From foiling art fraud to determining the age of an excavation site, a key question is, “what is this specimen made up of?” Answering the question without damaging the specimen or incurring prohibitive expense has always presented challenges. Imagine scraping paint off a long lost masterpiece or attempting to transport large rock formations from a remote site. Such actions seem unfeasible. Fortunately, handheld trace analyzers, more formally known as X-ray Fluorescence (XRF) Spectroscopy provides a safe, convenient, and fairly inexpensive way to learn the atomic make-up of a specimen. Of course, the answer to one question leads to another question: Is XRF reliable?

What is XRF?
How XRF works is that, first, a photon is emitted from the analyzer’s tube. If the photon is the correct energy, the photon is absorbed by one of the inner atomic electrons in the sample. This absorption causes an electron from an inner shell of the atom to leave the atom. When an electron leaves an inner shell, the atom fills the vacancy, so an electron from a higher shell drops down to fill that vacancy. When an electron drops from a higher to a lower shell, energy is released in the form of another photon, which is characteristic not only to each element, but also to each shell transition; this is fluorescence. A detector is used to count the number and energy of the photons coming back from the sample.

XRF Spectroscopy provides qualitative and quantitative atomic analysis. The qualitative analysis identifies atoms present in a specimen by associating observed characteristic lines with their atoms. The energies of large intensity lines are characteristic of the specimen’s atoms. The quantitative analysis determines the amount of each atom present in the specimen from the intensity of measured characteristic X-ray lines. The intensities of observed lines for a given atom vary as the amount of that atom present in the specimen.

XRF technology is certainly not new. In fact, the technology dates back to
What career path led you to your current position?
I always leaned toward the creative. I attended college at American University, majoring in art history, which led me to the masters program in arts administration with a visual arts emphasis at NYU. I began my museum career in New York at Sotheby’s and the Whitney Museum. I then became the registrar for Art Services International where I was fortunate to travel exhibitions all over the world. I served as the Associate Registrar for Loans and Exhibitions. At the Walters Art Museum and during my years as a registrar, I became more deeply interested in issues surrounding risk mitigation, insurance, legal documentation and similar matters that arose often. I chose to attend law school with the intent to merge the museum and legal skill sets. After graduating, I practiced law for a number of years and then returned to museums in a leadership capacity focusing on Collections and Exhibitions.

What is the name of your department, and where is it positioned within the organization?
Collections and Exhibitions – it falls under curatorial. I supervise registrars, preparators and rights and images. I report to the Chief Curator.

What does a typical day look like for you?
My typical day includes managing people, drafting contracts, strategic planning, negotiating with domestic and international partners, supervising my team and its collaboration with other divisions throughout the museum.

How does your legal training and experience add to the effectiveness of your current role?
My legal experience is critical to my position. I am able to issue spot and resolve legal questions with little outside counsel. When working with counsel I “speak the same language” and bring foundational knowledge that allows me to participate in problem solving more actively.

Who is your biggest ally in your organization?
The leadership staff.

What is the most interesting project you’ve worked on this year?
Our museum is mounting a survey show of a major contemporary artist this year. I have been working to bring a number of foreign national studio assistants to the US to work on the tour. The process of securing O1 and O2 visas has been very involved.

What keeps you up at night? And why?
I am always striving to bring best practice to my team and elevate our standards. I avoid staying up at night but at times it happens. When it does, I am thinking of ways to improve or change my department for the better. I stay away from focusing on matters or people I cannot control. If my team performs with best practice and mitigates risk properly, and stays positive, I am left to play with my kids each night.

What advice would you offer law students and recent law graduates interested in pursuing a career in law and the arts?
Gain experience in both fields.
Continued from page 1

the accidental discovery of X-rays in 1895 by the German physicist Wilhelm Conrad Roentgen. However, the use of X-rays for trace analysis was not determined until 1913, when H.G.J. Mosley showed the relationship between atomic number and the reciprocal of the wavelength for each spectral series of emission lines for each element. In 1948, the first XRF spectrometer was created.

XRF spectrometers improved throughout the 20th century, but remained inconvenient in that specimens needed to be transported to the spectrometer. Dr. Bruce Kaiser recognized this significant obstacle and created the handheld XRF spectrometer, the Bruker Trace Analyzer. At last, no longer did the mountain need to come to Muhammad.

Reliability: What the Courts Say

The issue of the reliability of XRF spectrometry has not been hotly debated in the courts. The bulk of case law weighing in on the reliability of XRF spectrometry, including handheld trace analyzers, involve toxic torts, such as children exposed to lead paint. Generally, the courts addressing the issue, state and federal, have recognized the reliability of evidence, though limitations or concerns regarding the evidence obtained have also been indicated for older XRF models.

The first published decision to address evidence obtained from XRF spectrometry was decided in 1993. Kendall Copeland, PPA v. People's Sav. Bank, Conn. Super. LEXIS 445 (Conn. Super. Ct. Feb. 16, 1993). In that case, the court did not specifically question the reliability of the results, but held that because the XRF spectrometry yielded results in an area measurement, it could not be used for comparison with the federal standard, which used a volume measurement. Id at 12-13.

Later cases have demonstrated federal courts' and regulatory agencies' acceptance of the reliability of XRF spectrometry in certain circumstances. For example, the U.S. Department of Housing and Urban Development (HUD) required lead paint testing via XRF spectrometry or another HUD-approved method. German v. Federal Home Loan Mortg. Corp., 885 F. Supp. 537, 575 (S.D.N.Y. 1995). Additionally, in Miller v. Evenflo Co., the United States District Court for the Western District of Pennsylvania held that XRF spectrometry evidence was reliable for determining the elemental composition of solids and liquids even if other techniques, such as Gas Chromatography-Mass Spectrometry, could be considered better methods for gaining evidence. 2011 U.S. Dist. LEXIS 151376, 12 (W.D. Pa. Dec. 29, 2011).

Nevertheless, the courts and regulatory agencies deemed there are limits to XRF results with regard to specificity, particularly for older models. For example, in re Chinese Manufactured Drywall Products Liability Litigation, the United States District Court for the Eastern District of Louisiana held that XRF technology was reliable for determining the general presence of elements, but not for pinpointing the location of specific elements. In that case, the court held that XRF could determine that Chinese drywall was present in a building, but was not able to determine which particular drywall sheets were of Chinese origin.

Another example is a November 2014 decision delivered by United States District for the Southern District of California. Myers v. United States, U.S. Dist. LEXIS 163219, (S.D. Cal. Nov. 20, 2014). The Myers court addressed the issue of a minor being negligently exposed to toxic levels of thallium during an EPA cleanup of Camp Pendleton. Id at 1. The court held that “XRF is a screening device” and “An XRF testing device was not a device that was relied upon by any regulatory agency for accurate results (at least at the time of this 1990s clean-up).” Id at 88-89. The court further held, “As with so many other testing methodologies, including Graphite Furnace Atomic Absorption Spectrometry (GFAAS), they are all subject to interference from other substances. In the case of XRF screening tests, the interference comes from other metals in the soil matrix such as iron.” Id at 89.

Notably, though Myers is very recent decision, the court clearly indicates that it was addressing the reliability of 20-year-old technology. Trace analyzers have continued to develop in accuracy and applicability. For example, the literature provided by Bruker Trace Analyzer stated that their total reflection X-ray fluorescence (TXRF) spectrometer was recently used to analyze gunshot residue to determine the distance at which a firearm was shot. Continued on page 4
Conclusion

As the applications for this tool increase, practitioners can expect to see more challenges to its reliability. Nevertheless, its history of use and general acceptance will also limit the success of such challenges. Overall, the handheld trace analyzer has already proven a remarkably useful invention if for no other reason than allowing researchers to examine specimens without damage.

Special thanks to Dr. Bruce Kaiser for his input and teaching and to Katherine Lewis for her ideas.

MALC Event Re-Cap

Stump the Lawyer: Legal Issues in Small Museums
New England Museum Association Annual Meeting
Wednesday, November 19, 2014, 3:35-5:30pm EST


Attendance at the panel was quite good with approximately 30 people. The audience brought incredibly interesting and diverse questions for the panelists. Some of the topics addressed included: Historic Building and ADA compliance, Deed of Gifts, Trademark Infringement, Deaccessioning & Provenance of Collections, Ivory Importation and Endangered Species Act, Gift Agreements and Apparent Authority, VARA & Public and Municipal Artworks, Utility of Permanent Loans v. Gifts. An audience member noted the potential impact of pending legislation to provide visual artists with a cut of resale royalties from auction sales, currently provided for in proposed legislation entitled the American Royalties Too (“ART”) Act.

Developing Copyright Licensing Templates
Wednesday, December 10, 2014, 2-3:30 EST

Speakers: Katherine E. Lewis, Chair, Museum and Arts Law Committee (MALC), Science & Technology Section, American Bar Association and Attorney-Advisor (Contract), Smithsonian Institution, Office of Contracting, New York City and Anne M. Young, Manager of Rights and Reproductions, Indianapolis Museum of Art. Special Guests: Susan Edwards, Digital Experience Specialist, J. Paul Getty Museum, Los Angeles and Peter Argentine, President, Argentine Productions, Pittsburgh. Moderators: Adam La Faci, Senior Producer, LearningTimes and Greg Stevens, Assistant Director, Professional Development, American Alliance of Museums, Washington, DC.

Developing Copyright Licensing Templates was a highly successful live webcast with approximately 182 people in attendance and actively participating in the conversation. Building off of the previous collaboration between MALC and AAM, Copyright Licensing: Giving & Receiving, hosted on July 23, 2014, which drew over 500 audience members, this panel reviewed the top ten elements in a license, identified key templates to have on hand and analyzed the templates to identify the licensing elements covered. Panelist strove to incorporate diverse licensing scenarios including, commissioning and loan agreements, non-exclusive licensing agreements, speaker and presenter agreements and releases as well as contracts for time-based media, images, software, etc.
In The News

Detroit Institute of Art reaches its goal
As part of the City of Detroit’s “Grand Bargain,” the Detroit Institute of Arts agreed to pledge $100 million dollars toward city pension funds. The DIA has reached its goal and as part of the deal has become an independently owned museum, where previously it was city owned. http://tinyurl.com/malc051

Accessing Cuban Art
The 1962 US embargo on Cuba also affected Cuba’s cultural heritage and art works. The US and Cuba could not exchange information regarding art preservation and conservation. Cuban art work was and continues to be illegally imported, and art thefts have increased despite high security in Cuban museums and galleries. At present, some Cuban art is accessible under a cultural assets exception to the Cuban Assets Control Regulation. The effect of President Obama's actions to “restore diplomatic ties” remains to be seen. http://tinyurl.com/malc053

Experience art in your own home
ACNE, a Swedish luxury brand, has launched a digital network called 'curater' that allows subscribers to access renowned works of art in their very own homes. Using a digital panel, six to eight, carefully curated exhibitions will be available temporarily in the subscriber’s home. http://tinyurl.com/malc055

Museums Subject to OSHA’s New Recordkeeping Rules
Effective January 1, 2015, OSHA will now require museums, historic sites, and other similar institutions to keep records of certain workplace-related illnesses and injuries. Mandatory reporting whenever death, hospitalization, or certain injuries are involved is still required and in addition, the new rules require keeping records of certain workplace-related illnesses and injuries not otherwise reportable and certifying and posting an annual summary. https://www.osha.gov/recordkeeping2014/OSHA3745.pdf


Upcoming Events

Sotheby’s Institute of Art
How to Craft a Law Practice for the Art World
January 26-28, 2015
Los Angeles, CA
http://tinyurl.com/ku44eq4

National Preservation Institute
NAGPRA: Writing Grant Proposals
January 29-30, 2015 | Denver, CO
February 10-11, 2015 | San Francisco, CA
http://www.npi.org/register.html

Georgetown University Law Center
18th Annual Meeting for the Study of Law, Culture and the Humanities
March 6, 2015
Washington, DC

The American Law Institute
Legal Issues In Museum Administration
March 25-28
Washington, DC
http://tinyurl.com/k87a9ks
The Museums & The Arts Committee is part of the American Bar Association’s Section of Science & Technology Law. **Provenance** aims to provide news and thoughtful, brief discussion on legal topics relevant to museology and the arts. [http://tinyurl.com/scitechmac010](http://tinyurl.com/scitechmac010)

Our committee undertakes a variety of projects related to all types of museums and all types of art that are being affected by new developments. Naturally, this requires an appreciation for how those institutions and communities function in general. The Committee thus welcomes active participation from those involved in museums or the arts. In addition to attorneys and law students, membership is also open to non-attorneys who may join as Associates at: [http://tinyurl.com/scitechmac011](http://tinyurl.com/scitechmac011)

Current projects the Committee is exploring include authenticating artwork, collecting digital forms of art, digitization for archival and commercial purposes, and copyright issues in ownership, derivative use, and online distribution.

**GET INVOLVED!**

**WORKING GROUPS:** MALC launched 4 working groups: Digitization and Archiving Collections, Document Archival and Electronic Communications Privacy, Social Media and Patents In Museums and Arts and invites you to learn more about the goals and objectives of each working group by joining our monthly committee calls.

**MONTHLY COMMITTEE CALLS:** MALC holds monthly teleconferences the last Friday of each month at 4:30pm EST. Please email Katherine at katlewis864@gmail.com for call-in information.

**NEWSLETTER:** We’re accepting submissions for the Spring 2015 Newsletter! Please email submissions, suggestions for topics you would like to see covered and/or questions to Ria De las Alas, our Newsletter Editor, at redelasalas@gmail.com.

**WEBSITE:** We are looking for volunteers to help maintain our website to keep things updated and interesting! If interested contact Barron Oda at boda@hawaii.edu for more information.

**ARTS LIAISON:** A major goal of the Committee is to act as a liaison between the museum/arts community and the legal profession. If you know of national, regional or local museum/arts groups we should be contacting, send an e-mail to boda@hawaii.edu.

**SUGGESTION BOX:** Have a suggestion? We’d love to hear it! Please share your ideas with Katherine Lewis at katlewis864@gmail.com.

---

**About Us**

**Lost and Found**

**The (Oldest) Writing on the Wall**
Images of human hands and large animals dating back 40,000 years have been found in an Indonesian cave. What were previously considered the oldest drawings were found in Europe. The discovery sheds new light on potential migration patterns and raises questions about protection and conservation of these historic sites. [http://tinyurl.com/malc048](http://tinyurl.com/malc048)

**Paintings Recovered in Six Year Old Art Heist Case**
In 2008, twelve paintings, which included a Marc Chagall and a Diego Rivera work were stolen from an elderly couple’s home. Thanks to undercover work by FBI agents, nine of the twelve paintings have been recovered. Some evidence suggests an insider who knew the couple may have been involved. [http://tinyurl.com/malc049](http://tinyurl.com/malc049)

**“Lost” 1967 Ferrari Found In Pennsylvania Garage; Headed to Auction**
A rare 1967 Ferrari 330 GTS, unaccounted for since being sold at an insurance auction in 1969, has surfaced in a Pennsylvania garage. It is expected to fetch $2 million at an upcoming auction. [http://tinyurl.com/malc050](http://tinyurl.com/malc050)