative Treatments Between Institutions / LaStarsha McGarity, Amanda Kasman, Julianna Ly

## AIC Awards Presentation

**WEDNESDAY, JULY 29**

AIC Awards Presentation (4:00pm)

## Textiles and Wooden Artifacts Session

**THURSDAY, JULY 30**

Collaborative Reconstruction: Exhibiting a Loose Cover for an Easy Chair / Gretchen Guidess and Leroy Grave

Biohazard at the Palace: Collaborative Response in Collection Care for Historic Interiors / Annika Blake-Howard and Gretchen Guidess

Holistic Gallery Restorations at the Isabella Stewart Gardner Museum / Holly Salmon

## A Failure Shared is Not a Failure: Learning from Our Mistakes

**FRIDAY, JULY 31**

A Failure Shared is Not a Failure: Learning from Our Mistakes (3:30pm –6:30pm)

## Textiles Session 1

**MONDAY, AUGUST 3**

Finding the Ming Style: Reconstructing a 15th Century Tibeto-Chinese Thangka Mounting / Michiko Adachi and Hsin-Chen Tsai

Highly Interventive: Three Tales of Treatment from the Deep End of the Workbench / Chandra Obie Linn

Exhibitor Meet & Greet: SmallCorp

Mechanical Damage in Historic Tapestries: Results from a Scientific Investigation on Causes and Remedies / Rosa Costantini

## Book and Paper Session 5: Library Collections Conservation Discussion Group

**TUESDAY, AUGUST 4**

Panel Discussion: When Damage Has Meaning: How Conservation Interacts with Interpretation

## Collections Care: Current Standards for Storage Materials

**WEDNESDAY, AUGUST 5**

When the Rubber Hits the Road: A Panel Discussion about Current Standards for Plastics as Storage Materials

## Architecture & Objects Historic House Session - Part 2

**THURSDAY, AUGUST 6**

Reactive, Proactive and Interactive - The Conservation and Reinstallation of the Cassiobury House Staircase at The Met / Mecka Baumeister and Lisa Ackerman

The Dark Side of the Gilded Age: An Investigation into Soot Deposition at the Vanderbilt Mansion / Margaret Breuker

Exhibitor Meet & Greet: Zarbeco

## Textile Specialty Group Business Meeting

**FRIDAY, AUGUST 7**

Textile Specialty Group Business Meeting (1:00pm – 2:00pm)

## Wooden Artifacts Session 2

**MONDAY, AUGUST 10**

Digital 3-D Reproduction and CNC Milling: Putting the Finial Touches on an Architectural Highlight, the Cassiobury House Staircase / Ivo Kipre and Jesse Ng

Exhibitor Meet & Greet: Getty

Technical Study and Cleaning Treatment of the Egyptian Coffin of Nakht / Luke Addington and Nancy Odegaard

## Electronic Media Session 5: Caring for Time-based Media in Institutions

**MONDAY, AUGUST 10**

Fitting the Pieces Together: Moving Towards a Collaborative Approach to Time-Based Media Conservation / Kristin MacDonough

One Size Does Not Fit All: Adapting the Institution for Collecting TBM Artworks / Morgan Kessler and Joseph G. Heinen

Exhibitor Meet & Greet: Getty

Preservation and Documentation of Time Based Media Art at the Reykjavík Art Museum / Sigga Regína Sigurthorsdottir and Edda Halldorsdottir

## Book and Paper: AP Discussion Group

**TUESDAY, AUGUST 11**

Art on Paper Discussion Group - Presentation and Panel

## Textiles Session 2

**TUESDAY, AUGUST 11**

The Use of Non-woven Support Materials for the Conservation of Three-Dimensional Painted Silk / Chuance Chen

'Riggisberg'? A Mexican Stitch to Remember / Laura Garcia-Vedrenne

## Collections Care - Big Data

**WEDNESDAY, AUGUST 12**

Assessing the Condition of the National Collection / Fenella France

Measuring Collections Care: Survey, Index, Self-assessment, Consultant / Lesley Langa



Join the conversation by using **#AICmtg20** to tag your social media posts!

# AUGUST SESSIONS

*ALL SESSIONS TAKE PLACE BETWEEN 1:00-3:00 P.M. EASTERN TIME UNLESS OTHERWISE NOTED. ABSTRACTS BEGIN ON PAGE 34.*

## Objects Session 3

**THURSDAY, AUGUST 13**

- Saving Moth Man: Conserving John Hampson's Insect Art / Nora Frankel
- Coating Iron: A Reactive and Proactive Solution / Gyllian Porteous and Anna Funke
- The Treatment and Reinstallation of Neo-Assyrian Northwest Palace Reliefs at the Brooklyn Museum / Victoria Schussler
- Preserving monumental plaster casts in a historic building: A conservation approach at the Victoria & Albert Museum London / Sarah Healey-Dilkes and Mariam Sonntag

## Objects Specialty Group Business Meeting

**THURSDAY, AUGUST 13**

- Objects Specialty Group Business Meeting (3:30pm – 5:00pm)

## Reacting to Hazardous Collections

**MONDAY, AUGUST 17**

- Navigating Deep Currents – Treatment of an Artifact with a Traumatic Origin and Potential Hidden Hazards / Steven Pickman
- Exhibitor Meet & Greet: Spacesaver
- Forces and Radiation: Dealing with the hazards involved with acquiring, displaying and lending a collection of artworks by Takis / Carla Flack
- Exhibitor Meet & Greet: Huntington T. Block
- Toxic Taxidermy and More: Evaluating Hazards and Developing Safety Guidelines at the Museum of Vancouver / Hayley Monroe and Fiona Hernandez

## Proactive Collections Care for Smaller Institutions

**TUESDAY, AUGUST 18**

- Three Approaches to Sustainable Collections Care / Anastasia Matijkiw
- Broadening the Dialog with our Allies through the Connecting to Collections Care Community / Heather Galloway
- Conservation Within Reach: Conservators and Lab-less Conservation for a Higher Standard of Care / Katharine Corneli

## Paintings Session 3

**WEDNESDAY, AUGUST 19**

- Project Blue Boy: The public conservation treatment of a painting with iconic status from The Huntington Library, Art Museum, and Botanical Gardens / Christina O'Connell
- Exhibitor Greet & Meet: Barnett Technical Services
- Treading New Ground: Technical examination and treatment of two eighteenth-century Philadelphia portraits by William Williams / Mina Porell

## Research & Technical Studies, Collection Care, & Contemporary Art Joint Session

**THURSDAY, AUGUST 20**

- Effect of Long-term Impact of Climate Change and Urban Pollutantson Cultural Heritage Sites and Collections / Peter Brimblecombe
- Accessible and State of the Art Pollution Monitoring Systems for Enclosures / David Thickett
- Addressing a Growing Concern: Preliminary Research Towards an Understanding of Mold on Modern Paints / Kyna Biggs
- Scratch That: Conservation Treatment of Abraded Plastic, a Technical Study Towards a Flexible Future: A National Approach to Managing Time-Based Media Art Collections in Australia / Sarah Barack and Batyah Shtrum
- Exhibitor Meet & Greet: Tru Vue

## Sustainability

**MONDAY, AUGUST 24**

- Cradle to Grave: Sustainable Manufacture, Use, and Disposal of Collections Care Materials in Museums / Justine Wuebold
- The Nunalleq Center and Archaeological Site: Community and Cultural Preservation in Southwest Alaska's Rapidly Changing Climate / Frances Lukezic
- Collaboration and innovation: Developing the potential of environmental monitoring data at the National Library of Scotland through industrial and academic partnerships / Julie Bon
- Glenstone: A Case Study in Energy Saving Measures in a Modern Museum Building / Samantha Owens and Steven O'Banion

## Proactive Digital Methods

**TUESDAY, AUGUST 25**

- Applying a Technology-Driven COMPSTAT Model to Collaborative Collection Protection Strategies for Artworks in the Galleries of the Detroit Institute of Arts / Eric Drewry and John Steele
- Uses and abuses of eye-tracking techniques in conservation decision making / W. (Bill) Wei
- Taking It All Apart: The Use of 3D Technology and Imaging in the Conservation of a Large-Scale Cambodian Stone Sculpture / Amaris Sturm

## Photographic Materials Session 3

**THURSDAY, AUGUST 27**

- The Niepce Heliograph, at the Harry Ransom Center / Diana Diaz and Heather Brown
- Deconstructing the creation of Daguerre's dessins-fumées: a photographic process or just smoke and mirrors? / Sarah Freeman, Nathan Daly, Lynn Lee, Michelle Sullivan, and Karen Hellman
- Removal of aged filmoplast P 90 tape from inkjet prints / Saori Kawasumi Lewis
- Exhibitor Meet & Greet: Bruker

## Collections Care: Emergency Response Session

**MONDAY, AUGUST 31**

- Construction Fires and Museums / Jeffrey Hirsch
- Few Resources, Much Creativity: Proactive actions to reduce the impact of major disasters / Juçara Farias, Gilcy Azevedo, Gabriela Lúcio, and Aline Ferreira
- Exhibitor Meet & Greet: G.C. Laser Systems

## General Session: Public Conservation Labs - Reactive or Proactive

**TUESDAY, SEPTEMBER 1**

- Are Conservation Visible Labs Effective? Evaluation of an interactive conservation lab at a science museum/ Rebecca Newberry and Melissa Amundsen
- Conservation Behind Glass – Interacting with the Public in a Lab on Permanent Display / Alicia Halligan
- Conservation in Action: One Museum's Experience with Public Conservation Projects Over the Past Two Decades and How That Will Inform Programming in a New Conservation Center / Lydia Vagts and Tanya Uyeda

# POSTER SESSION

*Presented July 21 at 1:00pm ET. View the session online at learning.culturalheritage.org/p/annual-meeting-jul-2020. Abstracts begin on page 75.*

Smithsonian Time-Based Media and Digital Art Website Redesign

**Crystal Sanchez - Video And Digital Preservation Specialist, Smithsonian Dams**

More Than Sticks and Stones: Historic Cemetery Management Amidst Climate Change

**Neela Wickremesinghe - Manager Of Restoration and Preservation, Green-Wood Cemetery**

Navigating the Labyrinth that Led to the Original Mobile Games: A Multi-Institutional Exercise in Digital Exhibition and Conservation

**Stephen Jacobs, Professor, The Rochester Institute of Technology, and Scholar-In-Residence, The Strong National Museum Of Play**

Seeing Red: Towards an Improved Protocol for The Identification of Madder- And Cochineal-Based Pigments by Fiber Optics Reflectance Spectroscopy (Fors)

**Beatriz Fonseca - University of Copenhagen**

The Effect of Various Aqueous Bathing Solutions on the Calcium Content of Paper

**Lindsey Zachman - Winterthur/University of Delaware Program in Art Conservation**

A Sticky Situation: Conservation of Historic Waterlogged Rubber

**Laurie King - The Mariners' Museum And Park**

Tablet Techniques for Digital Documentation

**Brianna Warren - The Menil Collection**

Using Quick Emulation (QEMU) for Software-Based Art Conservation

**Dylan Lorenz – Media Archivist, Jenny Holzer Studio, and Electronic Media Conservator In Private Practice**

"Respectfully Dedicated to My Friends Messrs. Bradley & Rulofson": Photographically Illustrated Sheet Music and Connections Between Photography Studios and Sheet Music Publishers in the 1860s and 1870s

**Jessamy Gloor - The Huntington Library, Art Museum, and Botanical Gardens**

# BUSINESS MEETINGS

| | |
|---|---|
| AIC Member Business Meeting | Friday, May 22, 1:00 p.m. ET |
| ASG Business Meeting | TBD |
| BPG Business Meeting | Monday, June 29, 3:30 p.m. ET |
| CIPP Business Meeting | TBD |
| EMG Business Meeting | Monday, July 20, 3:15 p.m. ET |
| OSG Business Meeting | Thursday, August 13, 3:30 p.m. ET |
| PSG Business Meeting | Wednesday, July 22, 1:00 p.m. ET |
| PMG Business Meeting | Friday, July 10, 1:00 p.m. ET |
| RATS Business Meeting | Thursday, July 23, 3:30 p.m. ET |
| TSG Business Meeting | Friday, August 7, 1:00 p.m. ET |
| WAG Business Meeting | TBD |

# EXHIBITOR PROFILES

## EXHIBITOR MEET & GREET SCHEDULE

| | |
|---|---|
| Monday, June 8 | G.C. Laser Systems |
| Monday, June 15 | Zarbeco<br>Carestream<br>Opus Instruments |
| Tuesday, June 16 | Spacesaver |
| Wednesday, June 17 | Carestream<br>Bruker |
| Monday, June 22 | Bruker |
| Tuesday, June 23 | G.C. Laser Systems |
| Monday, June 29 | Foster + Freeman |
| Tuesday, June 30 | Bruker |
| Thursday, July 2 | Carestream<br>Getty Publications |
| Tuesday, July 7 | Zarbeco |
| Thursday, July 9 | Small Corp<br>Barnett Technical Services |
| Monday, July 13 | Bruker |
| Tuesday, July 14 | Foster + Freeman<br>Zarbeco |
| Thursday, July 23 | Opus Instruments<br>Getty Publications |
| Tuesday, July 28 | Getty Publications |
| Monday, August 3 | Small Corp |
| Thursday, August 6 | Zarbeco |
| Monday, August 10 | Getty Publications |
| Monday, August 17 | Huntington T. Block<br>Spacesaver |
| Wednesday, August 19 | Barnett Technical Services |
| Thursday, August 20 | Tru Vue |
| Thursday, August 27 | Bruker |
| Monday, August 31 | G.C. Laser Systems |

## PLATINUM LEVEL

### Bruker Corporation

Virtual Meet & Greet: June 17, 22, 30; July 13; August 27

5465 E. Cheryl Parkway, Madison, WI 53711 USA
Contact: Kodi Morton
Ph: 608-276-3017 Fx: 608-276-3006
Email: kodi.morton@bruker.com
Website: www.bruker.com
Bruker is one of the world's leading analytical instrumentation companies. We cover a broad spectrum of advanced solutions in all fields of research and development. Bruker's innovative methods and non-destructive analytical techniques help to protect and preserve artifacts and historical monuments all over the world.

### Goppion

205 Mount Auburn St., Watertown, MA 02472 USA
Contact: Bruno Goppion, Ted Paschkis
Ph: 617-297-2546 Fx: 617-848-2641
Email: bgoppion@goppion-us.com, tpaschkis@goppion-us.com
Website: www.goppion.com

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## DIAMOND LEVEL

### Tru Vue, Inc.

Virtual Meet & Greet: August 20

9400 West 55th St., Countryside, IL 60525 USA
Contact: Yadin Larochette
Ph: 312-758-3737 Fx: 708-854-2660
Email: ylarochette@tru-vue.com
Website: www.tru-vue.com/museums-collections

With nearly 50 years of proven protection and preservation, Tru Vue fine art acrylic and glass solutions, including Optium Museum Acrylic and UltraVue Laminated Glass, are trusted by conservation and fine art professionals to protect and display the most celebrated artworks in the world. We work closely with the museum community to develop products that meet superior aesthetic and conservation standards. For more information visit our website: www.tru-vue.com/museums-collections.

## GOLD LEVEL

### Atlas Preservation Inc.

122 Spring St., Ste. B1, Southington, CT 06489 USA
Contact: Jonathan W. Appell
Ph: 806-558-2785
Email: sales@atlaspreservation.com
Website: atlaspreservation.com

Atlas Preservation, Inc. was conceived based on the need for a one stop source for all monument restoration supplies. Our mission quickly expanded to include many other fields relating to conservation & historic preservation, such as products for metal conservation, historic window repair, modern stone working, and more. Jonathan Appell is the founder of Atlas Preservation Inc., with over 30 years of experience he has personally conserved some of the oldest dated stones in America. He also performs the majority of historic gravestone preservation workshops throughout America.

## Foster + Freeman USA, Inc.

Virtual Meet & Greet: June 29; July 14

46030 Manekin Plaza, Ste. 170, Sterling, VA 20166 USA
Contact: David Tobin
Ph: 888-445-5048 Fx: 888-445-5049
Email: usoffice@fosterfreeman.com
Website: www.fosterfreeman.com

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## G.C. Laser Systems, Inc.

Virtual Meet & Greet: June 8, 23; August 31

900 S. Des Plaines Ave., Forest Park, IL 60130 USA
Contact: Magdalena Dajnowski
Ph: 844-532-10641 Fx: 773-353-8699
Email: magdalena@gclasers.com
Website: www.gclasers.com
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## Kremer Pigments, Inc.

247-C West 29th St., Frnt. 1, New York, NY 10001 USA
Contact: Roger Carmona
Ph: 212-219-2394 Fx: 212-219-2395
Email: roger@kremerpigments.com
Website: www.kremerpigments.com

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## NanoRay Biotech

7F, No. 91, Xinhu 1st Rd., Neihu District, Taipei 114 Taiwan
Contact: Ranganath Varma
Tel: +886 2-2796-8909
Fax: +886 2-2796-8910
Email: varma@nanoray.com
Website: www.artxray.net; www.nanoray.com

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534 N. Guadalupe St., Unit 32886, Santa Fe, NM 87501 USA
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Email: sbknuth@tandd.com
Website: www.tandd.com

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## University Products, Inc.

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Ph: 413-532-3372 Fx: 800-532-9281
Email: jadunphy@universityproducts.com
Website: www.universityproducts.com

University Products, the leading supplier of conservation tools, equipment and archival storage enclosures, will exhibit a variety of new tools and equipment for conservation. Working with our international partners, Preservation Equipment (PEL) in Europe and Marco Polo in Mexico, University Products selection of tools and equipment is the most complete selection of products specifically designed for AIC members.

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Ph: 313-320-1877
Email: mjaroma@bmscat.com
Website: www.bmscat.com

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Contact: Lesley Jones
Ph: 011-44-(0)1234-846333
Email: lesley.jones@cxdinternational.com
Website: www.cxdinternational.com

Conservation by Design is a part of an international group of complimentary companies dedicated to working with conservators from museums, galleries, libraries and archives around the world, in the protection of our cultural heritage. We believe in a holistic approach to conservation, understanding the essential value of "joined-up" thinking, in the development of innovative solutions that enable the long-term display, storage and survival of valuable materials.

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Contact: Patricia Ellenwood
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Contact: Jane Gasper
Ph: 508-743-3146
Email: jane_gasper@onsetcomp.com
Website: www.onsetcomp.com

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### Opus Instruments (Atik Cameras)

Virtual Meet & Greet: June 15; July 23

Unit 8 Lodge Farm Barns, New Rd., Norwich, Norfolk NR9 3LZ United Kingdom
Contact: Catherine Wilkinson
Ph: 011-44-(0)1603-740397
Email: hello@opusinstruments.com
Website: www.opusinstruments.com

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### Prairie Paper, University of Illinois, Library

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Email: jhain@illinois.edu
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## REL Inc.

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Email: kitti@relinc.net
Website: www.relinc.com

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Virtual Meet & Greet: July 9; August 3

19 Butternut St., Greenfield, MA 01301 USA
Contact: Michael Dunphy
Ph: 413-772-0889 Fx: 413-773-7386
Email: mdunphy@smallcorp.com
Website: www.smallcorp.com

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## Studio Arts College International

454 W. 19th St., New York, NY 10011 USA
Contact: Racini Aranda
Ph: 212-248-7225
Fx: 212-248-7222
Email: raranda@saci-florence.edu
Website: saci-florence.edu

Studio Arts College International (SACI) is more than an opportunity to study abroad in Florence, the birthplace of the Renaissance. Accredited by the National Association of Schools of Art and Design (NASAD), SACI offers a wide range of innovative, hands-on graduate and undergraduate programs in traditional and contemporary studio arts, design, conservation, art history, and Italian language and culture. Programs integrate diverse disciplines and emphasize the essential role of art and design in how we shape and sustain our planet both socially and environmentally.

# STANDARD LEVEL

## Applied Surface Technologies

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Ph: 908-464-6675
Email: roberts@co2clean.com
Website: www.co2clean.com

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## Barnett Technical Services

Virtual Meet & Greet: July 9; August 19

5050 Laguna Blvd., Ste. 112-630, Elk Grove, CA 95758 USA
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Ph: 916-549-4423
Email: steve.barnett@barnett-technical.com
Website: barnett-technical.com

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## Carestream Non-Destructive Testing

Virtual Meet & Greet: June 15, 17; July 2

150 Verona St., Rochester, NY 14608 USA
Contact: Stephen Pflanz
Ph: 585-627-6705
Email: stephen.pflanz@carestream.com
Website: www.carestream.com/nondestructivetesting.html

Carestream NDT is a worldwide provider of X-ray imaging systems used by Art Conservatories around the world. Products include digital computed radiography (CR) systems, digital radiography (DR) systems, imaging plates, cassettes, DICONDE archiving, conventional film & chemicals, automatic film processing equipment and accessories. Our innovative solutions enable our customers' success and reveal critical information on priceless works of art and artifacts. Our award-winning products keep conservators at the forefront of technological advancements in art imaging.

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Email: garavaglia@colibrisystem.com
Website: www.colibriusa.com

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Contact: Chad Grob
Ph: 410-284-3248 Fx: 410-284-3249
Email: chad@museumfigures.com
Website: www.museumfigures.com

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# EXHIBITOR PROFILES

## Getty Conservation Institute

1200 Getty Center Dr., Ste. 700, Los Angeles, CA 90049 USA
Contact: Anna Zagorski
Ph: 310-440-7325 Fx: 310-440-7712
Email: gciweb@getty.edu
Website: www.getty.edu/conservation

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

## Getty Publications

Virtual Meet & Greet: July 2, 23, 28; August 10

1200 Getty Center Dr., Ste. 500, Los Angeles, CA 90049 USA
Contact: Kimberley Westad
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Email: info@hirox-usa.com
Website: www.hirox-usa.com

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Virtual Meet & Greet: August 17

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Contact: Ever Song
Ph: 202-429-8506 Fx: 312-381-0698
Email: ever_song@aon.com
Website: www.huntingtontblock.com

The American Institute for Conservation (AIC) and Huntington T. Block Insurance Agency, Inc. (HTB) have partnered to provide AIC's members with the Conservator's Insurance Program – an insurance solution customized to your unique exposures.

## Jack Richeson & Co.

557 Marcella St., Kimberly, WI 54136 USA
Contact: Chrissy Stuczynski
Ph: 920-738-0744 Fx: 920-738-9156
Email: chrissys@richesonart.com
Website: richesonart.com

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## MuseuM Services Corporation

385 Bridgepoint Way, South St. Paul, MN 55075 USA
Contact: Linda Butler
Ph: 651-450-8954 Fx: 651-554-9217
Email: info@museumservicescorporation.com
Website: www.middletonspectral.com

MuseuM Services Corporation would like to thank the art conservation community for its support in this, our 40th anniversary year. MuseuM Services Corporation remains committed to safely and efficiently serving you with equipment, supplies and services. Please check out our newly launched website and call or email us with your conservation equipment and supply needs.

## National Center for Preservation Technology & Training (NCPTT)

Contact: Jason Church
Ph: 318-356-7444 Fx: 318-356-9119
Email: jason_church@contractor.nps.gov
Website: www.ncptt.nps.gov

The National Park Service's National Center for Preservation Technology and Training protects America's historic legacy by equipping professionals in the field of historic preservation with progressive technology-based research and training. Since its founding in 1994, NCPTT has awarded over $7 million in grants for research that fulfills its mission of advancing the use of science and technology in the fields of archaeology, architecture, landscape architecture and materials conservation.

## NEDCC | Northeast Document Conservation Center

100 Brickstone Square, Andover, MA 01810 USA
Contact: Bill Veillette
Ph: 978-470-1010 Fx: 978-470-6021
Email: info@nedcc.org
Website: www.nedcc.org

Founded in 1973, NEDCC | Northeast Document Conservation Center specializes in the preservation of paper-based materials for cultural institutions, government agencies, and private collections. NEDCC serves clients nationwide, providing conservation treatment for book, photograph, and paper collections, including works of art on paper, Asian art, and oversize works. NEDCC provides digital imaging, audio preservation, assessments, consultations, training, and disaster assistance, and is a trusted resource for preservation information worldwide.

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## RH Conservation Engineering

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Website: www.rhconservationeng.com

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Virtual Meet & Greet: June 16 ; August 17

1450 Janesville Ave., Fort Atkinson, WI 53538 USA
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## Talas

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## Zarbeco, LLC

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52 Main St., Ste. 1, Succassunna, NJ 07876 USA
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Ph: 973-933-2043 Fx: 973-933-2336
Email: mzweig@zarbeco.com
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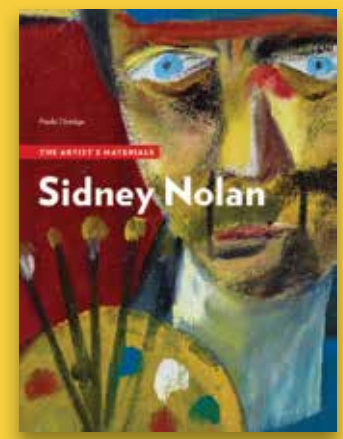
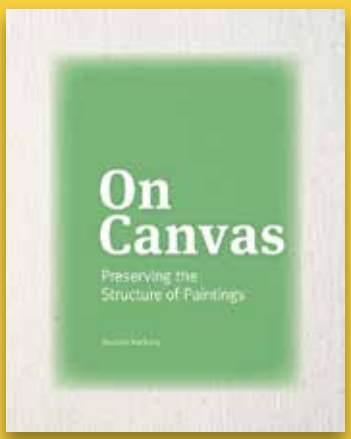
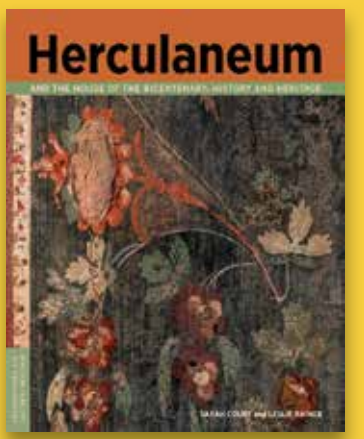
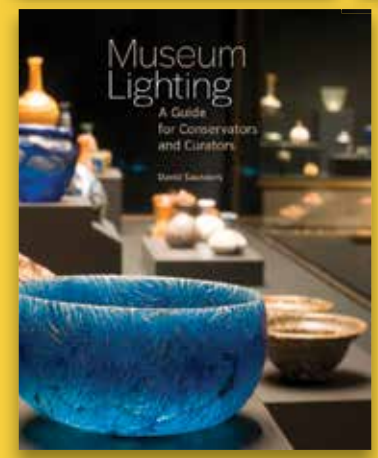
# NEW & NOTABLE

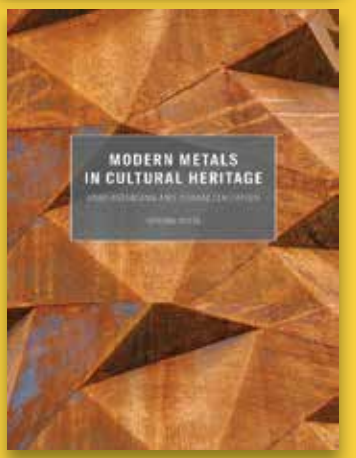







**Sidney Nolan**
The Artist's Materials

*Paula Dredge*

"Paula Dredge's exhaustive technical analysis of the work of one of Australia's greatest and most complex painters, Sidney Nolan, . . . is essential reading to anyone curious to see how a particular alchemy works to make an artist's imagery unforgettable."
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*David Saunders*

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**Herculaneum and the House of the Bicentenary**
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*Sarah Court and Leslie Rainer*

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**Modern Metals in Cultural Heritage**
Understanding and Characterization

*Virginia Costa*

This practical guide provides artists, conservators, curators, and other heritage professionals with tools for understanding, evaluating, and approaching the care and treatment of modern metals.

**Getty Publications**
getty.edu/publications

# ABSTRACTS

## Keynote Address and Opening General Session

### No More "Behind the Scenes": How Word Choice Matters in Presenting Collection Stewardship / Rebecca Fifield

"Behind-the-scenes" is often used to describe conservation and collections work that takes place in labs and storerooms. Websites and public programs that highlight conservation work often pair "behind-the-scenes" with the words "exclusive," "VIP," "special access," and "Members Only." Development colleagues may use behind-the-scenes to instill excitement and higher levels of patronage, but this concept runs counter to missions focused on public outreach. Does "behind-the-scenes" open doors, or does it just draw attention to the fact we often work behind locked doors? We may unwittingly deter support for conservation by creating an air of exclusivity and gatekeeperism around the less visible work we do. Strengthening our engagement strategies is possible by avoiding words that create roadblocks to inclusion. Gatekeeping terminology can foil connections we need to establish relevance, diversity, and inclusion as conservation prepares to meet the future. This can hamper conservation's role in capital planning, community outreach, funding, and the ability to attract conservation and preservation-focused donors. Proactive conservation is built on engagement with greater social goals, including climate change, sustainability, and emergency preparedness. Conservator outreach has reached thrilling levels; avoiding "behind-the-scenes" language invites the public to deeper engagement with our challenges, successes, and meaningful stewardship stories.

### Navigating Change through the Practices of Care / Pip Laurenson

In a room at Tate Liverpool sits a circle of people with one thing in common. Through their different forms of practice, they are all actively engaged in the care of an artwork, an experimental sound and film installation, *Ten Years Alive on the Infinite Plain* by Tony Conrad (1940 –2016). In the center are the 'transmitters' of the work that was first performed in 1972 and with them the group of musicians who had just played the work live for the first time. Gathered around are conservators, curators, registrars, technicians and a couple of academic observers. The work had just been performed working only from a "dossier" of information that drew on the knowledge of the work's "transmitters" that, in their different ways, continue to support *Ten Years Alive on the Infinite Plain* and the artist's legacy. Gently the conversation examined what had been conveyed and what had been lost in the transmission of this work, with the exchange focusing on the 'embedded know how' of those assembled. One of the "transmitters" read from her diary about her experience of playing of the piece: "My arm hurt, I wanted to stop but I was so worried that if I did I just wouldn't be able to start again." After all the preparation: (the readying of equipment and prints; the assembling of spaces, people; the testing; the shipping; the building; the unpacking; the tuning of instruments; the checking; the documenting) the performing all of these practices demonstrated the close attention to the specificity of the human and non-human material that makes up this work.

Whilst the week culminated in a second public performance of the work, what had also been performed was conservation as a social activity involving people and things which extend far beyond the museum, and also conservation and its associated practices as practices of care. To witness this care was deeply moving. This story has resonance in the programs of museums all over the globe and making it visible connects our practices to a growing literature from Science and Technology Studies and Anthropology, about the meaning and politics of care. Care is as much about what we neglect as what we care for. Caring builds value, and not caring signals what we consider worthless. Our practices shape the object of our care as well as produce knowledge that is uniquely rooted in that object's specificity. Framing our work as care encourages us to present the work we do differently; challenging the neutral voice of the institution to assert the individual contributions to the care of a work. Conservation, as a license to care, connects us to central ethical considerations about representation and collecting. Care not only connects conservation to the politics of visibility and invisibility, but also to the politics of knowledge and what as conservators we have license and want to care about. This research is funded by the Andrew W. Mellon Foundation as part of *Reshaping the Collectible: When Artworks Live in the Museum*.

**Referenced links:**

- TonyConradvideo:https://www.tate.org.uk/art/artists/tony-conrad-25422/conserving-tony-conrad

### Considerations for the Future of African Collections / Dana Moffett

Material culture provides tangible connections to the past, the present and the future. Some estimates suggest that as much as 95% of African cultural heritage resides beyond the boundaries of the continent. As a consequence Africa has been robbed of these valuable social connections. The 2018 Savoy-Sarr Report on the Restitution of African Cultural Heritage, commissioned by French President Emmanuel Macrone, is a well-publicized effort to address the damage caused by the historical removal of material culture from the Continent. But this report is just one of many events that indicate that change is in the air. In a nine-month period during 2019 there were no fewer than five international symposia addressing issues of ownership, restitution, and repatriation, or exploring the possibilities of engagement, collaboration and partnerships. This is an emerging effort; parties all over the world are starting to consider how we might begin to correct the imbalance in access to the cultural resources that represent Africa's heritage. What are the obstacles: geographic, political, cultural and financial? What are the possibilities for moving forward? And how might our field contribute to this effort?

**Referenced links:**

- Sarr-Savoy Report: http://restitutionreport2018.com/sarr_savoy_en.pdf
- CCI Technical Bulletin 32:https://www.canada.ca/en/conservation-institute/services/conservation-preservation-publications/technical-bulletins/products-used-preventive-conservation.html
- Trevor Noah video clip: https://www.youtube.com/watch?v=fOlmXQihow8&t=122s
- James Acaster video clip:https://www.youtube.com/watch?v=x73PkUvArJY
- National Museum of African Art Instagram account: https://www.instagram.com/six_degrees_of_restoration/

### Something Has to Give: Reworking Science Curriculum in Conservation Training / Chris McGlinchey

Recent graduates of American conservation training programs have been imbued with a broad knowledge base but at a cost: reduced time training and developing bench skills. The science component of the curricula is a significant contribution to this pull away from the bench. While the development of a scientific understanding of artworks and their conservation is integral to conservation training, this paper argues that the current approach to teaching science contains an acute flaw that must be addressed in order to develop a conservator with critical thought capacity and handskills that are better attune to their work. Finding the proper balance and form of science to teach emerging conservators has always been, and will continue to be, a moving target.

Today, training in analytical methods is common despite the fact not all treatments require such tools and not all graduates work where these resources exist. When students and graduates are in conservation studios that have access to such equipment, how they go about utilizing it varies; on occasion they might hope to utilize equipment because, as one student was told by their science professor, "you can't have too much data." The empirical "ground-truth" that scientific analysis provides can be invaluable and it is understandably tempting to gather as much of it as possible. Yet, I argue that it is best explored with a full knowledge of the most current tools available and with a high degree of confidence that the data can be interpreted accurately and within limits. While learning how to use analytical equipment is not too difficult, learning how to integrate it into one's treatment and examination is more challenging.

In focusing on the former, students may not fully appreciate which analytical tool can be most helpful, nor which tool might not be helpful enough. Occasional users of specific analytical equipment, scientists included, might have difficulty interpreting data or might not optimize experimental conditions sufficiently. Consultation and collaboration aid restraint and better target resources. I propose that science curricula focus on characterization rather than identification to understand the materiality of the works they treat and the conservation materials they handle. In making this shift to characterization, the student would obtain a deeper appreciation of how an object ages or the finesse by which a conservation material can, or may need to, be handled. This knowledge would apply to all objects that conservators come across - not just those that require analysis.

While this teaching approach may sound like yet more coursework, it should supplant the existing science module. The professionalization of conservation is young, and the discipline of conservation science is younger. Focusing on material characteristics promotes fruitful collaboration and steers scientific research in new and important directions. Most important, a recalibrated

science module that emphasizes characterization will better enable tomorrow's conservator to more efficiently grasp intellectually the physical properties of materials they are using and better understand why something may have changed the way it did.

### Delivering Values: Always in All Ways / Robert Waller and Catharine Hawks

Conservation is governed by the Second Law of Thermodynamics, that there is a natural tendency for systems to degenerate into more disordered states. If this was not a law, there would be no need for our field: time's arrow could reverse, and everything return to original states with no effort on our part. We live amid generations that have espoused, per George Harrison's "I me mine" and John Lennon's, "living for today" mantra, that often fail to recognize social diversity and intergenerational equity.

Museums are frequently mired in rectifying wrongs of the past, without proactively addressing diverse social interests and future societies' needs. As aspiration, conservation is geared to protecting the values, inherent or acquired, in cultural heritage, for all humankind, for as long as possible. In operation, conservation needs clear rational frameworks, which inform, without dictating, decisions. In economics, social discount rates are used to assign a present value on costs and benefits that will occur at a later date. Is it possible for the conservation field to formulate rational and optimal social discount rates for future preservation? Can it, at the same time, recognize the importance of multiple, and at times, seemingly irreconcilable differences in perceptions of value (e.g., living objects must change through their life, versus materials and form must not be allowed to change)? Our field has struggled with even considering, let alone agreeing upon acceptable preservation horizons. Can the more nominally proper, yet harder to conceptualize, social discount rate model facilitate a better understanding of our responsibility to future generations? Can we use rational models to overcome biases based on today's perceptions of best practices to ensure the future of pasts and presents? Social discount rates are formulaic. Even when adapted to sustainability of cultural heritage, these provide limited range for understanding the implications of decisions regarding long-term preservation. Still more complicated are rights in the decision-making processes, whether these are related to individual artists, source communities, or special interest groups. Rules and regulations in these arenas may force discussion, but resolution vests in collaboration.

Efforts in grappling with these issues are essential if we claim adherence to professional codes that recognize the importance of preventive conservation. Adapting our mindsets to encompass a pluralistic and distinctly intergenerational view of values should guide our work in everything from treatment to collection environments and storage designs. This presentation explores alternative perspectives that may prove helpful in wrapping our individual and collective minds around the topics that will frame conservation in the decades to come.

## Plastic Challenges in Cultural and Ecological Preservation

### Preserving Plastics in the Collection at the Harvard Art Museums / Susan Costello

**Co-authors: Georgina Rayner, Angela Chang, and Elizabeth LaDuc.**

In 2016, the conservation department at the Harvard Art Museums began the first comprehensive survey of polymeric materials in the collection. This talk will highlight the impact of the survey, and share challenges encountered during this ongoing project. The need for a survey was realized after the severe degradation of Claes Oldenburg's *False Food Selection* (1966, M26457) was discovered only 50 years after its acquisition. Its ready-made plastic food elements discolored, deflated and bloomed. The spoiling of the food is undoubtedly due to its unstable materials; a combination of polyurethane, poly(vinyl chloride) and rubber — three of the most at-risk plastics in museum collections. The survey sought to determine the scope of plastics in the collection, to identify the type of plastic, to update the media information in the museums' collection database (TMS), to upgrade storage and housing and to undertake conservation treatments as necessary. Since mid-2016, 500 objects containing plastic have been examined and 30 different polymer types identified through the tandem use of FTIR and pyrolysis-GCMS. Based on the survey results, a list of action items was compiled divided into preventive and interventive conservation. The preventive conservation measures form the bulk of the work and focus on slowing the deterioration of the most vulnerable plastics. The most labor-intensive portion of this work is rehousing, which includes placing poly(vinyl chloride) objects in non-absorbent boxes to prevent plasticizer loss, cellulose acetate and nitrate in blue board boxes to absorb their acidic vapor and rubber in anoxic storage. Additional preventive measures include moving objects to cool or cold storage and limiting cumulative light exposure. Interventive conservation forms a smaller portion of the work.

Most of the objects surveyed were in stable condition. Only 14% of the objects were deemed unstable, with 13 in need of immediate attention. Two treatments have been completed to date and will be discussed. The first is a poly(vinyl chloride) work by Joseph Beuys exhibiting serious plasticizer migration. The surface was cleaned, the object rehoused and moved to cool storage. The second treatment is a regenerated cellulose book cover by Herbert Bayer in multiple pieces and suffering losses. Mock-ups were used to determine an appropriate adhesive and backing material for regenerated cellulose and the best way to create a colored patina on the surface of a Mylar fill. Various methods were also tested to alter the surface of the Mylar to increase adhesion. Currently we are planning treatment for a Naum Gabo sculpture made of cellulose acetate, which has warped and sagged. We continue to identify plastics in our collection, predominantly objects lacking correct media descriptions in TMS. The current challenges include undertaking conservation treatments that are not exhibition driven, improving housing while maintaining access to objects, improving art storage while taking into account limited space and cost, increasing awareness throughout the museum of the needs and limitations of plastics, digitizing analog audio/visual materials, identifying plastics for potential new acquisitions, and determining the best way to monitor our plastic objects moving forward.

### Plastics You Know: The Plastics Identification Tool and Collection Surveys / Carien van Aubel and Olivia van Rooijen

**Co-author: Suzan de Groot.**

Plastic is a frequently used term in describing materials in artworks. Like describing a painting made of oil or acrylic, it is preferred to describe a plastic by the type of polymer used. Like paints, many of the different plastic polymers react differently to the environment and by knowing them by their name, correct measure in collections can be taken. During the two-and-half year Plastics Project, an identification tool for plastics without the use of analytical techniques for collection staff was developed. This project was initiated by the Foundation of Modern and Contemporary Art (SBMK) and the Cultural Heritage Agency of the Netherlands (RCE), and was a project within the Netherlands Institute for Conservation, Art and Science (NICAS).

During the development ten Dutch contemporary art collections collaborated to create a clear and user-friendly method. The outcome of the project is the Plastic Identification Workshop which facilitates a learning environment for organizations that care for plastics artworks in their collection, using the Plastic Identification Tool. After a two-day workshop, participants identify plastics in the objects of the museum during a collection survey. The workshop was first developed in Dutch and due to international interest was translated in English and presented at Future Talks 019 in Munich. Topics concerning plastic objects in a collection survey such as, what is found on average in a collection, which type of plastic polymer is showing most of the problems and what type of objects show difficulties to identify using this method have been investigated. This paper presents the outcome of these investigations based on results of a workshop given in Ghent (BE) at the Design Museum Gent and S.M.A.K, which was part of the Belgium project "Know, Name, and Assess your Plastics." It is good to know what type of plastic you are dealing with.

**Referenced Links:**

- https://plastic.tool.cultureelerfgoed.nl/
- https://www.sbmk.nl/en/projects/plastics_projects
- https://www.vanaubelvanrooijen.com

### Examining Plastics in a Historic House Museum through the Collections of the Walter and Ise Gropius House of Lincoln, Massachusetts / Megan Mary Creamer

This paper will explore the issues of exhibit and storage of plastic objects in historic house museums, an area of plastics research that is understudied in conservation. The material culture of the twentieth century was in many ways driven and defined by experimentation and industrialized mass manufacture of plastic to create fine art, furniture, household items, and clothing. As such, historic houses are increasingly places of collection and exhibition of plastics, along with their well-known issues of climate control and mixed-material

display in open exhibit environments. Plastics have known sensitivities to UV light, and fluctuations in temperature and humidity that can exacerbate inherent vice, or "infect" nearby objects.

The context of historic houses presents unique research opportunities to understand the aging characteristics and issues of plastics in non-standard museum conditions. The 1938 family home of Bauhaus architect Walter Gropius and its contents were bequeathed to Historic New England by Ise Gropius in 1982. Documentation and conservation then began on the thousands of objects in the bequest - many of them plastic, and the property has been open as a historic house museum ever since. This paper looks at interventive treatment paths of three synthetic twentieth-century objects in the Gropius House. Highlighted are the *CH1 38 Rho Space Modulator* - a cellulose acetate painting by László Moholy-Nagy, a flexible polyvinyl chloride (PVC) curtain manufactured by BF Goodrich used as a kitchen curtain, and a red, customized, synthetic-fiber dress worn by Ise Gropius. The issues of preventive conservation including environmental monitoring, integrated pest management, and storage are included for a broad, holistic look at collections care and maintenance for plastic collections in historic house museums.

**Referenced Links:**

- Historic New England: https://www.historicnewengland.org/visit/homes-farms-landscapes/
- Land acknowledgment: support the Mashpee Wampanoag: https://mashpeewampanoagtribe-nsn.gov/
- Take a virtual tour through Gropius House: http://gropius.house/

## Research and Technical Studies & Collections Care Session 1

### Examining Commercially Available Sorbents to Understand and Maximize the Mitigation of Volatile Organic Compounds / Kelli Stoneburner

**Co-authors: Eric Monroe and Fenella France.**

For decades, sorbents in a variety of forms and compositions, such as silica gel, zeolites, or activated carbon, have been sold and used in the conservation world. These materials are placed in exhibition cases and storage spaces to stabilize environments be it by controlling the humidity or removing compounds that can tarnish or degrade collection objects. Each of the different materials work to mitigate volatile organic compounds (VOCs) through different mechanisms and not much is known about the capacity, selectivity, or potential for off-gassing for these sorbents. As such, it can be challenging to know how much of a sorbent is needed for an exhibit case or how long before the sorbent needs to be replaced. Sometimes the silica gel used for humidity control can absorb volatiles, the challenge with this not being the ab/adsorption, but the potential future re-release of these compounds that could lead to degradation of collection materials.

Through the use of headspace sampling and thermal desorption gas chromatography mass spectrometry thirteen different sorbents and two silica gels were characterized. This work will detail how each sorbent and silica gel was tested to determine their selectivity for adsorbing a series of VOCs commonly found to be off-gassed by paper collections and then tested to determine how readily they off-gas the compounds that were originally collected. These tests were conducted with the goal of being able to assist in determining when sorbents need to be replaced and selecting the best type of sorbent for mitigating degradation products of different types of collection items and the residual VOCs from building, construction, and housing materials. Examples of sorbents used with collections items will be discussed.

### New Guidelines for the Desiccated Storage of Archaeological Metal Artefacts / Nicola Emmerson

Corrosion of archaeological metals, particularly iron and copper alloy artefacts, is an ongoing problem for conservation and collections care. If not managed, corrosion can lead to reduction in value or complete loss of artefacts and collections. This paper presents the results of a long-term research programme at Cardiff University which investigated corrosion rates linked to humidity levels and best practice in creation of desiccated microclimates for corrosion prevention. Surveying sector practices in the post-excavation storage of archaeological metals has revealed the complexity of the decision-making process and a distinct lack of evidence-based guidance to direct protocols. Immediately post-excavation, free water in corrosion product layers can create high humidities and drive destructive electrochemical corrosion.

Advice on drying techniques is limited and conflicting, leading to ad hoc practices and consequent danger to objects. Once dry, chloride-bearing compounds mean archaeological and marine iron artefacts can remain unstable down to 15% relative humidity (RH). Therefore, for most museums and archaeological units, long-term corrosion control is by desiccated storage reliant on creating and maintaining low RH microclimates in plastic boxes. Success of these microclimates is driven by air exchange rates of boxes which are in turn dictated by box design and size. Along with the mass of silica gel included, these variables determine the lowest RH achievable and its longevity. Without evidence of the influence of these variables, effective management of storage procedures is impossible.

This paper delivers new data on the influence of post-excavation drying, storage box variables, mass of silica gel and gel regeneration cycles in successful creation of desiccated microclimates for medium and high RH external store environments. Combining this with corrosion rate data for iron and copper alloy objects between 20-80% RH allows predictions to be made about the risk to artefacts of following a range of common protocols. Guidance on best-practice drying and storage procedures to minimize corrosion and enhance object longevity are now offered to the heritage sector. The research updates previous, generic guidance on storage box selection and silica gel use. Results of surveying practice indicate that the go-to guidance remains First Aid for Finds, the most recent edition of which was published in 1998. Advice on silica gel per volume of box in that publication was based on contemporary practice rather than evidence-based data and no guidance on box selection was offered beyond the ubiquitous Stewart Sealfresh.

The synergy of conservation science and practice reported here combines laboratory experimentation using climatic chambers, oxygen consumption corrosion rate testing and air exchange measurements with an extensive survey of sector practice and close liaison with end users to produce pragmatic guidelines for practitioners and managers. Supporting cost benefit decision-making in storage box selection and silica gel regeneration cycles, these guidelines will allow managers of archaeological metalwork collections to design bespoke storage protocols which have the potential to extend lifetimes of collections. Assessment of risk to objects can be weighed against hardware and human resource costs and variables manipulated to design workable, case-specific solutions to a widespread problem.

### A Case Study in Establishing and Maintaining Elevated RH Levels in Microclimate Casework / Laura Resch

**Co-authors: Beth Edelstein and Justin Baker.**

Loan negotiations for The Cleveland Museum of Art's 2019 exhibition "Shinto: Discovery of the Divine in Japanese Art" required the museum to maintain an elevated level of humidity for a large number of objects from Japan. In response, CMA conservation and production staff decided to view this as an opportunity to improve preventive conservation standards in display case design, and to test and utilize active humidification units.

This presentation will detail the research and preparation that went into establishing and maintaining a higher-RH environment for the exhibition, and the integrated efforts among museum staff that led to a successful solution. The lending requirements stipulated that the objects borrowed from Japanese institutions must be displayed at 60% RH, and in one instance at 62%, a significantly higher level than most U.S. standards of 50%. Elevating the CMA gallery spaces in their entirety to the required RH was not an option as it would cause undue stress to the machinery, and would raise the humidity in galleries and storerooms adjacent to our special exhibitions hall, risking damage to our own collection.

We required a solution that would allow us to present the entire exhibition using microclimate casework for each and every object on display. Carbon dioxide leakage tests and silica gel performance tests were performed using several different case types at the museum. The majority of CMA casework is constructed in-house, and leakage tests showed us which case styles were the most airtight, and which required improvements to decrease airflow. The silica gel tests used a 60% RH gel to test how well each case type would acclimate to and hold a 60% RH environment. Two important findings came from this testing: several cases failed to reach 60% RH despite having the required amount of gel and favorable air exchange rates, and all cases were observed to have discrepancies between the RH levels of the environmental chamber and the RH levels of the deck.

These findings led to useful practical changes in the design of cases produced in-house at the CMA. The new cases efficiently held a 60% environment for the exhibition. Active humidification units produced by Glasbau Hahn GmbH were also tested. These humidification units were found to be

very efficient, particularly for use in oversize casework or casework that had higher air exchange rates as a result of its design and construction. Members of the CMA conservation, production, and design departments worked in conjunction with staff from Glasbau Hahn GmbH to plan the installation and maintenance of several humidification units to provide the required climate to more than half of the casework in the exhibition. This project was an opportunity to work within the guidelines of Japanese preventive conservation standards in presenting an extraordinary loan exhibition in the U.S. The seemingly straightforward requirement of a higher RH for loaned objects led the CMA to an increased understanding of available resources for preparing and maintaining microclimates, and will hopefully provide useful data for other institutions facing similar challenges.

## Photographic Materials Session 1

### Technical Analysis of William Henry Fox Talbot's *The Pencil of Nature* / Colette Hardman-Peavy

**Co-Authors: Aniko Bezur, Rui Chen, Richard Hark, Paul Messier, Katherine Schilling, Marcie Wiggins, and Paul Whitmore.**

Published between 1844-1846 in a series of six fascicles, William Henry Fox Talbot's *The Pencil of Nature* was the first commercially produced photographically illustrated book. The book presented Talbot's proposed uses for photography on paper, accompanied by photographs printed by his assistant, Nicolaas Henneman. Unfortunately, the production of the photographs was fraught with challenges such as an intermittent supply of clean water, the questionable purity and unreliable supply of chemicals, changing paper quality, and a lack of sunny days for printing. These factors combined with low sales led to the halt of production, and *The Pencil of Nature* was never completed. The photographs within the fascicles faded shortly after publication, and the project was ultimately considered a failure. The Yale Center for British Art owns copies of the first four fascicles of *The Pencil of Nature*.

In 2018, an in-depth, collaborative, technical analysis of the fascicles began at Yale's Institute for the Preservation of Cultural Heritage. The project aims to better understand the current physical and chemical state the prints are in, the mechanisms behind the fading of the photographs, and whether change is ongoing. Analysis of the image materials, paper, inks and adhesives found in *The Pencil of Nature* was undertaken using principally non-invasive techniques such as X-ray fluorescence spectroscopy, Raman spectroscopy, microfade testing (with both visible and ultraviolet light), and Fourier-transform infrared spectroscopy.

Additional characterization of the paper was done using gloss measurements, micrometry, colorimetry, and texture photography. Short-term monitoring of reactive species, such as hydrogen sulfide and peroxides, using silver nanoparticle sensors indicated that chemical change within the fascicles may still be taking place. Further monitoring using silver nanoparticle sensors may reveal more information related to the preservation of this work. This presentation will address some of the initial findings of this study, and implications for the display and storage of these objects. Results related to the quality of the papers, the retouching media used, and the chemical composition of the photographs will be presented. The multi-technique analysis has found that stability assessment of early salted paper prints through visual examination alone is insufficient. It is hoped that the methodology developed and results obtained in the current project will serve as a baseline for the study of other copies of *The Pencil of Nature*.

### The Conservation of the Ernest J. Bellocq Glass Plate Negative Collection at The Metropolitan Museum of Art / Elsa Thyss

Discovered by Lee Friedlander in a New Orleans antique store in 1958, Ernest J. Bellocq's Storyville photographs have an unusual history. The negatives were made in New Orleans' Red Light District, also called "Storyville", which gave its name to the series. They depict individual portraits of women, brothel interiors, and landscapes in the area. Although the negatives were made in the early nineteenth century, the images were only revealed to the public in a major exhibition at MoMA in 1970 entitled "Storyville portraits : photographs from the New Orleans red-light district, circa 1912", using prints made by Lee Friedlander from the original Bellocq glass plates. In 2013, The Metropolitan Museum of Art acquired 89 original Storyville negatives from Lee Friedlander, and for the first time, the collection of negatives – for which, to date, no original prints from Bellocq's days have been found – became available for investigation and exhibition.

This presentation describes the condition of the collection and the research and decisions made to address these condition issues. The negatives most significant damage, the delamination of the gelatin binder from the glass support, was very challenging in part because of the different chemical nature of gelatin and glass and the difficulty to find an efficient adhesive for the long-term that also meets conservation ethics. A literature review on the topic made clear the need to customize the treatment for each typology of binder lifting, since each one of them present specific challenges. After conducting test treatments on experimentally-altered glass plate negative samples from The Met's study collection, we adapted existing solutions to stabilize the physical damage on the Bellocq negatives. These included an innovative approach developed in 2001 which has proven to be suitable for large areas of binder lifting.

In addition to these treatments on a selection of plates, individual enclosures were designed and created, conceived to accommodate the specific fragilities of each object. Made with non-interactive materials, these provide ultimate protection, while allowing access for further study. We used digital technologies to create custom sink mats for the plates broken in several pieces. Transparent acrylic sheets are embedded in the housing on front and back allowing for transmitted light viewing as well as viewing in both recto and verso orientations. Thus, we aim to foster safe access for scholars to view these outstanding photographic objects, which still have much to reveal.

### What Do Cigarette Filters and Photographic Films Have in Common? Cellulose Acetate: Durable in the Streets, Volatile in the Sheets / Ida Rebecca Ahmad

**Co-authors: Deborah Cane, Joyce Townsend, Cristian Triana, Luca Mazzei, and Katherine Curran.**

Cellulose acetate (CA) has found myriad uses since it was first synthesized in 1865, illustrating not only the versatility of the particular molecule, but that plastic as a material class offers infinite possibilities. Two of these possibilities, in the case of CA, are photographic (including cinematographic) films and cigarette filters. These two objects were designed to have very different functions. In the short-term, CA photographic films and cigarette filters serve their intended purposes reasonably well. In the long-term, the degradation behavior of the CA polymer reveals the plastic paradox: it is unstable in film archives, but ecologically persistent as litter.

The risks of CA films are familiar to both archivist and conservator. Over time, moisture reacts with CA and produces acetic acid, causing the film to emit a recognizable odor which has lent this phenomenon the name "vinegar syndrome." Once the vinegar syndrome has started, the film is very likely to degrade at an accelerating rate. This is because the reaction is autocatalytic—the acetic acid being produced will in turn catalyse the reaction (speed it up), which produces more acetic acid, and so on. The CA in cigarette filters is susceptible to the same chemical reactions as that in films, with designs for biodegradable filters using controlled-release acid catalysis to promote deacetylation.

However, in contrast to CA films, the degradation (or lack thereof) of cigarette filters is not characterized by autocatalysis – that is, acetic acid generated by deacetylation alone is not sufficient to increase the degradation rate. Setting aside the question of what constitutes the (subjective) acceptable/unacceptable degree of change for the two objects, we argue in this paper that the role of autocatalysis in the degradation of CA has been historically underestimated. We propose a mathematical model wherein the autocatalytic degradation of CA is controlled by (1) the rate of the deacetylation reaction and (2) mass transport processes such as diffusion and evaporation. Based on this abstraction, cigarette filters and CA films can be represented by the same model, simply differing in the relative contribution of mass transport processes to the degradation dynamics.

Highlighting some of the key differences in the conditions that characterize the degradation of films and filters, we will demonstrate how mass transport processes critically influence the degradation of CA when autocatalysis is taken into account. Autocatalytic degradation in cigarette filters may be virtually non-existent due to relatively high rates of mass transport of acetic acid to the surrounding environment. To contrast, our mathematical model shows that poorly-ventilated storage environments enhance the rate of degradation in CA films to a greater extent than was previously believed, even before the signs of vinegar syndrome may be present. Our model suggests that CA film permanence may be significantly overestimated by conservation guidelines (which do not account for autocatalysis) with urgent consequences for film preservation.

# ABSTRACTS

## Electronic Media Session 1 – Digital Preservation

### The First Stewards: Digital Preservation in Artist-run Platforms and Galleries / Colin Post

Artists have long used digital and networked technologies to both experiment with new methods of artistic production and new means to disseminate artworks. Digital artworks often circulate outside of traditional gallery and museum spaces: on artists' websites, online platforms, and other experimental networks. Whether by the conscious choice of the artist to skirt these typical exhibition contexts or due to myriad other factors, many of these artworks will never enter institutional collections.

Artworks that do eventually make their way into arts institutions will have likely faced preservation issues shortly after the point of creation. Long before these artworks receive professional conservation attention—if ever—artists and the curators of alternative exhibition spaces serve as the first stewards. Preserving a robust cultural heritage representative of the full breadth of artistic practices requires research that advances digital preservation tools and methods across institutional and artist-run exhibition and collection contexts. This paper presents a case study of Paper-Thin, an artist-run platform that has included online virtual reality exhibitions as well as a site-specific installation.

In this research, I conducted semi-structured interviews (n = 27) with the Paper-Thin curators, artists who contributed work to the platform, and additional individuals identified by the artists who have played some part in the ongoing care of their artworks. These individuals included artistic collaborators, collectors, and curators of other alternative platforms and galleries, all contributing to a rich and dynamic depiction of the shifting nature of the art world for digital and networked artworks. The aims of the research were twofold: 1) to characterize the preservation practices, challenges, and approaches of artists and curators of alternative platforms and galleries; 2) to understand the information practices of these individuals as they gained skills and learned techniques necessary to care for their artworks and related archival materials. Among the key findings, this paper discusses the cooperative activities of artists and curators in the care of artworks disseminated through these platforms and galleries.

While both collaborate to address technical difficulties encountered in the initial staging of works, there is a more marked division of labor in the ongoing care, with curators of these networked alternative spaces taking on primary responsibility for storing artworks and preserving these works against technological change and obsolescence. In these activities, curators and artists draw on a wide range of information sources and participate in communities both in and outside the art world. Importantly, artists and curators supplement their arts educations with tutorials, forums, and documentation for both open-source and commercial technologies. This research has several implications for professional conservation practice. Conservators can study the novel repertoires developed by these first stewards, as these practices stand to guide the ongoing care of artworks in institutional contexts. Additionally, arts institutions can find ways to support the preservation work of these alternative platforms, which is dependent on the volunteer labor of artists and curators with limited resources. The research demonstrates the potential for post-custodial and community-driven efforts, such as providing shared storage infrastructure or developing open-source digital preservation tools and resources.

### New Objects of Conservation: Web-Based Art and Web-Based Records / Christopher King and Sarah Haylett

As part of The Andrew W. Mellon Foundation funded project "Reshaping the Collectible: When Artworks Live in the Museum," a team of researchers are looking at a series of 15 internet artworks commissioned by Tate between 2000-2011. These were brought together under their own microsite http://www2.tate.org.uk/intermediaart/, which also includes contextualizing texts, discussion boards and a series of podcasts. Current developments mean that some relevant web-technologies, such as flash, will soon no longer be supported by our everyday browsers, while parallel developments in web-archiving tools allow for the capture and documentation of websites with a much higher level of completeness, so now was a timely moment to act.

The Reshaping the Collectible project calls on the expertise of Time Based Media Conservation, the Tate Archive, Tate Media and Tate Technology to understand the intricacies of how to document, conserve and maintain the integrity of web-based art in the contemporary art museum. This research is supporting the different contributors in understanding the context and developing the skills, infrastructure and knowledge required to undertake future Net Art acquisitions and preserve them for the long-term. In this paper we will share the perspectives of conservation and the archive on how we are changing practices to allow the collection, archiving and display of web-based objects, both as artworks and records of Tate's activity on the web.

### Conservation in the Contemporary Art Market / Ben Fino-Radin

When contending with replicable, variable, and iterative forms of contemporary art outside the walls of institutions, the role of conservation extends beyond an act to prolong and protect the life of a work. In considering how the work of a time-based media conservator may interface with and support the ecosystem of artist's studios, galleries, and private collections, conservation becomes a critical component of operational viability, and market acceptance, especially when considering small artist studios tasked with supporting sometimes hundreds of time-based media artworks in collections all over the world. At last year's annual meeting, Small Data's post-graduate fellow presented research and findings as to how private practice time-based media conservators can expand their remit to better support this sometimes fragile ecosystem.

This year, we will present three case studies offering a practical perspective on how TBM conservation can directly support the activities of contemporary artist studios. Our case study on collaborations with Cory Arcangel will offer a view into fabrication, preventive conservation, documentation, and supporting collectors; with Sondra Perry we will explore how documentation and remote support tools are aiding both private collectors and institutions; and finally, our case study on collaborations with John Gerrard's studio will share an exploration into the use of cloud-based virtualization platforms for the secure and reliable loan and display of complex and demanding software-based works of art. Ultimately, these case studies will be shared in the hope of providing colleagues with reproducible methods and tools for commonly encountered challenges in supporting time-based media art.

## Paintings Session 1

### Honoring a Legacy: The Technical Study, Digital Reconstruction, and Conservation Treatment of Margareta Haverman's *A Vase of Flowers* / Gerrit Albertson

The 2018 treatment and technical study of *A Vase of Flowers*, a painting from The Metropolitan Museum of Art signed and dated by Margareta Haverman (Dutch, 1693–?) in 1716, provided new insights into the artistic motivations and singularity of the artist, as well as material alterations that have occurred in the painting since its creation. Despite the skill evident in Haverman's painting, relatively little is known about the artist's life and work. Much of the art historical record repeats a likely erroneous rumor that Haverman was expelled from the Academie Royale in Paris, and writers have dismissed the artist due to her gender, claiming that her success relied on that of her teacher, Jan van Huysum (Dutch, 1682–1749). Additionally, Haverman's known oeuvre is small: her only other traced work is a flower piece on deposit at Fredensborg Castle from the Statens Museum for Kunst in Copenhagen.

Thus, this study represents a rare opportunity to more closely investigate an overlooked artist. Visual examination of the painting and technical imaging and analysis, including non-invasive infrared reflectography and X-ray fluorescence mapping (MA-XRF), and micro-sampling techniques such as light microscopy, scanning electron microscopy, and Raman spectroscopy, suggest that Haverman largely used materials and techniques common among flower painters of her era but that she altered aspects of this practice in unexpected ways in order to bring about results that aligned with her own artistic vision. This can be seen in multiple of the study's results: her choice of a walnut panel support differs from Van Huysum's clear preference for oak and mahogany, and her six overall priming layers far exceed the common one or two layers typically found in this period. *A Vase of Flowers* contains many compositional changes, indicating the artist was hard at work in crafting an independent composition that suited her own artistic vision. Her use of two newly available pigments, Prussian blue and Naples yellow, indicate that the artist was an early adopter of new materials, and it suggests a possible link with artists from the Holy Roman Empire's court in Düsseldorf, such as fellow flower painter Rachel Ruysch (Dutch, 1664–1750).

Cleaning of the painting was a subtle, but important step in recapturing some of the painting's vibrancy and tonal range, and it became clear afterwards that each of the artist's colors was chosen with extreme care and an eye for

accuracy. Some pigments, however, including yellow and red lakes and a copper-containing glaze, altered in the centuries since the painting was made. A digital reconstruction of the painting was made with the aim of visualizing the painting's original appearance. The process of creating this digital reconstruction, which involved data from MA-XRF elemental distribution maps, two paint samples containing unaltered pigment, and spectrophotometry to ensure color accuracy, was a collaboration across conservation, scientific, imaging, and curatorial departments at The Museum. The result was instructive, not only in what it taught us about how the painting originally functioned visually, but also because it raised questions regarding the limitations of digital reconstructions.

### Alfredo Volpi and Hélio Oiticica: Anachronistic Materials That Made the Modern / Corina Rogge

The Concrete Art movement of the twentieth century advocated the creation of non-representational, non-sentimental art. Theo van Doesburg, a Dutch painter and author of the Manifesto for Concrete Art, wrote that "the painting technique must be mechanic" and that before "physically made material, the work of art is fully conceived by the spirit. Thus its production must reveal a technical perfection equal to that of the concept. It should not reveal any trace of human weakness such as trembling, imprecision, hesitation, nor any unfinished parts."

As this movement spread worldwide, it was adapted with different regions developing their own unique "vernacular" styles that went beyond van Doesburg's rather dogmatic strictures. For instance, many works by Brazilian Concrete and Neo-concrete artists seem to possess the desired impersonal "industrial" finish van Doesburg recommended; but close inspection reveals that these works were not the result of a single gestalt moment of sublime creation. Scored lines created by ruling pens, ridges of paint left by removal of pressure sensitive tape, and pinholes left by compasses all betray bear witness to the human endeavor behind their creation. In addition to this rather subtle "betrayal" of the manifesto, many Brazilian artists also began to create objects with expressive lines and textured surfaces; works that are in no way purely ''mechanic."

Although many artists chose to use modern materials to pursue the Concrete movement, others eschewed novel materials and methods in their pursuit of modern abstraction. Analysis of the works of Alfredo Volpi and Hélio Oiticica reveals choices of materials and modes of paint application that were innovatively anachronistic. Four paintings in the Adolpho Leirner Collection of Brazilian Constructive Art at the Museum of Fine Arts, Houston, yield evidence that Volpi chose egg tempera as a binder, a medium most often associated with medieval panel painting, rather than new paint media such as the nitrocellulose paints favored by Lygia Clark or the alkyds used by Geraldo de Barros. Analysis of Oiticica's studio paints relating to the *Invenções* (1959-1962), *Penetráveis* (1961), and *Núcleos* (1960-63) series shows that he utilized a traditional medium, oil paint, as the base material for many of his works, but he manipulated his oils through the addition of other materials to create not only a precise color vocabulary but also to modulate their gloss, drying time, and flow. Oiticica also utilized traditional layering techniques in *Relevo Especial* (c. 1960) to create a luminous surface, one that has the "body of color" he so desired. These findings illuminate the complex and often unorthodox paints and painting methods used by these artists and help create a richer story of the material nature of Brazilian Concrete and Neo-concrete art.

### If the Curves Match the Color Will - Color Match Magic / Ulysses Jackson

With the aid of technology one can both improve the quality of a pigmented repair as well as save a significant amount of time by removing much of the trial and error guesswork associated with color matching. This is increasingly important as the colorant options available to contemporary artists continue to expand, and conservators are being faced with complex color mixtures that are challenging to match. Additionally, private residences, galleries, and museums are commonly being lit by a variety of light sources requiring a significant consideration of how the environment can affect the viewer's perception of a matched color.

This presentation will describe the cause, and show examples, of perceived color shifts due to different light sources, a phenomenon known as Metamerism. To do so we will demonstrate this effect in the form of a worst case scenario for a conservator, then demonstrate how using a spectrophotometer and gloss meter can give one a better understanding how color will look in different light sources. Finally we will share how one can create a database for a spectrophotometer with mixes to quickly match complex colors, and also a few case studies of successful color matches.

## Architecture & Objects Historic House Session - Part 1

### Preservation in Paradise: Working with the Collection at Shangri La / Kent Severson

Shangri La, a museum for Islamic art, culture and design, was built between 1936 and 1939 as the Honolulu home of American heiress and philanthropist Doris Duke (1912-1993). Inspired by her honeymoon trip to the Middle East and South Asia, Shangri La came to house her collection of Islamic Art. The Doris Duke Foundation for Islamic Art, supports Shangri La's mission today, including conservation and preservation of the collection of Islamic art and the ongoing presentation of Shangri La to the public.

Designed to resemble homes found in many parts of the Islamic world, the house and grounds bring courtyards, gardens and lofty living spaces together through the use of large scale windows and doors that blur the difference between interior and exterior spaces. Although Honolulu enjoys one of the most consistently pleasant climates anywhere on the planet, it is unmistakably tropical, with warm temperatures, elevated dewpoints and relentless sunshine. Located on a terrace above a rocky shore facing the Pacific Ocean, breaking surf generates seawater aerosols that drift across the campus twenty four hours a day.

Shangri La was first opened to public tours in 2002 with an exhibition intended to evoke the atmosphere that might have existed while Doris Duke was alive. The display includes furniture, textiles (including historic carpets), ceramic, glass and metal objects, as well as wood, ceramic and stone decorative elements permanently installed in the architecture. Although the interior spaces include a few built-in vitrines, much of this material is on open display in conditions rarely found in a museum. Presentation of the collection in this difficult environment consists of a wide-ranging mix of mitigation strategies that includes a rigorous program of intensive regular cleaning, light control measures, and protective coatings. While this has slowed the deterioration of many classes of materials, the work load of maintenance is strenuous and light exposure remains high. Shangri La is currently undergoing a curatorial transformation that will reduce the number of objects displayed in open air. Components of the collection that are permanently installed in the architecture of Shangri La, and the decorative elements of the architecture itself, likewise suffer in Honolulu's harsh marine environment. In some cases, exposure to the elements has resulted in degradation that is sufficiently severe to require partial replacement as opposed to conservation treatment.

Questions of sustainability and long term preservation in such an environment loom large at Shangri La. Overall climate control in exhibition spaces has been proposed but will require thoughtful resolution of many logistical challenges in order to preserve Shangri La's unique visitor experience.

### Tenements, Tourists, and Treatments: Managing Visitor Impact at the Lower East Side Tenement Museum / Stephanie Hoagland

When a building housed some 7,000 immigrants over the course of 72 years, how do you deal with the impacts of 200,000 visitors every year? New York's Lower East Side Tenement Museum is one of the most popular house museums in America which essentially translates to 400,000 feet tracking in dirt and climbing the stairs, 400,000 hands touching the walls, 2-million fingers aching to pick at loose paint and wallpaper, 200,000 mouths breathing hot air, and 50,000 students wanting to get "just a little bit closer" annually.

The Tenement Museum is a five-story brick building located in a neighborhood densely packed with tenements and factories which has historically served as a starting point for those new to the United States. Between its construction in 1863 and the 1930s immigrants from over 20 countries lived in the tiny apartments that made up 97 Orchard Street. Instead of making additional alterations to meet changing housing codes, the landlord evicted the tenants in 1935 and sealed off the upper floors, which remained uninhabited until 1988 when the museum took over the building. As a result, these apartments became time capsules of immigrant life in America.

The museum is unique in both its interpretation of the building and its occupants over time and its treatment of the ruin apartments in a state of "arrested decay" with their peeling wallpaper, curled plaster, bare wood, and faded linoleum. In addition to retaining the authenticity of the apartments, retention of these finishes assists in telling the story of the building's occupants including changes in aesthetic tastes over time. The use of these "stabilized ruin" apartments on the tours presents a special challenge, not only for interpretation, but also visitor comfort and safety, the development of conservation

treatments, and general maintenance of the finishes. The building has no air conditioning and the small cramped apartments get excruciatingly hot in the summer. When the threat of a visitor passing out after climbing five flights of stairs is not an uncommon occurrence in the summer, is the free cardboard fan handed out at the beginning of the tour enough? The building was never designed to handle the vibrations of hundreds of thousands of people climbing the stairs and walking the halls. When sections of the ceiling have started to fall, is consolidating a room or two per year sufficient to preserve the historic fabric? What is the best way to keep people from picking at the peeling paint and paper on the walls? Should it be an elaborate barricade, or can something simple be just as effective? How important is training the janitorial staff? Is it just about sweeping the floors, or should they be trained to be on the lookout for pests or areas of concern such as paint chips or plaster dust on the floor. This paper will explore how the museum overcame many of the technical and practical challenges of conserving and maintaining this one of a kind house museum.

### Preventive and Proactive Conservation at the Gilded Age Mansions of Newport, Rhode Island / Patricia Miller

The Preservation Society of Newport County is the steward of 11 historic house museums, the majority of which date from the late nineteenth to early twentieth century. In 2016, the conservation department began a series of comprehensive condition surveys, or health checks, of the structures and more than 60,000 collection objects to determine strategic conservation priorities. Our outward goal was to improve the quality of preventive care through collaborative winter cleaning projects with staff carpenters, painters, masons and caretakers. Our department goal was to evolve from a reactive to proactive workflow. The presentation will discuss survey methods including the use of apps to increase productivity and improve documentation, staff training and coordination, management of stakeholder expectations, and a series of unfortunate events.

## Preventive Care: Collection Storage

### Preventive Conservation: Collection Storage / Rachael Perkins Arenstein

How do we convey that we aren't just storing our stuff? How do we promote respectful and careful access to our collections while ensuring long-term preservation? Good storage is the foundation of effective collection care and plays a key role in advancing conservation while promoting accessibility and use of collections among all stakeholders.

Lunch and learn with colleagues while listening to subject experts presenting key insights centered around the main sections of the newly published *Preventive Conservation: Collection Storage*. Topics will include: Fundamentals of Collection Storage, Assessment and Planning, Creating and Renovating Storage Facilities, Facility Management, Specialized Collection Environments and Care, Storage Equipment and Materials and Storage at a Glance. As in the book, talks will focus on a range of collections including science, fine and decorative art, history, library, and archives from a risk-management perspective. Be ready! The session will include an interactive quiz based on one or more of the book sections that could win you a free copy of the book!

## Objects Session 1

### Conservation in Action: Japanese Buddhist Sculpture in a New Light / Linsly Boyer and Evelyn Mayberger

Visible conservation labs have become increasingly popular in American museums, as institutions feature behind-the-scenes opportunities and access in order to increase public engagement. For over fifteen years, the Museum of Fine Arts, Boston (MFA) has carried out work in galleries in the form of "Conservation in Action" projects. The MFA is currently in the middle of its largest endeavor, the two-year exhibition "Conservation in Action: Japanese Buddhist Sculpture in a New Light." While the treatment space in a public gallery was necessitated by logistical realities, conservators have proactively used this visibility to connect with visitors, collaborate with colleagues, and undertake new research.

The MFA has one of the largest and most important collections of Japanese Buddhist sculpture outside of Japan. This project focuses on the conservation of seven large-scale wooden sculptures from the Heian period (9th-12th centuries) depicting Buddhist deities. Since 1909, a selection of Buddhist sculptures have been displayed in the Japanese Temple Room, a space designed to evoke the contemplative atmosphere of a Buddhist temple and inspired by the architecture of Hōryū-ji near Nara. The Temple Room has long been one of the most beloved spaces at the MFA; however, the gallery will be temporarily closed to make improvements to the Museum's Asian Wing. This allows the rare opportunity for conservators to access these elaborately polychromed and gilded sculptures, many of which need urgent conservation. Conservators and conservation scientists are studying and treating the sculptures in an adjacent gallery in full view of the public. This "Conservation in Action" exhibition is a pilot project for interpretation that will inform the future reinstallation of the Japanese galleries. Museum guides are stationed at the exhibition daily to engage with the public about the project and determine what interpretive tools might be most effective. Although the Temple Room aspires to place the sculptures in an appropriate context for viewers, it does not accurately portray a complete temple environment. The conservators are working with the Interpretation and Design departments to envision what new technologies might be employed to better depict an authentic historical context for the objects (e.g. Augmented and Mixed Reality). The conservators will also seek to make documentation tools often utilized during the conservation process accessible to the public in unique ways, such as gallery didactics and social media.

External collaborations, both local and international, have proved essential for this project. The "Conservation in Action: Japanese Buddhist Sculpture in a New Light" project is a unique opportunity for conservation to be highlighted in a public space. Conservators are able to interact directly with the public to express the importance of conservation and share new discoveries while much-needed treatment is taking place. New research stemming from the project strives to contextualize historic treatment methods and inform decision making, as the MFA looks to the future reinstallation of the Japanese galleries. The Temple Room sculptures have epitomized the reverence of Buddhist devotional figures for generations of museum guests and now, through this project, the newly-conserved sculptures will continue to inspire future visitors.

### At the Core of the Problem: A New Method Used to Clean the Bores of *USS Monitor's* XI-Inch Dahlgren Shell Guns / Erik Farrell

When the turret from *USS Monitor* (1862) was archaeologically recovered in 2002, it contained the ship's primary armament: two XI-Inch Dahlgren Shell Guns. These guns are the largest caliber smoothbore, cast iron artillery ever recovered from a marine archaeological site, and as a result they represented a particular engineering challenge to clean. After comparing apparatuses used by other conservation laboratories to clean artillery bores, it was found that no extant boring method ideally fitted the requirements for the guns from *USS Monitor*. As such it was necessary to create a new method, incorporating some features of other designs into a largely unique system, tailored to the specific goals of the *Monitor* project. This involved the modification of a prior gun mount design, creation of a new drill mount design, and refinement of the methods used to establish alignment of the cleaning tool and gun bore. Additionally, a new set of tools and methods was created to remove concretion from the hemispheroidal, Gomer-type powder chamber. This paper describes the reasoning behind the decision to create a new methodology, details the equipment designs and construction, and provides a case study for its operation.

### It Gets Complicated: The Treatment of Zayamaca #4 by Alvin Loving / LaStarsha McGarity

**Co-author: Raina Chao**

Artists incorporate modern materials into their works in dynamic and innovative ways, creating fantastical forms and unique challenges for those charged with their long-term care and preservation. *Zayamaca #4* by Alvin Loving, made in 1993, is no exception. The piece – which came to the Saint Louis Art Museum as part of the Thelma and Bert Ollie Memorial Collection, a gift of 81 works by contemporary African American artists – can be described as a painting on paper, as a wall-mounted flat sculpture, or most accurately as a sculptural painting. The spiraling, boldly multihued tendrils of *Zayamaca #4* are comprised of acrylic paint and medium on collaged paper adhered unevenly with acrylic medium to an artist constructed, multi-part, red poly(methyl methacrylate) or plexiglass sheet backing. Loving also signed, dated, and titled the piece on the PMMA backing in black permanent marker. Due to a combination of inherent vice, manufacturing method, and the difficulties of handling the work, cracks and failed joins propagated throughout the sections of the PMMA backing. The failed joins particularly compromised the overall structural stability, prompting invasive conservation efforts to prepare the piece for exhibition.

While a mounting system to enable display could be constructed as a short-term solution for exhibition, it would not address the piece's inherent instability, postponing treatment until circumstances like a total failure of the PMMA backing, forced a reaction in the future. Instead, the decision was made to proactively address the weaknesses before further damage occurred throughout the plexiglass sheet and propagated into the paper and paint layers. Following conversations with the collector, the artist's gallery and the artist's estate about Loving's artistic intent and thoughts on his work's continuing longevity and care, the plan to carefully delaminate the paper layers from the backing so that a professionally cut support material could be inserted to provide a stiff, planar layer was implemented. The interdepartmental effort drew expertise from the Saint Louis Art Museum curatorial, installation, design, and conservation departments. Given the complex nature of the artwork, techniques typical of paper, painting, and objects conservation were employed in tandem to improve the reversibility and long-term stability of each component while respecting and honoring Loving's artistic aesthetic and intent.

## Wooden Artifacts Session 1

### A New Furniture and Frame Conservation Lab at the MFA, Boston / Gordon Hanlon

This talk will give an overview of the overall design, detailed planning and construction of the new Furniture and Frame Conservation lab as part of the new Conservation center at the Museum of Fine Arts, Boston designed by Samuel Anderson and Associates. The new conservation center will bring together the Furniture and Frame, Scientific Research lab and the Mountmaking studio on one level and the Objects and Paintings conservation studios on the floor above. The final design of the lab evolved over 2 years with periodic meetings with the architects at the MFA followed by numerous e-mail communications to refine the specific requirements of the lab and the many details that needed to be worked out with the architects.

To help us get an idea of what ideas and details might be useful to incorporate into our new lab the members of the Furniture and Frame conservation lab toured two local conservation labs that had been completed within the last few years. This proved to be extremely helpful as we worked out the details for our new space and we came away with many new ideas that we incorporated into our lab space. There were significant access problems with the old Furniture and Frame Conservation lab due to a small elevator and a series of steep steps that prevented us from bringing many large pieces of furniture or architectural woodwork to the lab. It was therefore necessary to work on larger objects in storage areas that was often problematic. The new labs have access to a large freight elevator that solves the access problem and will allow us to work on all of our objects in our new lab. The new lab was designed with a large open plan area that will accommodate the conservation work that we undertake on Furniture, frames, musical instruments and architectural woodwork. Tables are on wheels and the entire lab can be rearranged depending on the type and size of objects being worked on. Within our main lab we have an area for microscopy, cabinetry for the storage of smaller objects and tools and supplies. In addition to the main conservation space there are separate rooms for photography/examination, storage and office areas. A new feature of the lab is that there will be one long glass window that will allow visitors to come and see the conservation activities being undertaken within the lab space. Since 2005 the museum has had several different spaces with the museum for "Conservation in Action." These "Conservation in Action" spaces have proved to be very popular with visitors and conservators alike as it has allowed us to convey the many different aspects of our conservation work to visitors.

### Menthol and Detachable Paper Fills: A New Approach for Loss Compensation in Gilding Conservation / Yuqi Chock

An early 20th century carved and gilded rampant lion presented issues of flaking gold leaf and bole, areas of white bloom on a dirty surface, as well as patches of lost gilding. The lion used to be one of a pair decorating the top of a synagogue's Torah Ark, alongside other carved animals. The ark had been made by the prolific cabinetmaker Simon Katz, who furnished many synagogues in upstate New York and Boston. X-ray radiography was conducted to reveal the construction method of the lion. Cross-section microscopy and FTIR analysis were performed to better understand the unusual gilding layers, which were found to be extremely water-sensitive. Consolidation of the flaking gilding was carried out, as well as surface cleaning with a non-polar gel, which successfully removed the white bloom while preserving the original toning material. A paper-based detachable fill was considered as an option for masking the largest patch of lost gilding, as the sensitivity of the bole and gilded surface prevented the use of the usual materials for traditional gilding and conservation infills.

Two types of volatile binding media, cyclododecane and menthol, were considered to have potential as a temporary layer to protect the original surface while a mold was taken of the area marked for loss compensation. Cyclododecane was later excluded from testing after consulting recent literature that cited uncertainty over its potential health risks. Menthol, a derivative of peppermint oil that sublimes at room temperature, was tested for its suitability to be applied directly onto the original bole, while Japanese paper was laid on top of the layer of menthol using wheat starch paste in order to obtain a mold of the object's surface. The Japanese tissue mold was removed when dry, and the menthol was left to evaporate from the surface completely. The Japanese tissue mold was then gilded and toned to match the surrounding original gilding. This method of using menthol as a temporary layer during the molding process has the potential to be utilized in creating paper-based detachable fills for other water-sensitive surfaces. The presentation will focus on the surface cleaning of the gilding, testing process with menthol, and findings regarding the practical application of menthol and the making of the paper-based molded detachable fill.

### Through the Fire and Flames: Conservation and Analysis of a Polychrome Wood Madonna and Child / Mari Hagemeyer

On October 10, 1938, the *Baltimore Evening Sun* reported on a fire which had broken out at an historical brick townhouse in downtown Baltimore, which at the time housed offices and workspaces for The Walters Art Gallery. The fire consumed much of the rear part of the building, including the conservation studio newly established there. Museum employees successfully used heavy fire doors between buildings to keep the flames from affecting the artwork housed in the adjacent museum; however, at least one object was not so lucky. A polychrome wood statue of the Madonna and Child had been awaiting treatment in the conservation studio at the time of the fire. The sculpture received a heavy coating of soot in addition to whatever soiling had already been present. It had already been affected by flaking polychromy and old insect damage at the time; with the addition of the sooty grime, conservation efforts were halted and the object was placed into storage, presumably written off as a lost cause. It would not be moved to the conservation laboratory until the early 2000s—almost seventy years later. A significant period of time has elapsed since the fire in 1938, which has brought along with it a number of advances in conservation technology as well as an accumulation of data on the object from multiple conservators' treatment and research efforts.

The current campaign has sought to apply these recent advances to the condition issues affecting this object, as well as the dearth of information about its origins. Due to the documented sensitivity of the surface to organic solvents, an aqueous cleaning solution was developed using the Modular Cleaning Program. Analyses are also underway to both describe the techniques present in the polychromy and understand its materiality; these analyses have been helpful in studying the object from an art historical viewpoint in addition to pure conservation study.

The art historical study of the object has also been aided by the efforts to clean the surface, which revealed details of the polychromy which could not be discerned through the heavy soiling. Furthermore, cleaning has contributed to the understanding of the treatment history of the object prior to its sale to Henry Walters, revealing restorations which had blended into the darkened, dirty surface. Ultimately, it is hoped that this treatment campaign will allow the sculpture to be exhibited in the Walters Art Museum. The current campaign has already resulted in increased interaction with the statue both behind the scenes and in publicly accessible spaces such as the Conservation Window at the Walters Art Museum, where many visitors have expressed a desire to see the object once treatment is completed. Despite the damage it has sustained, this sculpture is unique in the Walters collection, and would prove a valuable addition to the displayable collection once cleaned, stabilized, and properly attributed.

## Research & Technical Studies Session 1

### Polymeric Treasure: Evaluating the Composition of Civil War Era Rubber Objects from the *USS Monitor* / Molly McGath

This paper evaluates the composition of Civil War era rubber objects recovered from the *USS Monitor* marine wreck and treated by conservators at The Mariners' Museum and Park over the last two decades. Compositional

changes are anticipated where rubber objects have been exposed to burial environments and differing treatment conditions. Some rubber materials in gaskets appear to have properties of "new" rubber due to their isolation from environmental conditions as components of larger machines. These "like new" rubber objects offer a unique analytical viewpoint on historical rubber objects and rubber manufacture in the mid-19th century. Other rubber materials have been greatly impacted by the marine environment or the treatment conditions of the metals to which they were attached. The composition of the rubber artifacts was evaluated using Fourier Transform Infrared Spectroscopy. The test results reveal a wide range of compositions for the various rubber objects from *USS Monitor*, providing us with a better understanding of rubber manufacture in the 19th century, the aging of rubber when exposed to a marine environment, and the effects of treatment on rubber artifacts.

### A Closer Look at School of Rembrandt's *Portrait of a Young Man in an Armchair* at the Memorial Art Gallery / Fiona Beckett

*Portrait of a Young Man in an Armchair* at Rochester's Memorial Art Gallery has seen a troubled past. Attributed to Rembrandt and demoted several times, it has been difficult for curators and conservators to determine how the painting fits into Rembrandt's greater oeuvre. The painting also suffered extensively, causing it to be conserved by the hands of four prominent American restorers. With a recent focus on Rembrandt paintings and conservation histories at institutions worldwide, updated information is now available to better characterize Rembrandt's use of materials as well as the cumulative effect of conservation campaigns. As such, the armchair painting was worthy of a closer look. Faculty at the Patricia H and Richard E. Garman Art Conservation Program embarked on a collaborative research initiative with the Memorial Art Gallery to conduct technical imaging, fiber optics reflectance spectroscopy, x-ray fluorescence, Raman spectroscopy, cross-sectional analysis, x-ray diffraction and scanning electron microscopy. The goal was to use current knowledge in the field and compare it to the information obtained from the painting. Of particular interest was the ground materials and specific compounds in the impasto.

This presentation details the history of the artwork including former conservation initiatives, the current research related to Rembrandt's painting materials, and how the Memorial Art Gallery's *Young Man in an Armchair* fits into Rembrandt's world. Finally, the challenges of obtaining the data as well as the greater context of attributions in the current museum environment are addressed. The results will be displayed in an interactive exhibition at the Memorial Art Gallery, enticing visitors to also have a closer look.

### Archaeological Plant Fiber Identification through DNA Extraction and Sequence Match / Runying Chen

It is commonly recognized that identification of different bast fibers and leaf fibers of archaeological objects can be very challenging. One such example is the debate between the research teams led by Kvavadze (2009) and the team by Bergfjord (2010) about the identification of 30,000-year-old wild flax fiber. DNA analysis can be a potential new tool in dealing with this challenge. Murphy, et al (2011) identified flax and hemp fiber present in the rope and fabric samples from the Christmas Cave in Israel through DNA analysis; and some of the samples were dated as early as the "fourth millennium BCE." This new technology can only work, however, when the plant fiber material contains other plant cells, such as parenchyma, because the dead fiber cells do not contain any plastids.

In this paper we present DNA extraction and sequence matching results of two textile fragments recovered from Mary Rose, an English Tudor navy ship of King Henry VIII which sank in 1545. Before using the limited archaeological samples, we first replicated and tested the sample preparation method by Dunbar and Murphy (2009) with commercial rope samples (Chen and Mayer 2018). In addition to the rbcl primers used by Murphy, et al (2011), we explored matK and psbA3 + trnHf primers which are recommended for addressing the limitation of overlapping rbcl genes between species. The extracted DNA were sequenced using BigDye v.3.1 on an Applied Biosystems 3130 XL Genetic Sequencer. The sequences were used as a query for a BLASTn through the Geneious software package. Three DNA extraction experiments were made with two rope samples and ten sailcloth samples prepared from Mary Rose. DNA extractions were successful with the two rope samples and six out of the ten sailcloth samples using rbcl primers, and other primers failed to work with these samples. The results of DNA sequence matching revealed the rope sample (marling twine) from Mary Rose being cannabis sativa (hemp), rbclF2: ID = 130/136 or 96% and rbclR3a: ID = 138/140 or 99%, along with other two high percentage identities such as Humulus lupulus (a flowering plant of hemp family). These matches do indicate the limitation of rbcl gene for plant identification. However, it is known that hemp is the fiber plant cultivated for textile production.

Among the six sailcloth samples' DNA matching results, three showed one directional identity match at 98% and 99% with Urtica family members (nettle fiber); one showed two different identities matching of Urtica family at 98% and Populus at 93%; and the remaining two showed matches lower than 90% with other plants, including flax. These results demonstrate that DNA extraction and sequence matching are possible with archaeological plant fiber material, but the sequence matching results need to be examined and interpreted carefully due to overlapping rbcl gene region between plants and contaminations which could produce a false matching.

## JAIC Session

### Scholarly Writing for Conservation

This session covers a variety of topics on scholarly writing and publishing in a panel format, with discussion and Q&A at the end. Julio M. del Hoyo, Editor-in-Chief presents an overview of JAIC, including aims and scope of the journal, how to prepare and format your article, and a pre-submission checklist. Suzanne Davis, AIC's Vice President, and Corina Rogge, JAIC Associate Editor, presents "The ethics of authorship, acknowledgements, and credit." They cover issues of authorship and acknowledgements; responsibilities of authorship: the roles and obligations of first authors and co-authors; and professional recourses: what to do if your work has been plagiarized, used without appropriate credit, or submitted under your name without your review. Catherine Stephens, JAIC Associate Editor, covers "Writing Style." She discusses the foundational aspects of figures, tables, and images; the importance of a clearly written abstract; and the physical layout of your article. Robin Hanson, JAIC Associate Editor, presents "The Mechanics of Writing for JAIC," including the use of citations in a scholarly work, image permissions, and transitioning a paper from a Specialty Group Postprint to JAIC. George Cooper, Managing Editor, Journals Anthropology, Conservation, Museum Studies & Heritage at Taylor & Francis, shares "How to publish an article with 'impact.'" He discusses how to get published, the benefits of being published, and innovative tools available to promote your accepted article. Lastly, Heidi Lowther, Commissioning Editor for conservation books at Routledge, briefly discusses "Tips on how to publish your first book."

## Architecture Session 1

### Maintaining Modernism: Acoustical Plaster at the Walter Gropius House / Edward FitzGerald

Acoustical plaster is among the innovations in architectural materials of the early twentieth century. The material was typically a standard lime or gypsum plaster modified with porous aggregate, air-entraining admixtures, or fibers such as cellulose, cork, or asbestos, to create a sponge-like finish that could better absorb sound. Hydroscopic ingredients and the porous and often friable nature of the plaster make it challenging to clean.

This presentation will discuss treatment options explored for cleaning acoustical plaster at the Walter Gropius House, a house museum operated by Historic New England. Gropius House, built in 1938 in Lincoln, MA, by influential German architect Walter Gropius, is an iconic example of the early modernist movement in the United States. The house notably combines traditional New England materials—wooden siding, brick, and fieldstone—with innovative products that had rarely been used in domestic architecture at the time, including glass block, metal casement windows, and acoustical plaster. The acoustical plaster features prominently, covering the walls and ceilings of the living room, dining room, and study as well as the ceilings of the first and second floor hallways. The plaster was a proprietary mixture, sold under the trade name, "Stucoustic", and is a soft and moderately friable material with a textured surface created by the presence of large (approximately 2mm in diameter), aspherical air voids. Based on microscopic analysis, the plaster has a lime-based binder with aggregate composed of a medium-grained pumice and minor crushed marble constituent. Fibers present in the finish coat were extracted from the matrix and have been identified as cellulose.

In 2016, Historic New England engaged Jablonski Building Conservation (JBC) to test and develop a cleaning program for the plaster. The once cutting-edge material was showing its age. Water stains and soiling discolored the white and pink-colored plaster. Dating back to 1945, several previous attempts to clean the plaster were made by others, including the Gropius Family. These efforts all relied on wet methods with varying levels of success. Concerned that wet methods could damage the hydroscopic material, JBC's testing focused on dry

cleaning methods including rubber sponges and proprietary poultices. Tests of these methods produced less than ideal results. In most tests, poulticing actually caused additional discoloration and all methods resulted in some surface loss. Ultimately, a light, masking coat of a modified limewash proved the most successful in returning the finish to its original appearance.

### Conservation Consumption: Measuring the Gains and Losses of Building Restoration / Xsusha Flandro

In 1871, a fourth level Architecture course was offered in New York City that instructed on topics such as heating, ventilation and circulation of water. Notably, it asserted that the only way to successfully ventilate a building was to use fuel. Fast forward 150 years and we find that we are still battling this same concept, while simultaneously forcing our historic buildings to perform within modern energy limits. In the words of Greta Thunberg, a teenage environmentalist, "you only talk about moving forward with the same bad ideas that got us into this mess, even when the only sensible thing to do is pull the emergency brake."

To further understand the impacts of building restoration on the environment a small research project was undertaken. Research took place using two buildings with cast iron facades. Dating from the 1870's, each structure underwent complete restoration and renovations between 2016 and 2019. Both were gutted of all interior finishes, entire facades were removed and restored off site and new backup wall assemblies were constructed using modern materials with the intent of improving the building's resistance to heat loss. Comcheck, WUFI and THERM software was utilized to analyze the energy efficiency of the new wall systems installed. The results of these computational analyses were then compared to the energy efficiency of the historic wall systems—calculated using the same software, an 8% increase in efficiency was identified. Additionally, the overall expected life span of the modern materials, construction waste generated, and the amount of fossil fuels used during restoration were roughly calculated and graphed to get an overarching idea of how "green" the two projects were (life cycle assessment). The prevailing belief in the construction industry is that historic buildings function poorly in terms of energy usage, and that restoration and preservation are "green" practices; however, very rarely is data actually presented to support these claims. We can no longer afford to be myopic about conservation and restoration. Measuring the environmental losses and gains of building restoration should be included in conservation discussions. This presentation will explore using modern software tools to assess the environmental impacts of building restoration.

### The Reality of Architecture as a Conserved Object / David Overholt

Over time, treatment protocol established by objects conservators expanded to include architectural conservation and preservation. With the ultimate goal to provide the highest level quality at the best value, and provide long-range performance and durability, preservation tradespeople and conservation firms are engaged to execute a defined scope of work. Construction managers and general contractors are challenged to find qualified firms that not only have the capability to deliver a high level of craftsmanship, but also possess the business acumen to manage and administer, for instance, submittals, shop drawings, requests for information, and provide the staffing necessary for a large-scale complex project. Creative solutions are necessary to help the best craftspeople cope with the pressures of a modern project, where documentation, accounting and meetings are overwhelming. The success of a preservation project lies ultimately in the hands of the craftspeople. The construction manager provides the conduit between the design professionals and work in the field. A building, as an object to be conserved, is made up of a myriad of complex, individual components; plaster, wood, masonry, ornamental metals, chandeliers, floors, elevators, staircases. Viewed as an aggregate, the quality of the individual parts contribute to the overall aesthetic of the whole.

The objective of this presentation is to provide a construction manager's perspective and analysis for the following project components: Procurement - Pre-Qualification of Preservation Trades, Conservators and Artisans understand specification requirements for the preservation/conservation scope of work summarize the scope of work in the construction documents, for individual trades, for bidding purposes help potential subcontractors fully comprehend the intent of the construction documents identify qualified firms, artisans, tradespeople and conservators identify certification required for specific tasks, for example laser cleaning understand which firms will be able to ramp-up staffing levels to match the needs of the project as it evolves towards completion understand how firms reach out to third tier subcontractors to match staffing level needs .

Budget procuring qualified firms within budget limitations balancing the client's high expectations for quality vs. the low bid reality of the budget best value concept working with the trades to assure that their business, administrative and project management capabilities are adequate for the project size mockups pre-construction qualification mockups - compare work against other subcontractors pre-construction design development mockups reliable subs help solve design issues ahead of final construction documents minimize change orders mockups required per specifications targeted, practical and most importantly reproducible on a large scale Schedule managing scope additions tracking progress what it means to supplement trades if they are unable to meet the needs of the schedule Quality qualify individual mechanics i.e. cutting, pointing, carving, and patching masonry monitoring quality managing expectations of the client will the work in place look "new" or maintain it's appearance as having aged Case studies to include: President Lincoln and Soldiers' Home National Monument Old Senate Chamber at the Maryland State House The U.S. Capitol Dome Skirt Rostral Columns at Union Station Laylight Restoration at the Daughters of the American Revolution Memorial Continental Hall.

## Electronic Media Session 2 - Hardware

### From Repair to Prepare, Concepts for the Preservation of Picture Tubes in Video Art / Jochen Saueracker

CRT televisions used to be a wide spread presentation medium and they also became a structural part in many artworks since the rise of video art in the 70s and 80s. With nearly all picture tube televisions at the end of their lifetime new concepts to keep this iconic cultural machine alive for the future are urgently needed. At the same time we face the fact that the supporting industry and the maintenance structure of analog televisions has vanished. The technique of rebuilding picture tubes was also lost.

Three years ago Christian Draheim, a specialist for display systems, established a new workshop for the rebuilding of picture tubes. This presentation will describe the process of rebuilding a picture tube and will focus on the preparations that are necessary today to support the CRT technology. A predictive maintenance process has to be established. The necessary steps for the near future to keep not only the picture tubes alive, but simultaneously the technical knowledge about the CRTs, will be reviewed. To experience the qualities of an analog image the viewers needs the technical structure of an analog display. The fragile equilibrium of artist-artwork-technology-time needs a prospective approach to be intelligible in the future.

### Jim Campbell: Caring for Custom Hardware in Time-based Media / Shu-Wen Lin

Contemporary artist Jim Campbell is renowned for his innovative approach of integrating custom electronics with multimedia works. Opposing the high-resolution world we are currently situated in, Campbell's blurry, pixelated moving images in his ongoing *Low Resolutions* series forces viewers instead to focus on movement and shapes. Collected by the Smithsonian American Art Museum, *Grand Central Station #2* illuminates moving images of passengers in the main terminal at Grand Central Station in New York City. It consists of a grid of nine LED panels as a display screen, nine FPGA-based controlling electronics adhered to the back of each LED panel, a printed Plexiglas, and a power supply. In the artist's own words, the controlling electronics are the brains, and the FPGA (Field Programmable Gate Array) integrated circuits are the heart. To communicate between non-digital electronic systems, the artist's source designs were taken through a complicated optimization process where human-readable codes are translated into specific binary forms to be loaded onto the circuitry. The LED matrix display with the adhered controlling electronics were collected as a self-contained unit comprising of the information carrier, playback, and display equipment. With a background in electrical engineering and mathematics, Campbell designs and configures all the custom hardware for the unique purpose of his art works.

Unlike many mass-produced consumer products used in time-based media, these modules are carefully and thoughtfully designed by the artist and his studio in San Francisco, California. Over the course of twenty years, the artist has demonstrated an early adoption of technology that requires highly specialized skills by consistently working with the same technology. The evolution of his design technique reflects the technological development and progression in the industry. Reprogrammable circuits and controllers play an increasingly significant role in interactive installations because they offer great flexibility for artists to execute specific functions. Emulation may allow a caretaker to retain software's functionalities over virtual machines

running on contemporary hardware; nonetheless, it cannot be accounted for maintaining and migrating embedded hardware designs over legacy technology. To address the unparalleled role of artist-made hardware, I performed a comprehensive study of both the creation process as well as the prevalent industrial practices. With the assistance of electrical engineers and computer science experts, I aim to identify the complex trajectory and technical characteristics of hardware configurations, and further disseminate the overarching principles to care for custom electronics in time-based media.

## Plastic Challenges in Cultural and Ecological Preservation – Session 2

### Fashion's Plastic Problem: Preventive Conservation for Synthetic Materials / Kaelyn Garcia and Marina Hays

**Co-Author: Sarah Scaturro.**

Contemporary fashion collections contain a time bomb: plastics of variable composition and stability found in clothing, shoes, hats, and other accessories. These plastics exist in a wide range of formats, like fabrics, fasteners, embellishments, laminates, and coatings. To date, there is no comprehensive method or study established that addresses the preservation and treatment of plastics in fashion collections. Those plastics which have been in use since the nineteenth century, such as cellulose nitrate and cellulose acetate, have been extensively studied, but the deterioration of more modern plastics—notably polyvinyl chloride and thermoplastic polyurethane—are less well understood.

The Costume Institute Conservation Department has been conducting a multi-year project on the preservation of plastics commonly found in fashion objects. One aspect of this project is a real-time aging experiment to assess the effects of various storage conditions on these materials. The experiment was inspired by and designed to expand on the findings of the cross-institutional POPART (Preservation of Plastic ARTefacts in museum collections) project, which used composite plastic dolls as reference objects to compare the natural aging behaviors of the various component materials. In the Costume Institute's experiment, the reference objects were designed to resemble mannequins and were made from nineteen different plastic materials that have been found in fashion objects in the CI collection. In spring 2017, fifteen mannequins were placed in a range of different locations and storage conditions where they would be exposed to various temperatures, levels of light, moisture, and oxygen.

Prior to placement, the mannequins underwent technological analysis to capture the color, mass, and tensile strength of the plastic components; in fall 2019, the component materials are again being analyzed to assess changes related to their real-time aging. The goal is to collect information on how the materials fared in each environment, thus providing guidance for storage decisions in the future. Questions that we hope to answer include: is cold storage a viable possibility for composite objects made of different materials? How are plastics affected by movement from cold storage to gallery conditions and back again? What is the best way to house objects in cold storage? Is anoxic storage an effective method for slowing the degradation of plastics that are prone to deterioration by oxidative mechanisms? Does airtight storage, which is cheaper and more accessible than anoxia, have a beneficial effect? Does anoxic or low-oxygen storage negatively affect any materials? What is the ideal relative humidity within an anoxic environment? How does light impact each material, and does it change depending on the environment? While the mannequin experiment was designed in part to provide specific information about the spaces where fashion is stored and exhibited at The Met, the answers to questions like these will be applicable to other institutions. The experiment is also a case study that will demonstrate the utility of relatively low-tech real-time time aging experiments in general, which may be a valuable way for institutions—especially those with limited resources—to learn about their particular collections storage spaces and how best to use them.

### Conserving Vintage Dior: Investigating New Methods for Cleaning Deteriorating Patent Leather / Natalya Swanson

The deterioration of the polymeric components in synthetic patent leather coatings is a concern for museums and institutions with collection items originally mass-produced for the consumer market. As these objects age and begin to chemically deteriorate, mobile components migrate out of the polymer matrix and deposit on exterior surfaces. Depending on the form of degradation, the object may become sticky and/or develop a bloom. Both of these conditions are unsightly and pose concerns for the object and surrounding collection items: sticky plastics adhere to mounts, storage housings, or adjacent collection items, and can attract soiling; the development of a bloom, or fatty acid exudate, compromises the physical stability of an object and can be mistaken for mold, which may prompt inappropriate actions. The complexity of caring for these objects is multifold, and without pro- and reactive action, these objects cannot be exhibited. The deteriorated surfaces are highly sensitive to mechanical action and to a variety of commonly used solvents, which makes interventive action challenging.

To address the void in published information regarding cleaning options for degraded synthetic patent leather coatings, an experimental investigation was undertaken with a pair of Christian Dior heels, c. 1968/9, from the Philadelphia Museum of Art's study collection. The exterior surfaces of the shoes had an uneven, blotchy appearance and the tongues and upper top edge were deformed from being unsupported in storage. Other condition concerns included cracking along the back line and signs of minimal wear. The study included research into the context of the object's creation and ownership, and an exploration of how the object's biography affects assigning values and subsequent conservation decision making; characterization of the coating as a polyurethane-ester blend and efflorescence as adipic acid with Fourier transform infrared spectroscopy; and development and implementation of a multi-step cleaning protocol based on extensive heuristic testing. This object's condition and status as a study collection item permitted a highly experimental treatment where various materials, including gels and silicone solvents, and delivery methods were tested. The overall treatment was very successful. The surface has a much more uniform finish and distortions were safely reduced. This talk will include findings of this pilot treatment, a discussion of problem solving and adjustments made based on local sensitivities of the surface coating, and the author's autoethnographic approach to documentation.

### The Conservation of *Turning Point*, Philip Johnson's Monumental Outdoor GRP Sculpture / Claire Curran and Julie Reilly

Philip Johnson's sculpture, *Turning Point*, a monumental, multicomponent composite glass reinforced plastic sculpture with five elements installed on a purpose-designed concrete plaza, was commissioned by Case Western Reserve University (CWRU) in 1995. It was the Cleveland native and acclaimed architect's first foray into sculpture. In 2012, the sculpture was de-installed and due to the size and weight of the pieces, was stored laying on its side, outdoors on a grassy lot, uncovered and fully exposed for six years. The subsequent development of a new campus green space in 2019 led to the desire to conserve and reinstall this important work. CWRU approached ICA-Art Conservation in late 2018 to oversee the conservation and reinstallation. The sculpture exhibited an extensive network of fine cracks deep into the GRP layers with loss to the paint and gel coat. Additionally, several large cracks and losses in one of the elements allowed water to infiltrate into the interior, leaving pools of water or blocks of ice, depending on the season.

ICA-Art Conservation worked with Thomarios©, a commercial painting, coatings, and construction contractor, for the project. Upon transport of the sculpture to the Thomarios indoor warehouse facility, closer examination revealed that the cracking in the GRP was pervasive, requiring a more involved course of treatment that was much costlier and time intensive than initially estimated. Budget and timeline concerns for the multimillion-dollar green space project ultimately resulted in delays and compromises to the course of treatment that produced an outcome that provided stabilization, but no clear warranty of long-term efficacy. This presentation discusses navigation through a complex of factors—deteriorating artist materials, limitation of the original fabrication, unavailability of original formulations, evolution of GRPs and replacement polymers, the passing of the artist and the fabricator, university politics, allied contractors, budgetary constraints, and time constraints—that challenged treatment protocols, timelines, and the successful completion of the project. *Turning Point* was reinstalled in August of 2019 and rededicated on September 5, 2019.

## Book and Paper Session 1

### Thinking Beyond the Frame / Victoria Binder and Allison Brewer

For centuries the frame has been the indisputable method of displaying two-dimensional artworks in Western society. The frame is versatile in appearance and forms a contained environment that protects the object. Yet it has its limitations. It can be costly, incompatible with the object, and create a barrier between the viewer and the work. Endless frames on a gallery wall,

typically in standard sizes, can sometimes create monotony and disengage the visitor. In this rapidly changing world, art institutions are shifting their approaches to engaging the audience, with trends towards immersive and dynamic exhibition environments. This includes the display of artwork and artifacts.

As exhibitions become more unconventional and lively, there is a need to think safely beyond the frame. For decades, the paper lab at the Fine Arts Museums of San Francisco has been developing safe alternative methods of displaying works on paper that present unique challenges in regards to size, material, and context. The honing of these methods over the years found its ultimate application in two recent major exhibitions at the de Young Museum, "The Summer of Love Experience: Art Fashion and Rock & Roll" (2017), and "Ed Hardy: Deeper than Skin" (2019). Both exhibitions, celebrating creativity and countercultures, showcased a wide variety of works on paper and presented big challenges. "The Summer of Love Experience" consisted of over 200 works on paper including rock posters, album covers, ephemera, and a large 10 x 21 ft screenprint billboard. "Ed Hardy: Deeper than Skin" featured nearly 400 of Hardy's tattoo and fine arts pieces including conventional prints, drawings on delicate ruled paper, tattoo parlor flash art on illustration board, preparatory drawings on tracing paper, works on thick amate paper, and large Tyvek paintings, including one 500 ft long scroll. To honor the original intent of the works and the vibrant and non-traditional nature of the art, and (not the least concern) the budgets for the exhibitions, alternative display methods were required. Solutions for these multi-faceted exhibitions required close collaboration with curators, designers, and technicians. Methods of display included the use of rare earth magnets and presenting many works on paper uncovered, in different ways. Acrylic sandwiches, generally frowned upon, were also successfully employed and turned out to be a huge cost savings.

Display solutions necessitated a balance of creativity and safety and, despite many unconventional display techniques, no art was harmed during the course of the exhibition. The logistics of treating and mounting so many artworks in a short period of time also demanded streamlined systems. One of the outcomes beyond the exhibition itself was the development of a test kitchen for display methods, a permanent showroom wall with the various possibilities for display.

### Laid Bare: Preserving Our Nation's History in View of the Public at the National Park Service / Angela Campbell

As is clearly laid out in its mission statement, the National Park Service (NPS) "preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations." Though the majority of the public associates the NPS with its natural resources, its cultural resource holdings exceed 50 million artifacts, reflecting the broad and diverse history of our nation. More than half of these artifacts are in collections located in the NPS's Northeast Region, which extends from Virginia to Maine. As a Paper Conservator for the NPS, based in the Northeast Region, I am routinely faced with the challenges of both encouraging access to these artifacts, as well as ensuring their preservation and safety.

Two distinct projects revealed some of the inherent tensions between these responsibilities. The Salem Maritime National Historic Site is home to 12 historic structures, all of which include paper and paper-based artifacts. In 1978, when a historic building newly acquired by the NPS was being renovated, an intricate Victorian wall mural comprised of approximately one thousand faces and figures cut from local performance posters and adhered directly to a wallpapered wall was discovered. In an effort to preserve the mural, the piece was cut out of the wall, with horsehair plaster and lath intact, and placed in storage. Treatment began on site, in the NPS Visitor Center, in 2017. The Visitor Center is open to the public and is treated by tourists as a gateway to all that Salem has to offer. Since the mural is both visually arresting and enormous, hundreds of visitors from all walks of life engaged with the project. I worked closely with both the curatorial staff and the interpretive staff at the Park in order to ensure a clear message, particularly when discussing some of the more culturally-charged elements of the mural.

The Martin Van Buren National Historic Site, which is likewise tasked with sharing its cultural resources with the public, is home to a beautiful Zuber wallpaper in what was used as the formal dining hall of our 8th President's home. In contrast to the mural in Salem, the spectacular Zuber wallpaper was never covered up, though it did suffer substantial damage. After an in-depth and off-site conservation treatment in the 1980s, the paper was rehung, and the park now encourages visitors to walk carefully through the space and view the wallpaper that bore witness to the dealings of eminent 19th-century politicians. Unfortunately, environmental fluctuations and the lingering hands of visitors have caused minor but repeated damage to the paper. In an effort to share the story of the wallpaper as well as the importance of its preservation, an informational film titled, "Saving the Scene: National Park Service Conservation of Martin Van Buren's Zuber Wallpaper at Lindenwald," was created. This film reaches a wide audience, and conveys both the history of this significant wallpaper as well as the care that the NPS has devoted to it.

### Varnished Artworks Created by Children during Art Therapy Sessions: Legal and Material Considerations / Laura McCann and Chantal Stein

A novel conservation challenge arose during research into varnished artworks on paper created by children during art therapy sessions at the Wiltwyck School for Boys from 1951-1957. The artworks are part of a large collection that documents the life and work of artist and pioneering art therapist Edith Kramer. As products of art therapy, the artworks are not only art; they are also medical documents, subject to specific regulations in the United States. These regulations impact conservation goals and documentation protocols. This presentation will detail analysis undertaken to identify the materials to best conserve the works, and will then describe how that analysis informed actions to make the works available to researchers while ensuring legal compliance with the health care privacy laws in the United States.

While Kramer used pseudonyms in her publications, the vast majority of the artworks reveal private health information that must be withheld for fifty years after the death of the art therapy recipient, according to health care privacy laws. Restricting access to the collection for up to 100 years (many of the artists are still alive) was considered an unacceptable option. Therefore the conservation goals included temporarily obscuring access to private health information until the restrictions are lifted. The forty-two expressive works under discussion depict a range of subject matter, including people, animals, objects, fantastical beasts, and cityscapes. They are executed in charcoal, graphite, and/or matte opaque paint. Kramer then hastily coated the surfaces with a brush-applied varnish she describes as "plastic paint." The unevenly-applied varnish is grayish in tone, slightly tacky, and contains many bubbles and accretions. Application of the varnish disturbed the original media, dramatically altering the surface texture from matte opaque to semi-gloss. Microchemical spot testing, SEM-EDS, and FTIR analysis were undertaken to study the varnish and paint media. The methodology will be presented along with the results that suggest that the varnish is a PMMA product and that the paint includes a polysaccharide binder and various inorganic extenders. Informed by the analysis and research into brush-applied acrylic-based varnishes available .

In the 1950s in the United States, a number of mounting strategies were employed that temporarily obstruct access to the private health information until the privacy regulations expire. Where the non-interventive mounting techniques could not block access to private health data, an interventive solution was developed that involved applying toned paper patches over the private information. These patches are visible and easily removable by future conservators without impacting the varnish layers, but not overly intrusive to the viewer. Reversibility is required, as once the privacy restrictions expire then the patches can be removed. The specific protocols were developed in collaboration with archivists to ensure that documentation practices adhered to the privacy regulations and that the composition and function of the obscuring mounts and patches are communicated to all stakeholders. These protocols provide a model for sharing conservation data with current and future stakeholders.

## Book and Paper Session 2

### Hair Today and (Not) Gone Tomorrow: The Conservation of a 19th Century Hair Album / Mary French

In the 19th century, hair art was a popular way to remember loved ones: regarded with sentimental affection, human hair was made into accessories or stored in albums. As it ages, hair art poses an interesting conservation challenge since hair becomes brittle and fragile, and is often incorporated into objects whose other components have competing conservation priorities. When multiple pieces of hair are introduced into a bound structure with moving parts, the result is a particularly complex object.

Formulating a treatment plan that maintains the functionality and historic appearance of the book while also addressing the conservation needs of the hair requires drawing from multiple conservation disciplines to overcome this

unique challenge. In 2019, the Davenport House Museum in Savannah, Georgia sent a 19th century hair album to the Northeast Document Conservation Center for conservation and digitization. Created in 1829 by Sarah Davenport, a boarding house keeper, widow, and mother of 10 children, the album contains locks of hair from members of Sarah's family, as well as handwritten poems and anecdotes. Having lost her husband, mother, and three of her children in the preceding years, the album is a tangible representation of Sarah's enduring love and remembrance. The locks of hair had been tied to the support leaves with silk ribbons, but the silk was degraded and broken, and many of the locks were detached. Because the locks could move freely within the support leaves, strands of hair were broken from mechanical wear. Some locks were no longer on the correct support leaf and many were already missing. Additionally, strain from the hair's extra bulk caused the binding to fail. The goals of treatment were to stabilize the hair and prevent further loss, restore functionality to the binding, mend the broken silk ribbons, identify the correct location and positioning of the hair locks, and reattach them to the support leaves.

Deciding how to treat the hair was complicated by its fragile nature and the curatorial desire to return the album to its original appearance and layout. Simply reattaching the hair with the lined silk ribbons was not possible since this would place too much strain on the hair at the single point of attachment. This paper will discuss how the author navigated the difficulty and limitations of treating human hair while preserving the artifactual and structural properties of the album. Drawing on book, textile, and objects conservation techniques, the book conservator devised an innovative and fully reversible treatment to stabilize the hair locks and reattach them to the support leaves along with the mended silk ribbons, and repaired the binding without causing further damage to the hair or the book. The author will also discuss how visual cues were used to determine the correct locations of the detached locks based on their size and shape in relation to surrounding text, the unique discoloration patterns they left in the support leaves, and by matching silk ribbon fragments from the locks with corresponding fragments still laced through leaves in the text block.

### Restoration, Rebinding, Conservation: Changes in Collections Care over 275 Years at the APS Library / Renee Wolcott

The American Philosophical Society, founded in 1743 by Benjamin Franklin for the "pursuit of useful knowledge," has maintained a research library since its earliest days. In the institution's 275-year history, the Library's approach to collections care has changed as the conservation field has evolved, from binding loose documents and pamphlets in the 1700s to item-level treatment in today's fully staffed and well equipped conservation lab. In the years between, the APS forged relationships with many contract binders and restorers beyond its walls and established its own in-house conservation facility. The APS Archives reveal the Library's long-standing concern with stabilizing its collections, and provide details concerning the individuals hired to perform the work, including Philadelphia binder Jane Aitken in the early 19th century; Library of Congress manuscript restorer William Berwick in the early 20th century; Carolyn Rugh (later Horton), who was hired as the first APS on-site conservator in 1935; and Willman Spawn, the Society's first full-time conservator. Not all of these restorers and conservators left records of their work, but the collections themselves reflect the changing materials and methods in use over the years, from Western-paper fills and silk lamination to indiscriminate rebinding to today's historically sensitive item-level treatment.

This long, varied history of collections care also means that today's conservators must sometimes reverse earlier treatments that no longer serve the needs of the books and documents they were designed to protect. This constant engagement with and reassessment of conservation work from the past is common in smaller research libraries, particularly as scientific conservation techniques have been slower to catch on in the complex interplay among binders, restorers, and program-trained book conservators. The Society's approach to the evolving history of conservation treatment may serve as a guide for other institutions in like circumstances.

### Arsenic and Old Bookcloth: The Safe Handling, Storage, and Treatment of Potentially Toxic Victorian-Era Cloth-Case Publisher's Bindings / Melissa Tedone and Rosie Grayburn

Analysis of decorated, cloth-case, publisher's bindings at Winterthur Library revealed starch-coated bookcloth colored with "emerald green," or copper acetoarsenite, a pigment known to be extremely toxic. This pigment's popularity in England and the United States during the Victorian era is well documented. While the colorant was known to be widely used in textiles for home decoration and apparel, wallpaper, and toys, its use specifically in bookcloth has not been formally explored.

Successful bookcloths were a closely guarded trade secret during the nineteenth century, limiting our current understanding of their materiality and manufacture. Conservation staff and interns at Winterthur Museum, Garden and Library conducted a survey of bookcloth pigments in order to correlate the presence of emerald green and other potentially toxic pigments with specific publishers and dates. The project initially focused on the library's circulating collection, which poses a greater potential risk to patrons, and then expanded to include the rare book collection. English-language books published between 1837 and 1900 align with the rising use of bookcloth on publisher's case bindings. X-ray fluorescence (XRF) was used to collect elemental information from bookcloths. When arsenic and copper were found together, Raman spectroscopy was used to confirm emerald green. The Winterthur Library data set was further expanded in cooperation with The Library Company of Philadelphia, which has significant holdings of cloth-case publisher's bindings. To date, ten books at Winterthur have been confirmed as containing emerald green, four of which were found in the circulating collection. A total of 28 books at The Library Company tested positive for copper and arsenic.

Trends in emerald green bookcloth use based on this data include: consistent, visually identifiable hue of vivid green; gold and blind stamped decoration; English and American imprints; imprint dates from the 1840s–1860, with peak popularity from 1852 to 1858. The data also revealed trends in green bookcloth use overall. Case bindings bound in green cloth from the 1830s through 1840s were more likely to show iron-based greens, while case bindings from the 1860s through 1900 were more likely to show lead-based greens. Quantitative analysis performed by the University of Delaware Soil Testing Lab revealed significant levels of arsenic. Arsenic pick-up tests revealed that a dry cotton swab rolled across the surface of the bookcloth attracted arsenic-containing offset, indicating that the bookcloth colorant is extremely friable.

In order to contextualize these results, the research team consulted with University of Delaware Environmental Health & Safety to develop approaches for mitigating routes of potential exposure. At Winterthur, arsenical books formerly housed in the circulating collection have been moved into the controlled environment of the rare book collection. Arsenical books are stored together in a designated area, in order to facilitate future monitoring as well as safety during collection emergency response. Arsenical volumes are shelved sealed individually in zip-top, 4-mil., polyethylene baggies. A code indicating a handling hazard has been added to the volumes' call numbers as an immediate signal to library staff when one of these books is requested by a researcher. Safe handling tips, such as wearing nitrile gloves, have been added to the library catalog record, and library staff have received training in how to handle the materials and advise patrons. Conservation treatment should ideally take place under a certified chemical fume hood. A description of the project and list of arsenical volumes can be publicly accessed on the Winterthur Wiki at http://wiki.winterthur.org/PoisonBookProject. A bookmark with color swatches and information to assist with non-instrumental identification of arsenical volumes is available from Winterthur Museum, Garden, and Library

### Audrey Amiss, Artist and Patient: Preserving Her Legacy / Stefania Signorello

This talk focusses on the challenges posed by a complex collection donated to Wellcome Collection in 2014 comprising of framed works on paper, unframed prints and drawings, diaries, photographic albums and scrapbooks by the contemporary artist Audrey Amiss. These artefacts tell a story of a promising Royal Academy art student whose life was changed by a mental breakdown, and eventually bipolar disorder and paranoid schizophrenia.

The author will highlight only part of this very large collection: a series of 150 scrapbooks, compiled by Audrey from 1980s to 2013. They contain food and drink packaging from what Audrey consumed, adhered in place by herself with pressure sensitive tape (Sellotape)/glue and annotated with her views on their design and on the food itself. The scrapbooks present the following challenges: Severe wedging due to packaging, paper cups, cartons, foil trays, plastic shopping bags attached to the leaves with either Sellotape -to be preserved-, or liquid glue -which has caused mould growth-. Remains of food are still present in the packaging (potential pest issue). They should be digitized before the Sellotape loses tackiness and prior to mould treatments as this shows the way Audrey worked (H&S issues). Once treated, they need to be made accessible to users, even if in anoxia storage (unsealed and resealed).

Balancing the needs of a collection with an intrinsically short lifespan, limited budget to preserve/store risky material for the rest of the core collection because of possible pest/VOCs issues. The talks will highlight work ethics and research questions raised by Audrey's scrapbooks. How the author is carrying out trials for feasible anoxic enclosures, starting from current techniques—doing some cross-discipline collaborative work with major UK institutions—and exploring possible sustainable and cost-effective ways to preserve Audrey's legacy. The goal is to work towards slowing down the degradation of these multi-natured materials, contain potential pests and mould issues, protect the surrounding collections whilst in storage, and to digitise it as soon as possible.

Throughout the whole project the author is constantly reminding herself that this collection is destined to break down faster than most collections held at Wellcome. Therefore, despite the duty of care, to extend the useful life of these scrapbooks and make them available to researchers, it is sensible to contain costs and accept compromising solutions. The author sees these challenges as a great learning experience she would like to share/raise questions with the conservation community, especially as these works give an invaluable and thorough insight into a common, but among the most misunderstood, medical condition.

## Paintings Session 2

### Identification and Removal of Disfiguring Zinc Oxalates from the Surface of a Frank Benson Portrait / Christine Gostowski and Gregory Dale Smith

This research characterized and informed the removal of opaque, white patches on the surface of a 1904 portrait of Laura Bowker Chapman, painted in oil on canvas by American Impressionist Frank W. Benson. The white surface hazes were obfuscating the sitter's face and lace collar, as well as blue sky, gray clouds, and distant mountains. The painting had no record or evidence of previously being treated. The white exudates were chemically analyzed through collaboration with Dr. Gregory Smith, Conservation Scientist at the Indianapolis Museum of Art at Newfields. Chemical imaging of a cross-section using Scanning Electron Microscopy-Energy Dispersive X-ray Spectrometry (SEM-EDS) identified zinc oxide. Raman and Fourier Transform Infrared (FTIR) spectroscopies conducted on a sample scraping of white material indicated an oxalate compound. The unknown sample was identified as zinc oxalate when its spectra were compared against that of a reference sample. Zinc oxalate, an ionic salt, may have formed in a metathesis reaction between oxalate anions, putatively derived from the oxidation of either the oil paint binder or natural resin varnish, and zinc white pigment cations. Although several cases of metal oxalates, most commonly oxalates of calcium, have been analyzed on painted surfaces, zinc oxalates have rarely been found. Metal oxalates have been reported to be insoluble in typical cleaning solutions, and hence, treatment attempts to remove them have had limited results. This quandary has prompted conservators to mask oxalate efflorescence with inpainting, which is less than ideal.

After conducting several cleaning tests on the Benson portrait, an aqueous solution proved to be safe and effective at solubilizing zinc oxalate hazes, which were lying beneath the natural resin varnish layer. From this realization, a cleaning system was developed and incorporated into the overall treatment plan. Cleaning dramatically improved the aesthetics of the painting by re-establishing brighter, more saturated colors, more distinctive forms, increased spatial depth, and Impressionistic light effects, so essential to Benson's paintings. The portrait was framed with glazing, and returned to the owner, where it has been on display since 2013. Maintaining climate control is imperative for retaining its stability. A visual examination in August of 2019 verified that zinc oxalate hazes had not reappeared on the painting's surface. This study may provide answers to the identification and treatment of zinc oxalate exudates on painted surfaces.

### Max Beckmann's *Karneval*: A Record of Turmoil and Evolving Philosophies / Rita Berg and Joyce Tsai

The University of Iowa Stanley Museum of Art acquired the monumental triptych *Karneval* just three years after German artist Max Beckmann executed the work under duress in exile. Early on in its history, it became clear that the painting bares traces of the constraints under which the artist worked. Beckmann reported running out of commercially primed canvas and painting on bedsheets. In fact, the central panel of the triptych was executed on a commercially primed canvas, while side panels were painted on an artist-primed fabric.

The University bought the painting in 1946, but the triptych already exhibited condition problems by the 1950s. The painting has undergone numerous interventions that initially responded to condition issues stemming from the inherently problematic materials the artist used. One of these responses included varnishing despite Beckmann's own preferences. More invasive treatments, aimed to address the ongoing flaking, continued in the following decades. By 1964, painting professor Byron Burford worked to establish a paintings conservation training program at the University of Iowa. He sought advice from Caroline and Sheldon Keck to amass the tools for a modern conservation studio. When the painting was examined at the university, its fragile appearance caused the painting to be described as "capable of destroying itself." Thus, in keeping with the philosophy and developments of the time to address flaking paint, all three panels were wax lined.

Throughout the years the varnish was partially removed, and flaking was repeatedly consolidated. In 2018, the Midwest Art Conservation Center (MACC) and the Stanley Museum of Art embarked on an in-depth examination to fully identify the painting's reoccurring problems. Research on Beckmann's paintings in exile often suggests that the artist used poor quality paints, specifically for black hues. To help characterize materials used, the three panels of the triptych were examined using X-Ray Fluorescence Spectroscopy (XRF) and Fourier-Transform Infrared Radiography (FTIR). Examination also revealed extensive compositional changes. To better understand the artist's revisions, the paintings were photo-documented using various techniques including Infrared Reflectography (IRR) and Transmitted Infrared Photography (IRT). This research provides a more comprehensive understanding of Beckmann's changing techniques and working methods in relation to the world events of his time. It places him within the broader context of artists working in war-time environments and illustrates the drive of creativity during the most trying of circumstances. These factors contributed adversely to Beckmann's choices and options in his materials and technique in terms of the long-term preservation of his work. However, the painting offers a palimpsest that captures evolving conservation philosophies, enacted upon a painting that held deep significance for the public university that acquired it. The history of treatment and care contributed to complex problems evident in the current state and condition of the triptych. The most recent treatment sought to use this knowledge of the painting's history to provide a sympathetic resolution to its condition issues while regaining Beckmann's original vision of the work.

### Nanogels: An Investigation into Nanotechnologies for the Cleaning of a Painting by Ernst Ludwig Kirchner / Caroline Hoover and Laura Maccarelli

There is no better exponent of German Expressionism than Ernst Ludwig Kirchner. A founding member of Die Brücke formed in Dresden in 1905, Kirchner's paintings are composed of flat, bold colors. The surfaces feature evident brushstrokes and textures that illuminate the painting process in addition to an overall surface quality that could be matte, dry and unvarnished. Such was the painting, "Still Life with Jug and African Bowl" from 1912, given to LACMA in 2003, before it was varnished in more recent times, a fate of many paintings of this type. In preparation for the reinstallation of LACMA's galleries for modern art, this painting was examined by Paintings Conservation for cleaning. Analyses such as Fourier transform infrared spectroscopy (FTIR) and gas chromatography-mass spectrometry (GC-MS) were performed in order to determine the composition of the paint, the surface dirt and grime, as well as the coating across the surface of the work. It was determined that the coating was likely a water dispersed polyurethane, an unusual coating to find on a painting since it is typically used as a coating for wood. No evidence of earlier varnishes was discovered. While this type of painting with its dry, underbound paints, originally left unvarnished, presents numerous problems for cleaning of any kind, a variety of traditional techniques were tested to reduce the modern coating. For example, free organic solvents rolled over the surface with a cotton swab and an isopropanol Carbopol gel were problematic. The painting technique coupled with the unusual coating, required a new approach for safely reducing this varnish to reveal the original surface. The application of Peggy 6 from Nanorestore Gel, an innovative technology based on a nanostructure matrix of poly (vinyl) alcohol, was found to be the most successful technique to reduce the coating while preserving the surface quality of the painting. The treatment of this modernist painting offers a preliminary study into novel techniques and solutions for solving the complex challenges that are so often associated with modern and contemporary artworks.

# ABSTRACTS

## Objects Session 2

### Her Majesty's Portable Museum: A 19th Century Box of Specimens from the Animal, Mineral, and Vegetable Worlds / Tom Braun

This talk will discuss the treatment of a late 19th century wooden cabinet (a bit bigger than a breadbox), containing approximately 300 specimens from the animal, mineral, and plant worlds, in addition to examples of refined products made from these raw materials. Cabinets such as this were created by Thomas E. Dexter and were part of a royal mission intended to educate military orphans in Britain, and to help them find professions that could sustain them as adults. Specifically Dexter's efforts were directed at the Royal Military Asylum, which at that time, was located in Chelsea, England. Each cabinet was accompanied by several books, also authored by Dexter, which explained the contents of the cabinet as to its place of origin, the manner in which the raw materials were harvested, prepared, refined, and finally manufactured into finished products. Often examples of intermediate stages of the refining process are also present, in addition to the examples of finished products. The cabinet has particular emphasis on the textile industry which was very strong at the time in Britain, but there are also many other specimens related to most other major industries of the 19th century, including farming, ranching, forestry, and mining. The cabinet also emphasizes the breadth of the British colonial system, with many examples of rare and unusual materials only available at the time in faraway lands, and many samples such as these are no longer used commercially.

Treatment of this cabinet involved mainly identifying and organizing the samples, which by the nature with which this cabinet had been used, were highly disorganized. Many samples had to be analyzed before they could be properly re-organized. Many samples as originally labeled were not familiar today, and had to be identified via historical research; for example the reference to mined graphite as "plumbago." Proper labeling of the samples and the sample trays also became an important part of the treatment, to help prevent the samples from getting disorganized again. Some samples such as lead and mercury had toxicity issues that needed to be addressed. Many of the samples will be familiar to conservators as those used to make art and artifacts of many kinds.

### Respecting the Service, Respecting the Surface: Treatment of the Copper Alloy *USS Utah* Ship's Bell and the Development of Treatment Procedures for Historic Metal Surfaces in the Naval History and Heritage Command Conservation Branch / Karl Knauer

**Co-authors: David Krop, Melissa Swanson, Yoonjo Lee, and Abigail Preston Naval.**

History and Heritage Command (NHHC) conservators have been developing methodical, proactive procedures for approaching the treatment of ships' bells in response to frequent requests for display. Borrowers include Navy museums and facilities as well as a wide range of civilian institutions around the globe. The Navy's collections include over 1500 ship's bells and bell-related objects. Bells are symbolically important artifacts often used to convey the histories of ships, their service members, and significant battles. These bells are typically cast copper alloys; others are iron alloys, have nickel or chrome plating, or have painted surfaces. The range of unpainted metal surfaces observed on these bells includes highly polished surfaces, applied patinas, patinas of age, uneven areas of corrosion, and extensive overall corrosion.

The treatment of the *USS Utah* ship's bell represents a case study in developing and utilizing an adaptive treatment protocol. The 775-pound copper alloy bell was recovered from the submerged hull of a US Navy battleship sunk during the attack on Pearl Harbor, December 7, 1941. After recovery, the bell was likely on open display for sixty years. Unfortunately, scant records convey the post-salvage life of this object. When transferred to NHHC's Conservation Branch in 2017, the bell suffered from tenacious corrosion products and excessive yet inadequate mounting hardware. Treatment necessitated resourceful, creative approaches to achieve stabilization including an aesthetically integrated surface and appropriate lifting hardware. This conservation treatment prepared the bell for a rededication ceremony at the University of Utah honoring the 76th anniversary of the Pearl Harbor attack. The Conservation Branch's evolving perspectives on metal surface treatments as well as practical limitations were influential in equipment acquisition and setting up workspaces for the official debut of the conservation laboratory. Potentially novel treatments include the use of zinc oxide as a polishing compound and potato starch micro-abrasive blasting for the selective removal of corrosion products.

### Poultice Desalination Using Buffered Rigid Gel with Ion Exchange Resin / Jessica Abel and Brittany Dinneen

**Co-author: Renee A. Stein.**

This paper presents an innovative method to remove soluble salts from extremely fragile materials, using a buffered agarose gel mixed with an ion exchange resin. Many highly unstable objects that are actively crumbling and/or spalling cannot withstand desalination by repeated immersion in water baths. Alternative poultice treatments can be slower, more difficult to monitor, and less effective at removing soluble salts. Historically, objects too fragile to undergo desalination have been stored in climate-controlled enclosures, which can be difficult to maintain and often prevent examination or display.

Conservators at the Carlos Museum of Emory University were faced with the challenge of stabilizing a 4-inch tall slip-decorated, ceramic vessel (4600-3600 BC) and a 4-foot tall limestone funerary stela from the Egyptian New Kingdom (1292-1191 BC). As the earliest example of Levantine decorated pottery in the Near East collection and one of the few large, relatively intact reliefs in the Egyptian collection, these objects were slated for display in the permanent galleries. Both objects exhibited salt efflorescence, along with crumbling and spalling surfaces; neither was stable enough to undergo desalination by immersion. Microchemical tests, X-ray diffraction, X-ray fluorescence, and thin-section analysis determined the presence of chlorides, nitrates, sulfates, and phosphates confirming that the extreme deterioration exhibited by these objects was the result of salt movement within the low-fired ceramic and marly limestone. Experiments to extract soluble salts were conducted with a wet poultice comprised of buffered agarose gel mixed with an ion exchange resin.

Preliminary testing on mock-up ceramic and stone tiles aided materials selection and method development. This testing will be discussed along with the two case studies. Challenges encountered and overcome during these treatments included mixing large batches of gel, covering expansive and complex surfaces, maintaining a wet system, preventing mold growth, and monitoring desalination progress. Observations and practical solutions will be presented, offering lessons that can be utilized in the future investigation and application of this method. Ultimately, soluble salts were reduced, increasing the stability and resilience of these highly fragile objects, thus allowing them to be made accessible for public appreciation through display.

## Electronic Media Session 3 - Digital Preservation/Storage

### Developing the Digital Preservation Handbook for Video Games and Digital Archives at The Strong National Museum of Play / Hillary Ellis

**Co-author: Julia Novakovic.**

Since 2016, the Strong has implemented major digitization policies to preserve the history of electronic games. Our archive collections include the personal and business papers of key individuals and companies in the electronic game industry, which includes a large amount of digital media. The collection of the International Center for the History of Electronic Games (ICHEG) comprises 60,000 items and growing.

Beyond game hardware and software, we collect the platforms on which they are played, original packaging and advertising, related press and publications, game-inspired consumer merchandise, and other items that illustrate the impact of electronic games on people's lives. There are practical challenges to short-term and long-term preservation planning in this context. Not all formats and carrier media in the collection have established preservation practices in the museum and library professional community. Many existing methods and technologies for preserving video games originate from game collectors and players rather than the conservation community.

The subject of our current study explores how we have adapted multimodal techniques and video game community-supported digital transfer methods in video game preservation at the Strong. In 2016, the museum's digitization working group performed major condition assessment surveys of digital and audio-visual media and wrote the preservation policy for the video game collection. Additionally, we established a digital asset management plan for the museum, devising the RAVE standard (Rare, At-Risk, Valuable, and Engaging) to prioritize collections items for digitization or migration. For example, these condition surveys informed two pilot projects in digitization and transfer of floppy disks and U-matic tapes— the formats identified as most at-risk.

This continued prioritization assists in organizing a sustainable approach to digital projects that centers staff resources and our mid-sized institution's data budget. This year, the creation of a Digital Preservation Handbook aims to establish institution-wide guidelines for each type of digital and audio-visual media. As part of the museum's strategic plan, the Digital Preservation Handbook identifies and documents preservation approaches and decision-making models for video games, archival materials, and collections objects that have a digital component. Produced by the digital preservation team, the collaborative document draws from the expertise of the museum's archivist, digital curator, collections manager, and conservators. In the past two years, the digital games curator has performed condition surveys that examine playability and capture data from two hundred randomly selected games each year. The archives have implemented a similar condition survey to identify endangered media formats in existing collection materials. In drafting the preservation handbook, the team members tested creative problem-solving methods for each carrier media and digital format to develop case studies with documented preservation actions.

As an internal document, the Digital Preservation Handbook communicates to staff the methodology and rationale for digitization actions. An external brief summarizes the work as a document that can disseminate the Strong's capacity for digitization to donors and fellow institutions. For our collective preservation efforts, this document improves our ability to continue to collect and preserve video games, digital games, and born-digital archives.

### Building a Storage System for Digital Art Objects at MoMA: The First Decade / Amy Brost

Ten years ago, in their 2009 AIC talk "A Case for Digital Conservation Repositories," Barbra Mack and Glenn Wharton outlined an approach to documentation and information management for time-based media artworks. Their model aimed to comprehensively organize the characteristics and dependencies of these works in a component-based, non-hierarchical repository ecosystem. Wharton, then time-based media conservator at the Museum of Modern Art in New York, was leading research and development of what would become the museum's Digital Repository for Museum Collections (DRMC).

This paper provides an overview of the 10 years since, including the workflows and technologies employed, and the growing pains during implementation. For collections of digital art objects, this project demonstrates the value of taking the approach that Mack and Wharton outlined, which is technology agnostic but in practice involves understanding and embedding the status of components according to artist-defined values, implementing cataloguing policies, arranging and describing artworks at the component level, exposing technical metadata, and defining relationships between components. What comes to the fore in this history is not the story of technical challenges alone, but also the more holistic story of how the Conservation Department at MoMA ultimately spearheaded the development of a team comprised of colleagues from across the museum to collaborate on the ongoing development of the DRMC. In this way, dialogues with the museum's leaders and specialists in IT infrastructure, applications and database administration, as well as TMS, DAM and Archives, led to practical, sustainable solutions that will involve and benefit stakeholders in the care of digital material across the museum.

### A Cross-Departmental Collaboration to Improve Digital Storage at The Metropolitan Museum of Art / Alexandra Nichols

**Co-author: Milo Thiesen.**

In 2017, staff members at The Metropolitan Museum of Art noticed that some of the digital video files stored on their servers, including artwork files, had become corrupted and could no longer be opened or played. This led to a cross-departmental investigation between members of The Met's Digital, Information Systems & Technology, and Photograph Conservation departments to determine the extent of damage and identify its cause. The corruption had been caused by an unusual bug that manifests when three different programs are used in combination with each other. Over a period of nine months, staff and a Fellow in the Museum's Photograph Conservation and Digital Departments worked to restore the corrupted files. The museum was extremely lucky that none of the affected files experienced irreparable damage. File redundancy and regular fixity checks are essential for monitoring and maintaining the authenticity of digital files. However, implementing these preservation actions is easier said than done, particularly with institutions with large numbers of files and files of large sizes in their collections. This file corruption incident sparked cross-departmental collaboration as means to implement these functions not only for the artworks in the collection, but for non-art digital assets across the Museum.

The authors interviewed colleagues in a number of other cultural institutions to learn more about digital storage policies and solutions currently in place. The authors identified three digital storage software vendors who could provide assistance and perform digital storage functions at The Met, and participated in demonstrations from representatives of each software product. The authors factored in the existing organization and culture of The Met in making their final recommendations. At the moment, these digital storage practices are being tested on a trial basis for the time-based media artwork collection, with the intention that if they are successful, they can be expanded to include The Met's other high-value digital assets. This paper would fit well with the conference theme of Conservation: Reactive and Proactive, as it describes how one museum addressed deficiencies in their digital storage infrastructure and practices and contributes to the evolving area of preventive conservation in the care of contemporary artworks. The hope is that this experience will help other museum administrators, conservators, archivists, and IT professionals who are concerned with the storage of digital files.

## Public Conservation Labs: Reactive or Proactive

### The Art Doctor is In: How the Lunder Conservation Center Broke the 4th Wall / Laura Hoffman and Amber Kerr

Since opening in 2006, the Lunder Conservation Center has taken a proactive approach to public engagement. As the first conservation facility in a U.S. art museum to be fully visible to the public, the Smithsonian American Art Museum's commitment to conservation-related education and public outreach has received world-wide recognition, including receiving the 2008 Keck Award. The center's mission is to engage the public about conservation through public programs, demonstrations of conservation work, interpretive materials, and digital outreach.

To effectively support this mission, the center created a program coordinator position to serve as a collaborator between conservators and other museum departments, such as Education, Public Programs, and Visitor Services, as well as to serve as an educator for our museum visitors. In addition to the public engagement initiatives, the center sets out to inspire new generations of cultural heritage professionals through training and professional development opportunities that expand beyond their traditional practical training skills to include the public engagement experience.

The presentation will begin with a brief historical background and the incentive for building a fully visible lab, detailing the realities of going public and the reactions from the conservation world at the time. It will then focus on the Lunder Conservation Center's evolution and development since opening fourteen years ago—addressing the evolution and growing pains and asking reflective questions: how can we both be proactive in keeping the lab content and interpretation fresh and relevant as well as be reactive to visitor and staff needs today? How do we define success? How do we fit into the institution's overall goals and strategic plan? Additionally, our discussion will cover the prevalence of social media and online outreach. Digital engagement has made conservation more in the public eye than ever before, and we will examine its impact. Lastly, this session will provide an overview of the center's strategic planning and new programming initiatives to enrich our visible labs, expand our public outreach, and engage our visitors through the conservation and preservation of cultural heritage.

### Surviving the Seven-Year Itch: Reflections from Conservators on Display at the Penn Museum / Lynn Grant and Molly Gleeson

In 2011, the Penn Museum's Development Department brought an idea to the Head of Conservation: expand the conservation lab space by putting a second lab in a gallery, on full public view. Funding was secured for two years with the possibility of continued support as funds allowed. Head Conservator Lynn Grant immediately set to work with the Museum's Exhibition Department to ensure that this new public work space would be functional for conservation and engaging for visitors. A critical component of the planning process was the content of the November 2011 conference "Playing to the Galleries and Engaging New Audiences: The Public Face of Conservation" that took place in Williamsburg, Virginia. "In the Artifact Lab: Conserving Egyptian Mummies" opened in September 2012: an immediate hit with the public, the Museum, and University of Pennsylvania staff. The enthusiasm by these audiences has not waned.

Over the last seven years, the Artifact Lab has been staffed year-round, six days a week; resulted in speaking to over 30,000 visitors and with the media

on more than 20 separate occasions; hosted and created programming for over 500 summer campers; and—through the Artifact Lab blog—reunited family members and affected conservation treatments and curatorial interpretation of collection artifacts. The Artifact Lab has been deemed a resounding success by the Museum's Executive Team, and in fact, it seems as if the Museum would be happy to have the Artifact Lab as a permanent fixture. The Conservation Department has felt greatly rewarded by the public interaction and increased profile within the Museum but simultaneously challenged by the ongoing demands. This presentation will focus on reflecting on the logistics and lessons learned, on what the Conservation Department sees as an ideal sustainable future for such a project, and how they are advocating for their position.

### Conservation on Permanent Display: The W. Brooks and Wanda Y. Fortune History Lab at the Indiana Historical Society / Stephanie Gowler, Ramona Duncan-Huse, and Kathy Lechuga

Conservation moved permanently into the public eye at the Indiana Historical Society in 2013 with the opening of the W. Brooks and Wanda Y. Fortune History Lab, a 1,000 sq. ft. interactive gallery and classroom designed to convey the importance of cultural heritage preservation. With a 25' window into the adjacent IHS conservation lab, visitors to the History Lab get a behind-the-scenes look at the daily work of professional conservators and IHS conservation staff play a visible role in the story of Indiana's history. This presentation will offer a virtual tour of the History Lab; describe its development from initial prototype to current iteration; highlight the impacts, successes, and challenges of a permanent preservation-themed exhibit; and discuss ongoing collaboration between conservators, exhibit designers, and educators to sustain and update the space in response to visitor feedback and museum education trends. The History Lab was developed by IHS conservators in close collaboration with staff in Exhibits and the Education and Community Engagement department. An initial protype was installed in 2009 and the development team was proactive in soliciting feedback via focus groups and testing by local Museum Studies students. Extensive brainstorming meetings and breakout sessions between conservators, exhibit designers, and museum educators resulted in language and visuals that convey the why, what, and how of conservation.

The exhibit is centered around 4 tenets – Identify, Examine, Treat, Store – and all components of the History Lab relate back to one or more of these tenets. Highlights of the space include: digital microscopes visitors can use to closely examine paper-based (non-collection) objects; a rotating display of IHS collection materials which have received conservation treatment, with treatment description and documentation photographs; "The Unfortunate Mr. Foster," an interactive touch-screen exploration of damage commonly seen on 19th c. lithographs; videos, wall graphics, and 3-dimensional objects illustrating the materials and processes used to create cultural heritage objects; and a hands-on paper mending activity. The History Lab is staffed by facilitators who receive training from IHS conservators. Facilitators are always available in the gallery to answer questions and interpret complex concepts for visitors; they also instruct visitors in the paper mending activity. Use of facilitators allows conservation staff to go about their regular workflows uninterrupted. Communication between conservators and facilitators about current projects in the lab, as well as the use of abbreviated reports for treatments located on benches near the windows, means that visitors can see and understand what it is happening in the lab even when conservation staff are working elsewhere.

## Book and Paper Session 3

### The Gentling Collection: Establishing a Treatment Protocol for Multi-Layered Works on Transparent Paper / Diane Knauf and Jodie Utter

The Amon Carter Museum of American Art acquired a large collection of works by twin brothers, Stewart and Scott Gentling. The Gentlings were local Fort Worth artists known for their figurative paintings, portraitures, and their seminal book *Of Birds and Texas*, an elephant folio of 50 prints based on their original watercolors. The acquisition allowed for the establishment of the museum's new Gentling Study Center and consisted of over 650 works on paper, a substantial number of personal documents, sketch books, manuscripts, costumes, model ships, and plaster casts.

Many of the works on paper were sketches for finished watercolor paintings, documenting the artists' process. Included were complex multi-layered pieces, comprised of numerous individual drawings on transparent paper taped onto a support to form the desired composition. The final artwork was then created by transferring a tracing of the composition to the watercolor paper prior to painting. Many of the multi-layered works were preliminary pieces for the watercolors in the *Of Birds and Texas* book. The condition of the multi-layered works included heavy layers of surface dirt, planer distortions, brittleness, discoloration, stains, oxidized tapes, and tears. Their structure and the presence of transparent paper made the treatment of these complex pieces far from straight forward.

A treatment protocol was needed that addressed the condition, preserved the structure and appearance, prevented further deterioration, and considered the works as archive items that documented the artists' process. Since transparent paper allows for repairs on the verso to be seen from the recto, can be highly reactive to moisture, and can lose transparency with solvents, treatment with traditional conservation methods and materials was inappropriate for these complex works. Tests on transparent paper samples were performed prior to the treatment of the objects. The tests used both traditional and new methods and materials to determine what treatments would be best suited for these multi-layered works.

Various adhesives and repair papers, including highly transparent nanocellulose sheets, were tested to find the most suitable translucent repair method. Agarose and gellan gum gels were tested in combination with solvents and conductivity adjusted water for potential use on stain and tape removal. Methods of preserving the carrier of the oxidized tape or replicating the tape present were also explored. This presentation will summarize the results of the tests and detail how those results were used during the development of the treatment protocol for the Gentling Collection. It will also examine the complexities of creating a treatment protocol aimed at preventing further deterioration while maintaining the structure and appearance of these multi-layered, preparatory sketches on transparent paper.

### Shiny, Lined, and Brown: Building Conservation Context for Harry Jander's Document Restorations / Sarah Norris and Kathryn Boodle

During six years in the 1940s and 1950s, a document restorer named Harry Jander used a self-devised method to treat approximately 200 maps and many more paper records at the Texas General Land Office. The treatment consisted of coating paper with a mysterious, homemade varnish and adhering a lining of nylon mesh. Treated items are distinguished by their shiny surface and medicinal odor, as well as by Jander's hallmarks of signing his work and trimming the lining with zig-zag pinking shears. Historical accounts described the results as "tough as leather" and "destruction-proof;" today, these treatments have become brittle and strongly discolored.

Archivists exploring Jander's background unearthed a handwritten recipe for his closely-guarded treatment cocktail. This offered tantalizing clues for conservation research. What were the treatment's goals? Was the recipe accurate and complete? Working from the recipe and from remaining treatment examples, this investigation establishes historical and chemical context for Jander's method. Historical touchstones build a frame of reference for Jander's work within 19th- and 20th-century restoration and conservation practices. Connections are assessed between Jander's treatment and overarching treatment concerns of the era: mending and protecting paper, imparting flexibility, and repelling pests. Commonalities are sought with contemporaneous treatment practices, such as lining, consolidation, and lamination.

This work enhances what is known of Jander's biography to create a fuller assessment of his place in the field. Jander's recipe is further assessed with an eye toward its chemistry. The discovered recipe has no mixing instructions; therefore, specific ingredients and the resultant solution are carefully considered. Special focus is given to unusual components like camphor and carbolic acid. Chemical investigation also describes ingredients that may be missing from the discovered recipe. These findings are complemented by informal observations of a modern-day test batch of Jander's recipe applied to varied paper samples.

### Indian Oleographs: Technical Analysis and Modern Treatment Methods / Emily Mülle

The Metropolitan Museum of Art acquired a significant group of chromolithographic prints dating between 1878 and 1930. Mass-produced in India during the nineteenth and twentieth centuries, these Hindu devotional chromolithographs, also called Oleographs, based on their varnished painting-like appearance, represent an important aspect of the country's historical and religious development. In preparation for an upcoming exhibition, they underwent scientific and technical study that included the characterization (and analytical examination via multispectral imaging, XRF, Raman-spectroscopy

and cross-sectioning) of constituents such as papers, coatings, printing inks and varnishes, that places the production of Indian chromolithographs within the global context of experimentation in printmaking.

One aspect of the research focused on the use of multispectral imaging to identify different printing processes and establish patterns that could lead to the attribution of some of these prints to specific studios. Varnish applications were analyzed as a comparative factor to distinguish between early twentieth century Ravi Varma printing studios in India, such as Press Karla, F.A.L. Press Bombay, and Press Malavi Lonavla. The second part of the study focuses on the conservation of the prints. Insect damage in the form of multiple losses and skinned paper represents a frequent phenomenon in collections housed in South Asia. Using the conservation of this print collection as case studies, modern treatment techniques, such as a laser- and (crafting) cutting machines are tested to adjust infills in an appropriate and efficient way. Furthermore an overview on historical repairs of the collection's chromolithographs is given and the question of ethical recognition of historic treatments and aesthetical expectations is discussed.

### The Read Muraqqa' Leaves: Disbound Persian and Indian Album Leaves at the Morgan Library & Museum / Bonnie Hearn

The Morgan Library & Museum holds a collection of 57 Persian and Indian leaves acquired by J. Pierpont Morgan from Charles Hercules Read in 1911. The Read album leaves are mostly double-sided, depicting miniature paintings and calligraphy that date between the early 16th century to late 19th century and have been divided into two groups, one "Persian" leaves (M.386.1-21) and the second "Indian" leaves (M.458.1-36). Most of these single leaves were once bound in muraqqa's (albums), and likely would have been presented in paired openings, two miniature paintings followed by two calligraphies, characteristically surrounded by decorative rulings and borders. Muraqqa' is a Persian word meaning "patched" or "patchwork" and adequately describes the nature of both the construction and use of these albums.

Muraqqa' leaves are pieced together physically with many layers of paper and albums often include paintings and calligraphy spanning many years, decades and even centuries apart. Persian albums appear from the early 15th century in Timurid Herat and developed further during the 16th century in Safavid courts, spreading from Iran to India, Central Asia and Turkey. Created in workshops and commissioned by emperors and courts, these albums were luxury objects detailing events, history and rulers of the time. They were used for intimate viewings, treasured and passed down within royal families and reformatted as ownership changed. By the late 16th century albums were created and used for a wider audience and were no longer exclusive to royal courts. Album pages were created to easily separate for the purpose of reformatting, reassembling, and adding more leaves.

This inherent trait was eventually exploited in the 19th and 20th centuries by dealers that had albums disbound and leaves split to increase profit. This has led to dispersed muraqqa' throughout museums and collections around the world, consequently making the study and attribution of single leaves challenging. Few of the Read album leaves have been split and although the leaves came into the Morgan collection disbound, many have the remnants of cloth hinges indicating past codex and accordion style album bindings. Since acquisition, the leaves have been used and handled variably in relation to conservation, exhibition, research, travel, and loan. Although all 57 leaves are currently housed in archival overthrow storage mats stored inside solander boxes, the different uses for each leaf are apparent according to housing materials and function.

As the housing of the Read album leaves vary depending on past use, the condition of these leaves follow accordingly. For example, leaves recently exhibited have undergone recent conservation treatment while those that have not been on display for many years, if ever, have not undergone thorough conservation examination in recent times. This presentation will detail the condition and housing survey undertaken to identify conservation concerns of the collection, a study of the materials and techniques used in creation, as well as conservation treatment of the Read muraqqa' leaves at the Morgan Library & Museum.

## Book and Paper Session 4

### PAPER – It's More Than That: A Syntax for Excruciatingly Thorough Descriptions / Jan Burandt

Drawings and prints tell a graphic story that is – in a visual sense – deeply dependent on the substrate on which they lie. Artists engaging with paper must choose from an astonishing array of substrates. Paper displays profound diversity of character resulting from the variances of fiber, formation, texture, thickness and many other attributes. A one-word description of paper will suffice for most public-facing medium descriptions – but without nuance. With conservation controlling the content of an "extended medium" field in the Menil Collection's database, an expanded standardized style guide for thorough physical characterization of paper was developed.

A lengthy list of characteristics is brought together in a syntax that reads as a descriptive meditation on paper. This extended support description resides in the extended medium field in the Menil Collection TMS database in conjunction with medium descriptions following the Menil Collection's adaptation of the Philadelphia Museum of Art's Descriptive Terminology for Works of Art on Paper: Guidelines for the Accurate and Consistent Description of the Materials and Techniques of Drawings, Prints, and Collages. The Print Council of America Paper Sample Book: A Practical Guide to the Description of Paper also serves as a reference. Using these standardized guidelines together during examination of drawings assures both a thorough and consistent exploration of paper. The resulting description allows readers to build a richly nuanced vision of paper and medium through text alone.

### Handle with Care: Treatment, Care and Prevention as Applied to East Asian Scrolls / Yi-Hsia Hsiao

With growing, global interest in East Asian culture there are increasing requests by scholars and art institutions to view East Asian Scrolls through loan exhibitions and in house research. Museums such as Freer/Sakler Art Gallery have been offering a series of annual workshops for teaching museum staff how to properly handle East Asian Scrolls. Because East Asian scrolls have problematic conditions that often result in common damages, there is a need for greater awareness of preventive methods. It is imperative, then, that people who handle these scrolls have a deeper understanding of their structures and how they are made. An East Asian scroll is known for its rolling system. This system increases efficiency by minimizing the amount of space used for storage as well as decreasing the cost for transporting. However, the complexity of the rolling structure and the vulnerability of material make it difficult to prevent damage such as creases and tears while handling. Unlike the more static character of framed art, frequent rolling and unrolling of scrolls challenges these fragile artworks. An East Asian scroll is neither composed with a single layer, nor a completed sheet of paper or silk. It is a complicated structure of artwork that could be damaged if displayed, handled or stored in an inappropriate way. The common damage issues of East Asian Scrolls should be discussed by describing the components used in making East Asian handscrolls and hanging scrolls and emphasizing their fragility.

To forestall the potential damages throughout, three issues will be outlined: display/exhibition; storage; and handling by scholars during close inspection and study in house. For display, an exhibition team in a museum needs high standards. The close collaboration among the designers, mount makers, curators and conservators in the Cleveland Museum of Art will be used as an illustration for safe and aesthetically beautiful displays of East Asian Scrolls. For storage, different rolling systems to store the scrolls in different East Asian conservation labs within the United States, as well as systems from other countries, will be compared and contrasted. Conservators can not always be on-call for requests by scholars to handle the scrolls. One of the most effective preventive methods for handling is the use of "support pillows" that can be custom made ahead of time with different lengths and widths. The methods of making these "pillows" and the effectiveness of their use in creating a more gentle rolling procedure must be demonstrated to those who handle the scrolls. Finally, as mentioned above the training must be made available to museum staff in order to reinforce and to refresh their knowledge of these three issues. In this way, new discussions in regards to sustainability can continue on a yearly basis.

### Sustainability with Regards to Intangible Culture: How the Increasing Scarcity of Craftspeople Impacts the Traditional Remounting of a 12th Century Japanese Buddhist Painting on Silk at the Cleveland Museum of Art / Sara Ribbans

Traditional remounting of Japanese paintings is reliant on materials, such as paper and silk, and traditional tools made by craftspeople who are often themselves recognized as living treasures. In the past, there was much demand for these materials as the traditional home always had a place, known as the tokonoma, where a hanging scroll would be hung. As Japanese homes modernize, the tokonoma has been eliminated and families no longer purchase hanging scrolls. This, in turn, has reduced the demand for mounting

materials and created a situation where it is difficult for traditional craftspeople to continue working.

The number of apprentices learning these crafts has also greatly decreased, not necessarily from a lack of interest, but due to the inability of studios to hire and train the younger generation at a reasonable salary. Studios that were once passed down through the family are closing as their children find more financially stable careers. Understandably, high quality materials have increased in cost but this has created a situation where the price of remounting paintings has become too expensive for the average customer. Therefore, new mountings are increasingly done with cheaper materials, such as papers containing pulp and synthetic textiles, while also using methods that cut down on time and effort in order to cut costs. As these materials and methods do not age well and are not reversible they cannot be applied to artwork in Museum collections. It is therefore necessary to support existing craftspeople as much as possible, adjust the method of purchasing materials, and adjust treatment methods slightly to the changing environment. The fluctuating materials situation and its impact on the remounting of a hanging scroll is demonstrated through the treatment of a 12th century Buddhist painting on silk from the Cleveland Museum of Art's collection.

## Electronic Media Session 4 – Web Software

### *El cuarto del Quenepón:* Collaborative and Cross-Disciplinary Approaches in the Preservation of Time-based Media on the Web / Amye McCarther, Caroline Gil, Danielle Calle, and Claire Fox

In 1995, Puerto Rican visual artist and designer María de Mater O'Neill created the cyber zine *El cuarto del Quenepón*, the first electronic publication devoted to cultural production in Latin America and one of the first Spanish-language electronic publications in the world. Taking its name from the artist's graphic design studio, O'Neill envisioned the website as a cultural space - a contribution towards the community - with the purpose of spreading the vitality and diversity of Puerto Rican culture to a global online audience. Central to *Quenepón* was its cultural projects section, which presented the work of a series of artists and writers from Puerto Rico and across Latin America, the USA, and other Caribbean islands.

A multidisciplinary platform that presaged the digital ecosystem of cultural production today, the site hosted the first digital library specializing in the contemporary cultural production of the Caribbean and served the online transmission of conferences via video, audio, and live chat. The site further acted as a hub of cultural activity, publishing news, artist calls, calendars of events, and an e-mail directory of artists, writers, curators, galleries, and museums., *Quenepón* is both a unique cultural document and an artistic work in its own right. An early adopter and producer of online content, O'Neill was only the second individual in Puerto Rico to install an internet connection at her home in San Juan. The original site was designed to be rendered in Mosaic, an early precursor to Netscape, and continuously evolved in step with emerging multimedia and browsing technologies until its close in 2005.

O'Neill, who continues to practice as a designer, art director, educator, and scholar, has noted her concern over the inaccessibility of *Quenepón* due to technological obsolescence of proprietary tape drives used for data backups and native browsing environments, as well as the broader threat posed to Puerto Rico's design heritage due to lacking technological infrastructure in the wake of ongoing economic austerity. In 2019, while visiting Puerto Rico to participate in the APEX (Audiovisual Preservation Exchange) Program, a group of conservators and students from MoMA, New Museum, and the NYU Moving Image Archiving program connected with O'Neill to evaluate the possibility of migrating and preserving the data backups of *El cuarto del Quenepón* and restoring the site to its original function so that researchers in Puerto Rico and beyond may once again access this rich document of the island's cultural past.

This presentation will report on the process of restoring the website from elements stored on data tapes and optical media, and efforts to realize its original functionality via a spectrum of emulated production and browsing environments. This interdisciplinary project highlights the importance of partnerships between the embedded knowledge of artists and the expertise of time-based media conservators in identifying and preserving cultural materials that fall outside the bounds of institutional collections or that exist in regions where institutional resources have been impacted by economic austerity.

### "Self-Documenting" Mode for Data and Software-Based Installations / Diego Mellado Martínez and Francesca Franco

This paper presents a method that allows external data-driven software-based works to keep a record of the data used as input. This method will prevent the artworks from failures when sources are no longer available. It also provides information on how the artwork was at a given, past moment. For the last five years, Daniel Canogoar's studio has developed several software-based artworks based on different data sources, accessed through the internet, e.g., Youtube (Cannula, 2016), weather information (Echo series, 2017) or stock market values (Xylem, 2017). In order to protect the artwork from not being rendered, the software implements a function to store the input data used to generate the output—whether YouTube videos, wind speed in a given city or the value of commodities. Data stored with timestamps is linked to a specific moment in time. If the source is not available the artwork would read those stored past values to generate its output. This change in the mode of operation can be made explicit to the public in different ways, affecting or not on the visual aspect of the work.

Programmed from the beginning as part of the artwork, represents conservation from the production and a way of preventive conservation. Storing the input data is not new or exclusive for Studio Daniel Canogar. Ernest Edmond's *Shaping Space* (2007) stores a processed version of the captured data; or Jose Carlos Martinat's *Brutalism: Stereo Reality Environment 3* (2007) that stores previous recollections of data. Rafael Lozano-Hemmer's *Pulse Index* (2010) stores data as accumulation to render the artwork itself. Other works, such as Siebren Versteeg's *Untitled Film II* (2006) had to reconceptualize the origin of data—from a live feed of newborn names to a database of most frequent names—once the data source was no longer available. All these forms of data accumulation could be understood as self-documentation, applied in different ways. In the case o Daniel Canogar's studio, the use of stored data leads to what the studio calls "demo-mode": an incomplete version of the artwork, that makes reference to the demos—incomplete or limited in functionality—of software and video games, very present in computer magazines in the 90s.

It is questionable if the artwork is still "the artwork" when entering this demo-mode. As defined, the artwork retrieves live information from external sources. Instead, it would be using past values to render the content again. In that sense, the artwork would show a past iteration, which can be understood as documentation. Similar to pictures taken from a painting or videos from a performance, the spectator would see a past representation. This time, not only the media but the "support" of the artwork would be those of the documentation. This paper analyzes this tool as an aid for the conservation of works that need to access external data and systematize it, how conforms a documentation mode of the work and tries to generate debate around the definition of the artwork when it enters this documentation mode.

### Conservation of a Software-Based Sound Installation: MoMA's Restaging of David Tudor & Composers Inside Electronics Rainforest V (Variation 1), or Rainforest in the field / Caroline Gil

The late artist's practice, the Rainforest series and its assorted versions–stretching over decades—are constructed upon experimentation and constant change, rarely being assembled or performed exactly the same way twice. MoMA's recent acquisition, restaging and reperforming of Tudor's Rainforest V (Variation 1) done in collaboration with members of Composers Inside Electronics (John Driscoll, Phil Edelstein, Matt Rogalsky and Ed Potokar) brought forth an institutional examination of the potential practice of collaborative modes of conservation that places the work at a "point in a continuum." For Rainforest V (Variation 1) CIE conceived a customized, self-running sound environment using control software (Max/MSP patches) and a sound library of more than a hundred audio files. Twenty objects are affixed with audio transducers, essentially making each object a speaker without a cone. The objects are then suspended throughout the space to create a visual and acoustic environment. Audio files are relayed to the transducer via speaker wire – intended to create a resonant effect or in Tudor's own words, a "loudspeaker-object." Computer software has an unparalleled potential for creating and manipulating sound, visual programming languages such as Max/MSP/Jitter endow artists with tools that automate, shift, and alter signal sources in real time as one could with a hardware modular synthesizer. Max programs or patches are made by arranging and connecting object blocks within a visual canvas. These object blocks behave as self-contained programs, but under the hood are dynamically linked libraries that can receive an input and generate an output. A conservator or artist may approach these

patches and software programs as a means to an end for installing the work, but they may also contain the salient logic or acoustic tuning schemas and retain a critical aspect of a performance at a given time.

Taking into consideration previous research on conservation documentation of sound artworks, this talk will describe methods for documenting and assessing the condition of sound art; including analyzing audio files and evaluating the material value placed on artist provided control systems as part of an electronic chain. Just as media art installation derives meaning through a system of interconnected components, this talk will reflect on how works that use this technology compel conservators to work through a coordinated web of signification in order to document the work-defining properties that will enable the feasible restaging of the work in the future.

## Photographic Materials Session 2

### Past, Present, and Future of the Collaborative Workshops in Photograph Conservation / Margaret Wessling and Nora Kennedy

The Collaborative Workshops in Photograph Conservation Committee is celebrating 10 years of programming following a generous endowment from the Andrew W. Mellon Foundation to the Foundation for Advancement in Conservation for the support of continuing education in photograph preservation. The grant has been overseen by a rotating advisory committee and representatives from FAIC and has offered varied programming covering treatment, identification, characterization, analysis, and preservation of photographic materials. The grant arose from a workshop series initiated by Debra Hess Norris and Nora Kennedy in 1997 that strove to meet the training needs of photograph conservators and those who care for photograph collections. Programs have taken the format of 15-20 person workshops, symposia of up to 200 people, and the globally viewed web series "Photographic Chemistry." Topics in development for future programs include identification and care of inkjet prints, care of large-scale photographs, identification and treatment of 20th century negatives, and identification and characterization of photomechanical processes. Looking to the future, the Collaborative Workshops in Photograph Conservation Committee would like to solicit ideas from the AIC community for programming that will continue to serve the needs of photograph preservation professionals and continue the collaborative spirit of the past programs.

### Fifteen Years of Teamwork: Teaching Photograph Conservation in Central and Eastern Europe / Monique Fischer

When the Northeast Document Conservation Center (NEDCC) began the initiative to train Central and Eastern European conservators in photograph conservation, there wasn't a single professional in the region trained in this specialized field. The aim of the program was to raise awareness among institutions about the preservation needs of the region's valuable photograph collections and teach a highly specialized skill. From 2003-2008, NEDCC worked in partnership with the Academy of Fine Arts and Design (AFAD) in Bratislava, Slovakia; the Conservation Center at New York University; the Metropolitan Museum of Art (MET) in New York City; the Getty Conservation Institute (GCI) in Los Angeles, California, and George Eastman Museum (GEM) in Rochester, New York to provide local basic training workshops in photograph conservation to professors, conservators, and students in Central and Eastern Europe. In addition, each year from 2004 to 2008, four participants were chosen from the Bratislava workshops to travel to NEDCC in Andover, Massachusetts, for a three-week long program, where they received further training. All-day sessions gave students ample opportunity for hands-on practice of treatment techniques and lectures under the supervision of instructor Gary Albright, Photograph Conservator in private practice. The workshops and training programs in both Slovakia and Massachusetts led to the further evolution of the program and helped NEDCC identify qualified individuals for advanced internships.

The collaboration was expanded in 2010 when a Photograph Conservation Internship program was established. The internship initially responded to the need for more in-depth training and practical experience for photograph conservators in Eastern Europe. It was designed to provide advanced hands-on training for one individual at a time in photograph conservation. The interns, a talented group of young professionals, will now help set the future course for the preservation of important photograph collections in their respective countries and throughout the region. During a fifteen-year period, over 40 conservators, teachers, and graduate students from eleven countries have received training in photograph conservation through NEDCC's programs. This training brought together conservation professionals from the Central and Eastern European countries to study conservation of photographic materials, and to build valuable and lasting connections.

### Strengthening the Preservation of Photographic Materials in Latin America: Celebrating 30 Years of APOYOnline / Beatriz Haspo and Amparo Rueda

Founded in 1989, APOYOnline – Association for Heritage Preservation of the Americas (formerly Apoyo), is deeply committed to strengthening exchange and global professional networks, and sharing technical conservation information across Latin America, the Caribbean region, and other Spanish and Portuguese speaking countries. In recent years, many APOYOnline efforts have focused on bolstering the preservation of photographic collections by providing access to hands-on training and professional development, grant funding to attend workshops and conferences, organizing the donation of preservation materials, and improving access to technical knowledge through translations. These initiatives include three workshops on photograph conservation that brought international experts to Colombia, Cuba, and Brazil, and the establishment of two new scholarship funds: the José Orraca Memorial Fund to promote Photographic Conservation in Latin America and the Toby Raphael Memorial Fund to Promote Preventive Conservation in Latin America. These scholarships have already facilitated the attendance of professionals and students from across the Americas to the recent 2019 Photograph Conservation Workshop in Rio de Janeiro, Brazil.

In addition to theoretical knowledge and hands-on study provided through workshops, conferences, and translated technical resources, APOYOnline organized a 2018 donation campaign to send preservation supplies to Cuba after Hurricane Michael devastated several cultural institutions. APOYOnline has also provided direct assistance in rehousing archival and photographic collections through the "Manos a la Obra" ("Helping Hands") volunteer event. This presentation will outline several APOYOnline initiatives and highlight their impacts on the preservation of photographic collections in the Americas.

## Concurrent General Session: External Forces in Contemporary Art Conservation Session 1

### Exposing Deterioration and Gradual Conservation Treatment of Works by Gustav Metzger as a Way of Broadening Modes of Understanding Reception and Conservation of Contemporary Art / Mirosław Wachowiak

After fifty years of being kept in shred, dozens of early painting of Gustav Metzger were rediscovered. It was unexpected surprise for the artist famous as autodestructive art and manifests creator dealing in his works with memory, oppression of systems, history and technology, performing deterioration of objects and exposing their imperfect, fugitive, organic, impermanent nature. Paintings stored in very bad conditions were dirty and significantly damaged by fungi. Thick deposits of dust, deformations of the support and dramatic flaking were ironically expressing ideas of the artist fascinated with decay.

The real condition of the 24 works that arrived ten days before the exhibition opening was misjudged and needed conservation treatment in a degree strongly underestimated by the curators. In order not to abandon paintings from display, after conferring with curators, artist's assistant and the artist it was decided to undertake the most necessary steps of conservation treatment before the opening. Subsequently works were going to be exposed in still visually "bad" state and later - gradually conserved and restored during the time of display. It enabled not to exclude paintings from the show and represent their history of the oblivion and poor storing. Moreover the organic forces and damaging factors appreciated by the artists became visible. Importantly it exposed also conservation and restoration process it-self, curatorial and arrangement dilemmas.

Step by step changed condition shown subjectivity of the moment of the proper display and the conservator's decision to stop his work. The solution attracted visitors to return to check on the progress and actual "state of the art." All the works were disinfected and undusted before the opening. Two most damaged works had to be finally excluded from the show. Only few of them were thoroughly cleaned before hanging. Week by week works were gradually cleaned, some of them filled with putty but not in-painted at the beginning of the exhibition. Two were exposed showing different phases of cardboard support regeneration. Some works had other works' paint flakes

and priming embedded into their paint layer, causing other challenges. Remnants were slowly removed from the surfaces. The biggest - significantly damaged but stable canvas paintings - was shown untreated through all the exhibition time.

This controversial exposition unveiled conservation process, object history and underlined autodestructive attitude of the artist to his art. It questioned the readiness of objects for display and the necessity of conservation treatment. The works were not only protected from being excluded from the "Act or perish!" show in the Centre of Contemporary Art in Toruń, but brought important added value to the perception of the individual works, exhibition it-self as whole and the artist oeuvre understanding. It also broadened understanding of the act of conservation and restorers profession and its significance and influence on the different modes of appreciation of contemporary works of art.

### Fugitive Gestures: Contemporary Art Conservation and the Obsolescence of Practice / Hélia Marçal

The conservation discipline has set itself to transmit cultural objects to future generations. But what can we do when the context where those objects exist and thrive ceases to exist? This presentation will explore some of the ways the obsolescence of cultural and bodily practices impacts the preservation of contemporary art. Drawing on the notion of "obsolescence of practice," two case-studies and several other examples from Tate's collection, will explore the ways in which cultural practices have become crucial for sustaining, transmitting and preserving these artworks.

Cultural objects have always been context-dependent. Changes in the social significance of archaeological and ethnographic objects, for example, has been explored by several authors since the mid-1980s (cf. Appadurai 1986, Clavir 1987, 2009). Contemporary artworks involving some degree of interaction, performance, or site-specificity, are however, typically dependent on cultural practices to be activated or experienced. That is the case of the bodily practice involved in navigating a website or experiencing a contextual installation, but also when performing an artwork in a given context. Some of those practices are rather fugitive, elusive, hard to pin down, and even harder to document and preserve. Although the overarching idea behind an "obsolescence of practice" is yet to be systematically explored, it has been theorized by scholars in the social and human sciences, namely in the fields of decolonial theory and material culture (e.g. Ogbechie 2005), heritage studies (e.g. Kirshenblatt-Gimblett 1998), design (Leong and Clark 2006), or media studies and history (e.g. Burges 2018). The field of memory studies has also recently introduced the concept of "memory ecologies" to study cultural practices of memory and transmission, and what is remembered and forgotten (Hoskins 2006). By focusing on interactions between material and discursive practices, the notion of "memory ecologies" highlights the relational nature of the objects and their contexts.

In the context of this presentation, the notion of "memory ecologies" will be used to study the case-studies in detail, mapping their cultural infrastructures and dependencies, and understanding the skills and practices that are maintained outside the realm of the museum. In exploring the ramifications of these external dependencies, the presentation will explore documentation strategies developed to accommodate forms of embodied knowledge. In doing so, it will also explore some of the ways the museum can proactively reflect on the inevitable obsolescence of cultural practices: by reframing the role of the conservator, introducing new forms of participation, and reflect on what it means to conserve these works in an ethical and sustainable way. This presentation fits with both the theme of the meeting - Conservation: Reactive and Proactive and the theme of the Contemporary Art Network Concurrent General Session on External Forces in Contemporary Art Conservation.

### Hans Haacke, *News*: A Case Study on Migration and Cross-Institutional Collaboration for a Conceptual Software Based Artwork / Mark Hellar and Daniel Finn

Hans's Haacke's' *News* was first realized in 1969, for the "Prospect 69" exhibition in the Kunsthalle, Düsseldorf. Haacke presented the concept of the work as follows: A telex machine installed in the Düsseldorf Kunsthalle prints all the news communicated by the German press agency DPA. The printouts were put on display for further reading one day after being delivered, and on the third day, the rolls of paper were labeled and dated, then stored in plexiglass containers.

The work was reconstructed in 2005 for an exhibition at the Paula Cooper Gallery in New York. In this manifestation, the telex machine was replaced with a dot matrix printer which was fed from a software program that gathered news from Really Simple Syndication (RSS) feeds via the Internet. SFMOMA acquired *News* in 2008 and displayed in this form for the exhibit, "The Art of Participation 1950 to Now." In 2017 the museum exhibited again for the "Nothing Stable Under Heaven" exhibition.

In preparation for the exhibit, it was determined that the computer source code needed a complete migration, and a complete rewrite of the software was completed. As an instruction-based, conceptual art installation, *News* varies significantly from iteration to iteration, including the instructions themselves. When the Smithsonian American Art Museum (SAAM) loaned the work from SFMOMA in 2018, all that changed hands between the museums was the most recent source code. The materials for the installation are sourced new for each install, and the code must change to accommodate new specifications from the artist.

As every component of the work changes with each iteration, extensive collaboration between the artist, developers, conservators, curators, registrars, and exhibition designers is essential to a successful realization of the work. In this talk, we will have a detailed look at the process of migrating the software and what it entailed. We will reflect on the collaboration that took place with the artist studio in the process to maintain the authenticity of the work. Additionally, we will share what was learned from cross-institutional partnerships in loaning a conceptual software-based artwork.

## Electronic Media/Contemporary Art Joint Session

### Perfect Sound Forever: Addressing Intermittent Functionality in the Permanent Installations of Max Neuhaus / Meaghan Perry and Sarah Thompson

Pioneering sound artist Max Neuhaus (1939-2009) was known for his innovative "sound installations," nonvisual artworks that use aural perception to alter the qualities of a specific space. Prior to his death, Neuhaus was exploring new technologies, such as automatic gain control and website-controlled calibration systems, that he believed would allow his software-based audio works to self-regulate indefinitely.

Despite the artist's efforts, several of these works became only intermittently operable within a few years of their installation. Building upon the work discussed by Brad Epley and Sarah Thompson at the AIC Annual Meeting in 2018, this presentation follows the continued process to conserve the Menil Collection's *Sound Figure* (2007), and explores the cultivation of collaboration across disciplines and between institutions charged with the care of related works. Menil Conservation enlisted the expertise of programmers, engineers, and other consultants to address technical aspects of *Sound Figure*'s treatment, including code resituation and disk-imaging. Concurrently, interinstitutional collaboration enriched the understanding of *Sound Figure*'s significance within Neuhaus' larger body of work and informed further treatment decisions. Treatment outcomes, documentation strategies, and improvements to the Menil's digital preservation policies will be discussed, as will forthcoming plans to further scholarship of Neuhaus' software-based audio installations.

### Developing the Joan Jonas Knowledge Base: An Open Access Digital Resource / Glenn Wharton, Deena Engel, and Barbara Clausen

In this presentation, research collaborators behind the Joan Jonas Knowledge Base (JJKB) will review the soon-to-be-launched digital resource housing information about the multimedia and performance artist Joan Jonas. Open to the public, the resource will be of use to conservators, curators, and other researchers who seek to learn more about the artist's work. In addition to interviews, photographs, notebook scans, and biographical information about the artist and people she has worked with, the resource will feature studies on important exhibitions and two key early works, *Organic Honey* (1972/73) and *Mirage* (1976/2004/2008).

Through the JJKB, the researchers strive to communicate the artist's point of view as well as the history of her early works as they transitioned from performance to video and multimedia installations. The authors will discuss the challenges that documenting Jonas' installations and performances pose with respect to software selection and design along with a focus on the role of linked open data in conservation research. The JJKB is a project of the Artist Archives Initiative, an interdisciplinary research effort dedicated to creating and developing open access information resources for individual artists.

The motivation behind the initiative is the growing need for searchable, digital sources built with flexibility to support discoverability on studies of complex contemporary works in ways that counter the constraints of traditional highly structured databases. The research undertaken by the Initiative's collaborators places equal emphasis on the work produced by individual artists, their concerns for public experience of their work, and appropriate technologies to archive and make information accessible to the public. In addition to developing models for artist-specific information resources, the initiative aims to stimulate discussion on topics related to the future of today's art, including authenticity, authorship, and artwork integrity.

### Examination and Assessment of AI in Contemporary Artworks: Is It Possible to Preserve the Algorithm? / Julia Betancor, Daniel Finn, and Ana Mata

When artificial intelligence creates the work of art, (it is possible to preserve the algorithm) and it is then when there are no limits. The preservation of Artificial Intelligence is a new challenge. Conservators need to find a balance between the preservation of original materials, the evolution of the algorithm, and the latest content the algorithm produces. What tools do we have to preserve these works of art for the future?

AI intersects with many ethical, political, and philosophical issues, but it also poses immediate technical challenges... Are we prepared as art stewards to adapt to automatic learning? The conservation of this type of work is a challenge for curator-restorers, not only in material terms but also conceptually. This paper will provide a case study of the 2018 AI artwork by Mario Klingemann (AI's godfather) "Memories of Passerby 1" (2 screens and an autonomous machine). The work commissioned by Coleccion Solo, and ONKAOS, a collection promoter based in Madrid and a world leader in representing artists working with technology. Conserving a neural network is a challenge, not to speak of the visual output of the piece, 4K video produced in real-time 24 hours a day, and will never repeat the same image. What are the agents of AI deterioration? How do we manage the integration of monitoring and the creation of a regular basis for an AI Status Report? Is it a machine that recreates patterns, or is it an evolving brain creating an infinite ephemeral form? How is this information stored? How do we catalog this work? Is it a human action with the character of a happening? Therefore, one critical questions are ho is the generator of the work, the machinery, or the artist? What we need to preserve are Output Art-Input data-Software/algorithms ("the neural network")-Hardware.

Although contemporary art media are becoming more frequent in collections, new technologies pose new documentary problems. Many of us have to review, readapt, and in some cases, generate specific reports when new artworks enter the collection and do not fit within existing documentation practices. Therefore, it is necessary and substantive that conservation-restoration unite international collaborative efforts that will bring new knowledge and solutions to carry out this work. In this case, an international interdisciplinary team has been created, which will result in new and better workflows, providing options for professionals concerned with the preservation of artworks incorporating AI technology. The machines want us to spend time with them, for the first time, they are asking us to take care of them, indeed. How to deal with "deep learning algorithm" systems?

## Untold Stories

### Untold Stories: Preserving Cultural Landscapes

Our world is at a critical juncture where, as global citizens, we are confronted with urgent questions such as how to address devastating climate change, how to counter increasingly violent rhetoric about who "belongs" and does not belong in our societies, and what place the arts and cultural institutions have in responding to painful histories and on-going injustice to build a vision for a more equitable, sustainable future. The 2020 Untold Stories theme, "Preserving Cultural Landscapes," focuses on the landscape of the state now known as Utah, and invited panelists who consider this landscape as one that has been shaped in part by many histories of use as well as violence. What lessons can we learn from the palimpsest that is this cultural landscape, and how might we begin to shift our perspectives on our responsibilities as conservation professionals to the lands we now inhabit?

Untold Stories 2020 features Kimi Kodani Hill, Alessandra La Rocca Link, and Jacqueline Keeler. More information about this event is available at https://www.untoldstories.live/aic-2020.

The mission of Untold Stories is to pursue an art conservation profession that represents and preserves a fuller spectrum of human cultural heritage. Our work expands the ethical framework for art conservation by recognizing and conserving a broader range of cultural heritages; embracing a more diverse set of conservation practices and practitioners; and affirming the deep emotional connection between objects and sites of cultural heritage and the communities that claim them. Untold Stories is supported through generous funding by the Andrew W. Mellon Foundation. For more information, visit https://www.untoldstories.live.

## Research & Technical Studies Session 2

### Comparing DART Analysis to Traditional Wood Anatomy for the Identification of West African Woods: Research at the Smithsonian National Museum of African Art and Museum Conservation Institute / Julia Campbell-Such, G. Asher Newsome, and Cady Lancaster

In the field of African Art Conservation, understanding which species of wood was used to construct an artwork enriches our understanding of the object; it may help us develop a provenance for a piece of artwork, connect it to a particular cultural community, or help us determine the historical time in which it was made. In addition, museums must comply with increasingly strict regulations on the international transport of goods made from endangered plant species; reliable species identification of the woods used to make art will help to protect art objects when they travel. Wood genus and species are traditionally identified by anatomic and micro-anatomic features, but to do this with accuracy requires specialized training, access to reference materials and databases, and many years of experience. A relatively large sample must be taken from the object, and, most often, woods cannot be distinguished beyond the genus level by their cellular anatomy.

Recently, alternate methods of wood speciation have been developed that rely on the chemistry of different species rather than on their anatomical characteristics. Wood identification by Direct Analysis in Real Time (DART) Mass Spectrometry is currently being used by the National Fish and Wildlife Service's Forensic Lab as a practical technique to aid in the prevention of trade in endangered woods; the Smithsonian National Museum of African Art, in collaboration with Smithsonian's Museum Conservation Institute, is currently researching the potential of this tool to aid in the speciation of woods used in African art.

In 1998, the conservation lab at the Smithsonian National Museum of African Art received a donation of 62 wood samples from Ghana, labelled with botanical and local names. These samples were donated for use in the identification of woods in the museum's collection; current research compares DART analysis with traditional microanatomical identification by performing both techniques on the same sample set. The primary goal of this project is to provide an initial, practical assessment for working conservators of the potential of the DART technique for the identification of wood species in art and cultural heritage collections.

The project is also investigating the compatibility of the US Fish and Wildlife technique with the Smithsonian's own instrumentation to determine how easily this technique can be transferred to facilities with slightly different capabilities. This comparison demonstrates how useful the database of DART spectra for wood species managed by US Fish and Wildlife may be for analysis done in other contexts. The larger goal of this project is to contribute to the database of DART spectra of known woods, which is still being developed, and which has the potential to be a valuable resource not only for cultural heritage research and preservation but also for researchers in other fields such as plant biology, ecological conservation, and the protection of endangered species.

### Evaluation of Angle-Resolved X-Ray Fluorescence for Stratigraphy Elucidation in Paintings / Antonio Martinez-Collazo, Cristyan Quiñones-Garcia, Gabriel Martinez-Gonzales, and Danielle Chavis

X-ray fluorescence (XRF) spectroscopy has become a widely used technique in the identification of pigments in paintings. The portability and ease of use of portable XRF instruments has contributed to this popularity. Nevertheless the interpretation of spectra may become complicated due to matrix effects and the presence of a layered or stratigraphic structure in the analyzed piece.

We have explored the acquisition of spectra at normal and glancing angles in order to aid in the interpretation of XRF spectra of layered structured paints. Bi-layered samples of acrylic- and oil-based paints were prepared on 75 mm x 75 mm-foam board supports; each layer being approximately

0.15 mm thick. XRF spectra were collected with an AMPTEK 123 outfitted with a 6mm2 Si-PIN detector with 0.5 mil Be window. The x-ray source was a Mini-X source with an Ag anode using power settings of 25kV and 40μA. The spectrometer and the x-ray source were mounted on an AMPTEK experimenter's kit plate with a 45° angle between them. Spectra were acquired for 60 seconds at 90° and at 40° angles between the spectrometer-x-ray source plane and the bi-layer samples. In most of these angle-resolved spectra corresponding to a bilayer pigment combination, it was found that the peaks corresponding to constituent elements of the pigment in the lower layer were more intense in the spectra acquired at 90° as compared to the spectra acquired at 30°. The results are interpreted by a simple model that incorporates the increase in absorption of both the primary and secondary x-rays at the 30° angle. We will report also on the application of this technique to the analysis of pigments in paintings from XIX century Puerto Rican painter Francisco Oller.

### Digital Simulations: Terminology and Ethical Use / Becca Goodman

Digital simulations are a useful and effective visual tool for conservators to share findings with scholars, researchers, and the general public. These simulations function as translations of the scientific and historical data we have collected; however, it is important for the audience, who may not be well-versed in reading technical images and spectra, to understand that such simulations are informed hypotheses—not fact. As Hyperspectral Imaging (HSI) and Macro X-Ray fluorescence (MA-XRF) scanning are becoming more accessible, conservators and allied professionals are generating more digital simulations, but we have not begun to talk about the ramifications of presenting and publishing potentially misleading images that depict visual interpretations of data, not physical artworks. In an era of the Internet and widespread misinformation, it is imperative that we develop appropriate terminology to describe these images. Thus, now is the time to be proactive and address the language and ethical use of digital simulations and their current and future place in the field of Conservation.

In this paper, I will propose a list of terminology, definitions, and disclaimers to initiate efforts to codify the language we use to describe digital simulations. As examples, I will provide three case studies of work resulting in digital simulations. The first two studies were produced in collaboration with imaging scientists, curators, and other conservators at the National Gallery of Art, Washington. Using information derived from traditional imaging methods (infrared reflectography, x-radiography, and transmitted light imaging), cross sections, HSI, and MA-XRF, I created simulations of Young Girl Reading by Jean Honoré Fragonard and Feast of the Gods by Giovanni Bellini and Titian to approximate each respective painting in an earlier state of its creation.

The last case study I will discuss includes several simulations that I made in collaboration with the Conservation Department for the Detroit Institute of Arts. These simulations address color changes that have occurred in The Wedding Dance by Pieter Bruegel the Elder. This series of digital simulations was informed by XRF spot analysis and fiber optics reflectance spectroscopy (FORS). Each case study will highlight different methods used to emphasize the hypothetical nature of digital simulations, and offer solutions to ensure that such simulations can be readily identified.

Finally, I will offer other ways that we can use Adobe Photoshop to suit our needs (for example, to better visualize underdrawings in infrared images and to quantify areas of loss in a paint layer) and suggest free web-based alternatives that can perform most of the same functions. Adobe Photoshop and similar software are powerful tools, and I encourage conservators to approach and explore them with both creativity and mindfulness.

## Concurrent General Session: External Forces in Contemporary Art Conservation Session 2

### The Conservation of an Outdoor Public Artwork in an Aquatic Zone: a Highly Interventive Approach and Limited Options / Stéphanie Gagné

The conservation of an outdoor public artwork created in 1984 by artists Pierre Leblanc and René Derouin proved to be particularly challenging. The artwork, entitled "Cinq tables métaphoriques pour un élément en porte-à-faux" ("Five metaphorical tables for a cantilevered element "), is located in Terrebonne (Quebec, Canada) and was constructed on the vestiges of an historic water-powered sawmill. It is therefore in regular contact with the waterway and exposed to harsh climatic conditions. Since the work comprises concrete, steel and wood, the surfaces were covered with moss, algae and lichens, the metal exhibited active corrosion, and the wood was rotten and disintegrated. Several wooden elements were missing from the work; its physical integrity was severely compromised. The custodians of the work were keen to see the work conserved and restored. The preferred approach by the custodians and the conservator, one also approved by the artists, was highly interventive.

This approach raised ethical questions around the preservation of the sculpture's authenticity. Originally, the piece had included a wooden beam that was cut and carved by the artists, and four wooden pulleys, recovered from the historic sawmill, that had been integrated into the work. The restoration included the reproduction of these lost elements, which, while made to be as close as possible in spirit to the original elements, also had to be more durable. Several challenges arose throughout the project: the making of reproductions with little supporting documentation to rely upon; the collaboration with the artist (which at times could be rather laborious); the in-situ treatment; and, finally, the overarching context imposed by a framework of strict environmental laws and regulations.

Such factors led us to search for and to adopt innovative conservation solutions. For example, in order to meet regulations concerning activities carried out in riparian and aquatic zones, our research helped us to identify environmentally-friendly products, including a natural biocide and biodegradable paint and industrial grease. In the end, the conservation treatment of this public artwork restored its very meaning and its role as a significant marker of collective memory for the site.

### The Long Road to Minimalist Intervention: Installing Richard Serra's First Public Work in a Public Street / Raina Chao

**Co-author: Hugh Shockey.**

In November 2018, Richard Serra's *To Encircle Base Plate Hexagram, Right Angles Inverted,* was installed in front of the Saint Louis Art Museum, embedded in Fine Arts Drive. The installation was the culmination of an 18-month long process of planning, meetings, presentations, design, construction, and conservation treatment. *To Encircle...,* Serra's first public work, is a two-part, circular steel sculpture designed to be installed within an active roadway. Since its original 1970 installation in 183rd St in the Bronx, it had been installed in a number of locations in the Saint Louis area, including on the grounds of SLAM.

The 2018 installation, intended to be permanent, was the first time since 1970 that it would be sited in a public street or in such a highly trafficked area. These factors, in addition to the inherent issues with exposing a steel sculpture to the elements, presented a formidable set of challenges for the protection and installation of the artwork. The sculpture's condition in storage and documentation from past interventions demonstrated that lamellar corrosion had resulted from each interment, necessitating treatment upon each deinstallation. The upper edges of the piece, in plane with the road's surface when installed, also showed expected signs of wear from vehicular traffic or other impacts.

For this permanent interment, SLAM's conservation staff chose a more proactive approach, to protect the sculpture from corrosion with an impressed current Cathodic Protection system. The conservation requirements drove decision making about the CP system design, sculpture placement, and site preparation. The CP system, preparatory treatment, and placement provide the sculpture with multi-level protections and formed an integral aspect of the museum's project plan. Installing an accessioned museum artwork in a public city street is an inherently complex process that involved a multitude of stakeholders including various departments and levels of local and city government, preservation councils, external funders, and the museum itself. The process of working with these diverse external forces to obtain the permits and permissions needed for the project to proceed was lengthy and required a cooperative, cross-departmental effort from museum staff to communicate about and advocate for the project to the various stakeholders.

Throughout its messaging, SLAM chose to highlight the conservation aspect of the project, especially the museum's plan to proactively protect the sculpture with a CP system, as an integral part of the project proposal. This emphasis helped allay concerns about potential deleterious effects the sculpture might have on city functions and reaffirmed the museum's commitment and ability to care for the sculpture once installed, contributing to the project's eventual approval. By choosing a proactive approach, SLAM was not only able to improve the sculpture's preservation, but also to help ensure that the overall project became a reality.

### Conserving the Uncollectible: Caring for Land Art and Earth Installations / Rosa Lowinger and Christina Varvi

In the early 1960s, large scale, site-specific abstract sculptures emerged as features of public spaces throughout the United States. Encouraged by national initiatives, like the General Service Administration's (GSA) Art in Architecture Program and the National Endowment for the Arts (NEA), that mandated that a percent of construction for new buildings be set aside for art commissions by living artists, these monumental artworks brought conceptual, non-representational imagery by emerging contemporary masters like Claes Oldenburg, Tony Smith, and Alexander Calder into the streets and plazas of America's urban public spaces.

During this same period, Land Art, or Earth Art, emerged as a parallel movement of site-specific sculpture. Built far from population centers, hard to reach by design, and most often made of materials of the earth itself, these works share certain criteria with the aforementioned monumental commissions, but they expand the boundaries of art in many other ways. Arguably the most famous work of land art, Robert Smithson's Spiral Jetty (1970) employs only rocks found in the vicinity of its siting in a remote outcrop of Utah's Great Salt Lake. Similarly, James Turrell's Roden Crater (1970-present) is an ongoing construction in Arizona's Painted Desert formed only by relocating millions of cubic yards of earth to create tunnels and craters for viewing the dark night sky. Other works of land art, like Nancy Holt's Sun Tunnels (1973-6) in the Great Basin Desert, Walter De Maria's Lightning Fields outside of Quemado New Mexico, and Alberto Burri's Il Grande Cretto in a remote corner of Sicily (1984-1989, 2015) use traditional materials, like concrete and steel.

Nonetheless, the essence of all of these works is characterized by remoteness and lack of commercialism. They are also linked to the landscape in a manner that makes their stewardship and conservation uniquely challenging. This paper will discuss some strategies that have been employed for conserving Land Art by the authors. Using our recent work on Nancy Holt's Sun Tunnels as the primary example, the paper will examine the philosophical and material challenges of addressing works that are singularly hard to access and whose essence straddles the boundary between art, architecture, conceptual practice, and landscape design.

## Architecture Session 2

### An Uplifting Story: Re-Supporting the Gun Turret of *USS Monitor* / Will Hoffman

In 2002, archaeologists from the National Oceanic and Atmospheric Administration and US Navy divers used a massive lifting apparatus to recover the upside-down 120-ton revolving gun turret from the wreck site of the American Civil War ironclad *USS Monitor*. The two-part system consisted of a cage-like structure that locked around the turret for lifting; referred to as the "Spider", and a secondary support which was installed under the turret to keep its roof in place as the artifact was raised. Once recovered, the turret was transferred to The Mariners' Museum and Park in Newport News, Virginia for conservation.

In 2003, the spider assembly was removed, but the artifact still remained on top of the lower recovery structure. What was intended to be a temporary mount, ultimately became the artifact's long-term support. To advance the conservation treatment for the turret, and to set the stage to ultimately right it, a new support system was installed in 2019. This paper describes the multi-year process to design and install a pedestal support system under the turret and the challenges with lifting the iconic artifact and the removal of the old support pad.

### An Exploration of Consolidants for Ancient Egyptian Limestone / Nina Owczarek, Anna O'Neill, and Molly Gleeson

The Penn Museum has many monumental architectural elements of the Palace Complex of Merenptah, a 19th Dynasty Egyptian pharaoh. The palace was excavated from Memphis by Clarence Fisher and elements of it, including columns, doorways, and windows, were brought to Philadelphia and installed in the Museum in 1926. The limestone architectural pieces are exhibiting various condition issues including powdering, flaking, and cracking.

In preparation for reinstallation in the Museum's renovated Egyptian galleries, methods and materials for strengthening and stabilizing the stone were investigated. First, the stone was characterized using thin-section petrographic analysis. Then, following a literature search, the following consolidation materials were selected for initial testing: Conservare, CaLoSil E5, CaLoSil E25, CaLoSil E50, CaLoSil IP5, CaLoSil IP25, diammonium phosphate, and M-3P (a bacterial nurturing solution). The test areas were evaluated for reduced powdering, improved strength, and minimal visual change (if any). CaLoSil E5 and M-3P were then further tested to better compare their performance with each other. Paraloid B-72 was also considered for this project and selected for stabilizing areas with structural damages like breaks and cleavage. This paper outlines the steps taken and results of testing. It also addresses the treatment choices made for these architectural elements, and the rationale for them.

### Early Reinforced Concrete Construction in the United States / Mayank Patel and David Wessel

Before becoming world-famous as a technology epicenter, the San Francisco Bay Area more than a century ago was an incubator for early advancements in reinforced concrete technology in the United States. This is where groundbreaking projects in architectural engineering were being catalyzed. They included the Alvord Lake Bridge (1889) in Golden Gate Park, the first reinforced-concrete arch bridge in the United States; the Leland Stanford Junior Museum (1891) at Stanford University, the first major building in the United States made entirely of concrete; and the Main Street Bridge (1899) near Half Moon Bay, possibly the oldest prestressed concrete bridge in the world.

Both the Alvord Lake Bridge and the Leland Stanford Junior Museum utilized twisted reinforcing bars for reinforcement of the concrete. These bars were patented in 1884 by an English-born innovator Ernest L. Ransome, whose experimentation with reinforced concrete sidewalks in San Francisco led to his breakthrough. The twisted shape provided a stronger bond between the steel and the concrete. The testament to Ransome's innovation was the fact that while many of the sandstone buildings at Stanford University suffered significant damage during the 1906 earthquake, the central part of the museum which was built with Ransome's new reinforcement system survived with only minor damage.

The Main Street Bridge was designed by Curtis Tobey and Davenport Bromfield. The bridge has a concrete arch span of sixty feet, the largest span of its kind in California at the time. The reinforcement was provided by embedding old steel wires in the concrete, inspired by the wick embedded in a wax candle and the string in the stick of popular rock candy. A century later, the Main Street Bridge remains open and in continuous use. Learning Objectives 1. Discuss history and development of early reinforced-concrete systems in the United States, specifically the San Francisco Bay Area. 2. Describe concrete reinforcement types used for constructing the Alvord Lake Bridge, the Leland Stanford Junior Museum, and the Main Street Bridge. 3. Describe our firm's experience with restoring the Alvord Lake Bridge and the Leland Stanford Junior Museum. 4. Compare concrete reinforcement encountered during the restoration work with what is written about the original construction.

## Education and Stakeholder-Engaged Practice: Session 1

### All in the Family: Bringing Conservation to Early Learning / Ellen Chase, Matthew Lasnoski, and Laura Hoffman

In 2016-2017, the Freer|Sackler, the Smithsonian's museums of Asian art, piloted "Art & Me," a series of hands-on family workshops introducing basic conservation principles to children aged 3 to 5 and their caretakers. Based on the success of the pilot, the museum has developed a permanent program of four workshops held twice a year, to be supplemented with accompanying online videos and downloadable activities. Starting this year, the program has expanded within the Smithsonian by forming a collaboration with the Lunder Conservation Center at the Smithsonian American Art Museum, which doubles the offerings for families.

Originally developed collaboratively by the F|S departments of Conservation and Scientific Research and Public and Scholarly Engagement, the workshops are designed to encourage young children and their caretakers to enjoy art and art museums, to learn developmentally appropriate foundational skills in both art and science, and to gain in social skills by working together as a family. The workshops address the preservation of cultural heritage, first by avoiding potential damage and then by responding to damage that has occurred. The lesson plans include documentation and observation of artworks as an important component of art conservation, as well as the concept of prevention as a component of art conservation, not just active intervention. Lastly, the workshops include an art-making component as a way for families to explore materials through hands-on experimentation.

By connecting familiar objects and activities to the world's cultural heritage and its conservation, the initiative aims to be proactive in fostering a new generation that intrinsically and intuitively understands the importance of participating in, or at least supporting, the goal of preserving that cultural heritage, both in museums such as the Smithsonian and worldwide. Because the museum's family programs are more diverse than its regular attendees, "Art & Me" also provides an important entry point for young people to become involved in the museum and visibility to behind-the-scenes museum work.

Integral to the "Art & Me" program is the evaluation and assessment of each workshop. Upon launching in 2016, there was some skepticism that children as young as 3 years old could understand and benefit from such a program. As such, a goal of the pilot program and its evaluation process was not only to determine an effective way to introduce conservation to early learners, but also to demonstrate that it would indeed be of benefit to them. Assessments of participants to date indicate overall visitor experience satisfaction and repeat visitation to the museum. The session will discuss this audience feedback and how staff has reacted and evolved the program based on this research.

### Outreach and Education Through Collections Care: A Case Study with Central High School in Philadelphia / Melissa King, Joelle Wickens, and Andrea Keefe

Central High School in Philadelphia, the second oldest continuously public high school in the United States, has a large collection of important cultural artifacts. These include paintings and works of art on paper by and of alumni, an archive documenting the more than 183 year history of the school, and the David Rilling Collection which largely consists of works from Africa and Oceania. Andrea Keefe, an art teacher at the school, saw the potential for this collection to have a positive impact in many different teaching situations. It could be used to build a deeper understanding of the world, broaden art history perspectives, bring material science to life, provide artistic inspiration, connect staff and students to new or less traditionally studied cultures, and so much more. Keefe identified cataloging and caring for the collection as the first steps in the process of making it an accessible, multi-disciplinary teaching tool. Her work to take these steps led her to faculty at the Winterthur/University of Delaware Program in Art Conservation (WUDPAC).

In May 2018, preventive conservator Joelle Wickens led a group of first year graduate students through the process of a preventive conservation assessment of the collection and the school that houses it. The goals were to begin to train conservation students in the process of collection care surveys and offer short- and long-term goals for the school to move forward with a preservation plan. The following year, Melissa King, a preventive conservation major at WUDPAC, developed a collection care training program for students at the school. It included guidelines for regular housekeeping, dry-surface cleaning, and integrated pest management. Determining that visual media could be an effective way to educate high school students and encourage the continuation of preventive care of the school's collection, Melissa created several short videos with information on vacuuming techniques, and compiled a library of existing collections care videos to put into a lesson plan.

The project has also presented opportunities for WUDPAC students and faculty to teach at the school within the AP Environmental Science classes, illustrating the fascinating ways that art and science can come together. Teaching preventive conservation in this setting is an excellent way to introduce conservation to students that are less likely to be exposed to our field, teach a new and exciting type of applied science at a high school level, preserve school history, and bring more meaning to the cultural artifacts that enliven the halls of the school.

### Treating Tuskegee's Dioramas: A Perspective on Inclusive and Collaborative Treatments Between Institutions / LaStarsha McGarity, Amanda Kasman, and Julianna Ly

As of June 2020, fifty-two competitively selected students from Historically Black Colleges and Universities (HBCUs) participated in collaborative summer initiatives aimed to increase access by traditionally underrepresented minority groups to careers in the preservation of cultural heritage. The goal of these very successful initiatives is that they inspire similar collaborative efforts to foster long-lasting relationships between conservation and underrepresented institutions, and introduce current graduate students to more objects from diverse communities.

The initiative began in 2016 when Dr. Jontyle Robinson, the Director and Curator of the Legacy Museum at Tuskegee University, and Dr. Caryl McFarlane, a Higher Education Diversity Programs and Strategy Consultant, formed the Alliance of HBCU Museums and Galleries with 18 member-HBCUs. The Alliance arose from the 2016 United Negro College Fund Mellon Teaching and Learning Institute at Tuskegee University's Legacy Museum. In the winter of 2016, members of the Association of North American Graduate Programs in Conservation, the Yale Institute for the Preservation of Cultural Heritage, the American Institute for Conservation, and Winterthur Museum Garden, and Library, were gathered by the Alliance to acknowledge and address the lack of diversity within the conservation field. The goal of this meeting was to develop programs to engage underrepresented student populations in the field of cultural heritage and create a network to rectify historic marginalization.

The pilot program, which began in the summer of 2017, introduced select HBCU students to technical art history through the Students and Mentors in Technical Art History (SMITAH) at the Yale Institute for the Preservation of Cultural Heritage, and art conservation at the Winterthur / University of Delaware Program in Art Conservation (WUDPAC). The hands-on conservation treatments performed by the HBCU students at Winterthur for the last three years have focused on historic dioramas from the Tuskegee University's Legacy Museum collection of twenty original dioramas, created for the 1940 American Negro Exposition in Chicago. These dioramas depict and celebrate milestones in African and African American history.

Four institutions have since joined this collaborative effort, creating additional programs that treated eight dioramas and engaged more students. These institutions include the Smithsonian American Art Museum, the Patricia H. and Richard E. Garman Art Conservation Department at Buffalo State College, Fisk University, and Shelley Paine Conservation, LLC. Students representing ten HBCUs have participated in the intensive three-week summer program thus far.

The students completed a comprehensive introduction to the field of technical art history and art conservation specialties, explored a range of analytical techniques used by conservators to investigate works of art, networked with conservators, museum professionals, fellow students and interns, to explore and continue their work in the field of conservation and museums.

## Textiles and Wooden Artifacts Session

### Frosting on the Cake: Creating a Showcover, Substructure and Underupholstery for Marie-Antoinette's Fauteuil from her Cabinet Intèrieur at Versailles / Nancy Britton

Showcovers on seating furniture are a highly visible component of their presentation in period rooms and galleries, conveying the owner's status, taste and financial resources. Their fragility and ease of succumbing to subsequent owner's tastes (including museum curators) results in the original textile rarely surviving, or surviving in a severely altered state. Using the perspective that reproduction or replacement showcovers are compensation for loss, the conservator is led to consider the information available for understanding and identifying the fibers, colors, twist, and weave structure of the original showcover.

To complete a period presentation, the underupholstery must have an historically appropriate form, and convey period techniques. The intersection of textiles being affixed to the furniture frame must be believable, but must also adhere to conservation standards of introducing minimal new information on the frame. The conservation decisions' challenges were due to the extensive documentation and textile complexity.

The large suite that includes this chair appears in several period inventories at Versailles. The brocade is a well-known design woven in the late 1770s and reproduced heavily during the mid-19th c. with alterations. A confluence of historical events preserved some of the suite on this side of the Atlantic when Gouverneur Morris, Minister to France in 1792-4, bought them for his New York estate. One is preserved intact in the New York Historical Society (N-YHS), another is in the Museum of the City of New York. These two chairs, one intact but in poor condition, the other with the original brocade showcover removed and preserved, provided an inordinate and unusual amount of information for the showcovers, trims, boxings, and underupholstery. This brocade would be technically demanding to weave and numerous dyes were degraded necessitating dye analysis to determine hue. Using 21st c. advanced modern textile industry technologies to produce a high-end 18th c. handwoven fabric isn't possible for a high quality reproduction, and specialized compatible technologies were required. The chenille yarns would be particularly challenging to source. Passementerie is another highly specialized business. Because we determined the chair originally had a cushion, not a tight seat, the boxing for the cushion required locating an exemplar.

After a false start with one company, a second company was found that could meet the high level of execution required. An example of the specialized skill sets required meant that only a single weaver was capable of weaving the brocaded components of the showcover. Specialty skills within the silk mill, such as computer assisted designing, expertise in complex woven silk structures, and an in-house archive were invaluable. The Met's contingencies include an exhibition driven schedule, meaning objects not scheduled for exhibition are low priority. Pest infestations are a major concern and substructure and underupholstery materials were frequently chosen on this basis and not preferential historically and visually alternatives. Non-interventive techniques used carbon fiber for slender and durable showcover carriers. The project was highly successful and took nearly four years to completion, receiving acclaim on French television. The chair is now situated in a period rooms.

### Collaborative Reconstruction: Exhibiting a Loose Cover for an Easy Chair / Gretchen Guidess and Leroy Graves

Conservators at the Colonial Williamsburg Foundation were faced with a rare treat; how to display an 1820s loose cover for an easy chair. Loose covers were made to fit furnishings throughout the 18th and 19th centuries and even today to protect expensive show covers and to provide a detachable and launderable seating cover. Often easy chair forms contained a chamber pot accessible once the cover was pulled aside.

The cover was found amongst a rich cache of family heirlooms in North Carolina, an area of the Southeast studied by the Foundation. The cover is constructed from a blue copper plate printed cotton depicting several agrarian vignettes of men, women, and children engaged in various activities: harvesting wheat, bringing in the hay, hunting, traveling by coach, cooking and visiting out of doors, and what may be men active in road maintenance. Major seams are turned to the outside and covered with undyed twill tape. Although the cover survived, the chair for which it was constructed for did not. Numerous easy chairs demonstrate the longevity of chair frames preserved in collections but few extant examples of the loose covers that were made to fit them endure. The private owners generously made this rare surviving cover available for study and display.

In preparation for its exhibition in "Printed Fashions: Textiles for Clothing and Home" at the DeWitt Wallace Decorative Arts Museum, an easy chair mount was made to display the cover. Taking from a range of approaches used in upholstery conservation Graves combined them with rare earth magnets to produce a mount that reconstructed the size and appearance of the easy chair. Guidess treated the most compromised areas of the cover with custom-dyed supporting fabrics and sheer overlays. Close collaboration with the wooden artifact, upholstery, and textile conservators alongside talented volunteer furniture makers produced a display that made the cover intelligible and interpretable. To dress the cover onto its display mount it was assembled inside the cover, piece by piece, with the aid of many hands.

### Biohazard at the Palace: Collaborative Response in Collection Care for Historic Interiors / Annika Blake-Howard and Gretchen Guidess

The Colonial Williamsburg Foundation maintains a range of historic interiors in its Historic Area, housed both in reconstructed and original structures. Many of the interiors, especially those within reconstructed buildings, provide opportunities to expand visitor experience through in-depth interpretive programming. To support this aspect of the educational mission, some interiors have faithful reproductions, sometimes alongside period decorative art pieces. This confluence means that maintenance and preservation are critical to keeping expensive reproductions attractive and functional while permitting guests to have a seat and speak with costumed interpreters. Collection care within the Historic Area is conducted by 13 staff members in the Historic Interiors and Collections Care (HICC) team. They provide daily inspection and maintenance as well as coordinate closely with building supervisors, who are tasked with the operation of each site. HICC team members bring a variety of skill sets and regularly train and practice every aspect of preventive conservation.

When incidents happen within the historic interiors the HICC team is frequently the first to respond. Curators, registrars, and conservators provide support to preservation efforts in each of their respective specialty. As often has been seen across the field collaboration is key for preserving historic interiors. Of frequent occurrence, but little discussed, is response and mitigation of visitor created biohazards in historic interiors. For the most part these incidents involve vomit. For this reason, every member of HICC undergoes annual biohazard awareness and remediation training. A set of backpacks is prepped and ready to dispatch necessary supplies to respond to these biohazard events.

Colonial Williamsburg is fortunate to host about 600,000 visitors and school groups each year, but the physical effects of walking around in the summer heat of Virginia can take its toll, as was experienced by a young visitor who became ill in the Palace. This event provides an opportunity to demonstrate how historic interpretation staff, conservation technicians, and conservators worked together to stop and remediate damage to a fully upholstered reproduction back stool in the Upper Middle Room of the Governor's Palace. Having preexisting biohazard protocols, interpretation staff trained in both biohazard and conservation awareness, and technicians trained in biohazard remediation allowed for a speedy response that was safe for guests, staff, and the object affected. The rapid deployment and thorough response ensured the success of the subsequent treatment and allowed the return of the back stool to the Palace.

### Holistic Gallery Restorations at the Isabella Stewart Gardner Museum / Holly Salmon

Over the past 25 years, the conservation staff of the Isabella Stewart Gardner Museum has carried out several ambitious gallery restorations in order to return the original splendor of these spaces as envisioned by its founder. Opened in 1903, the building interior was designed to look like a 15th century Venetian palace in the heart of Boston, Massachusetts. Three floors of galleries surround a glass roofed central courtyard and house highly personal installations of paintings, sculpture, textiles and furniture that Gardner collected.

Since her death in 1924, the museum has maintained the stipulation in Gardner's will that the arrangement of objects remain unchanged and the collection held in trust, "as a Museum for the education and enjoyment of the public forever." Under this mandate, and with such a wide variety of objects displayed together, preservation of the Gardner collection and installations, has been a challenge for many generations of museum staff.

Past approaches to this problem have varied between restoration, replacement and reproduction. Often these valiant attempts, carried out through small projects over the course of many years, created significant alterations in the overall appearance of individual galleries. Examples include the replacement of multiple patterns of deteriorated original wall upholstery with only a few patterns of modern textiles and changing of wood flooring materials to improve durability while sacrificing original color and pattern.

More recently, and working in collaboration with departments across the museum and specialists in various fields, the conservation staff has undertaken a more holistic approach to gallery restorations, considering everything from floor to ceiling and in between. Galleries with wall upholstery presented some of the most complicated and exciting projects requiring extensive research, planning for deinstallation and storage of the collection, installation of multiple new wall fabrics and associated conservation treatments. In many cases these projects were undertaken while remaining open to the public, offering a separate set of challenges but also an opportunity for education and interpretation around Gardner's installations, the history of the museum and our work to preserve it. This talk will also examine the rationale and benefits for approaching a project in this way, the lessons learned, as well as some of the fascinating discoveries made along the way.

## Textiles Session 1

### Finding the Ming Style: Reconstructing a 15th Century Tibeto-Chinese Thangka Mounting / Michiko Adachi and Hsin-Chen Tsai

Mountings are commonly seen in East Asian and Tibetan paintings. They are usually constructed using silk or paper, functioning both as structural support and for displaying paintings. In addition, mountings combined with painting can be viewed holistically which can reflect the corresponding cultural aesthetic, through the use of fabric pattern, colors of the borders, and proportions for example. Mahakala as Panjaranatha is a late 15th century Ming era (1368-1644) court produced Tibeto-Chinese Buddhist thangka painting on cotton. In the 1980s, the thangka was re-mounted in a Japanese style panel format with a thin gold brocade and blue silk borders.

Although the panel format kept the thangka stable it did not fit the thangka's period nor aesthetics, which potentially provided a confusing viewing experience. This format also obscured the inscriptions on the verso, evidence of consecration, which are usually visible. Although the inscriptions were

documented, photographs were not taken. Moreover, the thangka had previous repairs and retouching that were crudely done and visually distracting. An opportunity to treat this thangka allowed us to address these issues by removing it from the panel format, re-treating, and reconstructing an appropriate mounting.

Research was conducted to determine an appropriate mounting style that reflected both the Tibetan Buddhist and Chinese Ming aesthetics. First, Ming period thangkas from different collections were surveyed by closely observing the mounting style, size, and textile. Next, Ming textiles were researched to find a textile pattern most likely used on Tibetan Buddhist objects but produced in the Ming court. From the results of the survey and research, a mounting was designed for Mahakala as Panjaranatha with small practical adjustments. Finally, treatment involving surface cleaning, aqueous cleaning, partial facing, reinforcement, infilling and inpainting was undertaken.

After treatment, the thangka was stitched in the reconstructed mounting along the margins, which was then secured onto a fabric covered padded aluminum panel and framed. Mahakala as Panjaranatha, in its newly constructed mounting was exhibited as part of "FAITH AND EMPIRE: Art and Politics in Tibetan Buddhism" at the Rubin Museum of Art. It is difficult to claim that the reconstructed mounting is completely historically accurate, but the mounting is a step forward, closer to a Tibeto-Chinese aesthetic than its previous state. It is hoped that by sharing this process of the mounting reconstruction, it will encourage some further research or treatment opportunities for other thangkas in similar states.

### Highly Interventive: Three Tales of Treatment from the Deep End of the Workbench / Chandra Obie Linn

Modern conservation's emphasis on ethical standards, minimum intervention, reversibility, and general restraint has sometimes created a concern that we are developing a "do nothing" climate in conservation labs, one in which the "best" conservation is no conservation.

This paper will venture into the other end of the spectrum: into the world of the "highly interventive." Highly interventive treatments may have fallen out of favor, but they do occasionally still happen—and are still sometimes the right thing to do. This paper will discuss three highly interventive treatments: how and why they came to happen, their success (or otherwise), and how they might fit into the broader ethical climate of modern conservation.

The first treatment to be discussed is the care of a Civil War-era flag, first treated in 1925. The 1925 treatment involved covering the entire face of the object in a honeycomb of stitching, per the recommendation of the "custodian of the Smithsonian Institution in Washington D.C." according to a 1925 article in The Confederate Veteran. The flag was treated again in the 1980s and by the author in 2019, but the honeycomb stitching was far too interventive to tolerate removal or modification... but also the reason for the flag's continued existence.

The second treatment to be discussed is the care of a set of 24 rag dolls created by Laura Turpin around 1900 and gifted to the Cincinnati Art Museum by the artist. Turpin's dolls were on display for long periods at CAM and their condition 100 years later was poor, mostly due to light damage and weak, degraded silks. When the curator wanted to explore conserving the dolls for possible future display, a discussion of several highly interventive approaches arose and ultimately, a great deal of (irreversible) adhesive was deployed.

The third treatment to be discussed explores the sometimes difficult, ethically fraught but potentially satisfying world of working to satisfy a private client. The author was contacted to care for a lace veil that was an important family heirloom that had been used by family brides since at least the 1890s, though the lace components dated from earlier. It had been treated before, but something was wrong: it sat on the head awkwardly and the soon-to-be family bride wanted to use it, but not in its current configuration.

Through extensive consultation with the owner, and ultimately, the kind of highly interventive approach the author had planned to assiduously avoid, the veil was fixed and walked down the aisle once more. These three treatments provide a humble starting point for a discussion of the other end of the conservation spectrum: far from "hands off," and instead, "sleeves up" and into the sometimes forgotten virtues of the highly interventive.

### Mechanical Damage in Historic Tapestries: Results from a Scientific Investigation on Causes and Remedies / Rosa Costantini

**Co-authors: Frances Lennard and Philip Harrison.**

Tapestries represent a key component of many historic collections, as well as a complex challenge for textile conservators who aim to ensure their preservation and mechanical integrity, especially during long-term display. Many different approaches are still used to conserve historic hangings but, in many cases, they are not systematically compared, thus making the treatment choice a subjective matter.

The current interdisciplinary study carried out at the Centre for Textile Conservation and Technical Art History of the University of Glasgow employs engineering techniques to better understand the mechanical damage mechanisms of historic hangings and how effectively different conservation approaches and display methods may mitigate them. Namely, Digital Image Correlation (DIC) is used to monitor both actual tapestries (some from the Burrell Collection) and model samples. DIC is an optical contactless technique that measures strain and displacement, providing maps that locate areas susceptible to physical degradation.

An overview of the project and its objectives were discussed at the AIC meeting in 2018, and now results and conclusions are shown. The work presented here, after highlighting how different damage mechanisms may contribute to the mechanical degradation of tapestries (i.e. relative humidity related fatigue and time-dependent creep), focuses on evaluating the efficacy of sloping boards in easing strain. The effects of this, untraditional but increasingly frequent, display method were tested considering the role played by inclination and friction. Tapestry-like model samples were monitored when displayed at different angles to observe the impact in reducing time-dependent strain across damaged areas, like open slits.

Results show that, when minimal friction is present, small angles, for example 5 degrees from the vertical, do not seem to promote noticeable reductions in strain. On the other hand, fabrics commonly used for backing slanted supports (e.g. cotton molton) demonstrate a high coefficient of friction when in direct contact with tapestries (>1); this is therefore an important variable to be carefully considered. Alongside with strain monitoring, trials to investigate dust accumulation at different angles are currently carried out. Similarly to sloping boards, common stitching and support methods/materials are now tested and compared. The study has contributed to the validation of DIC as a technical tool for the monitoring of cultural heritage artefacts, identifying criteria for the successful analysis of historic textiles.

## Book and Paper Session 5: Library Collections Conservation Discussion Group

### Panel Discussion: When Damage Has Meaning: How Conservation Interacts with Interpretation

**Panelists: Jessamy Gloor, The Huntington Library, Art Museum, and Botanical Gardens; Lauren Telepak, Harvard Library; Elizabeth Ryan, Stanford Libraries Preservation Dept; Rebecca Wingfield, Ph.D., Stanford Libraries; Victoria Stevens ACR, Library and Archive Conservation and Preservation; Jen Hunt Johnson, University of Notre Dame; Erika R. Hosselkus, Ph.D., University of Notre Dame; Todd Pattison, New England Historic Genealogical Society; Quinn Morgan Ferris, University of Illinois Library; Siobhan McKissic, University of Illinois Library.**

The signs of creation, use, and damage of library and archive materials provide vital clues for researchers. The Association of College and Research Libraries now considers the ability to "factor physical and material elements" into the interpretation of primary sources to be part of primary source literacy. But these same signs can be easily erased or obscured in the conservation treatment of library materials. How do conservators, curators, and collections managers collaborate to balance the sometimes competing priorities of usability and long-term preservation versus signs of use? What is the role of conservators in interpreting and sharing these signs of use and provenance? Conservators and curators discuss their approaches to these problems and opportunities, followed by a discussion with the audience for questions, comments and sharing of experiences.

Curator Rebecca Wingfield and Conservator Elizabeth Ryan share "Salvaged from Lake Erie: Conserving Ginsberg's Improvised Poetics and preserving a story." They discuss the history and conservation of a water-damaged publishing proof that tells the story of an abandoned publishing project. Teaching with ephemeral Beat Generation collections, material evidence of use, conservation tracking and information sharing, and documenting damage that has research significance will be addressed.

Conservator Victoria Stevens discusses "Appetite for Destruction: The Judgments behind the Conservation of Intentional and Unintentional Damage." The conservator has a privileged viewpoint on an object's overall materiality and construction, revealing aspects that may be hidden to other users. This candid look into an object's history is a powerful interpretative tool, but one that could be easily lost in the need to stabilize objects for current use. Through an analysis of the condition of three written heritage survivors from the Salters' Company, London, Jesus College, Oxford and the Wordsworth Trust collections, this paper shows how the intentional and unintentional damage they have sustained not only adds to their interest as information conveyors but also how their stability was balanced with the need to maintain this evidence of use and abuse.

Conservator Jen Hunt Johnson and curator Erika Hosselkus share "Intentional Accidents: Identifying Corrections in Early Printed Material." Iron gall ink burn-through is a common but typically unintended feature of early manuscripts. One example at the University of Notre Dame's Hesburgh Libraries proved to be clearly intentional. During treatment of The Gaceta de Lima, an early printed Peruvian periodical, two unusual burn marks were discovered, each obliterating a single word of text. These artifacts point to unexpected editorial practices occurring during the expedited process of printing a newspaper. Ongoing research seeks to understand how extensive these corrections were, to confirm the point at which they were made, and to understand what this might reveal about printing in colonial Peru.

Conservator Todd Pattinson discusses "The Role of Conservation in the Electronic Age." The increasing use of digital surrogates is changing the role of physical books as their primary importance is no longer tied to providing access to the text. Instead, books and other physical library objects will increasingly be valued and researched for their physical components, methods of production and evidence of use. This talk will highlight two areas of damage in printed books that have led to a greater understanding of the production and dissemination of print culture in America and why the conservator is often the best individual to identify and convey that information to researchers and educators.

Conservator Quinn Morgan Ferris and Archival and Literary Manuscript Specialist Siobhan McKissic share "Reconsidering Damage: Collaborative Approaches to the Conservation of the Gwendolyn Brooks' Archival Collection." In 2013, Gwendolyn Brooks' archives were acquired by the University of Illinois Rare Book and Manuscript Library. While Brooks was many things--a writer, teacher, Poet Laureate and the first Black person to win a Pulitzer Prize--she was also an avid record keeper. As she tore lines from her notebooks, ripped photographs, and taped return addresses to correspondence, her materials became a sweeping reflection of her personality. Her "intentional damage" was such a feature of the unprocessed acquisition that collection managers wanted to preserve--not "fix"--it. This presentation, a collaboration between conservator and archivist, proposes a paradigm shift in how we consider damage--both intentional and incidental--based on our experience with Brooks' papers.

## Collections Care: Current Standards for Storage Materials

### When the Rubber Hits the Road: A Panel Discussion about Current Standards for Plastics as Storage Materials

**Panelists: Paige Schmidt, Molly McGath, PhD, Gina Watkinson, Kate Wight Tyler, Thea Van Oosten, Catherine Stephens**

Given the growing number of concerns and unanswered questions regarding plastics as storage and display materials, conservators faced with the responsibility of assessing, recommending, and approving said materials can feel overwhelmed and underprepared.

This panel discussion will bring emerging and seasoned conservators and scientists to a common table to speak openly and candidly about the status quo (or lack thereof) of guidelines for selecting plastics as storage materials, the standards by which we vet plastics, current accepted analytical methods for assessing plastics against these standards, the accessibility of these methods, and the ethical considerations that the field and individual conservators must make when choosing plastics as storage materials. Panelists will present a framework for assessing plastics, in addition to highlighting available resources and how conservation and museum professionals can utilize and contribute to these resources moving forward. After the planned question and answer period, questions and comments will be open to the audience.

## Architecture & Objects Historic House Session - Part 2

### Reactive, Proactive and Interactive: The Conservation and Reinstallation of the Cassiobury House Staircase at The Met / Mecka Baumeister and Lisa Ackerman

**Coauthors: Ivo Kipre, Nick Pedemonti, Jody Hanson, and Jesse Ng.**

An architectural highlight reinstalled in The Met's new British Galleries is the 1680s wooden staircase from Cassiobury House in Hertfordshire which was acquired by the museum in 1932, and was first installed in 1956. In the new British Galleries, the staircase has been reinstalled in a configuration aiming for a closer approximation of its original 17th century layout. To fully experience the elaborate pierced, double-sided acanthus scroll carving of the baluster friezes, which are also depicted in the reconstructed trompe l'oeil paintings on the stair's wainscoting, visitors will be welcomed to walk up and/or down the staircase which required a different approach to the conservation treatment.

To realize this concept the conservation team was responsible for structurally stabilizing the staircase, rejoining staircase elements that were cut during the previous installation, and making replacements of missing sections and fragile elements. Additional precautions were made including a supporting steel structure installed underneath the stair, a modern handrail attached to the wall, and a carpet runner on the original stairs using a similar mounting system to when the staircase was at Cassiobury House. Another conservation challenge was the surface treatment of the staircase, which was constructed using three different woods: elm for the newel post finials and the double-sided carved baluster friezes; pine for the newel posts, stringers, baluster bases, and handrails; and oak for the treads and risers.

Prior to the Museum's acquisition of the staircase, the original and subsequent finishes were chemically stripped by the dealer to reflect an unpainted aesthetic associated with the renowned Grinling Gibbons (1648–1721), to whom the carving was attributed at the time. It is now believed to be the work of Edward Pearce (ca. 1635–1695).

Our research and examination revealed that the balustrades of the staircase were originally painted, however, there is not enough residual evidence to determine its earlier appearance. Developing a protocol for treating the extremely compromised surfaces of the elm, pine and oak elements while preserving the integrity, protecting all surfaces of the staircase elements and creating an aesthetically unified uncoated appearance of the staircase was a complex task.

Given the fragility of the original carved elm newel post finials, they needed to be replaced to withstand possible touching by unruly visitors. Laser scanning of the most well preserved original finial was carried out in The Met's Imaging Department and losses could be digitally reconstructed in the resulting three-dimensional image. A 3-D print proved essential for reviewing the shape and details of the "digital" finial before the data could be used to mill wooden reproductions from a solid block of oak, recycled from a one hundred twenty year old church balcony beam. The new finials are hand-finished by a professional carver and their surfaces treated to blend in with the rest of the staircase elements before a custom mounting system locked them in place.

### The Dark Side of the Gilded Age: An Investigation into Soot Deposition at the Vanderbilt Mansion / Margaret Breuker

An on-going investigation of soot deposition that began in 2014 is being conducted at the Vanderbilt Mansion by the Historic Architecture, Conservation and Engineering Center (HACE), of the National Park Service and EYP Architects. Interior surfaces, furnishing and historic objects in the mansion have been chronically subjected to soot deposition for the past 120 years. Though the soot may be entering the supply ductwork, and then the historically furnished rooms, the placement of furnace filters over the registers had been previously employed to mitigate the effect. Since it has not, it was determined that a more detailed examination of the soot, heating system and air circulation in the Vanderbilt Mansion should be performed. Initial efforts of the investigation included an assessment of heating system configurations, the collection of soot samples throughout the mansion, running X-ray Photoelectron Spectroscopy (XPS), Scanning Electron Microscopy (SEM), Portable X-ray fluorescence analysis (pXRF), and Infrared Spectroscopy analysis of the samples in order to determine their source.

Designed by McKim, Mead and White and built in the late 1890's by Frederick and Louise Vanderbilt in upstate New York, the Vanderbilt Mansion was the height of opulence and Gilded Age luxury. Mrs. Vanderbilt's Louis XIV bedroom, with expertly painted and gilt walls designed by Ogden Codman Jr., and Frederick's masculine Renaissance Revival bedroom with its dark wood and tapestry covered walls still retain an exceptional degree of integrity to the Vanderbilt period and original construction. The Vanderbilts occupied the mansion during the summer and early fall months, occasionally staying over a weekend in the winter months.

During this time, the mansion was heated by convection- based warm air system utilizing a fully ducted supply air distribution system driven by two coal-fired steam boilers located in the sub-basement of the north side of the building. When the National Park Service received the property from Mrs. Vanderbilt's niece, in 1939, several upgrades were made to the property, including the installation of new coal fired steam boilers that were eventually retrofitted with oil burners in 1950. In the early 1970s, a portion of the convection system was reconfigured as a forced air system utilizing an air handling unit and the existing boilers.

It was originally believed that this system produced the large amounts of soot that can be seen on the historic fabric in the mansion today due to poor combustion draft conditions. Consequently, in 2004 new oil boilers were installed to replace the coal fired boilers. However, large amounts of soot continue to be deposited throughout the mansion. The study thus far has hypothesized that the soot may circulating throughout the mansion directly from the sub-basement level. More testing, including Differential Pressure Monitoring will be conducted this fall in order to either confirm or refute this hypothesis.

## Wooden Artifacts Session 2

### Digital 3-D Reproduction and CNC Milling: Putting the Finial Touches on an Architectural Highlight, the Cassiobury House Staircase / Ivo Kipre and Jesse Ng

In 1932, The Metropolitan Museum of Art acquired the wooden staircase from Cassiobury House in Hertfordshire, England, ca. 1680. Attributed at that time to the renowned carver Grinling Gibbons (1648–1721), the surfaces finishes were chemically stripped by the dealer prior to The Met's acquisition of the staircase, to reflect Gibbons' preference to leave the carved wood unfinished. It is now believed to be the work of Edward Pearce (1635–1695). To enjoy the full experience of the pierced, elaborate double-sided carved elm balustrade friezes and exquisitely carved newel post finials, visitors will be welcomed to walk up and down the staircase.

In allowing the public to interact with this architectural highlight, a proactive approach was taken in determining the course of treatment. The elm finials are extremely fragile due to pest damage, stripping, previous alterations and repairs. At the same time, the position of each finial catches the eye and its tangible qualities will inadvertently cause the public to touch.

Considering these factors, the decision was made not to use the originals, but to reproduce the finials for the staircase in a way that best resembles their original splendor. In collaboration with the Met's Imaging Department, the reproduction process began with laser scanning of the most well-preserved original finial. Losses and damages were digitally reconstructed resulting in a digital model that was first 3-D printed, proving to be an essential step for reviewing the shape and details of the "digital" finial. The data was then used to CNC mill reproductions from solid wood. Sourcing elm or a timber of similar ring porous open-grain structure in the necessary size had its challenges until a reclaimed oak balcony beam from a one hundred twenty year-old church in Indiana was found.

To prepare for milling, the sections of the beam were carefully selected, treated and packaged to withstand climate fluctuations during shipping. The milled replacement finials were hand-finished at the Met by a professional carver and the surfaces were treated with a protective and aesthetic coating to blend in with the rest of the staircase elements. Mounting the finials really was the final touch in bringing this architectural highlight back to life.

### Technical Study and Cleaning Treatment of the Egyptian Coffin of Nakht / Luke Addington and Nancy Odegaard

The Egyptian Coffin of Nakht is an Eleventh Dynasty (2120-1981 B.C.) painted wooden coffin of the scribe Nakht from Asyut, Egypt. To safely and effectively stabilize the coffin a technical study was undertaken, during which several novel approaches to the cleaning of ancient matte paint and identification of binding media were developed. The coffin is constructed of several materials. The wood was identified by visual analysis as acacia, tamarisk, and sycomore fig which are consistent with the literature. The calcium carbonate preparation layers were identified by FTIR and chemical spot testing. The paints consisting of yellow, blue, and red were determined by p-XRF. The white and black were identified by FTIR. All pigments are reported in the traditional Egyptian funerary palette.

Characterization of paint binding media in regard to polychrome wooden Egyptian artifacts is often difficult or impossible, even with analytical instrumentation. FTIR and p-XRF analysis of twenty-five samples from the coffin and over thirty individual chemical material characterization tests did not yield conclusive data pertaining to the binding media of this object. We identified proteinaceous binding media in multiple paint samples by modifying the lead acetate and pyrolysis material characterization test by conducting the test inside half of a 1mm dia. capillary tube, with a lead acetate test paper cut to 0.3mm in width. The technique provided a reliable test which cost only a few dollars. Traditional Egyptian technology would suggest the proteinaceous binder is likely from domesticated animals or wild game.

To appropriately clean the object's surface we understood that the nature of matte paint with ancient soiling materials is complex and presents a wide variety of challenges. Some ancient soiling materials become less soluble over time and cannot be removed effectively without risking significant damage to or alteration of painted surfaces. We considered the Modular Cleaning Program (MCP) approach and developed an aqueous buffered chelating solution consisting of Tris, citric acid, and pH 8 deionized water conductivity adjusted to 1,000µS.

To clear this solution, we prepared a second pH 8 solution consisting of glacial acetic acid, 10% ammonium hydroxide, and deionized water. The slightly basic nature of both solutions aided in deprotonating portions of the aged soiling material, hence increasing the solubility of ancient grime ingrained in the surface. To clean the surface with an aqueous solution without the typical disadvantages of grime migrating into the pores of the paint, discoloring the paint, or creating tide lines it was necessary to restrict the aqueous phase to the topmost layers of paint.

A range of solvents and absorptive textiles were investigated. Decamethylcyclopentasiloxane [(CH3)2SiO]5 commonly called cyclomethicone D5 and Evolon CR micro-filament textile were used. The Evolon CR textile served to restrict the aqueous phase and for its wicking properties. Once we understood the materials involved, these novel methodologies enabled us to successfully clean the surface of the ancient matte paint without damaging or saturating the paint, altering its color, or creating additional tide lines, along with significantly reducing tide lines present at the start of treatment.

## Electronic Media Session 5: Caring for Time-based Media in Institutions

### Fitting the Pieces Together: Moving Towards a Collaborative Approach to Time-Based Media Conservation / Kristin MacDonough

With support from the Andrew W. Mellon Foundation, the Art Institute of Chicago (AIC) has, in the last three years, undertaken to build up our practices regarding the exhibition and conservation of time-based media art. In that time, we have progressed very quickly, striking a fine balance between becoming more proactive in our manner of care while remaining flexible and responsive to new developments. This presentation will go into detail about our transition towards building sustainable processes and the growing pains along the way. AIC has found equal success by both marshaling the expertise of existing staff as well as through the pairing of two fellowship roles, one in curatorial and one in conservation, each devoted to the questions around time-based media art and co-organizers of AIC's Time-Based Media Working Group.

As the conservation fellow, I will share both the intended and unexpected outcomes of this approach, and explain how, as a result of our efforts, the museum has changed its overall strategy in areas such as staffing, media acquisition, and preservation procedures. Throughout this process, I have referenced models and principles from fields unrelated to art conservation to help identify gaps in our thinking and methods. As many members of the Electronic Media Group are aware, conserving electronic and digital media requires creative thinking and problem solving. What can we learn from disciplines outside of conservation where attention to detail and habit forming are essential to bringing about lasting change?

I'll describe how this approach has led to the development of new practices, and how it will be useful for reviewing established ones. Our TBM Initiative has also established the Midwest Media Arts Consortium, a community network committed to field-testing best practices and addressing challenges related to time-based media installation and preservation. Our symposia and workshops have provided opportunities for museum professionals in the midwestern United States to attend more participatory events and connect with regional colleagues. This presentation will also outline the development of the consortium and next steps for its continued growth.

### One Size Does Not Fit All: Adapting the Institution for Collecting TBM Artworks / Morgan Kessler and Joseph G. Heinen

The past couple of decades have seen enormous strides in terms of institutions tackling the issue of managing time-based media artworks. Dedicated positions have been created, professional organizations, training programs, and interest groups have been formed, residency and fellowship programs have been established, and open-source resource platforms and starter templates have been freely shared. However, some institutions are struggling to make a case for a TBM program beyond the occasional internship, fledgling committee, collection assessment, or one-off fellowship. Too often TBM artworks are brought in before the infrastructure is in place to manage, let alone preserve them. Museums are plentiful with opportunities for this kind of dedicated conservation work but they are also political environments - projects need to fit in with strategic initiatives, budgets fall under certain degrees of oversight and control, new positions need to go through rigorous rounds of approval, and staff turnover leads to information gaps and for work of this nature to slip through the cracks.

While the standard for TBM management appears to fall within the purview of Conservation, not every institution has a Conservation department nor are these departments always in a position to lead this type of work relative to the institutional structure. It takes a village to manage TBM works after all, so what are some alternative ways that this work can be done which bears in mind institutional context? How can a TBM program be created across departments and budgets (or in the absence of a dedicated TBM budget line per se) or built off of existing infrastructure? How do you advocate from within and generate excitement and buzz around this work when museum's are tackling so many initiatives at once and issues such as this are considered less pressing? How does one begin to break down silos and challenge gatekeepers, particularly in large institutions when work is divided and turfs are often explicitly defined? What options or platforms exist for sharing the work across institutions?

Based on our experience at The Los Angeles County Museum of Art (LACMA), we will demonstrate how we have grown our TBM conservation program from scratch on a strict budget with limited resources, particularly when change is initiated without a mandate from above. We will cover digital storage solutions, leveraging collaboration within various departments in order to effectively condition screen incoming TBM artworks, and creating institutional buy-in by creating an active and effective TBM committee. This talk will focus on suggestions and priorities for institutions with limited resources and employees as we discuss the lessons we have learned in our work. We are also planning on conducting a survey to gauge the varieties of ways that institutions are approaching this work, particularly ones who similarly are responding to the challenges of caring for TBM without the aid of dedicated staff, budgets, or defined programs.

### Preservation and Documentation of Time Based Media Art at the Reykjavík Art Museum / Sigga Regína Sigurthorsdottir and Edda Halldorsdottir

In recent years, the Reykjavík Art Museum has been establishing new workflows and improving documentation regarding electronic and time based media art in the museums collection. The process was jump started with the exhibition project titled Bout (Hrina) in 2017, where the majority of the 75 time based media artworks in the collection was exhibited. The museum had identified gaps in the documentation of its time-based media art and so the project was conceived of as a response. The installation of these pieces provided an opportunity to examine these gaps further and address them with the assistance of the artists.

A series of public artist interviews were conducted by conservation, collection and curatorial staff as part of the project, and the documentation for the works profoundly grew. Using the setting of a public interview to address the museums documentation and the artists priorities and intent provided an opportunity to engage the public and simultaneously to harness their interest during the sessions. In some cases the artists could even look to members of the audience when memory failed regarding some specifics in dates and technology.

Audience questions provided an insight into the pieces reception and generated a further dialog. This summer, the institution continued the project with the Icelandic Rannís innovation and research grant. A researcher was hired to perform a survey of the time based media artworks in the collection, assess the storage conditions specific to the media and bring documentation from the Bout exhibition into context with findings from the survey.

The specific needs of various media formats were addressed as well as the more theoretical grounding for various preservation practices, different for every piece following the artists intent and the requirements of the media. One example of a piece from the collection examined as a part of the survey was Steina Vasulka's Tokyo Four, a multi screen moving image piece originally projected from Laserdiscs, but currently stored and projected using Bluray discs. The transfer and display of this piece on a new media, as well as the storage on a format not intended for preservation, bring up a bounty of questions regarding the nature of the original, the digital display taking over from analog (Laserdiscs are an analog medium), the issues brought on by technological development and the importance of documentation that deals with all of these issues.

This is just one example of the many interesting cases found in the collection. The collection can always be examined more thoroughly and striving to meet individual pieces needs takes evaluation and reevaluation, interpretation and reinterpretation, installation and reinstallation. In this presentation, we will discuss the results of the survey as well as the results of the reinstallation and artist interviews conducted as a part of Bout, delving into how the public became engaged in the ongoing preservation research for the collection, the steps already taken and the work yet to be done for the collection.

## Book and Paper AP Discussion Group

### Art on Paper Discussion Group - Presentation and Panel

### Imaging in Practice: Techniques for the Examination of Works of Art on Paper / Becca Pollak and Linda Owen

While photographic documentation has long been integral to conservation practice, recent advances in digital equipment, instrumentation, and image processing have both improved existing technologies and introduced new techniques to conservators. These developments have allowed more conservators to examine works on paper in ultraviolet, visible, and infrared spectral ranges and expand into hyperspectral imaging. Collaboration with allied professions to perform elemental mapping of paper objects and computer-assisted integration of imaging with other data increasingly contributes to the scholarship on prints and drawings.

The Art on Paper Discussion Group (APDG) of the Book and Paper Group (BPG) will gather together practicing conservators to make short presentations followed by a panel discussion on imaging techniques paper conservators have incorporated into their practice and how they inform our connoisseurship and treatment of paper artworks.

**Panelists & Presentations:**

- Technical Studies of Works of Art on Paper: What IR Luminescence Can Reveal / Theresa J. Smith, Garman Art Conservation Department, SUNY Buffalo State, Buffalo, NY
- A Practical and Versatile Microscope Imaging System / Victoria Binder, Legion of Honor, Fine Arts Museums of San Francisco, San Francisco, CA
- Investigating Process Using a USB Microscope / Jennifer McGlinchey Sexton, MS Conservation, Colorado Springs, CO
- Multiple Imaging Modalities Reveal Evolving Imagery in Picasso's Gouache / Kristi Dahm, Art Institute of Chicago, Chicago, IL
- Searching for Moldmates in Leonardo's Papers / Margaret Holben Ellis, Conservation Center, Institute of Fine Arts, New York University, New York, NY

# ABSTRACTS

## Textiles Session 2

### The Use of Non-woven Support Materials for the Conservation of Three-Dimensional Painted Silk / Chuance Chen

**Co-author: Karen Thompson.**

This research aimed to determine the effectiveness of non-woven support treatment for stabilising splits from three-dimensional painted silk. A literature review established that Tengujō (a Japanese paper made from the kōzo plant) was the most frequented non-woven support material in paper and textile disciplines. Available literature from the paper conservation has also indicated that cellulose nanofibers (CNF) to be a promising cellulose-based support.

The effectiveness of Tengujō and CNF support, applied using a non-aqueous adhesive method, were evaluated for their strength, removability and flexibility. The strength of the material was determined through a tensile test and comparative shear test. Results were interpreted with stress-strain graphs and visual analysis of the tested samples. Removability of the material was established by characterisation of the adhesive residues left on the supported silk substrate using optical microscopy. Sensory evaluation was used to establish the flexibility of the material by assessing the physical attributes of supported samples. The results determined that Tengujō and CNF can effectively be applied to stabilise splits in silk textile. CNF is stronger than Tengujō in term of material strength, whereas the Tengujō gave the best results for use as support material.

### 'Riggisberg'? A Mexican Stitch to Remember / Laura Garcia-Vedrenne

This paper inquires the story behind the term "riggisberg" which has been used in Mexico over the last 40 years to refer to the self-couching conservation stitch. The term is now falling out of use and being replaced with the phrase "costura de restauración" (conservation stitch), which might be an imprecise term for the purposes of documentation. This paper reflects on the diverse forms of speech related to conservation stitching.

A questionnaire directed towards Spanish-speaking conservators was distributed to survey differences in the usage of words. Although inherent conflicts of adapting vocabulary from other languages have hindered communication between conservators in the past, it is time to revisit and assess if the information is flowing more effectively nowadays. A review was completed about how the profession of textile conservation was born and spread across Mexico, specifically with regards to stitching treatments.

By looking at previous documentation and comparing it with references published outside of Mexico, the paper explores how information traveled for the term "riggisberg" to be adopted for daily use within confined geographic borders. A possible explanation is offered after revisiting topics such as the textile conservation workshops held by Spanish chemist María del Socorro Mantilla in Mexico (1977) and the decades-long debate between "stitchers and gluers" (mainly 1980's). These scattered ideas have not been previously connected by conservators, despite showing unique aspects and traditions of current textile conservation practice in Mexico.

The value of this contribution lies in keeping practitioners informed of recent changes and developments relevant to their field of work, specifically with regard to documentation. The author calls for action to promote discussion, to keep the creation and maintenance of records up to date with adequate lexicon, and to increase the amount and availability of publications written in Spanish.

## Collections Care – Big Data

### Assessing the Condition of the National Collection / Fenella France

**Co-author: Ian Bogus.**

An Andrew W. Mellon funded research project has begun providing data to objectively assess the condition of the textblock of books held in the United States. The research study is performing in-depth scientific analyses on a representative sample – measuring the same 500 volumes from five partner research libraries. The contribution of this research data will provide the necessary pre-requisite for developing a national plan that will ensure that books retained and preserved in shared print programs have the best physical properties for long-term preservation. Many institutions are currently making withdrawal and retention decisions based upon subjective and incomplete information. The collections data will help ensure that large-scale withdrawal of materials does not compromise the overall robustness of cultural heritage collections, informing the shared print, preservation and digitization communities. A number of shared-print and future of the print-record initiatives have noted the need for objective data to assist with decision-making.

The project is characterizing the physical, chemical and optical characteristics of a selection of general collection library materials across five large research libraries in distinct regions of the United States for paper-based collections spanning the time period of 1850-1950, a time period when the mass production of print collections included less stable pulp types. The data will be used by institutions, collections care managers and librarians to determine the current physical state of items held nationally with the intent of identifying those materials that are in good condition, where they can be found, and inform institutions about the potential risk of loss for preserving the printed corpus held within the country.

The ultimate goal is to fill gaps in our knowledge to guide the community as it develops a national print archiving effort as part of shared print initiatives by answering questions on how materials naturally age and decompose as well as allowing institutions to be able to predict with a strong probability of accuracy good quality and poor quality copies of books. The project has begun comparing the same titles and editions to quantify and objectively assess the condition of these volumes to create a comparable and reliable decision-making method for retention, to avoid disposal of materials that may be crucial to a national preservation effort.

### Measuring Collections Care: Survey, Index, Self-assessment, Consultant / Lesley Langa

Collections care is a coordinated practice of several functions within memory institutions to help preserve collections items. It includes conservation alongside many other responsibilities like security, funding, making digital surrogates, and more. In theory, any institution with a collection that performs these responsibilities - regardless of staff size, location, or conservation practice - should be able to perform them at an appropriate scale to their collections size.

This presentation will provide an overview of several methods to measure collections care practice. It starts with an overview of the HHI 2014 study, the largest and most comprehensive tool to measure practice across the U.S and compares it to other surveys. Second, there is an overview of an original index derived from the HHI survey questionnaire to distill several key practices for their centrality to collections care and consistency across all collections types from archives to libraries to museums. The index follows the standard methods to test for the statistical relationships, and likeness of the questions and then calculates assigns a score to each measure and then all measures are compiled into a single composite index score.

The score is meant to aid institutions in self-assessment of their collections care practice, where there are many other tools. This presentation will then provide a brief overview of these tools with a discussion about their similarities or differences for institutions to consider before closing with the final assessment tool of hiring a professional consultant whether through the Conservation Assessment Program (CAP) or directly.

## Objects Session 3

### Saving Moth Man: Conserving John Hampson's Insect Art / Nora Frankel

John Hampson created intricate and works of art using insects as a medium. These works used thousands of dried animals, mostly lepidoptera (moths and butterflies) and coleoptera (beetles) to create images, often of historical themes. The Fairbanks Museum & Planetarium (St. Johnsbury, VT) currently owns Hampson's entire collection of insect art, created in a period between his immigration to the US in 1860 and his death in 1923. The piece General Slocum was fragile with large areas of loss, and the museum considered it too damaged to display. Slocum was previously brought to Williamstown Art Conservation Center (WACC) for consolidation to stabilize the crumbling, aging insect bodies.

Following further funding, Slocum returned to WACC to address the aesthetic aspects of the treatment to allow for future display. Due to the pictorial nature of the work, the second phase of treatment of Slocum focused on loss compensation and visual infills to enhance readability of the image. As the piece

consisted of several species across multiple genera, a wide range of techniques were required to create appropriate fills for lost or damaged insects.

While initially using real insect specimens was explored, it was determined that replicas would be more consistent, durable, and reversible. Moths were replicated with Japanese tissue, utilizing digital printing, hand toning, and folding to achieve the appropriate effect. Tissue wings were mounted on original pins and secured with Klucel G. Where losses of beetles were distracting, replicas were hand molded or cast in acrylic resin from silicone molds taken from detached specimens. The opalescent color on some species was replicated with mica powders and replica beetles were toned with acrylic paints.

## Coating Iron: A Reactive and Proactive Solution / Gyllian Porteous and Anna Funke

**Co-authors: Flavia Puoti, Johanna Rivera-Diaz, Justin Schwebler, Chris McKenzie, and Claire Achtyl.**

As the theme of this year's AIC conference states, conservation can include both reactive and proactive interventions. This paper will closely investigate two case-studies of cast iron cannons that were treated with an epoxy and polyurethane three-part outdoor marine coating commonly used in historic preservation. It will discuss how the same coating system can be used both as a reactive treatment when it stops advancing corrosion as well as a proactive treatment when it prevents future damage.

In addition to the detailed discussion of these complex treatments, this paper will investigate the challenges that metals conservation in particular faces around the principle of re-treatability. The first case study discussed in this paper is a cast iron cannon from the revolutionary war that was recovered from the Cooper river in South Carolina in the 1980s. After recovery it was left to dry out. Over the years, large fragments had started to fall off the surface due to chlorides trapped in the iron. A treatment reacting to mistakes made in the past was therefore required.

Given that the object is owned by a small county museum, funds for this project were very limited and made full desalination impossible. It was therefore decided to use the afore mentioned coating system as it would eliminate interaction between the iron and oxygen and was therefore the best option in trying to prolong the life of this rapidly corroding object. The second case-study discussed here is the treatment of three civil war era cannons. While these were in very good condition when they were recovered from the PeeDee river, it was discovered half way through the treatment that they would be displayed outside where they would be exposed to the harsh climate of South Carolina as well as roaming visitors. This prompted us to take a much more proactive treatment approach and apply the same heavy coating system, which would be able to protect the underlying material from a harsh environment and prevent future damage.

While the coating system described here is significantly more interventive than would usually be advisable for conservation treatments, the nature of these two case-studies required both reactive and proactive approaches in order to ensure the longevity of these cast iron cannons. Furthermore, these treatments presented an interesting opportunity for exchange between conservation and historic preservation. Given that the latter often deals with treatments that must withstand much greater pressure from both the environment as well as human interactions.

## The Treatment and Reinstallation of Neo-Assyrian Northwest Palace Reliefs at the Brooklyn Museum / Victoria Schussler

**Co-authors: Tina March and Lisa Bruno.**

The Brooklyn Museum collection includes twelve monumental gypsum stone reliefs from the Northwest Palace of Ashur-nasir-pal II (883 to 859 B.C.E.), King of Assyria. Ashur-nasir-pal II chose to build his palace in the city of Kalhu, also known as Nimrud, now in Iraq's Nineveh Province. Almost three thousand years later, Sir Austen Henry Layard, a British archaeologist, rediscovered the palace in 1840 and began excavation with British funding in 1846. Traveling through London and Boston, the reliefs arrived at the Brooklyn Museum, first on indefinite loan from The New York Historical Society in 1937 and finally acquired in 1955.

Since their arrival at Brooklyn, the reliefs have been on display in various galleries throughout the Museum. When the reliefs were installed in the Kevorkian Gallery, their current location, the fragments were assembled with small brass rods and plaster and pinned to the wall. After nearly five decades on display, six of the twelve reliefs were fully conserved in 2002. Through the generous support of a Bank of America Conservation grant, the remaining six reliefs have been treated over the last two years. Because of their size, weight, and previous installation, the reliefs were documented in situ in the Kevorkian Gallery and treated in a temporary work space created in the Museum's adjacent Egyptian Galleries.

The current treatment was greatly informed by the 2001-2002 treatment, while incorporating new and newly available tools. In addition to digital photography in visible and raking light, conservators were able to document the objects before treatment with a partial multiband imaging suite including visible-induced infrared luminescence imaging to characterize Egyptian Blue. In conjunction with conventional hand tools, the use of a Compact Phoenix Nd:YAG 1064nm laser from Lynton Lasers Ltd. allowed for the sensitive reduction of non-original mortar from the reliefs' surfaces, revealing previously obscured carving.

The two-year project proceeded in view of the Museum's visitors, with signs encouraging visitors to ask questions, take pictures, and post to social media. Working in a gallery space imposed important limitations on treatment material choices but also afforded Brooklyn Museum's objects conservators the opportunity to engage with the public, sharing information about the project, the field of art conservation, and the ethos of cultural heritage preservation.

The need for visual consistency with the 2002 treatment of the other six reliefs in the collection created constraints on the method of the reliefs' mounting; however, the resulting compatibility has allowed the Museum the opportunity to revisit the reliefs' installation and interpretation in the Kevorkian Gallery, creating physical and iconographic groupings more representative of the objects' original architectural context. In 2015, the Iraqi government announced that the Islamic State of Iraq and the Levant, ISIL, had purposefully destroyed much of the Northwest Palace site, part of a program of obliterating cultural heritage monuments in their original archaeological contexts. This type of violence makes urgent the need to support cultural heritage preservation and unfortunately timely the conservation of these Neo-Assyrian reliefs, which have endured, and will endure.

## Preserving Monumental Plaster Casts in a Historic Building: A Conservation Approach at the Victoria & Albert Museum London / Sarah Healey-Dilkes and Mariam Sonntag

The V&A has two historic galleries built in 1873 to display the Museum's large scale works of art and architecture. These spaces were known as the Architectural Court and showed original works alongside plaster casts. The galleries were extensively decorated and were furbished with improved and effective environmental controls that were innovative and modern at that time. Protective coatings were variously applied over the last 150 years to the casts to manage atmospheric pollutants and changes in humidity and temperature.

Whilst archival records suggest interventions in the gallery which reflect changes in viewpoints of original art works to casts and the shifts in the casts' significance over time. This has influenced the approach to their preservation. Now known as the Cast Courts, their spectacular displays comprising more than 300 casts include full scale plaster copies of Trajan's Column (h: 20 m) and the Cornelis Floris' tabernacle (h: 18 m) displayed in natural daylight and built around elaborate support structures making it impossible for the museum to easily dispose of them when they were no longer fashionable.

The survival of this exclusive cast collection has recently been celebrated and re-instated as three dedicated galleries following an 8-year refurbishment programme. The Cast Collection is displayed often in a better condition than the original art work in situ which has suffered from deterioration. Some of the originals do not exist anymore. Despite being displayed indoors, our monumental plaster casts show visible signs of damage due to the environment and to being housed in an historic building. Plaster is a hygroscopic material; dust that settles on the plaster surfaces can form a damaging "cement", humidity is taken through the material to corroding iron armatures, salts are being mobilized etc. The appearance of coatings and paint layers changes due to pollutants and UV light.

This paper will consider the impact of the historic and current environment as well as their management measures on the plaster cast collection investigating the surfaces of the casts as a point of Reactivity. We will explore the various deterioration patterns of salt activity, heavy and preferential soiling, inconsistent surface coatings and corrosion of armatures. We will use information gathered from archival research, preliminary condition surveys, material analysis, observations and hands on working experience generated from the recent conservation programme. We will refer to risk assessment

frameworks to interpret the information to further understand the interactions and help focus proposals for sustainable maintenance and long-term care of the cast collection.

## Reacting to Hazardous Collections

### Navigating Deep Currents – Treatment of an Artifact with a Traumatic Origin and Potential Hidden Hazards / Steven Pickman

**Co-authors: Grant Czubinski and Kate McPhaul.**

Artifacts born out of traumatic and desperate circumstances often serve and remain as the only tangible memories directly accessible to particular historical events by their museum audiences. When rooted within a context of survival, they can also reflect evidence of displacement, ingenuity, and rebirth. As such, the meanings and values of these charged objects are imbued with added emotional and psychosocial significance that resonate in the present and must be taken into consideration when developing treatment protocols and procedures. Balanced along this tightrope are the needs of an artifact's material landscape, often never intended for long-term use or preservation, and requiring both responsive and pre-emptive considerations.

This paper will explore the concerns and treatment of a Cuban refugee raft in preparation for 3D scanning and loan. Part of the museum holdings within the Anacostia Community Museum and intended for loan to a new permanent gallery space at the National Museum of American History being developed by the Smithsonian Latino Center, the raft is a representative artifact of the Balseros and the precarious vessels on which they attempted transit (balsas). For many of those who attempted this route, little to no evidence exists of the voyage or their passing; numbers indicate that between 1959 and 1994, at least 20% of those who attempted the crossing perished with sources indicating a possible death rate as high as 75%. Having gone into storage soon after acquisition and remaining there for the last 24 years, existing documentation on the scavenged composite artifact itself was relatively scant with limited information available about its overall construction and condition.

Treatment needed to be carried out within a limited scope, budget, and timeline, preserving the overall integrity and visual impact of the raft while stabilizing any physical and chemical deterioration present. Concerns during the development phase of treatment methodology, procedures, and protocols left the contract conservator needing more information and advice regarding potential biological related contaminants present on surfaces, confirming or modifying existing proposed actions. This project became a collaborative effort between the contract conservator, project managers, industrial hygienists, the larger conservation community, and other relevant stakeholders. Approaches were kept fluid and flexible to adjust for limited accessibility to resources from smaller institutional entities but allow for ongoing communication, precautionary health and safety risk assessments, and ultimately, towards a successful treatment.

### Forces and Radiation: Dealing with the Hazards Involved with Acquiring, Displaying and Lending a Collection of Artworks by Takis / Carla Flack

**Co-author: Deborah Cane.**

In 2018, when Tate acquired twenty artworks by the Greek artist Takis, one of the most technologically innovative artists of the 20th Century, it was clear the works were going to pose many challenges for the Sculpture Conservation department. Over half of the works contained kinetic and light elements driven by various forces including electricity, magnetism and physical motion; and all were in their original mid-20th century condition. The complexity of displaying and preserving kinetic artworks has been widely discussed within contemporary art conservation and the difficulty of balancing the authenticity of the original motion against conserving or replacing original material is a constant challenge. Something highlighted by the Menil Collection when they spoke about conserving their own Takis works at the 2016 ICOM: Keep it Moving conference in Milan.

These challenges and complexities certainly existed for our collection, however they were increased significantly by the hazards inherent to many of the artworks, which meant Health and Safety legislation and procedures needed to be adhered to in order to safely display and lend the collection. As conservators we are trained in the hazards of working in our studios and well versed in COSHH and risk assessment, however, how does this translate when the works themselves are hazardous? There were many hazards within the artworks however the main focus will be on electro-magnetism, mercury and radiation, as these posed the biggest issues for display and handling.

As well as the complexities the contemporary art conservator usually faces, such as retaining the artist's intention, the hazards brought additional challenges. For example the potential impact on the health of the public or those handling the works, managing curatorial expectations of what can be achieved while adhering to EU and UK legislation and documenting these complex issues for those dealing with the works in the future and external to Tate. The talk will highlight how experience from working with social history and industrial collections led the preparation for the intake of these works and how it was crucial to work with various specialists within differing hazard sectors. Finally, how the conservation team dealt with the challenge of researching and understanding very complex fields of knowledge to apply to fine art, and ultimately what compromises had to be made.

### Toxic Taxidermy and More: Evaluating Hazards and Developing Safety Guidelines at the Museum of Vancouver / Hayley Monroe and Fiona Hernandez

The Museum of Vancouver (MOV) has spent the past year developing a risk management strategy for hazardous collections. This project aimed to address concerns from both the City of Vancouver as well as museum staff about the presence of hazardous materials in the museum environment. Most recently, preparation for an exhibition consisting primarily of heavily contaminated taxidermy specimens made it increasingly clear that guidelines for safe handling, storage, conservation, display and appropriate disposal were needed for the entire collection.

This project consisted not only of hazard identification, but also the production of a safety manual, training sessions for staff, physical tagging of objects and the improvement of a hazard module within the object database. Not least of all, this work set out to provide a balance between the realities of daily museum work and compliance with City of Vancouver and government guidelines. This talk will briefly cover the steps taken to identifying hazards in the MOV collection, as well as the framework developed for determining risk and guidelines for staff to use when approaching known or suspected hazards. Since the project began in the spring of 2018, a wide range of hazards were identified, including organic and inorganic pesticides, heavy metal pigments, botanical toxins, radioactive materials etc.

Following identification, a rubric was designed to plot the overall risk posed by individual objects. The final risk score designated an object as either no/minimal, low, moderate, or high risk. This information then corresponded to requirements for personal protective equipment, handling, transportation, conservation and display. Colored hazard tags corresponding to the risk score are attached to objects to provide a visual warning. Further information and additional instructions are entered into the hazard module of the object's database record.

For museum staff, the manual provides a comprehensive overview of the new system as well as relevant background information. Training sessions provided by the conservation department for the collections staff were instrumental in setting the new guidelines in action and empowering staff to feel both safe and confident that if proper procedures are followed, even hazardous collection items can be handled, displayed, and visited with minimal disruption to staff and minimal environmental impact. To properly address risk into the future, this project has provided the MOV collections department with a framework for strategic planning as well as an interdisciplinary working team. Ongoing staff time and effort will be required to proactively manage the risks to staff and the environment.

## Proactive Collections Care for Smaller Institutions

### Three Approaches to Sustainable Collections Care / Anastasia Matijkiw

**Co-author: Dyani Feige .**

Across the United States, important historical records and other cultural collections are held by organizations large and small, urban and rural, professionally staffed and volunteer-run. Many of these organizations operate on the margins of professional standards and require conservation and preservation services, but do not have access to them through traditional means. Since 2002, the Conservation Center for Art & Historic Artifacts (CCAHA) has developed and administered programs geared towards helping these organizations build capacity and make sustainable preventive conservation decisions. These ongoing programs have helped CCAHA to establish an

adaptable approach that has a proven positive impact on preservation and conservation activities across the country, regardless of size and type of collecting institution.

This session will focus on three programs managed by CCAHA: the Philadelphia Stewardship Program serving the Philadelphia region, the Documentary Heritage and Preservation Services for New York (DHPSNY) in New York State, and the Regional Heritage Stewardship that serves three distinct regions across the United States (Northern Appalachia, the Eastern Gulf Coast, and the Intermountain West). This session will touch on the development of each program, how they meet the needs of their respective regions, and what funding structures allow them to exist.

While each of these programs have similarities, there are intentional and conscientious differences in their approach, depending on the region, funding, and resources available - as well as lessons learned along the way from participants and regional partners. Each program has grown over time to become three distinct offerings that offer feasible, scalable solutions adapted to the regions they serve. The success of these programs has been the direct result of CCAHA's ability to offer adaptable, flexible, and responsive programs that meet organizations where they are, rather than impose standards beyond their capacity. Just as each program is different in their approach, so too are their funding streams. From state funding to grant funding, each face questions and issues of sustainability. The presenter will also address the ongoing hurdles of sustainability CCAHA is constantly addressing, both in regard to participating organizations being able to support preservation and conservation activities and CCAHA's own ability to offer these programs.

### Broadening the Dialog with Our Allies through the Connecting to Collections Care Community / Heather Galloway

The act of seeking, giving and receiving advice in an online community can seem like a fraught endeavor at times. Those who seek advice can feel anxious that gaps in their experience are being publicly exposed, while those who offer up advice can feel concerned that they are providing how-to instructions that will encourage others to perform tasks outside their area of expertise. The apparent ease with which one can post a query is at times at odds with the actual time-consuming task of communicating one's needs clearly. The responding audience is often at a disadvantage to the full scope of the issue while those looking for guidance can have difficulty in discerning whether the expert advice offered up is in fact the advice of an expert.

The Connecting to Collections Care (C2CCare) Community is the only community hosted by the AIC website that is specifically geared to a broader collections care audience, outside the foundational audience of treating conservators. In addition to representing a diverse range of collection care professionals, the forum members also constitute a wide gamut of training and experience from volunteers at small institutions to graduate-trained professionals. As it is an outward facing effort to reach a larger public the answers are monitored by volunteer conservators in an effort to assure that posted answers represent best practices within the professional field.

Where uncertainty exists volunteer-experts are contacted by the monitor and the Find-A-Conservator function of the AIC website is often linked to in order to direct community members to the professional help they may need. This talk will explore the ways in which the C2CCare Community has created a venue that has brought together conservators and collection care personnel in an explosion of direct communication that has been overwhelmingly positive but not without its hurdles.

Questionable advice and products have been offered up, high-standard yet financially unattainable solutions have been suggested and members have at moments felt shut-down or disrespected in their quests for new knowledge. Yet both communities, conservators and non-conservators a like, have also gained an opportunity to observe more directly the most pressing concerns for their allied professionals within a social setting that is raising awareness and building more constructive relationships.

The C2Care Community, at the time of this writing, with 2,600 members is the forth largest discussion group after the recently introduced Global Community which has 7,600 members, the Emerging Conservation Professional Network which has 4,000 members and the AIC Member Community itself, which numbers 3,700. When viewed alongside the other communities, the number of discussions on the C2CCare Community has made it the second most trafficked community hosted by the AIC coming in slightly behind the Global Community. As such this forum represent an outreach opportunity that can benefit traditional membership and expand upon AIC's efforts to raise awareness of conservation and preservation. This talk would like to posit that it remains our responsibility, as members of AIC to welcome into our discussions a greater variety of voices for the advancement and benefit of us all.

### Conservation Within Reach: Conservators and Lab-less Conservation for a Higher Standard of Care / Katharine Corneli

Of more than 35,000 museums in the United States only a small proportion have a conservation lab and in-house conservator. Most institutions lack the capacity or the funds for either. Though professional conservators are increasingly reaching out to smaller, unequipped museums many barriers still exist to the long-term preservation of these collections. Hence, many institutions must outsource their conservation or do without.

From contracting with conservators in private practice to attempting "do-it-yourself" solutions after some online research, the disparity in available resources leads to a disparity in standards of care. Incorporated herein are the results of a nationwide survey exploring how cultural heritage institutions care for their collections. Some have conservation labs but no conservator, relying on occasional training by off-site professionals.

Some museum conservators make do with limited resources, including using distilled water and working with limited solvents. Occasionally a lab space may be rented off site. Roving conservators may cover many smaller institutions at once. These and myriad other solutions are discussed. There are ways in which any museum, no matter the size, can enhance their standards of in-house conservation, both preventive and remedial. Herein are discussed methods for making the most of a minimal budget with respect to materials and equipment as well as creative solutions, such as renting equipment or collaborating with local schools and businesses. The argument is made that employing a formally trained conservator, in any available capacity, raises the overall standards of care within an institution even in the absence of a conservation lab.

Therefore it is recommended that conservators gain experience in collections management, registration, and other (more commonly funded) museum positions. Much of the content is based on the personal experience of the author. Katharine Corneli is a professionally trained objects conservator who is currently the collections manager for a mid-sized rural museum where, with no formal lab and a limited budget for conservation materials, much is still accomplished in-house.

## Paintings Session 3

### Project Blue Boy: The Public Conservation Treatment of a Painting with Iconic Status from the Huntington Library, Art Museum, and Botanical Gardens / Christina O'Connell

Project Blue Boy was a multi-year and multi-faceted public conservation project of Thomas Gainsborough's *The Blue Boy*. First exhibited at Britain's Royal Academy of Arts in 1770 and acquired by the Huntington's in 1921, the painting has been on almost constant view since the gallery opened to the public in 1928 due of its iconic status. The painting has undergone several conservation treatments over the past nine decades, but many of those treatments were minimal and designed to limit the time the painting was off display. When The Huntington hired its first full time paintings conservator in 2013, structural and visual condition issues were noted that warranted treatment.

With new staff and funding that made public conservation possible, Project Blue Boy was planned as a thorough technical study and comprehensive treatment with a strong outreach component. A satellite conservation space was set up in The Huntington's Thornton Portrait Gallery where the painting is normally on long-term display. This location provided art historical context and made it possible to adopt a flexible conservation timeline that could run separately from the temporary exhibition space that operates with an ambitious rotating schedule. The flexibility in treatment schedule was also critical as The Huntington employs only one paintings conservator on staff. Project Blue Boy was treatment and education driven, as opposed to deadline driven.

When planning the satellite conservation space within the gallery, considerations were given to security, visitor access and experience, healthy and safety, and the intense focus necessary for a conservator during treatment. To achieve these criteria, a temporary half-wall was built in the gallery which provided enough space for the conservator and equipment. The half-wall

was fabricated with a slanted surface to display didactic content and interactive media for audience engagement. Huntington docents were trained and scheduled to be in the gallery during all public hours to prevent interruptions of the conservator's work and to allow security staff to focus on their tasks. Regular conservator gallery talks comprised the bulk of the public programming for the project. A set schedule of treatment hours and public presentations by the conservator was kept throughout the year-long public phase.

These talks provided details on how a conservator examines a work of art to understand the materials and condition, how decision-making unfolds for treatment, and professional guidelines of practice and code of ethics. By directly engaging the public, the conservator was able to foster a deeper understanding that went beyond what a visitor might observe on their own. Public conservation is intensive work and can pose many challenges because it takes place outside of the regularly equipped work space. There are also benefits, such as institutional education, especially when certain conservation expertise is new to that institution. Overall, what made Project Blue Boy successful was the painting's status and ability to draw visitor interest, the flexibility in the conservation schedule, and the financial support to appropriately plan the public space.

### Treading New Ground: Technical Examination and Treatment of Two Eighteenth-Century Philadelphia Portraits by William Williams / Mina Porell

**Co-authors: Matt Cushman, Rosie Grayburn, Stephanie Delamaire, Jason Fischel, and Donald Sparks.**

Defined by a handful of surviving paintings of shifting style and a limited archival record, the work of eighteenth-century painter William Williams (1727–1791) has long evaded straight-forward interpretation. Born in Bristol and forced into labor as a seaman in the Virginia trade, Williams is first recorded in Philadelphia in 1754 as a painter; how and where he was trained remains a mystery. An ongoing in-depth technical examination and conservation treatment of his paintings, conducted at the Winterthur Museum in preparation for an upcoming exhibition, has shed light on the artist's materials, technique, and possible sources.

This investigation is centered primarily on Williams's 1766 portraits of William and David Hall. Along with that of their sister Deborah, now in the collection of the Brooklyn Museum, the paintings are considered the earliest full-length portraits executed in the Philadelphia area and the most ambitious of Williams's colonial works. Examination of the paintings at the onset of treatment revealed areas of degraded paint, pervasive drying and mechanical crackle, and suspicions of overpainting. These observations accelerated the already planned investigation of Williams's materials and process. The multi-analytical approach included non-invasive imaging and destructive sampling to characterize the original inorganic and organic components, as well as restoration materials of special interest.

Among the extensive study's most significant discoveries is the identical preparation of the primary supports. Each canvas is pieced together from three strips of linen and coated with three ground layers of distinct colors, consisting primarily of very coarse iron earths, silicates, and lead white. Such triple colored-ground preparation has not been reported previously in American paintings and is rare in published occurrences in Western painting. Additionally, the characterization of the extraordinarily thick preparatory layers contributed to our understanding of the present state of the paintings and highlighted potential pitfalls of the planned structural and aesthetic treatment.

The analysis of the artist's palette revealed few surprises, but indicates deliberate choices in the use of orpiment ($As_2S_3$). Williams's selective use, and the mineral's tendency to degrade to colorless and water-soluble arsenic oxides, likely caused the differential deterioration of specific passages of green paint, which exhibit color changes and undermined organic binder susceptible to abrasion. Synchrotron based micro-X-ray absorption near edge spectroscopy (μ-XANES) reveals photodegradation of orpiment at the paint surface to arsenate ($As^{5+}$) compounds. Just below the surface, arsenic remains bound primarily as arsenite ($As^{3+}$) compounds, with some still complexed to sulfur as orpiment. In the ground, hotspots of $As^{5+}$ can be found where humidity transported $As^{5+}$ in the aqueous phase via capillary action.

This paper discusses the results from the extensive technical study of the two Hall brothers' portraits in light of our concurrent archival and comparative research, as well as the ways in which these findings have informed conservation decisions. The potential for water-induced mobility of orpiment's oxidized degradation products is of special concern and was a major point in the discussion of the structural treatment of the paintings as part of a Getty Foundation Conserving Canvas masterclass at Winterthur.

## Research & Technical Studies, Collection Care, & Contemporary Art Joint Session

### Effect of Long-Term Impact of Climate Change and Urban Pollutantson Cultural Heritage Sites and Collections / Peter Brimblecombe

A changing climate is now widely observed. Within the field of heritage protection, it is seen as important factor, even though it is not always clear how its impact will be revealed. Coastal flooding and increased tropical storms are key cause of concern. Gradual change to climate can also have effects, although a few degree increase in temperature or 10% change in rainfall amount might seem of little relevance to monumental structures. However, small changes can be amplified: ice melts at 0oC, so a very small increase in temperature can cause the loss of an archeological site in permafrost. Small changes in humidity can cycle salts between crystals and brines, so induce salt weathering in porous stone.

Biology can also amplify small changes. Insect infestations may be catastrophic after only a slight change in temperature or a new species may suddenly become a threat, while microbial growth on surfaces can be affected by subtle shifts in relative humidity. Air pollution though decreasing in many cities is changing in character resulting in altered pressures on heritage. As historic houses often lack climate control, the changed climate can propagate indoors. Landscape, the context to heritage sites is affected by climate change altering the picture they offer visitors. This presentation will explore with a range of examples of changes under way, the effect on heritage and attempt to project these through the current century.

### Accessible and State of the Art Pollution Monitoring Systems for Enclosures / David Thickett

Enclosures are a very valuable approach to individually controlling environments and offer very significant improvements in sustainability. Their major drawback is the concentration of pollution from materials and objects. In both the British Museum and English Heritage all instances of observed corrosion were investigated. Corrosion products were identified, environmental conditions and pollution levels were measured and any materials not previously Oddy tested were tested if possible. In over 1000 instances no gas phase corrosion was observed where materials passed Oddy tests. Several instances of direct contact corrosion and object-sourced corrosion were recorded. The Oddy test has been modified to also include direct contact. A test has been published using paper instead of metals, and evaluating with viscometry. This has now been modified to use the more accessible ATR-FTIR. Additional tests to evaluate materials including silk and archaeological bone have been developed. English Heritage has showcases that date from as early as 1840.

Although testing is essential for new cases, measuring pollution levels or corrosion rates is also critical for existing enclosures. Several instances of objects causing corrosion of other objects or components within themselves are documented, meaning even comprehensive materials testing will not eliminate the problem. Research over the past three decades has developed several continuous monitors and dosimeters.

Whilst there is no doubt continuous measurement is desirable, such systems are expensive and dosimeters tend to cost less, but give more limited information. The function and utility of coated piezo electric quartz crystals, resistance based metal sensors, tVOC and single gas sensors, glass slide dosimeters and early warning organic dosimeters will be reviewed. Costs are often a critical restriction for many smaller institutions, simple, more accessible methods have been developed. Exposure and colorimetry of Acid/detection (A/D) strips can measure equivalent acetic acid levels. Visual examination of exposed lead and silver coupons should also be used.

This combination of rapid and long or very long term monitoring provides tools covering the whole gamut of common needs. Colorimetry can be used with silver coupons to provide quantitative results, if available. This approach deals with the most commonly reported damaging pollutants. The weaknesses of each method will be discussed.

The response of A/D strips to formic acid at a range of RH values, and to light has been assessed, as well as response times. A guide chart has been developed to assess A/D strips semi-quantitatively, without a colorimeter. A survey of heritage institutions found a lack of knowledge was another major barrier to pollution monitoring. The EU funded MEMORI project developed a decision support model to guide non-expert users through the measurement, assessment and mitigation process.

The basic data has now been expanded to include sulfur gases and silver and the impact of RH on metal corrosion rates, allowing the incorporation of archaeological iron and copper alloys. Improved use of enclosures has dramatically reduced English Heritages carbon footprint. Pollution issues can derail such improvements without adequate measurements and suitable mitigation.

### Addressing a Growing Concern: Preliminary Research Towards an Understanding of Mold on Modern Paints / Kyna Biggs

**Co-authors: Alison Murray and Patricia Smithen.**

Microbial activity is a critical concern within museum and cultural institution collections due to the ability of microorganisms to contribute to many deterioration processes and the limited treatment protocols available. The extent of mold damage and the physical and chemical nature of the affected material can quickly complicate potential conservation treatments.

To date, most research performed on microbial activity within cultural heritage focuses on stone, textiles, wood, and other plant-based objects. However, little research has been done to investigate microbial degradation of modern paint films. Due to the limited foundation of prior studies, very little is known about the species of mold that can develop on modern paint films, or the vulnerability of certain paint films to mold infestations based on their chemical composition.

Furthermore, modern paints provide a particular challenge for mold cleaning and treatment due to their generally sensitive nature, the risk of material loss and deformation with both wet and dry cleaning methods, and the ability of the mold spores to become deeply embedded within the structure of the paint. In order to improve the understanding of microbial activity as it pertains to modern paint films, appropriate protocols, preferably ones that involve easily accessible materials and techniques, must be developed that allow for reproducible research to be conducted.

This study explores the complex microbial ecosystems that can arise with modern paintings and their degradational effects, as well as presents the development of a simple protocol to promote microbial growth on experimental paint samples to be used for further studies. Mold species were identified from the painted surface of a mold-ridden 20th-century oil painting, using DNA extraction and sequencing. Experimental samples of fresh acrylic paint films, in a range of colours, were then inoculated with the isolated mold species and subjected to increasing relative humidity conditions using saturated salt solutions to determine the optimal conditions for microbial growth.

The challenges in inducing microbial growth on experimental samples to be used for subsequent research as well as best practices for studying microbial activity will be discussed. The results of this study, combined with additional future efforts, will provide insight into the microbial activity, and related degradation, associated with modern paint materials and will inform future conservation efforts. Keywords: Microorganisms, microbial activity, biodeterioration, modern paint films, DNA analysis, relative humidity, saturated salt solutions.

### Scratch That: Conservation Treatment of Abraded Plastic, a Technical Study Towards a Flexible Future: A National Approach to Managing Time-Based Media Art Collections in Australia / Sarah Barack and Batyah Shtrum

**Co-authors: Jessica Waltew, Beth Edelstein, and Greg Lastrapes.**

Between 2013 and 2018 SBE Conservation LLC, a Brooklyn based private objects conservation firm, conserved three vacuum-formed reverse painted UVEX (Cellulose Acetate Butyrate or CAB) sculptures by Tom Wesselmann, created in the mid-1960s. These complex, large-scale objects presented a range of condition issues, including that related to fabrication stress, expected plastics degradation, and past restorations.

The conservation treatments carried out focused on overall stabilization of the fragile objects, visual reintegration of areas of plastic loss using a fill technique commonly used in glass conservation, surface cleaning and polishing, and replacement of the deteriorated backing. Two other similar reliefs were examined but not treated. This comprehensive project led to further investigation of treatment strategies for degraded plastics and a technical study utilizing samples of discarded, aged CAB as well as recently manufactured "fresh" CAB. As plastics often exhibit scratches, abrasion, and other surface damage as they age and cycle through display and other use, discussion around treatment options typically includes the question of cleaning and/or polishing.

This on-going technical study of aged CAB, a collaborative effort involving Cooper Hewitt, Smithsonian Design Museum, SBE Conservation LLC, the Cleveland Museum of Art, and Case Western Reserve University, attempts to contribute to this conversation through consideration of a commercial product marketed for plastic/acrylic objects, the NOVUS 7100 Plastic Polish system. This three-part system includes a more aggressive polishing solution (number 3, "heavy scratch remover), a mid-range compound (number 2, "fine scratch remover"), and a polishing solution (number 1, "plastic clean and shine"). Samples of both fresh and aged CAB will be abraded with known grit sizes of Micro Mesh, and then treated with NOVUS solutions 1-3. Optical profilometry and ellipsometry will be used to compare before and after treatment surface texture; these results will be contrasted with Reflectance Transformation Imaging (RTI). Together, these imaging techniques will be used to consider the effectiveness of the Novus system. Samples will then be aged under controlled conditions and re-examined to assess long-term effects of different polishing techniques and materials, including questions of residues left on sensitive plastic surfaces.

## Sustainability

### Cradle to Grave: Sustainable Manufacture, Use, and Disposal of Collections Care Materials in Museums / Justine Wuebold

Managing material waste requires a customized and collaborative design to control the museum's ecosystem of buying, using, repurposing, and discarding material. This presentation takes a closer look at commonly used collections care and storage materials to determine their sustainability based on responsible manufacturing, length of transport, durability, and recyclability. The following materials were investigated for their lifecycle sustainability: Green Solvents, Tyvek, Ethafoam, Acrylite, and Plywood. In researching these materials, conclusions were made based on literature review and interviews with industry professionals in manufacture, use and recycle.

On a practical level, specific companies were investigated for their sustainable manufacture (DuPont, Evonik, Sealed Air), specific materials were chosen for their use in collections care (Tyvek, Ethafoam, Acrylite), and specific recycling facilities were interviewed regarding their acceptance of museum quality materials (Terracycle and SuperLink Plastics). Surveys performed by Sustainability in Conservation (SiC) and the AIC Materials Working Group (MWG) informed material investigation and provided data about sustainable use in the collections care field. Conclusions and results of this investigation will be presented to paint a better picture of sustainability in our most-used materials. Here are some of the practical issues to be discussed: recycling pre-consumer waste; cost and carbon footprint for shipping material scraps; reuse of materials in storage; excess custom displays and enclosures; non-curbside recycling materials; and hazardous contamination and disposal. On a behavioral level, accountability plays a strong role in how museums choose to focus their efforts toward sustainability.

In some cases repurposing can be problematic due to material contamination or enclosure customization needs. Storing scraps for special recycling is a major issue in overcrowded collections departments, and hasty decision-making leads to inappropriate disposal of trash, recycle and hazardous waste. It is necessary to consider how recycle and disposal best-practices can be better encompassed within the Collections Policy, a document that should be accessible and familiar to all employees regardless of their status within the department.

This level of accountability requires every professional working in the collections environment to understand proper material disposal. Accountability is most effective in collaborative circumstances, where everyone plays a role in successful environmental initiatives. Special recycling measures involve a monetary cost, which is often the decision of a higher ranking professional within an organization or department. Involving everyone, including important decision-makers, is the only way to make a successful transition toward a more environmentally responsible workplace.

This research is intended to lay the groundwork for future Life Cycle Assessments and raise awareness of sustainability issues that exist in collections care. Defining criteria for considering a material sustainable will provide a necessary tool for collections care professionals to help them be more informed about the impact of these materials that are ubiquitous in collections departments. Accountability and collaboration are key elements to building a more sustainable practice as a collections care team. Continuing research will take into consideration the practical and behavioral changes required in the manufacture, use, and disposal of collections care materials.

# ABSTRACTS

### The Nunalleq Center and Archaeological Site: Community and Cultural Preservation in Southwest Alaska's Rapidly Changing Climate / Frances Lukezic

In the Yup'ik language, Nunalleq means "the Old Village." Nunalleq is a pre-contact archaeological site, dating from 1400 to 1670 AD, and is located in Southwest Alaska near the Native village of Quinhagak. Confronted with increasingly violent winter storms and the tundra's melting permafrost, villagers of Quinhagak noticed that coastal erosion was endangering the site and exposing perfectly preserved organic artifacts.

Concerned their cultural heritage was being lost and swept out in to the Bering Sea, Quinhagak's village corporation of Qanirtuuq Incorporated partnered with archaeologists from the University of Aberdeen and conducted rescue archaeological excavations from 2009 to 2018. The excavations produced over 60,000 artifacts, the largest collection of prehistoric Yup'ik artifacts in the world. All the artifacts remain in the village of Quinhagak, housed in the newly created Nunalleq Culture and Archaeology Center.

During the final excavation season of 2018, the Center also served as a conservation lab. In prior years, wet organic artifacts had been shipped to the University of Aberdeen in Scotland for conservation then back to Quinhagak after treatment, at an unsustainable tremendous cost. This paper presents the work undertaken at the Nunalleq Center during the 2018 excavation season, highlighting the adaptations required to conserve wet organic artifacts in a geographically remote location with limited resources and modifying the building to accommodate the archaeological collection, all in an environment affected by climate change. The paper will also discuss the Nunalleq Center's future as it weathers the rapidly changing climate of Southwest Alaska.

### Collaboration and Innovation: Developing the Potential of Environmental Monitoring Data at the National Library of Scotland through Industrial and Academic Partnerships / Julie Bon

**Co-author: Ian Symonds.**

The National Library for Scotland cares for over 30 million items held in trust for the people of Scotland. The Library cares for and protects these collections through a rolling programme of interventive conservation in combination with a robust preventive conservation approach ensuring that our collections are stored and displayed in conformity with our environmental parameters. The Collections Care and Estates teams at the Library work closely to ensure that these parameters are maintained. This work has become much more streamlined following the recent introduction of a new front-face to our BMS.

The new LEEP (Library Environmental Energy Platform) has redesigned how Library staff can access and analyse data within the BMS. Real-time data for environmental conditions and energy consumption can be accessed via a user-friendly and highly intuitive platform. This open protocol platform has been designed by the Library in conjunction with their industry partner, Craigalan Controls. The innovative and collaborative approach taken on this project has resulted in two recent nominations for national facilities management awards in the UK.

This paper will introduce the new platform and demonstrate the benefits that it has brought to the Library in terms of energy consumption reductions as well as facilitating quick and proactive collections care responses to environmental issues that have arisen. The paper will then go on to outline the next steps in this work which involves partnership working between the Library and Heriot-Watt University in Edinburgh to undertake research utilising the real-time data that is now available. A research proposal has been submitted which would apply ANN (Artificial Neural Network) modelling techniques to examine environmental fluctuations on a number of Library microclimates.

The aim of this research is to establish acceptable fluctuations to allow a relaxation of tight hygrothermal controls and therefore reduce energy consumption to enable the Library to meet, and exceed, national climate change targets. Tight environmental controls in exhibition areas are crucial to ensure that the Library complies with its obligations in loan agreements with lending organisations as well as with Government Indemnity Insurance requirements. The modelling developed will improve exhibition design and planning and will allow the Library to provide lenders with the reassurance that the microclimates in use are protecting the collections.

Another outcome of relaxing tight environmental parameters for display when using microclimates will be to allow NLS (and possibly other national organisations) to display collections in smaller libraries, museums and galleries that are currently unable to meet such parameters. This will enable Library collections to reach a much wider audience, which is a key strategic priority for the Library's new 2020 – 2025 strategy.

### Glenstone: A Case Study in Energy Saving Measures in a Modern Museum Building / Samantha Owens and Steven O'Banion

Glenstone is a museum of modern and contemporary art integrated into nearly 300 acres of rolling pasture and woodland in Montgomery County, Maryland, allowing for a contemplative experience of art and architecture within a natural environment. In 2018, Glenstone opened an expansion that includes a new 204,000-square-foot building called The Pavilions. Designed with Glenstone's environmental mission in mind, the building features green roofs, controlled natural lighting, and cisterns that collect rainwater.

Through precise mechanical manipulation, Glenstone was able to cut energy usage in half over the course of the first year of operation. To achieve this goal, the building management system was configured to provide useful information that highlights inefficiencies at a glance. Temperature and relative humidity are controlled with moving set points that allow for gradual drift in response to seasonal fluctuations in the weather. In coordination with the expansion, Glenstone's original 30,000-square-foot museum building, termed The Gallery, was upgraded and optimized. The careful attention paid by Glenstone's staff allows the Museum to maintain environmental conditions that minimize energy consumption while still meeting the needs of the collection.

## Proactive Digital Methods

### Applying a Technology-Driven COMPSTAT Model to Collaborative Collection Protection Strategies for Artworks in the Galleries of the Detroit Institute of Arts / Eric Drewry and John Steele

In January of 2019, the Detroit Institute of Arts (DIA) quietly launched a new internal initiative modified from a statistical analysis model used by police departments across the country to combat crime. COMPSTAT – short for "compare statistics" – includes four components: timely and accurate information or intelligence, rapid deployment of resources, effective tactics, and relentless follow-up. The DIA adapted this model not to fight crime, but to understand how and where visitor behavior threatens the collection and to find ways in which the museum can better protect the art on display.

For the DIA, the process begins with information gathering from a variety of sources, including object protection systems, security technologies, attendance tracking systems, historical records and data, and anecdotes shared by museum staff. Data from incidents that affect the collection are visualized using heat maps that show their location and frequency. This information is then analyzed and discussed by a cross-departmental team representing multiple disciplines across the museum including staff from Protection Services, Conservation, Collections Management, Registration, Curatorial, Interpretation and Visitor Services. Regular review of COMPSTAT data is now key to informing staffing decisions for front-line employees, physical and technical object protection strategies, and curatorial and interpretive planning efforts. With this model, the DIA has created a near real-time risk assessment tool for its public galleries with truly fascinating and sometimes unanticipated results. It has also allowed for both the rapid deployment of protective measures as well as valuable information for long-term strategic planning. This session will introduce the COMPSTAT model and describe how it has been successfully implemented at the DIA, encouraging institutional collaboration to proactively develop and implement collection protection strategies for artworks in the galleries.

### Uses and Abuses of Eye-Tracking Techniques in Conservation Decision Making / W. (Bill) Wei

**Co-authors: IJsbrand Hummelen, Oliva Barry, and Katherine Kelley.**

Increasing numbers of objects are entering museums and other collections around the world, and requests for objects for exhibitions or loans are also increasing rapidly. This state of affairs is putting pressure on limited conservation resources, thus exacerbating discussions and debates about what needs to be restored and how. One of the main goals of conservation is to try to return an object to a state in which viewers can see what the maker intended them to see or how the object was intended to be used. Making the necessary conservation decisions and setting priorities is a complex task,

often made after much research and discussion on artist's intent, historical context, originality and previous conservation efforts. However, this begs the question as to what it is the average viewer is "supposed to see," who decides, and on what basis.

In order to better understand current viewer perception as related to conservation decision making, the RCE has begun using so-called eye-tracking techniques to determine how viewers look at an object. Modern eye-tracking equipment uses infrared light to follow eye movements as a subject observes a given object. It produces so-called gaze plots which document what the subject looks at, in what order and how long, and so-called heat maps which document which features of the object the subject focusses on regardless of order. Low-cost eye-trackers which the RCE has used study how subjects look at computer displays of objects. More sophisticated eye-trackers worn as glasses allow subjects to move around the objects they are observing.

Due to budget limitations, the RCE has used interviewing techniques to roughly simulate the work of such portable eye trackers. Interviewers ask people to look at objects and say which features they are looking at the moment they do. They are then asked to recall the features that stand out in their minds, simulating the heat map. For three dimensional objects and installations, subjects were anonymously filmed while they interacted with (or not) the objects. Based on the films, plots were made of how they moved around the object, where they stood still, and how long. Initial results confirm earlier RCE perception tests that there are often areas of objects which conservators consider very important, but which are not at all noticed by many viewers.

However, this should not imply that conservation priorities should be solely based on what viewers see or perceive. As pointed out by, among others, Baxandall, Jay and Crary, what might not attract the attentions of a viewer today may have been very important at the time the work was made. On the other hand, Maisey, et al. reports the results of eyetracking experiments which show that viewers can fill in a large lacune based on the information around it. Thus, while eye-tracking techniques can be quite useful in "objectively" determining how current visitors interact with objects, care must be taken in the ("subjective") interpretation of this type of data with considering the historical context in which the object was made.

### Taking It All Apart: The Use of 3D Technology and Imaging in the Conservation of a Large-Scale Cambodian Stone Sculpture / Amaris Sturm

**Co-authors: Beth Edelstein and Colleen Snyder.**

A centerpiece of the Southeast Asian permanent collection of the Cleveland Museum of Art (CMA), Krishna Lifting Mount Govardhan depicts a young Krishna, an incarnation of Vishnu, holding up a mountain to protect villagers from a flood brought down by Indra. Now fractured into multiple pieces, this once monolithic sandstone sculpture stood at nearly eight feet tall within a cave temple at Phnom Da, the earliest known sacred hilltop site in Cambodia. The only one of a group of figures from this site housed in a US institution, this monumental sculpture exemplifies the early transition of Hinduism from India to Southeast Asia. Initially treated in 1978 at the CMA, the sculpture and its previous treatment were recently revisited in order to incorporate an original fragment reacquired by the museum.

Treatment required four major steps: the deconstruction and removal of restoration materials, treatment of the stone's surface including stain reduction and stabilization of extensive contour scaling, reconstruction of the fragments using contemporary conservation techniques, and mounting of the sculpture for display. This paper introduces the complex collection history of the sculpture and its conservation, while focusing on the use of digital technology as an essential tool supporting global collaborations, decision-making, and treatment, as well as its use in the final presentation of the object. 3D scanning and photogrammetry were employed throughout the treatment process to document and model both the CMA's Krishna and additional sculptural fragments from Phnom Da housed at the National Museum of Cambodia. The resulting digital models were used as during treatment documentation, to digitally adjust fragment orientation, to study Cambodian sculptures in collections globally, and to enhance conservation outreach. These digital models were printed both at 1:1 and miniature scale, which was essential for creating treatment mounts and further testing fragment orientation, and as well as for didactic purposes.

Additional imaging, including CT scanning and x-radiography, was also employed to better understand the internal structure and stability of the stone fragments. Ultimately, these imaging, modeling, and printing techniques facilitated communication with conservators and scholars in Cambodia: something that was impossible during previous decades. This opportunity for digital sharing and comparison of stone fragments, which reduced the cost of travel for people and artworks and limited handling of the fragile stone surfaces, was essential for the successful treatment of the sculpture. Funded by a Bank of America Art Conservation Project grant, this project brought together an interdisciplinary team of professionals, including conservators, curators, mount makers, structural engineers, materials scientists, and technology specialists, who worked to better understand, treat, and display the sculpture.

Through these collaborations, non-traditional tools and specialized equipment were used to support the conservation and curatorial goals. The culmination of this work is a fall 2020 exhibition where Krishna, in his newly realigned form, will be displayed for the first time alongside other sculptures from Phnom Da. Digital technology will continue to be an essential tool in the exhibition, with physical didactics and augmented reality applications being used to tell Krishna's mythology, history, and conservation.

## Photographic Materials Session 3

### The Niépce Heliograph, at the Harry Ransom Center / Diana Diaz and Heather Brown

In 2002, Harry Ransom Center conservator of photographs Barbara Brown and Getty Conservation Institute (GCI) scientist Shin Maekawa joined forces to create a long-term, anoxic display case for one of the most treasured items in the Ransom Center collection, The Niépce Heliograph. The goal of the project was later expanded to include scientific analysis with GCI, and with The Getty Museum, create the first reproduction of the plate since Helmut Gernsheim's analog attempts in the mid-twentieth century. The results were successful at providing the Ransom Center with valuable information regarding the materiality of the unique object and documenting the condition of the plate in a sophisticated way.

Now, looking back, Google was only six years old in 2002. Gmail, Facebook, Twitter, and Instagram didn't exist, the most popular world wide web browser was Internet Explorer, and BlackBerry was the smartest phone commercially available (iPhone was first released in 2007). Human visual literacy has evolved tremendously since then, as technology keeps pushing the boundaries of visual perception. Therefore, cultural institutions have also been pushed to change the ways their collections are digitally accessible. In 2019, this became true for the Ransom Center when curator of photographs Jessica McDonald revisited the historiography of The Niépce Heliograph. With newer monitors and many image requests for publication, it became apparent the need for new digital images of the "earliest photograph produced with the aid of the camera obscura known to survive today."

Ransom Center photograph conservators Diana Díaz-Cañas and Heather Brown began working with the curator to obtain new images, while also seizing the opportunity to review the anoxic case system and study the plate more closely. The goals of the project were to gather more information about the condition and materiality of The Niépce Heliograph through photo-documentation and instrumental analyses, to update the case as needed, and to create a reference manual for the long-term care and maintenance of the plate and case.

This collaborative project was a team effort involving many professional staff at the Ransom Center as well as other photograph conservators, conservation scientists, and engineers across the U.S. It fostered beneficial partnerships with institutions such as The Lens Media Lab and the Institute for the Preservation of Cultural Heritage at Yale University, The Menil Collection, The Museum of Fine Arts Houston, The Science Department at the Getty Center Institute, and The High-Resolution X-ray Computed Tomography Facility at The University of Texas at Austin.

### Deconstructing the Creation of Daguerre's Dessins-Fumées: A Photographic Process or Just Smoke and Mirrors? / Sarah Freeman, Nathan Daly, Lynn Lee, Michelle Sullivan, and Karen Hellman

In the years before the public announcement of the daguerreotype process in 1839, Louis-Jacques-Mandé Daguerre and others experimented with variations on photographic processes. Daguerre wrote a letter in 1827 to future partner Joseph Nicéphore Niépce describing a new process "tending more to perfection than to multiplicity," used to create a group of objects known as dessins-fumées (or "smoke drawings"). Exacting in style, and miniature in scale, each of these objects depicts one of a limited number of architectural motifs in black media. While compositions are repeated within the small set

of known dessins-fumées, variations in superficial details and shading are observed between "copies." No explicit primary documentation of the creation of these objects exists, and the limited secondary descriptions that do exist do not agree on the materials and methods used. Therefore, a research project was undertaken to ascertain whether Daguerre used photographic processes or more traditional drawing and printing techniques to create his "smoke drawings."

Two of these rare objects, "Fantasies": Moorish Arch and Courtyard of a Gothic Castle, in the collection of the J. Paul Getty Museum, were studied using a combination of non-invasive analytical methods, including digital microscopy, macro x-ray fluorescence (MA-XRF) scanning, Fourier-transform infrared spectroscopy (FTIR), and Raman micro-spectroscopy. The array of black materials used by Daguerre were identified and their potential methods of application assessed by comparison to mockups. The findings of this research will be discussed and how they address the uncertainty surrounding the development of photographic processes by Daguerre and others in the 1820s and 1830s.

### Removal of Aged Filmoplast P 90 Tape from Inkjet Prints / Saori Kawasumi Lewis

A line of ilmoplast tapes by Neschen Coating GmbH, Germany, has been marketed as "self-adhesive repair tapes," and found their way into book, paper, and photographs conservation laboratories and preservation-forward frame shops. Among the filmoplast products, one of the most commonly seen tapes in conservation laboratories today is filmoplast P 90 owing to its archival qualities as advertised by the manufacturer. Suggested applications of filmoplast P 90 include various paper and book repairs, as well as perhaps not-so-recommendable application by photographs conservators, "fixing originals to passé-partouts or rear mounts."

Manufacturer's advertisement efforts were successful. Conservators have adopted filmoplast P 90 tape in various applications around art, and, consumers outside of art conservation profession appear to have adopted the tape even more liberally. At The Nelson-Atkins Museum of Art, Kansas City, MO, a group of oversized inkjet prints were found to be mounted to a backing board using tabs of filmoplast P 90 tape. These tabs were attached by a framer to prepare the prints for an exhibition in 2012. Since their display, the prints remained framed and stored in room temperature art storage. The tape attachments were located near the sheet edges, where there is no image on recto, therefore there is no risk of the adhesive affecting integrity of the image. The margins, however, is a calculated visual component in final presentation of the image, and a decision was made to attempt removal of the tape to avoid future issues that may arise due to the creep of the tape adhesive.

The inkjet prints were executed on Hahnemühle Photo Rag paper which contains optical brightening agent. In order to soften the adhesive without impacting the paper support or the optical brightener, Evolon CR, non-woven micro-filament textile was used as poultice medium. Testing on a mockup and the actual artwork proved acetone to be effective for freshly applied tape, but petroleum benzine was needed to remove aged tape without leaving tacky adhesive residue or skinning soft surface of the paper. During the test, it was also found that petroleum benzine did not visibly (when observed with UV-A) move optical brightening dye, while acetone created distinct tideline even with minute contact with the paper.

Results of accelerated aging tests of select inkjet paper samples treated with p-benzine poultice is reported. With anticipation of similar treatment challenges with filmoplast P 90 and P 90 Plus tape removal, this paper will also touch on investigations into the two products' aging properties, methods of identification and suggested removal protocol.

## Collections Care: Emergency Response Session

### Construction Fires and Museums / Jeffrey Hirsch

If the museum building is a tool for preventive conservation, then its maintenance is critical to the safekeeping of cultural heritage. Repair and renewal projects are necessary for the long-term preservation of the building, but the construction process itself introduces risk to the people and objects within the museum. Recent fires at the Museu Nacional in Rio De Janeiro and at Notre-Dame de Paris demonstrate the vulnerability of historic buildings undergoing renovation. What are the most serious threats to building contents during construction, and where can planning help museum professionals mitigate these risks?

This oral presentation uses a critical path schedule to present an overview of the construction process. Discussion will identify how risk changes during construction, where work increases the vulnerability of collection material to damage and what measures can be taken early in a project to manage these factors. The presenters will focus on fire protection engineering, referencing published reports about fire incidents and their causes, then connecting this data to challenges unique to museum projects. Budgets and museum professionals' time should be directed toward mitigating damage based on a risk assessment built upon data from multiple sources within the construction industry.

### Few Resources, Much Creativity: Proactive Actions to Reduce the Impact of Major Disasters / Juçara Farias, Gilcy Azevedo, Gabriela Lúcio, and Aline Ferreira

Brazil's Chamber of Deputies has a historical, artistic and cultural heritage comprising about 23,000 linear meters of objects, in which are included rare and current books, historical documents, museum collections, videos and photographs. As most of the South America Institutions, the Chamber of Deputies does not have all fire protection devices being this agent one of our major risks. The Heritage Preservation Services is the area responsible for the preservation of all collections and has been always developing projects aiming to minimize the challenges of preventive conservation in a creative and cost-effective way.

The objective is to reduce the impact of a disaster and improve security in the storage areas while the Institution cannot implement an effective measure. In this presentation, we will highlight two practical actions, which were developed by the preservation area technicians in collaboration with the fire brigade: the mapping of storage areas and the development of the Emergency Collections Security Kit (in Portuguese, KESA). The first action covered the elaboration of maps entitled "Location of Collections and Rescue Priorities." They were developed to provide an easy and fast reading in emergencies situations. With detailed subtitles, colorful design, collection's type and priority, air conditioning systems, location of combustible materials and KESAs position they provided a clear vision for brigades, firefighters, managers and even untrained people.

The maps were plotted and fixed in strategic places of the Chamber of Deputies, enhancing understanding about storage areas and reducing considerably the time of action in case of a disaster. The other action, was the conception of an Emergency Collection Security Kit (KESA), were a set of equipment to assist in collections damage in case of emergencies and disasters were assembled. Depending on the severity of the accident, the KESAs can be used for immediate action while expert support is underway but definitely, they will be helpful during recovery. Twelve identical sets of properly marked yellow containers were strategic placed near the storage areas or strategic points. Each KESA has 27 items, including lockable bags to isolate and store objects, paper towels, flashlights, sandbags, personal protection equipment, and first aid kits, among others.

In conclusion, we want to show that wait for the ideal solutions is not the answer. We need to react to the continuous cutting of budget in the preservation area. It is necessary to have ideas and proactive. Before the ideal resolution, there will be short and medium term methods that can reduce the level of risk and its impact on the cultural materials. On top of that, it is essential to build a teamwork in your Institution and this can be achieved by an education program all over the Institution. The preservation area of the Chamber of Deputies believes that resiliency makes you go far, teamwork keeps you strong and creativity allows solution with low cost and efficiency.

### Sustainable Practice in Conservation and Collections Care: Tools and Tactics / Lorraine Finch

How often do you hear 'We don't have the money for that'?. How often are your efforts to care for your collections thwarted by the statement 'We can't afford that'? In the current climate we are going to hear this more often. In the next few years, budgets are going to become more restricted and smaller. Conservation and preservation, which are already bottom of the list for funding will be squeezed even more. We are going to have to do more with less. This presentation will explore how we can do more with less. Based on my workshop 'Collections Care on a Shoestring', we will examine areas of collections care where we can reduce spending whilst maintaining high standards. Using case studies, we will look at initial estimates for the cost of projects and how these were reduced. In some case by almost 80%! The areas to be discussed include packing and moving collections, environmental monitoring and control, and re-housing.

## General Session: Public Conservation Labs: Reactive and Proactive

### Are Conservation Visible Labs Effective? Evaluation of an Interactive Conservation Lab at a Science Museum/ Rebecca Newberry and Melissa Amundsen

The Science Museum of Minnesota has a long history of showcasing conservation work in visible labs. The museum strongly emphasizes interactive experiences in all of the exhibits. Staff working in visible labs are expected to interact with visitors. There is a dedicated lab in one gallery which has been used to showcase multiple types of behind the scenes work for the past 20 years. It has numerous windows that open so workers can speak directly to visitors.

We began a new project in 2014 by hiring a full time conservation technician to work in the visible lab, preparing objects for We Move and We Stay, an exhibit about the Dakota and Ojibwe in Minnesota. The technician was expected to staff the lab during busy time periods and to interact with visitors. The project also included front end formal evaluation by the museum's Evaluation and Research Department to gauge visitors' interest in what they wanted to see in the lab (Spoiler alert, it was dinosaurs.) While there was no summative evaluation of the lab, other subsequent evaluations shed light on visitors' experiences. This case study will explore the highs and lows of working in the visible lab and how we adapted to better engage visitors. We developed Agents of Deterioration hands-on activities and trained volunteers to present them. We honed our science communication skills and scheduled the most engaging work for the busiest times. We will discuss the challenge of continuing conservation public outreach in the space when the project funding ended. We will also discuss the importance of evaluation for visible lab and recommendations for future evaluation work.

### Conservation Behind Glass: Interacting with the Public in a Lab on Permanent Display / Alicia Halligan

**Co-Author: Louise Beck.**

When museum visitors wander to the back of the Henry Ford Museum of American Innovation, they might discover two large windows, glowing from the bright work lights inside. The windows are nestled between steam engines and machinery, and they reveal the object conservation lab. The work on display in the lab since 2013 is primarily that of a team tasked with a storage relocation project funded by a grant from the Institute of Museum and Library Services. In addition to the hard work of cleaning a myriad of objects from storage, this team faces many challenges in the work they do to expose their project, from communicating the intricacies of conservation to visitors as best as possible in the short timespan they are at the window, to toeing the line in terms of collaborations without creating work for other departments such as IT or programs. The fundamental goals have remained the same: to engage visitors in conservation, with the hope that they learn something new about the field, and to highlight the grant-funded nature of the work. A small visitor exit survey in 2017 revealed that fewer than 5% of visitor could recall information about conservation or IMLS, leading the team members to explore new ways to reach out to in-person visitors. Efforts over the past few years have included: a whiteboard of daily activities, a tablet with a cycling slideshow, and a QR code in the window with links to our blog posts. Specific efforts have been made to engage visitors rather than act as a passive viewing window. A "sneak peek" object has been very successful – a photo of a light-sensitive object is placed in the window, with a caption indicating that visitors should speak up if they'd like to see "the real thing". The boxed object is then unveiled to excited audiences, with an explanation of the damage that light can do to certain materials and how conservators make efforts to prevent that and other types of damage. Another successful engagement is a "seek and find" game in the slideshow – pictures of parts of objects are included on a few slides, and the visitors are encouraged to look closely at the lab and see if they can find the whole object. The resources required for these interactions varies, but time is almost always the major factor. The weekly slideshow takes more time overall to update than the daily whiteboard did, for example, but has proven easier to schedule and keep up to date. The time spent interacting with visitors also varies, depending on factors from weather to attendance, and there is a balance to be struck between the interruption to the flow of the conservator's work and the value that visitors receive from the interaction. These day-to-day outreach efforts are punctuated by other types of interaction, both digital and in-person. Digital outreach includes a monthly 'Facebook Live' video from the lab, blog posts about the project, and photo posts on other sites, such as Instagram.

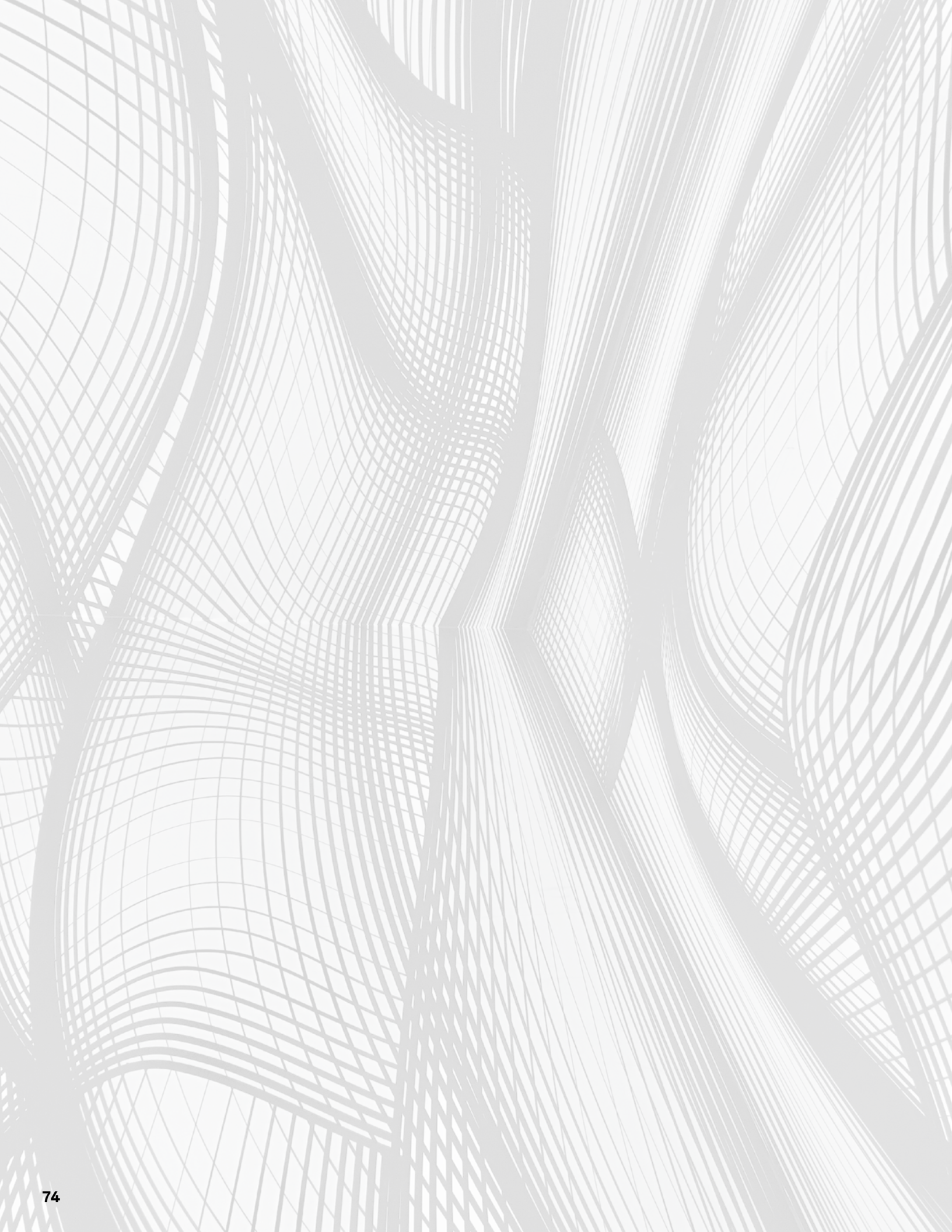
### Conservation in Action: One Museum's Experience with Public Conservation Projects over the past Two Decades and How That Will Inform Programming in a New Conservation Center / Lydia Vagts and Tanya Uyeda

**Co-authors: Charlotte Ameringer, Linsly Boyer, Andrew Haines, Gordon Hanlon, Abigail Hykin, Evelyn Mayberger, Louise Orsini, Christine Storti, Mei-An Tsu.**

Over the past 20 years the MFA has carried out many conservation projects in full view of the public. These projects began with the conservation of the murals and sculptures by John Singer Sargent in the Rotunda and Colonnade of the original building and the treatment of a monumental Roman floor mosaic. Starting in the early 2000's the organization of these projects was formalized under the theme of "Conservation in Action." Since that time approximately 20 such projects have been undertaken, with two currently underway. These projects have crossed disciplines within conservation, and have involved the Paintings, Objects, Furniture and Frames, and Asian Conservation departments, with the participation of the Scientific Research staff as well.

The original impetus for these public conservation projects arose from the necessity of finding spaces to work on very large artworks that couldn't fit into our conservation studios, or else needed to be treated before they could be moved. However, these projects became increasingly popular with the public and were in some cases woven into the exhibition schedule. The MFA has in general two types of public conservation projects: ones behind glass walls where the interface with the public is minimal, and ones where the project takes place in an open-air gallery setting. Each type of project has evolved over time in the ways in which the conservators can share information about the treatment. From simple white boards with daily notes, to more sophisticated PowerPoints scrolling on screens, the MFA's conservators working behind the glass have tried to engage their viewers with relevant information.

For the conservators working in direct contact with the public, they have developed a relationship with the Museum Associates or guides who are actively involved in interpreting the projects for the public. In addition, for each type of project there have been public lectures, tours, and private events with the development staff for various groups of patrons and donors. This paper will involve a discussion of the evolution of the MFA Boston's public conservation projects, as well as the virtues and pitfalls of working on view. Conservators at the MFA are actively evaluating our public conservation programs, past and present, as we formulate content and programming for our new Conservation Center which is scheduled to open in the spring of 2020. The Conservation Center will feature the MFA's first permanently visible conservation and collections care studios and will include a publicly accessible lobby space. With this lobby space we have the opportunity to showcase our work in a variety of ways: live, static, and through interactive media. Our aim is to apply the lessons learned from these previous projects to inform our decisions about what types of projects and experiences appeal to the public, and what will keep them coming back to visit the Center over time.



## SMITHSONIAN TIME-BASED MEDIA AND DIGITAL ART WEBSITE REDESIGN


### CRYSTAL SANCHEZ

*Video and Digital Preservation Specialist, Smithsonian DAMS*


The Smithsonian Time-Based Media and Digital Art Working Group (TBMA) developed a public website in 2013 to document the Working Group's history and projects and to share unit case studies. Five years after the site was developed, the SI TBMA website has become a valuable resource for SI staff as well as the entire media art stewardship community. It is often referenced as a leading resource in time-based media art collections care.

In the last year, the TBMA Working Group members revisited site goals and began to pursue a redesign for the site that is more outward looking with its goal of sharing resources developed across SI over the past 5 years in a more comprehensive and clearer way. This poster will introduce the new site as a resource for media art conservation.

This website was developed with SI TBMA members in partnership with the Office of the Chief Information Officer and the Smithsonian National Collections Program. The new redesigned website is expected to be published in May 2020. si.edu/tbma

## MORE THAN STICKS AND STONES: HISTORIC CEMETERY MANAGEMENT AMIDST CLIMATE CHANGE


### NEELA WICKREMESINGHE

*Manager of Restoration and Preservation, Green-Wood Cemetery*


Within a historic cemetery setting, clean up from damage caused by severe storm events has rapidly become a larger and larger portion of yearly maintenance. In 2019 alone 9 veteran trees were lost to storms less than 20 minutes in length. These, in addition to increasing droughts and rising temperature has also lead to immense strain on the veteran tree population of the cemetery which is home to one of the most diverse tree populations in New York City and the only level three accredited arboretum in Brooklyn. These storms create not only tree damage but often damage to historic monuments and buildings as well.

As part of a larger digital documentation effort the cemetery has adopted a GIS system to map and track tree locations and vital information as well as locations and conservation issues within its over 300,000 monuments. This system is used when weather events occur to track work, document damage, and track work as it is done in real time. The system is also used to try to identify trees and monuments that may be in danger of damage before a storm comes through.

During this presentation Green-Wood staff will talk through collections management of both historic trees and monuments and how digital documentation tools can help overall collections management issues within a cultural landscape.

## NAVIGATING THE LABYRINTH THAT LED TO THE ORIGINAL MOBILE GAMES: A MULTI-INSTITUTIONAL EXERCISE IN DIGITAL EXHIBITION AND CONSERVATION


### STEPHEN JACOBS

*Professor, The Rochester Institute of Technology*
*Scholar-in-Residence, The Strong National Museum of Play*


In March of 2017, the CEO and Vice-President of Exhibits at The Strong National Museum of Play and their Scholar-in-Residence, a Professor from RIT's School of Interactive Games and Media and it's MAGIC Center, decided to work with RIT students to prototype a collection of emulations of historic "Dexterity Games/Puzzles" from the museum's collections as an act of conservation, exhibition and outreach. The museum likes to look at its holdings as playable artifacts, with the majority accessible to the public at large and/or scholars in the field. That said, the over 100 of these types of games in their collections are too delicate to be made widely available to the visiting public.

That initial exercise in prototyping would lead the museum and university teams to go through numerous iterations of the project and eventually bring a local educational game studio, Second Avenue Learning, Inc, into the partnership to produce a commercially distributable product. The final product is The Original Mobile Games on iOS and Android devices and the Nintendo Switch. It contains playable emulations and digital images of the original games in the collections. It also includes historical mini-essays on each game.

Often thought of as just "ball in maze" games, there were actually a wide range of types of playstyles incorporated in this genre. While they are an important pieces of games history, their range and impact is little known to either scholars in the field or the general public. The game that defined the genre, and "went viral," was Pigs in Clover and its popularity and a "Senatorial tournament," landed it in the popular press and political cartoons of the day. These types of games were themed around and/or commented on the events of their times; the Boer War, the debut of the Queen Mary, the Dionne Quintuplets and others. These handheld, "mobile" entertainments share similar play mechanics (tilting, tapping and shaking) to today's digital mobile games.

The Original Mobile Games has brought these virtual versions of objects from The Strong's collections into the hands of thousands, and the digital press on the projects has received millions of media impressions. Twenty-four hours before this abstract was submitted an 18 minute YouTube playthrough of the Nintendo Switch version had received over 320,000 views. Amongst the hundreds of comments on the video were ones that discussed the writers new-found understanding of the foundational nature of the games, mentioned their nostalgia at having played them before, asked what the goals of the museum had been for creating the collection, and generally praised the institution for bringing these kinds of game to the attention of today's avid gamers.

This talk will go in-depth into process of engagement and creation the curators, conservators and game developers engaged in to create the partnerships and the product. All parties learned a great deal about bringing their varied expertise in scholarship, content creation, IP and legal agreements and industry process to the project and this presentation will share those lessons learned.

## SEEING RED: TOWARDS AN IMPROVED PROTOCOL FOR THE IDENTIFICATION OF MADDER- AND COCHINEAL-BASED PIGMENTS BY FIBER OPTICS REFLECTANCE SPECTROSCOPY (FORS)


### BEATRIZ FONSECA

*University of Copenhagen*


Fiber optics reflectance spectroscopy (FORS) is commonly used to non-invasively identify madder- and cochineal-based pigments on works of art, but the significant shifts sometimes observed in the position of their diagnostic absorption features can hinder correct interpretation of the spectra. To better understand these shifts, and improve the ability to confidently identify these pigments, a systematic study was carried out to evaluate the effects of different pigment recipes and laking substrates on reflectance spectra. Sixteen different madder- and cochineal-based

pigments were synthesized using historical recipes and painted in four different binding media (gum Arabic, linseed oil, beeswax, and egg yolk). The results of the study showed that, in contrast to the absorption features typically used for identification, features in the first derivative transformation of the FORS spectra provided a more robust means of primary identification. In addition, once it has been identified as cochineal, the absorption features in the spectra of cochineal-based pigments could be correlated to the recipe employed, providing a possible means for inferring the method of manufacture and laking substrate from a non-invasive analysis. The results of this study were used to create a decision tree for the identification of madder and cochineal pigments based solely on FORS. The presentation will walk the audience through the decision tree using several different case studies, while discussing the strengths and limitations of the method.

## THE EFFECT OF VARIOUS AQUEOUS BATHING SOLUTIONS ON THE CALCIUM CONTENT OF PAPER

**LINDSEY ZACHMAN**

*Winterthur/University of Delaware Program in Art Conservation*

Careful tailoring of aqueous solutions for paper bathing has long been part of paper conservation. Previous research (Bogaard and Whitmore 2001; Hanson 1939) has revealed that calcium content within paper promotes better aging qualities (e.g. retention of strength and reduced yellowing with age), thus calcium has been used to enrich bathing solutions. However, the comparison of different bathing solutions and their quantifiable effect on the calcium content of paper has rarely been discussed. Therefore, answers were sought to the following questions: In aqueous paper bathing procedures, how much is the inherent calcium content of the paper affected? Does the use of chelators remove calcium from the paper? When paper is bathed with calcium-enriched water, is calcium successfully incorporated into the paper substrate?

A series of baths was designed to emulate common bathing, cleaning, and rinsing solutions. Atomic absorption spectroscopy (AAS) was used to quantify the calcium content of historical paper with inherent calcium content. Calcium content was measured before treatment, after one round of bathing (including chelators, DI water, pH adjusted water, and calcium-enriched water), and after a second round of rinse-bathing with a variety of calcium-enriched solutions.

The AAS results after the first round of bathing revealed that all of the solutions reduced the inherent calcium content significantly, including the calcium-enriched solution. Depending on which chelator is used and their respective pH and conductivity, additional calcium was also extracted. The second round of bathing revealed that the calcium-enriched solutions were unequal in terms of reintroduction of calcium back into the paper. Some of the paper samples were left with much less than their original inherent calcium content, while other solutions restored the content and imparted a calcium reserve.

Based on the results of this preliminary study, it appears that some of the common assumptions of aqueous treatment may warrant closer scrutiny. This study found that bathing solutions leached calcium out of paper, and the calcium-enriched solutions did not always reintroduce enough calcium back into the paper to return the content to its original level. Future studies could examine alternate methods of re-introducing calcium to paper and methods of adjusting chelators to spare calcium content. Ultimately, further study on a larger scale is necessary to fully understand the effect bathing solutions have on the calcium content of paper.

**References:**

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## A STICKY SITUATION: CONSERVATION OF HISTORIC WATERLOGGED RUBBER

**LAURIE KING**

*The Mariners' Museum and Park*

Rubber is a relatively modern material which gained popularity in the 19th century with the development of vulcanized rubber. As museums expand their modern collections, rubber is finding a more common place in conservation labs, as is the study of rubber deterioration. The Mariners' Museum and Park is the repository for the gun turret, engine, and condenser of USS Monitor, a 19th century iron-clad ship which sank in 1862. The steam engine and condenser used rubber and textile composite gaskets to secure valve connections. These gaskets are now part of Monitor's waterlogged archaeological collection and are undergoing conservation. This poster will illustrate the cleaning, drying and storage processes that have been standardized for waterlogged rubber from USS Monitor.

The poster expands on previous experimentation and research concerning the treatment of waterlogged rubber undertaken at The Museum. Practical methods to prevent object distortion during both desalination and drying will be discussed. Mechanical and chemical methods of removing corrosion as dictated by the needs of the object will be examined. The development of an air-drying method will be specifically detailed, focusing on practicality and minimizing object distortion. The method uses materials that are commonly found in most conservation labs, and thus can be easily applied to other waterlogged rubber objects for treatment.

## TABLET TECHNIQUES FOR DIGITAL DOCUMENTATION

**BRIANNA WARREN**

*The Menil Collection*

Digital documentation with an iPad and the PDF Expert application makes it possible to work expediently with increased accuracy when creating condition reports for artworks. Hundreds of iPad reports have been completed in the paper conservation studio since this system was introduced to the Menil Collection conservation department in 2016. Following up on Katrina Rush's 2018 presentation to AIC's Collection Care Network, examples will show how these tools have the flexibility to easily adapt for purposes such as high volume acquisitions, documenting large-scale works, and other project specific needs. The ability to insert detailed photographic images directly into a report while working in storage or a gallery setting make working with a digital tablet extremely efficient. The incredible portability and ease of adoption adds to the appeal of documentation with this method. Techniques demonstrated in this poster are easy to implement and can be readily adopted into new or existing digital documentation toolkits with this or other tablet and PDF editing systems.

## USING QUICK EMULATION (QEMU) FOR SOFTWARE-BASED ART CONSERVATION

**DYLAN LORENZ**

*Media Archivist, Jenny Holzer Studio*
*Electronic Media Conservator, Private Practice*

Emulations provide an excellent method of preserving attributes of a software-based artwork for both exhibition and conservation. The inclusion of Tatsuo Miyajima's software-based installation, Floating Time (Marine Blue) (2000) in the exhibition The Light Show at the Denver Art Museum in 2019, served as an excellent opportunity to research emulation

possibilities of the artwork's original computing environment. After many attempts with various software applications, the open source, command-line software QEMU created an emulated version with the highest fidelity to the original artwork.

This poster illustrates the process at the Denver Art Museum from working with the components acquired in 2003 to the emulated version of Floating Time. Part of that process was the digital preservation of the original exhibition computer's hard drive, which, once saved to the museum's digital repository, was used to build a virtual hard drive for the emulation. The process of creating an accurate emulated version of the artwork also informed the process of building the computers used to exhibit Floating Time (Marine Blue) in 2019 through 2020.

## "RESPECTFULLY DEDICATED TO MY FRIENDS MESSRS. BRADLEY & RULOFSON": PHOTOGRAPHICALLY ILLUSTRATED SHEET MUSIC AND CONNECTIONS BETWEEN PHOTOGRAPHY STUDIOS AND SHEET MUSIC PUBLISHERS IN THE 1860S AND 1870S


### JESSAMY GLOOR

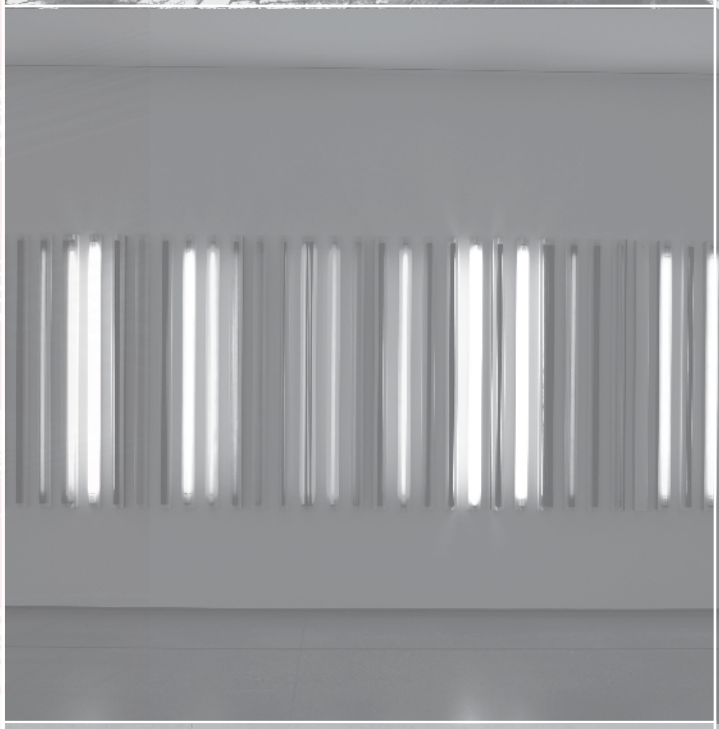
*The Huntington Library, Art Museum, and Botanical Gardens*

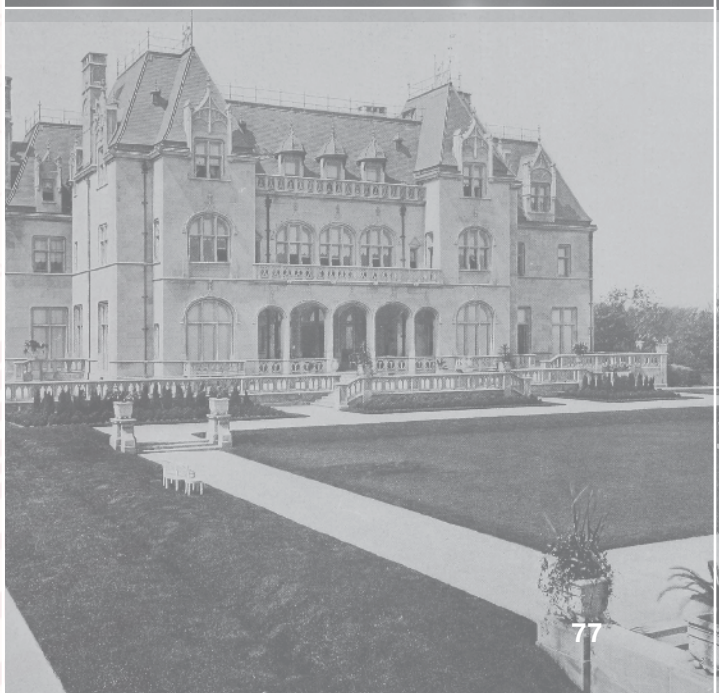

Printmaking history and photographic history are usually treated independently, but this poster will examine their connections through the lens of one specific era of photo-illustrated sheet music production. The title quotation is from an 1877 edition of W. Stuckenholz's "The 'Elite' Race Galop," lithographed in four colors with an albumen photo of the composer directly adhered to the cover, credited in lithographic printing to "Bradley & Rulofson, Photo, S. F."

The Huntington Library holds several thousand pieces of 19th and 20th century American sheet music, all slated for digitization, including one box labeled simply "Photography: Photos Attached." This box contains about 50 printed pieces of sheet music, each with a paper photograph directly adhered to the cover, and all dating between the early 1860s and the early 1880s. Although some technology did exist in this era to print photographs as part of the cover illustrations, several music publishers seem to have found the combination of albumen photograph and lithographed cover a satisfactory way to meet the appetite for both celebrity portraiture and sheet music. Customers could purchase the same sheet music with a choice of celebrity portraits, or sometimes purchase the plain sheet music more cheaply.

San Francisco is the best represented city in The Huntington's collection, but examples were created in many other American towns and cities from Jersey City Heights to Leavenworth, Kansas. San Francisco's leading music publishers Matthias Gray and Sherman & Hyde produced sheet music illustrated with photographs from San Francisco's leading photography studios, especially Bradley & Rulofson, well-known for publishing Eadweard Muybridge's views of Yosemite Valley, and their competitors Thomas Houseworth & Co. All these businesses were located within a few city blocks of each other, and it can be hypothesized that this lavish sheet music was mutually beneficial, driving business to both the photography studios and the music stores, as well as generating publicity for the performers and composers.

This poster surveys this type of sheet music from collections around the United States, illuminating connections between printers and photography studios in this era, and discussing the most common condition problems of these hybrid objects. The poster will be illustrated with examples from The Huntington Library, Art Museum, and Botanical Garden's collections.



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