
Conference Review

Arthur M. Sackler Colloquia Scientific Examination of Art: Modern Techniques in Conserva- tion and Analysis

An interdisciplinary colloquium, "Scientific Examination of Art: Modern Techniques in Conservation and Analysis," was held at the National Academy of Sciences in Washington, DC, March 19-21, 2003. The colloquium was organized by Barbara Berrie, E. René de la Rie, Janis Tomlinson, John Winter, and members of the National Academy of Sciences. The over 130 participants included conservators and scientists from the US, Canada, and Europe.

The colloquium provided a vital opportunity for scientists and conservators to discuss novel and emerging methodologies and techniques used in the examination of art objects.

Speakers included Roy Berns, Barbara Berrie, Jaap Boon, Robin Clark, John Delaney, Janet Douglas, Molly Ann Faries, Melanie Gifford, Tom Learner, Carol Mancusi-Ungaro, Ralph Mitchell, Richard Newman, James Reilly, E. René de la Rie, Michael Schilling, Maurizio Seracini, Joyce Hill Stoner, Pamela Vandiver, Timothy Whalen, Paul Whitmore, and John Winter.

The tone for the meeting was set wonderfully by Maurizio Seracini, who gave the opening lecture. Mr. Seracini described his use of scientific techniques appropriated from other fields, such as medical imaging, in the examination of artworks by Leonardo da Vinci. Mr. Seracini's examination of Leonardo's *Adoration* has shown that only the gray-green underdrawing is by Leonardo's own hand.

His talk also included discussion of Leonardo's lost masterpiece, *The Battle of Anghiari*, which Seracini believes still exists in the Palazzo Vecchio behind walls built by Vasari. Needless to say, the talk was quite thought provoking and was the object of much discussion at the reception.

The talks were a well orchestrated mixture of overviews of conservation science as it exists in the various conservation disciplines and case studies. The first

day was devoted to more comprehensive talks, which looked at the state of scientific examination of artworks in various disciplines; while the second day focused on specific applications of several emerging scientific techniques. Several of the overviews included discussions of the goals and aims of scientific research. John Winter gave a brief history of the field of "technical art history," a.k.a. "conservation science," which has its roots in the field of archeology.

A number of talks focused on non-destructive techniques, with a particular emphasis on various types of spectroscopy. Paul Whitmore described the construction and practical applications of a spectroscopic device that is able to read the spectrum of a small sample area every few seconds while simultaneously exposing the same area to illumination. This makes it possible to observe pigment changes and fading. It has been used primarily for paper artifacts.

Molly Faries described her research into imaging in the infrared spectrum. She compared the various types of IR imaging devices currently available, including the newer Platinum Silicide technology, which was developed for military application.

Roy Berns discussed Spectral Imaging as an analytical tool (website www.Art-SI.org). The result is the creation of a high resolution spectral image where each pixel location has a spectrum associated with it. Possible applications include pigment identification.

On a somewhat similar note, John Delaney detailed the use of Infrared Multi-spectral Imaging (MSI) as an analytical tool. MSI involves imaging using both visible and infrared spectral data. This allows identification of pigments based on their "unique signatures," and the creation of ratio maps, which show spatially where each specific pigment has been applied by the artist.

Several of the talks focused on the use of various analytical techniques to identify pigments present in works of art. Barbara Berrie detailed the reexamination of samples taken from several paintings by Lorenzo Lotto prompted by the recent

discovery of a 16th-century Color Seller's inventory in Venice. Using SEM-EDX and X-ray Powder Diffraction Lotto's use of "glassy" (silicone containing) pigments was revealed. These pigments derive from the glass and dye industries.

Robin Clark described the recent adaptation of Raman Microscopy coupled with a CCD detector to identify pigments. This non-destructive technique has been used on medieval manuscripts and other small artworks. Mr. Clark also discussed the use of LIBS (laser-induced breakdown spectroscopy), which uses a pulsed laser to produce an emission spectrum of the materials present on surface which, in turn, is used to determine the elements present.

Melanie Gifford described the use of Polarized Light Microscopy (PLM), IR, and cross-section analysis as part of a technical study of Matthias Grünewald. Findings indicate that although Grünewald used a conventional 16th-century palette, he was able to achieve many refined color effects through complex color mixtures and layering techniques.

James Riley described several innovative examination techniques, such as the use of RIT edge reflection analysis, which reveals the texture of photo paper at the boundary of the light/dark edge and is used not only to aid in identification but also to track changes from treatment. Mr. Riley also mentioned the ongoing creation of a library of spectra of binders and overcoats found on photographs at GCI.

A number of talks chose to focus on the examination of a specific group of artifacts.

Richard Newman discussed the use of techniques from the field of geology, such as neutron activation analysis and laser ablation-ICP spectrometry, to study stone sculpture. Analysis of rock composition has proven useful for provenance research, while the study of alteration layers has proven useful for authentication.

Pam Vandiver described new research directions in the study of ancient ceramic and glass technologies that focus on as-

certaining technological practices.

Michael Schilling discussed the use of GC-MS to identify organic binding media present in artworks by Jacob Lawrence and Willem de Kooning. This research has provided new insights into the painting practices of both artists.

Janet Douglas discussed the use of FTIR and XRD to determine geological sources of various jade artifacts. She also emphasized the need to study working methods.

Two of the talks took a reflective, philosophical tact. Joyce Hill Stoner gave a comprehensive history of science in the field of art conservation, divided into 2 parts: "progress" (1925-1975) and "process" (post 1975.) She noted how advances in scientific examination and our resulting understanding of artifacts have changed the goals and attitudes of the conservation profession.

Carol Mancusi-Ungaro discussed the importance of materiality – the idea that process and materials are as important as meaning in understanding a work of art. She noted that scientific examination can help conservators understand how a painting does and should look in some cases helping to dispel myths about the artist's technique.

Several talks focused on materials analysis with an emphasis on aging and/or deterioration mechanisms. Ralph Mitchell described the use of micro-computer assisted tomography to look at penetration of microorganisms into stone as part of investigations into biodeterioration of archeological sites. This permits analysis of the mechanisms of biodeterioration of both the stone and consolidating polymers and has many important implications for long-term preservation.

Tom Learner discussed his ongoing research into 20th-century paints using PyGCMS and FTIR to identify and characterize media. He also discussed ongoing research into aging properties and effects of surface cleaning and other conservation treatments of acrylic paint media. These investigations will look at swelling and leaching of acrylic films from exposure to typical conservation solvents such as the removal of surfac-

tants present on the surface of acrylic films through routine surface cleaning.

Jaap Boon discussed his ongoing research, in collaboration with MOLART, investigating the aging of oil paint films and specifically the formation of metal soaps, now thought to be a part of the natural aging of oil paint films. In some cases these metal soaps form aggregates which are thought to underlie effluorescence and ground staining.

To close, the reviewer's appreciation is extended to the National Academy of Sciences and the colloquium's organizers. The conference was very well organized, and the talks were well chosen to represent a broad spectrum of materials and analytical techniques. The conference highlighted the need for continued collaboration between scientists and conservators and illustrated perfectly the rich discoveries such collaborations yield. (Colloquium proceedings are published in the *Proceedings of the National Academy of Sciences* (PNAS).)

Charlotte Seifen Ameringer