

## President's Letter

*Dana Senge*

Dear Membership,

Thank you to Marie Labinis-Craft and the Portland, Oregon art conservation community for planning and hosting the 2010 annual meeting this past September.

The location was wonderful and the talks very informative and enjoyable. The WAAC annual meetings are such a great place to catch up with new techniques, especially in specialties outside my own, and learn from friends from around the region. My congratulations to the Portland team for pulling together a great event.

In addition I want to thank our outgoing board members: Members-At-Large: Marie Svboda and Albrecht Gumlich, and President Marie Labinis-Craft. Your time and dedication in working with the board over the past few years is greatly appreciated!

A big welcome is extended to the newly elected board members: Daniel Cull, serving as Vice-President, and Sean Charette and Molly Gleeson serving as Members-At Large. Thank you to all those who ran for office in 2010, we hope you will consider service in future years!

The 2010 board election was our first foray into using web services for balloting. The 2010 membership renewal forms included options for members to receive some information and materials via email or online services. Members who selected to receive their annual meeting registration materials online also received the opportunity to vote online through a Survey Monkey ballot. Members who selected to receive the annual meeting materials via regular mail received paper ballots in the mail. (The 2011 membership renewal forms include a specific selection regarding how members would like to receive their ballot.) The election was quite successful with approximately half of our voting membership participating in one form or the other. We look forward to continuing to utilize web services for our elections, in addition we will continue to provide paper ballots to members who prefer this method for voting.

As the new year begins I am excited to announce that the next annual meeting will be held in Austin, Texas, October 19- 22, 2011. The conference talks will be held at the Thompson Conference Center at the University of Texas, Austin. The receptions and tours will be mostly based on and around the campus — and let me assure you that the UT Austin Longhorns football team will be playing an away game that weekend. Catch up on all the latest information regarding the annual meeting on our website: cool. [conservation-us.org/waac/](http://conservation-us.org/waac/)

And finally... WAAC has joined Facebook. We will be using our page to alert the conservation community of WAAC related updates and information while directing folks to more in depth information on our website. Come find us and "Like" us!

Happy New Year to you all,

Dana K. Senge

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# Weirdness in Austin

WAAC Annual Meeting    October 19- 22

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Some of you may be familiar with Austin's unofficial town motto "Keep Austin Weird." But it's likely that only a few know there is a direct WAAC connection to the saying: Red Wassenich, who coined the phrase, is the husband of long-time member Karen Pavelka at the Kilgarlin Center, School of Information at UT. The following is from the introduction to his book, *Keep Austin Weird: A Guide to the Odd Side of Town*, which describes its origin.

"Keep Austin Weird" came into this world on a Saturday (the day God created humans as an afterthought) in spring 2000. I was calling in my donation to a fund-raiser on all-volunteer radio station KOOP for the Lounge Show, which features smooth crooners such as Bobby Darin and Louis Prima along with strange tunes such as Bing Crosby's "Hey Jude" and William Shatner's "Lucy in the Sky with Diamonds." When asked why I chose this show, the words came out: "It helps keep Austin weird."

Bingo. Sounds like a good slogan, I thought. I mentioned the phrase to my wife, Karen Pavelka, who soon had a thousand bumper stickers in hand. We started handing them out for free to friends and those who seemed worthy (not a mutually exclusive group).

Soon I had a web site ([keepaustinweird.com](http://keepaustinweird.com)) up and the phrase very slowly caught on. We never tried to make money on it and have been very successful at that. Those who started giving away and selling KAW-related stuff are largely responsible for the slogan's popularity, which has some drearly ironic aspects in that the commercialization of the phrase — it's largely seen as a marketing slogan — contradicts one of our underlying inspirations for Keep Austin Weird: Stop the obsession with money and development that leads to the homogenization that makes every American city look alike. Now some say the phrase is becoming so widespread as to be homogenizing itself. And its use as a marketing tool is spreading to other cities, to further the irony.

"Weird" has many shades of meaning, from goofy to unpleasant. For instance, Austin ushered in the era of random mass sniper murders when Charles Whitman killed thirteen in 1966 shooting from the University of Texas tower. Let us instead look to fact that Austin has the largest urban bat colony in the world.

Many, probably most, think of the weird aspects of Austin as the highly visible ones — Leslie, the cross-dressing homeless perennial mayoral candidate, funky stores along South Congress, and the freakish number of live music venues. And these are all cool, but to me the fundamental weirdness is the high quotient of everyday weirdos working in the next cubicle, living next door, sitting next to you, building statues out of beer bottles.

Austin is quantifiably different. Psychedelic rock developed here to some degree in the mid 1960s, with the 13th Floor Elevators. Janis Joplin cut her teeth as a performer here before moving on to the West Coast. Underground comic artist Gilbert Shelton, creator of "Wonder Wart Hog" and "The Fabulous Furry Freak Brothers" started here. Outlaw country music, largely inspired by sometimes Austinite Willie Nelson, flourished in the early 1970s, with the legendary Armadillo World Headquarters (along with many other venues) showcasing it. As you can see, much of this weirdness happened decades ago. It created an aura that exists to this day that draws would-be weirdos who in turn pass along this mentality to the next generation, thus turning the great wheel of life a little closer to the jolly abyss.

While the phrase Keep Austin Weird was invented in 2000, it didn't become a common catchphrase for a couple of years. Perhaps the main incident that popularized it was its use in a campaign by two locally owned excellent central city businesses, BookPeople and Waterloo Records, to fight a \$2.1 million incentive package from the city for a developer to build a shopping center that was to include a Borders Books, right across the street from BookPeople. Steve Bercu of BookPeople and John Kunz of nearby Waterloo Records had bumper stickers printed saying "Keep Austin Weird: Support Local Businesses." They put them out for free in their stores and the fuse was lit. The bumper stickers were everywhere. Public support for their campaign grew. Eventually the city backed away from the incentive and Borders stayed in the burbs.

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#### REGIONAL NEWS

Daniel Cull

#### HEALTH & SAFETY

Chris Stavroudis

#### ARTICLES YOU MAY HAVE MISSED

Susanne Friend

**COPY EDITOR**    Wendy Partridge

#### Photocopying

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#### Internet

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

#### Deadline

Contributions for the May Newsletter should be received by the Editor before **April 30, 2011**.

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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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Dana Senge

**VICE PRESIDENT**  
Daniel Cull

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Individual Membership in WAAC costs \$40 per year (\$45 Canada, \$50 overseas) and entitles the member to receive the WAAC Newsletter and the annual Membership Directory, attend the Annual Meeting, vote in elections, and stand for office. Institutional Membership costs \$45 per year (\$50 Canada, \$55 overseas) and entitles the institution to receive the WAAC Newsletter and Membership Directory. For membership or subscription, contact the Secretary.

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## Regional News

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*Daniel Heath Cull*  
*column editor*

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### ALASKA

**Ellen Carrlee** has been working on totem poles, waterlogged wood/ basketry, and shipwreck artifacts. She is involved in the design phase of a new combined facility for the Alaska State Library, Museum, and Archives, particularly environmental concerns and lab planning. She also took the NOAA/ NAS Part 1 training in Foreshore and Underwater Archaeology. **Scott Carrlee** organized an interesting conservation related session at the Museums Alaska conference in Fairbanks this fall entitled "Preservation Ethics and Industrial History Collections." On the panel were representatives from small Alaskan museums who care for (and sometimes restore) planes, trains, and automobiles. Scott recently did a conservation assessment of the Seward Museum to help them prepare for a move into a new facility in 2012.

**Seth Irwin** continues to do nomadic paper conservation work for institutional and private clients in Alaska. Lately he has found a champion in the Alaska Aviation Heritage Center, who has hosted his free workshops on tear repair and framing while he has been working on their archives. Seth also made the evening news for his treatment of a rare 1826 watercolor of Barrow, Alaska.

**Janelle Matz** is organizing the deinstallation and re-installation of three large scale canvases by Spence Guerin at Fairview Recreation Center. The canvases will be cleaned and lined at WCCFA.

**Monica Shah** was recently hired as the new Director of Collections at the Anchorage Museum at Rasmuson Center, where she will oversee Conservation, Registration, Collections, and the Archives/Library. Monica has been the conservator at the Anchorage Museum since 2007, and has recently been occupied with the conservation assessment of the museum's Alaska Gallery.

*Regional Reporter:*  
Ellen Carrlee

Bronwyn Freya Charette, daughter of new board member Sean and his wife Maria, born August 24, 2010. (4 months)

Julia Walters Moreno, daughter of longtime WAAC secretary Teresa Moreno and Julie Walters, born on Dec. 31, 2010. (1 week)



(only babies of WAAC board members get photos in the Newsletter)

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## Regional News, continued

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### ARIZONA

Many WAAC members may not realize that long-time member **Gloria Fraser Giffords** is the mother of Congresswoman **Gabrielle Giffords**. Gloria (Jinx) has mentored many conservation interns in her Tucson studio. Former interns, friends, the WAAC board, and by proxy, the WAAC membership, wish Gabby a full and complete recovery and offer Jinx and the rest of Gabby's family our heart-felt support.

**Martha Winslow Grimm**, textile conservator, continues her stitching ways by treating uniforms, a housewife (sewing kit), and ribbons from the Civil War period for an major exhibit at the Missouri History Museum on preparing couture gowns for the upcoming Fashion Design exhibit at the Phoenix Art Museum.

Gloria Giffords is consulting with a San Diego firm on the design, iconography, and construction of two late-baroque style retablos including four life-size statues for the Cathedral of Tucson. Both the retablos and statues are being constructed in a traditional manner entirely of cedar with encarnación and gold leaf. Dedication is planned to coincide with the 200th anniversary of the cathedral.

**Linda Morris** has been busy in the studio treating a number of water damaged works on paper from private collections with interns **Kevin Wohlgemuth**, **Alison Pinto**, and **Rachel Shand**.

At the National Park Service lab, **Audrey Harrison** and **Dana Senge** designed a new internal support system for beaded buckskin clothing. Pre-program intern **Amy Molnar** has been working on the treatment of a small basket with multiple complex breaks. Both projects are for Grand Teton National Park's ethnographic collections. Dana and **Maggie Kipling** treated three historic architectural models on exhibit at Salinas Pueblo Missions National Monument in New Mexico.

**Brynn Bender** surveyed NAGPRA collections for heavy metal pesticides using the handheld XRF for 8 tribes at the Colorado Historical Society. Initial results identified patterns of contamination located within accession groups. The XRF was also useful in the lab for identifying

bromide corrosion products on Spanish reales (coins) from Padre Island National Seashore in Texas.

**Nancy Odegaard** was a keynote speaker at the Nordic Countries PhD Consortium in November. She lectured on the importance of advanced research in conservation. Also in the Arizona State Museum lab, **Ida Pohoriljakova** (Queens University) is completing a post graduate fellowship and **Emilie Heddebaux** (Sorbonne Program) completed a graduate internship. **Gina Watkinson** has begun a graduate degree in American Indian Studies at the University of Arizona.

**Lesley Frame** has begun a Fulbright with **Ian Freestone**, Research Professor in Archaeological Science/ Head of Archaeology and Conservation, at Cardiff University in Wales. She and Nancy presented/wrote a paper for the Metals 2010 meetings about deactivation of civil war era ammunition.

**Marilen Pool** completed treatment of two panels from the Maricopa County Court House Jail that consisted of scratched graffiti images through paint on heavy sheet metal. She continues with the Pottery project treatment phase at the Arizona State Museum.

Staff at the Musical Instrument Museum mourns the loss of Head Conservator **Barbara Hamann** who passed away on November 29th after a struggle with cancer (read a full obituary at [cool.conservation-us.org/byform/mailling-lists/cdl/2010/1228.html](http://cool.conservation-us.org/byform/mailling-lists/cdl/2010/1228.html).) **Irene Peters** steps up to take over as the new head of the conservation department; she is busy planning the conservation efforts for the next phase of the museums development and expansion. As part of a collaboration between the MIM and Graceland, Irene recently assessed the condition of a Martin guitar that was the last guitar played live by Elvis Presley.

**Daniel Cull** can most often be found in the visible conservation laboratory treating objects for exhibit at the MIM. Further, he recently completed a project working with the MIM photographer to safely photograph a series of complex shaped objects on loan from the Royal Museum of Central Africa, Belgium. Outside of his responsibilities at MIM,

Daniel continues on the board of e-conservation magazine and writes a column for every issue, and as Vice President of WAAC he is currently working on plans for the 2012 annual meeting.

*Regional Reporter:*  
Brynn Bender

### GREATER LOS ANGELES

**Chris Stavroudis** is happy to report that over 1,000 conservators world-wide have registered as users of the Modular Cleaning Program.

**Sculpture Conservation Studio** just completed a project for the Federal Government on the USS Bennington Monument and Wall at the Rosecrans Cemetery in San Diego. Both structures are from 1915 and are made from large granite stones, with the monument being an obelisk 60' high. The granite wall had been buried for over 50 years and was raised from the ground and conserved.

**Linda Strauss** has retired from the Autry National Center. Linda graduated from the University of Delaware in 1983 and worked many years at both the Getty and in private practice. She was with the Autry National Center for 12 years. She and her husband, Monty, have purchased a home in Costa Rica and are wrapping things up stateside.

**Mark Watters** continues to work with **Gloria Williams** at the Norton Simon Museum on the examination and treatment of the museum's collection of Fragonard drawings.

**Robert Aitchison** has been studying the deterioration of platinum/palladium photographs to design a treatment for the staining which often disfigures this photographic process. Robert is participating in the Platinum/Palladium Print Research Project initiated by **Connie McCabe** and sponsored by the National Gallery of Art.

In November of 2010, **Victoria Blyth Hill** participated in a two-day symposium on

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## Regional News, continued

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East Asian Art: Historical Context and Modern Preservation of Paper-based Works. The informative symposium was held in Philadelphia at the Athe-neum. While on the east coast, Victoria also visited the new wing at the Virginia Museum of Fine Art in Richmond, to see the installation of thangkas which she, **Cara Varnell**, **Ashley Macomber**, and **Jane Berman** of Ota House, worked on last year.

LACMA's on-going treatment of an 18th-century Korean Buddhist painting taking place in the newly renovated Korean ceramics gallery is progressing well. **Prof. Park Chi-Sun** (Jung-Jea Conservation Center, Seoul, Korea) and her staff have finished blotter washing and are currently removing remnants of old backing material from the silk painting.

**Lacey Lieberthal**, pre-program volunteer intern in conservation and collections management at LACMA, will be moving to San Francisco at the end of December to attend the University of San Francisco. She hopes to focus on museum studies in preparation for a career in either collections management or conservation. **Douglas MacLennan**, pre-program volunteer intern in paper conservation, has completed several storage upgrade projects for the Chinese and Korean department at LACMA.

**Jennifer Badger**, assistant paper conservator on contract at LACMA, has settled in nicely with the staff. She has completed numerous treatments on a range of material from Islamic and Indian miniatures, Western prints, ink drawings on tracing paper, Japanese prints, and most recently a recent acquisition of Hawaiian Kappa. This last enters LACMA's growing collection of Pacific Arts. It is a 19<sup>th</sup>- century bark cloth, decorated with a simple quilt design, made as a bed covering for Princess Ka'iulani, 1875–1899. Jennifer is also working closely with LACMA'S new assistant curator in the prints and drawings department, **Naoko Takahatake**, who is systematically reorganizing the entire collection of small format prints and drawings in anticipation of the opening of a new study center.

**Chail Norton** attended the Mellon funded workshop 'Characterization of Silver

Gelatin Photographs' held at the New York Public Library in October 2010.

In December **Chetan Suryawanshi** started in the research laboratory of LACMA as Mellon Postdoctoral Conservation Research Fellow. He takes over from **Rebecca Broyer** who accepted a tenure track teaching position at USC and left LACMA in July. Chetan will continue LACMA's research in the preservation of objects made of plastic, esp. cellulose acetate and other cellulose esters. Chetan's research during his graduate work (PhD at Northern Illinois U. and M.S. at U. of Cincinnati) dealt with polymer based composite materials for multi-functional applications.

**Bianca May** is continuing her second year as Mellon Fellow in painting conservation at LACMA. Bianca is restoring paintings from the series *The Ports of France* by Juan Morlete Ruiz, which the museum acquired in 2007. **Nicole Bloomfield** began her Mellon Fellowship in textile conservation at LACMA in October, 2010. She graduated from the Fashion Institute of Technology program in Textile Conservation and Fashion Studies in May of 2009.

**Erin Jue** from the Huntington Library and **Jennifer Kim** from the AMPAS Margaret Herrick Library are continuing their full time positions at their respective institutions but have also begun taking on private work both independently and jointly.

*Regional Reporter:*  
Virginia Rasmussen

### HAWAII

**Thor Minnick** completed treatment of a gilt-wood frame for the Bishop Museum; this treatment involved more than 160 hrs, over 59 straight days using more than 600 leaves of 23 kt leaf. Thor is presently treating an 1880s American wooden, leather-covered camel-back trunk and an early 19th-C New England chest of drawers.

**Gregory Thomas**, Art Care, has just completed the treatment of three conte crayon figurative drawings by E. Savage and an oil on canvas portrait by Lloyd Sexton. Greg continues his private practice working in his studio in Kailua, Hawaii.

**Dawne Steele Pullman** volunteered 2 weeks in Haiti helping to teach a Collections Management course organized by ICOM. Aside from helping with lectures, work included digging on site amidst rubble for art works, supervising case study teams, and researching availability of materials locally (truly a challenge!); simultaneously a stimulating and exhausting experience. Also, for her private practice she finished the treatment of three Howard Hitchcock paintings in Hawaii for private clients.

*Regional Reporter:*  
Dawne Steele Pullman

### PACIFIC NORTHWEST

**Megan Salazar-Walsh** and **Isabel Blue** interned with **Alice Bear Conservation** this summer into fall.

**Jack Johnson** conducted a CAP survey of the Tillamook County Pioneer Museum on the Oregon coast and is currently restoring a collection of early (1900) photomurals of farming in Moro County, Oregon, which were exhibited at the centennial celebration of the Lewis & Clark expedition of 1805-06.

The staff at the Royal BC Museum has been extremely pleased to host two recent conservation interns. **Johanna Wilms** worked for six months between April and October, bringing her wooden objects expertise from the University of Applied Science and Art in Hildesheim, Germany. Johanna was fortunate to have the opportunity to attend the WAAC Portland meeting while in the neighborhood. **Mary-Lou Florian** spent considerable time training Johanna on fibre identification. **Krystyna Halliwell** joined them from the Sir Sandford Fleming College Collections Conservation and Manage-

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## Regional News, continued

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ment Program in September. Krystyna has been busy researching current practices in coatings for silver objects. She's also shown wonderful initiative in preparing artifacts for loan, making object mounts, and moving the contents of the museum's on-site historic house to an off-site warehouse while fire suppression is installed.

Also joining them in the lab is **JoAnn Peters**, chemistry professor at Central Washington U. JoAnn is spending her sabbatical in Victoria, researching methods for identification of plastics in the History Collection. JoAnn is also looking into options for storage of deteriorating plastics, including cold storage and isolation with scavengers. JoAnn plans to attend the Eastern Analytical Symposium in New Jersey in November, engaging with her colleagues in plastics research.

The Helmcken House fire suppression project has involved every one of the conservators at the RBCM, with **Lisa Bengston** leading the team. Lisa and **George Field** were on a roadtrip just prior to that, assisting with the transfer of artifacts to the Nisga'a First Nation. George also travelled to the interior of BC to attend the CCI totem pole workshop in September.

**Kasey Lee** attended the WAAC meeting, including RTI workshop and Gamblin Paints tour. **Kjerstin Mackie** and **Colleen Wilson** are back from extended holidays during which they galavanted overseas. They're now busy planning the Pacific Conservation Group meeting in Victoria, marking the 60th meeting of this group! Colleen is also contributing to the RBCM blog.

**Betty Walsh** is busy preparing for the upcoming opening of *The Other Emily* exhibition, with the assistance of contract conservators **Barry Byers** and **Simone Vogel-Horridge**. **Robert Davison** is facilitating ongoing preparations for cold storage of AV collections, as well as working with Kasey on the latest round of collections risk assessment.

*Regional Reporter:*  
Corine Landrieu

### ROCKY MOUNTAIN REGION

**Lisa Capano** will be travelling to the island of St. Croix to restore an oil on canvas by Charles "Bud" Hawes from 1969.

**Emily Kleinkauf**, **Erin Murphy**, and **Rachel Dook** were in residence as pre-program conservation interns at the Buffalo Bill Historical Center this fall.

**Jessica Cosmas** from Bryn Mawr and **Kallie Holt** from the University of Iowa returned this winter for two weeks to work with the XRF carrying out analysis of some of the paints and paintings of Harry Jackson and other works in the Buffalo Bill Historical Center collection.

**Mark Minor** is beginning treatment on a pair of 1870s-era military wagons for the Frontier Army Museum in Fort Leavenworth, Kansas. One is a cavalry cart for a gatling gun; the other, a 4-mule escort wagon.

This February, **Victoria Montana Ryan** taught the introductory course, Care of Paintings, through Northern States Conservation Center's museum classes online. The class introduces basic principles for the care of paintings and has previously had students from small institutions, international students, and undergraduate students from around the country.

**Carl Patterson** attended the IIC Congress in Istanbul and took the opportunity to travel for two weeks through the country visiting museums and archeological sites. Of special interest was the current conservation and stabilization of mosaics. Patterson is currently teaching Introduction to Art Conservation at the University of Denver.

**Cindy Lawrence** (paintings), **Judy Greenfield** (objects), **Mark Minor** (furniture), **Camille Moore** (paper), and **Paulette Reading** (textiles) have joined together to form Mountain States Art Conservation. It is a consortium of independent conservators in private practice.

By time this goes to press, the Denver

Art Museum will have re-opened its American Indian galleries. Planning, conservation, and installation have been underway for the past nine months. Over 700 objects, paintings, works on paper, and photographs have passed through the conservation department in need of treatment and or special mounts.

Objects conservator **Gina Laurin** has been overseeing the conservation of a broad range of ethnographic objects. Contract objects conservators **Julie Parker** and **Judy Greenfield** and American Indian specialist **Tom Towner** have devoted many hours to supporting and implementing the project.

**Steve Osborne** and **Jacob Galey** designed and fabricated a myriad of mounts. In addition **James Squires** readied paintings and **Sarah Melching** works on paper and photographs. Volunteers **Beryl Jacobsen**, **Julie Scott**, **Alice Yockey**, and **Jane Matthews** provided time and expertise in finishing mounts. Conservation assistant **Aaron Burgess** and pre-program intern **Micheal Mike-sell**, contributed towards all of the disciplines with true talent and enthusiasm.

*Regional Reporter:*  
Paulette Reading

### SAN DIEGO AREA

Paintings conservator **Gary Hulbert** recently completed a complex, nearly two-year project involving the re-location and conservation of a large fresco mural depicting the San Diego tuna fishing industry. The mural, painted by George Sorenson in 1936, was rediscovered in 2004 on the campus of San Diego State University. The fresco was partially destroyed and covered up by renovations in the 1950s. The mural is now in the university's library.

*Regional Reporter:*  
Francis Prichett

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## Regional News, continued

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### NEW MEXICO

In November, **Bettina Raphael**, **Mark McCormick**, and **Steven Prins** presented a panel discussion on technologies and analysis used in conservation for the annual meeting of the New Mexico Association of Museums in Las Vegas, New Mexico.

Museum Development Associates, the nonprofit museums services organization serving small and rural museums in New Mexico and surrounding states and directed by **M. Susan Barger**, closed the end of December due to the vagaries of the economy. Small Museum Pro! the certification program started by Museum Development Associates and Eastern New Mexico University will continue through the Distance Learning Department of ENMU.

Bettina Raphael is working on a project for the conservation of Sioux buckskin garments for a museum in South Dakota.

*Regional Reporter:*  
M. Susan Barger, PhD

### SAN FRANCISCO BAY AREA

**Elisabeth Cornu** has retired from her position as Head Objects Conservator at the Fine Arts Museums of San Francisco. Elisabeth will continue to teach conservation courses, especially abroad, and has recently co-taught a stone monument conservation course at the Universidad del Museo Social in Buenos Aires, with biochemist **Marcela Cedrola** and stone conservator **Patricia Riadigos**, both from Argentina. She will continue to be active in conservation projects in the San Francisco region, and will host Egyptian Fulbrighter **Mahmoud El Shendidy** in October and November of this year.

**Candis Griggs Hakim**, private practice objects conservator, recently moved one hour north from San Francisco to Sebastopol, in Sonoma County. Before the winter rains came, she was racing to treat several outdoor sculptures including Deborah Butterfield horses and an Ola-

fur Eliasson, and is now snugly in studio working on a Native American basket, Vietnamese wood carvings, a ceramic sculpture by an Oakland artist, and a World War II Japanese sword. She loves the slower pace of life in wine country and invites all her Bay Area colleagues to come up for a visit.

**Katharine Untch** has been promoted to Director of Conservation at ARG Conservation Services, a conservation contracting firm based in San Francisco providing conservation of buildings, sites, and monuments. The firm frequently teams with objects, paintings, paper, and architectural conservators for special field projects. Katharine was the lead instructor in developing a new workshop for the American Institute for Conservation (AIC) on Outdoor Sculpture Conservation, funded in part by the National Endowment for Humanities. The first workshop venue took place in San Francisco in partnership with the Arts Commission. The next workshop will be in the DC area in the fall of 2011.

**Will Shank** spoke in an education session during the annual meeting of the National Trust for Historic Preservation in Austin, Texas, in October about "American communities and their murals." He has also written a paper for the NTHP *Journal* called, "Recognizing and Protecting America's Public Murals." With faculty members **Laura Fuster López** and **Mercedes Sánchez Pons**, of the training program of the Universidad Politécnica de Valencia (Spain), Will is organizing a symposium about contemporary murals and their conservation, scheduled for spring 2011.

**Mark Harpainter** recently finished a three year project for Iolani Palace in Honolulu, completing work on five objects in October, including the Kamehameha throne and a koa wood stand supporting two elephant tusks originally given to King Kalakaua on the occasion of his 50th birthday jubilee. The collections and curatorial department at Iolani Palace was one of two recipients of a National Collections Award for 2010 for their exemplary work reconstructing the interiors of the palace. Another interesting project during the past year was the reconstruction of four badly broken legs from a mid-eighteenth century Venetian

commode, using unidirectional carbon fiber reinforcement. Mark would be interested to hear from other object/furniture conservators who have employed this material in their conservation work.

**Martha Little** has been working two days a week as library conservator for the Environmental Design Library rare books conservation project at UC Berkeley. The project, funded by a gift earmarked to address the most urgent conservation needs of the collection, will last from October 2010 to July 2011.

The conservation department of the Asian Art Museum is very busy with upcoming exhibitions and projects. **Katie Holbrow**, department head, is working to bring the lab into the twenty-first century with digital record-keeping and a stronger web presence. She is also working closely with **Shiho Sasaki**, conservator of paintings and paper, to secure grant funding for the survey and treatment of the Korean and Japanese paintings collections.

Third-year graduate intern **Elizabeth Seatta** (Buffalo) has been working with XRF to examine bronzes. In conjunction with that project she invited conservation scientist **Aaron Shugar** to visit for an intensive two-day study of XRF equipment, qualitative analysis of spectra, and strategies for quantifying the results.

Pre-program technician **Kimi Tiara** has been working with Shiho and **Denise Migdail**, conservator of textiles, to redesign and upgrade magnetic mounting systems for light-sensitive paintings and textiles. Outside of her responsibilities with the Asian Art Museum, Denise has completed her work with the Oakland Museum of California providing information and conducting presentations regarding their textile rehousing grant.

*Regional Reporter:*  
Beth Szuhay

### TEXAS

**Sylvie Pénichon**, conservator of photographs at the Amon Carter Museum

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## Regional News, continued

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of American Art, attended the Interim Meeting of the Photographic Material Working Group of ICOM-Conservation Committee (Athens, October 19-20, 2010) where she co-presented a paper titled "Preliminary Investigation on the Preservation of Backlit Works of Art" with **Kate Jennings**, conservator of time-based media at Tate London. While in Athens, she taught a one-day workshop on contemporary photographic practices that was attended by 64 conservators from 20 different countries (Benaki Museum, Athens, October 21, 2010).

Since November 2010, **Diana Díaz**, adjunct faculty of the International Post-graduate Course in Photograph Conservation at the National School for Conservation (ENCryM), National Institute of History and Anthropology (INAH), in Mexico City, has been working with Sylvie at ACMAA. During her three-month residence, Diana will assist with exhibition preparation and work on a number of different projects.

In early October, **Mark van Gelder** and **William Hayden** re-gilt the star being held aloft by the Goddess of Liberty statue atop the Texas State Capitol dome. (on scaffolding over 300 feet above ground level). **Brian Howard** also consulted with the State Preservation board on aspects of the project, which involved working with other contractors who were repainting the replica statue and many of the other metal roof surfaces.

Judd Foundation conservator **Shelley M. Smith** returned to Marfa, TX at the end of June after having worked on the de-installation of Donald Judd's building at 101 Spring Street that served as his New York residence and studio. The 5-story cast-iron building designed by Nicholas Whyte in 1870 is currently undergoing major restoration scheduled for completion in 2013. During this 4-month project, immovable works were protected on-site and 5000 objects, furniture, and artworks were documented and some treated onsite before being packed and moved to temporary storage or to local area conservation studios.

Assisting in this project was conservation intern **Kendra Dacey**, who primarily worked to stabilize Judd's significant collection of African masks and **Vickie**

**Arndt** who worked as preparator and registrar. Contract conservators who worked onsite with Shelly include sculpture conservator **Eleonora Nagy**, paintings conservator **Suzanne Siano**, Frank Stella specialist **Luca Bonetti**, and **Marlene Eidelheit** of Saint John the Divine Textile Conservation Center.

In July, Nora Nagy travelled to Marfa, TX to lead a groundbreaking treatment of a work in the collection of the Judd Foundation. Nora was assisted by Shelly and by **Bettina Landgrebe**, conservator at the Chinati Foundation. This collaborative project was the result of over three years of research and planning as part of the Judd Foundation's effort to set the standard for the conservation of works by Donald Judd, by retaining all original materials. It will culminate in published articles geared at conservation professionals and collectors alike to raise awareness by improving the methodology that is being practiced in the restoration of Judd's work, and to change the current ideology that drives these methods.

Bettina Landgrebe recently accepted a post on the Judd Foundation's Advisory Committee for Conservation and Restoration (ACCR), which was established in 2005 under the purview of **Marianne Stockebrand** to promote best practice in the handling, installation, maintenance, and care of works of art by Donald Judd. The ACCR consists of sculpture conservators **Derek Pullen** and Nora Nagy as well as **Dudley DelBalso** who worked as Donald Judd's first assistant; she presently serves on the Judd Foundation's Board of Directors. Since the committee's inception it has successfully furthered the presence of art conservation within the foundation by appointing a permanent full time conservator and has recently published a paper on the care and maintenance of Judd works in metal. This will be followed by a paper on the care and maintenance of Judd works in wood.

In early November 2010, **Stephanie Watkins**, head of paper conservation at the Harry Ransom Center at the University of Texas at Austin, attended the CCAHA symposium on East Asian Art held in Philadelphia, PA, along with other WAAC members. In December 2010,

**Desirae "Desi" Peters** graduated from the U. of Texas at Austin with a double-major in art history and Spanish/hispanic studies with a minor in chemistry. During her last semester volunteering in paper conservation at HRC, Stephanie and she treated 18th-c. parchment contracts and announcements. Currently, she is pursuing additional conservation training opportunities and applying to conservation graduate programs in the USA.

Austin paper conservator, **Lauren Morales**, continues to volunteer in paper conservation in HRC under Stephanie's supervision, working primarily on early English and French circus advertisements.

The last of the University of Texas at Austin Kilgarlin School graduate conservation students volunteering in paper conservation included **Alex Bero** who worked on circus posters, and **Jennifer Evers** who worked on manuscript tape removal. Alex currently interns in the conservation department at the American Museum of Natural History in New York City and Jennifer currently interns in the conservation department of the University of Illinois.

*Regional Reporter:*  
Ken Grant

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*Horoscopes from the Los Angeles Times. These were written for Sagittarians before the thirteenth zodiac sign, Ophiuchus, was announced. So, now they apply to ???*

*If you had the money, you would be miles away from your job site. The secret is that your heart is restored and your brain re-created by what you call "work."*

*Worthy goals come with a certain amount of risk. When you set your aims high enough, they'll actually create a vacuum that sucks you forward.*

*There's something inconvenient on your list of things to do. Take solace from the fact that your ancestors had to kill their own food.*

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*The stars reveal you to be a touch obsessive. When you feel this strongly about something, you can't turn your back on it. Hang in there, and eventually it will come to you.*

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*When one way doesn't feel right, choose another. It's that simple. There doesn't have to be any drama, pain, or struggle.*

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*You will be drawn to artistic (possibly moody) people, as your creativity is developing in new ways. Keep in mind: It is possible for a person to think deeply without thinking clearly.*

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## Jobs

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### Associate Conservator

LOS ANGELES COUNTY MUSEUM OF ART

The Conservation Center of the Los Angeles County Museum of Art is seeking a temporary, full-time, associate conservator who will be responsible for the day-to-day care and maintenance of the Watts Towers of Simon Rodia (Watts Towers State Historic Park, Los Angeles, CA).

The Watts Towers is a collection of 17 interconnected structures, two of which reach heights of over 99 feet. The Towers were built by Italian immigrant construction worker Sabato ("Sam" or "Simon") Rodia in his spare time over a period of 33 years, from 1921 to 1954. The armatures of the structures are constructed from steel pipes and rods, wrapped with wire mesh, coated with mortar that is embedded with pieces of glass, tile, porcelain, and sea shells. Working alone, Rodia built the structures entirely by hand using no special equipment or predetermined design.

The incumbent will be responsible for the implementation of minor repairs and restorations under the direction of the Conservation Center as well as the training and supervision of volunteers and hourly workers. The conservator will also review current repair and maintenance procedures and assist in the development of new and/or improved approaches to the preservation of the Towers. The incumbent will report to the Senior Conservation Scientist at the Conservation Center at the Los Angeles County Museum of Art.

Minimum requirements: Master's degree in art conservation or architectural conservation as well as three to five years related experience and/or training. The successful candidate must be conversant with standard software for writing reports and processing images. Clear oral communication skills and a desire to work cooperatively with curatorial, conservation and scientific staff are essential. Experience with the conservation of concrete sculptures and/or structures is desirable.

Applications: This position will be

available beginning April 1, 2011. Title and salary will be commensurate with experience. A competitive benefits package is provided. Position is open until filled.

To apply: Submit letter of intent, resume and the names and contact information for three professional references to (with copies to Dr. Mark Gilberg, Director, Conservation Center, LACMA; mgilberg@lacma.org):

Gerrie Maloof  
Director of Human Resources  
The Los Angeles County Museum of Art  
Human Resources Department  
5905 Wilshire Boulevard  
Los Angeles, CA 90036

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### Of interest

#### Seattle Heritage Emergency Response Network (SHERN)

Cultural institutions face the challenge of preparing for and responding to emergencies that affect their collections. To help address this challenge, several Seattle heritage organizations have formed a new collaborative disaster network called the Seattle Heritage Emergency Response Network (SHERN). All SHERN members have institutional disaster plans for their collections, but have agreed to help each other to "respond to emergencies and disasters affecting cultural resources and collections by providing advice, support and/or actual recovery assistance."

SHERN is broadly based with archives, libraries, museums, and records management programs as charter members.

SHERN, in addition to responding to collections emergencies, will help members acquire the expertise needed to cope with emergencies and disasters, and facilitate partnerships between members and local first responders and emergency managers before disasters in order to enhance cooperation and understanding.

For more information, please contact: Gary Menges, (206) 685-8727, menges@u.washington.edu

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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: \$8.85**

(\$6.60 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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**Prices include shipping and handling. Make checks payable to WAAC drawn in US dollars on a US bank.**

**For information please contact the WAAC Secretary:**

Brynn Bender

**Send prepaid orders to:**

Donna Williams

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# The iPad: Condition Reporting for the XXI Century *or* The use of the iPad as an image-based tool for condition reporting and location marking for scientific analysis

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by Yosi Posilev

## Introduction

For some years now the Conservation Center at LACMA has considered the idea of using available computers and technology to implement image-based condition reporting and examination mapping for the array of objects that are studied, treated, and couriered by the conservators at the Center. It seems that the gesture-based multi-touch technology, of which the iPad is at the forefront (at the time I write this article) may finally be the answer to a simple, portable, and efficient image-based workflow that would revolutionize this aspect of the conservation field.

## Historical background

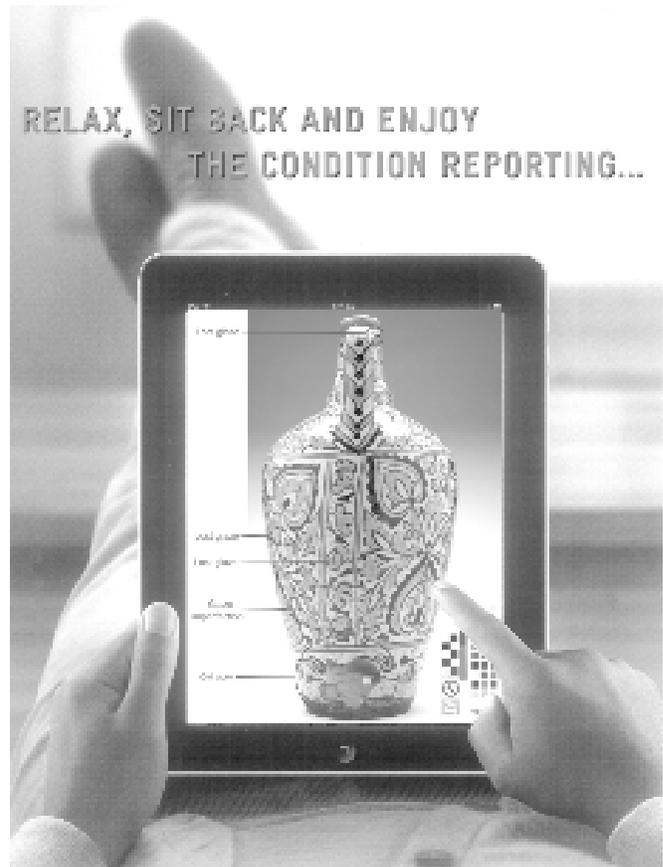
In a very basic way, image based condition reporting has been part of the LACMA Conservation Center since its inception over forty years ago. Black and white prints and negatives, together with 35mm slides and 4x5 color transparencies, have been part of an artwork's file, which contained the treatment and travel history of that specific object.

Traditionally the photo documentation included in the object's file was considered to be unique and of added-value due to the process and resources involved in the elaboration of the images. The photo documentation reflecting the state of being of an artwork at a specific time, has always being complemented with a descriptive narrative in which aspects of the artwork seen or not in the image, were described as precisely as possible using a controlled vocabulary to aid in the continuity of the documentation for the future.

Since the use of words to describe elements observed in an image became redundant and augmented by the desire to save time, conservators have used shortcuts to aid in this process. By laying transparent material over a print, the conservator could mark the elements of interest right on top of the photograph without permanently marking it; in some cases this same approach was done on 4x5 transparencies. But the use of the transparent material was the exception rather than the rule, since the bulk of the photo documentation for most works of art was done using 35mm slide film impeding the use of the above mentioned shortcut. This resulted in the continued use of verbiage for a large percentage of the reports generated.

The implementation of digital capture by the Conservation Photo Studio, together with the in-house production of photographic-quality color prints, triggered a culture change at the Conservation Center; the use of images became less restricted as they were considered to be more commonplace. Previous techniques described, like laying a transparent material for marking the image, as well as the use of photocopies were still in use, but now images were used in ways not imagine before with the aid of computers.

Along with the culture change, the widespread use of photo editing software augmented the conservator's experience in working with a digital image and its manipulation, allowing for a fully digital workflow when it came down to documenting elements in an object after the inspection was conducted. The next step in this workflow shift was to make the whole system portable so that the documentation could be done right in



front of the work of art being examined. By doing so we would eliminate the intermediary step of translating the markings done physically on a print and/or the written description done on paper to the stationary computing system in our office.

In order to bridge this gap the Conservation Center obtained laptop computers (although originally PC tablets were requested) in which DragonSpeak software for voice dictation was installed, as well as photo editing software to work with the images. The implementation of this portable solution fell short of being a practical option. The dictation software was unreliable and the image manipulation was cumbersome and could not be done as a freestanding operation. Nevertheless the use of this less-than-perfect portable solution has continued on a regular basis working around the shortcomings.

## Mobile multi-touch technology

The time is right to experiment with newer technology and deliver the promise of a truly portable solution that would allow for freestanding image marking and note taking while doing condition reporting in front of an object. Apple Computer's iPad in principle would allow for a very organic use of the device while doing the condition reporting of an artwork. By using one's finger, or a stylus, a conservator could mark the elements of interest on a digital image right on the screen, and add notes to that same image if further description would be required.

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## The iPad: Condition Reporting for the XXI Century, continued

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In principle the use of the iPad would allow for a direct transfer of well established methodology in the physical world (analog) into a purely virtual (digital) environment, with a lot less adjustment required than if a non multi-touch device was being used. All this information could then be transferred on the fly via email or sync to a stationary computing system with very little secondary manipulation required.

### Questions and preparation

As we embark on this project some questions become evident; some pertaining to the new technology and its capabilities, others regarding the implementation and use of new software and the workflow that that implies. Questions also arise on how our current infrastructure and file managing would allow for an easy integration of this new device. Considerations were made with regard to the global approach of this project and its comparison with other available, and some would argue, more mainstream technologies like Windows-based netbooks.

Several preparatory steps were taken before the iPad was deemed ready for testing and everyday lab use. Initially together with the acquisition of the iPad (\$500), we purchased the camera connection kit (\$29), protective case (\$29), and the Mac OS desktop (\$79) and iPad (\$30) versions of the iWorks software packages (Apple's Office suite.) Additionally research was done to select the best Apps (software applications) available at the iTunes store for Photo-editing and drafting/drawing. This search yielded the selection of two Apps: 1) Artstudio for iPad (\$5) and 2) Photogene for iPad (\$5).

After the selection and installation of the software, the testing period started. We selected the scientific department to test the iPad first by using it to mark images of objects being examined by digital microscopy and XRF. The type of mapping being done by the scientist represented one of the most simple and controlled examples of image based recording that could be done, allowing us to identify shortcomings and perform a direct comparison to the analog paper based method.

With a better sense of the capabilities of the iPad and its software, conservators proceeded to condition report artwork in the objects and paper labs, with very satisfactory results.

**Note:** A word on the fast-moving development of this platform and its software. Although shortcomings were identified in both Apps initially chosen to work with, continued free updates of the software that included functionality and stability enhancements superseded the initial shortcoming. The improvements in Artstudio were such that it became the only App necessary to perform all the image-based condition reporting needed. Enhancements to the operating system were also promised so that multitasking capabilities on the iPad would be possible.

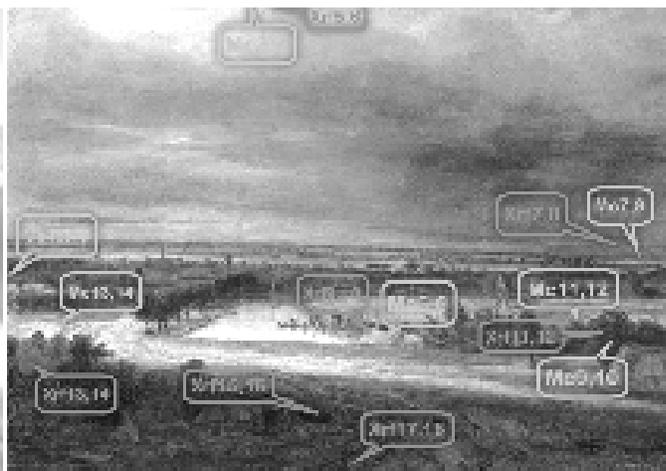
### Implementation and workflow

Initially the iPad requires a base-computer, either Mac or PC, with iTunes to register and initialize the device. Loading Apps and the managing of files/images is done most efficiently through the computer. Although, once the iPad has been setup, the connection to the computer is not necessary to update existing Apps or acquire new ones. Most importantly the transfer of images and files, to and from the device, can be done through e-mail or wireless internet servers with the aid of dedicated Apps for this purpose like, GoodReader, DropBox, Evernote, and Zumocast just to mention a few.

The "Artstudio" App has the ability to work on images by freehand marking on the images using a layering system very similar to the one found in Photoshop. The images can be saved as layers in the iPad and can be exported layered or flattened via email or through file sharing in iTunes. The "Photogene" App can save typed labels (bubbles) on an image, but only five labels in one session, it's strength though is the image editing capabilities similar to the ones found in Photoshop.

In terms of the workflow, it was necessary to assign an e-mail account to the iPad, so [consipad@lacma.org](mailto:consipad@lacma.org) was created as if it was a member of the conservation staff. In this way conservators were able to send images from their personal account to the iPad; doing this allowed for any one in the Conservation Center to use the device without having to setup their personal account every time the iPad changed hands.

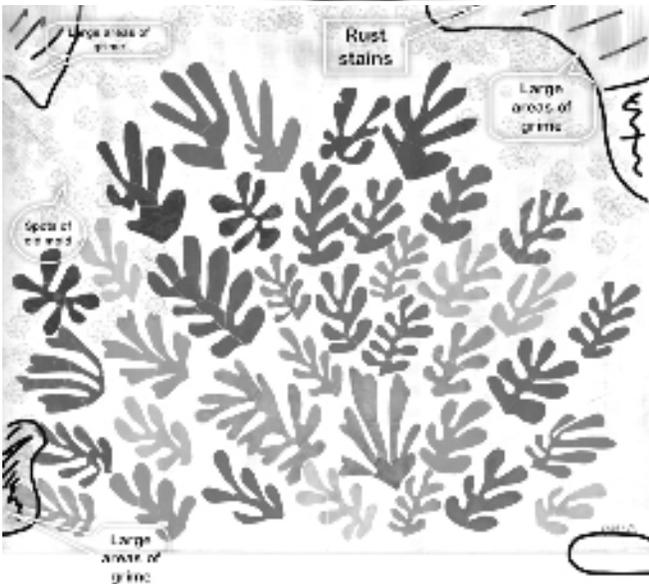
Once the image was saved in the iPad then the conservator would be able to open it in Artstudio at its maximum working resolution of 1024x1024 pixels, create a new transparent layer on top of that image, and proceed to mark it up freehand and/or with type as needed.



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## The iPad: Condition Reporting for the XXI Century, continued

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The idea behind using the layering system is that as many layers can be used as needed. For example, the first layer could be used to mark the initial condition of an object at LACMA, and subsequent layers could be used to mark changes at each different venue (i.e. layer 2: New York, layer 3: Paris, etc.)

### Feedback and comments

As I was writing this article, the iPad population at LACMA has grown. We have now four devices deployed throughout the Conservation Center, and they are being used daily.

This fact clearly speaks to the acceptance of the device and reinforces some of the comments that have been made to me during this inception period. In general all agree that the iPad is easy to use, that the applications used are intuitive and simple to understand, and that the satisfaction level with the end-product is high having experienced a small learning-curve with little frustration.

By no means is the iPad perfect, shortcomings exist such as the closed system that Apple imposes on its devices. Although such limitations do not weight in significantly to deter the use of the iPad, they should be acknowledged.

The maximum pixel resolution of 1024 x 768 at 132 ppi may seem on the low side, although it is higher than any of the VGA monitors that we had in the past. More of an issue would be the image degradation that the uncontrolled JPEG compression causes on the image. The lack of a camera has also been mentioned as a downside, although I personally disagree since any camera that could be included in the iPad (and probably will be in the future) would be of very low resolution. I believe that having the optional camera connection kit with a high end point and shoot camera is a much better solution for the type of work that we do in conservation.

A bigger issue is the inability of the iPad to transfer freely information to and from a USB thumb-drive, or have an expansion slot for a SD card. But other than these physical/hardware limitations the iPad is a powerful and simple tool that continues to amaze us. As I write this article, I just installed iOS ver. 4.2 of the iPad operating system which, among other improvements, includes the long anticipated multitasking feature that allows for multiple programs and operations to run concurrently making it easy to jump from one App to another.

### Conclusion

There is still more work to be done regarding the managing and flow of the new digital condition reports. Our intention is for these new files to reside in the general repository of images within the existing structure of the archive. Also a better relationship between the iPad and the desktop computers has to be created so that the use of the device is as independent of one person/account as possible. This would be a bigger challenge since restrictions imposed by the IS administrator makes it complicated to work independently in the Windows environment.

Additionally we are trying to forge some type of integration between the iPad's output and our massive and museum-wide collections management software. As this new technology changes and adapts, so will we. We have successfully transitioned into digital photography; having had that experience we will undoubtedly continue to advance, as well as revolutionize, the process of documentation and condition reporting.

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## Detecting and Identifying Salts during the Desalination Process with Spot Test Papers

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Desalination is a relatively common conservation treatment used to remove soluble salts and prevent ongoing damage on objects including ceramics, metals, stone, and textiles. As part of the desalination treatment process for an extensive collection of Native American ceramic vessels, Arizona State Museum conservators sought to find an inexpensive, efficient, and accurate method for soluble salts identification. This paper describes a study of EM Quant test strips which were found to meet these criteria, providing semi-quantitative determination of chloride, nitrate, and sulfate ions in desalination bath solutions in the mg/l range without additional preparation of the samples.

A number of methods have been used over the years for the determination of salt concentrations. Rathgen (1905) and Plenderleith (1971) describe some of the methods employed in the last century. Many protocols have been developed based on the direct relationship between the salinity of a solution and the conductivity of a solution (Lal Gauri 1986, Holbrow 1995, Costa Pessoa 1996, Ling 1996, Paterakis 1996, Beaubien 1999, Unruh 2001, Selwyn 2006, White 2010).

Conductivity bridges were used in conservation labs in the twentieth century and portable meters came into common use in the 1990s (Zimmt 1993). Readings through these instruments are extremely useful for the interpretation of soluble salt quantities based on the measure of current carried by salts in bath solutions but they can not be used to calculate exact amounts. Nor do they indicate the types of salts present.

Previously, the identification of specific salts has been possible through several methods. Chemical spot tests, particularly the silver nitrate test, have been used by conservators for many years to test for halides in solution but it requires the use of silver nitrate reagent and is fairly difficult to use for gathering quantitative data. Ion meters with combination electrodes for specific ions became available and remain useful for providing concentrations in parts per million (Semczak 1977). However, when testing desalination water, the meter must be calibrated and multiple electrodes must be used to identify multiple components.

Other analytical instruments used for identification of salts have included XRD, FTIR, Ion chromatography, and Microscopy. At the Arizona State Museum, the cost in equipment, time, and labor in doing FTIR, specific ion electrode meter readings, microscopy, and microchemistry in the ASM lab could not be justified for all of the hundreds of ceramic pots treated by desalination. XRD, Ion chromatography, and other instrumentation available at the UA are particularly expensive due to laboratory and technician charges.

Spot test papers for materials characterization have great utility in conservation labs, and sulfate and nitrate test papers have been discussed previously (Odegaard 2005). The EM Quant test strips which we investigated and used allow time-saving, semi-quantitative determination of important ions and compounds in the mg/l range without additional preparation of the samples, thus saving time and labor.

When very large numbers of pots are to be treated, this becomes a consideration.

The procedure for proper use of the strips is:

- the reaction zones are wetted with the solution being tested by simple dipping;

- the excess liquid is then shaken off;

- after the given reaction time has elapsed - a maximum of two minutes - the coloring of the reaction zone is compared with the color scale on the package to determine the concentration.

Evaluation of the EM Quant test strips involved several steps. Dr. Patricia Hill, a chemistry professor from Millersville University in Pennsylvania, was a visiting scholar at the Arizona State Museum in 2009 and agreed to make up six concentrations for each of the chloride (Cl), nitrate (NO<sub>2</sub>), and sulfate (SO<sub>4</sub>) salt solution concentrations for testing the EM Quant strips. The EM Test Strips provided consistent and accurate readings for the six test concentrations of each type of salt solution, and these solutions were retained for reference and training purposes.

It was also important to examine possible difficulties that might arise from differences in an operator/tester's interpretation of the results. Desalination water samples were retained from the ASM Pottery Project desalination treatments. Over 160 samples were evaluated using the EM Test Strips during two separate reading sessions. 150 were selected for further evaluation taking into account the microsiemens ( $\mu$ S) conductivity level, the pottery pre-treatment condition, and the presence of pre-treatment fills.

Samples with significant reading discrepancy were run again and judged by Odegaard and Zimmt. An Excel spreadsheet of the readings from the sessions indicates that there was a significant discrepancy between testers' interpretation of the test strip reaction. The operator of session 2 had much less experience than the one from session 1. This testing demonstrated that experience, patience, and diligence in protocol procedure are required in order to obtain reliable results.

Sulfate testing

- 30 discrepancies (@20%) including
- 3 errors in session 1
- 30 errors in session 2

Nitrate testing

- 30 discrepancies (@20%) including
- 10 errors in session 1
- 30 errors in session 2

Chloride testing

- 11 discrepancies (@ 8%) including
- 4 errors in session 1
- 7 errors in session 2

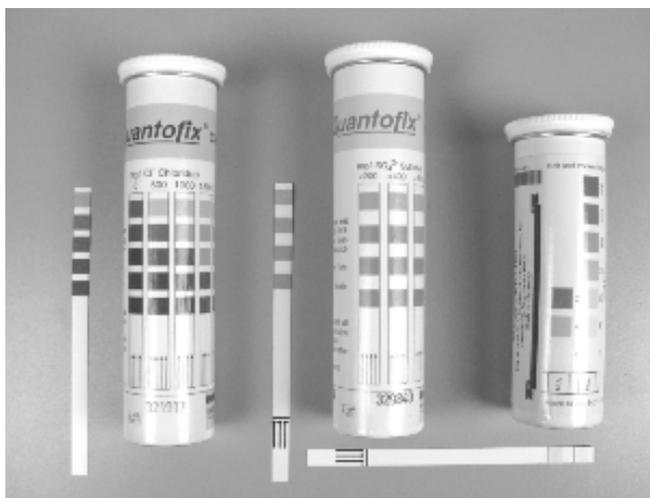
Numerous desalination water samples were prepared for Fourier Transform Infrared Spectroscopy (FTIR). Selections were based on particularly high levels of sulfate, nitrate, or chloride salts detected by the EM Test Strips or because the conductivity levels were high yet these salts did not reveal high levels on the test strips. Brunella Santarelli, a graduate student in the Heritage Conservation Science program in the Department of Materials Science at the University of Arizona and research assistant at the Arizona State Museum, performed the analyses.

Small samples of water were taken from their vials, dried on glass slides, and a scalpel was used to transfer the dry crystals to the ATR platform. The FTIR was run then compared to several libraries for identification.

The EM Quant papers utilize different chemical reactions and are measured in different increments but they do follow the same procedures for use. The chemical reactions take place on paper squares affixed to a plastic strip and are indicated by color changes. We also found that the test strips for the different salts have different detection levels and categorized them at the following levels.

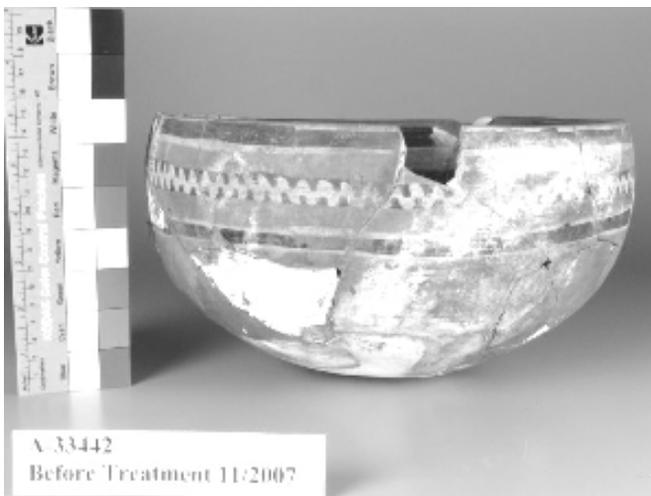
|        | Chloride   | Nitrate  | Sulfate    |
|--------|------------|----------|------------|
| Low    | <500 mg/l  | 25 mg/l  | <200 mg/l  |
| Medium | >1000 mg/l | 100 mg/l | >400 mg/l  |
| High   | >2000 mg/l | 250 mg/l | >1200 mg/l |

Chloride, Sulfate, Nitrate Quantofix test strips from EM Quant as they appear before use.



The Sulfate Test Papers have test zones on the strips that contain varying amounts of the red-colored thorin-barium complex. In the presence of the equivalent amount of sulfate ions the color changes to that of the yellow thorin (*o*-[3,6-disulfo-2-hydroxy-1-naphtyl-azo]-benzenearsonic acid). The color reaction is red - yellow, and the detection gradations are : <200 · >400 · >800 · >1200 · >1600 mg/l SO<sub>4</sub><sup>2-</sup>. High sulfate levels in several samples were also analyzed and confirmed with FTIR using a Thermo Nicolet Avatar 360 instrument and found to correlate to the extensive use of old plaster-of-Paris fills used in the pottery.

Salado bowl:      500 mg/l Cl  
                          250 mg/l NO<sub>2</sub>  
                          **1660 mg/l SO<sub>4</sub>**  
                          1000 μS conductivity  
                          2.6 days for desalination



## Detecting and Identifying Salts during the Desalination Process with Spot Test Papers, continued

The Nitrate Test Papers have test zones on the strips that form a red-violet color when nitrate is reduced and converted to nitrous acid which diazotizes an aromatic amine, this coupled with N-(1-naphthyl)-ethylenediamine to form a red-violet azo dye. The color reaction is white - red-violet, and the detection gradations are: 0 · 10 · 25 · 50 · 100 · 250 · 500 mg/l  $\text{NO}_3^-$ . High nitrate levels in several samples were also analyzed and confirmed with FTIR and found to correlate to possible contamination from agricultural fertilizers used on the soils where the pottery was excavated.

Salado bowl:     500 mg/l Cl  
                     **250 mg/l  $\text{NO}_2$**   
                     200 mg/l  $\text{SO}_4$   
                     640  $\mu\text{S}$  conductivity  
                     1.6 days for desalination



The Chloride Test Papers have test zones on the strips that contain varying amounts of silver ions. In the presence of the equivalent amount of chloride ions there is a decolorizing as silver chromate is converted to silver chloride. The concentration of chloride is measured semi-quantitatively by visual comparison with the color scale. The color reaction is brown - yellow, and the detection gradations are: 0 · 500 · 1000 · 1500 · 2000 ·  $\geq 3000$  mg/l  $\text{Cl}^-$ . High chloride levels in several samples were also analyzed with FTIR; however, the characteristic wavelength region for chloride is outside the instrument's range. We suspect that many of the pots with high chloride levels were treated with hydrochloric acid to remove calcium carbonate deposits obscuring the decorations. When used for this purpose, HCl converts the insoluble calcium carbonate to the soluble calcium chloride leaving soluble chloride salts.

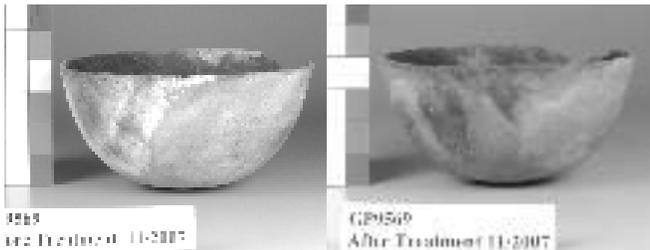
Anasazi jar:     **2000 mg/l Cl**  
                     0 mg/l  $\text{NO}_2$   
                     200 mg/l  $\text{SO}_4$   
                     1810  $\mu\text{S}$  conductivity  
                     3.0 days for desalination



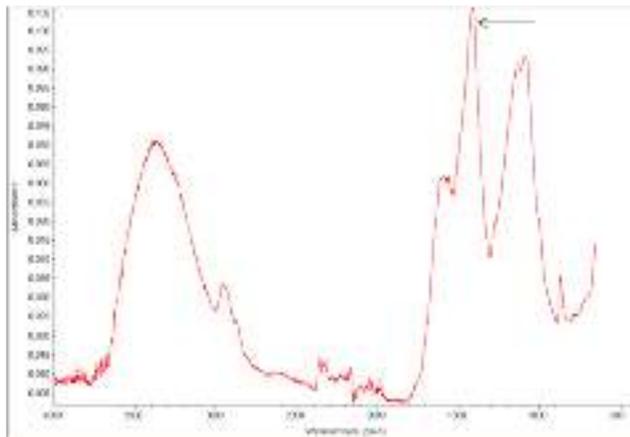
## Detecting and Identifying Salts during the Desalination Process with Spot Test Papers, continued

Pottery examples that had very visible soluble salt efflorescence in pre-treatment and high micro-siemmen conductivity reading during desalination but low sulfate, nitrate, and chloride test strip levels during desalination bath water testing were also analyzed with FTIR. Calcium carbonate was the most commonly identified semi-soluble salt identified. Polysilicates were also found. These soluble silicates, especially sodium, potassium and lithium silicates, are generally not distinct stoichiometric chemical substances (with a specific chemical formula and molecular weight), but rather aqueous solutions of glasses, resulting from combinations of alkali metal oxide and silica in varying proportions.

Hohokam bowl:  
500 mg/l Cl                    1210  $\mu$ S conductivity  
100 mg/l NO<sub>2</sub>                4.8 days desalination  
200 mg/l SO<sub>4</sub>



FTIR spectra indicated high peak for calcite (calcium carbonate)



In Conclusion, EM Test Strips offer inexpensive, time-saving, and semi-quantitative determination of chloride, nitrate, and sulfate ions held in desalination bath solutions without additional preparation of the samples.

They can suggest possible explanations for salt efflorescence on pottery such as: (a) the use of hydrochloric acid for the removal of insoluble salts (calcite) without dilution or rinsing, (b) a burial deposition associated with fertilized fields, (c) the generous use of plaster of Paris in restoration fills, and (d) the probable presence of other salts including carbonates, phosphates, and silicates.

They can also be cut into smaller strips, can be carried/used anywhere, and do not require special disposal restrictions. Different test strips can also be efficiently used together. These test strips are a useful analytical tool for conservation labs of any size or budget.

### Acknowledgements

The ASM pottery project is grateful for the support of Save America's Treasures, NSF, NEH, NCPTT, NAGPRA, IMLS; Kress, Stockman, Lowell, Seger Foundations; AK-Chin, Gila River, Salt River Communities; and especially Christina Bisulca, Alandra Klinger, Gina Watkinson, Marilen Pool, Emilie Heddebaux, and Chris White for their help with this study.

### Supplies and Equipment

Merck Chemical Company. [merck-chemicals.com/industrial-laboratory-chemicals](http://merck-chemicals.com/industrial-laboratory-chemicals)

MACHERY-NAGEL Inc. 2850 Emrick Blvd. Bethlehem, PA 18020, USA. 1-888-321-6224. [sales-us@mn-net.com](mailto:sales-us@mn-net.com).

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# Aging Properties of Select UV-Blocking Window Films

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## Introduction

The need to remove damaging ultraviolet radiation from the natural daylight currently popular in exhibition spaces requires placement of UV-blocking films on windows and glass doors and ceilings in galleries. The film properties desired for museum use are different from those by which manufacturers rate their products (1-4). In a previous study (5), we characterized the UV absorption, visible transmission, and colorimetric properties of a large number of transparent UV-blocking window films, applying criteria suitable for museum consideration.

Manufacturers guarantee their commercial film products will last without significant change for several, typically ten, years. Their criteria - again - can be different from those important to museums. An essential part of our investigation has thus been to characterize optical changes which may occur upon aging of the potentially useful UV-blocking films.

Samples of all the films that were observed to have acceptable optical properties in the earlier experiments (5) have now been artificially photoaged. Absorption of UV radiation and transmission of visible light by the samples were monitored during the aging process. This paper reports the changes observed in the films as the samples underwent aging. Again the suitability of the films for use on windows in exhibition spaces has been evaluated with criteria we have identified as appropriate for consideration by museums and galleries. It must be emphasized that this investigation has characterized only the changes in optical properties of the films. Other properties, such as physical deterioration of the films and adhesives, delamination, and ease of removal (3,7), have not been directly addressed by these experiments. Consideration of any or all of these additional properties may be as least as important in the overall process of choosing appropriate films.

## Film Selection

Samples of all films that met the criteria for UV-blocking used in the previous study, absorption of  $\geq 95\%$  UV radiation between 300 and 400 nm (5), were included in the artificial aging phase of the investigation. This group included films which did not meet the requirements for color neutrality employed in the earlier experiments. Subtle color effects may be desirable in some display applications, and aesthetic choices will vary among curators and exhibition designers.

## Experimental Procedure

### Film Preparation

Each film sample was individually mounted on 1 cm x 4 cm pieces of window glass as previously described (5). Triplicate samples of the films were used in the investigation. UV-visible transmission spectra of these mounted samples were obtained with an Ocean Optics DT 1000 CE UV/Vis light source and an Ocean Optics ADC1000-USB

detector calibrated in the 200-850 nm range according to the same procedure used in the previous study. The results presented below are all averages of the data for the three samples of each film.

### Film Aging and Characterization

Artificial photoaging was conducted with an Atlas Ci4000 Weather-O-Meter fitted with a xenon lamp, a CIRA inner filter, and a soda-lime glass outer filter to simulate natural daylight. Each film sample was attached at one end only to the sample holders with a binder clip, with the film side facing away from the light source (Figure 1). The sample holders were placed on the middle level of the rotating rack so they were vertical (Figure 2). The power setting was 0.5 watts/m<sup>2</sup> at 340 nm. At this setting the total near UV plus visible power delivered to the samples was approximately 495 W/m<sup>2</sup>, calculated from data provided in the instrument handbook. The relative humidity in the exposure chamber was 50 $\pm$ 10% throughout the experiment.

Figure 1: Films on the sample holder

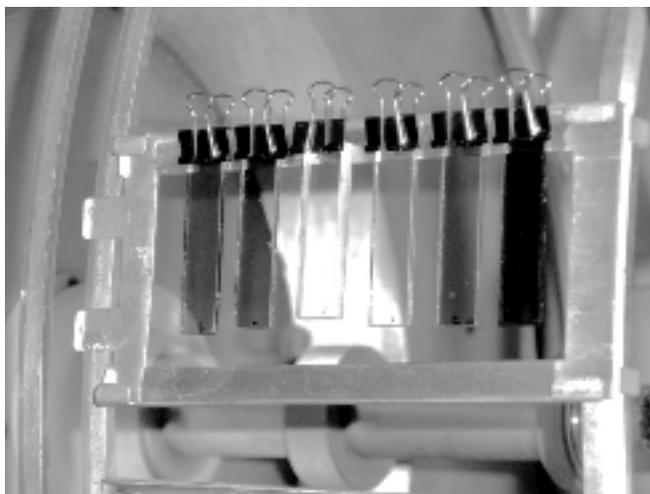
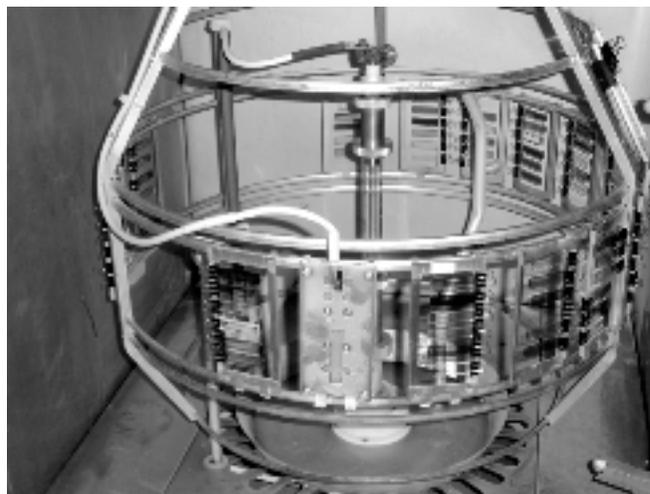


Figure 2: Films in the Weather-O-Meter. A black and white photograph showing the interior of the Weather-O-Meter, a rotating rack with multiple levels. The film samples are mounted on the middle level, held vertically by sample holders.



The films were exposed for 6 to 15 day periods over the course of several months, for a total exposure energy (equal to power x time) of about 5840 MJ/m<sup>2</sup>. This is equivalent to roughly 6.7 years of exposure at a north-facing window in Los Angeles, California. See endnote (6) for additional information on exposure equivalents.

The transmission spectra of all samples were recorded as described above after each of the fifteen exposure periods. In between exposures, the samples were kept in the dark at room temperature and stable humidity in the Conservation Center. Between the sixth and seventh measurements, a machine malfunction resulted in water spraying on some of the films and leaving mineral deposits; however, this did not appear to have a significant effect on the results.

### Results and Discussion

Figure 3 shows several aged samples with varying extents of change in transmission of visible light. The labeled end of the film, which was protected by the opaque sample holder and binder clip, indicates the original appearance.

The visible transmission of the films on the left decreased, i.e., the aged film transmits less light, the one in the center shows no change, and those on the right increased, i.e., the aged film transmits more light. Some delamination can be seen in a few samples.

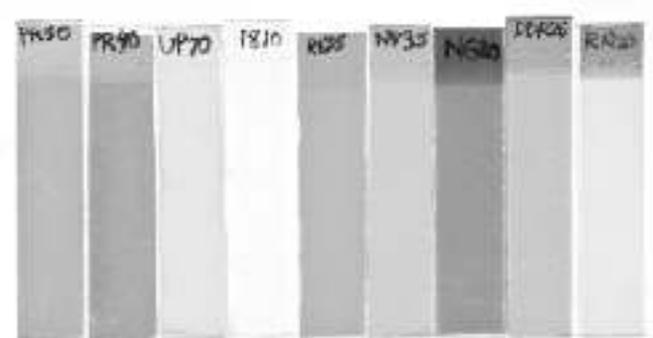


Figure 3: Several films after aging. L to R: Change in visible transmission approx. -25%, -20%, -10%, -5%, 0%, 5%, 10%, 15%, 40%

Spectral transmission data were evaluated in several ways. As an example, the results for a film that underwent significant change in its optical properties, 3M Night Vision 35, are shown. The transmission spectra of the film after each exposure period are plotted in Figure 4. The data for wavelengths between 655-657 nm were corrupted by a detector artifact and have been omitted from all spectra.

The film transmits about 5% more light after 5840 MJ/m<sup>2</sup> of exposure. More importantly, it loses a large fraction of its UV absorption in the 340-400 nm range. This behavior suggests the film may have at least two UV blockers: a UVA blocker that is degraded by light exposure and a UVB blocker that is not significantly changed after this cumulative light exposure.

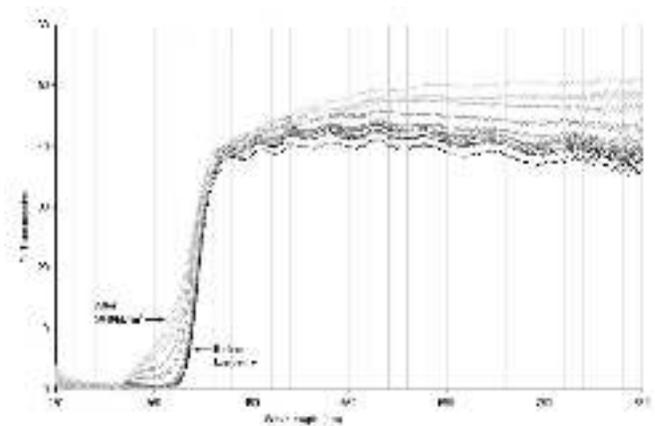


Figure 4: Spectra of Night Vision 35 over time (lighter shades are later weeks)

Figure 5 shows the changes in UV absorption and visible transmission of Night Vision 35 as a function of light energy exposure. Little change occurs during the first 2500 MJ/m<sup>2</sup>, after which the film begins transmitting both more UV and more visible radiation. UV absorption decreases and visible transmission rises.

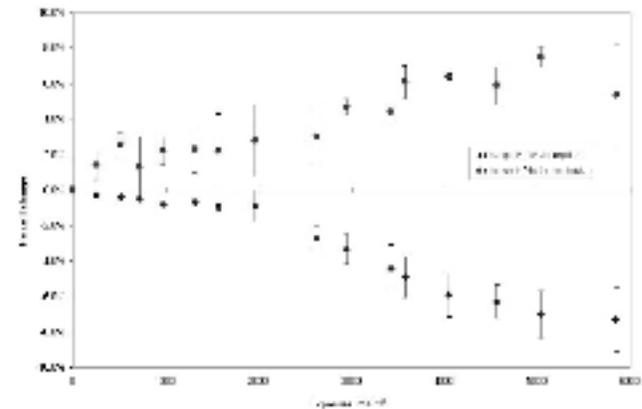


Figure 5: Change in visible transmission and UV absorption of Night Vision 35

At the end of the experiment, the aged film transmits about 5% more visible light and 7% more UV radiation. The former is noticeable with the naked eye, but may be acceptable, depending on the sensitivity of the objects on display and the aesthetic requirements of the museum staff. However, the increase in transmission of UV fails to meet our criterion of 95% absorption up to 400 nm (See below).

Table 1 summarizes the photoaging results for all films. The second column lists the final UV absorption at the end of the study, equivalent to about 6.7 years of north-facing exposure (6), with the initial value shown for comparison.

## Agging Properties of Select UV-Blocking Window Films, continued

The third column shows how many equivalent years of north exposure it took for the film to fall below 95% UV absorption, the criterion used in the previous study for determining acceptable film performance (5). A value in parentheses is an extrapolation based on the aging rate at the latest stage of the aging process; this number should be regarded as a very rough estimate. An empty cell indicates that UV absorption is not predicted to fall below 95% on the basis of the behavior observed in this experiment.

The fourth column lists the equivalent years of exposure it took for the film to show a significant colorimetric change (defined as a  $\Delta E$  of 5 or greater); an empty cell indicates that this extent of change was not observed during the investigation.

The fifth column shows the initial visible transmission, final transmission, and change in visible transmission of each film.

### Conclusions

Table 2 summarizes our evaluation of the effects of photochemical aging on the optical properties of the films. The acceptability of film durability during this exposure was assessed using three criteria. The most important of these is the ability to maintain a high level of absorption of UV radiation between 300 and 400 nm. In the previous study, a minimum of 95% UV-absorption was set as the cutoff (5). In this study we have continued to apply this criterion. Absolute UV absorption is a better measure than change in UV absorption; for example, if a film with 96% absorption initially drops by 3%, it is no longer acceptable, but a film with 99% absorption can drop 3% and still meet this requirement. 3M Neutral 20 is a borderline case; although its UV absorption was above 95% at the end of the experimental exposure, UV absorption is predicted to fall below this cut-off within a few more year equivalents of aging (see Table 1, column 3). The second criterion, how closely the films maintained

Table 1: Overall Aging Results

| Film                         | Initial/Final<br>UV Absorption<br>(absolute %) | Years* to<br><95%<br>absorption | Years* to<br>$\Delta E = 5$ | Initial/Final/<br>Change in<br>Visible Transmission<br>(absolute %) |
|------------------------------|--|---------------------------------|-----------------------------|---|
| 3M Night Vision 15           | 98.6 / 97.1                                    | (19)                            |                             | 17.8 / 20.9 / 3.1   |
| 3M Night Vision 35           | 97.2 / 89.9                                    | 3.0                             | 4.5                         | 39.2 / 44.6 / 5.4   |
| 3M Prestige 40               | 98.5 / 99.3                                    |                                 | 3.0                         | 38.9 / 21.2 / -17.7   |
| 3M Prestige 50               | 98.3 / 99.4                                    |                                 | 4.0                         | 47.1 / 22.4 / -24.7   |
| 3M Prestige 70               | 97.3 / 98.0                                    |                                 | 3.0                         | 66.3 / 52.9 / -13.4   |
| 3M Ultra Prestige 70         | 98.4 / 98.8                                    |                                 | 1.5                         | 65.4 / 52.5 / -12.9   |
| 3M Neutral 20                | 98.8 / 95.5                                    | (8)                             |                             | 14.7 / 15.2 / 0.5   |
| 3M Neutral 35                | 97.2 / 91.2                                    | 4.0                             |                             | 35.4 / 35.9 / 0.5   |
| LlumarN1020                  | 97.8 / 98.2                                    |                                 |                             | 23.1 / 21.6 / -1.5  |
| LlumarNUV65                  | 98.0 / 98.1                                    |                                 |                             | 70.1 / 73.1 / 3.0   |
| LlumarUVCL SRPS              | 97.2 / 97.1                                    |                                 |                             | 85.9 / 82.3 / -3.6  |
| Vista Soft Horizons V33      | 98.2 / 98.7                                    |                                 |                             | 34.0 / 32.8 / -1.2  |
| GAM 1810                     | 95.5 / 93.6                                    | 2.0                             |                             | 82.8 / 78.3 / -4.5  |
| GWF Delta Dual Reflective 25 | 95.9 / 93.6                                    | 4.0                             | 1.0                         | 28.8 / 43.6 / 14.8  |
| GWF Residential Neutral 20   | 97.7 / 90.3                                    | 3.5                             | 0.5                         | 22.1 / 65.5 / 43.4  |
| Hanita Tek Cold Steel 70     | 97.2 / 96.6                                    | (28)                            |                             | 67.1 / 69.5 / 2.4   |
| Hanita TekOptitune 15        | 99.0 / 98.6                                    |                                 |                             | 12.4 / 15.7 / 3.3   |
| Hanita TekUV Filter Film     | 97.9 / 97.9                                    |                                 |                             | 81.3 / 79.7 / -1.6  |
| Madico Advanced Ceramic 3000 | 97.3 / 94.0                                    | 5.0                             |                             | 36.4 / 35.2 / -1.2  |
| Madico Advanced Ceramic 6000 | 95.0 / 95.7                                    |                                 |                             | 61.5 / 58.6 / -2.9  |
| Madico CLS-200-X             | 98.5 / 98.2                                    |                                 |                             | 79.1 / 71.8 / -7.3  |
| Madico NG -20                | 99.2 / 97.8                                    | (22)                            | 1.5                         | 10.8 / 21.3 / 10.5  |
| V-Kool VK 40                 | 98.2 / 98.1                                    |                                 |                             | 39.4 / 41.3 / 1.9   |
| V-Kool VK 70                 | 97.1 / 97.1                                    |                                 |                             | 62.2 / 62.3 / 0.1   |

\*Equivalent North light exposure in Los Angeles

## Aging Properties of Select UV-Blocking Window Films, continued

their initial visible light transmission properties, may be influenced more by individual exhibition needs and subjective judgments. Although a small change in visible transmission may be easily noticed, depending on the initial transparency of the film, it need not in all cases be as detrimental as a loss of UV absorption. Also, both increases and decreases in visible transmission were observed in the investigation. Under these circumstances, the relative change in visible transmission is a more useful criterion to

apply. For example, a highly transmitting film placed on a window where interior visible light levels need not be very low could drop from 90% to 85%T without causing problems, but for a dark film in a very light-sensitive setting, a change of a few percent might be a major failure. In consideration of the range of needs for visible %T of the films, the more generous criterion of a relative change of 10% or greater was designated to be unacceptable. Absolute and relative changes in visible transmission are both listed in

Table 2: Acceptability of UV-Blocking Window Films, Based on Aging Results

| Film                         | UV Absorption after 5840 MJ/m <sup>2</sup> (absolute %, with standard deviation) | Change in Visible Transmission (absolute %) | Change in Visible Transmission (relative %) | Change in color (ΔE) |
|------------------------------|--|---|---|----------------------|
| 3M Prestige 50               | 99.4% ± 0.08%  | -24.7%                                      | -52.4% x                                    | 25.1 x               |
| 3M Prestige 40               | 99.3% ± 0.16%  | -17.70%                                     | -45.4% x                                    | 21.8 x               |
| 3M Ultra Prestige 70         | 98.8% ± 0.28%  | -12.9%                                      | -19.8% x                                    | 10.3 x               |
| Vista Soft Horizons V33      | 98.7% ± 0.02%  | -1.2%                                       | -3.4%                                       | 2.4                  |
| HanitaTek Optitune 15        | 98.6% ± 0.12%  | 3.3%  | 26.5% x                                     | 4.8                  |
| Madico CLS-200-X             | 98.2% ± 0.17%  | -7.3%                                       | -9.2%                                       | 4.8                  |
| Llumar N1020                 | 98.2% ± 0.08%  | -1.5%                                       | -6.7%                                       | 2.0                  |
| Llumar NUV65                 | 98.1% ± 0.09%  | 3.0%  | 4.2%  | 3.1                  |
| V-Kool VK 40                 | 98.1% ± 0.04%  | 1.9%  | 4.9%  | 1.4                  |
| 3M Prestige 70               | 98.0% ± 0.24%  | -13.4%                                      | -20.3% x                                    | 11.3 x               |
| HanitaTek UV Filter Film     | 97.9% ± 0.13%  | -1.6%                                       | -2.0%                                       | 1.5                  |
| Madico NG-20                 | 97.8% ± 0.07%  | 10.5%                                       | 97.1% x                                     | 19.7 x               |
| Llumar UVCL SRPS             | 97.1% ± 0.41%  | -3.6%                                       | -4.2%                                       | 1.5                  |
| V-Kool VK 70                 | 97.1% ± 0.16%  | 0.1%  | 0.2%  | 0.7                  |
| 3M Night Vision 15           | 97.1% ± 0.14%  | 3.10%                                       | 17.7% x                                     | 4.2                  |
| HanitaTek Cold Steel 70      | 96.6% ± 0.16%  | 2.4%  | 3.6%  | 3.3                  |
| Madico Advanced Ceramic 6000 | 95.7% ± 0.19%  | -2.9%                                       | -4.7%                                       | 3.1                  |
| 3M Neutral 20                | 95.5% ± 0.31% *  | 0.5%  | 3.4%  | 1.4                  |
| Madico Advanced Ceramic 3000 | 94.0% ± 0.60% x  | -1.2%                                       | -3.2%                                       | 2.0                  |
| GWF Delta Dual Reflective 25 | 93.6% ± 0.13% x  | 14.8%                                       | 51.5% x                                     | 11.8 x               |
| GAM 1810                     | 93.6% ± 0.05% x  | -4.5%                                       | -5.4%                                       | 2.5                  |
| 3M Neutral 35                | 91.2% ± 0.08% x  | 0.5%  | 1.5%  | 1.2                  |
| GWF Residential Neutral 20   | 90.3% ± 0.34% x  | 43.4%                                       | 196.5% x                                    | 34.1 x               |
| 3M Night Vision 35           | 89.9% ± 1.78% x  | 5.40%                                       | 13.8% x                                     | 5.5 x                |

\* See text.

x Does not meet the criteria described in text.

## Aging Properties of Select UV-Blocking Window Films, continued

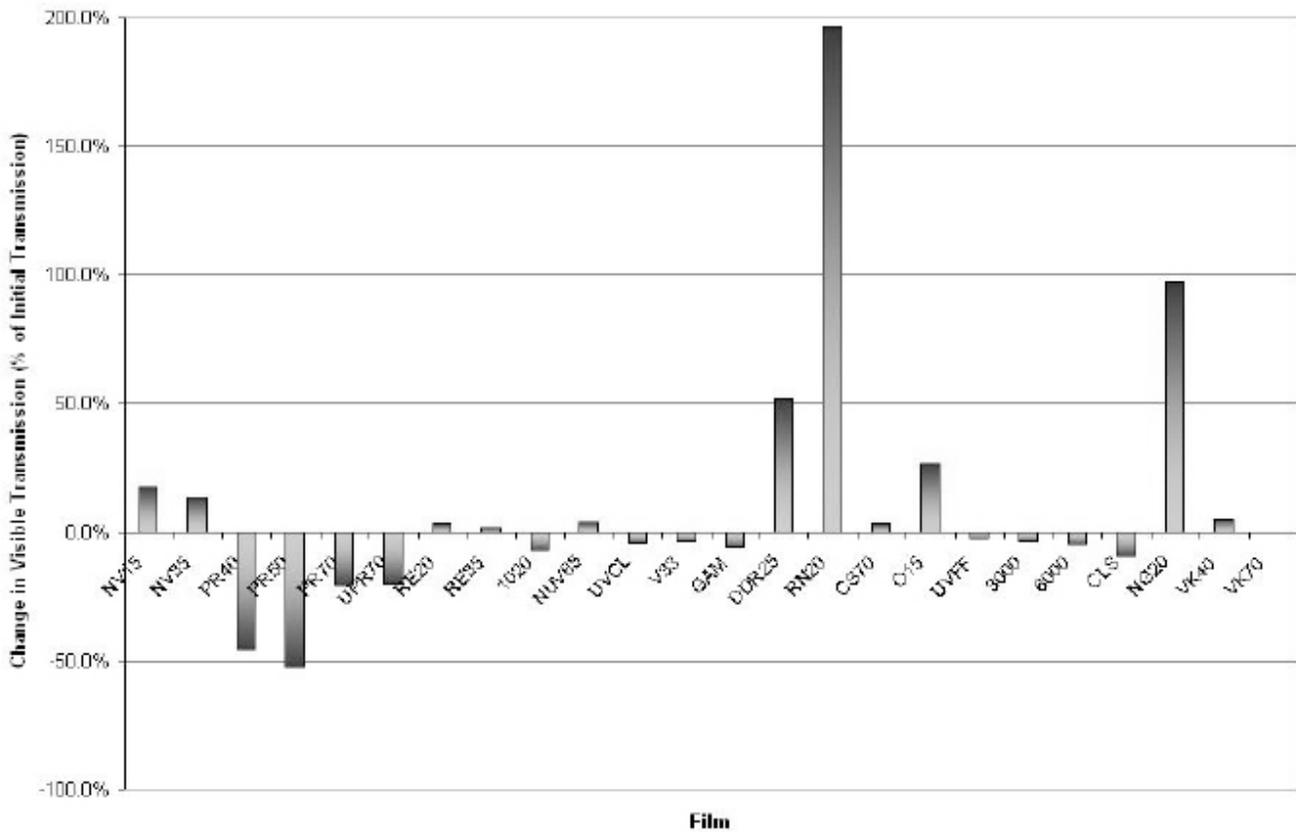


Figure 6: Relative change in visible light transmission of UV-blocking films

Table 2 for comparison. Relative percent change in visible transmission is also shown in Figure 6.

The third important criterion for optical performance is color. In the previous study we measured the CIE  $L^*a^*b^*$  values of all films. In this experiment we have characterized the appearance changes ( $\Delta E = \sqrt{[(\Delta L^*)^2 + (\Delta a^*)^2 + (\Delta b^*)^2]}$ ) of all films during the accelerated aging process. These changes are given in Table 1, column 5. A  $\Delta E$  of more than 5 may be unacceptable, but again this is a subjective judgment; different institutions/individuals may have different needs. Because the calculation weights changes in lightness or darkness ( $\Delta L^*$ ) and changes in the two different color measures ( $\Delta a^*$  and  $\Delta b^*$ ) equally, the resulting  $\Delta E$  can be dominated by a large value for any one of these three changes. Thus the films that darkened or lightened significantly without a color shift had large  $\Delta E$ s. No film in this study changed color significantly without changing overall percent visible transmission sufficiently to be rejected solely by the former criterion.

All the 3M films performed well in the previous study and were recommended. However, in this study the UV absorption of the Night Vision and Neutral lines dropped rapidly (see Figures 4 and 5); some of these films had less than 95% UV absorption by the end of the aging regimen. The spectra of those that did not fall below this cut-off did

nonetheless show significant loss of UVA absorption. The Night Vision line also underwent large changes in visible transmission. In contrast, the 3M Prestige films became more opaque, losing as much as 40% visible transmission. As a result of significantly increased opacity, they actually showed marginal increases in UV absorption. A similar phenomenon had been reported previously for a Scotchtint 3M film (4). The Prestige samples also appeared cloudy to the eye. Due to the variety of undesirable changes observed upon aging of these samples, the 3M films tested in this investigation can no longer be recommended for other than very short term use.

The UV-blocking properties of the three HanitaTek films tested remained well above our cut-off criterion, although the highly tinted Optitune 15 showed a large change in relative visible transmission. Other Hanita Tek films had not met our requirements to be included in the photoaging study.

Madico films performed well in this investigation: only the Advanced Ceramic 3000 fell below 95% UV absorbance. The Advanced Ceramics films showed very little visible change. However, Madico NG20 showed a major change in visible transmission. The acceptability of these films will depend on the discretion of the museum personnel. CPFilms (Llumar and Vista) performed well according to

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## Aging Properties of Select UV-Blocking Window Films, continued

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all criteria used. None of the films tested showed a significant change in UV absorbance, all staying above 97%, and none had more than 4% transmission change in the visible range. Because this brand easily met all our criteria, it can be strongly recommended with regard to optical performance.

The Global Window Films samples included in this phase of the study rapidly lost UV-blocking properties and showed significant changes in visible light transmission. GAM 1810, which barely met the original performance criteria, with 95.5% UV absorbance, fell significantly below this during aging. None of these films met the criteria of the aging study.

The two V-Kool films tested showed virtually no change in either their visible or their UV properties and are therefore acceptable, but curators should bear in mind their noticeable green tint.

The accelerated photoaging used in this investigation was the equivalent of less than seven years of light exposure for a north-facing window in the Los Angeles region, and slightly less than 3 years of direct sunlight exposure on a south-facing window. During this time the UV absorption properties of roughly one-fourth of the films studied fell below the level deemed acceptable for use in exhibition spaces. Almost one-third of the films underwent a large change in visible transmission, due to significant lightening or darkening, sometimes accompanied by change in color.

The other films in this study met or exceeded our optical criteria after this aging equivalent. These particular films can be recommended on the basis of the stability of their optical properties. However, we did not test the films for deterioration of other physical properties such as cracking or crazing, adhesive cross-linking, or delamination. The absence of these changes is also essential to acceptable film performance in a museum setting. Ease of removal without damage to the glazing is particularly important if films are installed on historic glass (3,7).

Formulations of commercial UV-blocking window films may be expected to evolve over time. When a museum or gallery is considering the installation of these films, measurement of the initial optical properties of each product under consideration is strongly encouraged (1,8).

The results reported above underscore the importance of characterizing both the UV and visible properties of the films. Also, the optical performance of the film should be measured immediately after installation and on a regular schedule thereafter, using the same calibrated light meter when possible, at the same location and time of year under similar weather conditions. In addition, because chemical changes in the adhesive, e.g., cross-linking, might make the film intractable, it is recommended that no UV-blocking film is left on museum windows for more than five to seven years whether or not the optical properties have changed.

### Acknowledgements

We wish to thank the Getty Conservation Institute (GCI) for the use of their Weather-O-Meter. Special thanks to Dave Carson, Tina Segler, and Gary Mattison for facilitating our 15 comings and goings for the installation and de-installation of the samples. Dave also kept an eye on our experiment and made sure that the equipment functioned properly. We also thank Charlotte Eng for editorial comments.

### Suppliers

Aladdin Glass (supplier of glass blanks)  
9007 De Soto Ave  
Canoga Park, CA 91304  
818.700.7833  
[www.aladdinglass.com](http://www.aladdinglass.com)

CPFilms (distributor of Llumiar and Vista)  
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## Aging Properties of Select UV-Blocking Window Films, continued

### Appendix

Btu/sq.ft./day were converted into J/m<sup>2</sup>/day using the factor 11,356.5 (9), and multiplied by 365 for an approximate annual exposure. But these values include heat radiation. Several sources indicate that approximately one-half of the total solar energy is heat energy (e.g., 10, 11). So the J/m<sup>2</sup>/yr. were divided by 2 to give approximate solar energy/area/year due to ultraviolet and visible radiation striking vertical surfaces in the Los Angeles area. The values are (in MJ/m<sup>2</sup>/yr):

North, 870; East, 1680; South, 2280; West, 1930.

The total Weather-O-Meter dose of 5840MJ/m<sup>2</sup> is thus equivalent to approximately the following years of exposure in Los Angeles:

North, 6.7; East, 3.5; South, 2.6; West, 3.0.

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## Investigation of Pink Staining on

### Introduction

During the 2008 conservation of four marble sculptures in the antiquities collection at the J. Paul Getty Museum (JPGM), localized bright pink discoloration in association with a brownish, slightly rubbery adhesive was observed on join surfaces. (Figure 1) All four objects had been treated sometime in the 1970s with unknown materials, including undocumented adhesives.



Figure 1. Pink staining on the join surface of JPGM 78.AA.61.

While retreating the sculptures in 2008, JPGM conservators encountered pink discoloration already present on join surfaces and observed its active formation. Upon the introduction of deionized water and polar organic solvents, the pink material became very mobile, and in some cases bled to the exterior surface of the stone and newly applied fill material.

In 2009, samples of the brownish adhesive with pink staining were removed in order to understand the nature of the discoloration, how to prevent its formation, and how best to remove the stain. Following characterization of the adhesive, experimental trials were conducted to determine if the pink stain could be replicated, thereby helping to reveal the mechanism by which it forms.

### Research and Results

Samples of pink stained adhesive from the four sculptures were investigated with polarized light microscopy (PLM), Fourier transform infrared spectroscopy (FT-IR), and scanning electron microscopy-energy dispersive spectroscopy (SEM-EDS) in order to characterize the adhesive and to better understand the composition of the pink color. FT-IR spectra were acquired for pink and brown portions of stained adhesive samples, and the pink-colored material's

# Marble Sculpture at the J. Paul Getty Museum

by Allison Lewis and Monica Ganio

spectrum was isolated by subtracting that of the brown. Extractions were made with water and ethanol.

In attempts to characterize the adhesive, results were compared to the FT-IR spectra of four epoxy resins obtained from a sample board created in 1988 as part of an adhesive study initiated by former GCI senior scientist Cecily Grzywacz and assistant antiquities conservator Susan Lansing Maish. (Figure 2)

The 1988 sample board included the following epoxy resins: UHU plus quickset, Devcon 5 minute, Devcon 30 minute, and Araldite 506 (unknown hardener). A more recent sample of Araldite AY 103 epoxy resin was also compared to the unknown samples.

FT-IR confirmed that the adhesive associated with the pink discoloration is an epoxy and that the same epoxy was used on several of the marble sculptures. The analyses showed a very good match between the samples and UHU plus quickset and Devcon 5 minute epoxies from the 1988 GCI reference board, suggesting the use of a rapidly setting epoxy.

An ethanol extraction did not appear to effect the discoloration, while the water extraction revealed that it is partially soluble in water, consistent with conservators' experiences when attempting to remove the staining.

SEM-EDS was used to investigate the presence of metal elements in the pink-stained areas. The elemental analysis of the pink material revealed the presence of chlorine, sulfur, calcium, carbon, and oxygen on the adhesive and marble. No metals were observed, indicating that the discoloration is organic.

The similarity between FT-IR spectra of the sampled adhesive and the UHU plus quickset epoxy from the 1988 reference board prompted further investigation of UHU plus quickset epoxy. A representative of the company confirmed that the product was launched in the early 1970s, which is consistent with the treatment dates of the marble objects in this study. It was also reported that the formulation has only been changed "in very small parts" since 1988, when the reference sample board used to aid identification of the adhesive was created. Detailed information on the nature of such changes was not provided.

New tubes of UHU plus quickset epoxy were purchased (Shell-lap Supplies, Australia). The FT-IR spectra of the newly purchased epoxy matched those of the GCI reference board and two adhesive samples from the objects, with very minor differences assumed to be due to age related changes.

After tentative identification of the adhesive associated with the pink discoloration as UHU plus quickset epoxy (via comparison to the GCI reference sample as well as to a sample of recently purchased UHU plus quickset epoxy), trials with the recently purchased UHU were initiated in order to see if the pink staining could be replicated.

The experimental trials sought to correlate the pink staining with the presence of other conservation materials and/or with environmental conditions. In order to examine the effects of binder: hardener ratio and foreign materials (cyanoacrylate, cellulose nitrate, Paraloid B-72, 3M double-sided tape, and copper flakes), UHU plus quickset epoxy was applied to four marble boards in varying binder: hardener ratios, and correct binder: hardener mixtures were applied to the marble surface in contact with the materials listed above.

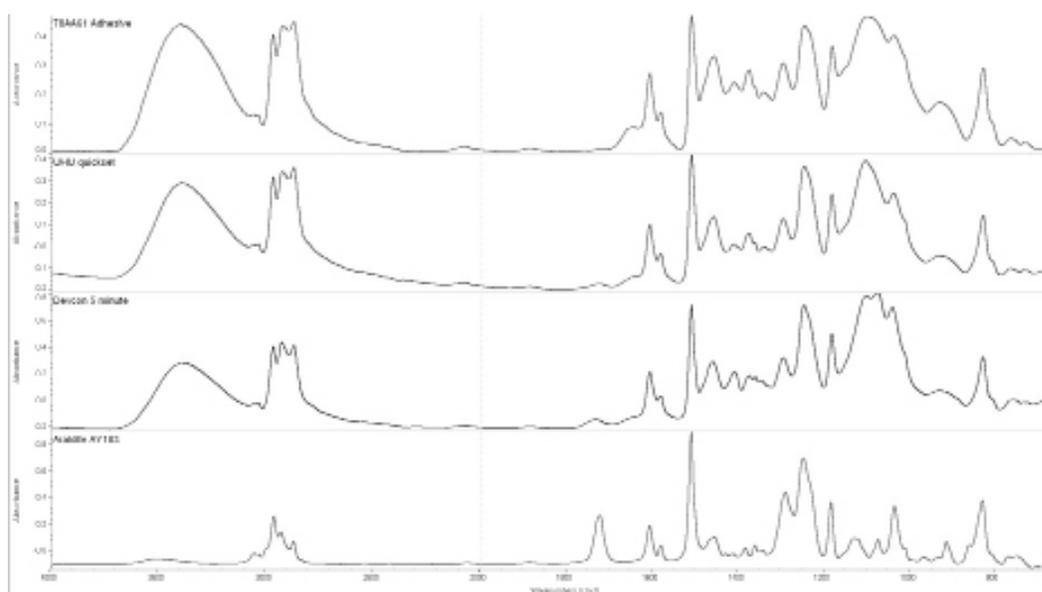
Figure 2. FT-IR spectra of:

pink-stained adhesive from JPMG marble sculpture 78.AA.61

UHU plus quickset epoxy (applied 1988)

Devcon 5 minute epoxy (applied 1988)

and Araldite AY 103 epoxy (applied 2009).



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## Investigation of Pink Staining on Marble Sculpture at the J. Paul Getty Museum, continued

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To investigate the possible effects of moisture, solvent vapor, and direct wetting, boards were subjected to elevated relative humidity (approximately 100%) during setting, exposure to acetone fumes during setting, and direct wetting during setting.

One control board was stored in a cool, dark location with minimal relative humidity fluctuation, and another board was later heated at 60°C at low humidity for one month to accelerate deterioration of the adhesive.

During the course of experimental trials, it was discovered that a slab of marble once used as display furniture at the Getty Villa exhibited pink discoloration in association with a brown rubbery adhesive used to attach hardware. FT-IR spectra of the adhesive found on the furniture slab strongly resembled those of the adhesive sampled from the four statues and the UHU plus quickset epoxy from the 1988 reference board. The date of application of the adhesive to the furniture slab is unknown, but could be roughly contemporaneous with the original treatment of the four statues.

The slab of marble was subdivided and used to carry out additional investigation of the effects of high relative humidity, direct wetting, and high pH on both newly applied and naturally aged adhesive on a marble surface. (Figure 3)

Pink staining developed in two locations on the experimental marble pieces over a period of four months. In both instances, pink discoloration appeared on the marble surface adjacent to new UHU plus quickset that had been cured at elevated relative humidity. On the board which had been



Figure 3. Experimental marble boards 1 (control) and 2 (cured at elevated relative humidity) four months after the application of UHU plus quickset epoxy. Faint pink discoloration formed on board 2, slide 3, the site of UHU plus quickset with excess hardener.

prepared at near 100% relative humidity, a faint pink halo appeared around the application of 1:3 binder: hardener (v: v) UHU plus quickset, the excess hardener formulation. No other pink staining appeared on any of the marble boards.

On one of the slab ends, diffuse bright pink discoloration appeared surrounding an application of properly mixed 1:1 binder: hardener UHU that had been directly wet with de-ionized water and cured at near 100% relative humidity.

### Discussion

The results of the scientific investigation of adhesive samples and of the experimental trials suggest that the pink discoloration is unrelated to secondary materials in contact with the epoxy, that moisture may be a key factor in its formation, and that excess hardener may also influence the formation of the pink staining.

The mechanism of pink stain formation remains unclear, but both analytical results and experimental work indicate that the pink discoloration forms from components present in the epoxy. FT-IR and SEM-EDS analysis of adhesive samples from the stained sculptures detected only epoxy, although there were some additional unidentified peaks in the FT-IR spectrum of the pink-colored portion of the adhesive. On the marble mock-up boards, the pink staining only formed in instances where UHU plus quickset alone had been applied to the marble surface.

The only successful replications of pink discoloration on the experimental marble pieces occurred when the epoxy was cured at high relative humidity, and in one case was directly wet. The marble boards which were not subjected to elevated RH did not exhibit any pink discoloration. The formation of pink discoloration around the UHU plus quickset with excess hardener also suggests that an improper ratio of the two components may contribute to pink staining.

Because of the correlation between moisture and the pink discoloration, its possible relationship to the amine blushing phenomenon may merit exploration. When epoxy resins cure in high humidity environments, amine compounds in the epoxy can combine with airborne carbon dioxide, forming mixtures of ammonium bicarbonate and ammonium carbamate on the surface of epoxy coatings. However, amine blush products are usually described as whitish in color rather than pink.

While this preliminary work has characterized the adhesive associated with the pink discoloration on the JPGM marble sculptures and suggested that exposure to moisture during curing and excess hardener may result in stain formation, additional research into the nature of the staining is necessary. Further analytical investigation is required to clarify the mechanism of the stain formation, and additional study of the most effective stain reversal techniques should be undertaken.

Edited by Debra Hess Norris and Jennifer Jae Gutierrez  
from the Readings in Conservation series.  
Los Angeles: Getty Conservation Institute, 2010

When I received my copy of the new book *Issues in the Conservation of Photographs*, which is the most recent publication in the Getty Conservation Institute's series "Readings in Conservation," I could tell even as I unwrapped it that it would be something special. As I opened it and with growing excitement perused the Table of Contents, I found myself thinking nostalgically of a period in the past when as a conservation student there were so many books that I turned to with an eager anticipation of discovery. In time comes familiarity, the texts become references, and fewer publications appear with such excitement and novelty. *Issues in the Conservation of Photographs*, now that I've had time to examine it more fully, turns out to have profound value that fleshes out my initial interest in a most satisfying way. This will be a reference I turn to many times, initially to recapture something of that eagerness of my student days, later as a memory refresher as any true reference will be; and also as a very useful tool in teaching.

In fact, as I recall another book I fell upon in this manner was the first volume in the Getty Conservation Institute's series "Readings in Conservation," *Historical and Philosophical Issues in the Conservation of Cultural Heritage*. I suppose it shows my nerdiness that I read that book from cover to cover, and promptly used it in teaching. *Issues in the Conservation of Photographs* is the third in the series; I do not have the second, *Issues in the Conservation of Paintings* but I now think I will have to get it, despite the fact that I am not a paintings conservator, since the other two are such valuable compilations of core material.

One great frustration that I and others experienced in studying photograph conservation was the fact that the most important sources of information about the materials and their stability and preservation were so dispersed and in some cases hard to obtain. (Clearly this is a problem shared with other specialties, thus the need for the GCI series). Once acquired, usually in photocopy form, the articles became an ongoing storage and access problem that even the best bibliography and filing system would struggle to conquer. This new book is a first step, and a critical one, in solving these problems.

Comprising 72 texts, the earliest from 1850 and most recent published in 2010, *Issues in the Conservation of Photographs* was compiled by Debra Hess Norris and Jennifer Jae Gutierrez, both of the University of Delaware. (Telling, isn't it, that as early as 1850 Eugene Vaillant published an article entitled "Process for Restoring Stained and Oxidized Old Prints to their Original Condition"--the "old prints" in question being daguerreotype plates a maximum of 11 years old!) According to the opening pages of the book, the editors solicited suggestions for citations from 50 photograph conservators and made their selections with the help of an international advisory committee of well-recognized photograph conservators and a core group of readers.

The articles are divided into eight sections: "I. History of Photograph Conservation," "II. Silver Image Structure and Stability," "III. Silver, Mercury, and Gold: Philosophical and Practical Approaches in the Preservation of Daguerreotypes," "IV. Albumen Print Materials: Manufacture, Structure, and Treatment," "V. Photographic Negatives: Problems and Issues," "VI. The Preservation of Color Photography," "VII. Developing Criteria in the Conservation of Photographs: Collection Management and Treatment," and "VIII. Exhibition Practice." There are also three valuable Appendices with identification aides; and an extensive section of "Further Reading" which is a bibliography organized in sections paralleling the topics detailed above.

In many cases the book reprints the original article in its entirety; in others the work is excerpted or a chapter taken from a larger work of importance (e.g., Robert A. Weinstein's and Larry Booth's "Introduction" from their book *Collection, Use, and Care of Historical Photographs* of 1978.) In still other cases, such as James M. Reilly's "Stability Problems of 19<sup>th</sup> and 20<sup>th</sup>-Century Photographic Materials (1980)," an article originally published as a stand-alone text is used apparently in place of a better-known, but longer work—in this case, Reilly's book *Care and Identification of 19th-Century Photographic Prints*, 1986.

The selection of articles is excellent and clearly benefited from the wide range of professionals who contributed during the selection process. Indeed, it is an achievement to have compiled such a comprehensive list of sources and then to have arranged them so coherently, seemingly without anything important omitted or misplaced. (Please note that I, like the editors, am counting the "Further Reading" section as containing important references that could not be included in the text itself.)

Comprehensive though the book is, it is still very consciously within its specific topic of the conservation of traditional photographs. Related topics, such as the history of photographs or the conservation of digital materials, are notably and rightly absent. In the case of the former, the topic is a discipline in its own right and including even a limited section of it would have hopelessly lengthened and bogged down this book and complicated the process of compiling it. In the case of the latter, again the topic touches broader issues beyond the range of the field of photograph conservation proper; also these materials and their preservation issues are still recent in development. While research on their preservation has been initiated and quite a bit already published, it would be difficult to feel that a section about them could be truly comprehensive, as yet. While a photograph conservator needs knowledge of both these topics, it must be gained from other sources. Finally, *Issues* is a book of readings, and as such it is not a textbook per se. A student of photograph conservation will find it a treasure of core texts, but must rely on her instructors or her own comprehension of the subject to provide the context and structure necessary to make sense of the group of readings as a whole.

(continued page 28)

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## Book Review, continued

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When I was asked to write something about *Issues in the Conservation of Photographs*, it was pointed out that our field is still so small, and everyone involved is so familiar with each other through training and work relationships, that a true critical review of such a publication may be impossible. Fortunately for me as a reviewer, as well as for the field as a whole, this publication is so genuinely valuable and well-presented that it is not necessary to parse my criticism. However, in the interests of full disclosure I must point out that, not only do I count Debra Norris as a former teacher, mentor, and inspiration (as does, it would be fair to say, most of the field); but I was also privileged to be a summer internship supervisor for Jae Gutierrez when she was a graduate student. I congratulate them, as well as their advisory committee, on the completion of this wonderful book. The field has been enriched from their efforts.

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### **“Restoration Brings more Power to Parliament Paintings,”** *Financial Express (India)*, 09/06/2010

The 58 historic paintings adorning the walls of the outer circular corridor of Parliament House have acquired a fresh lease of life following a massive restoration exercise. The paintings unfold major landmarks of the 5,000-year history of India.

The painstaking job has been executed by a known authority in the field, IK Bhatnagar, a retired professor and head of the Department of Conservation of the National Museum Institute of History of Art, Conservation and Museology, and his five assistants.

It took Bhatnagar and his team seven months to remove dust from the surface, sharpen outlines of drawings and shine them. This was followed up with a chemical treatment, which leaves a transparent film over the paintings.

He traced the damage to four sources. The first came from splashes of whitewash, which were only made worse by the labourers, who, while wiping them off, ended up damaging the paintings more. A number of paintings had splashes of water. There were scratches left by furniture moved carelessly through the corridor while several paintings bore marks of human vandalism.

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## Articles You May Have Missed

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For the future, Bhatnagar has advised Lok Sabha Speaker Meira Kumar to consider providing glass casings for the paintings. He has also offered to hold a one-day workshop for training the staff in their upkeep. One aspect, which has been overlooked while conceiving the idea, is that the entire corridor is not adequately lighted and, therefore, the effect of the paintings is also lost. Bhatnagar, however, is not in favour of spotlighting the paintings, because it would compromise their life. A diffused lighting, according to him, would do.

### **“Virtual Restoration of Cluny,”** *Le Monde*, 09/09/2010

The Benedictine abbey of Cluny was founded 1,100 years ago this year: it was perhaps the most important center of monastic life in the Middle Ages, the mother house from which radiated a far-reaching reform of the Benedictine order.

At its height the community had the largest church in the western world, 187 meters long, with five naves, a multiple choir, large and small transepts, three hundred chapels, seven bell towers, a building eventually surpassed only by the new St. Peter's in Rome.

In 1791, the abbey's community had dwindled from the 400 monks living there in the Middle Ages to only twelve monks, who were expelled by order of the French Revolution. The abbey's precious objects were sold, and most of the buildings were reduced to rubble: the vast, fortress-like church had to be detonated with a mine, and the demolition lasted some twenty-five years. The French government has spent three years restoring the convent building to its 18th-century state and laying out a way for visitors to envision that grand church.

### **“LA Artists Draw Battle Lines to Save City's Legacy of Murals,”** *Boston Globe*, 09/19/2010

At one time hosting an estimated 1,500 pieces of wall art, Los Angeles is the nation's mural capital, but that's a fading distinction thanks to prolific graffiti taggers, a legal morass over classifying the artworks as illegal signs, and neglect.

Spawned in the '70s on the city's eastside, LA's murals form a kaleidoscope of color and imagery in a city known for bland urban sprawl. Most of

the murals — some 1,100 — are located on private property, while 400, created as part of the city's mural program that ended in 2006 in a municipal budget crunch, are mostly on public land.

The exact number of lost murals is hard to determine. From a sample of 105 city-sponsored works, 60 percent had vanished. Murals are disappearing with increasing frequency since the mural program, which included maintenance, died.

Murals are often targeted by vandals because the city does not regularly remove tags from murals so the spray-paint scrawls remain indefinitely. Blank walls are easier to clean and are whitewashed by city workers within days. In the case of private property, the city requires the owner to remove the graffiti or face a fine. Sometimes, the owner removes the mural, too, to avoid repeated citations.

About 60 murals face removal or daily fines under the city sign code because they do not conform to size and location rules governing signs. But a proposed ordinance would change that by issuing permits for murals and requiring them to be protected with an anti-graffiti coating.

### **“School's Historic Artwork Restoration gets National Trust Grant, One of Three Awarded Locally,”** *Pasadena Star News*, 09/15/2010

Since 1933, sculptor Donal Hord's bas-relief sculpture, *Civilian Conservation Corps Workers*, has been shuffled around the South Pasadena Middle School campus, most recently attached to an outside wall on the auditorium.

The panel became such a part of the scenery at the 1928-vintage school that when the auditorium was painted, the cast-stone carving was painted over with it. Later, when everyone realized a work of art had been covered up, the surface was sandblasted.

“Not a good idea,” said Lori Fuller Rusch, an art historian and president of the PTA's Arts + Architecture Restoration Committee. Now the PTA has received an \$8,000 National Trust for Historic Preservation matching grant to restore the Works Progress Administration artwork and start what Rusch hopes will be restoration of several historic artworks on campus.

Rusch said the panel will be “properly lit” and rehung in the lobby with an information plaque when restoration is finished in about six months. Temple City Mayor Fernando Vizcarra said the grant will “get us started on establishing a historic preservation entity in the city” for the first time.

**“Restoring Roosevelt’s Head,”** *Allentown Examiner*, 09/16/2010

The Fund for Roosevelt is acting to conserve and preserve a significant piece of the borough’s history — the sculpture of Franklin Delano Roosevelt.

The bust, which was created by Roosevelt resident Jonathan Shahn in the 1960s, is being restored under the direction of the artist and the Fund for Roosevelt, a nonprofit organization that helped to raise money for the project.

Vandals spray-painted graffiti on the memorial that serves as the town’s centerpiece in 2008. For resident Tom Curry, the incident brought to light how 45 years had taken a toll on the sculpture’s bronze bust and granite veneer pedestal. Seeing an urgent need for the monument’s conservation and preservation, he sought support for a restoration project from the Fund for Roosevelt.

The fund agreed to help raise money for restoring the bust’s original patina and repairing and weatherizing the granite pedestal. By 2008 the concrete pedestal had cracked, allowing water inside, which pushed the stone facing away. Weather conditions had also compromised the patina of the bust. The graffiti had also destroyed the original gold leaf on the monument.

Curry met with a couple of conservation companies and found Aegis Restauro, of Belle Meade. Aegis Restauro started on-site repairs Sept. 1 under the direction of the Fund for Roosevelt in consultation with monument creator Jonathan Shahn. “Our greatest concern and riskiest part of this project was the removal of the granite veneer,” Curry said. “I am happy to report the panels were removed without a problem. The bronze conservation is under way, and its patina is looking wonderful.”

When complete, the granite pedestal will be polished and weather-tight. The bronze sculpture finish will be protected with a wax, and the engraving will be gold-leaf gilded.

**“Shoe of Discord: Archeologists and Officials Divided over Care of Ancient Artifact,”** *ArmeniaNow.com*, 10/12/2010

Armenian archeologists are worried about the future of the world’s oldest (5,500-year-old) leather shoe, found in a cave in Armenian province Vayots Dzor in 2008.

It has not been fully examined yet; conservation issues of the shoe are not settled, and specialists are indignant that government officials take no steps to preserve it.

The shoe which is now displayed at the Yerevan History Museum, was found during the excavations in a cave conditionally called Areni-1 which is part of The Arpa River Valley Monument. Inside the cave where the oldest shoe and other important artifacts, including a winery, were found.

Now, however, hard feelings, perhaps bruised egos, and apparent carelessness by the Ministry of Culture delay the possibility of exposing even more significant treasures discovered in Areni that would arguably serve to put Armenia in the world spotlight.

The expedition has discovered that 39 caves in the cave complex of Vayots Dzor were once populated. Besides the shoe, well-preserved wooden, bone and leather objects, a clothing item, even human soft tissues and human body remnants were found in Areni.

**“The Improvisational Remedies of an Art Healer,”** *New York Times*, 10/25/2010

Eleonora Nagy remembers the first time she got a close look at “Untitled,” a 1966 sculpture by the artist Paul Thek. One of a series of works known as “meat pieces,” it looked like a fresh limb fragment that had gone bad. With its bizarre hyper-realistic details — a shiny tongue of material that oozes from the innards, hairs that seem to grow through the surrounding yellow-tinted plexiglass case — the sculpture was meant to shock and repulse the viewer.

But Ms. Nagy, an art conservator, was less interested in the overall impression of the piece and more in its condition. After four and a half decades, “Untitled” had gone bad — very bad.

A fluffy white substance seemed to be growing, like mold, in one area.

Outside the case, the hairs had lost their color. Above all, the surface of the “meat” was cracking and peeling.

The sculpture seemed to have a core of plaster, the “hairs” were certainly monofilament nylon, and there was evidence that polyurethane resin and Day-Glo paint had been applied. But it was unclear what the “meat” itself, including the cracked fleshlike surface, consisted of.

Ms. Nagy sent a few tiny samples off to the Harvard Art Museums who determined it was beeswax. Analysis of other samples determined that what earlier conservators thought might be mold was palmitic acid, which evaporated from the beeswax over time and crystallized in the enclosed space of the vitrine.

Early on, a decision had been made not to repair the cracks cosmetically. With the right amount of resin in place — enough to bind the materials but not ooze out and be visible — the peeling edges could be flattened and brought together.

“Our purpose was actually not making it beautiful again,” she said. “We think it’s much better to be honest. The original impact that he wanted is here. Even when it was all in bits and pieces, even then people went ‘ewwww.’ So it worked, even then. But we were really concerned about the actual stability of the piece.”

**“South Pasadena Comes Together to Save Historic Gage Sculpture,”** *San Jose Mercury News*, 10/28/2010

Thanks to the efforts of local officials and preservations (sic), a 1930s-era stone casting by artist Merrell Gage won’t be forgotten. Broken into pieces during a library renovation, *The Children’s Hour* survived a 2009 fire that destroyed the city yard, where the sculpture was moved for safe-keeping.

Now, the 850-pound casting depicting a father reading to his three daughters is waiting to be restored and hoisted onto an exterior wall at the South Pasadena Library, where it hung inside, above the children’s room, until it was broken during the 1982 renovation.

Until 2009, the casting, which includes a line from poet Henry Wadsworth Longfellow - “Comes a pause in the day’s occupations, that is known as the Children’s Hour” - was planted in pieces in the ground near the library on Oxley Street. It continued to deteriorate

until the library launched an exterior beautification project that year.

“Merrell Gage was a significant artist, especially in Southern California, and made it specifically for the library,” said Donna Williams of the Williams Art Conservation. “It really is an integral part of the building in that regard.”

### “Chartwell’s Winter Conservation Work Begins,” *BBC News*, 11/02/2010

Every winter, many of Kent’s stately homes close to the public, and behind the scenes vital cleaning and restoration work begins.

At Chartwell, Sir Winston Churchill’s home, a team is repairing the damage from light and temperature changes plus a season’s worth of visitors. The National Trust’s conservators will be working on picture frames, textiles, glassware, and ceramics.

The house, near Westerham, will re-open to the public in March 2011. The National Trust at Chartwell near Westerham said: “The team take great care in ensuring that the much loved art and historic objects stay in the best condition possible for generations to come.”

During the winter months Judith Wetherall, a specialist conservator, will be working on the frame on the famous portrait of Lady Churchill by Chandor.

Some of Sir Winston’s uniforms including his iconic Siren Suit, and Lady Churchill’s robes will be remounted, providing better support for the textiles in preparation for the house re-opening to the public next spring.

### “Missing Piece of 16th-century Mural Recreated Virtually,” *The Art Newspaper*, 11/03/2010

Light projection technology developed for theatrical performances and rock concerts is being used to “virtually reintegrate” a lost sequence of a German 16th-century mural.

The adaptation of this technology for conservation purposes is the brainchild of Michaela Janke, a student at the Institute of Conservation Sciences at the Cologne U. of Applied Sciences. A team of conservators, led by Dr Nicole Riedl from the University of Applied Sciences and Art in Hildesheim, began work on the mural at the Brömserhof Museum in Rüdeshheim am Rhein in 2007.

The ancestral hall and chapel of the former stately home turned musical instrument museum contains a series of secco paintings (paintings on dry plaster) by Hans Ritter, a student of Lucas Cranach the Elder, that were damaged during the second world war.

Janke knew that a watercolour copy of the missing sequence made in 1898 by German artist and restorer Gustav Ballin was held in the Rüdeshheim municipal archive. “I wanted to show Ballin’s historic copies of the murals, not a 21st-century reconstruction,” said Janke, adding: “I first thought of slide-projection, but the curvature of the vault would make this extremely difficult.”

She contacted software and hardware companies Coolux GmbH and Burmester Event und Medientechnik, which created a digital picture file of the 19th-century watercolour. A grid pattern was then projected onto the 1.5 sq. m area that was missing its decoration and the digital image was manipulated using specially developed software to allow for the curvature of the wall.

A UV filter can be put in front of the light source to avoid possible light damage to the paintings,” said Janke. “It also helps the spectator clearly distinguish between the original and the newly restored areas. It’s not an attempt to mislead the spectator into thinking that the mural is completely original.”

### “Art Believed Destroyed by Nazis Found in Berlin,” *Yahoo! News*, 11/08/2010

Nearly a dozen sculptures considered by the Nazis to be “degenerate” artwork and believed to have been lost or destroyed after World War II have been unearthed during construction near Berlin’s city hall.

The terra-cotta and bronze statues were found during a dig to lay down a new subway line. They belonged to a collection of 15,000 works condemned by Hitler’s regime for containing “deviant” sexual elements, anti-nationalistic themes, or criticizing Nazi ideology.

The sculptures mainly depict women — a woman holding grapes, a mother and her child, a full-figured woman stretching — the other three are of males.

Construction workers found the art on the site of an office building that burned down in the summer of 1944,

Museum Director Matthias Wemhoff told reporters Monday. The fire started in the roof, burning the building from the top down. “Each floor fell onto the next and everything that couldn’t be burnt collected at the bottom in the basement,” including the sculptures, he said.

Otto Freundlich, whose large, elongated 1925 terra-cotta statue of a man’s head was left partially standing, was murdered in the concentration camp Lublin-Maidanek in 1943. Naum Slutzky, a member of the Bauhaus school, fled to England in 1933, where he taught art and lived until his death in 1965. His work *Female Bust*, was originally a glinting bronze, but has been left only partially restored to reflect the damage of time and fire.

### “Caring for Paintings,” *Malaysia Star*, 11/13/2010

Priya Khanna could well be called a “surgeon” — except it’s not people but works of art that she works on. Give this New Delhi-based art restorer mouldy paintings, shattered Ming vases, damaged murals, weather-beaten sculptures, broken glassware, or musty ceramics, and watch her breathe new life into them.

Working from her studio — Art-Life Restoration Studio — with a team of about 15 staffers, Priya, 43, belongs to a growing tribe of art restorers in India’s exponentially expanding art market, currently valued at US\$500mil (RM1.5bil).

Art restoration in India, according to the expert, has a great future despite the current acute shortage of professional and efficient restorers. “More and more art galleries are coming up, which has fueled a demand for people like us,” says Priya who has been a professional restorer for 15 years.

The expert has just finished her toughest assignment yet — the restoration of over 300 paintings and works of art at the Taj Mahal Hotel in Mumbai. The hotel suffered massive damages during the three-day terror attacks on the city a couple of years ago and art restoration was a pivotal part of the hotel’s US\$50mil makeover.

For 10 months, Priya’s team of five restorers would work for hours daily in a makeshift studio they had constructed within the hotel.

**“Albrecht Dürer’s Adam and Eve Returns to Public Display at the Prado Museum,”** *Art Daily*, 11/24/2010

The Museum is once again displaying the magnificent pair of paintings of Adam and Eve (1507) by Albrecht Dürer, following two years of restoration to their pictorial surfaces and supports.

The work on the two panels has benefited from the participation of a team of international experts, jointly co-ordinated by the Prado and the Getty Foundation in Los Angeles. The latter institution funded the restoration of the delicate panels on which the two paintings are executed, leading to the development of an ingenious technical solution in order to stabilise them.

Adam and Eve are mounted on a metal structure specially designed to allow both the front and back of each work to be seen. In an adjoining gallery (Room 55b) the restoration of the two panels is explained in detail through several text and image panels that include images of reflectographs and x-rays of the works.

Over the course of their history, the paint surfaces of the two panels have undergone successive restorations that accumulated, one on top of the other, and finally concealed Dürer’s original intentions and his exceptionally refined technical skills.

These old restorations also affected the panels, particularly that of Adam, which had vertical cracks on the surface that produced distortions and bulging, in turn causing shadows and irregularities on the pictorial surface and thus negatively affecting the forms of Dürer’s composition.

**“Another Collapse at Pompeii Renews Calls for Better Care,”** *The New York Times*, 11/30/2010

Less than a month after Pompeii’s so-called House of Gladiators collapsed into rubble, portions of a garden wall at the nearby House of the Moralist fell down on Tuesday, prompting new calls to better safeguard the city buried by an eruption of Mount Vesuvius in 79 A.D.

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*It seems that you are ill adjusted to what is going on in the world around you now.  
But what if it’s the world, not you.  
The stars suggest you’re saner than you feel.*

Antonio Varone, Pompeii’s director of excavations, said the house – which actually consists of two adjacent abodes that belonged to two families – was in no danger. The wall, which bordered an unexcavated area and was shored up earlier this year, had been completely rebuilt after the United States bombing of the Naples area in World War II, according to the culture ministry. Mr. Varone told the news agency ANSA that the wall had most likely succumbed to the “incredible, incessant torrential rains” that have washed over central Italy in recent days.

“These atmospheric phenomena are so unusual that they’ve even surpassed the protection that we have set into place,” he said. Pompeii officials were monitoring the areas most at risk.

Demands that the Italian government take better care of its fragile archaeological sites grew after the collapse in early November of the Schola Armarum, whose walls were decorated with frescoes of military themes. Political opponents of the government have called for the resignation of the culture minister, Sandro Bondi, and a confidence vote is expected in December.

**“Back When Theater Was Simply Unrolled,”** *The New York Times*, 12/02/2010

Victorian theatergoers packed halls to watch canvases roll past. Entrepreneurs would ship paintings of exotic scenery hundreds of feet long to theaters nationwide, and stagehands, as if anticipating animated movies, would slowly reveal section after section of the “moving panoramas.” Pianists supplied uplifting music, and actors’ voice-overs explained the plot.

One of the more successful productions, “Moving Panorama of Pilgrim’s Progress,” started making the rounds in 1851. Artists as prominent as Frederic Edwin Church and Jasper Cropsey had designed the images, based on John Bunyan’s 1678 didactic Christian allegory about a family confronting angels and demons at the edges of abysses and castle walls.

By the 1860s, however, Bunyan’s somewhat ponderous tale of journeys through the “slough of despond” and “valley of humiliation” had gone out of fashion, and a theater owner in Maine let crates of the rolled-up muslin molder

in storage. The Dyer Library and Saco Museum in Saco, Me., inherited them in 1896 and rediscovered them a century later.

For the last year, restorers at the Williamstown Art Conservation Center in Massachusetts have been working on about 800 feet of fabric stretched out in the hallway and driveway. The restorers sometimes wore socks to avoid leaving footprints while removing dust, creases and signs of water damage known in the trade as tide lines. Lower portions of the paintings have been left slightly scraped, as evidence of countless unrollings.

**“Rock Art Vandalized,”** *Mesquite Local News*, 12/05/2010

Three prehistoric rock art panels were vandalized with graffiti recently at Red Rock Canyon National Conservation Area. Both pictographs and petroglyphs were severely damaged.

The damaged rock art panels vary in size from three feet by six feet to eight feet by nine feet. Several panels were completely covered with maroon spray paint. The rock art (mainly pictographs) is probably late prehistoric to historic and was made by the known prehistoric archaeological cultures that lived in the area (Virgin Anasazi, ancestral Paiute, Lower Coloradoan River groups).

It also is likely that the pictographs date to the contact period after the late 1820s, and was made by Southern Paiutes, as there is some evidence in the surrounding area that pictographs may have been made more recently than much of the petroglyphs. These are highly abstract pictograph designs, including a few smears that were made with fingers dipped in pigment.

Restoration of the site is estimated to cost approximately \$10,000. “This is the most severe damage to archeological resources we’ve seen in Red Rock for several years,” said Mark Boatwright, Archeologist for the BLM’s Red Rock/Sloan Field Office.

**“Westminster Abbey to get Million Pound Makeover in time for the Royal Wedding,”** *The Telegraph*, 12/05/2010

Westminster Abbey, the wedding venue for Prince William and Kate Middleton, is to undergo a major conservation programme to restore its most precious works of art.

The Abbey is to receive a grant from an American bank to conserve more than 10 of its important treasures. Among the artefacts to be restored is the Cosmati Pavement, the medieval tile mosaic in front of the High Altar where Prince William and Miss Middleton are expected to take their vows. A 14th-century portrait of King Richard II, which hangs on a pillar by the Great West Door, will also be restored. Painted on wooden panels circa 1398, it depicts the king enthroned in coronation robes, and is the earliest known contemporary painted portrait of an English sovereign.

Other key pieces that will be restored include a painting of Queen Elizabeth I dating from 1594; Queen Mary II's wooden coronation chair made in 1689; and the Liber Regalis, and a 14th-century manuscript describing how a coronation is carried out, which was made for the crowning of Ann of Bohemia, the consort queen of Richard II, and has provided the basis for the order of service for all subsequent coronations.

The grant, which is thought to be in the region of £1 million, is one of the largest ever donations received by the Abbey. It is the first grant of its kind by Bank of America Merrill Lynch, which has established an inaugural art conservation programme to provide funding for the restoration of important works of art around the world.

### **“Family on a Mission,”** *Arizona Daily Star*, 12/5/2010

Vincent Morales turns to expert counsel when he has a question about his work on the restoration of historic Mission San Xavier del Bac: his father, Daniel. Daniel knows where to go when he has a question: his father, Sonny. Sonny, in turn, got his mission knowledge from - yup - his late father, Apolino. Apolino, well, he learned some things from his own padre, Ernesto.

Five generations of the Morales family have worked on stabilization and restoration of the 213-year-old mission southwest of Tucson. “We go way back,” says Daniel, who oversees the family’s business - Morales Restoration and Builders Inc.

From early stabilization work by Ernesto and Apolino in the 1940s and continuing toils by Sonny in the 1950s, the building has been shored up and beautified by many a Morales hand.

“There is so much historical knowledge about the mission contained within that family, and it really benefits the work,” says Vern Lamplot, executive director of the Patronato San Xavier.

The Patronato was formed in 1978 to promote and raise funds for conservation of the mission. The group has employed the Morales crew in recent decades for extensive work - including renovation of the mission’s west tower and removal of water-trapping cement plaster applied during earlier renovations. The plaster is being replaced with a lime-and-cactus-juice-mortar like that used by the original builders.

Historians trace the beginnings of San Xavier to 1700, when a Jesuit missionary, Father Eusebio Kino, began the foundations of a church that was never built. Work on the current church, built to replace an earlier nearby structure, began in 1783 and was completed in 1797.

### **“Saving San Sebastian Church,”** *Philippine Daily Inquirer*, 12/06/2010

Bring a refrigerator magnet with you when you join the “S.O.S.” (Save Our San Sebastian Church) walking tour. Part of the fun is being able to slap the magnet onto portions of the church that have been painted to look like stone.

That’s because the Minor Basilica of San Sebastian is the only prefabricated all-steel church in the Philippines, and, according to some sources, in Asia.

Unfortunately, the biggest scandal in the making is the fact that the all-steel structure is rusting away.

Run by the Order of the Augustinian Recollects, or the Recoletos, the church is the first Philippine shrine to Our Lady of Mt. Carmel. Three previous churches made of masonry were destroyed by earthquakes from the 1600s to the 1800s. In 1880, Spanish engineer Genaro Palacios rallied the friars to use a very modern (at the time) solution: steel.

Termite-proof and earthquake-proof, prefabricated parts were shipped from Europe and erected in Manila. “The church is a great mix of art and technology, of devotion and profession, of Europe and Asia,” says architectural conservator Tina Paterno.

That the church is still standing is a testament to engineered steel’s ability to withstand strong forces. However, it’s succumbing to another force of nature.

Seeping water has caused panels to warp, rivets to pop off, paint to deteriorate, and rust to form. Most alarming and dangerous is that all the surface rusting could indicate the likely rusting of the church’s hidden internal structural supports.

The order has long noticed the church’s condition. Recollect Fr. Rene Paglinawan had attended a conservation talk given by Paterno, and invited her to see their church in 2008.

Paterno assembled a conservation team that has already begun the first phase of its restoration: investigation and assessment of the problem. “Our team has found over 50 leaks and many puddles of water inside the church,” she says. “During a recent storm, they detected one meter of water inside a column. What can possibly be more corrosive to an all-steel church?”

### **“Award for 18th Century Droitwich Wall Paintings Work,”** *BBC News*, 12/06/2010

An 18th-century Worcestershire house has won a national award for the conservation of wall paintings. The honour relates to the 1710 Sir James Thornhill paintings, which adorn the main staircase at Hanbury Hall in Droitwich. Icon awarded its Pilgrim Trust Award for Conservation to the Perry Lithgow Partnership over the paintings.

The large pieces of art depict the Greek god Achilles. Hanbury’s conservation work included cleaning the surface of the wall paintings, consolidating cracks, repairing previous restoration work, and restoring areas of flaking paint.

Sir James Thornhill, who was commissioned by Hanbury Hall’s builder, Thomas Vernon, also painted the dome of St Paul’s Cathedral and the Painted Hall at Greenwich.

The Conservation Awards were launched in 1991, are supported by Icon, and are sponsored by The Pilgrim Trust, Digital Preservation Coalition and the Anna Plowden Trust. Since 2005, the awards have also been generously supported by Sir Paul McCartney, the National Trust said.

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*Your best work is a product of joyful creativity. But when that doesn't happen, a deadline will do.*

(not always. Ed.)