

President's Letter

Marie Labinis-Craft

Dear Membership,

I'm pleased to announce that plans for the annual meeting are slowly but surely falling into place. The annual meeting will take place September 15th through the 18th, beginning Wednesday evening with a reception at the White Stag Block in historic Old Town Portland, our venue for the next two days. The last day presentations will take place at the Center for Architecture, home to the Portland Chapter of the American Institute for Architects.

I'm excited about both venues for many reasons but in particular because they provide an opportunity for outreach, and both are beautiful historic buildings with great facilities for meetings.

The White Stag Block is comprised of three historic buildings—the Bickel Block Building, 1883, the Skidmore Block Building, 1889, and the White Stag and Hirsch-Weiss Building, 1907, all of which are on the National Register of Historic Places. In 2006, the buildings were refurbished, retaining the historical integrity while making mechanical, electrical, and seismic upgrades to make them safe and functional. The restoration also revealed the cast-iron columns that had been hidden by later modifications.

In 2008, the University of Oregon moved into the White Stag Block combining existing Portland-based departments and programs from their School of Architecture and Allied Arts, AAA. Within AAA, (though not in Portland yet), is their Historic Preservation Program, an interdisciplinary program that provides students an understanding of historic resources and the processes for their preservation. The curriculum's focus is in research methods, preservation history and theory, and the economic, legal and administrative processes of preservation. My hope is faculty and/or some students will present and join us at the meeting in September.

The development, restoration, and green renovation of the buildings would be a wonderful presentation as the White Stag Block is a gold LEED-certified building. Located a few blocks away and on track for platinum LEED-certification, is the Center for Architecture, an 1880s building that was once a horse stable.

Contents

President's Letter	1
Back Issues Online	4
Regional News	5
Illuminating Art Using a Daylight System at the Broad Contemporary Art Museum	10
<i>by Mark Gilberg, Charlotte Eng, and Frank Preusser</i>	
Safe Handling of Plastics in a Museum Environment	16
<i>by Jai-sun Tasang</i>	
AYMHM	22



President's letter, continued

The Center for Architecture is in the heart of Portland's newly refurbished Pearl District. A few blocks away is Portland icon Powell's City of Books, the Museum of Contemporary Craft, Portland Institute for Contemporary Art, and many other great galleries, shops, restaurants, and parks.

I'm still looking into possible workshops and walking tours. Portland has many great walking tours or you can just take walks through some of the Parks. The White Stag is across the street from Waterfront Park and Portland Saturday Market, one of my daughter Emily's favorite places to buy hand made gifts. For even more ideas, history, and general info, check out Wikitravel Portland at [wikitravel.org/en/Portland_\(Oregon\)](http://wikitravel.org/en/Portland_(Oregon)).

The Ace Hotel is offering rooms for WAAC at a reduced rate, and I hope to add other hotels for reduced rate rooms, so keep an eye out for the registration materials next month.

In addition, please contact me if you would like to present a paper. I have submissions from many conservators in the Pacific Northwest and would like to have more from other places.



Silent Auction

Once again we will be holding our Silent Auction at the Portland Meeting.

Please start thinking what lovely, useful, fascinating, and/or bizarre contributions you can bring.

New this year !!! Prizes for best items !!!!!!!!

Bev Perkins will be the organizer, so please contact her with any questions.

BevP@BBHC.org
(307) 578-4029
Buffalo Bill Historical Center
720 Sheridan Ave.
Cody WY 82414

Volume 32 Number 2 WAAC Newsletter

WAAC Newsletter (ISSN 1052-0066) is a publication of the nonprofit Western Association for Art Conservation (WAAC). It is published three times per year, in January, May, and September. WAAC Newsletter is printed on alkaline paper. Copyright 2005 Western Association for Art Conservation.

EDITOR

Carolyn Tallent

REGIONAL NEWS

Dana Senge

HEALTH & SAFETY

Chris Stavroudis

ARTICLES YOU MAY HAVE MISSED

Susanne Friend

COPY EDITOR Wendy Partridge

Photocopying

To make academic course packets that include articles from WAAC Newsletter, contact the authors of the articles directly.

Note to Authors

Authors of articles and other contributions accepted for publication in WAAC Newsletter assign to WAAC Newsletter the right to publish their work in both print and electronic form and to archive it and make it permanently retrievable electronically. Authors retain copyright, however, and may republish their work in any way they wish.

Disclaimer

The Western Association for Art Conservation does not recommend particular individuals, businesses, treatments, products, or services. WAAC Newsletter is simply a vehicle for the presentation of information from various sources. Publication of articles or reports in the Newsletter should not be construed as an endorsement of their content by WAAC. Opinions expressed in articles published in the Newsletter are those of the authors.

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) hosted by Stanford University Libraries, at <http://palimpsest.stanford.edu/waac/>.

Deadline

Contributions for the May Newsletter should be received by the Editor before **August 4, 2010**.

Western Association for Art Conservation

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

PRESIDENT

Marie Labinis-Craft

VICE PRESIDENT

Dana Senge

SECRETARY

General Information
New Memberships
Publication Orders

Brynn Bender

TREASURER

Change of Address
Payments

Natasha Cochran
3650 Watseka Ave., Apt. 14
Los Angeles, CA 90034-7566
310/707-8055
EMail: natasha.cochran@gmail.com

MEMBERSHIP SECRETARY

Chris Stavroudis

MEMBERS AT LARGE

Ria German-Carter
Albrecht Gumlich
Beverly Perkins
Marie Svoboda

WEB EDITOR

Walter Henry

PUBLICATIONS FULFILLMENTS

Donna Williams

Individual Membership in WAAC costs \$35 per year (\$40 Canada, \$45 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 \$40 per year (\$45 Canada, \$50 overseas) and entitles the institution to receive the WAAC Newsletter and Membership Directory. For membership or subscription, contact the Secretary.

WAAC Contributes to Support CoOL

CoOL and the Conservation DistList have become essential resources to our field, a fact that was clearly demonstrated when we were left without them last year. Fortunately, FAIC has committed to their long-term support, but has yet to secure funding and is actively looking for both long and short term money.

In consideration of WAAC's long history with CoOL (and Cons DistList), the Board decided at the mid-year meeting in Los Angeles that it was appropriate that WAAC members pay their way. We voted to donate \$5 / member for last year, totalling \$2300. The money to come from our fund for special projects. We also decided that, pending a vote at the Portland meeting, dues would be increased \$5 / year for all categories, with the money going to CoOL. It's a tiny amount of money for a year of connection and information.

As far as we know, WAAC is the first organization to take this step. We encourage other organizations to look into the possibility of making the same commitment on behalf of their members.

From the Editor: back issues online

Good news. We have finally sorted out the problems with getting the back issues online, and possibly by the time you read this, or shortly thereafter, the first group should be up on our web site. Nine volumes for now, more to follow.

They will appear as pdfs; you can read the entire issue or each article as a separate pdf. (You may observe that we have a new policy of removing all contact information in the interests of privacy.) Hard copies are still available, and after we are caught up we will return to the policy of waiting 6 months to post an issue online, in deference to those who actually pay for the *Newsletter*.

In case you missed them in print, or just to remind you of the terrific contributions we get, here is a list of the feature articles from the newly posted issues.

v. 27 # 2 May 2005

Pigment-medium Interactions in Oil Paint Films Containing Lead-based Pigments

by Catherine Higgitt, Marika Spring, and David Saunders

A New Approach to Cleaning I

by Chris Stavroudis, Tiarna Doherty, and Richard Wolbers

v. 28 # 2 May 2006

Tear Repair of Cotton Canvas: A Variation of the Heiber Technique

by Linda Waters

Cultural Considerations in the Care of American Indian Objects

by Sherelyn Ogden

What about Sacred Objects?

by Alyce Sadongei

v. 29 # 3 September 2007

A Novel Approach to Cleaning II: Extending the Modular Cleaning Program to Solvent Gels and Free Solvents, Part 1

by Chris Stavroudis and Tiarna Doherty

Protecting Collections in the J. Paul Getty Museum from Earthquake Damage

*by McKenzie Lowry, BJ Farrar, David Armendariz,
and Jerry Podany*

v. 30 # 1 January 2008

Strip 'Teas' - Solubility Data for the Removal (and Application) of Low Molecular Weight Synthetic Resins Used as Inpainting Media and Picture Varnishes

by Gregory Dale Smith and Ronald Johnson

Edge Finishing Silk Crepe

by Yoonjo Lee

Working with Daylight in the Museum Environment

by Steven Hefferan

Annual Meeting Abstracts

v. 30 # 2 May 2008

Conservation Issues: The Case of Time-Based Media Installations

by Marie-Catherine Cyr

UV and Visible Light Filtering Window Films

by Samantha Springer

v. 30 # 3 September 2008

Thoughts About "Crosslinking"

by Robert L. Feller

The Deterioration of Newsprint and Implications for Its Preservation

*by Charles S. Tumosa, David Erhardt, Kathy Hufford, and
Evan Quasney*

Working for the Man, Government Contracts

by Carolyn Tallent

The AGS2000 Aerosol Generator

by Nancy Turner

v. 31 # 1 January 2009

A Preliminary Review of Some Alternatives to PhillySeal R Epoxy for Conservation and Mountmaking

by BJ Farrar, Jeff Maish, and Mara Schiro

**Steamlining Condition Reporting:
A New Approach at the Victoria and Albert Museum**

by Helen Nodding, Victoria Oakley, and Sandra Smit

Sorting Out Surfactants

by Chris Stavroudis

Naming of Generic Hydrocarbon Solvents: an Update

by Alan Phenix

Annual Meeting Abstracts

v. 31 # 2 May 2009

**Forging Ahead Or,
How I Learned to Stop Worrying and Love eBay**

by Charles Stanish

Filming in Museums

Never Yell "Cut" A Brief Guide to Filming in Museums

by Chris Stavroudis

Glossary of Film Terms

**It's a Wrap!
Protecting Hampton Court Palace During Filming**

by Laurie Gibbs

A Compilation of Guidelines for Filming

by Carolyn Tallent

v. 32 # 1 January 2010

**On Again, Off Again: Conservation Aspects in
Accessible Display Case Design**

by Michele Austin Dennehy and Kim Cullen Cobb

**UV-Blocking Window Films for Use in Museums
— Revisited**

by Colleen Boye, Frank Preusser, and Terry Schaeffer

Reform of the MSDS is Coming

by Monona Rossol

Regional News

Dana Senge, column editor

ALASKA

Monica Shah has been in Washington DC installing *Yuung-naqpiallerput (The Way We Genuinely Live): Masterworks of Yup'ik Science and Survival* at the National Museum of Natural History. She continues to work on exhibits for the grand opening of the expansion project at the Anchorage Museum at Rasmuson Center as well as changing exhibits of objects from the permanent collections and preparing to install the Arctic Studies Center.

Scott Carrlee has been working with paper conservator **Seth Irwin** on a project to bring basic paper conservation services to small museums around the state of Alaska. Thus far, Seth has worked at the Valdez Historical Museum and the Clausen Museum in Petersburg. Future sites include the Aviation Heritage Museum in Anchorage, the Dorothy Page Museum in Wasilla, and several museums on the Kenai Peninsula. The project includes workshops and staff training as well as minor conservation treatments on photos and archival materials.

Ellen Carrlee is working on object treatments for the summer exhibition of recent acquisitions *From Gift to Gallery* and had help from a visiting conservator from Wales, **Siobhan Coop**. Ellen co-presented an Archaeology Curation and Conservation Seminar at the Alaska Anthropology Association conference in March, and will be co-presenting an AAM/AIC webinar in May, offering the case study of the Alaska State Archives flood for discussion.

Regional Reporter:
Ellen Carrlee

ARIZONA

Martha Winslow Grimm has been involved with many local exhibits involving costume and textiles. She has helped the Phoenix Art Museum open two exhibits on South East Asian textiles and also a Fashion Design Department exhibit featuring clothing of World War II. The big news in Phoenix is the opening of the Musical Instrument Museum where Martha prepared costume and textiles for exhibition and helped dress the uniquely sculptured metal mannequins.

Gloria Giffords and **Meredith Milstead** have begun work on a trilogy of paintings by the local matador turned artist, Corona, for the Pimaría Alta Historical Society in Nogales, Arizona. Painted in the 1940s, these 6' x 12' oil on "manta" cotton paintings were originally intended for a restaurant in Nogales, AZ. They represent three early phases of Mexican history (pre-Columbian, the Conquest, and the colonial era). All suffer from years of exposure to grime and other airborne nasties, as well as being thinly painted with a number of unstable materials and hanging slack on the inadequate size

Regional News, continued

bars. The treatment consists of mending tears, surface and reverse cleaning of the painting, and reattachment and stretching upon heavy-duty bars.

At the National Park Service Lab in Tucson, **Maggie Kipling** and **Audrey Harrison** treated a group of 800 year-old yucca and cotton textile fragments from Montezuma Castle National Monument.

Brynn Bender, Audrey, and Maggie surveyed historic Native American jewelry, basketry, and ceramics on exhibit at Mesa Verde National Park.

The lab happily welcomes assistant conservator **Dana Senge** to the NPS staff. As Dana settles into lab operations she has begun addressing the conservation needs for 740 ethnographic artifacts from the Vernon Collection of Grand Teton National Park, including the remaining 150 individual treatments. Pre-program intern **Kevin Wohlgenuth** joined the crew on a trip to Grand Canyon to continue treatments to the historic boat collection.

The ASM Preservation Division hosted two National Preservation Institute workshops including Conservation Strategies for Archaeologists taught by **Emily Williams**.

Nancy Odegaard and **Christina Bisulca** curated ASM's newest exhibit *Ice Age Arizona: Preserving the Naco Mammoth* which includes a lecture series and a tour of the mammoth kill sites. Christina presented her research on the deterioration and stabilization of the semi-fossilized mammoth remains on April 22nd. Christina has also been working on a NEH funded survey of the ASM's paleontological collection. She received a scholarship award to work with the Viking Ship stabilization project in Oslo, Norway over the summer.

Nancy organized a special conservation program for high school students from the Arizona School for the Blind in the ASM conservation lab. In April, Nancy taught archaeological conservation in Baku, Azerbaijan. Nancy is working with the repository staff on a

major move of archaeological materials to new storage.

Molly McGath continues her research and analysis of nano-particle treatment on cordage with **Werner Zimmt** who is also working on iron corrosion and a comprehensive reference on adhesives used in conservation treatments of ceramics.

Esther Echenique continues with projects at the ASM including the documentation and conservation of West Mexican ceramic figurines. She has also been working part-time with the Musical Instrument Museum in Scottsdale as they prepare for their opening. She was accepted to the UA School of Anthropology graduate program and is interested in studying archeological pigments.

Teresa Moreno is currently on sabbatical in London doing coursework and research on silver for her Ph.D. at UCL Institute of Archaeology. Teresa will be returning to the Mt. Lykion archaeological site in Greece in the summer.

Gina Watkinson has been working on the documentation of objects for various exhibits and loans. Gina has also participated in NAGPRA consultations with ASM collections staff. She continues to assist conservation staff and students with projects and is preparing a conservation lab manual.

Regional Reporter:
Brynn Bender

GREATER LOS ANGELES

Associate conservator **Angela McGrew** and conservator **Ozge Gencay Ustun**, working at the Autry, are examining collections of the Southwest Museum of the American Indian and Museum of the American West. Ozge has been working on scanning NAGPRA items for presence of heavy metal pesticides within the Southwest Museum. Angela continues to work on the Southwest Museum move project.

They recently worked on the basket exhibition, which opened last year in November at the Museum of the American West at Griffith Park. The show organized in a very short time features around 300 northern Native American baskets from the collections of the Southwest Museum. It will be running until November this year.

Angela has been doing treatments and mount preparations for the *Home Lands* exhibit, which opened in April at the Museum of the American West. This show includes a quilt from the Colorado Springs Pioneer Museum that underwent a major treatment of its shattered silk border performed by **Yadin Larochette**.

Recently, Ozge co-presented a paper at the Society of California Archaeology's annual meeting in Riverside with **Vanesa Muros** and **Molly Gleeson**, who also organized and chaired the symposium session on Conservation of California Sites and Artifacts.

Douglas MacLennan has recently begun interning under **Jennifer Kim** at the Academy of Motion Pictures Arts and Science. Douglas graduated from the University of Michigan in 2003 with degrees in History and German. He will be applying to the Conservation Center for the Fall 2010 academic year. Douglas plans to pursue further conservation training in medieval art specifically working with panel paintings or illuminated manuscripts.

LACMA paintings conservators were busy in January and February preparing and installing new exhibitions. **Joe Fronck** traveled to Paris to collect *Renoir in the 20th century* at the Grand Palais, and **Elma O'Donoghue** traveled to New York to collect *American Stories, Paintings of Everyday Life* at the Met.

In March, **John Hirx** and **Bianca May** went to El Museo del Barrio in NYC to install LACMA's exhibition *Phantom Sightings*.

Chail Norton attended the workshop "Care and Identification of Photographic Materials" at the end of February given

Regional News, continued

by **Gawain Weaver** at UCLA. The 4 day workshop covered early 19th-century photography through modern color digital processes. It was a wonderful introduction and refresher.

Jennifer Porter, Frank Preusser, Laura Parodi, and Yosi Pozeilov published an online article entitled "Tracing the History of a Mughal Album Page in the Los Angeles County Museum of Art" for AsianArt.com. The article discusses the technical study and interpretation of a 16th-17th-century Mughal album page, *Hunters in a Forest*, undertaken by the LACMA conservation research laboratory and **Laura Parodi**, an art historian specialized in Mughal paintings. The study focused in particular on the extent and significance of historic repainting of the piece. The article can be viewed at asainart.com/articles/mughal/index.

Over the last ten months, **Victoria Blyth Hill** has been working with the Virginia Museum of Fine Arts in Richmond on 20 paintings from their collection of Tibetan and Nepalese thangkas and scrolls. The project has been in preparation for the opening of the new Southeast Asian wing of the VMFA in May of this year.

The project included treatment, matting and mounting and required a team of specialists, including **Cara Varnell**, textile conservator, **Jane Berman** of Ota House to create the silk covered mats and custom shaped mounts, and **Ashley Macomber**, an artist who assisted Victoria with the documentation and treatments. In addition, there were seven thangkas which required technical photography and analysis. Victoria is very grateful for the research performed by Frank Preusser, senior scientist and **Rebecca Broyer**, Mellon postdoctoral fellow, and photography by Yosi R-Pazeilov, all in the Conservation Center at LACMA.

The second edition of *Care and Handling of Thangkas: A Guide for Caretakers*, written by Victoria, is arriving this month. The new addition will include a Chinese translation in addition to the English and Tibetan from the first edition. Ten thousand copies will be dis-

tributed for free to monasteries, libraries, and temples in China.

Sculpture Conservation Studio just finished the conservation of the United Spanish War Veterans Monument at the Los Angeles National Cemetery (on the corner of Veteran and Wilshire Blvd) and will be working on the Battle of San Pasqual and USS Bennington Monuments in April. SCS moved offices in January to 1946 South La Cienega Blvd, Los Angeles. It is a great location for the studio, with lots of art galleries just down the street.

Griswold Conservation Associates, LLC completed the conservation treatment of the original painted ceiling at Mission San Miguel. Directed by **John Griswold, Leslie Friedman** and **Sylvia Schveri** supervised a site lab and fieldwork to treat almost 500 painted planks, along with the massive *vigas* and corbels. John also directed the treatment of the stone facade of the Royal Presidio Chapel in Monterey, CA, including the sandstone relief of *Our Lady of Guadalupe*, the oldest, non-indigenous sculpture in California.

GCA staff has also completed an environmental study at Hearst Castle, following up on an earlier study done by **Nathan Stolow** in the 1980s. They welcomed **Laura Prickett** as the new project manager, **Mary Fletcher** as manager of administrative services, and assistants **Eve Doolin** and **Kami Lerner**, and said goodbye to technicians **Andy Ritzo** and **Jennifer Argenta**, who will be missed,

Regional Reporter:
Virginia Rasmussen

HAWAII

Presently, working for clients in Hong Kong and Tokyo, **Dawne Steele Pullman** has been treating contemporary Western and Eastern paintings by the Canadian artist Leoplod Plotek as well as the Vietnamese artist Ngyuen Thanh Binh.

Gregory Thomas has continued to provide fine art conservation services to his clients, while setting up his new more spacious studio in Kailua, Oahu. During March of this year Gregory again worked with **Anne Rosenthal** on her mural conservation project at the Maritime Museum in San Francisco for the National Park Service.

Thor Minnick has completed treatment of a 19th-c. turned fruit-wood zograscope for the University of Hawaii at Manoa's Jean Charlot Collection. In addition he has been working with two silver, gold, and enamel King Kalakaua - Royal Order badges and with an extensive treatment to an important C. E. Williams koa-wood circular table.

Regional Reporter:
Dawne Steele Pullman

NEW MEXICO

On March 12, 2010, **Bettina Raphael** gave a talk "A Portrait of Olive Rush: An Independent Spirit," sponsored by the Office of the State Historian. The lecture was held at the Olive Rush studio, a building that is now the meeting place of the Society of Friends in Santa Fe, and it is usually not open to the public. Bettina gave a very interesting talk, and it was a treat to be able to see the Rush Studio.

Regional Reporter:
M. Susan Barger, PhD

PACIFIC NORTHWEST

Jan Cavanaugh has received a Lecture Grant from the FAIC. She will be offering a 5-part public lecture series titled "What is Art Conservation?" at the Portland Art Museum in the fall.

Claire Dean continues to work periodically at the Natural History Museum in Los Angeles County. She has also

Regional News, continued

recently completed the cleaning of 30 pieces of fire damaged bead work belonging to members of the Nez Perce Nation, Idaho. Claire is also getting ready for a two-week dog sledding expedition to the Arctic in April. With luck, global warming will not have stripped the far North of all of its ice and snow by then.

Charles Rhyne's website, "Architecture, Restoration, and Imaging of the Maya sites of Uxmal, Kabah, Sayil, and Labna, the Puuc Region, Yucatan, Mexico" was recently cited as one of 24 great websites for art history (Ching-Jung Chen, "Great Websites for Art History," *Collection Building*, Vol. 28, no. 4, 2009, pp. 155-158).

The Royal British Columbia Museum conservators have been busy with preparations for a new cold storage facility, dismantling the wonderful S'abadeb exhibition on loan from the Seattle Art Museum, testing natural history specimens for pesticide residues, and devising a plan for the totem poles and other outdoor artifacts.

In April, **Johanna Wilms** will be joining the RBCM, completing a graduate internship for the University of Applied Sciences and Arts in Hildesheim, Germany. And in the fall, **JoAnn Peters** will be joining the RBCM as a visiting researcher from Central Washington University, carrying out analyses of plastics in the History Collection. The conservators are also gearing up for a comprehensive collections risk assessment, building on the last one completed in 2005.

Regional Reporter:
Corine Landrieu

ROCKY MOUNTAIN REGION

Victoria Montana Ryan is presenting a pre-conference workshop for CWAM and a spring workshop for the Society of Rocky Mountain Archivists (SRMA). Both workshops are funded by Connect-

ing to Collections grant awarded to Colorado last year. She is also scheduled for a lecture at Colorado College on 'Fakes and Forgeries' where she'll be discussing the latest in portable XRF analysis.

Beverly Perkins served on an NEH review panel and an IMLS review panel.

Laura Downey Staneff and **Camille Moore** have changed their minds about the disposition of their business, Silverpoint Art Conservation, LLC. In an amicable arrangement, Laura will retain the Silverpoint name with a reduced business scope. Camille will start a new company, Moore Art Conservation, LLC for her private practice in paper and photograph conservation.

WCCFA is proud to announce the addition of a new paintings conservator to the staff, **Yasuko Ogino**. Yasuko comes to WCCFA from the Atlanta Art Conservation Center in Atlanta, GA (a satellite regional center of the Williamstown Art Conservation Center in Williamstown, MA.) Yasuko is originally from California, and she, along with husband and fellow conservator James Squires (newly appointed to the Denver Art Museum and a native of Colorado) are thrilled to return to the West to work and raise their two sons, Finn and Calder.

WCCFA conservator, **Camilla Van Voooren** has joined the board of DUART!, a non-profit student support group of the Art and Art History Department at the University of Denver. Camilla was also awarded an FAIC Professional Development Grant to attend "Cleaning 2010" in Valencia, Spain in May.

University of Denver undergraduate student, **Rachael Meisel**, is currently a pre-program intern at WCCFA.

WCCFA conservators completed the treatment of 56 paintings by the important American artist, Julien Alden Weir, as well as his father, Robert Weir, and his half brother, John Ferguson Weir, as part of a Save America's Treasures Grant awarded to the Brigham Young University (BYU) Museum of Art. This col-

lection from the estate of J. A. Weir was bequeathed to the museum by one of Brigham Young's grandsons, Mahonri Young, who was an artist in his own right, and was married to J. A. Weir's daughter, Dorothy. This was a two year project and BYU will present much of this material as part of an exhibition planned for 2011.

Meghan McFarlane accepted the Assistant Conservator position at the Denver Museum of Nature and Science.

Regional Reporter:
Paulette Reading

SAN FRANCISCO BAY AREA

Claire Antonetti, **Niccolo Calderaro**, **Chris Augerson**, and conservation assistant **Jena Hirshbein** completed treatment on a set of eight choir loft panels for the Mills College Jeannik Méquet Littlefield Concert Hall in Oakland, California. The college embarked on a full-scale restoration of its Music Building, which houses classrooms, practice rooms, and offices. In 1928, architect Walter H. Rattcliff Jr. designed the modern-era Spanish Colonial Revival Style building that also sports open colonnades, walled courtyards, and Moorish fountains, all of which surround a 500-seat concert hall, considered a jewel of its time.

The choir loft panels painted in fresco on wood were created by Bay Area artist Ray Boynton, known for his mural work throughout the area as well as for his experimental painting techniques with fresco. Each of the eight panels are set fifteen feet above the stage of the concert hall into a tracking system, which is powered by hand. The panels are made up of single planks, prepared with layers of linen, adhered with animal glue and a finely applied plaster layer to facilitate the application of tempera paint and various metal leafs. This unconventional approach to fresco making -- coupled with years of physical motion -- created a unique set of conservation problems

WAAC Publications

Handling Guide for Anthropology Collections

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

Price: \$8.85

(\$6.60 copy for orders >10 copies)

Back Issues of WAAC Newsletter

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

**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

for the panels which primarily required cleaning, consolidating, and inpainting.

Will Shank is pleased to announce that he has been awarded the 2010 Conservation Advocacy Award for distinguished achievement in conservation by the American Institute for Conservation. He is being acknowledged for his work with Rescue Public Murals, an initiative of Heritage Preservation, that he co-founded with **Tim Drescher** of Berkeley in order to raise public awareness of the plight of outdoor community murals. The award was presented at the May meeting of A.I.C. in Milwaukee. The Conservation Advocacy Award recognizes the accomplishments and contributions of conservation professionals who, through substantial efforts in public outreach and advocacy, have advanced the field of conservation and furthered the cause of conservation.

Regional Reporter:
Beth Szuhay

TEXAS

Sylvie Pénichon, Conservator of Photographs at the Amon Carter Museum in Fort Worth, Texas received a 2010 FAIC Samuel H. Kress Conservation Publication Fellowship to work on her manuscript in progress *Care and Identification of 20th-Century Color Photographs*. In March, she taught a one-week course on the history, identification, and care of color photographs to students of the International Post-graduate Course in Photograph Conservation at the National School for Conservation, Restoration and Museography (ENCRYM), in Mexico City. While in Mexico City, she also gave a public lecture “El montaje de In the American West de Richard Avedon.”

Since taking on the post as the Judd Foundation’s conservator in September 2008, **Shelley M. Smith** has been conducting a sculpture survey of over 300

permanently installed works by the late artist Donald Judd. The works are located throughout 7 properties in Marfa, TX and 3 ranches located on the south side of the Chinati mountain range some 80 miles south of Marfa.

Shelley is currently working in New York preparing for the deinstallation of Donald Judd’s building that served as his New York residence and studio. The 5-story cast-iron building designed by Nicholas Whyte in 1870 is located at 101 Spring St. The building is about to undergo a major restoration in late 2010. In preparation for this, the interior and immovable works will be protected in place and 5000 objects, furniture, and artworks conserved and moved to temporary storage. Assisting in this project is **Kendra Dacey**, a graduate of University of Lincoln with an MA in Conservation of Historic Objects and **Vickie Arndt** as art preparator.

Aniko Bezur, Andrew W. Mellon Conservation Research Scientist for the Museum of Fine Arts, Houston and the Menil Collection, writes:

The Gulf Coast Conservation Group (GCCG) was established in June 2008 by conservators and scientists at the Museum of Fine Arts, Houston, the Menil Collection, and Rice University to provide a local and regional forum to professionals and students for exchanging and enhancing knowledge about conservation and scientific research through presentations, discussions, and social networking. We hope to nurture good relations between area conservators and scientists, building a thriving conservation community in Houston, and the Gulf Coast region that will help attract other conservation professionals, fellows, and interns to this area.

For more information about GCCG, you may contact Aniko at abezur@mfa.org or by phone at 713-639-7738.

Regional Reporter:
Ken Grant

Illuminating Art Using a Daylight System at the Broad Contemporary Art Museum

Introduction

In February 2008 the Broad Contemporary Art Museum (BCAM) opened on the campus of the Los Angeles County Museum of Art (LACMA). Designed by the award winning architect, Renzo Piano, the three-story building features 72,000 square feet of gallery space, a distinctive red escalator that transports visitors to the third-floor main entrance, and a horizontal roof composed of glass panels and saw-tooth skylights that channel north light into the third floor galleries while excluding direct sunlight (Figure 1).

The use of diffuse natural light to illuminate the third floor galleries is one of the defining features of the building and was purposely incorporated into the design to take advantage of the varying intensity and color of natural light to enhance the visitor viewing experience. In this paper, the authors will review the design of the roof lighting system and present an assessment of its overall effectiveness using environmental data collected over the past two years. The practical implications associated with recent changes in museum architecture to take advantage of diffuse natural light to illuminate artwork will be discussed in terms of the changing nature of exhibition and conservation practice.

Broad Contemporary Art Museum

Designed in the shape of a truncated “H”, each floor of BCAM consist of two, 10,000 square foot galleries separated by two corridors which are used as additional gallery spaces and also function as foyers. All utilities including the passenger and freight elevators are housed in the central core which separates the main galleries on each floor. The



Figure 1 Third floor gallery ceiling construction

main gallery spaces on each floor are free of support columns and measure over twenty two feet tall giving the galleries of sense of openness and a loft-like appearance. With the exception of the first floor, humidified air is delivered through an underfloor, air-distribution system to achieve appropriate environmental conditions within the galleries.

A key element of the design of the BCAM building is the use of natural light as the primary means of illuminating the third floor galleries. To accomplish this objective a roofing system was designed using north facing skylights to allow diffuse light to enter the galleries and external motorized shades to reduce the overall amount of light transmission into the galleries to a level appropriate for the display of moderately light sensitive works of art based on current museum standards for cumulative light exposure for “old master” oil paintings. Conservation standards and practices vary from museum to museum but typically limit paintings to illuminance exposure of 30 foot-candles (ftc). Since the potential for visible light to degrade light-sensitive objects is a function of the cumulative effect of light intensity over time, these instantaneous guidelines are often multiplied by 3,000 annual hours operation to yield annual allowances of 45,000 -90,000 ftc-hrs.

This approach eliminates the need to provide constant illumination at a specified light level and takes advantage of the varying intensity and color of natural light when viewing works of art.

Design of third floor roof system

The BCAM roof consists of a series of north facing skylights placed in a saw-tooth pattern at ten foot intervals which allows diffuse north light to enter the gallery (Figure 2). The roof system consists of a number of layers: (a) inclined fixed external shading; (b) external motorized roller blinds; (c) horizontal roof glazing panels and (d) horizontal shading mesh.

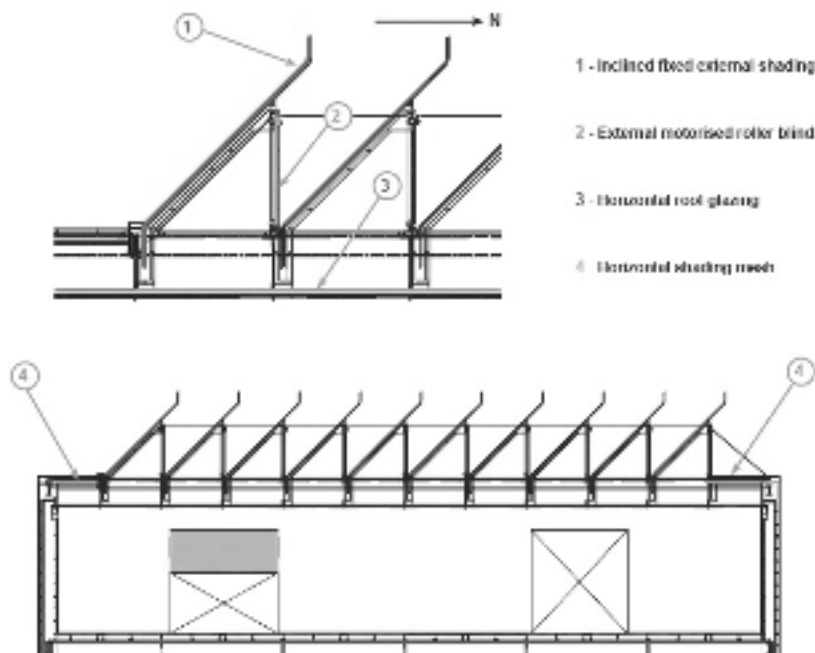


Figure 2 Third floor roof construction

Inclined fixed external shading

These white panels are inclined at 45 degrees and are open to the north to allow diffuse north light to enter the building. Their orientation prevents direct sunlight entering the gallery for most of the year, but allows reflected diffused sunlight through. In addition, the panels have a matte finish to reduce specular reflections. Gloss measured on the panels at the angle of incidence of 60 degrees is 2 gloss units. For painted surfaces, gloss measurements less than 10 gloss units at 60 degrees are considered matte.

External motorized roller blinds

The external motorized blinds serve three functions. The blinds diffuse early morning and late afternoon summer sun that can pass through the inclined fixed shading panels. They also provide a further degree of control of natural light levels within the gallery when the museum is open. When fully deployed, the blinds also reduce the amount of daylight entering the galleries when the museum is closed thereby reducing unnecessary exposure of art to light.

Horizontal roof glazing

Low iron insulating glazing units provide the weatherproofing layer. Low iron glass is used to maximize color rendering, therefore minimizing the distortion of the color of natural light transmitted into the gallery. Clear polyvinyl butyral (PVB) interlayers are also provided within the glass to filter ultra violet radiation to within conservation limits. A custom white frit pattern is applied to the glass to provide diffusion and to reduce glazing transmission to within the required range.

Horizontal shading mesh

This additional shading layer consists of fixed aluminum louvers in an east-west and north-south orientation. The spacing of the mesh is designed to prevent sunlight from entering the galleries throughout the year and is required where there are no inclined panels to provide shading.

Gallery lighting and daylight linking

Track lighting with UV filters are integrated within the glazing mullions of the third floor gallery and installed to provide ambient light for circulation, to spotlight sculpture, and to supplement available natural lighting when appropriate. The majority of track mounted fixtures are daylight linked through the use of photocells connected to the electric lighting control systems.

As designed, the system is intended to adjust the level of electric lighting to the available natural light to maintain a given total illuminance. When natural light falls below a given threshold, the control system automatically adds the required amount of electric light to increase the total illumina-

nance to the set level. Daylight linking ensures that energy consumption of track lighting is minimized when natural lighting levels within the gallery are sufficient and also provides for a gentle transition from daytime to night time lighting conditions.

Daylight predictions

During the design phase, a detailed annual illuminance exposure analysis was conducted to assess the performance of the roofing system. The light transmission through the roof system is a function of two factors referred to as the daylight factor and sun factor. The daylight factor is the ratio of the external horizontal illuminance from diffuse skylight to the internal illuminance. The sun factor is the ratio of the external horizontal illuminance from the sun to the internal illuminance.

Whereas the daylight factor can be assumed to be largely constant for all sky conditions (overcast, partly cloudy, or clear), the sun factor is a function of the position of the sun throughout the day and year and is thus variable. The analyses were conducted using a detailed three-dimensional computer modeling program created by Arup Lighting which made it possible to calculate the daylight and sun factors at various points on the walls of the third floor galleries.

Combining the daylight factor and sun factor analysis with measured weather data published for Los Angeles enables the annual variation of internal wall illuminance due to daylight to be predicted. From this data the annual exposure due to daylight can be calculated.

These analyses incorporate a wide range of data associated with the material characteristics of the roof and gallery construction including the percent transmission and reflectance of the glazing, internal walls and floors, roof structure, inclined shading panels, vertical roller blinds, and horizontal ceiling mesh. As expected these analyses also incorporate various assumptions associated with the operation of the museum including hours of operation, gallery cleaning and roof maintenance schedule, and roller shade operation.

The original design specifications called for a maximum of 30 ftc with the roller shades set at a fixed position for certain months of the year; thus, ensuring that the natural lighting remains within a given range throughout the year while maintaining some variability of natural light entering the third floor galleries.

The daylight linking system was programmed to add electric lighting when the daylight levels fell below 19 ftc, adding sufficient electric light to increase illumination due to daylight and electric light to 19 ftc when the museum is opened. When closed, the shades would be fully deployed and the electric lighting programmed to provide sufficient lighting for cleaning (19 ftc) and security (0.5 ftc).

Illuminating Art Using a Daylight System at the Broad Contemporary Art Museum, continued

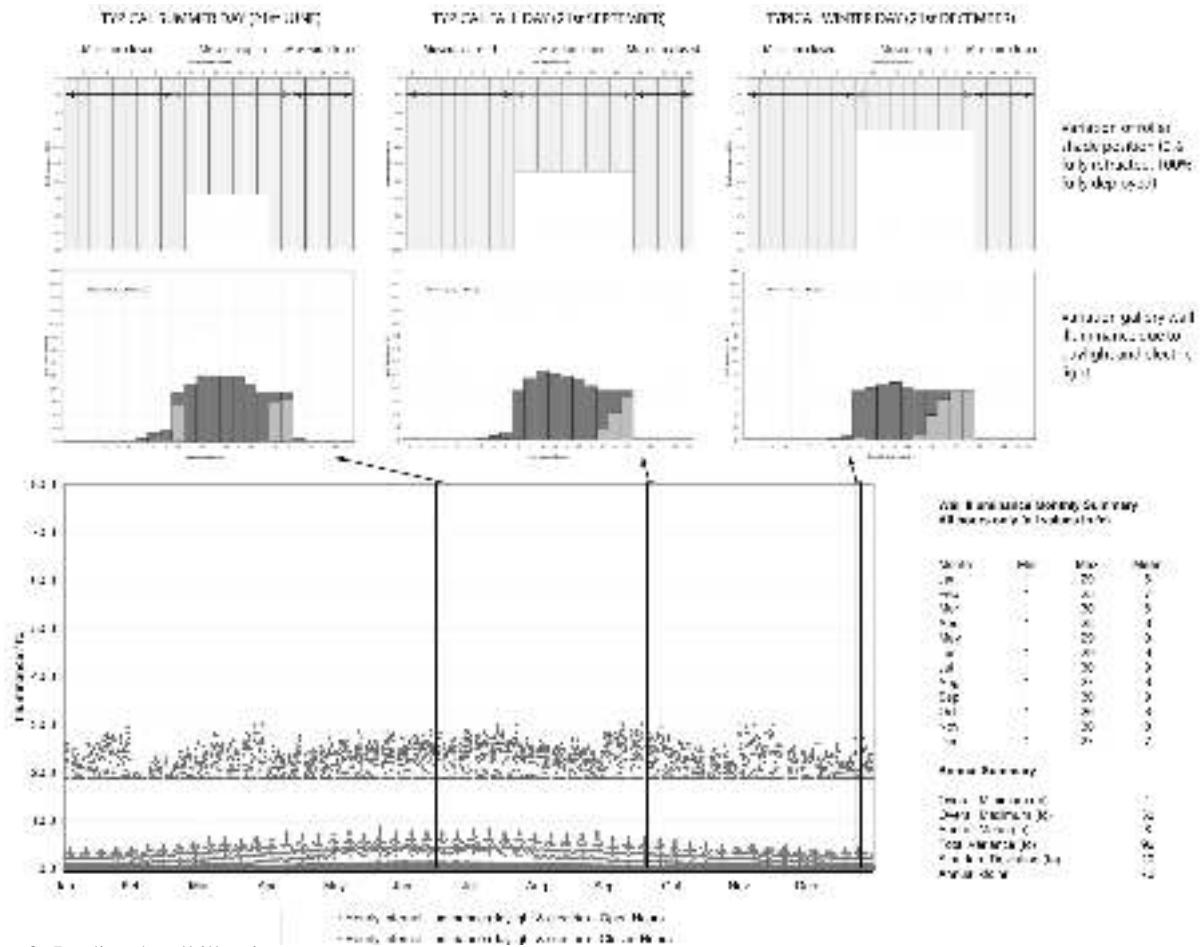


Figure 3 Predicted wall illuminance

The following series of diagrams illustrate the variation in wall illuminance at six feet above floor level due to natural and electric lighting within the third floor galleries predicted by the daylight and sun factor analysis incorporating the operational parameters discussed above (Figure 3). These diagrams illustrate how maximum natural light levels within the galleries can be controlled by partially deploying the roller shades. Predicted illuminance readings are illustrated for a typical summer, fall, and winter day.

Results and Discussion

Immediately following the opening of the museum it became readily apparent that the light levels in the galleries were far in excess of the predicted values. Even when the shades were fully deployed, the wall illuminances during the day were consistently above the predicted light exposure and reaching levels as high as 60 ftc. Given the magnitude of this discrepancy it was initially thought that the light transmission of the roller fabric was greater than anticipated. According to the manufacturer’s specifications, the roller blind had a total visible light transmission of 14% (10% diffuse and 4 % direct). Testing of the roller fabric in-house as well as by an independent laboratory yielded a

total visible light transmission of 16% (11% diffuse and 5% direct). Given that the test allows a 2% tolerance for error, the light transmission of the roller fabric was eliminated as one possible reason for the higher than predicted light levels in the galleries.

Attention soon focused on gaps in the design of the roofing system that allowed light to by-pass the roller blinds and enter the galleries. The original design specifications did not propose to provide 100% blackout to the galleries but that some daylight (5%) would pass between adjacent roller blinds. Hem bars that were supposed to be on the bottom of each roller shade were not installed due to a manufacturing problem. The absence of hem bars as well as gaps between the roller shade tube and the inclined roof panels also contributed to unfiltered light entering the third floor galleries and resulted in streaks of light moving across the gallery walls during certain hours of the day (Figure 4).

In order to estimate the amount of light infiltration into the galleries as a result of these gaps additional daylight factor analysis was conducted under total black-out conditions. The contribution due to hem bar gaps and the gaps between the roller shades was predicted to be 2% and 6.6% respec-

Illuminating Art Using a Daylight System at the Broad Contemporary Art Museum, continued



Figure 4 Unfiltered light entering third floor galleries

tively, yielding a total contribution of 8.6%. This amount was confirmed experimentally by comparing the light transmission of the roller blinds measured in-situ on the roof (15-17%) using an Elsec light meter with the gallery light readings obtained by measuring wall illuminances immediately before and after fully deploying the roller blinds (26%).

Even with the properly manufactured hem bars installed, it was not possible to eliminate the gaps between the roller blinds or the roller shade tube and the inclined roof. For this reason it was decided to replace the roller shades with a fabric possessing a lower visible light transmission to reduce the cumulative light exposure to an appropriate level. A roller blind was selected possessing a visible light transmission of 7% (6% diffuse and 1% direct).

The light levels in the galleries were subsequently monitored using data-loggers placed at six foot levels from the floor facing in each of the four compass directions. The data-loggers were placed in the corners of the galleries beneath the horizontal shading mesh.

While this placement was not ideal, it was unavoidable given the location of installed artwork and temporary walls. Furthermore, it was necessary to move several of the data-loggers throughout the year to accommodate additional changes in art installation and the exhibition schedule. Nonetheless, concurrent measurements taken along the same wall using hand-held light meters confirmed that the locations chosen and the orientation of the data-loggers are representative of the visible light exposure of paintings in the galleries, although they will always be slightly higher in the afternoon due to the presence of the metal grating.

The results of the light level readings in the galleries from May to December are given in Figure 5 which shows a considerable variability in gallery wall illuminance and a maximum light exposure in excess of the desired 30 ftc.

While the high light levels on certain days can be attributed to on-going changes in the roller blind schedule involving the prolonged retraction of the roller blinds to accommodate roof maintenance and filming in the galleries, the overall trend line is well above 30 ftc during the summer months. This may be due to any number of factors including cumulative tolerance errors associated with measurement equipment, construction, and the daylight/sunlight factor analysis.

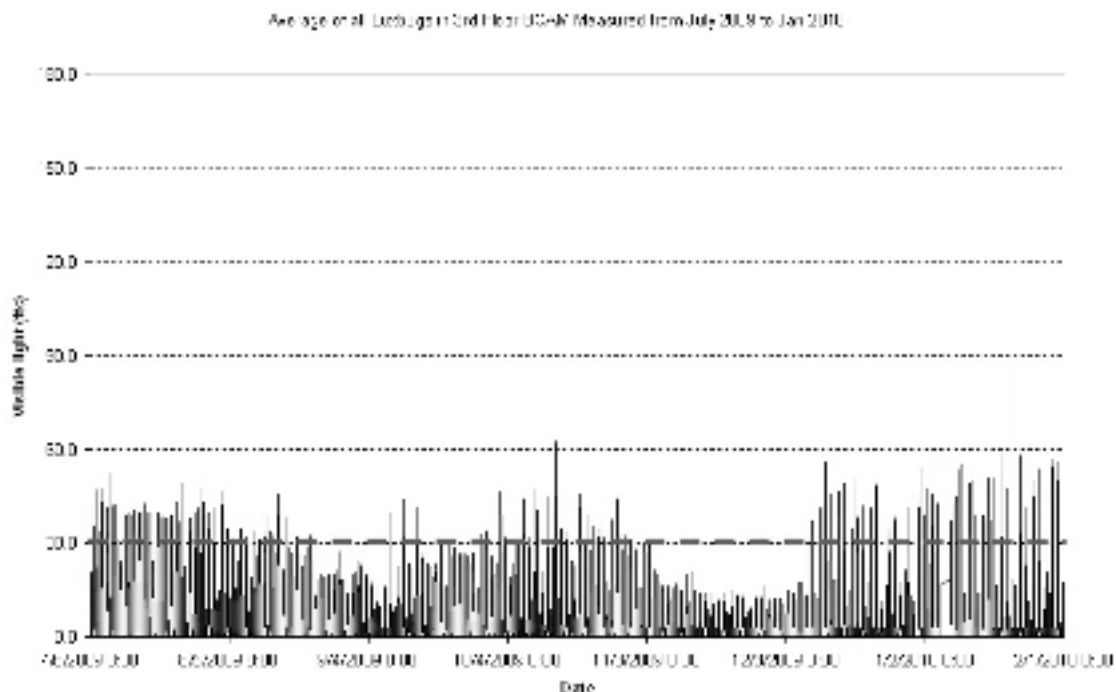


Figure 5 Measured wall illuminance

illuminating Art Using a Daylight System at the Broad Contemporary Art Museum, continued

It also may be a reflection of how the analysis addresses the difference in transmission of diffuse and direct light through different roller blinds. The high reflectance (~92% reflectance) of the bright white walls in the third floor painted walls is certainly a contributing factor. When a new exhibition was installed in one of the galleries with a change in wall color from bright white to light grey (~56% reflectance), the wall illuminance dropped dramatically.

Figure 6 Measured wall illuminance for a typical summer day

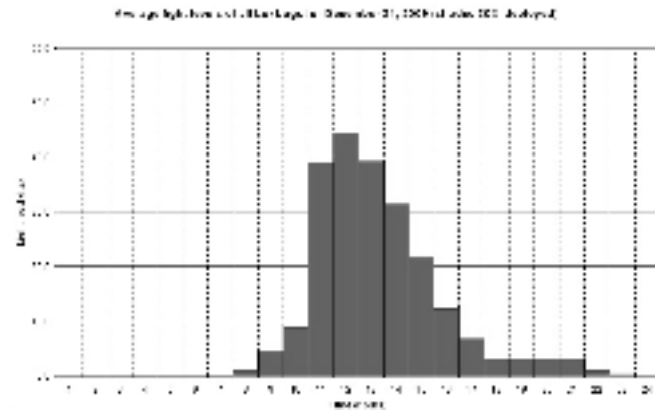


Figure 7 Measured wall illuminance for a typical fall day

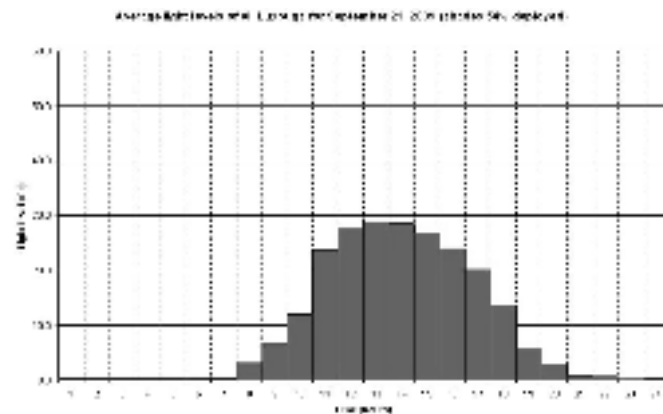
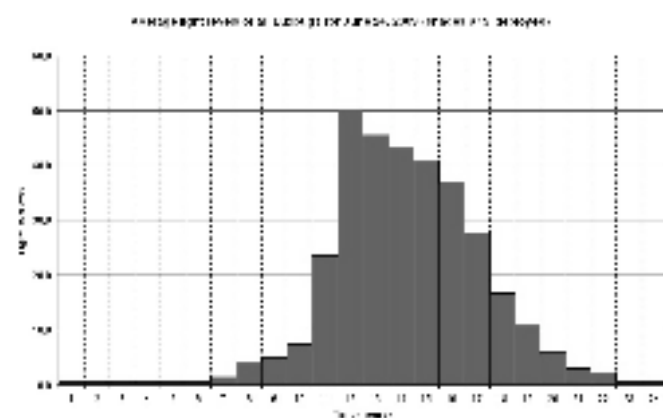


Figure 8 Measured wall illuminance for a typical winter day



Graphs of the variation in measured data representing the internal wall illuminance at six feet above the floor for a given day in summer, fall, and winter are illustrated in Figures 6, 7, and 8, respectively.

When compared with predicted values illustrated in Figure 3, it is readily apparent that the measured wall illuminance was not always greater than or equal to 19fc as predicted for daylight linking for all museum open hours. The contribution to the gallery light levels provided by the gallery track lighting and the daylight linking system proved difficult to assess.

The track lighting was programmed to automatically turn on and off when the museum was open and closed to the public, respectively. The two track system was fully energized when the museum was open to spotlight specific works of art and to provide a gentle wash of the walls.

In general, the system failed to maintain the minimum 19 fc of illumination in the galleries (as defined in the program) during the fall and winter months when the natural light levels fell below 19 fc in the late afternoons and evening hours. This is probably a reflection of the number of gallery lights installed in the gallery which was not sufficient to generate the required wall illumination.

Table 1 Measured wall illuminance (monthly average)

Month	Roller Shade Control	Minimum (fc)	Maximum (fc)	Mean (fc-hrs)
May	67% deployed	0	174	13
June	67% deployed	0	142	13
July	67% deployed	0	62	14
August	67% deployed	0	47	9
September	54% deployed	0	44	7
October	54% deployed	0	63	9
November	30% deployed	0	29	4
December	30% deployed	0	56	7
January	54% deployed	0	86	8
February	54% deployed	0	88	7

* Shades deployed when museum closed and when early morning and late summer sun shading is required in summer. Shades otherwise operate seasonally to limit maximum daylight illuminance to 30fc. Gallery electric lighting controlled when museum is open to maintain 19fc of illumination on the walls at 6 feet. Electric lighting off when natural lighting is greater than 19 fc.

Illuminating Art Using a Daylight System at the Broad Contemporary Art Museum, continued

Table 2 Measured wall illuminance (annual summary)

Minimum	0	ftc
Maximum	174	ftc
Annual Mean	9	ftc
Total variance	164	ftc
Standard deviation	13	ftc
Annual kftc.hr (10months)	66	kftc-hr

The mean monthly wall illuminance calculated in ftc-hours over a 24 hour period from May through February is given in Table 1. An annual summary of the wall illuminance is given in Table 2. With the exception of the maximum monthly illuminances, these values are comparable to that predicted by the computer modeling simulations (Figure 3). The projected cumulative light exposure for the year is also within the predicted range originally identified for the display of oil paintings.

The higher maximum monthly wall illuminance can be attributed to a number of factors though it is primarily a function of the automated behavior of the roof shades. In order to protect the shades from wind damage, the shades will automatically retract if the wind speed exceeds 25mph. Under these conditions all the roof shades will fully retract and all other fully automated behavior and manual override capabilities will be disabled thus allowing direct light to enter the galleries.

Conclusions

The ramifications of adopting a daylight system for illuminating art galleries can be significant with respect to the display of light sensitive artwork. Not only is it critical that conservation be involved during the initial planning phase but conservators must stay involved throughout the commissioning process and after.

Despite everyone's good intentions and efforts, computer modeling is input-dependent and light level predictions and reality can diverge significantly due to small calculation errors or subsequent changes in operational parameters. Post monitoring and evaluation is critical but difficult to undertake given museum galleries generally open immediately after construction and the commissioning time is too short to properly evaluate a daylight system.

It must also be recognized that when using this approach to gallery illumination, daylight levels in the galleries will still vary appreciably throughout the year. Rather than targeting specific and constant illumination levels for the display of art, it is necessary to consider a range of light levels and

study the total illumination exposure received by artworks over a given period of time as well as instantaneous light levels.

Such an approach is not compatible with current standards for the display of many works of art and thus may have a significant impact on negotiations with other museums. They may be hesitant to loan an artwork for an exhibition under these circumstances particularly if the light levels exceed the maximum permissible exposure during the loan period.

The complexity of such a system must also be taken into consideration when adopting a daylight system. Constant requests for manual overrides to accommodate maintenance, filming, and other marketing and development activities can have a significant impact on the total cumulative light exposure and require an additional degree of diligence in monitoring activities within the galleries.

While recent architectural approaches to gallery lighting have expressed a preference for natural light and describe its varying intensity and color as both pleasant and more enjoyable than conventional gallery track lighting, it is debatable whether or not this variability in natural light was achieved and indeed translated to the galleries in this case. Based on the experience with the BCAM building, changes were made in the design of a similar roofing system of the new Lynda and Stewart Resnick Exhibition Pavilion. Pre-opening light monitoring has been initiated and the results from the new building are pending.

Appendix: Instrumentation

Universal Light Monitor Type 774 and 764
Littlemore Scientific Engineering (ELSEC)
Gutchpool Farm, Gillingham, Dorset SP8 5QP, UK
International tel: +44 1747 835550
www.elsec.com

Luxbug Datalogger ML4701 and 2525
Hanwell Instruments Limited
Pendle House, Jubilee Road
Letchworth
Hertfordshire SG6 1SP
International tel: +44 1462 688078
www.hanwell.com

Micro-Tri-Gloss meter
BYK-Gardner USA
Rivers Park II
9104 Guilford Road
Columbia, MD 21046
Phone: 800-343-7721
www.byk.com

Safe Handling of Plastics in a Museum Environment

Abstract

Research on the theory and mechanics of plastics degradation and conservation has made steady progress over the years, yet regarding the safe handling of plastics, current knowledge and practices are long overdue for an update. The purpose of this paper is to translate the science of plastics degradation into practical guidelines for the safe handling and conservation of plastics in a museum environment. The safety practices outlined here are based on an analysis of naturally aged plastics in museum collections, and are relevant to the specific problems faced by conservators, curators, and museum specialists who must handle and evaluate many types of plastic materials.

Background

Just as paintings, paper, glass, ceramic, and metal are collected for their historical and cultural significance, plastics, too, are collected as tangible evidence of the most widely used modern material of the 20th and 21st centuries. Plastics have an important place in the life of a museum, not only as objects of art and culture, but also in building facilities, exhibitions, and installations, making their proper care and handling a vital element of museum life. In the world of plastics, the last several decades have seen rapid growth in new methods of application, new technologies, and new composite materials. And as the earliest products of plastics technology have aged, the responsibility for conserving them has fallen to museum specialists, who have become repositories of the information and skills necessary to preserve many types of plastic products for future generations.

Many notable figures have contributed to advancements in plastics research and conservation. Scientists and conservators such as Mary Baker (Baker 1992), Sharon Blank (Blank 1990), Julia Fenn (Fenn 1995), David Grattan (Grattan 1993), Brenda Keneghan (Keneghan 1996, 2005), Thea B. van Oosten (van Oosten 1999), Anita Quye (Quye 1999), Yvonne Shashoua (Shashoua 2008), Scott Williams (Williams 2002), and Colin Williamson (Quye 1999), to name a few, have pioneered the field of plastics conservation.

Moreover, conservators at institutions such as the Museum of Modern Art, the Tate Modern, the Netherlands Institute of Cultural Heritage, the Getty Conservation Institute, and the Victorian and Albert Museum have consistently shared their new findings and techniques with others in the field. In 1996, in recognition of the need for new developments in the field of plastics conservation, the International Council of Museums established a working group called "Modern Materials and Contemporary Art" to address the urgent concerns of managing plastic materials in a museum environment.

Plastics Conservation

Following on the work of these pioneering figures and institutions, Mary Coughlin, Objects Conservator at the Smithsonian Institution (SI), initiated a program in 2006 to investigate the condition of the plastics collection at the National Museum of American History (NMAH). As part of this effort, Jia-sun Tsang of the SI's Museum Conserva-

tion Institute has surveyed hundreds of plastic artifacts at the NMAH, ranging from a cellulose nitrate vanity set from 1875 to polycarbonate safety glass made in 1971. Tsang has worked to identify the chemicals used to manufacture these modern materials and to assess their impact on both modern culture and their immediate environment. Working in collaboration with NMAH curators Ann Seeger and Eric Jentsch, Coughlin and Tsang made discoveries (Coughlin 2006; Tsang 2008) about the plastics in their collection that went far beyond the objects' cultural and aesthetic value. Significantly, they concluded that plastic is not the everlasting material it was originally considered to be.

Risks or Plastics Degradation

Plastics old and new have begun to show disturbing signs of instability. Plastics behave and degrade differently from more traditional materials. Because they are organic, they are subject to degradation by light, heat, moisture, and pollutants. They have a relatively long induction period during which the material is stable, followed by an accelerating degradation that is rapid and irreversible. The leaching, migration and evaporation, and degradation of plasticizers that result from plastic degradation are of special concern. In medical terms, plasticizers such as phthalate esters and bisphenol-A (BPA) are endocrine disruptors, and most regulatory bodies classify them as priority pollutants. The offgassing of volatile organic compounds (VOCs), which are major indoor air contaminants, can create a serious environmental hazard.

To a museum conservator, the degradation of plastics poses risks not only to the integrity of the objects themselves, but also to those involved in handling and exhibiting them. These risks are often downplayed by manufacturers seeking to promote the widespread use of plastics, and data from the scientific community and regulatory agencies is often controversial, conflicting, and inconclusive. It is difficult for museum specialists to sift through rapidly emerging scientific data and to separate solid information from myth and alarmism.

The most reliable studies, however, clearly show that plasticizers such as BPA, found in common objects like food containers, toys, medical devices, cell phones, and compact discs, can leach from plastics and have negative health effects. One recent federal study estimated that BPA is present in the urine of 93% of the population in the United States. It is uncertain whether the changes seen in animal studies are applicable to humans, but John R. Butcher, associate director of the National Toxicology Program, stated in 2008 that "we have concluded that the possibility that BPA may affect human development cannot be dismissed" (Layton 2008).

In a retrospective human biomonitoring study (Wittassek 2007), a group of German researchers reported finding metabolites of all known phthalates in over 98% of urine samples studied, indicating a ubiquitous exposure to phthalates among the German population throughout the last 20 years. Recent media attention on the widespread use and effects of phthalates has raised public interest and stirred intense

debate in the arenas of medicine, industry, and government. Given the abundance of new and old plastics currently displayed and archived in museums, it is critical that conservators translate this emerging, interdisciplinary information on plastics degradation to the museum environment in order to grapple with the health and environmental concerns raised. Conservators are in a unique position to inform their colleagues of these concerns and to share valuable information with the community at large.

Plastics in Museum Collections: Challenges and Risks

Since modern plastics are the product of two centuries of innovation and development, it would be absurd to assume that any museum's artistic and cultural collections were devoid of plastics. Indeed, plastic can be found in textiles and costumes, furniture, industrial machinery, books and papers, sound recordings, and as single or composite entities. However, many museums are victims of "plastics denial syndrome," a term coined by Keneghan, "where those in charge will swear blindly that there are no plastic objects in their collection and are absolutely astonished when a hidden cache is uncovered" (Keneghan 1996). Although Keneghan reported (Keneghan 2005) that this syndrome has been eradicated at the Victoria and Albert Museum, it can still be found in many large and small historical and cultural museums in the United States.

A further challenge facing conservators and conservation scientists in dealing with plastics conservation is a lack of information. Since no two plastics were made the same way, with the same formulation, under the same manufacturing conditions, it is reasonable to expect that plastics vary widely in their response to heat, light, moisture, and solvents. Without proper information regarding the chemical components of various plastic objects, it is difficult to pin down the exact cause of degradation, separate harmful from safe plastics, and devise a suitable conservation plan. Thus, in order to properly and systematically identify existing and potential problems, a survey of plastics collections must include a chemical analysis of individual pieces.

The principle of caution that guides a good conservator should also inform an approach to plastics conservation. Whether or not the exact mechanisms of risk can be assessed for each individual object, handlers should observe standard guidelines to ensure their health and safety. Even in the generally safe and stable environment of a museum, plastic objects pose risks to the environment and the people who handle them. Plastics are relatively durable and degrade rather slowly. However, it is impossible to know whether plastic objects, prior to their accession to a museum's collection, were exposed to elevated temperatures, high humidity, or mechanical stress, all of which could initiate material degradation and the release of chemical pollutants. A loss of power in a museum facility, resulting in elevated temperature and humidity, could also initiate degradation. For this reason, it is important to document the condition of plastics, making no assumptions about the degree of degradation without thorough examination, and to thoroughly monitor working environments and record the way in which plastics are handled.

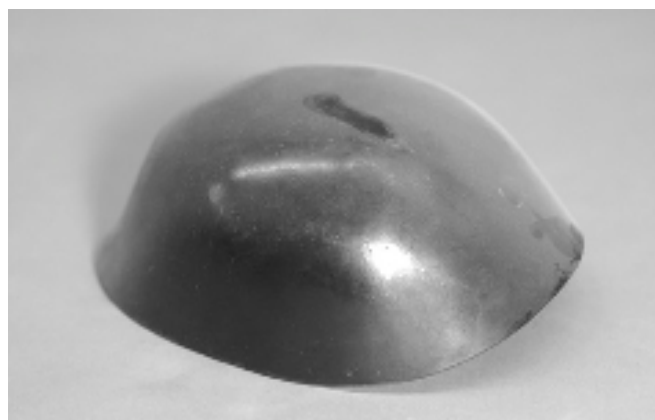
As new findings on plastics become available, new risks and concerns will undoubtedly emerge. For now, the major risks of plastics degradation and resultant chemical pollution are migration and evaporation of plasticizers and offgassing. These were the most prevalent issues in the survey of collections at the NMAH reported here.

Degradation of Plasticizers

Leaching, and migration and evaporation of plasticizers lead to the deterioration of plastics and shortening of a plastic object's usable lifetime. Leaching refers to the extraction of a substance from a solid via contact with a liquid medium. Since most of the plastics in museum collections do not come in contact with liquid, leaching is not a significant problem for conservators and will not be discussed in this paper. Migration refers to any method by which a component leaves a material as a gas, liquid, or solid. Plasticizers can evaporate to the environment as a gas and deposit as a liquid or solid onto the surface of the plastic. The migration and evaporation of plasticizers is a major cause of plastics degradation in a museum environment.

Plasticizers are low molecular-weight resins or liquids that form secondary (noncovalent) bonds to polymer chains, spreading the polymer apart. Plasticizers are added to reduce a plastic's tensile strength, hardness, density, melt viscosity, glass transition temperature, and electrostatic chargeability, while increasing its flexibility, elongation at break, toughness, and dielectric constant. Plasticizers, most commonly phthalates, make the hard, brittle plastic in polyvinyl chloride (PVC) pipe malleable and flexible enough to be made into Barbie dolls. Some PVC can consist of as much as 30% to 50% phthalates. "These liquid plasticizers, which have relatively high boiling points, may form sticky films at the surface of the plastics prior to evaporation. The sticky surfaces trap dust, which can harbor moisture and other pollutants resulting in further chemical degradation" (Shashoua 2008). During the NMAH survey of degraded plastics, it was noted that when these liquid plasticizers migrated to the surface of the plastics, they retained their high boiling point. The resultant sticky film is a "magnet" for dirt (Fig. 1).

Fig. 1 Dust-covered Bakelite helmet. Migrated plasticizers on the surface form a sticky film that traps dust.



Safe Handling of Plastics in a Museum Environment, continued

Conservators and museum staff must be aware that when they wipe the dirty film from a plastic object, they are most likely wiping off, and thereby being exposed to, plasticizers such as phthalates. Observing proper health and safety precautions, even during the simple task of dusting plastic objects, must therefore include properly disposing of dust cloths and wipes, perhaps in the recycled waste bin.

Phthalate Plasticizers: Risks of Exposure

Developed in the 1920s, phthalates are widely used industrial additives that have been produced in large quantities since the 1950s, around the same time PVC was introduced. Phthalates can be found in plastic objects such as toys, textiles, tools, vinyl recordings, and everyday products from adhesives, cosmetics, and inks to food packaging and building materials such as paints and flooring.

Because phthalate plasticizers are not covalently bound to plastics, they can leach, migrate, or evaporate into the environment and, as a result, have become ubiquitous contaminants. Exposure may be through ingestion, inhalation, or dermal exposure and may begin in utero and continue throughout an individual's lifetime. Studies suggest that exposure to phthalates increases the risk of birth defects and hormonal alteration in baby boys, as well as reproductive problems and hormonal changes in adult men. Though phthalates are considered hazardous waste and are regulated as air and water pollutants, they are unregulated in food, cosmetics, and consumer and medical products. Exposure to infant care products such as lotion, powder, and shampoo has been associated with increased urinary concentration of monoethyl phthalate, monomethyl phthalate, and monoisobutyl phthalate (Sathyanarayana 2008).

Studies of workers in the building industry have shown that eye irritation, sore throat, and other nonspecific symptoms were often linked to volatile organic compounds (VOCs) such as phthalates. High concentrations (980-3000 mg/kg) of diethyl hexyl phthalate (DEHP), an endocrine-disrupting chemical, have been detected in dust samples taken from building sites (Hutter 2006). Plasticizers may be responsible for up to 50% of VOC emissions from flooring (excluding the adhesive). A 2008 publication (Hwang 2008) reported workers' exposure to indoor dust that contained high levels of DEHP.

The World Health Organization's International Agency for Research on Cancer has identified phthalates used in PVC as a carcinogen. The European Union has banned the use of DEHP, the most widely used plasticizer in children's toys. Scientists fear that even minimal levels of this chemical may reduce immunity, alter behavior in adults, and cause cancer. Responding to growing consumer anxiety, California lawmakers have enacted statewide restrictions on some widely used plasticizers in children's toys. Starting in January 2009, the use of some phthalates became restricted in California. Following California's lead, the U.S. Congress has banned the use of six phthalates in the manufacture of toys, effective beginning in 2009.

The migration of plasticizers such as phthalates to the surface of a plastic object poses a health risk for museum conservators. It is clear that phthalates can separate from aging plastics and contaminate both those who handle them and the museum environment. In a study of the mechanism of degradation of plasticized PVC under artificial aging conditions, Ito and Nagai (Ito 2007) reported that the concentration of plasticizers varied through each phase of the aging process. They observed the surface and a cross section of PVC during weathering conditions and found a stepwise outflow of inorganic components and plasticizer, presumably a main mechanism of plastic degradation. Phthalates can be found not only in PVC, but in many early plastics such as cellulose acetate and cellulose nitrate. Because phthalates create surface residues on a wide variety of plastic objects, it is crucial that museum conservators monitor the handling of plastics and take proper precautions.

Case Studies of Phthalate Degradation

The survey of plastic objects at the NMAH included a man's loafer (Fig. 2), listed in the catalog as the first vinyl shoe



Fig. 2 Vinyl shoe from the Medicine and Science Division, NMAH. Migrated plasticizers form a sticky deposit on poorly ventilated areas of the shoe, such as the sole.

made in the U.S. It has been in the collection since 1981, and the manufacturer's name, International Vulcanizing Corporation, is visible on the sole. When it was routinely surveyed in 2007, the top of the shoe was found to be covered with sticky droplets, most likely the result of migration of plasticizers to the surface of the shoe. The follow-up survey in 2008 noted that since the object had been moved to a

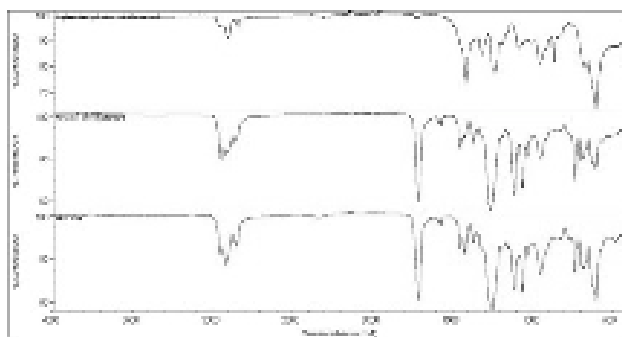


Fig. 3 FTIR-ATR spectrometry of unplasticized PVS standard (top), plasticized PVS standard (center), and a sample from the vinyl shoe.

Safe Handling of Plastics in a Museum Environment, continued

well-ventilated location, the droplets had disappeared from the top of the shoe but were still abundant on the sole, which was not exposed to increased ventilation. A small sample of the vinyl shoe was taken for Fourier Transform Infrared-Attenuated Total Reflectance (FTIR-ATR) analysis (Fig. 3) and comparison with unplasticized and plasticized PVC. The material in the vinyl shoe matched the plasticized PVC standard. This information was added to the data file, along with a recommendation to store the shoe in a less ventilated environment.

The NMAH survey also uncovered a two-part buckle (Fig. 4), listed in the catalog as made of black plastic, with an



Fig. 4 Two-part buckle made of cellulose nitrate. Plasticizers have migrated to the surface and formed white deposits. Medicine and Science Division.

etched design picturing a rickshaw with a driver and passenger. Both circular pieces have six holes near the rim for sewing onto a garment. One piece has a metal hook and the other has a metal eye. On visual inspection, museum personnel were unable to determine whether the plastic material was cellulose acetate, cellulose nitrate, Bakelite, shellac composite, or polystyrene. Disfiguring stains were identified as some kind of adhesive. However, FTIR-ATR

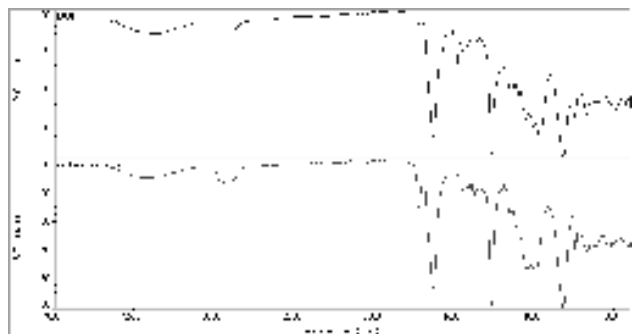


Fig. 5 FTIR-ATR spectrometry of cellulose nitrate buckle described in Fig. 4 (top) and cellulose nitrate standard (bottom).

analysis identified the plastic as cellulose nitrate (Fig. 5) and the stains were found to be solid deposits of plasticizers that had migrated to the surface.

Offgassing

Another feature of plastics degradation is offgassing, or the volatile emission of chemicals from a solid material. Building industry investigations have found that a large proportion of indoor VOCs comes from building materials such as plastics, paints, and adhesives. In a museum environment,

offgassing of plastics comes from three sources. The first source is vapor released from newly manufactured plastics, such as those found in new flooring material, new installations, and newly produced artwork. New plastics release soluble oligomers present as unbound additives, including plasticizers or organic modifiers. These unbound volatile chemicals escape into the air, where some eventually disappear and others linger for some time. This type of offgassing is associated with what it was often described as “new car smell” or “new shower curtain smell.” When warmed to 50–60° C, plastics give off odors ranging from the sweet, fruity smell of acrylic to an odor similar to the preserving fluid urea-formaldehyde (Shashoua 2008, 119). These odors are evident at room temperature; at high temperatures and in poorly ventilated areas, these odors can be noxious.

The VOCs given off by newly manufactured plastics come from a wide array of materials, many of which have been shown to be toxic or carcinogenic. For example, sources of offgassing in a new car may include acetonitrile, decanol, formaldehyde, naphthalene, and carbon disulfide used in foams, adhesives, and fabrics. The two most toxic chemicals in most new vehicles are polybrominated diphenyl ethers, used as fire retardant, and plasticizers including phthalates (Chien, 2007). Even new flooring may be a source of numerous VOCs. Analysis of a PVC floor sample using solid-phase microextraction sampling techniques with GC-MS analysis identified acetic acid, styrene, alpha-pinene, benzaldehyde, n-decane, 2-theyl-1-hexanol, in addition to phthalates (Nuicolle 2008).

Another source of offgassing in museums is degraded plastics. As plastics degrade, they can emit acids, plasticizers, and solvents in the form of alcohols, ketones, and aldehydes. Plastics are made from fossil fuels, and as they age the large molecules of polymers break down into smaller molecules that react with moisture to produce acids and alcohols.

Additives and plasticizers can also be released as vapor, especially at high temperatures or high humidity. This type of offgassing is primarily a result of chemical degradation through oxidation and hydrolysis, and can be initiated by ultraviolet radiation and light, heat, oxygen, and moisture. As many as 92 VOCs are associated with the thermal degradation of acrylonitrile butadiene styrene (Shapi 1991), while 190 volatile compounds are emitted during the decomposition of polystyrene (Shapi 1990).

Additional VOCs from degraded plastics include nitrogenous organic gas from polyurethane, and hydrogen sulfide and sulfur-containing gas from rubber and vulcanite objects. Many other forms of chemical offgassing are described in the conservation literature.

A third type of offgassing encountered in museum collections is acid vapor specific to degraded semiplastics such as cellulose nitrate and cellulose acetate. The damage to objects caused by such acid vapors has been widely studied and reported. Less studied is the negative impact these acid vapors have on the safety and health of people who handle plastic objects in a museum environment.

Safe Handling of Plastics in a Museum Environment, continued

Early plastics are more prone to degradation through release of acid vapors than anything else, but can still suffer the effects of migration and evaporation of plasticizers. Cellulose nitrate, a semisynthetic polymer, was discovered in 1845 in Germany and used commercially from the 1860s to the late 20th century. Deteriorating cellulose nitrate emits reactive nitrous oxide that can be converted to nitric acid, a strong oxidizing agent, by reacting with moisture, especially in high relative humidity.

This offgassing is flammable and toxic and can create dangerous fumes, fade dyes, corrode metals, and tarnish silver. These byproducts are harmful not only to the objects' environment, but also to the people involved in handling and transporting the objects.

Cellulose acetate, a plastic known for releasing vapors with a sour, vinegary odor, was developed in 1910 as a less toxic and less flammable alternative to cellulose nitrate. Also known as "safety" film, it was used in cartoon cels, medical devices, glasses frames, combs, and toothbrushes. However, 20 years after its development, handlers noticed that cellulose acetate emitted acetic acid and sulfuric acid when exposed to high temperature and high humidity. As it degraded, the plasticizers leaked, leading to hydrolysis and oxidation of the acid compound. The resulting effect was a sticky, acidic surface along with warping and breakage of the plastic object.

The negative effects of acid vapor release were evident in a routine collections survey at the NMAH. A single drawer (Fig. 6) contained a mixed assortment of metalware, handbags, glass, and plastic. Plastic objects in the center of the



Fig. 6 Acid vapors released from degraded plastic materials (center) have corroded a metal pan (photo center top) and a metal box (photo lower right) in the same drawer.

drawer had deteriorated and released an acid vapor. Over time, this slow offgassing resulted in corrosion of metal objects in the drawer, offering solid evidence that acid vapor released from plastic has a corrosive effect on other materials, and thus poses a risk to museum personnel.

In the published literature, reports on the sensory indicators of plastics degradation have doubled in the last ten years. In addition to telltale odors and corrosion of nearby materials such as metal, textile, and paper, many visual signs indicate the degradation of plastics, such as blistering, blooming, breaking, brittleness, chalking, cracking, crazing, crumbling, dents, delamination, discoloring, fraying, pitting, scratching, staining, warping, weeping, and yellowing. (Quye 1999; Shashoua 2008).

Conservators should collect and regularly consult reliable data on the detection of plastics degradation and the environmental conditions that promote it. Such information is necessary in order to set institutional priorities regarding the preservation of collections, to protect collections from further damage, and to mitigate possible health risks to museum personnel.

Guidelines for the Safe Handling of Plastics in Museum Collections

Hand washing is the single most important way to prevent the spread of contaminants arising from plastics degradation. Yet despite the proven health benefits of hand washing, many people don't practice effective hygiene. Regular hand washing with simple soap and water has proven absolutely crucial in a conservation laboratory where conservators handle harsh chemicals and sensitive objects. Throughout the workday, conservators who handle plastics must ensure that they do not contaminate objects or surfaces through the spread of plasticizers. Hand washing should thus be regarded as a job requirement, not an option.

Proper Hand Washing Technique

Wet hands with warm running water and lather well with liquid soap or clean bar soap.

Rub hands together vigorously for at least 15 to 20 seconds.

Scrub all surfaces, including the backs of the hands, wrists, between the fingers and under the fingernails.

Rinse well.

Safe Handling of Plastics

Avoid direct contact with plastics. When handling plastics, always wear gloves that are impermeable to acid, dust, and plasticizers. Check chemical compatibility guide for suitable gloves. (EZfacts, 2002)

Wear laboratory clothing when handling plastics.

Remove gloves and lab coats before leaving the workplace.

Wash laboratory clothing separately.

Use dedicated pens or markers when surveying or handling plastics.

Safe Handling of Plastics in a Museum Environment, continued

Never smell or taste plastics; avoid wet chemistry tests involving heating and smelling, especially in poorly ventilated areas.

Wash hands and arms with soap and water after removing gloves and before leaving the work area.

Never eat, drink, chew gum or tobacco, smoke, or apply cosmetics in the work environment.

Remove gloves before touching phones, tools, doorknobs, etc.

Keep all work tables and benches clean and uncluttered.

Post a sign notifying others of possible hazards and list emergency contact numbers.

Safety in the Care of Plastics Collections

Isolate degraded plastics.

Use local exhaust ventilation to remove toxic fumes or dust at the source.

Ventilate the area with fresh air.

Train staff in proper handling of plastics collections.

Ensure that information on the chemical components of the plastics is available to curators, museum specialists, art handlers, and others involved with the plastics collections.

If degraded objects can be deaccessioned, contact your institution's environmental or safety officer for proper disposal techniques.

Keep the temperature at or below 20°C and relative humidity 30% to 50%, suitable conditions for most plastics.

Conclusion

Much has been written on the proper care of plastics in museum collections, with little focus on the health and safety of those who handle and care for plastic materials. This is unfortunate in light of increasing evidence, on a global scale, of the health and environmental risks posed by exposure to plastics. Further research and education are needed to develop safe handling practices and create safe environments for plastics collections.

In the meantime, conservators who handle plastics—especially degraded plastics—should work closely with their safety officers and building engineers to establish safety guidelines, and should develop habits of good personal hygiene as a precaution against potential contamination. The risks are too great to ignore.

ACKNOWLEDGEMENTS

The author likes to thank Ann Seeger, Eric Jentsch, Richard Barden, and Beth Richwine at the National Museum of American History, Rebecca Giesekeing at MCI, and the Smithsonian Green Team for their knowledge and support.

Jia-sun Tsang is a senior paintings conservator at the Smithsonian Museum Conservation Institute (MCI), where she has worked since 1988. She has a Master of Science degree (1973) in chemistry from Bowling Green State University, Ohio and a Master of Science degree (1985) in paintings conservation from the University of Delaware/Winterthur Program in the conservation of artistic and historic works. Prior to becoming a conservator, Tsang worked for seven years as a clinical chemist at the Medical College of Ohio in Toledo. Tsang is also certified with LEED, AP (accredited professional in the Leadership in Energy and Environmental Design), an internationally recognized green building certification system. She is a member of Smithsonian Green Team and has worked on many interdisciplinary and interinstitutional exhibitions, treatments, and research projects.

REFERENCES

- Baker, M.T., and E. McManus. 1992. History, care and handling of American's spacesuits: problems in modern materials. *Journal of the American Institute for Conservation* 31(1): 77-85.
- Blank, S. 1990. An introduction to plastics and rubber in collections. *Studies in Conservation* 35(2): 53-63.
- Chien, Y.C. 2007. Variations in amounts and potential sources of volatile organic chemicals in new cars. *Science of the Total Environment* 382: 228-239.
- Coughlin, M. 2006. Kress Fellowship Report: an investigation of the plastics at the Smithsonian Institution's National Museum of American History, Washington, D.C.
- EZfacts, 2002. Chemical compatibility guide for gloves. <http://www.lss.com>. (accessed 9/11/ 2008)
- Fenn, J. 1995. The cellulose nitrate time bomb: using sulphonephthalein indicators to evaluate storage strategies. In *From Marble to Chocolate: the Conservation of Modern Sculpture*, ed. J. Heuman. London: Tate Gallery. 87-92.
- Grattan, D.W. 1993. Saving the twentieth century: the conservation of modern materials. *Canadian Conservation Institute, Symposium 91: Saving the Twentieth Century*. Ottawa, Ontario, September 15-20, 1991.
- Hutter, H.P., H. Moshhammer, P. Wallner, B. Damberger, P. Tappler, and M. Kuni. Health complaints and annoyances after moving into a new office building: a multidisciplinary approach including analysis of questionnaires, air and house dust. *International Journal of Hygiene and Environmental Health* 209(1): 65-68.
- Hwang, H.M., E.K. Park, T.M. Young, and B.D. Hammock. 2008. Occurrence of endocrine-disrupting chemicals in indoor dust. *Science of The Total Environment*. In press.

Safe Handling of Plastics in a Museum Environment, continued

Ito, M., and K. Nagai. 2007. Analysis of degradation mechanism of plasticized PVC under artificial aging conditions. *Polymer Degradation and Stability* 92: 260-270.

Keneghan, B. 2005. Plastics conservation at the V&A. *V&A Conservation Journal* 50(Summer). Available at: http://vam.ac.uk/res_cons/conservation/journal/number_50/plastic/index.html (accessed 9/7/2008)

Keneghan, B. 1996. Plastics? Not in my collection. *V&A Conservation Journal* No. 21 (October): 4-6.

Layton, L. Chemical in plastic is connected to health problems in monkeys. *The Washington Post*, September 4, 2008: A2.

Nuicolle, J., V. Desauziers, and P. Mocho. 2008. Solid phase microextraction sampling for a rapid and simple on-site evaluation of volatile organic compounds emitted from building material. *Journal of Chromatography*. In press.

Quye, A., and C. Williamson, eds. 1999. *Plastics: Collecting and Conserving*. Edinburgh: NMS Publishing Limited.

Sathyanarayana, S., C. Karr, P. Lozano, E. Brown, A. Calafat, F. Liu, and S. Swan. 2008. Baby care products: possible sources of infant phthalate exposure. *Pediatrics* 121(2): 260-268.

Shapi, M., and A. Hesso. 1990. Thermal decomposition of polystyrene: volatile compounds from large-scale pyrolysis. *Journal of Analytical and Applied Pyrolysis* 18: 143-161.

Shapi, M., and A. Hesso. 1991. Gas chromatographic-mass spectrometric analysis of some potential toxicants amongst volatile compounds emitted during large-scale thermal degradation of poly(acrylonitrile-butadiene-styrene)plastic. *Journal of Chromatography* 562: 681-696.

Shashoua, Y. 2008. *Conservation of Plastics: Material Science, Degradation and Preservation*. U.K. Butterworth Heinemann.

Tsang, J. 2008. In-house report 6193. Smithsonian Museum Conservation Institute, Washington, D.C.

Van Oosten, T.B. 1999. Here today, gone tomorrow? Problems with plastics in contemporary art. In *Postprint of Modern Art: Who Cares?*, ed. Y. Hummelen et al. Amsterdam: The Foundation for the Conservation of Modern Art and The Netherlands Institute for Cultural Heritage. 158-163.

Williams, R.S. 2002. Care of plastic: malignant plastics. *WAAC Newsletter* 24 (1).

Wittassek, M., G.A. Wiesmüller, H.M. Koch, R. Eckard, L. Dobler, J. Müller, and J. Angerer. 2007. Internal phthalate exposure over the last two decades: a retrospective human biomonitoring study. *International Journal of Hygiene and Environmental Health* 210: 319-333.

Articles You May Have Missed

“No longer a Lady in Waiting: Manship Fountain Restored at Addison, \$30 Million Museum Project Continues,” *Andover Townsman*, 1/14/2010

When the Addison Gallery of American Art reopens this fall, Venus, goddess of love and beauty, will be waiting to welcome patrons. Carved in 1927 by American sculptor Paul Manship, Venus sits atop a marble fountain in the museum's entryway rotunda.

Thanks to a painstaking restoration process, water now flows over Venus — the first time the fountain has worked properly since the museum opened in 1931. The Addison closed in June 2008 for a \$30 million renovation and expansion project. That summer, the Manship fountain, titled *Venus Anadyomene*, was disassembled and sent to the lab of the Williamstown Art Conservation Center, where it underwent 200 hours of cleaning, structural repairs, and restoration. Through the restoration process, a new updated plumbing system was installed within the fountain that controls flow and also balances the water's acid levels, to combat erosion.

“Angels to Wing Their Way back to Saint-Enfant-Jésus Church,” *The Montreal Gazette*, 01/18/2010

Saint-Enfant-Jésus's sculpted angels, which have been stored in the basement of Mary Queen of the World Cathedral-Basilica for 30 years, will be returning to the corner of St. Dominique St. and St. Joseph Blvd. via Quebec City. The angels will be delivered to the Centre de conservation du Québec. Saint-Enfant-Jésus, which celebrated its 150th anniversary in 2008, is the oldest church in Plateau Mont-Royal. The facade's wedding-cake design, facing Lahaie Park and visible from St. Lawrence Blvd., is architecturally unique among Quebec churches.

In 1909, Saint-Enfant-Jésus added two angels to its facade. The ornaments, representing angels with the star of Bethlehem and the Last Judgment, were the work of Olindo Gratton. The statues are carved in wood and covered with copper. The disadvantage of this technique is water seeps in between sheets of copper and the wood starts to rot. If everything happens on schedule, the restoration work will take seven months.

“Restored Orca Mural Will Greet Vancouver Olympic Commuters,” *Vancouver Sun* 1/18/2010

A weathered 7,200-square-foot orca mural on the side of the Old Continental Residence at the north end of the Granville Street bridge is getting a makeover.

A rededication ceremony was held Monday at the mural by the Wyland Foundation, a non-profit organization that promotes, art, science, and conservation. Vancouver's mural, which greets downtown commuters each day, was originally painted by renowned muralist Robert Wyland, the foundation's creator, in 1994 and features orcas breaching the water. He volunteered to repaint the mural in an effort to raise awareness towards environmental conservation during the Olympics.

Steve Creech, the foundation's special projects director, said the restoration effort has been “massive.” There are about 70 layers of paint that need to be chipped away, and the surface needs to be refinished in many areas. “He's kind of

like the Terminator of art so we're just going for it," in time to finish for the Olympics, Creech said of Wyland, who owns the Guinness record for the world's largest mural.

"Rodin Museum Will Reinstall *The Thinker* Following Facade Conservation and Restoration," *Artdaily.org*, 1/18/2010

Auguste Rodin's *The Thinker*, one of the artist's most famous works and a familiar fixture of Philadelphia's Rodin Museum, will be reinstalled on its pedestal outside the Museum's entrance on the Benjamin Franklin Parkway on Wednesday, January 13th. It has been on display in the Philadelphia Museum of Art's Great Stair Hall, while the Rodin Museum's limestone façade, known as the Meudon Monument, underwent restoration.

Modeled after the 18th-century façade of the Château d'Issy, which Rodin had installed at his estate at Meudon, France, the structure was cleaned to remove the layer of vehicular grime and pollution that had accumulated on its surface during the past 80 years. Its façade was also repointed and its stone repaired where necessary.

The large French wrought-iron gate and transom, fashioned in Paris in 1926-7 after the gates at the Château d'Issy, designed around 1700, were removed for cleaning, restoration, and coating. During the course of the renovation, the monument's pediment, roof and flashing system were repaired and two flights of limestone steps leading to the Museum entrance were replaced using new stone quarried in France.

"Angel Frieze Returns to Davenport Library," *Quad City Times*, 01/19/2010

Davenport's old Carnegie library fell to the wrecking ball long ago, but a cherished piece of that building has returned home. A 105-year-old frieze, cast from an original sculpture of cherubs by the Italian artist Donatello, has been cleaned up and reinstalled at the downtown Davenport Public Library's special collections area.

When the museum was razed in 1966, the plaster reproduction found a new home at the Blackhawk Hotel in downtown Davenport. As restoration

work began on the hotel this fall, developers Restoration St. Louis decided to donate the valuable piece of art back to the library. Although it is a reproduction, it still is a legitimate and important work of art, said Nicole Grabow, a specialist with the Midwest Art Conservation Center in Minneapolis who traveled twice to Davenport to assist in the moving and reinstallation project.

The plaster reproduction, made in 1904, had to be moved in six sections, each about 4 feet wide and weighing about 100 pounds. After it was cleaned, it was reinstalled using the same mounting method used previously, consisting of 4-by-4 pieces of wood mounted to the wall and a metal shelf for support.

"Leonardo da Vinci's Bones to be Dug up by Italian Scientists," *The London Times*, 01/24/2010

Scientists seeking permission to exhume the remains of Leonardo da Vinci plan to reconstruct his face to discover whether his masterpiece, the Mona Lisa, is a disguised self-portrait.

A team from Italy's National Committee for Cultural Heritage has asked to open the tomb in which the Renaissance painter and polymath is believed to lie at Amboise castle, in the Loire valley, where he died in 1519, aged 67. Silvano Vincenti, head of the Italian team, said its first step would be to verify that the remains are Leonardo's. They will use carbon dating and compare DNA samples from the bones and teeth to those of several male descendants buried in Bologna, central Italy.

Bone tests could tell whether Leonardo died of syphilis and could also establish whether he suffered from lead poisoning, as did many fellow-painters of the time. However, the plans have provoked criticism from Leonardo scholars who regard the notion of a self-portrait as a myth and who believe his remains should be left alone.

"Edinburgh College of Art Reveals Mystery Behind Cast of an Unknown Criminal," *Artdaily.org*, 1/25/2010

For generations, the cast of an unknown criminal dubbed with the mock Latin title of 'Smugglerius', has been used in the teaching of anatomical drawing at Edinburgh College of Art with no

real knowledge of its provenance. Dating from 1854, Smugglerius is a copy of an original écorché – a figure with the skin and fat removed to expose the muscles and tendons - made in 1776 at Royal Academy of Art in London.

This earlier cast, now lost, was moulded from the body of a hanged criminal by the sculptor Agostino Carlini, following its dissection by William Hunter, the famous anatomist. The College cast, which retains the stunning detail of the original, was made by a little known 'moulder and figure maker' called William Pink.

In 2008, The Heritage Lottery Fund (HLF) awarded a grant of £498,500 for the conservation and restoration of Edinburgh College of Art's 200-year-old Cast Collection, and as part of this, Smugglerius has been restored to its former glory.

"Picasso Painting Ripped After Visitor Bumps Into Museum Exhibit," *Bloomberg.com*, 01/25/2010

A Picasso painting, worth more than \$130 million by some estimates, was gouged on Friday at New York's Metropolitan Museum of Art when a museumgoer fell into the artwork, leaving a six-inch gash.

The 1904-1905 painting, "The Actor," depicting a graceful, gaunt male figure in a dusty pink costume on stage, was hung in a second-floor gallery among a display of early Picasso artworks. The Picasso has been removed from the gallery and taken to the museum's conservation studio for "assessment and treatment," the statement said. Because the tear occurred in the lower portion of the canvas, the repair is expected to be "unobtrusive," according to the museum.

"Despite Assurances, Met Finds Artworks Aren't Restored Overnight," *The New York Times*, 01/27/2010

After a museumgoer's trip and fall opened a rip in a century-old Picasso painting last week at the Metropolitan Museum of Art, officials there assured the public that conservators would be able to fix the work quickly, in time for a major Picasso show in April. But two other rare mishaps at the Met in recent years have provided hard lessons about the difficulty of making broken master-

pieces whole again and of predicting when they will go back on view. In 2002 a 15th-century marble statue by the Venetian sculptor Tullio Lombardo crashed to the floor and broke into hundreds of pieces when part of its dense plywood base buckled. Nearly six years later an Andrea della Robbia terra-cotta relief from the same period shattered after falling from a shelf above a doorway. Neither piece is back on view.

More than seven years later an immense conservation research project has grown up around the sculpture, but the marble is still probably three years from re-emerging, said Ian Wardropper, chairman of the Met's department of European sculpture and decorative arts. It has also been conducted in a kind of seclusion unusual for the museum, one that in combination with the long delay has fed occasional speculation that the statue might be beyond repair.

Conservators have also used recently developed laser-mapping technology to create a three-dimensional "virtual Adam" that is being used to piece the work back together and also to allow engineers to determine the places within the sculpture that will undergo the most stress when it is standing again. The restoration will eventually be the subject of an entire exhibition, he said, and the sculpture will be the centerpiece of a new gallery devoted to the Venetian Renaissance.

"Restoration of National Gallery's 18th-Century Scagliola Table Top," *ArtDaily.org*, 02/01/2010

In 1902, Lady Geraldine Dowager Countess of Milltown gifted to the National Gallery of Ireland the contents of Russborough, Co. Wicklow, in memory of her husband, Edward Nugent, 6th Earl of Milltown (1835-1890). The gift was so extensive and varied - it included paintings, furniture, sculpture, mirrors, silver, and objets d'art - that it was necessary to construct a new building (The Milltown Wing) to accommodate the collection.

Included in the Milltown Gift were three eighteenth-century scagliola console table-tops, the largest of which is currently on loan to Russborough, and now in need of conservation. To this end the National Gallery of Ireland has commissioned two conservators, Chiara Mar-

tinelli and Francesca Toso of the Opificio delle Pietre Dure in Florence, who have the specialist expertise in the restoration of this medium.

Scagliola is an artificial ornamental marble. Used as a substitute for real marble it is created by way of a complex process which uses pulverized selenite, mixed with glue and pigments. The technique was refined in the mid-eighteenth century by Enrico Hugford, Abbot of the Vallombrosan Monastery of Santa Reparata, near Florence. The scagliola table-top and its original base will return to public view when the house reopens in the spring.

"Imaging Method for Eye Disease Used to Eye Art Forgeries," *PhysOrg.com*, 02/03/2010

Scientists in Poland are describing how a medical imaging technique has taken on a second life in revealing forgery of an artist's signature and changes in inscriptions on paintings that are hundreds of years old.

A report on the technique, called optical coherence tomography (OCT), is in ACS' Accounts of Chemical Research. The scientists describe how OCT, used to produce three-dimensional images of the layers of the retina of the eye, overcomes those difficulties.

They used OCT to analyze two oil paintings from the 18th and 19th centuries. In one, *Saint Leonard of Porto Maurizio*, OCT revealed evidence that the inscription "St. Leonard" was added approximately fifty years after completion of the painting. In the other, *Portrait of an unknown woman*, OCT found evidence of the possible of forgery of the artist's signature.

"Shakespeare Garden Bust to Receive Full Conservation Treatment," *San Francisco Sentinel*, 02/04/2010

Director of Cultural Affairs Luis R. Cancel is pleased to announce a new partnership between the San Francisco Arts Commission, Senior Conservator Katharine Untch of ARG Conservation Services, and the Foundation of the American Institute for Conservation of Historic and Artistic Works to present a national pilot workshop for mid-career conservators on Outdoor Sculpture Conservation.

In the fall of 2009, FAIC received \$202,243 in funding from the National Endowment for the Humanities to develop a curriculum for a national series of workshops over the next two years. Slated for this summer in San Francisco, the first pilot workshop will focus on the City's public monuments, particularly those in Golden Gate Park.

Hands-on treatments will include cleaning of the bronze bust of George Bullock's Shakespeare, located in the Shakespeare Garden. Cleaning tests during the workshop will culminate in full conservation treatment of the rest of the monument at a later date. The workshop will also include the participation of local conservation experts from the Fine Arts Museums of San Francisco and the San Francisco Museum of Modern Art.

"Gallery Staff 'Stamped on Rats'," *BBC News*, 02/04/2010

Staff at the National Portrait Gallery dealt with unwanted visitors by stamping on their heads, according to previously unseen documents. The visitors in question were rats which infested the central London gallery in the 1940s.

The records are part of a new online archive of papers belonging to the gallery's first director, Sir George Scharf, revealed this week. Last month the National Cataloguing Programme for Archives gave the gallery a £17,909 grant to publish Sir George's papers.

His work covers the first 38 years of the gallery from 1857 - with notes and drawings of portraits, places and people, including Winston Churchill as a baby. They detail how workers tackled the rat population which occasionally infested the gallery in the 1940s.

According to the records, 34 rats were captured and killed between 1940 and 1946, with the staff's boots being the main weapon of choice.

"A Puzzle for the Ages," *Buffalo News*, 02/05/2010

A fourth-century clay amphora painstakingly restored at Buffalo State College for the past four years is finally on its way back home to Utah. While the 3-foot-tall, two-handed storage jar has

proved to be one of the art conservation department's toughest assignments, the southern Italian pottery piece was still no match for the renowned Buffalo State program.

The amphora came to Buffalo State from the Utah Museum of Fine Arts in 2006. "It was partially assembled and partially restored, but not according to standards that we would expect," said James Hamm, a professor of painting conservation and interim director of the Buffalo State department.

After researching and analyzing the ancient clay piece, there was the slow, delicate task of disassembling it. Solvents were used to loosen the old adhesive that had held the poorly reconstructed storage jar together for as long as 100 years.

"Tile by Tile, A Mural Is Saved," *The New York Times* 2/25/2010

At the end of a subway line in downtown Pittsburgh, the artist Romare Bearden filled a wall with ceramic scenery. Loosely based on memories of his childhood years at his grandparents' boardinghouse in Pittsburgh, his 1980s tile mural showed canoeists and ships on rivers snaking around steel mill smokestacks and crowds of soldiers and factory workers.

The set of 780 tiles, 60 feet long, was cemented onto concrete walls three feet thick. When the terminal was slated for demolition a few years ago, the mosaic was appraised for \$15 million and deemed worthy of reinstallation somewhere. But no one was quite sure how to get it down. "It's the first one we've encountered that's bonded directly to a thick concrete wall," said Robert G. Lodge, the president of McKay Lodge Conservation Laboratory in Oberlin, Ohio.

On a \$1 million budget, the company has been dismantling and restoring the Bearden tiles to hang in a new station next year. Mr. Lodge devised a plan to separate the tiles after taping an identification number onto each front. With diamond-coated saw blades his crews sliced between and behind each ceramic sheet. Freeing them required chain saws and circular saw blades up to 36 inches wide, powered by hydraulics.

When the new subway walls are ready, McKay Lodge will fit the cleaned

tiles into a portable aluminum frame so that the whole landscape can be popped back out someday if that station ends up obsolete too.

"Celebrated Art of Haiti is Buried under Rubble," *The Guardian*, 02/15/2010

Outside the Musee Galerie d'Art Nader, perched on a hillside overlooking Port-au-Prince, a sign greeted visitors. "On top of the town, top in the arts," it boasted. Inside, the walls were plastered with thousands of paintings recording nearly a century of Haitian history.

Now the three-story art gallery is gone, reduced to a dusty heap of rubble and torn canvases. The human cost of Haiti's worst earthquake in more than 200 years – at least 150,000 lives lost – has been well documented. But the disaster also struck a knockout blow to the heart of Haiti's vibrant arts community. Several galleries were destroyed and thousands of paintings lost under the rubble of flattened government buildings and art museums.

The Cathédrale Sainte-Trinité, built in the early 1920s, was almost completely destroyed, taking with it a series of celebrated 1950s murals depicting scenes from the life of Christ. A painting by Guillaume Guillon Lethière, the 18th-century French neoclassical painter, is thought to have been destroyed when the presidential palace collapsed. Nowhere was the destruction greater than at the Musee Galerie d'Art Nader, Haiti's largest private collection of Haitian and Caribbean art.

"For New Wing, MFA Rolls out a Masterpiece," *The Boston Globe*, 02/19/2010

After 10 years of effort and more than \$500 million in fund-raising, the Museum of Fine Arts installed the first painting in its new Art of the Americas Wing yesterday, and it's no ordinary work.

Thomas Sully's 19th-century masterpiece *The Passage of the Delaware* is just the kind of painting the MFA hasn't been able to display properly in the past. Why? It's simply one of the largest in the museum's collection. At 17 feet by 12 feet and weighing 1,000 pounds, the painting has been too big to put in a gallery.

The painting will not be entirely new to many museumgoers. Until 1998, it hung in a cavernous second-floor passageway near an escalator. Then, over 14 months starting in January 2007, it underwent a meticulous restoration process by conservator Charlotte Ameringer. The MFA also found the picture's original frame, which had been in storage for more than a century, and restored it, covering the worn bronze paint with gold leaf and building new ornamental corners to replicate the original.

"Pierre Soulages Mural finds new Home in Ohio," *Pittsburgh Post-Gazette*, 02/22/2010

The Pierre Soulages mural, in the lobby of Downtown's One Oliver Plaza since 1968, wasn't destroyed as some observers feared might happen, but its new home isn't in Pittsburgh.

The Butler Institute of American Art in Youngstown, Ohio, accepted the ceramic tile mural as a gift from the owners of One Oliver Plaza, which permitted its new tenant, the law firm K&L Gates, to remodel the lobby. That meant the removal last year of two large, abstract murals created for the building -- the Soulages and another by Virgil Cantini, which went to the University of Pittsburgh's Posvar Hall.

The mural, 20 feet long and 14 feet high with bold black and blue diagonal swaths on a mottled white ground, was painstakingly removed over a 10-day period last summer by Michigan tile restoration expert Larry Mobley. Now undergoing conservation -- some of its 294 tiles didn't easily come off and are being restored -- it will be installed in a 29-foot-square room designed and built especially to house it at one of the Butler's two satellite locations, the Trumbull Branch in suburban Howland east of Warren.

"Getty, Disney Partner on Study of Animation Cel Artwork," *Los Angeles Times*, 02/24/2010

The Getty Conservation Institute said Wednesday that it is partnering with a division of Disney to study the deterioration that can occur in plastics -- specifically, the kind used in animation cels.

The study will be conducted as a partnership between the Getty Institute and the Disney Animation Research Library. Tom Learner, a senior scientist at the Getty, said in an interview that the research will take place at both locations, with some of the cels traveling to the Getty for in-depth analysis. He said the study, which is likely to take three years to complete, is intended to explore the reasons why certain cels are deteriorating and to possibly come up with ways to slow the deterioration process.

The Getty said the initial phase of research will involve an assessment of the best methods for the identification of the actual plastics used in the cels, and for monitoring the condition of cels made with cellulose nitrate and acetate. The new collaboration is part of the Getty's "Preservation of Plastics" project that was initiated to study signs of deterioration in plastic objects in museum collections.

"Lasers Lift Dirt of Ages from Artworks," *BBC News*, 02/26/2010

Physicists have applied the same laser techniques commonly used for tattoo removal to clean several famous works of art, including wall paintings. It has now been successfully applied to the wall paintings of the Sagrestia Vecchia and the Cappella del Manto in Santa Maria della Scala, Siena, Italy.

The results are described in the journal of the American Chemical Society. A team led by Dr. Salvatore Siano at the Applied Physics Institute-CNR in Florence, Italy, studied the results on several works of art. Wall paintings are the most recent application, and were a real test of the developing method. Dr. Siano said, "if you compare it with mechanical means, the laser is able to distinguish what must be removed in a way that is much more selective than traditional techniques."

The difficulty is in choosing the right laser and sometimes, if it doesn't exist, having to build it. Problems have had to be overcome. Discoloration of stone and metal after laser cleaning slowed the spread of the technique. The team says this has been addressed with a new generation laser and careful selection of the parameters set.

"Painting in a Damp Church is the Missing Half of a Masterpiece," *The Times*, 03/01/2010

Art historians identified a previously unknown masterpiece by the greatest early 16th-century Flemish artist, Quentin Metsys, in Holy Trinity, the parish church of Bradford-on-Avon in Wiltshire.

Metsys produced a series of religious paintings, of which the Bradford Christ has been identified as one of the earliest and finest. Painstaking detective work has revealed that the painting is one half of a picture that once included the Virgin Mary, sawn in half more than 100 years ago by a greedy art dealer hoping to double his money. Experts were able temporarily to reunite the two halves at the National Gallery where the painting was taken for further study.

Although the two pieces have since been separated, art historians hope that one day they will be restored as a complete picture. The Virgin, now in the Fitzwilliam collection of Lady Juliet Tadgell, had been heavily and rather poorly restored. It had been cut down to a more regular shape and the boards had been chamfered to make it appear to be a stand-alone picture.

Apart from the damage done by the separation, the Bradford Christ was in untouched condition, having escaped clumsy restoration, though the heavy varnish had turned brown. The painting had been hanging in Holy Trinity since being given to the church by Colonel Goff, a local landowner, in the 1940s.

"Arrests Rock Drouot," *Art and Auction Magazine*, 03/01/2010

Drouot, the celebrated central-Paris auction house, is facing one of the biggest crises in its 158-year history: Eight of its commissionaires (agents responsible for the storage and transport of artworks) have been charged with criminal association and organized theft, and auctioneer Eric Caudron has been arrested for collusion in the sale of stolen goods.

The raids were the culmination of a six-month investigation by France's Office Central de Lutte contre le Trafic des Biens Culturels prompted by the disappearance during an estate inventory of a seascape attributed to Gustave Courbet worth an estimated \$75,000-\$145,000.

The commissionaires are an integral part of Drouot's business, but have had a dodgy reputation for decades. They have been known to pilfer auction items they handle or alter them — by, say, drawing a crack on a vase or removing a door from a wardrobe — only to buy the "damaged" goods themselves at a bargain price and then put them up in original condition at a later Drouot sale.

Until now, auctioneers and Drouot habitués have turned a blind eye to these practices; when crossed or challenged, the commissionaires have been known to "accidentally" break or lose items. But the police's highly publicized descent on Drouot has made such willful ignorance impossible.

France's state-appointed auction watchdog, the Conseil des Ventes, took the strongest measures at its disposal by suspending auctioneer Caudron and reminding Drouot that it was legally obligated to guarantee "secure" and "honorable" service to its clients.

"Art Restorer Conserves Hidden Treasures in Seminary," *Macau Daily Times*, 03/03/2010

Professional painter and art restorer, Cristina Mio, has conserved the paintings of Saint Joseph Seminary. The restoration project, commissioned by Instituto Cultural, involved 41 paintings, five wooden sculptures and a map in the art collection of Saint Joseph Seminary.

As well as the paintings brought by missionaries from Europe in the 18th and 19th century, Cristina Mio and her group also treated other artifacts of great historical significance. One of them is a chart of a religious congregation. This chart has removable name tags that facilitate amendments as missionaries came and went.

Another unique work is a painting of *Nossa Senhora de Guia* — a very important patron saint in Macau. Some of these paintings were very badly damaged by dirt and termites, and the oils were becoming dust. They required very complicated procedures of re-backing the canvas and stabilizing the oils. Filling in the missing parts also required techniques that only those who have acquired authentic skill in the European painting tradition can handle. This restoration project was commissioned with the in-

tion of a establishing a museum that holds the art collection of St. Joseph Seminary.

“DNA Clues Hunted in ’90 Art Theft,”
Boston Globe 03/04/2010

On the eve of the 20th anniversary of the theft of masterpieces from the Isabella Stewart Gardner Museum, the FBI is resubmitting evidence taken from the crime scene for DNA analysis in hope of gaining a long-sought break in the case. Because of advances in DNA analysis since the 1990 robbery, the lead agent in the case, Geoffrey Kelly, decided to send evidence to the FBI’s scientific laboratory in Quantico, Va.

The heist, which included three Rembrandts and a Vermeer, remains the world’s largest art theft in dollar value. Kelly said he could not disclose the type of evidence to be reviewed, but others familiar with the case said it would probably include long strips of duct tape used to tie up the museum’s two night watchmen, whom the thieves overpowered to get access to the artwork.

Huge strides in DNA analysis in the two decades since the crime could mean a different outcome this time. Kelly acknowledged that, despite having pursued countless tips over the last two decades, investigators have received no verifiable leads on the artwork’s whereabouts or even how the theft took place.

“Episcopal Cathedral Celebrates Restoration, Return of Copy of Painting,”
Dallas Morning News, 03/03/2010

After 18 months of painstaking restoration, a 19th-century reproduction of Spanish painter Bartolomé Murillo’s *The Holy Family* was reinstalled Tuesday in St. Matthew’s Cathedral in Old East Dallas.

The 6-foot-by-8-foot oil painting, purchased in 1873 by a New York woman traveling through Europe, was a fixture at the Episcopal church for more than 70 years until it was taken down to be cleaned. Murillo’s 1620 painting, also known as *The Virgin of Seville*, is part of the Louvre’s collection in Paris.

Mary Adams Bulkley of New York purchased the copy of *The Holy Family* at the urging of her daughter while they traveled in Europe, said Barry Pound, a member of St. Matthew’s. She

paid \$10,000 for the reproduction, done by French artist Ernestine Huet.

Stashka Star of Dallas, who restored *The Holy Family*, said the painting had blisters, tears and a deep, long horizontal crack. At some point, a painter, untrained in restoration work, had glued the canvas to a Masonite board, among other damaging techniques.

“New Art Restoration Technology Wows the World,” *Business Weekly*, 03/08/2010

The Hamilton Kerr Institute has joined forces with Cambridgeshire company, SmartDrive to provide revolutionary technology which will enable art restorers, curators, gallery visitors, and web-users to view masterpieces in a way never seen before.

The innovative tool to image artwork resulted from a partnership between art conservators at the Hamilton Kerr Institute (HKI), a research department of The Fitzwilliam Museum, and SmartDrive, which specializes in precise motor control systems. The aim of the joint venture was to use tools that SmartDrive had developed for science and technology applications to create a scanning system to guide art conservation.

The result, SatScan, is capable of revealing hidden layers of paint, as Chris Titmus, imaging consultant at HKI, explained: “The information SatScan provides guides the restoration process and enriches the history of the work. It can also help with authentication by revealing details that may show consistency with a certain artist.” High-resolution digital images in visible light, infrared and ultraviolet parts of the spectrum are used to visualize under-drawings or to examine previous re-touching.

“Rijksmuseum Launches Ambitious Restoration Program,” *Artdaily.org*, 03/12/2010

The Rijksmuseum is today launching an ambitious restoration program at Tefaf Maastricht. Masterpieces specially selected from the Rijksmuseum’s collection will undergo an intensive restoration process to ensure that they shine like never before by the time the museum’s main building re-opens in 2013.

The pieces in question include *Woman in Blue Reading A Letter* by Vermeer, Six burial figures from the T’ang Dynasty, a mahogany period room from 1748 called *The Beuning room*, and the silver table ornament by Jamnitzer which is one of the absolute highlights of the museum’s collection of European silversmithery. The Rijksmuseum is seeking sponsors for each of these projects.

“Blog Follows Restoration of Van Gogh Artwork,” *The Independent*, 03/13/2010

A new blog will allow art lovers to follow the restoration, step by step, of Dutch post impressionist painter Vincent van Gogh’s famous *The Bedroom*, the Van Gogh Museum said Thursday. “It is the first time we have rendered each step of a restoration accessible to the public in this way,” the museum’s director Axel Ruger said.

The blog, www.vangoghmuseum.com/bedroomsecrets, will have weekly updates of the restoration work with pictures and video. Van Gogh painted the canvas in Arles, France, where he lived in 1888 and 1889 in the well-known “Yellow House” which he shared for a while with fellow painter Paul Gauguin.

The painting was damaged during the artist’s lifetime due to damp conditions in his studio, said the museum. “To stop the paint flaking off, Van Gogh pasted newspapers over the canvas and wanted to have his brother Theo reline the work with an additional canvas to reinforce it.” The painting was extensively restored in 1930.

“See Why Conservation is Costly,” *The Art Newspaper*, 03/17/2010

Recognizing the public’s desire to watch conservation in action, the Fondation Beyeler will open a new, glass-fronted conservation studio later this month as part of its restoration and technical and scholarly investigation of Matisse’s *Acanthes*—a large format papier découpé or paper cut-out.

The three-year *Acanthes* project, which launched in 2009, is an interdisciplinary exploration of the 1953 cut-out, combining art historical research with the expertise of conservators to

learn more about Matisse's method and devise the best course of action for the work's restoration.

The project is a collaboration between the Beyeler Fondation and Nationale Suisse, with cooperation from the Matisse Archives in Paris, the Hochschule der Künste in Bern, and institutions with paper cut-outs including the Museum of Modern Art in New York.

Although Acanthes suffers from problems typically associated with works on paper, it is in remarkably good condition, with only minor discoloration located mainly on the edges. The studio opens on 30 March and the public can follow the project's progress online at www.beyeler.com/acanthes.

"Watts Towers May Get LACMA as a Guardian," *Los Angeles Times*, 04/07/2010

The Los Angeles County Museum of Art is interested in stepping into the breach as curator and conservator of the Watts Towers starting this summer as a severe budget crisis saps the city of Los Angeles' ability to continue those functions.

Olga Garay, executive director of L.A.'s Department of Cultural Affairs, met with two top museum officials, LACMA President Melody Kanschat and general counsel Fredric Goldstein, over enlisting the museum's know-how and fundraising connections on behalf of a national historic landmark that's owned by the state and operated and maintained by the city.

Under the plan, LACMA would contribute its expertise and direct the conservation work. It would still be up to the city to pay for manpower and materials. Garay hopes to draw on the Getty's conservation expertise; the Getty has also granted the Department of Cultural Affairs \$156,000 to research an exhibition on the role the Watts Towers Arts Center and the Municipal Art Gallery played in nurturing Los Angeles artists during the 1960s and 1970s.

The towers, topping out at just under 100 feet high, were created single-handedly by Simon Rodia, an uneducated Italian immigrant stonemason who built them in his spare time from 1921 to 1954. He created the framework of steel, wire and concrete and ornamented the three

main spires and their 14 surrounding sculptural elements with colorful bits of broken glass, pottery, and seashells.

"Zoffany's The Last Supper to be Restored," *The Hindu*, 03/19/2010

A 10x12 feet canvas depicting The Last Supper that took German neoclassical painter Johann Zoffany six weeks to paint, will take a team of six conservators five months to tend to the many damages it has suffered in the 223 years since its creation.

Two previous restoration efforts have adversely affected the painting. Renate Kant, a Singapore-based German conservation expert approached to lead the project, said that almost 50% of the work has been de-restoration.

The painting was presented to the St. John's parish on June 24, 1787, for the consecration of the first church built by the British. "It created quite a stir in those days, as Zoffany had modeled the faces of Jesus and some of the apostles on some controversial members of the Calcutta Society, which was not a favorable comment," Ms. Kant said.

While she describes the tropical climate of Kolkata as "a kiss of death" for the painting, she felt it has suffered far more due to vandalism and negligence. A team of conservators from the Indian National Trust for Art and Cultural Heritage (INTACH) is working to reverse the damage. The project is also aimed at training conservators in India according to current international standards and ethics in art preservation.

"Nero's Golden Palace Suffers Roof Collapse," *CBC News*, 03/30/2010

A ceiling portion of Nero's Golden Palace in Rome collapsed Tuesday. A large portion of the roof crumbled and caused a section of the garden over it to fall straight into the first century A.D. palace. Also known as the Domus Aurea, the residence garnered its name from its extravagant materials, including extensive gold leaf, marble and ivory, as well as ceilings decorated with semi-precious jewels and sumptuous frescoes.

Not long after Nero's death the Golden Palace was stripped of its finery and, eventually, filled in and built over.

Over time, archeologists and restorers uncovered parts of the original residence. The now-underground palace has naturally faced a myriad of structural problems over the years and was closed to the public in the late 1970s because of worries about its soundness.

Though reopened 1999, it has closed regularly for further restoration, including in 2005 after masonry crumbled and a significant amount of water began seeping inside. Tuesday's collapse occurred during a period of repairs on the ancient palace and following a season of heavy rain.

"After Repairs, a Picasso Returns," *New York Times*, 04/20/2010

The Actor, the Metropolitan Museum of Art's rare Rose Period Picasso is back on display, now safely behind Plexiglas. It's virtually impossible to tell that a woman accidentally fell into the canvas, causing a six-inch vertical tear. Three months of work had gone into getting the 105-year-old *The Actor* as near to its original state as possible, made more complicated by the presence of another painting on the back of the canvas.

The painting dates from a period in Picasso's life when he was particularly poor, and he often employed canvases that had already been used. X-rays taken at the museum revealed a landscape with a large figure that might have been a female nude. The bold, swirling brushstrokes and palette were definitely not Picasso's. Rather the colors were in keeping with the work of Symbolist painters in Barcelona who appear in caricatures by Picasso.

Lucy Belloli, a conservator at the Met, began restoration by adhering flakes of paint on the tear and then a slow and careful realignment of the painting. For six weeks "The Actor" lay face down, with varying weights on it to counteract the "memory" of the damage. Once the canvas seemed stabilized, she placed a clear Mylar patch on the back. "We didn't want to hide any part of the other painting," she said.

Ms. Belloli used three layers to carefully retouch the area: a synthetic gesso over which she applied gouache and finally a pigment-and-synthetic resin that resembles the original oil paint.