

## President's Letter

**Catherine Coueignoux**

Hello WAAC!

Somehow another year has come and gone, and with it an amazing annual meeting on the beach in Pacific Grove.

Those of us who were fortunate enough to be there thoroughly enjoyed ourselves. We got sticky with melted marshmallows while chatting around a bonfire, enjoyed drinks overlooking

the beach, munched popcorn in our jammies during Movie Night, and celebrated a VIP's tenth birthday. There were walks on the beach (nobody tell Asilomar they are short a few seashells) and all sorts of weather, including some much-needed rain! We had visits from raccoons, lots of deer, and even a (temporarily) hungry coyote.

Of course, there were plenty of serious, educational goings-on as well. Every single presentation was fabulous, starting with our captivating keynote by Seth Bergstein of PAST Consultants, who gave us a history of Monterey Bay adobe architecture and its conservation challenges. Not only did Seth's talk inspire a number of us to go see some of the buildings he mentioned, but it also awakened us to the danger these historic buildings are in today.

Our California art and history themed talks continued with Patty West's presentation of a huge California Mission project to restore a polychrome and gilded Christ. Elma O'Donoghue showed us the examination and clever treatment of some gorgeous paintings from New Spain with fascinating themes (and very large fruit). Rachel Burch and Pam Rosser, speaking about particular CA and TX missions, respectively, presented their very different and wonderful discoveries of hidden original interior wall decorations. Pam's dynamic presentation closed our opening day with a bang!

The rest of the talks covered enormous ground, which kept our minds active and engaged. We had two fortuitously complementary presentations on monitoring the environments around artwork: Vincent Beltran spoke about the Getty's research on the transport environment, and Mark MacKenzie presented his ingenious solution to tracking multiple environmental variables.

We also became intimate with two pieces of outerwear: Anne Getts taught us about Arctic bird-breast parkas while Tracy Hudson unraveled the mystery of a Northwest Coast Haida tunic.

The metallic among us were treated to Irmak Yüceil's systematic approach to treating hundreds of religious objects at the Hagia Sophia in Istanbul; Martin Remmen's entertaining and culturally sensitive presentation of his treatment (and 3-D reproduction) of a German rangefinder from WWII; Arlen Heginbotham's complex journey into coatings for copper alloys; Julie Wolfe's breathtaking CO2 treatment (pun intended) of a lovely Barbara Hepworth, and Jena Hirschbein's painstaking scrutiny of tool marks on silver.

Problem solving, an activity we all love, was humorously addressed by Mark Gilbert, who spoke about the complexities of maintaining a huge kinetic sculpture at LACMA and by Debbie Evans, who regaled us with tales from her three-decade's long experience heading the de Young's annual Bouquets to Art extravaganza. Seth Irwin took us on a close-up and informative tour of the complicated world of stereomicroscopes, and Tammy Zavinski showed us how she creatively employed magnets (and humidity) to flatten a crinkled, buckled vellum document.

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## President's letter, continued

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Other talks took us around the world. Geneva Griswold described a group of incredible wall paintings from Herculaneum. Karen Bonne took us into the wacky world of the Belgian painter James Ensor. Lesley Bone brought us to France to look at the painted walls of an 18<sup>th</sup>-century period room and then shot us south to contemplate the powerful materials used in African sub-Saharan figurative objects.

The Angels Project at the Carmel Mission was particularly timely, given the vandalism that occurred on the grounds the previous weekend in response to the Pope's canonization of Father Junipero Serra, the mission's founding father. Not only did Angels coordinators Anne Getts and Geneva Griswold do a fantastic job of leading our Angels through our original group of objects, but also helped the mission deal with some of the new damage.

John Rexine, registrar at the Monterey Museum of Art, shared his challenges in caring for a collection housed in two buildings with very different issues. His candid presentation encouraged an open discussion that benefited everyone.

Carolyn Tallent and Susi Friend ran the most successful Silent Auction ever. Some great stuff was on offer, although the most eye-catching item was a hot-pink, skull-emblazoned T-shirt advertising next year's meeting in Tuscon, AZ!

With that, it is my moment to bow out as WAAC President and reluctantly hand over the post to Terri Moreno of the Arizona State Museum. It's not that I'm power-hungry, but rather that being a part of this board has truly been an extraordinary experience. A warmer, more supportive group of people just doesn't exist. I'm sure our out-going members-at-large, Sue Ann Chui and Yadin Larochette, who we thank for their service, would echo that sentiment.

Onward and upward! In her (former) capacity as VP, Terri has already added some real star power to the board. WAAC welcomes Christina O'Connell, senior paintings conservator at the Huntington Library, Art Galleries, and Botanical Gardens; and Seth Irwin, the paper conservator for the University of Hawaii Library at Mānoa as members-at-large. Our incoming VP is Randy Silverman, head of preservation at the University of Utah's Marriott Library.

As I mentioned above, next year's meeting will be held in Tuscon and be hosted by Terri's institution. A born-and-bred Tusconian, Terri will organize an excellent conference. Watch this space for more information, and start planning a little trip to the sunshine!

And with that, I bid farewell to the front page of the *Newsletter*. It's been wonderful.

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## Membership

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*Chris Stavroudis*  
*membership secretary*

WAAC welcomes the following new members and late renewals.

Sally R. Andrew, Vincent Beltran, Jennifer Burger, James Bernstein, Karen Bonne, Kellie Boss, Devon Browning, Elizabeth Burr, Giulia Corrada, Julie Creahan, Gerry Crofts, Elizabeth Drolet, Miranda Dunn, Debra Evans, Melinda Flatsker, Lisa Forman, Kiernan Graves, Kathryn Harada, Laura Hartman, Jena Hirschbein, Tracy Hudson, Vicky Karas, Diana Komejan, Kamila Marta Korbela-Dunigan, Dawn Kriss, Cynthia Lawrence, Jose Luis Lazarte, Mary L. Levkoff, Iliana Lopez Salado, Rosa Lowinger, Mark MacKenzie, Emanuelle Mallet, Ian G. McClure, Courtney VonStein Murray, Musée du Quai Branly, Douglas Nishimura, Kathleen Orlenko, Penn Museum Conservation, Natasha Rebrov, Martijn Remmen, Pamela Rosser, Ieva Rozentale, Randy Silverman, John Slavin, Magdalena Solano, Spectra Company, Samantha Springer, Kristen St. John, Elisa Stewart, Sabina Sutherland, Kim Taira, Dana M. Tepper, Serena Urry, Christina Varvi, Alison Walker, Paul J. Wells, David D. Wilson, Julie Wolfe, Irmak Gunes Yüceil, Cathleen Zaret, Tammy Zavinski, and Aneta Zebala

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## Volume 37 Number 2 WAAC Newsletter

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**HEALTH & SAFETY**  
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### Internet

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

### Deadline

Contributions for the September *Newsletter* should be received by the Editor before **January 5, 2016**.

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# Western Association for Art Conservation

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

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Catherine Coueignoux

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Teresa Moreno

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General Information  
New Memberships  
Publication Orders

Denise Migdail

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Payments  
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# Regional News

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*Teresa Moreno*  
column editor

## **Alaska**

**Helen Alten** and the Sheldon Museum staff have completed cataloging, humidifying, and reshaping the oversized archival material stored in the museum's map cabinets, a project completed with a Museums Alaska Collections Management Grant. Now they are preparing for the next storage upgrade, changing the lower level exhibit gallery into an archives storage and research area. The project can move forward, despite not receiving an NEH Sustainability Grant, thanks to the generous donation of two sets of compactor shelving from the State of Alaska, donation of shipping by Alaska Marine Lines, and reduction in construction fees by Dawson Construction. The new storage area will quadruple the museum's archives space and allow the museum to accept an accession that doubles its holdings. Staffing for the project will come from the Texas A&M Internship Program, which places interns in small museums for six months.

Helen attended the AASLH meetings in Louisville, Kentucky in September and the Museums Alaska Meeting in Cordova in October. She is giving three presentations at the Museums Alaska Conference – one on conservation outreach projects that support small museums, one on preparing new collections for storage, and one on building community support for a small museum.

**Ellen Carrlee** hosted three graduate conservation interns this summer: **Anne-Marie Guérin** from Queen's, **Leah Bright** from Buffalo, and **Betsy Burr** from the UCLA/Getty program. Treatments included a Tsimshian totem pole, a 39-star flag, a Yup'ik kayak, a carved ivory tusk, sink mounts for archaeological textile and basketry fragments, and many mannequins. Ellen has also been collaborating with textile conservator **Beth Szuhay**, paper conservator **Karen Zukor**, paintings conservator **Gwen Manthey**, and the staff at **Paul Messier** LLC for preparation of artifacts in other specialties. Approximately 2,000 artifacts are being prepared for the opening of the new Alaska State Museum in May 2016.

**Scott Carrlee** organized a mannequin making week at the Alaska State Museum in early July that included several conservators (Helen Alten from the Sheldon Museum in Haines, **Sarah Owens** from the Anchorage Museum, Ellen and Scott Carrlee from Juneau) and the three conservation interns who were working with Ellen Carrlee this summer. In addition there were as many as twenty other participants such as mount makers, registrars, and volunteers who helped with the process. In the end the group was able to produce 12 finished mannequin forms and start 18 others. Scott will continue to push the process through to create mannequins for all the articles of clothing and regalia that will go on display when the new museum opens in May.

As part of this endeavor, Sarah Owens provided specialized textile conservation assistance with a Haida button blanket made in the 1970s by Selina Peratrovich for her daughter Delores Churchill. Sarah also advised mannequin makers on how to adjust problem areas that could cause pulling, tearing, or other damage to clothing over time. In addition to her work on the mannequin making at the State Museum, Sarah participated in a skin object preservation/conservation workshop in Kodiak. This was a collaborative project with the Alutiiq Museum and the Peabody Museum of Archaeology and Ethnology, where skin sewers gathered to demonstrate sewing techniques and stitches; conservators discussed the care of skin objects; and a squirrel skin parka was restored. More recently, Sarah has been preparing a variety of objects for three exhibitions opening this fall at the Anchorage Museum.

During the summer, **Monica Shah** traveled to Nome to help with an ivory carving workshop, part of the Material Traditions residency hosted by the Alaska State Museum. Carver **Jerome Saclamana** taught the class, and students were able to examine objects from the Carrie McClain Museum and Kawerak Cultural Center. The video for the residency and community class will soon be online. Monica

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## Regional News, continued

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also hosted the first two programs in the museum's new Urban Interventions series, which seeks to connect teens to the museum collections and empower youth through healthy expression. The first was a Skate Art project with at-risk teens and the second, Tupik Mi, is a project to revitalize cultural tattooing. In between programs, Monica has been assisting Sarah Owens in preparing collections for the Anchorage Museum's three fall exhibitions.

*Regional Reporter:*  
Ellen Carlee

### Arizona

The conservators at the Western Archeological and Conservation Center (WACC) have been busy conserving historical objects from Manzanar National Historic Site, pots from Joshua Tree National Park, and historic leather from Chiricahua National Monument. **Audrey Harrison** is beginning to focus on specialized storage mounts for large baskets stored at WACC, while **Maggie Hill-Kipling**, **Dana Senge**, and pre-program interns **Brenna Stonum** and **Sam Merrifield** continue work with the Grand Teton National Park ethnographic collection.

**Marilen Pool** recently completed the conservation treatment of a collection of Bolivian silver plaques at the Phoenix Art Museum and a Mexican lacquer tray for the Heard Museum. She continues working on the archaeological perishables collections at the Arizona State Museum. As part of that project she has been working with conservation scientist, **Christina Bisulca**, on the characterization of pine pitch, creosote lac, and plant gums found in the archaeological botanical and artifact collections.

**Nancy Odegaard** has returned to the Arizona State Museum from sabbatical leave. Since May she was a visiting fellow at ICCROM and visiting scholar

at the American Academy in Rome where she researched 19th-century ceramic restoration and lectured on basketry. In July-August, she completed a Fulbright Senior Specialist Award project in Colombia. A partnership with the University of Arizona, the Universidad Externado de Colombia, the Ministry of Culture, ApoyOline, and the collaboration with Amaparo Rueda involved teaching at five universities, a public lecture at the Gold Museum, and visits to thirty museums, twenty churches, nine archaeological and natural sites, and seventeen other cultural sites.

In September, she will present several sessions at the American Tribal Archives, Libraries and Museums Conference (ATALM) in Washington DC and will present a paper on the use of CO<sub>2</sub> cleaning for basketry and textiles at the *Ice Cold: Solid Carbon Dioxide Cleaning Symposium* also in Washington, DC. **Gina Watkinson** will co-present a lecture with Nancy on basketry and on working with tribal representatives at the ATALM conference.

**Teresa Moreno** continues to oversee the environmental monitoring program at ASM. Her work continues on the NEH SCHC funded planning and design for the museum's new climate controlled photo collections storage vault. Teresa is advising and providing guidelines for the environmental requirements and exhibition case design for ASM's new Basketry Interpretive Gallery that will open in early 2017. She is working with staff from ASM and the University of Arizona (UA) libraries in preparation for hosting the Folger Shakespeare Library traveling exhibit *First Folio! The Book that Gave Us Shakespeare* in February-March 2016.

In addition she has been busy conducting condition assessments and treatments, and making mounts for a number of objects for loans, including a small collection of Roman glass, ceramics, and bronzes for loan to the UA Museum of Art for an exhibit titled *Rome: The Legacy of an Eternal City*, and a Mexican Tehuana dress and several pieces of

jewelry for loan to the Heard Museum for their exhibit *Las Favoritas de Frida*.

During the summer Teresa lectured at the ASM Rock Art Ranch (RAR) archaeological field school near Winslow, AZ and conducted a two-day introductory workshop on archaeological conservation in the ASM conservation lab for ten RAR students funded by the NSF Research Experiences for Undergraduates program. Teresa continued to teach for the Balboa Art Conservation Center (BACC) as an instructor for their *Focus on Collections Care* workshop series. She taught the *Care of Metal Objects* workshop in San Jose in June, San Diego in August, and Eugene in September.

Also in September, in addition to attending this year's WAAC conference at Asilomar in Pacific Grove, California at the end of the month after which time she assumed her new role as WAAC President, Teresa participated in the Protecting Cultural Collections: Disaster Prevention, Preparedness, Response and Recovery Workshop put on by the Western States and Territories Preservation Assistance Service (WESTPAS) and taught by **Randy Silverman**, preservation librarian at the University of Utah Marriott Library.

**Brunella Santarelli** defended her dissertation in June and earned her PhD from the University of Arizona in Material Science and Engineering (MSE) with a concentration in Heritage Conservation Science. This fall she will begin a post-doctoral fellowship at the Metropolitan Museum of Art. **Elyse Canosa** will return to the UA and ASM in September from the Netherlands where she has been researching metal corrosion on daguerreotypes. She will continue her research towards her PhD in the MSE Heritage Conservation Science program.

*Regional Reporter:*  
Dana Senge

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## Regional News, continued

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### Hawaii

On August 31, **Lynn Ann Davis** retired as librarian and preservation department head for Hamilton Library, University of Hawai'i at Manoa. Many of us know Lynn from her work here with the library over the past 19 years and many people in Hawaii's museum, library, and archive community know Lynn from her past years with the Bishop Museum. Among many other initiatives (including creating the listserv for Hawaii's Connecting to Collections grant), Lynn has been a champion for disaster planning and response and is a founding trainer for the Western States and Territories Preservation Assistance Service (WESTPAS). Stay tuned for upcoming disaster response training this fall, as she continues to share her knowledge and experience.

**Seth Irwin**, paper conservator of the University of Hawaii at Manoa Library Preservation Department has ended work on the FEMA contract for treatment of photographs, prints, and books that were damaged when a tsunami hit Hulihee Palace in Kona on Hawaii Island in 2011.

**Dawne Steele Pullman** continues to treat paintings for clients in Hawaii and around the world. She attended a seminar for conservation of acrylic paintings at the Tate Modern this summer while working in private practice on a tempera painting by Hedda Sterne and stabile sculpture by Marcel Louis Bagniet. Before this she was in Burma with UNESCO and Memory of the World Committee-Asia Pacific (MOWCAP) as well as in discussion with conservators from India who were treating 11<sup>th</sup>-century temple wall paintings in Bagan.

**Kent Severson**, conservator at Shangri La, hosted two conservation interns this summer, **Colette Khanafarov** from UCLA's Conservation of Archaeological and Ethnographic Materials Training Program and **Emily Wroczynski** from the Winterthur/University of Delaware Program in Art Conservation. Colette researched the history of the mosaic tile decorations

on the dining room lanai and initiated a program of treatment.

Emily has been analyzing the wood, paint, and varnish layers of the ceilings in the foyer and the living room, as well as the doors at the passage from the living room to the mihrab room. She also found time to initiate a program of treatment that will continue in coming years. Shangri La thanks both of these interns for their hard work and contributions to the preservation of the collection.

**Thor Minnick** continues with treatment of Queen Lili'uokalani's furniture located in Washington Place. Recent items treated are a Chinese rosewood altar table and the Queen's koa sewing table. He has just completed French polishing an unusually large 19<sup>th</sup>-century koa circular table made by C. E. Williams and another smaller koa table made by John J. Halstead from the same period.

*Regional Reporter:*  
D. Thor Minnick

### Los Angeles

**Christina Fisher** has left LACMA's Watts Towers team to concentrate on her creative work and **Traci Lucero** joined the team as assistant conservator.

**Silviu Boariu** has been promoted to associate objects conservator at LACMA. **David Armadariz** has also been hired at LACMA as a new mount maker.

In August **Kamila Korbela-Dunigan** joined LACMA paintings conservation for a three-year position as assistant painting conservator, funded by a generous grant from the Ahmanson Foundation. Kamila received her degree from the State Academy of Fine Art and Design in Stuttgart. Kamila has held fellowships at the National Gallery of Denmark and the Balboa Conservation Center in San Diego. Among her other duties Kamila will be assisting with the project to publish a catalog of Old Master and 19<sup>th</sup>-

century paintings that have been given to LACMA by the Ahmanson Foundation.

**Elma O'Donoghue** presented a talk at WAAC's annual conference entitled "Recent Treatments and Analysis of Colonial Paintings at LACMA." **Joe Fronek** is currently restoring a painting in LACMA's collection that is an unusual example of painting on marble, *Saint Agnes Protected by an Angel* by 17<sup>th</sup>-century artist Alessandro Turchi.

**Elizabeth Shaeffer** will be staying on at LACMA for her second year as Andrew W. Mellon Fellow in textile conservation. In April she will be helping to install nearly 400 costumes and accessories for the exhibition *Reigning Men: Fashion in Menswear, 1715 - 2015*.

In fall of 2015 LACMA will open a new study center on the Art of the Americas plaza as a direct result of generous grants from the Institute of Museum and Library Services and the Frederick Roberts Foundation. The IMLS grant resulted in a more searchable database for photographic processes with the implementation of a naming convention.

The IMLS grant also resulted in the rehousing of the photographic collection in preparation for use in the new study center. Activities in the studio of the new study center will be viewable through a glass wall where conservators, scientists, and collections managers will be working on preservation, documentation, and treatment of the collection.

The paper conservation lab at LACMA is pleased to announce that **Sarah Newby** has joined the staff as collections administrator for the photography and prints and drawings collection and manager for the study center. The paper lab filled its senior technician position with **Adriana Breisch**, formerly of the Charles Schultz Museum. Both staff will play an active role in the study center and its programs for public outreach. The center itself will be a model for the development of a variety of study centers at LACMA that will make collections accessible for teaching and research purposes.

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## Regional News, continued

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This summer was busy for UCLA Library Preservation Services. In the Library Conservation Center, pre-program intern **Emma Guerard** traded her work at the Watts Towers for work on circulating collection materials for eight weeks. In AV preservation, post-graduate intern **Allie Whalen** a graduate of the NYU AV conservation program, worked on the S.A. Griffin Collection of neo-beat and punk poetry recorded in long-gone LA venues.

**Chela Metzger** served on five academic committees at the Winterthur/University of Delaware Program in Art Conservation to help usher ten new art conservation graduates into the world. **Dawn Aveline** has been serving on the UCLA Library strategic planning committee. Collection care coordinator **Maria Elena Gonzalez**, joined the team in July to help handle large scale risk management and environmental concerns for the various library locations. They are also very excited to have had a new fume hood installed into the conservation lab!

*Regional Reporter:*  
Virginia Rasmuss

### New Mexico

**Susan Barger** became the *Connecting to Collections Care Online Community* coordinator for the FAIC. This is the successor program to *Connection to Collections* and it is now sponsored by the FAIC with funding from IMLS.

The NMSU Museum Conservation Program received a donation of \$80,000 from **Candis Stern** to establish the Candis Stern Endowed Scholarship. This scholarship will help the museum conservation undergraduate students to do internships, go to workshops, or attend conferences outside Las Cruces, NM.

*Regional Reporter:*  
Silvia Marinas-Feliner

### Pacific Northwest

At the end of June, the Seattle Art Museum conservation department hosted a convening to consider the possibility of establishing a facility for the conservation of Asian paintings at the Seattle Asian Art Museum. Collections stewards from across the Western U.S. and Canada came to Seattle for two days to discuss the idea of creating a center that would serve the SAM collections and those of collecting institutions across the region. The meeting was funded by the Andrew W. Mellon Foundation and was part of SAM's ongoing Mellon-Funded Asia initiative, which also includes a conservation survey of SAM's Japanese paintings and other conservation and curatorial collaborations.

More recently, a set of Brussels tapestries from the museum's decorative arts collection were transported to Mechelen in Belgium for comprehensive conservation treatment at the De Wit Royal Tapestry Workshops. These spectacular tapestries from around 1700 depicting Asia, Africa, and America (unfortunately, Europe was absconded with before they came to SAM) have seldom been seen in the museum's galleries because of condition concerns, but after conservation they will be prominently featured in a global textile exhibition at the Asian Art Museum next spring.

A recent treatment highlight was the return of an important Japanese painting *Scenes from the Life of Gensei Sho-nin* following two years of conservation. The Nambokucho period painting depicts the life of the priest Gensei Sho-nin who can be spotted in various parts of the painting. The large hanging scroll features both landscape and a topographical view of the priest's temple complex, and in one little scene, one can see Gensei getting a tonsure. Treatment took place at Studio Sogendo and was made possible by the generosity of the Sumitomo Foundation.

Recently Alexander Calder's *Eagle* was re-painted at the Olympic Sculpture Park and sculptures and paintings by Judd, De Wain Valentine, Mary Corse, and other artists were treated by SAM's

conservators in preparation for a new installation in the downtown museum galleries.

SAM conservation intern **Jennifer Myers** recently completed treatment of an early acrylic painting by Peter Young.

In July **J. Claire Dean** fulfilled the goal of her Kickstarter project that raised enough funds to erect a temporary shelter over a historic story pole at the workshop of Lummi carver Felix Solomon. Among the volunteers who helped were graduate student **Lesley Day** and conservator **Ellen Pearlstein**, both from the UCLA/Getty conservation program. Lesley was also undertaking a summer internship with Claire at the Hibulb Cultural Center, Tulalip, Washington, and Ellen came to visit at just the right time to help with both projects.

Claire also became hooked on time lapse videos this summer - you can see a video of the shelter raising at the Kickstarter page (search for J. Claire Dean at the Kickstarter website), and videos of all three of them at work at the Hibulb Cultural Center on the Center's Facebook page.

**Corine Landrieu** of Landrieu Conservation has been busy this summer treating outdoor sculptures from the Washington State Arts Commission public art collection: *Reach*, an Alaskan yellow cedar sculpture by Lorna Jordan at the Edmonds Community College and *Four Corners*, a Forton bas-relief by Susan Points at the North Seattle Community College. She also worked on *Skip to My Lou*, a red cedar sculpture by Ursula Von Rydingsvaard located on the Microsoft campus and on a few projects in the studio, including a Chinese mid-20<sup>th</sup>-century lacquer screen.

Amidst the smoky haze that periodically covers the Willamette Valley, **Susan Lunas** has been busy repairing a box for an Asian parasol from the early 1920s. The silk, painted parasol is gorgeous! She is replacing spines on two books, one from 1660 and the other from 1758. In addition she is cleaning, washing, and removing paper tape from two pencil

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## Regional News, continued

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drawings from the 1850s.

*Regional Reporter:*  
Corine Landrieu

### Rocky Mountain Region

**Beverly Perkins**, Division Director of Museum Services at the Center of the West, is serving as the chair of the Buffalo Bill Art Show and finishing her duties as treasurer on the executive board of Heritage Preservation.

She finished the conservation on the Winchester 1873 that was discovered in Great Basin National Park just in time for the arrival of eight summer interns. Radiography on the Winchester revealed a cartridge lodged in the small tool chamber in the butt of the gun. Once the rusted door of the chamber was freed, the cartridge was removed and dated. According to the Winchester factory records stored at the Center of the West, the firearm left the factory in 1882 and the cartridge dates to circa 1900. These dates confirm that the Winchester could have been left resting against a tree 100 years ago.

The summer conservation interns in the lab at the Center of the West included four pre-program university graduates: **Nicole Schmidt**, **Allison Rosenthal**, **Perrine Le Saux**, and **Vanessa Omayor**.

As well as completing many conservation treatments, they designed and launched a project in conjunction with **Bruce Kaiser** to study the bronzes of Alexander Phimister Proctor. Two university students, **Dee Rudolph** and **Kevin Page**, joined two Cody High School students, **Effie Clark** and **Zeta Eirtree**, to survey and carry out condition reports on the Center's collection of Buffalo Bill's Wild West Show posters.

**Teresa Knutson** of Rocky Mountain Textile Conservation in Kalispell, Montana is treating three U.S. flags with 39, 41, and 42 stars for the Louis & Antoinette Hagener Museum of the Northern Plains Indian at Montana State

University-Northern. The flags are considered unofficial because they are from a nine day period in November of 1889 when several northwestern states were admitted to the union, including the state of Montana. The 41 star Montana flag is extremely rare because Washington was admitted three days after Montana.

WCCFA conservators, **Carmen Bria** and **Yasuko Ogino**, completed a condition survey of almost 200 paintings at the Utah Museum of Fine Art at the University of Utah in Salt Lake City in July. **Hays Shoop** recently finished a complicated treatment of a portrait of Brigham Young for the Utah Museum of Fine Art.

**Camilla Van Vooren** completed the treatment of an eleven-piece, 35 foot wide mural from the Historic Sheridan Inn in Sheridan, Wyoming with the assistance of summer intern, Winterthur Fellow, **Alexa Beller**. Alexa also assisted Yasuko on the filling and inpainting of two parts of a multi-piece mural from Wilson Elementary School in Oklahoma City. In addition, she assisted Camilla in a condition survey of twenty governors' portraits at the Colorado State Archives.

WCCFA won the 2015 Conservation/Preservation Project Award from the Oklahoma Museums Association for the removal, treatment, and re-installation of two Olinka Hrdy murals from the historic Oklahoma City Central High School Building which was recently renovated and is now the Oklahoma City University School of Law.

**Tara Hornung** is returning to her private practice in Colorado after spending the past year as contract conservator at the Smithsonian National Air and Space Museum. Tara completed over 100 treatments on space and aeronautical artifacts, including components of space suits and aircraft engines. This spring Tara was awarded Professional Associate status in AIC.

Under the supervision of **Kate Moomaw** at the Denver Art Museum, **Eddy Colloton**, a graduate student in the NYU Moving Image Archiving and Preservation (MIAP) program, completed

an eleven-week internship, cataloging and preserving dozens of born-digital objects in the American Institute for Graphic Arts (AIGA) design collection. Kate also worked with outdoor sculpture interns **Rachel Henderson** and **Nicole Feldman** who assisted with annual maintenance of eight outdoor sculptures on the museum's campus.

Towards its preservation, the interactive piece *Walking in Venus Blue Cave* (2001) by Brazilian artist Ernesto Neto, was re-fabricated in PreVIEW, a multi-disciplinary space that highlights textile art and related conservation activities. The project took place in the month of September and included two assistants from Neto's studio, Kate, **Allison McCloskey**, and Andrew W. Mellon Foundation textile fellow **Julie Benner**. The public was able to watch and periodically engage as the large-scale sewing and assembly project progressed.

Over the summer, a late 20<sup>th</sup>-century *Egungun* was collaboratively treated. The *Egungun* is a composite ceremonial mask used by the Yoruba people of West Africa in a dance honoring ancestors. It consists of a removable multi-layer cloth skirt and a wooden head piece. Allison and Julie, along with Rachel, performed wet cleaning of the skirt. **Gina Laurin** cleaned and stabilized the head piece. Gina also recently completed treatment on a 17<sup>th</sup>-century Mexican feather painting on copper depicting St. John the Evangelist.

**Pam Skiles** and **Courtney Murray** recently assisted with infrared examination of underdrawings covered by murals in the Denver State Capitol building. The drawings revealed ranged from a portrait of Abraham Lincoln to various intricate scroll-like representations.

Courtney has completed her Samuel H. Kress Foundation fellowship in objects conservation. Her project involved the research, analysis, and treatment of six 18<sup>th</sup>-century Ecuadorian polychrome Magi figurines. Mount-maker **Steve Osborne** and assistant **Nick Donaldson** fabricated custom mounts for safely uniting the three riders and their horses.

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## Regional News, continued

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Conservation assistant **Caitlin Whaley** completed exhaustive photo-documentation of the AIGA food and toiletry collection – noted for package design. In September, Courtney will commence treatment of this unorthodox range of materials.

In April, **Sarah Melching** participated in an artist interview workshop sponsored by Voices in Contemporary Art (VoCA, formerly INCCA-NA) at the Brooklyn Museum of Art. In June, she attended the convening at the Seattle Art Museum where conservation needs of Asian paintings in the western region of the U.S. were discussed and evaluated. Both the workshop and the convening were supported by the Andrew W. Mellon Foundation.

*Regional Reporter:*  
Julie Parker

### San Diego

No news.

*Regional Reporter:*  
Frances Prichett

### San Francisco Bay Area

The objects lab of the Fine Arts Museums of San Francisco is as busy as usual. **Geneva Griswold**, objects Mellon Fellow, and **Anne Getts**, textiles Mellon Assistant Conservator, have finished preparing and installing a show they curated on the science and conservation of feathers, called *Featherwork: A Conservator's Approach*. This small but exquisite show will be open alongside a larger exhibition of featherwork: *Royal Hawaiian Featherwork: Nā Hulu Ali'i*, which runs until February 28, 2015.

**Catherine Coueignoux**, associate objects conservator, spent many happy hours organizing the 41st annual WAAC conference, which was held in Monterey

Bay, CA, from September 29—October 2, 2015. By press time, those of you who were able to go will surely agree that it was a wonderful experience, and that the talks given by FAMSF conservators, including Geneva, Anne, head of objects conservation **Lesley Bone**, and head of paper conservation **Debra Evans**, were all stellar.

**Margaret (Meg) Geiss-Mooney**, textile/costume conservator in private practice, was appointed to the City of Petaluma Public Art Committee by the Petaluma city council earlier this year. She is the first professional conservator appointed to the PPAC.

**Mark Fenn** and **Colleen O'Shea** have completed treatment on four Korean lacquerware objects for the upcoming exhibition *Luminous: Mother-of-Pearl Lacquer from Korea*, scheduled for spring 2016 at the Asian Art Museum. Colleen graduates from the SUNY Buffalo State Program in Art Conservation in September. After graduation, she begins a year-long Mellon Fellowship at Historic New England.

**Shiho Sasaki** and **Kathy Gillis** participated in two Mellon-Foundation funded initiatives aimed at increasing resources for the treatment of Asian artworks in North America. They participated in the consortium at the Seattle Art Museum that was initiated to explore establishing a regional studio for the treatment of Asian paintings. At the Cleveland Museum of Art, many of the same professionals met to discuss initiatives to provide specialized training for emerging conservation professionals in the specialties of Asian materials.

Shiho and conservation technician **Courtney Helion** are exploring innovative ways to display large-scale contemporary works of art on paper for the museum's fall exhibit, *First Look*.

Courtney has also co-authored a poster with **Denise Migdail** for presentation at the North American Textile Conservation Conference in New York City in November 2015 on preparing museum quality mannequins.

Denise and Shiho have been consulting with contemporary living artists on appropriate hanging devices to assist in long-term preservation and best display practices for their artwork. A number of interviews with contemporary Asian artists are being conducted at the museum for better understanding of the long-term needs for their artworks.

*Regional Reporter:*  
Alisa Eagleston-Cieslewicz

### Texas

The Harry Ransom Center at the University of Texas at Austin currently has on view an exhibition entitled *Frank Reaugh: Landscapes of Texas and the American West*. Reaugh, a Dallas-based artist whose career spanned the late 19<sup>th</sup> and early 20<sup>th</sup> century, was known as the “Dean of Early Texas Art” and specialized in landscapes executed primarily in pastel. The companion book to the exhibition is entitled *Windows on the West: The Art of Frank Reaugh*. **Kenneth Grant** has an essay in the companion book entitled “Frank Reaugh as Inventor: Innovations for the Use of Pastels in Field Sketching.” The essay outlines Reaugh's inventions with regard to pastel materials including hardness formulations and a unique palette of colors, as well as an ingeniously-designed patented lap easel to better adapt the pastel medium for field sketching. The exhibition is on view through November 29.

**Judith Hastings** at the Menil Collection contributes the following items: **Erin Stephenson**, the Andrew W. Mellon fellow in paintings conservation at the Menil for the past three years, was awarded the William R. Leisher Memorial Fellowship for Research and Treatment of Modern Paintings at the National Gallery in Washington, D.C. and will begin that appointment in October; the incoming fellow will be **Desi Peters**, a graduate of Institute of Fine Arts, New York University, whose most recent position was as a graduate intern at the Lunder Conservation Center, Smithsonian American Art Museum. They will miss Erin and wish her the very best in her new post, and they look

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## Regional News, continued

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forward to working with Desi in the fall.

**Kari Dodson**, who joined the Menil Collection conservation department as assistant objects conservator in August of 2014, has been managing two large outdoor sculpture projects, the first comprehensive conservation treatment of Mark di Suvero's *Bygones* since it was acquired in 1978 and the treatment and repainting of Tony Smith's *The Snake is Out* in advance of its installation at the University of Houston this fall.

This summer, **Anne Schaffer**, who just completed her second year at the Department of Art Conservation, Buffalo State College, worked with assistant paintings conservator Katrina Rush during an eight-week summer internship in paintings conservation. Anne will be starting her third-year internship at the Philadelphia Museum of Art in the fall.

On April 9-10, the Menil hosted a two day symposium, *Barnett Newman: The Late Paintings in Context*, around the exhibition *Barnett Newman: The Late Works*, co-curated by Menil chief conservator **Brad Epley** and curator **Michelle White**. The symposium presented perspectives on the material, aesthetic, and philosophical issues at the heart of the exhibition's presentation of Newman's late and unfinished paintings and will be available in the spring of 2016 on the Menil's website. **Cory Rogge**, the Andrew W. Mellon Research Scientist at the Museum of Fine Arts Houston and the Menil Collection, and Brad also presented their recent Newman research at the AIC meeting in Miami in May.

Construction of the Menil Drawing Institute is underway and in preparation, conservator of works of art on paper **Jan Burandt** has been surveying the collection's drawings and working with colleagues in collections management to strategize the move. Pre-program intern, **Grace Walters** has rehoused the entire collection of cased photographs and tintypes and completed the re-matting of several hundred photographs by Henri Cartier-Bresson.

*Regional Reporter:*  
Ken Grant

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## WAAC Publications

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### Handling Guide for Anthropology Collections

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

**Price: \$10.00**

(\$8.00 copy for orders >10 copies)

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### Back Issues of WAAC Newsletter

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

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Anna was frowning. "But today we think far beyond these old boundaries. We don't just think of being Scottish or Danish or whatever. Those are old-fashioned things. We think of being human."

The Duke smiles at her. "Of course, we think of our shared humanity; of course we do. But I must disagree with you about the rest. We have to have some meaningful sense of the local in order to understand what our shared humanity is. If you take that away from people – as is happening – then they don't know who they are and that means they won't care very much about others. You'll get a crude materialism, because the material is all that we will have in common. You'll get vast, anonymous societies where we are all strangers to one another. We get much of our humanity from the local, the immediate, the small-scale."

From *Sunshine on Scotland Street*  
by Alexander McCall Smith

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# Ammonium Citrates for Stain Removal in Paper

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Staining in paper is varied and complicated. It can be local or overall, can be caused by degradation of cellulose, or be initiated by pollution, grime, or paper additives. Because of this complexity, conservators need numerous materials and procedures which can be used as far as possible to selectively treat stains without causing further complications.

There are many concerns to be taken into consideration. For instance, using oxidation (hydrogen peroxide or light) or reduction (sodium borohydride) agents might not remove the stain and might also contribute to degradation reactions, or an alkaline bath combined with light exposure might catalyze irreversible reactions of photo sensitive optical brighteners.

Another variable is metals in paper, either as contaminants brought in environmentally or intentionally included in the paper pulp.<sup>1</sup> Metals can be problematic if initially processed with light, hydrogen peroxide, or sodium borohydride treatments. Or having a high alkaline pH or oxidative process in the initial wash might change soluble metal contaminants into insoluble metal oxides. In some cases, recurrence of staining may be observed.



Portion of a light-bleached drawing 10 years after treatment.

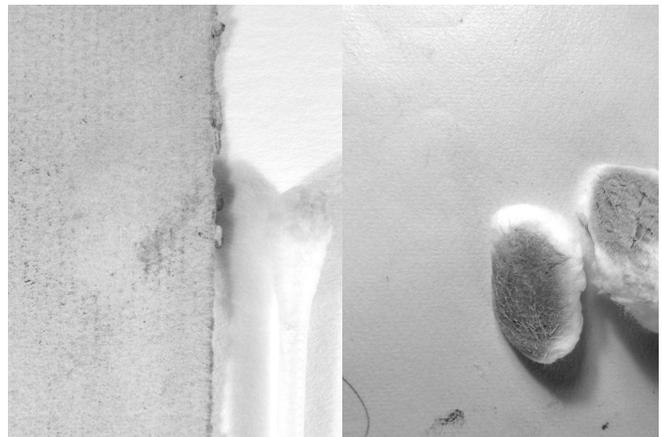
A different approach for addressing metal-related stains in paper is to consider ammonium citrate in dibasic or tribasic form. Ammonium dibasic and tribasic are mild chelating agents. They can capture and sequester staining material and create a favorable environment for stabilizing artifacts. Their use provides a logical starting point in the sequence of stain-diminishing options.

Ammonium citrate has been used in object, textile, and painting conservation specialties for over twenty-five years, and its properties are well known to the profession. The following introductory articles will familiarize paper conservators with the basic concepts. Leslie Carlyle's et al. 1990 article describes how the ammonium citrate tribasic at low pH and low concentrations compares to other surface cleaning systems for paintings.<sup>2</sup> Rachel Morrison's et al. article of 2008 shows that any potential residue is easily removed with a damp swab.<sup>3</sup> The textile article by Timar-Balazsy and Eastop describes in more detail the possible mechanisms and interactions with stains or grime.<sup>4</sup>

With some accommodations, this useful reagent can be adapted to the requirements of paper artifacts and their media. In general, this means using either the ammonium citrate dibasic or tribasic at a pH in the neutral range and at a 1% concentration. The solution is prepared in demineralized water. The pH is adjusted with drops of ammonium hydroxide.

Ammonium citrate dibasic is more readily available through conservation suppliers and is economical for bathing. The ammonium citrate tribasic can be obtained through chemical suppliers, but in smaller and pricier quantities. The ammonium citrate dibasic as prepared has a pH of 6.0 and for paper artifacts should be adjusted into the neutral range for most uses. Ammonium citrate tribasic as prepared has a pH of 7.0 and can be adjusted as determined best for specific stains. You can also make your own citrate solutions, either ammonium or sodium citrates, as described by Chris Stavroudis.<sup>5</sup>

Ammonium citrate can be substituted for more traditional dry-cleaning techniques. On sized papers, it can be applied on a swab to lift grime, followed with a damp swab as a rinse. Whenever rinsing, adding some calcium to the rinse solution is a good practice. For large areas, such as the reverse of an oversize artifact, it can be applied with cotton balls followed by rinsing. This is a very effective and non-abrasive method. On non-sized papers, overall immersion is a better option for grime removal.

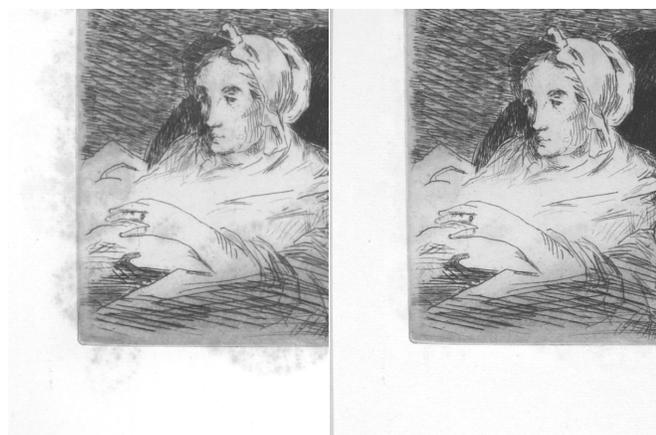


One of the outstanding advantages of using ammonium citrate dibasic or tribasic is the ability to remove stains without lightening paper support color which typically happens with bleaches. This is especially important on toned papers where the media and the paper color were closely designed by the artist.

Overall foxing stains have been successfully eliminated from a drawing on pink paper, and mat burns have been removed from brown papers without altering the support paper color. Often, all staining can be removed without any additional bleaching agents. Because the ammonium citrate solutions are used at a neutral pH and low concentrations, generally media is not adversely affected.



Michel Manzi, overall foxing on pink paper. Float washed, followed by float application of ammonium citrate 1 and 2 % at pH 7.0 with rinsing and drying between applications. Before and after photographs. (Unfortunately, the image is not able to show the distinct pink color of the paper. Editor.)



Manet, overall foxing on brown paper. Bathing and drying followed by 1, 2% ammonium citrate bathing at pH 7.0 with rinsing and drying between applications. Before and after photographs.

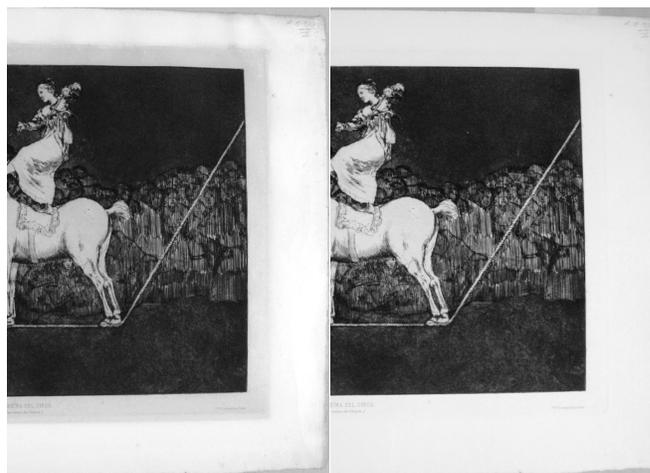


Anonymous red chalk drawing, overall foxing. Float bathing and drying followed by 1,3% ammonium citrate baths at pH 7-8 with rinsing and drying between applications. Before and after photographs.

Always test on media for stability. Always test media when changing concentration. Stability at 1% does not mean stability in 2%.

If the media is stable, bathing follows typical paper conservation practices. First bathe the artifact (float, suction, blotter, etc.) in water baths to remove any water-soluble degradation products. Dry the artifact and prepare the ammonium citrate solution. If the ammonium citrate is going to effectively remove stains, it will be obvious as the solution pulls out degraded material, similar to regular water bathing. Change the exhausted solution for a fresh 1% solution, and continue the exchange until no more color is observed in the solution. Follow by rinsing with some calcium added to the rinse water, and dry the artifact for observation.

At this point, if stains persist, a 2% concentration of ammonium citrate can be tested and the sequence repeated. Again, it will be obvious if staining is being pulled into the solution or not.



Goya, overall discoloration, foxing, mat burn. Bathing and drying followed by 1,2,3% ammonium citrate baths at pH 7-8 with rinsing and drying between applications. Before and after photographs.



Curtis, severe foxing overall. Bathing and drying followed by 1,3, 5% ammonium citrate baths at pH 7-8 with rinsing and drying between applications. Before and after photographs.

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## Ammonium Citrates for Stain Removal in Paper, continued

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Alternatively, ammonium citrate can be considered a pre-treatment step for other stain removal processes. After an initial treatment with ammonium citrate, often only a dilute (0.01 – 0.1) sodium borohydride treatment is needed to completely remove residual staining. Remember that a condition for most bleaching options is to remove metal impurities prior to either oxidative or reducing bleaches, and the ammonium citrate fulfills this requirement. In some instances the reducing agent, sodium borohydride, can change  $\text{Fe}^{3+}$  to  $\text{Fe}^{2+}$  so that it is more soluble. The washing process may require a back and forth sequence between citrate and sodium borohydride. However, for iron or copper particles or metal oxides, a chelating agent such as DPTA or EDTA may be necessary.<sup>6</sup>



Gericault, overall discoloration, foxing, mat burn. Float wash and drying followed by float application of 1 (2x), 2 (2x), 4 (2x)% ammonium citrate baths at pH 7 with rinsing and drying between applications. Followed by .01% sodium borohydride applied by spray on verso. Before and after photographs.

Ammonium citrate also works very well when used locally. Often mat burns can be removed with local application, followed by rinsing. In general, keeping the solution at a neutral pH and varying concentration works well. However, for some stains it works best to stabilize the concentration and work up and down pH range. Another successful local application method is to use sodium citrate prepared in a 5% agarose gel and placed along a mat burn or other stain, followed by rinsing. The sodium doesn't evaporate like the ammonium citrate so the pH is stable when making gels.

The effectiveness of ammonium citrate solutions seems to implicate some metallic contribution to many stains in paper. It also suggests that metallic particles can be more soluble at lower pH concentrations, and that using high alkaline solutions on paper artifacts can form insoluble metal oxides that will continue to stain and degrade the artifact. When viewing artifacts in ultra violet light before and after treatment there is often no change noted, even though the stain has disappeared from the visible range. Our profession would benefit from scientific research into this area.

After some practice and experimentation on expendable items, ammonium citrate may become a useful tool to add to your repertoire in treating paper artifacts. It may also change your standard of practice and view on the mechanisms of staining in paper.

This material was first presented in February 2013 as a workshop at the National Gallery Paper Conservation Department and at the Winterthur Paper Conservation lab and as a talk at the annual WAAC meeting, September 2013. The author wishes to thank Dr. Galen George, Head of Chemistry Department, Santa Rosa Junior College for his contributions.

### Notes

1. Sarah Bertalan. 2015. Foxing and reverse foxing: condition problems in modern papers and the role of inorganic additives, Miami AIC presentation.
2. Leslie Carlyle, Joyce Townsend and Stephen Hackney. 1990. Triammonium Citrate: An investigation into its application for surface cleaning. In *Dirt and Pictures Separated*. United Kingdom Institute for Conservation of Historic and Artistic Works, 44 - 48.
3. Rachel Morrison, Abigail Bagley-Young, Aviva Burnstock, Klaas Jan van den Berg, and Henk Van Keulen. 2008. An investigation of parameters for the use of citrate solutions for surface cleaning unvarnished paintings. *Studies in Conservation*. 52 (4): 255-270.
4. Agnes Timar-Balazsy and Dinah Eastop. 1998. "12.2 Sequestering agents" in *Chemical Principles of Textile Conservation*. Butterworth Heinemann, 221-225.
5. Chris Stavroudis. 2015. A tale of two citrates. *WAAC Newsletter*, 37(2).
6. Helen Burgess. 1991. The use of chelating agents in conservation treatments (CCI).

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# CYCLODODECANE: Observations on Residues and Substrate Interactions

by Renée A. Stein and Courtney Murray

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## Cyclododecane Use in Conservation

Since its introduction in the mid-1990s, cyclododecane has found increasing use globally in the field of conservation. Conservation publications describe cyclododecane's use on a variety of substrates to facilitate stabilization, transport, and treatment procedures. Several means of application are described, including molten and solvent systems. Spray methods are employed with increasing frequency, noting a more uniform and continuous coating result.

Since Rozeik and Rowe compiled a thorough summary of the relevant conservation literature in *Reviews in Conservation* in 2008, articles about the practical uses of cyclododecane continue to be published. Recent articles cite the successful use of cyclododecane as a consolidant and facing material for painted surfaces (Ryan 2009; Borgioli 2009), as a protective coating to enable revised or difficult treatment (Rozeik 2009; Sahmel, et al. 2012), as a fixative for friable media (Balzarotti-Kämmlein 2010), and to temporarily stabilize fragile materials during excavation and transport (Ma 2011; Bayer 2011; Davidson 2010). Additional articles will be published as postprints to the "Subliming Surfaces: Volatile Binding Media in Heritage Conservation" conference, held at the University of Cambridge in April 2015.

Published discussions generally focus on the application method and treatment scenario, with repeated acknowledgement of concerns about sublimation rate as well as health and safety. Rate of sublimation has been shown to be influenced by external environmental factors such as temperature, ventilation, and pressure (Bruhin 2012) and has been explored by nuclear magnetic resonance (NMR) profilometry and Fourier transform infrared spectroscopy (FTIR) with the conclusion that the rate of sublimation is quasi-linear and dependent on film thickness (Anselmi 2011). Though some ecotoxicological data exist, long-term health effects and permissible exposure limits for cyclododecane have not been determined (Vernez 2011).

Additional concerns are repeatedly raised about the presence of residual compounds and interaction of cyclododecane with various substrates.

It is important to distinguish between residual cyclododecane and residues of other compounds. Tissier and Bruhin observed residues using FTIR and gas chromatography-mass spectrometry (GC-MS) after visual and weight assessment suggested complete sublimation from various materials. These residues were not detected in the stock cyclododecane and their mass was less than 1% of the cyclododecane applied during treatment (2009). Jägers reported that observed white residues were linked to the polyethylene pipettes used to apply the cyclododecane as well as to saponified wax compounds present in the substrate, suggesting that cyclododecane mobilized these compounds (2012).

## Cyclododecane Chemistry and Manufacture

The chemistry of cyclododecane predicts that the pure compound should sublime completely. The cyclic, semi-crystalline hydrocarbon has a melting point of 60°C (NIST 2012), low vapor pressure of 0.1 hPa (Watters 2007), and a relatively low enthalpy of sublimation,  $\Delta H^{\circ}_{\text{sub}}$ : 76.4 +/- 1.7 kJ/mol (NIST 2012), which permits sublimation at room temperature. As a monocyclic saturated alkane, it has numerous conformations and thus demonstrates its somewhat malleable semi-crystalline character.

Cyclododecane converts from solid to gas through the disruption of intermolecular forces, causing intact rings to separate from the aggregate without breaking into smaller fragments. This sublimation occurs spontaneously at ambient conditions of temperature and pressure.

A series of US patents granted in the late 1960s and early 1970s describe the synthesis of cyclododecane by selective hydrogenation of cyclododecatriene (Misono 1973; Gosser 1970; Levaie 1968; Mcalister 1968; Smith 1963). The patent literature indicates that solid cyclododecane is relatively stable and unreactive, typically requiring a catalyst and increased temperature and pressure to react with other compounds. Patent authors consistently noted difficulty with the control of side reactions and product purity but by 1968 were able to demonstrate 99% product purity (Leviae).

It is assumed that synthesis of cyclododecane is today achieved via this method or a similar variation, but current suppliers Sigma Aldrich and Kremer Pigments could not offer product preparation details. Samples from several cans of cyclododecane were tested as part of a study by Caspi and Kaplan (2001); one was found to contain very small amounts of fatty acid and hydrocarbons, but the source of these contaminants was not identified.

## Experimental Observations

In the present study, questions about residues and substrate interactions were further investigated through four analytical and practical experiments. A series of high magnification cryogenic Scanning Electron Microscopy (cryo-SEM) images were taken following the sublimation of cyclododecane from a gold planchette. GC-MS was conducted following the sublimation of cyclododecane from an aluminum foil weighing pan. Objects previously treated with cyclododecane were re-examined macroscopically. Finally, cyclododecane was applied to glass slides that had been treated with a variety of materials commonly used as adhesives, consolidants, or coatings in conservation.

The experimental procedures were designed to minimize variables and to limit possible contamination. The same stock of cyclododecane, purchased from Kremer Pigments in 2005, was used for all four experiments. Cyclododecane was applied in its molten state to avoid contamination from solvents.

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## CYCLODODECANE: Observations on Residues and Substrate Interactions, continued

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### 1. Cryo-SEM imaging

A new BAL-TEC gold planchette with a flat-bottomed well measuring 1.4mm in diameter was first cleaned by sequential sonication for approximately five minutes in distilled water, reagent grade acetone, and finally reagent grade methanol. The empty planchette was placed in the cryo-preparation stage, cooled under liquid nitrogen, chromium-coated, inserted in the field emission SEM, and imaged at -120°C.<sup>1</sup> The microscope was operated at 10kv and images were digitally captured at increasing magnifications from 40x to 10,000x.

Once removed from the microscope, this planchette was re-cleaned, and a small piece of solid cyclododecane was placed into the well with stainless steel tweezers. The planchette was heated on a hot plate at 70°C for a few minutes to melt the cyclododecane. It was covered with an inverted shallow plastic dish to prevent dust accumulation and was allowed to sit at room conditions. After seven days, the planchette was again chromium-coated and imaged under cryo conditions.

Comparing images of the planchette before and after treatment with cyclododecane and its subsequent sublimation, it was evident that the bulk of consolidant had readily departed. The surface area of the planchette well was too small to flush with solvent for further analysis.

### 2. GC-MS analysis

An aluminum foil weighing pan was rinsed with acetone, allowed to evaporate and then warmed on a hot plate at 100°C to dry. The empty pan was weighed on a digital scale to one-hundredth of a gram, and one gram of solid cyclododecane was placed into each pan using stainless steel tweezers.

The pan was heated on a hot plate at 70°C to melt the cyclododecane, and the temperature was raised to 85°C for one minute to produce a more level layer. The pan was placed under an elevated plastic box to limit dust accumulation while also promoting air circulation. The cyclododecane was allowed to sublime at room conditions for approximately eight weeks until it was no longer visible to the naked eye and the pan had returned to its empty weight.

The pan was rinsed with 500uL of hexanes, and this rinse solution was analyzed via GC-MS.<sup>2</sup>

Comparison spectra were also collected from the hexanes, an unused pan rinsed with hexanes, and solid cyclododecane dissolved in hexanes. The detection limit was estimated to be approximately 100ppb. The spectra from the treated and untreated pans were the same within instrumental precision. All impurities in the samples were also seen in the solvent and were therefore determined to originate from the solvent or the column. These results suggest that the cyclododecane was uncontaminated, sublimated completely, and did not leave behind derivative compounds.

### 3. Re-evaluation of objects previously treated with Cyclododecane

Several objects that were previously treated with cyclododecane in preparation for transport were visually evaluated for the presence of surface alterations such as a deposit, bloom, or haze that might relate to their prior treatment with cyclododecane.

A limestone column capital in The Cloisters/ Metropolitan Museum of Art was treated in 1999 with cyclododecane, applied both in 3:1 Shellsol OMS:xylenes solution and as a melt (Stein, et al. 2000). Ceramic vessels in the National Museum of the American Indian were treated in 2001 with molten cyclododecane (Caspi and Kaplan 2001). A painted linen fragment with glue and textile backing in the Michael C. Carlos Museum of Emory University was faced in 2010 with molten cyclododecane on tissue. None of the conservators who examined these objects at the authors' request observed any visible surface alterations on the previously treated objects.

### 4. Glass slides coated with conservation materials and treated with Cyclododecane

Glass microscope slides were washed with Aquet glassware soap, rinsed with acetone, and dried with Kimwipes. Using a glass stir rod, an approximately 1-inch area of each slide was coated with one of several conservation materials (see Table 1).

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1. Cryo-SEM imaging was accomplished at the Robert P. Apkarian Integrated Electron Microscopy Core at Emory University. Procedures for imaging cyclododecane under cryogenic conditions in a scanning electron microscope were developed for a separate study to examine how the temporary consolidant interacts with porous substrates (Murray et al., 2015).

2. GC-MS analysis was conducted by Applied Technology Services, Inc. The agilent GC-MS system consisted of a model 7890A gas chromatograph with split/ splitless injection port and a model 5975C mass selective detector. A HP-5MS 5% Phenyl Methyl Siloxane column (30m, 250µm diameter, 1µm film

thickness) was used with helium as the carrier gas at a flow rate of approximately 1ml/min and linear velocity of approximately 36.6 cm/sec. The injection port temperature was 280°C at 8.16 psi and a total flow rate of 1ml/min. Injections were carried out in split mode with a split ratio of 20:1 and split flow rate of 20ml/min. The temperature was held at 55°C for 2.5 minutes, then ramped at 20°/min to 115°C and then 10°/min to 280°C, and held at the final temperature for 2 minutes, giving a total run time of 24 minutes. MS analysis was carried out in scan mode with a transfer line temperature of 230°C and temperature of the quadrupole ion source at 150°C. Scan parameters were low mass 29.0 and high mass 352.0 with a threshold of 50.

## CYCLODODECANE: Observations on Residues and Substrate Interactions, continued

The coated slides were allowed to dry overnight and were digitally photographed. A small piece of cyclododecane was placed on each slide with stainless steel tweezers and then melted in place with a heated spatula, forming a layer that partially covered both coated and uncoated areas of the slide. As this experiment was designed to be practical, the amount of cyclododecane delivered to each slide was not weighed, and the thicknesses of the resulting layers were not measured.

The treated slides were digitally photographed. The cyclododecane was allowed to sublime under room conditions. After approximately three weeks, the slides were examined through a stereobinocular microscope and compared with images taken before sublimation.

A thin deposit remained on the coated and uncoated areas of the slides with PVA-AYAF, B-72, Multiwax, and Bowling Alley Wax. The slides coated with the waxes clearly appeared to have a more generous application of cyclododecane, which would require longer to sublime. It is also possible that the sublimation was slowed by the presence of the chemically similar waxes.

The uncoated and coated areas of the other slides appeared unchanged by the application and subsequent sublimation of the cyclododecane. The surfaces of the glass and the conservation materials were not visibly deformed, etched, or otherwise physically altered. No haze, film, or residue appeared to be present.

Figure 1 presents a detail of the glass slide coated with carnauba wax and treated with cyclododecane, viewed

under magnification after more than three weeks of sublimation. Less cyclododecane appears to remain on the uncoated glass than on the carnauba wax coating. The partially sublimated cyclododecane layer has a very porous gauzy appearance, more so on top of the carnauba wax. Streaks in the carnauba wax coating are visible through the cyclododecane layer.

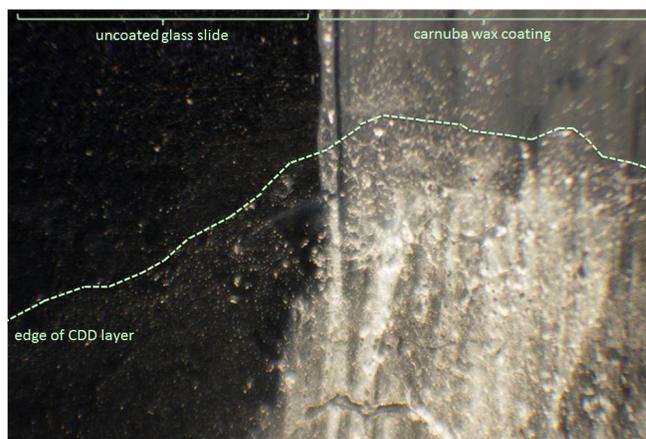


Figure 1

### Conclusions

The cryo-SEM imaging and GC-MS analysis indicate that cyclododecane sublimates completely. Objects previously treated with cyclododecane do not appear to be altered as a result of the treatment, suggesting that the temporary coating does not react with substrate materials nor causes changes to them over time.

The porosity of the treated surface as well as its chemical affinity for hydrocarbon compounds may influence cyclododecane's rate of sublimation, as do the amount and thickness of cyclododecane applied.

The very "quick-n-dirty" tests with coated glass slides suggest that the cyclododecane does not visibly interact with a variety of commonly used conservation materials; further analytical investigation would be worthwhile.

It is important to distinguish between residual cyclododecane and residues of other unknown compounds. The chemistry of cyclododecane and these experimental results indicate that residual cyclododecane will sublime with time. Anything left behind after complete sublimation could be a contaminant.

As with any material manipulated for use in conservation, there is opportunity for contamination by manufacturing, tools or equipment, solvents, and handling. The heat, solvent, and/or movement of the consolidant system within a substrate could also cause interactions with materials present in the substrate.

### Table 1. Adhesives and Preparation Methods

Adhesive	Preparation Method
Jade 403	commercially prepared, undiluted
Rhoplex AC234	commercially prepared, undiluted
Fish Glue (Veritas)	commercially prepared, undiluted
Butvar B-98	dissolved in ethanol
Klucel G	1% (w/v) in ethanol
PVA-AYAF	15% (w/v) in ethanol
Paraloid B-72	40% (w/v) in acetone, diluted
Aquazol 200	20% (w/v) in 1:1 ethanol:deionized water
Multiwax X-145A	as purchased
Bowling Alley Wax (100% Carnauba wax)	as purchased

Note: Commercially prepared adhesives had been previously opened. Other adhesive solutions were not prepared for this experiment, so could have been contaminated through prior use.

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## CYCLODODECANE: Observations on Residues and Substrate Interactions, continued

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Cyclododecane itself may act as a solvent for nonpolar compounds (e.g. oils, fatty acids, soaps, resins, and plasticizers) within the treated object, causing them to move. Such potential for contamination and substrate interaction exists with cyclododecane just as it does with any other system encountered in conservation treatment, whether used for temporary or long-term cleaning, consolidation, or adhesion, etc. The extent to which these potential effects can be predicted, prevented, mitigated, and reversed is an essential evaluation in choosing all treatment materials and methods.

### Acknowledgements

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# An Aromatics-Free Hydrocarbon Solvent / Diluent for Laropal® A 81 and Gamblin Conservation Colors

by Alan Phenix and Agata Graczyk

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The commercially available, low molecular weight (LMW), urea-aldehyde resin Laropal® A81, made by BASF, has become an established material for conservation-restoration treatment of painted works of art. Evaluated first as binder for retouching (inpainting) paints (de la Rie et al 2000; de la Rie 2002) and eventually commercialized in the range of Gamblin Conservation Colors,<sup>1</sup> Laropal® A81 is increasingly finding use too as a picture varnish, perhaps partly because of the lack of availability of another LMW resin intended for that purpose.

Whether used as retouching medium or varnish, Laropal® A 81 needs a solvent for application; according to the manufacturer's datasheet<sup>2</sup> it is soluble in "alcohols, esters, ketones, and aromatic hydrocarbons; aliphatic hydrocarbons – solutions tend to separate at temperatures below 15°C, adding 2-5% of an aromatic solvent produces stable solutions."

Conservators know from experience, however, that a pure aliphatic hydrocarbon solvent has insufficient solvent power/polarity, under normal studio conditions, to dissolve Laropal® A 81 properly, and they almost always need to choose another solvent altogether, blend with one or more polar oxygenated solvents, or increase the proportion of aromatics appreciably above the 2-5% level suggested by BASF.<sup>3</sup>

As has been ably demonstrated, with the assistance of the Teas chart, by Greg Smith and Ronald Johnson in a previous WAAC Newsletter (Smith & Johnson 2008), for Laropal® A81 to dissolve in a mineral spirits-type solvent there generally needs to be ca. 30% aromatic hydrocarbons present.<sup>4</sup> Since most aliphatic mineral spirits products nowadays have low proportions of aromatics, topping up the aromatics by adding xylenes to ca. 30% is the simple, usual solution.

Boosting polarity/solvent power by using oxygenated solvents such as alcohols as diluents for Laropal® A 81 is not generally a problem in terms of risk to the underlying strata when the application is retouching/inpainting, but for

varnishing, especially by brush, there are definite benefits to using a solvent/diluent that is as inactive on the sub-strata as possible, and 100% aliphatic hydrocarbons have a distinct advantage in this respect because of their low solvent power and swelling effect (Phenix 2002; Phenix 2013).

It would be advantageous too, from the point of view of human health and olfactory comfort, to have the option of a 100% aliphatic hydrocarbon solvent for Laropal® A81 and Gamblin Conservation Colors. We think we may have a solution to the problem of dissolving Laropal® A81 in 100% aliphatic hydrocarbons.

In the PSG session at AIC Miami in May this year we presented a paper that reported on work we have been doing towards a new solubility descriptor system which retains some of the graphic accessibility of the Teas fractional solubility parameter system with its familiar ternary diagram, while hopefully improving on the discrimination of solvency effects.

The essence of the approach is to take as the main descriptors of the solubility behavior of organic liquids two properties that can be quite easily measured using not-too-elaborate instrumentation: refractive index ( $n$ ) and the normalized Reichardt solvatochromic solvent polarity parameter,  $E_T^N$  (Reichardt 2011).<sup>5</sup>

When presented graphically in a simple  $x$ - $y$  diagram, the combination of these two measurable properties seems to separate organic liquids remarkably well in terms of their solubility character.<sup>6</sup> The graphic visualization can be applied also to mixtures of solvents, though one of the main outcomes of our study is that the representation of mixtures is far from linear and ideal.

Even before combining it with Reichardt polarity parameter  $E_T^N$  into the new, composite scheme, we were aware that refractive index ( $n$ ) alone was quite a sensitive discriminator of solvent power for the general class of hydrocarbon liquids. Refractive index is connected with, and an indicator of, the *polarizability* of organic substances;<sup>7</sup> that is, the disposition for the electron cloud of the molecules to be distorted from normal shape by an external electric field. With regard to

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1. <http://www.conservationcolors.com/>

2. [http://worldaccount.basf.com/wa/NAFTA/Catalog/FunctionalPolymers/doc4/BASF/PRD/30041405/pdf?title=Laropal\\_A\\_81\\_Dec\\_2010&asset\\_type=ti/pdf&language=EN&urn=urn:documentum:eCommerce\\_sol\\_EU:09007bb28008474f.pdf](http://worldaccount.basf.com/wa/NAFTA/Catalog/FunctionalPolymers/doc4/BASF/PRD/30041405/pdf?title=Laropal_A_81_Dec_2010&asset_type=ti/pdf&language=EN&urn=urn:documentum:eCommerce_sol_EU:09007bb28008474f.pdf)

3. Typical solvents/diluents suggested for Gamblin Conservation Colors® include: ethanol, iso-propanol (propan-2-ol), methoxypropanol (PGME; Dowanol PM), methoxypropyl acetate, (PGMEA; Dowanol PMA), ethyl lactate, diacetone alcohol, and mineral spirits of 30-40% aromatics.

4. Smith & Johnson 2008 present a full Teas fractional solubility diagram for Laropal® A81 as their Appendix 1, plus a detail of the non-polar region as their Figure 2.

5. The  $E_T^N$  parameter is an empirical scale of solvent polarity parameter obtained from UV/Vis spectroscopic measurements of a solvatochromic pyridinium-*N*-phenolate betaine dye (Reichardt's dye) in solution. Normalized polarity values ( $E_T^N$ ), which cover a scale from 0.0 to 1.00, are derived by calculation from the position of the longest-wavelength intramolecular charge transfer absorption band of the dyestuff dissolved in the test solvent.

6. The Reichardt  $E_T$  polarity parameters are understood to be independent of polarizability (Laurence et al 1994: 5815; Machado, Stock, & Reichardt 2014: 10441); thus  $E_T^N$  and  $n$  are complementary descriptors of solvent character.

7. Polarizability and refractive index are related according to the Lorenz-Lorentz equation (Reichardt, 2011: 14).

## An Aromatics-Free Hydrocarbon Solvent / Diluent for Laropal® A 81 and Gamblin Conservation Colors, cont'd.

solubility, *polarizability* reflects the tendency of the solvent molecules to acquire induced polarity in proximity to a dipole; solvents with relatively high refractive index and high polarizability, such as aromatic hydrocarbons, are capable of strong dispersion force interactions.

Within the family of linear aliphatic hydrocarbon liquids, refractive index increases progressively from 1.3723 for *n*-hexane up to 1.4195 and above for *n*-dodecane and higher homologues. Cycloparaffinic (alicyclic; naphthenic) hydrocarbons are always higher refractive index than their linear counterparts. The greater solvent power of aromatic hydrocarbons is reflected by the magnitude of their refractive indices: for example, the value for toluene is 1.491; xylene 1.4933-1.5030 depending on the isomer (Table 1). Linear aliphatic hydrocarbons, including *n*-hexane,

Table 1. Refractive indices of hydrocarbon solvents: pure substances, proprietary products, and blends.

	Refractive index at 25°C	Solvent for Laropal® A81?
<i>Pure Hydrocarbons</i>		
<i>n</i> -hexane	1.3723	✗
<i>n</i> -heptane	1.3851	✗
<i>iso</i> -octane	1.3890	✗
<i>n</i> -octane	1.3951	✗
<i>n</i> -decane	1.4097	✗
<i>n</i> -dodecane	1.4195	✗
cyclohexane	1.4235	✓
methylcyclohexane	1.423	✓
toluene	1.4941	✓
xylene (isomers)	1.4933 - 1.5030	✓
<i>Commercial products</i>		
Benzine (petroleum naphtha)	1.4063	✗
CBG Formula 83™	1.4142	✗
Shellsol D38	1.4180	✗
Shellsol D40	1.4200	✗
<i>Mixtures</i>		
Shellsol D38 : xylene 80 : 20	1.4310	✗
Shellsol D38 : xylene 70 : 30	1.4379	✓
Shellsol D38 : xylene 60 : 40	1.4450	✓

*n*-heptane, *n*-decane, *n*-dodecane, and aliphatic mineral spirits products composed of them, such as VM&P naphtha (refractive index = 1.407), petroleum benzine (refractive index = 1.406),<sup>8</sup> and Shellsol D38 (refractive index = 1.4180), are not in themselves capable of dissolving Laropal® A81. As we have seen, it takes an addition of ca. 30% aromatics

8. Products called Petroleum benzine, like that offered by Fisher Chemical, seem to correspond to ASTM Standard D3735 specification for VM&P Naphtha HT.

to Shellsol D38 to increase solvent power sufficiently to dissolve the resin: a 70:30 v/v mixture of Shellsol D38 and xylene has a refractive index of 1.4380.<sup>9</sup>

However, cyclohexane (refractive index = 1.4235) and its relative methylcyclohexane (refractive index = 1.423) can fully dissolve Laropal® A81. These cycloparaffinic solvents seemingly represent the limit of solubility of the resin on the non-polar side. With boiling points respectively of 80.7 °C (177.3 °F) and 101 °C (214 °F), cyclohexane and methylcyclohexane are rather too volatile, though, for most practical applications; something slower evaporating would be more useful.

Proprietary hydrocarbon solvents that were aromatics-free and composed substantially of cycloparaffins – such things as Shell's Cypar 9 and ExxonMobil's European product Nappar 10 – used to be available until quite recently, but these are discontinued and there seem now to be no products of this type on the market. Even products marketed as substitutes for aromatics, like CBG Formula 83™ (refractive index = 1.4142)<sup>10</sup> lack the solvent power to dissolve Laropal® A81. We have, therefore, been looking at other options within the cycloparaffinic hydrocarbons range, using refractive index as a guide to determine the necessary solvent power.

On the basis that the cycloparaffins have the highest refractive indices and greatest solvent power in the class of aliphatic hydrocarbons, we looked to see if any homologues larger than cyclohexane were commercially available.

Cyclooctane, in particular, has some useful properties: refractive index 1.4557; boiling point 149°C (300°F).<sup>11</sup> When tested, cyclooctane was found to comfortably dissolve Laropal® A81, as might have been predicted from its refractive index value. Usefully, cyclooctane presents no special health risks: according to the new Globally Harmonized System (GHS) for classification and labelling of hazardous substances, it carries just the 'Warning' signal word, and the hazard statement '*H226 Flammable liquid and vapour.*'

We think this combination of properties makes cyclooctane a good choice as solvent/diluent for Laropal® A81; likewise for products made from that resin, specifically the Gamblin Conservation Colors. Admittedly, cyclooctane is not especially cheap at about \$50 for 100 ml or \$125 for 500ml, but there are some adaptations that can be done for economization.

With a refractive index for cyclooctane of 1.4557, there is quite a bit of latitude in terms of the non-polar solubility limit of Laropal® A81 (demanding a r.i. of around 1.430) to 'dilute' it by blending with a hydrocarbon solvent having lower r.i./solvent power.

9. An 80:20 v/v mixture of Shellsol D38 and xylene (r.i. 1.4310) was not capable of dissolving Laropal® A81 under normal lab conditions.

10. <http://www.cbgtechnologies.com/clearing-solvent.aspx>

11. Cyclooctane is available in the US from Sigma-Aldrich: catalog number C109401.

## An Aromatics-Free Hydrocarbon Solvent / Diluent for Laropal® A 81 and Gamblin Conservation Colors, cont'd.

Petroleum benzine (= VM&P naphtha) is an obvious choice as the co-solvent on grounds of having a boiling range (119-140°C; 246-284°F) a little below that of cyclooctane, and relatively good solvent power because of >50% cycloparaffins already in the product. A 50:50 v/v mixture, for example, of cyclooctane and petroleum benzine, with a measured refractive index of 1.4322, was found still to dissolve Laropal® A81 effectively and to produce a coherent dry film of resin on evaporation.

By contrast, a 40:60 v/v mixture of cyclooctane and petroleum benzine, with a refractive index of 1.4276, just lacks the solvent power necessary to dissolve the resin. So, with Fisher Chemical 'benzine' (Cat. No. 264-20) selling for just \$12 per 500ml, the possibility of 50:50 blending of benzine with cyclooctane offers quite a saving on cost for preparing a functional, aromatics-free hydrocarbon solvent/diluent for Laropal® A81 and the Gamblin Conservation Colors.

Finally, since conservators are familiar with the representation of resin solubility in the form of regions within the ternary Teas fractional solubility parameter diagram (see Smith & Johnson, 2008: 14, 17; Horie 2010: 402), we thought it useful to compare the Teas chart rendering of Laropal® A81 solubility with that of our new *x-y* graphic presentation of normalized Reichardt solvatochromic polarity parameter,  $E_T^N$ , plotted against refractive index ( $n$ ).

Using the solubility data reported by Smith & Johnson 2008, and  $E_T^N$  and refractive index data obtained from Marcus 1998 and other sources, our graphic rendering of the solubility of Laropal® A81 in pure solvents is given in Figure 1. We should note, though, that the solubility of the resin in binary solvent mixtures would almost certainly not plot coherently with this plot of solubility in pure solvents.

#	Solvent	$E_T^N$	$n$	#	Solvent	$E_T^N$	$n$
1	n-hexane	0.009	1.3723	17	tetrachloroethylene	0.043	1.503
2	n-heptane	0.012	1.3851	18	tetrahydrofuran	0.207	0.207
4	Aliphatic mineral spirits (Shellsol D38)	0.009 <sup>w</sup>	1.4180*	19	1,4-dioxane	0.164	1.4203
5	cyclohexane	0.006	1.4235	20	2-ethoxyethanol (cellosolve)	0.657	1.4057
7	ethylbenzene	0.105	1.4932	21	2-methoxyethanol (methyl cellosolve)	0.627	1.4002
C8	cyclooctane	0.006 <sup>^</sup>	1.4557*	23	1-methoxypropan-2-ol	0.556*	1.402*
9	benzene	0.111	1.4979	25	methyl acetate	0.253	1.3589
10	toluene	0.099	1.4941	26	ethyl acetate	0.228	1.3698
11	xylenes (mixed isomers)	0.106	1.4970*	27	iso-propyl acetate	0.21	1.3828
12	dichloromethane`	0.309	1.442	28	n-butyl acetate	0.241	1.3918
13	chloroform	0.259	1.442	30	propylene carbonate	0.472	1.419
14	tetrachloromethane	0.057	1.457	31	acetone	0.355	1.356
15	1,2-dichloroethane	0.327	1.457	32	butanone (MEK)	0.327	1.3769
16	trichloroethylene	0.16	1.475	33	methyl iso-butyl ketone (MIK)	0.269	1.3936

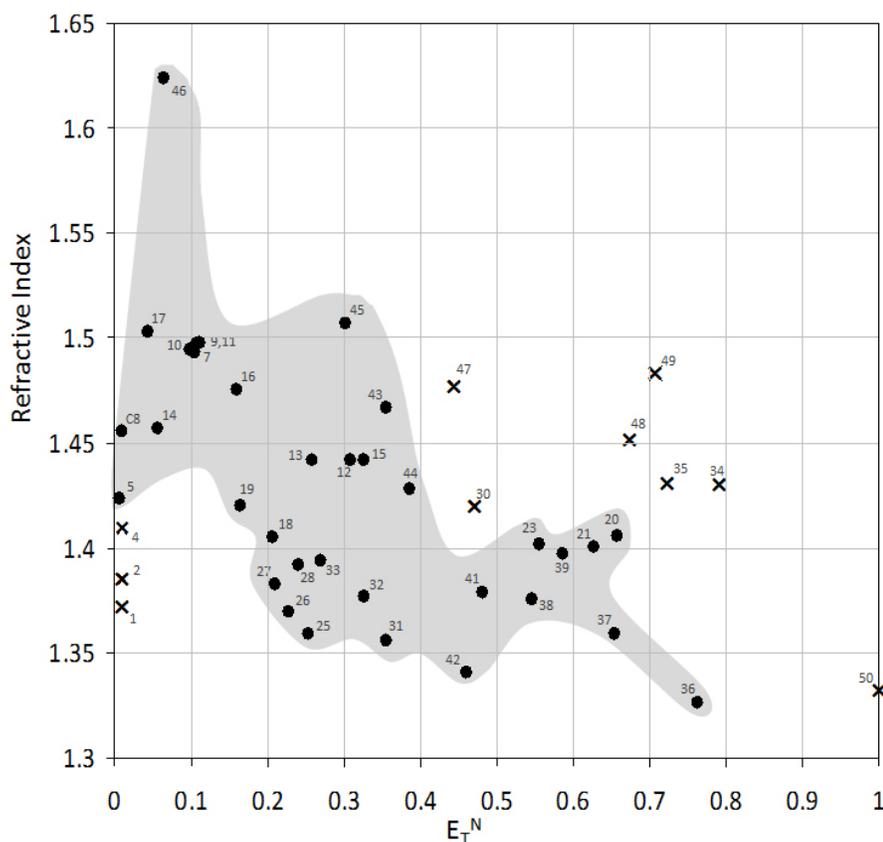


Figure 1. Solubility region of Laropal® A81 expressed in terms of refractive index and normalized Reichardt solvatochromic solvent polarity parameter,  $E_T^N$ . Data on refractive index and  $E_T^N$  mostly from Marcus 1998. For key to solvents, see table below. Individual solvents numbered same as in Smith & Johnson 2008; cyclooctane included here as solvent C8.

#	Solvent	$E_T^N$	$n$
34	ethylene glycol	0.79	1.4306
35	propylene glycol	0.722	1.4314
36	methanol	0.762	1.3265
37	ethanol	0.654	1.3594
38	iso-propanol	0.546	1.3752
39	n-butanol	0.586	1.3974
41	nitromethane	0.481	1.379
42	acetonitrile	0.46	1.341
43	N-methyl-2-pyrrolidone	0.355	1.467
44	N,N-dimethylformamide	0.386	1.428
45	pyridine	0.302	1.507
46	carbon disulfide	0.065	1.624
47	dimethyl sulfoxide	0.444	1.477
48	ethanolamine	0.673	1.452
49	triethanolamine	0.707	1.483
50	water	1.0	1.3325

<sup>^</sup> Estimated by comparison with cyclohexane

<sup>w</sup> Estimated by comparison with n-decane

\* Our measured values

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## An Aromatics-Free Hydrocarbon Solvent / Diluent for Laropal® A 81 and Gamblin Conservation Colors, cont'd.

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In mathematics you don't understand things,  
you just get used to them.

Johann von Neumann

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## A New Conservation Tool

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The conservators at Birmingham Museums Trust have been using thorns to clean decorative metalwork, such as vesta cases, coins, buttons, and in particular the Staffordshire Hoard, for the past few years.

### Why thorns?

The idea of using thorns for the Staffordshire Hoard objects was first considered as gramophone records were historically played with thorns, suggesting that it may be a suitable material to trial.

Steel implements such as scalpels, picks, and pins are commonly seen in a conservator's toolkit, but these tools are much harder than the hoard gold and silver alloy objects and are therefore not suitable due to the risk of scratching and possible marking the gold.

Many hoard objects already have a number of surface scratches, but the majority of these are the result of manufacture construction marks or from the subsequent removal of their component parts from the original objects in the 7<sup>th</sup> century. Thorns have become the perfect solution for the conservation of the 4000 fragments and objects that make up the Staffordshire Hoard.

### The benefit of thorns

Thorns have the advantage of having very fine, naturally sharp but flexible points that can get into very small areas. Many hoard objects have very fine cloisonné or filigree decoration, and a tiny implement is required to remove soil around these decorative features.

A selection of different thorns ready for action



© Birmingham Museums Trust

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## The Staffordshire Hoard Conservation Team at Birmingham Museums Trust on Using Thorns to Conserve the Staffordshire Hoard

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Thorns from several species of plant were trialed, but the thorns that had the properties we were looking for—softness, flexibility, and thin/small size—were berberis, pyrocanthus, hawthorn, and blackthorn. These thorns vary in size and flexibility, which enables us to select the thorn that is most appropriate for a particular object.

### Other virtues

In addition to being softer than steel and safer to use on hoard objects, using thorns in conservation has other indirect benefits:

thorns are a natural product that is completely biodegradable, so they can be disposed of along with regular rubbish;

they are a sustainable and renewable product;

they are free of charge and in abundant supply in the back gardens and allotments of Britain, so they do not affect our budget;

Cleaning with a thorn



© Birmingham Museums Trust

The results of careful cleaning with thorns



© Birmingham Museums Trust

unlike cocktail sticks, they do not tend to split and splinter; instead, the point grows dull or the entire thorn snaps in half, at which point it is simply thrown away.

### Possible drawbacks

A few potential risks to using thorns have been identified, the first one being that insects might hitch a ride into the studio on the thorns and their associated branches and leaves. To minimise this risk, bags of thorns are inspected prior to being brought into the museum, at which point they are held in the conservation offices instead of the studio until they are ready to be clipped. The second risk is that some natural substance such as plant juice/sap might be transferred from the thorns to the objects. To minimise this risk thorns are inspected and only dry, clean thorns are used.

### Thorns in action

The use of thorns has been very successful in conserving these important objects and the conservation process can now be seen featuring in the New Staffordshire Hoard Gallery which opened last October at Birmingham Museum and Art Gallery. Visitors can see the tools, learn about how the hoard has been conserved since its discovery, and even look down a microscope to see the cleaning in action.

Reprinted with permission from ICON News, The Magazine of the Institute of Conservation. May 2015, Issue 58.

Visitors around the new conservation and research tables at Birmingham Museum and Art Gallery



© Birmingham Museums Trust

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## Jobs

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### **The Asian Art Museum**

San Francisco

Assistant Conservator, Works on Paper

Under general supervision by Head of Conservation, the Assistant Conservator, Works on Paper will assist the conservation staff in the conservation duties related to the examination, preservation, conservation treatment, exhibition, and storage of the Asian Art Museum's collection as well as art objects on loan. The works of art on paper and silk include, but are not limited to, East Asian screens and scrolls, South and Southeast Asian paintings, prints, drawings, albums, books, photographs, and contemporary artworks from over 40 countries in Asia. The incumbent prepares a variety of reports to document conservation activities; performs research; publishes articles, and gives oral presentations related to conservation needs of the museum. The nature of this highly skilled work requires manual dexterity, intense concentration, and aesthetic sensibility in addition to excellent organizational skills. The incumbent must have the ability to prioritize work, coordinate and consult with exhibition team members, and sequence projects in order to meet agreed upon deadlines.

#### Examples of duties

Under the direction of the Head of Conservation, the Conservator will: Writes condition reports on new acquisitions, art installed in in-house exhibitions, outgoing loans, and traveling exhibitions; conducts surveys of art works in storage and on exhibit to determine stability as needed; insures that completed documentation complies with the American Institute for Conservation Code of Ethics. Determines the materials of fabrication and assesses the stability of the art object; prepares treatment proposals; performs conservation treatments including consolidating, cleaning, and repairing; writes treatment reports and provides photographic documentation. Conducts scientific tests when applicable that aid in the authentication and treatment of art; arranges consultancy resources for additional scientific analysis or treatment as needed. Prepares works of art for exhibition; consults with curators, designers, preparation staff, and external contractors (i.e. framers) to insure that art is appropriately matted, framed, and otherwise prepared for exhibition; assists in designing installation methods in consultation with

mountmakers and exhibition designers for the proper display, storage, and treatment of works of art on paper and silk. Improves storage and installation methods; investigates and researches materials used in contact with works of art on paper and silk such as packing materials, display mounts and storage cases; recommends environmental control conditions for storage and display; advises the building engineers on the physical requirements of the collection; monitors environmental conditions to ensure appropriate conditions are maintained. Assist with purchasing and maintaining supplies for treatment and display. Advises on conservation issues related to preventative conservation, including but not limited to storage fixtures, conservation studio designs and equipment, and gallery installation methods. Advises non-conservation staff on the preservation of the collections; acts as resource person concerning works of art on paper and silk to the museum, collectors, and the public. Publishes articles describing conservation research and techniques; prepares written and oral presentations for general public, connoisseurs, museum staff, and other conservators. May be assigned to act as agent for the museum by couriering works of art, including: traveling with the art; unpacking at destination; writing condition reports and performing emergency treatments as necessary and as approved; repacking and condition reporting at the close of the exhibition.

#### Minimum qualifications

Masters Degree in Art Conservation specializing in Paper Conservation from a recognized college or university. Verifiable minimum 3 years of conservation experience with the techniques, materials and equipment used in the conservation of Asian works on paper and silk, prints and drawings, in museum environments. Knowledge of the technology and materials of Asian works on paper and silk, prints and drawings, and of the chemical and physical processes of their deterioration. Knowledge of the procedures relating to the examination and the preventative and corrective treatment of Asian works on paper and silk, prints and drawings. Knowledge of the environmental requirements and of controls for handling, storage, exhibition, and travel of Asian works on paper and silk, prints and drawings. Ability to write technical reports in an understandable, clear, and concise manner, utilizing appropriate punctuation and grammar.

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## Articles You May

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### **“Visitors Enjoy Canterbury Cathedral’s Celebrated Stained Glass at Ground Level,” *The Guardian*, 05/17/2015**

Some of the oldest stained glass windows in the world have temporarily come to ground level at Canterbury cathedral, while the massive window that is their normal home is rebuilt.

The style of one of the anonymous medieval artists who worked on the glass is so distinctive that he is known as the Master of Methuselah, and his work has been identified in several windows on the continent.

The glass could have been lost forever if the great south window had collapsed. The first warning came in 2009, when a large piece of carved stone fell from the window surround. Although it has been repaired many times – with the mixture of types of stone and mortars adding to its problems – the huge window dates back to the 1420’s. It was at the edge of what was technically possible when built, 16.8m tall and 7.6m wide.

Over the centuries the entire building has moved slightly, tipping the window forward and sideways. Iron cramps and bars intended to strengthen it were also corroding and fracturing the stone. At a cost of £2.25m almost all the stonework is being replaced, with tonnes of stone brought from France like the original.

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Ability to provide sound advice and recommendations regarding the design of facilities to ensure the proper display, storage and treatment of Asian works on paper and silk, prints and drawings. Ability to make clear oral presentations to the general public as well as to technical specialists. Ability to maintain ongoing effective working relationships with museum staff, colleagues in the field, and the public; demonstrate good judgment, flexibility and resourcefulness. Ability to use various computer software including Microsoft Office, Photoshop, Lightroom, and The Museum System.

#### Compensation

\$25.27- \$30.35 per hour with benefits package.

Please note: This position is represented by SEIU 1021. Apply online at [www.asianart.org](http://www.asianart.org). The Asian Art Museum embraces diversity in its mission, programs, and staff.

**“Sword of Damocles Restored,”** *Pune Mirror*, 05/30/2015

Last week, after a gap of nearly 10 years, one of the most important paintings at Mumbai’s Chhatrapati Shivaji Maharaj Vastu Sangrahalaya (CSMVS) — Sword of Damocles by 19th century French artist Antoine Dubost — went up on display.

The iconic 228 x 258 cm canvas has been undergoing restoration for seven years. As Anupam Sah, who heads the museum’s conservation department, says, “It took that long because this project was also used to create a document of a good practice case study. Every detail was documented. The notes will eventually lead to a book.”

In November 2011, *Mumbai Mirror* had reported how the museum had discovered the existence of Dubost’s work amongst its collection while restoring many of the works it owned. The signature of the artist, concealed by several coats of varnish, was revealed when these layers were removed.

**“Historic Deerfield Awarded \$3000 for Needlework Conservation,”** *Antique Digest*, 06/08/2015

Historic Deerfield, Deerfield, Massachusetts, has been awarded \$3000 by the Felicia Fund to conserve two important needlework pictures acquired by the museum in 2013. The pictures, examples of “schoolgirl” art, have connections to the Connecticut River valley.

The earlier example, wrought around 1755 by Springfield native Lois Breck (1738-1789), depicts the Biblical scene “The Death of Absalom” (or hanging of Absalom), from the second book of Samuel, chapter 18. The second is a pastoral scene known as “The Apiary.” Wrought in 1804 by Betsy Knox (b. 1791), it depicts a woman tending to a beehive.

When they entered the Deerfield collection, both pieces exhibited similar condition problems. Each piece needed stabilization of the ground fabric, cleaning, and reframing.

Following conservation, these pieces will be on display in the Helen Geier Flynt Textile Gallery at the Flynt Center of Early New England Life in 2016.

**“Disputed Painting is Declared an Authentic Rembrandt after Decades,”** *The New York Times*, 06/09/2015

The painting was sliced down the middle and straight through its center in the 19th century, probably to be sold as two Rembrandt portraits. At some point in the next 40 years, it was sutured back together and layered with paint to cover up its scars.

In 1898, the director of the Mauritshuis Royal Picture Gallery proudly displayed it in the museum as “Saul and David,” one of Rembrandt’s most important biblical works. Then in 1969, a top Rembrandt authority discredited the painting.

Now, after eight years of examination and restoration by the museum’s own conservators — with support from researchers from various outside institutions -- the Mauritshuis has reclaimed the painting as an authentic Rembrandt, saying it was painted in two stages by the master’s own hand.

Scientific data gleaned from paint sample analysis and a new X-ray technique allowed restorers to look beneath the overpainted surface and gain fresh perspective on aspects of the painting that had been obscured by damage and previous restorations. Macro X-ray fluorescence analysis isolated individual elements in pigments used to make the paint, allowing researchers to differentiate original pigments from those that were added later.

Rather than taking the step of stripping the painting back to its most raw state, they chose to make the work “presentable” but not to hide its complex history.

**“The Demolished Buddhas of Bamiyan are Reborn as 3D Projections,”** *Hyperallergic*, 06/16/2015

This month the two sixth-century Buddhas of Bamiyan demolished in Afghanistan were temporarily returned to their towering places in the Bamiyan cliffs through 3D projection.

The project by Chinese couple Janson Yu and Liyan Huboth was reported on June 7 by the Khaama Press of the Afghan News Agency Network. With the clearance of both the country’s government and UNESCO, the temporary revival was the most recent consideration of how to honor the memory of the statues

destroyed by the Taliban in 2001, while respecting the gaping void left by their demolition.

The project follows last year’s controversy when brick stabilization work was halted at one of the empty sites out of a suspicion the construction was aimed at “secretly trying to rebuild one of the statue’s feet.” Whether or not the Buddhas should be rebuilt has been of debate for over a decade since their loss.

**“Macclesfield Art Restoration: Virgin Mary gets a Make-over, ends up being Saint Catherine,”** *Mancunian Matters*, 06/17/2015

A 500-year-old painting will go on display in Macclesfield this November after research by a University of Manchester student led to a full restoration of the work of art.

The painting, titled ‘The Virgin Mary Releasing a Soul from Purgatory at the Intercession of King David’, originally went on display at the West Park Museum in Macclesfield following its opening in 1898 and was initially thought to depict the Virgin Mary. But research by Anna Rhodes, who works for the Macclesfield museum as part of her Masters Degree in Art, History and Visual Studies, revealed that the painting was misunderstood and had remained mis-labelled until she decided to take a closer look.

“It became apparent that the panel was very unusual and deserved to be conserved and put back on display at West Park Museum,” she said. The 15th century painting shows Saint Catherine of the Wheel, who was tortured and executed by the Roman Emperor Maxentius for her Christian beliefs. However, it is said that the spiked wheel he intended to use in torture broke when Saint Catherine touched it, leading to her beheading. The torture device was later known as a Catherine Wheel, and also lent its name to the popular firework.

**“First Look: Schreckengost Mammoth and Mastodon Sculptures Moving to Cleveland Museum of Natural History,”** *cleveland.com*, 06/18/2015

The huge and popular Viktor Schreckengost sculptures of a mammoth and mastodon that once graced the Pachyderm Building at the Cleveland

Metroparks Zoo will soon start a new life on the grounds of the Cleveland Museum of Natural History.

Schreckengost, who died in 2008 at age 101, was one of America's leading midcentury modern industrial designers. Schreckengost originally created the sculptures for the exterior of the zoo's Pachyderm Building in 1956. Cleveland Metroparks, which took over the zoo in the 1970s, deinstalled the sculptures in 2008 when the agency demolished the Pachyderm Building to make way for its new African Elephant Crossing.

The nonprofit Cleveland Zoological Society raised \$100,000 to pay ICA Art Conservation of Cleveland to remove the sculptures. The sculptures were originally produced in 87 segments, each weighing roughly 600 pounds, or roughly 26 tons altogether.

ICA Art Conservation will collaborate with Fentress Architects of Denver and with AECOM of Cleveland, the architects of the museum's expansion and renovation, on the reinstallation of the Schreckengost sculptures.

**“Treasure Lost in Iraq: The Story of Mar Behnam Monastery,”** *Hyperallergic*, 06/23/2015

Among the most tragic losses of the many antiquities destroyed in Iraq by the Islamic State in Iraq and Syria (ISIS) has been the destruction of Iraq's seriously understudied medieval architecture.

The demolition of the mausoleum of Imam Yahya ibn al-Qasim and the tomb of Imam Ibn Hassan Aoun al-Din wiped out two of Mosul's prominent medieval landmarks. When another explosion obliterated the Imam Dur mausoleum in Samarra, it wiped out the earliest example of a muqarnas dome in the world.

While the destruction of medieval sites has received far less media attention than attacks on better known ancient sites such as Nimrud or Hatra, the loss of Iraq's medieval sites is perhaps even more tragic due to the relative lack of scholarly documentation.

On March 19, 2015 ISIS fighters rigged the tomb of Mar Behnam and Mart Sarah with explosives and blew it up, completely leveling the structure. Gone is the unique architecture blending Muslim and Christian art, along with one of the Middle East's few inscriptions in Uighur. The destruction of the site fits both ISIS'

targeting of Christians and Yezidis as well as the destruction of graves revered as shrines. It has also made Iraq and the world that much poorer.

**“Restoration of Tutankhamun's Funerary Mask to Start in August,”** *Ahram Online*, 06/23/2015

Beginning in August, visitors of Tutankhamun's galleries at the Egyptian Museum in Tahrir will not be able to admire the king's distinguished gold funerary mask which will leave its original display for intensive restoration to repair the improper restoration carried out recently.

Minister of Antiquities Mamdouh Eldamaty told *Ahram Online* that Tutankhamun's gold funerary mask will go for restoration after scientific studies identify the materials used in its restoration and establish how to remove them without causing harm. Eldamaty said that German restorer Christian Eckmann assisted him in such studies because he is an expert in metal restoration. Eckmann will travel to Germany with the results, where he will create a gypsum replica of the mask.

An international conference is to be held in August in Cairo to explain to the public and scholars the method selected to restore the beard through state-of-the-art technology. Then, the restoration itself is to start and all the work will be documented. In January 2015, it was reported that the blue and gold beard of the mask was broken during a cleaning process at the Egyptian Museum and that conservators hurriedly glued the beard back on with epoxy resin, damaging the artefact.

**“State-Of-The-Art Conservation on View at Formal Dedication of Cultural Heritage Laboratory,”** *Yale News*, 06/23/2015

Over 100 members of the Yale community gathered June 19 for the formal dedication of a state-of-the-art conservation laboratory shared by all collections at Yale.

The IPCH Conservation Laboratory covers over 8000 square feet and comprises a large open-plan workspace offering free-flowing collaboration across a wide range of projects and media — paper and textiles, paintings, natural history specimens and

other objects. Many of the collections in the laboratory have their own conservation space within the same building, providing direct access to the new facility, which also houses rooms for formatting and framing, a structural workshop for sculptures, and a lead-walled imaging room equipped with a 300 kilovolt X-ray.

Among the institute's priorities are sustainable and preventive conservation, materials aging diagnostics, technical and technological studies on cultural artifacts, and mechanical and non-destructive testing in the built heritage field.

Led by inaugural director Stefan Simon, it engages in research and teaching in a multidisciplinary setting, working closely with the Yale University Art Gallery, the Yale Peabody Museum of Natural History, the Yale Center for British Art, and the Beinecke Rare Book and Manuscript Library, among others.

**“Sleuth Work Leads to Discovery of Art Beloved by Hitler,”** *The New York Times*, 06/25/2015

The recent startling recovery of long-lost artworks made for Adolf Hitler and his chief architect, Albert Speer, began with a telephone call to a Berlin art dealer.

Two large and imposing bronze horses by Josef Thorak — missing from a Soviet military base outside Berlin since some point in communism's collapse — were available. Was the dealer, Traude Sauer, interested? Ms. Sauer, 76, who by her own estimation is a dealer of distinction, has long been a police informant. Realizing that the Nazi-era sculptures might be classified as stolen state property, she turned to René Allonge, a chief investigator with the Berlin police.

That was in September 2013. Last month, those tips culminated in one of the more sensational police raids in recent memory in Germany. The authorities descended on 10 properties nationwide, uncovering dozens of missing pieces of Nazi art and throwing rare light on the secretive market where such works are traded. It is legal to possess art commissioned by the Nazis, but it can remain in private hands only if the state has no direct claim on it. That is almost certainly not the case with several of the recovered works.

**“The Great Wall of China Is Falling Apart,”** *Hyperallergic*, 07/01/2015

The Great Wall was once China’s most fearsome defense. Construction began as early as 300 BC, and by the time the Ming Dynasty finished it, more than 1,000 years later, it had grown to span 13,000 miles.

Sadly, according to the Beijing Times, the once-mighty wall that shielded the country from northern invaders is now in serious need of protection itself. The Great Wall of China Society claims that more than 30% of the original structure has disappeared. The news comes after a 2012 study found that only 8.2% of the wall is in good condition.

Humans are big contributors to the wall’s destruction. More than 10 million tourists flock to the structure every year. It’s become popular to visit the less-frequented stretches, and people often camp out for the night, driving tent stakes into the delicate stones and leaving garbage behind.

Poor local villagers loot the wall’s gray bricks to build their own houses or peddle the stones to tourists.

Nature has also played a role. Trees grow in its cracks, breaking the structure apart and making it even more vulnerable to the elements. Local governments tasked with caring for it lack the necessary funding to do so and often don’t have enough staff members to monitor it regularly. And though China passed the “Great Wall Protection Ordinance” in 2006, obligating citizens to help protect it, no organization exists to enforce the rule.

**“Workers Restore Majesty of Jefferson’s Rotunda in Virginia,”** *Columbus Dispatch*, 07/04/2015

Thomas Jefferson’s Rotunda at the University of Virginia is the focus of a \$58.3 million renovation of the World Heritage Site. The Rotunda face-lift is part construction zone, part art restoration.

To ensure all this work doesn’t stress the nearly 200-year-old structure, a \$500,000 laser-monitoring system targets 130 points to detect any movement in the brick walls. If the lasers sense a shift of a quarter inch, “the project shuts down and we figure out what’s going wrong,” said Jody Lahendro, a historic-preservation architect who is overseeing the work for the university.

The centerpiece of U.Va.’s historic grounds, the Rotunda was the largest construction project of its day. Jefferson modeled the Rotunda on the Pantheon in Rome. The Rotunda’s connection to Italy doesn’t end there. The capitals were mined and carved in Italy. The original capitals also were from Carrara, Italy, but they were replaced with domestic marble after a fire in 1895. They failed to withstand the weather and are being replaced.

The work also has revealed secrets: A hearth used in chemical experiments and dating to Jefferson’s era was found behind a brick wall. A cistern, 16 feet deep, was discovered in the east courtyard. The signatures of workers who built it in 1853 also were found, and they were preserved for future display.

**“Ipswich Museum Jug Smash Boy’s Family ‘Thrilled,’”** *BBC News*, 07/05/2015

The mother of a little boy who accidentally smashed an 18th Century jug has said the family is “thrilled” it has been repaired.

Staff at Ipswich’s Christchurch Mansion appealed for him to get in touch, so they could tell him the jug he knocked off a window ledge was now fixed. The boy’s mother, who wishes to remain anonymous, contacted the museum after reading about the appeal online.

The Delftware puzzle jug had broken into 65 pieces. Each of the 65 pieces of the jug was logged and photographed as part of the repair project. It took about 65 hours of work to repair the 221-year-old jug. The boy was thought to be about five when the accident happened last summer.

The restored jug has been moved from Christchurch Mansion and is on display at the Ipswich Art Museum in the High Street.

**“Restoration Work on Timbuktu’s Historic Tombs to Finish this Month,”** *The Art Newspaper*, 07/06/2015

A project to restore 14 historic mausoleums destroyed in Timbuktu three years ago by hardline Islamists is due to finish at the end of July.

The news was announced in Bonn, Germany, at the 39th session of Unesco’s World Heritage Committee.

Extremist groups targeted the tombs of Muslim saints as well as the city’s vast libraries when rebels occupied northern Mali following a military coup in March 2012.

Located at the crossroads of several Trans-Saharan trade routes, Timbuktu grew to become a major centre of Koranic culture in the 15th century. Known as “the city of 333 saints”, it has 16 mausoleums inscribed on Unesco’s World Heritage List.

Unesco, the Malian government as well as various international organisations are behind the effort to restore the mud-brick shrines, the earliest of which dates back to the 13th century. Local craftsmen used traditional materials and techniques in the reconstruction process, which contributed to the local economy by creating around 140 jobs.

**“The Dirty Business of Protecting Precious Paintings,”** *Philly Voice*, 07/08/2015

When the Museum of the American Revolution opens in 2017, guests will be able to explore a life-size recreation of Boston’s Liberty Tree and see what Independence Hall looked like under siege. They’ll also find George Washington’s original headquarters tent and a range of artwork depicting the Revolutionary War.

Two of the paintings in the Museum’s collection were created by local artist Harrington Fitzgerald, who studied under Thomas Eakins. Fitzgerald was also an editor and later business manager of the Philadelphia Item, a newspaper started by his father Thomas.

But before Fitzgerald’s late 19th century paintings, “Washington Crossing the Delaware” and “Valley Forge Winter, the Return of the Foraging Party,” can be displayed at MAR, they need a bit of a makeover. MAR has enlisted University of Delaware Art Conservation Assistant Professor Brian Baade, fellow conservator Kristin deGhetaldi and a group of undergraduates to bring them back to life.

**“Rome is on the Verge of Collapse and needs Urgent Repair, Leaders Warn,”** *The Telegraph*, 07/16/2015

The Eternal City is facing crisis, with its administration engulfed in corruption scandals and debt, its

roads scarred by pot-holes, the main airport partially closed and a growing immigration crisis.

For generations, the Italian capital has rested on past glories rather than built on them but now its multiple problems have come to a head. A survey by the European Commission two years ago placed Rome last out of 28 EU capitals in a ranking for the efficiency of city services.

Despite great food, superb coffee and an enviable climate, on an index of quality of life, the capital came second to last, with Athens at the bottom.

**“Conservator Channels Caravaggio to Freshen a Cleveland Museum of Art Masterpiece,”** *cleveland.com*, 07/21/2015

The cleaning and repair of one of the most important paintings in the Cleveland Museum of Art has reached the point where conservator Dean Yoder needs to channel his inner Caravaggio.

After having spent eight months cleaning away yellowed varnish and fixing earlier repairs on the painting, Yoder is touching up areas of damage on the surface of the 1607 “Crucifixion of Saint Andrew. Yoder, who is 56 and who joined the museum six years ago after having run his own paintings conservation firm in Cleveland since 1985, said he prepared himself in part by traveling to Italy to study other works by Caravaggio. It has also helped that several vintage copies of the Caravaggio exist, enabling Yoder to compare his work to that of the early copyists.

Working on the Caravaggio for many months had made Yoder think about the man whose brushstrokes he is following. Hot-tempered and combative, Caravaggio killed a man in Rome in 1606, reportedly in a fight over a prostitute, and died on the run four years later while seeking a papal pardon.

But channeling the artist hasn’t meant taking on his inner turbulence. Instead, Yoder said he’s more impressed than ever by Caravaggio as an artist after having spent what already amounts to a significant chunk of his own career working on the “Saint Andrew.”

**“Master Forger Librarian Swaps 143 Artworks with His Own,”** *ArtNet News*,

07/21/2015

Art theft and forgery appears to be a major problem at China’s Guangzhou Academy of Fine Arts, where former chief librarian Xiao Yuan has admitted to replacing 143 artworks with fakes he created himself. He claims that several of his fakes were subsequently replaced with even poorer quality copies.

His defense for his crime? Everyone else was doing it. Xiao claimed that he noticed fake artworks beginning his very first day on the job. Apparently, the academy library treated paintings like books, allowing students and staff to check artworks out and remove them from the premises, making it shockingly easy to swap the originals out for forgeries.

Beginning in 2004, Xiao began substituting landscape paintings, calligraphy, and other famous artworks from the school’s collection with his forged copies. Xiao confessed to stealing works from 20th-century Chinese artists Qi Baishi and Zhang Daqian, as well as Zhu Da’s 17th-century ink masterpiece *Rock and Birds*.

But then his own fake works suffered a similar consequence. “I realized someone else had replaced my paintings with their own,” Xiao told the court, “because I could clearly discern that their works were terribly bad.” (Which seems like a convenient way to defend his own artistic ability, if not his actions.)

**“Bid to Preserve Armstrong Moon suit,”** *BBC News*, 07/21/2015

The US National Air and Space Museum has turned to crowdfunding to conserve the spacesuit Neil Armstrong wore on the Moon. The museum aims to raise \$500,000 on Kickstarter to help safeguard the suit and build a climate-controlled display case.

Conservators say the suits were built for short-term use with materials that break down over time. They also plan to digitise the suit using 3D scanning.

The suit used by Armstrong on the Moon during the Apollo 11 mission in 1969 is deteriorating and hasn’t been displayed for nine years. “In 2006, we decided to give it a rest, to take it off display and put it in our state-of-the-art storage, which is at a low temperature

and low humidity, to preserve it and figure out how to get those climate-controlled conditions from storage into a display case,” said Cathy Lewis, spacesuit curator at the Washington DC-based museum.

She added: “The suit itself is a very complex machine. It’s made of many different materials - about 12 different types of textiles and fabrics that have been combined together in one. “To preserve or conserve any single one of those textiles would be very easy, but then we would have to take the suit apart and we’re not going to do that.”

**“Restoration of Alamo Painting Completed,”** *Houston Chronicle*, 07/24/2015

Art conservator Anne Zanikos has nearly finished saving a 114-year-old painting from the Alamo that depicts a key moment in the Texas independence struggle. After four months of conservation work, “Ben Milam Calling for Volunteers,” painted in 1901 by Texas artist Harry Arthur McArdle, could return next month to the shrine.

Zanikos estimates that she and her lab assistant have spent close to 100 hours cleaning, repairing and remounting the work. Details of the painting are now emerging from the damage left by previous unsympathetic conservation efforts, she said.

McArdle’s painting shows Milam, at 47 about twice the age of the average Texan soldier, rallying the troops to renew their long-stalled assault on the Mexican forces holding the village of Béxar in December 1835, when the rebels were considering whether to keep fighting for Texas independence or go home for the winter.

**“IFA Conservation Center Launches first ever MFA/MA Dual Degree Program,”** *NYU press release*, 07/31/2015

In recognition of the substantial role that science plays in educating and training students of art conservation, the NYU Institute of Fine Arts (IFA) has been accredited by the New York State Board of Education to award students in its conservation program the degree of Master of Science in Conservation of Historic and Artistic Works.

Conservation Center students,

who receive full scholarships and are required to concurrently pursue a Master of Arts degree in art history, previously earned an Advanced Certificate. The new dual degree program is the first of its kind in the United States. The MS and MA dual degree will be effective for the fall 2015 incoming class.

**“Italy Earmarks €80M for 12 Cultural Projects, Including Rebuilding Colosseum Floor,”** *Hyperallergic*, 08/05/2015

On Tuesday Dario Franceschini, Italy’s Minister of Heritage, Culture, and Tourism, announced that the superior council for cultural assets and landscape has committed €80 million to 12 major cultural projects.

Foremost among the projects are an €18.5 million plan to rebuild the floor of Rome’s Colosseum — which was removed during excavations toward the end of the 19th century — so that the ancient amphitheater might be used for reenactments of Roman spectacles and other events, and €18 million for the so-called “Great Uffizi” project to renovate and expand the most-visited art museum in Italy.

Italy’s cultural and archaeological sectors have long suffered from chronic underfunding, as illustrated most poignantly by the deterioration of the ancient site of Pompeii. Recently the country has turned to private and corporate funding for major restoration projects, from Fendi bankrolling the \$4 million cleaning of Rome’s Trevi Fountain to Bulgari putting \$2 million toward tidying up the Spanish Steps.

The Colosseum is already in the midst of a €25-million renovation funded by leather goods billionaire Diego Della Valle and due to be complete next year.

**“Thumbs down! Why it’s a Disaster to Restore the Colosseum,”** *The Guardian*, 08/06/2015

Rome is giving the Colosseum a new floor at a cost of more than €18m. Italy’s Culture Minister Dario Franceschini calls the reflooring “a promise kept”. I call it a history betrayed.

It is totally barbarous to spank up this noble mass of stone with a brand new floor. That floor will cover up what visitors today see when they look down:

a warren of cavernous exposed tunnels where gladiators and animals once awaited their entrance into the arena.

By covering it with a fake cinematic arena, the Italian state proposes to turn the Colosseum into a film set. The beauty of ruins is precisely that they leave space to imagine what they were once like. To restore is to wreck. Step beyond simple preservation and you replace history with cheap fantasy.

Renewing the Colosseum’s arena is not the kind of necessary restoration that raises the odd fallen stone or keeps a structure safe — it’s a gross intervention for the sake of modern bad taste.

If Rome feels the need for a new-looking Colosseum to keep the most superficial visitors happy it should build a replica elsewhere in the city, and stage fake games there. And why not? In fact, what this monument most needs is a lot less visitors. The task of restoration is to preserve the past — not replace it.

**“Hidden Dimensions: 3D Scanner Reveals the Inner Secrets of Artworks,”** *Euronews*, 08/18/2015

Researchers at the University of Oviedo in northern Spain think they have found a way of looking below the surface of works of art without damaging them: a scanner using the highly versatile material, graphene.

Samuel Ver Hoeye, a telecommunications engineer involved in the research explained its advantages: “Graphene acts as a frequency multiplier. It is able to generate higher frequency signals out of lower frequencies. Graphene also allows us to go deeper into the work of art, and to identify the chemical composition of its materials.”

The pictures obtained with the graphene scanner are then combined with image processing techniques and 3D high-performance scanning to generate images of sealed 3D objects, whose hidden secrets can then be studied more easily.

The scanner has a versatility much needed in the world of art conservation and restoration, as existing scanners for works of art are currently very expensive. The new technology has been designed to be much cheaper, resulting in a compact, lighter scanner that can easily be transported to museums or laboratories to study objects.

**“Infamous Jesus Painting Restoration Inspires Opera about the Woman who Botched it,”** *Independent*, 08/21/2015

Preparations are underway for a comic opera about a Spanish artist who tried, hugely unsuccessfully, to restore a faded 1930 oil painting of Jesus Christ.

Cecilia Gimenez skyrocketed to viral fame after attempting to repair “Ecce Homo (Behold the Man)” by Elias Garcia Martinez and failing dismally. Her 2012 effort was soon branded “the worst restoration in history” and described as a “crayon sketch of a very hairy monkey in an ill-fitting tunic”.

Gimenez’s “miraculous” story is now the basis for an upcoming production, which does not intend to mock her but instead “honour her faith that she could overcome this”. Andrew Flack, who has written the libretto, told the Guardian that the internet will play a key part in the opera. “It was really the internet that caused the sensation,” he said, adding that Gimenez, now 83, struggled to cope when she became famous for all the wrong reasons. “She was devastated when it first happened. She was in depression, she was on medication, she felt so terrible. But then it kind of turned around.”

Gimenez’s artwork attracted more than 130,000 tourists to the local church in Borja, helping it economically in the midst of the Eurozone crisis and turning her into a local legend.

**“Earthquake? No Damage. But What About Loud Music?”** *The Washington Post*, 08/22/2015

Vibrations, although little understood in the art conservation field, can pose grave risks to art. Organizers of PEACOCKalypse at the Freer and Sackler galleries in June promised that the party would have the courtyard buzzing with danceable hits. And so it did. Nearly 1,000 visitors donned peacock-style feathers, sipped colorful cocktails and danced to live music until midnight.

But the courtyard wasn’t the only thing buzzing that night: The galleries were also were shaking from the amplified music. As museums are increasingly hosting events to increase foot traffic and court younger visitors, those concerns are weighing on conservationists.

With vibrations, sometimes you can have a cumulative effect that you cannot see,” says Terry Drayman-Weisser, who recently retired from Baltimore’s Walters Art Museum, where she directed conservation and technical research for nearly 40 years. More research is needed on acceptable decibel limits for musical performances in museums and on the role played by such factors as object material and architectural structure.

**“A 12-year-old trips and Puts his Hand Through a Painting at an Art Exhibition in Taiwan,”** *The Guardian*, 08/25/2015

A 12-year-old Taiwanese boy lived out a slapstick nightmare at the weekend when he tripped at a museum and broke his fall with a painting, smashing a hole in it.

Footage released by the organisers of the Face of Leonardo: Images of a Genius exhibition in Taipei shows the boy – in shorts, trainers, a blue Puma T-shirt and holding a drink – walk past the still life, catching his foot and stumbling over. He looks up at the canvas, shown later to have a fist-sized gash at the bottom, and freezes, looking around at other people in the room.

The organisers will not ask the boy’s family to pay for the restoration costs, according to Focus Taiwan news. It said the exhibition organiser, Sun Chih-suan, said the boy was very nervous but should not be blamed and the painting, part of a private collection, was insured.

Porpora was a leading still life artist who produced baroque-style paintings, often of fruit and flowers. The damaged work, 200cm tall, depicts flowers in a vase. Tsai Shun-Jen, the chief conservator, said the painting was very fragile due to its age. “When we start working on the painting’s restoration, the priority is to strengthen its structure, not retouching the paint on the damaged area,” he said.

**“Theater’s Hidden Murals to Undergo Restoration,”** *Laguna Beach Indy*, 09/06/2015

In 1918, the artist Edgar Payne made his home in Laguna Beach where he founded the Laguna Beach Art Association, which later became the

Laguna Art Museum, one of the county’s earliest cultural institutions.

Self-taught, the artist is best known as a plein-air painter, who supported his family in part by painting murals on commission. Yet, his murals have received relatively scant recognition in scholarly works. The four that he painted for the now closed Laguna South Coast Cinemas hardly received any recognition at all.

Even so, a local historian expressed concern over the state of the Payne murals commissioned by the Aufdenkamp family, the theater’s founders. “They have been hidden from view and been allowed to deteriorate after it had been remodeled into a double-screen facility in 1976,” Laguna Beach historian Jane Janz said this week.

The theater’s owner, Leslie Blumberg, recently engaged a conservator to assess the damage and determine if restoration is possible.

**“L.A. to Spend \$750,000 to Conserve Public Murals and Paint New Ones,”** *Los Angeles Times*, 09/15/2015

Los Angeles will announce a new Citywide Mural Program on Tuesday that calls for \$750,000 to be spent on the restoration and preservation of historic fine art murals as well as the development of new ones.

The Department of Cultural Affairs program, which will run through June 2016, is an outgrowth of the city’s 2013 ordinance allowing new murals after a nearly 10-year ban, said Danielle Brazell, the department’s general manager of cultural affairs. “Once it passed and murals were no longer illegal, we had a new set of guidelines in which the city could get behind murals once

again,” Brazell said.

“For close to a decade, there were no resources to restore fine art murals or commission new ones. This is something the mayor put in the budget last year and the City Council supported it.” The funds include \$400,000 that will go to the Social and Public Art Resource Center, or SPARC, and the Mural Conservancy of Los Angeles. The two nonprofit groups will conserve 11 murals that have been damaged. The work will include applying an anti-graffiti coating to protect the artwork from vandals.

**“Restoring the Value of Damaged Art,”** *Wall Street Journal*, 09/20/2015

Insurers of fine art hear lots of excuses in their line of work. The movers dropped it. A pipe broke and sprayed water all over it. But when it comes to protecting the value of one’s art, the manner in which a piece was damaged doesn’t matter. What matters a thousand—perhaps a million—times more is how the owner can go about restoring the piece’s value—or recouping it if the piece is deemed a total loss.

Protecting art’s financial value isn’t as simple as it might seem. There is a “book” value to your car, which helps insurance companies decide if the cost of repairs will be higher than the overall value of the vehicle. The worth of damaged art, decorative arts and antiques is more elastic and may lead to disputes between owners and insurance companies.

This article takes a look at what every art owner should know about damage and restoration in the world of private art collecting, and how owners can best protect their pieces—and pocketbooks.

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At the top of Black Hill they stopped to catch breath. They tightened up their race helmets. It was 1989. It was before safety had been invented. But Greg LeMond had just won the Tour de France in a futuristic streamlined hat - it had been on the television news - so she and Adam had made aerodynamic helmets out of chicken wire, paste, and newspaper. The newspaper was the Daily Telegraph, which their mother took. Under the paste of Zoe's helmet you could see three-quarters of the photo of the man in Tiananmem Square, standing in front of the tanks. The tank man was famous for being slow. Four tanks bearing down on him, every nerve of his body screaming at him to run, and somehow he stood his ground. It was the only kind of race you could win without moving.

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