

Salted Paper Prints: Process and Purpose

Symposium Abstracts

September 14-15, 2017
Harvard Faculty Club
Cambridge, MA

ABSTRACTS AND SPEAKER BIOGRAPHIES

Section A: Historical Use / Materials and Techniques

Henry and the Kitchen

Larry Schaaf, Bodleian Libraries, University of Oxford

Abstract: The invention of photography did not take place in a sterile research laboratory but rather in the context of familiar domestic routines. While there is no evidence that Henry Talbot ever paid much attention to cooking (aside from his botanical interest in the Kitchen Garden), the invention and evolution of photography was closely tied to the kitchen. Talbot likely was generally unaware of the bustling culinary activities taking place daily within Lacock Abbey. Yet, in the country house the kitchen was the source for chemicals such as table salt, heated water, and pans and receptacles for chemical solutions. Alchemists had discovered that long ago. The kitchen staff was always on call to provide labor and advice. Perhaps even more importantly, Talbot had to possess the intuitive sensibilities of a chef in order to perfect his new art. Like any good cook, much of his success depended on a largely subliminal feel for minor but critical adjustments to proportions and to the facile manipulation of materials. Talbot's heart and his hands were as essential as was his head to the performance of his black magic.

Speaker biography: Professor Larry J. Schaaf taught photojournalism and the history of photography at The University of Texas at Austin from the late 1960s - his work with the Gernsheim Collection and in Sir John Herschel's archive drew him into research and he lapsed as a photographer. Based in Baltimore since 1982, Schaaf has alternated between being an independent researcher and consultant and a serial monogamist with numerous institutions. In the late 1980s, he founded the online Correspondence of William Henry Fox Talbot at the University of Glasgow, now based at De Montfort University, where he remains as editor. In 2014 he was appointed professor to the Bodleian Libraries at the University of Oxford and is director of the online William Henry Fox Talbot Catalogue Raisonné, currently in publication.

Evolution of the Salted Paper Print

Mark Osterman, George Eastman Museum

Abstract: The invention of chemical photography begins not with the making of an image by light, but by the successful keeping of light based imagery. Papers made sensitive to light by a combination of a chloride and silver nitrate date to the end of the eighteenth century. But the salted print as we know it does not emerge until the first quarter of the nineteenth century when William Henry Fox Talbot offered several different options for preserving silver chloride images. The invention of the salted paper print therefore was also one of the important origins photography.

From Talbot's innovation to the 1890s the salted paper print evolved to include printing-out technology, chemical stabilization, true fixing and chemical toning. It was also used for latent image formation and developing-out processing. Salted paper prints from the dawn of photography were contact printed using botanical samples, stained glass fragments and lace. Throughout the evolution of in-camera photographic processes salted paper prints were also made in contact with paper negatives, albumen on glass negatives, wet and dry collodion negatives and gelatin dry plate emulsion negatives. The salted paper process was also used in conjunction with the first solar enlargers; initially using the technique of

printing-out and later by developed-out technology. This presentation features the basics needed as a foundation for subsequent case studies presented in the symposium.

Speaker biography: Mark Osterman is photographic process historian at the George Eastman Museum in Rochester, NY. Osterman is well known internationally for his primary research, writings and hands-on workshops on early photographic processes. While he originally came to the Museum in 1995 as a specialist in collodion process variants, Osterman is unique in his comprehensive knowledge of the evolution of 19th century photographic techniques including Niepce's asphalt heliograph process through making early 20th century silver gelatin motion picture film. As a photographic artist Osterman is represented by Howard Greenberg Gallery [NYC] Photo gallery International [Tokyo] and Tilt Gallery [Scottsdale, AZ].

The Evolution of Salted Paper Print Processed During the 1850s: Published recipes

John McElhone, Canadian Photography Institute of the National Gallery of Canada

Abstract: Based on a systematic reading of the major French and English publications on photography – treatises and journals – from the late 1840s through to 1860, this presentation traces the communications that occurred among photographers of the time on the subject of how to make a photographic print. The main part of the story follows the gradual emergence of egg albumen as a component in the recipe for preparing printing paper and the eventual emergence of a print carrying a distinct albumen layer on the surface of the paper in which the silver image is held. Along the way we glimpse a rich mixture of innovative ideas for alternate materials and processes, categorical aesthetic judgements, practical ingenuity, serious scientific investigation, outraged contempt, and low-level class warfare.

Speaker biography: John McElhone is chief conservator at the National Gallery of Canada, Ottawa. Trained first in science (biochemistry), he moved into museum work and obtained a graduate degree in art conservation in 1985. He spent twenty-five years as conservator of photographs for Canada's national art collection before becoming chief conservator. He has written extensively on photographic technology and preservation; in recent years, he has translated several major publications on photography from French into English.

Section B: Harvard Initiative

The Harrison D. Horblit Collection of Early Photography

Hope Mayo, Houghton Library, Harvard University

Abstract: The Harrison D. Horblit Collection of Early Photography comprises more than 7,000 items that document the history of photography from the 1830s until ca. 1900. It includes some 3,000 daguerreotypes, more than 1,000 salted paper photographic prints, more than 50 photogenic drawings, and more than 300 paper negatives, to name only those holdings from the earliest period of photography. Important photographers include William Henry Fox Talbot and his circle, Frédéric Flacheron, Giacomo Arena, and Roger Fenton. Formed in the third quarter of the twentieth century by Harrison D. Horblit (1912-1988), the collection was given to Harvard University in 1995. Because Horblit came to his interest in photography by way of a previous interest in the history of science and technology, he bought widely and without applying the kinds of aesthetic judgements that tend to

shape museum collections. As a result, the Horblit Collection not only offers significant material for the social history of photography, but also provides a large set of actual photographs that are themselves examples of the wide range of photographic processes used in the nineteenth century.

Speaker biography: Hope Mayo is Philip Hofer Curator of Printing and Graphic Arts at Houghton Library Harvard University, where she is responsible for a large collection of books and manuscripts formed for the purpose of document the history of book illustration from the Middle Ages to the present, and for the Harrison D. Horblit Collection of Early Photography. She has written on a variety of topics related to the Printing and Graphic Arts Collection, including the library's holdings of original art by Edward Lear and Walter Crane.

Overview of Salt Print Collections at Harvard

Melissa Banta, Weissman Preservation Center, Harvard Library, Harvard University

Abstract: The Weissman Preservation Center (WPC) has undertaken a university-wide project to preserve and enhance access to salt prints at Harvard. The project focuses on photogenic drawings, salted paper prints, and paper negatives found in twelve repositories throughout Harvard's libraries, archives, and museums. The paper will look at the origin of these images, how they came to Harvard, and ways in which they were used for teaching and research.

Because of their significance and vulnerability, the salt print collections at Harvard emerged as ideal candidates for an initiative to address the preservation of a single photographic format across the university in a systematic way. This paper looks at series of initiatives the WPC has undertaken to enhance our understanding of these rare photographs and to ensure their long-term preservation. The collections include a wealth of materials illustrating advances by early practitioners including Talbot and his circle of British contemporaries as well as technological refinements in the medium by commercial photographers. The initiative, which has involved conservators, scientists, photograph historians, curators, and collection managers, has provided insights into technical and aesthetic dimensions of this early photographic process.

Speaker biography: Melissa Banta is projects curator at the Weissman Preservation Center, Harvard Library. She works to preserve, enhance access to, exhibit, and publish special collections throughout Harvard Library. Banta also serves as a consulting curator at Baker Library, Harvard Business School and at the Historical Collections, Mount Auburn Cemetery. She was formerly director of the photographic archives at the Peabody Museum of Archaeology and Ethnology at Harvard.

Non-destructive Analysis of Coatings on Early Photographs

Elena Bulat, Weissman Preservation Center, Harvard Library, Harvard University

Abstract: Harvard Library's Weissman Preservation Center has been working on a multi-year initiative which seeks to enhance our understanding of salted paper prints and to ensure their long-term preservation. This comprehensive project encompasses an integrated approach to photograph preservation: survey, conservation treatment, housing and storage, cataloging, digitization, instrumental analysis and interpretation.

Material analysis and characterization of photographs are important tools for dating and identifying individual photographs, making preservation decisions, and contributing new scholarship to our understanding of the history of photography. A large number of coated salted paper photographs were identified in Harvard collections. Examples of the possible coatings include wax, varnish, gum Arabic, albumen, gelatin, casein, dammar, sandarac, shellac, copal and mixes.

This paper highlights the latest work in scientific analysis carried out in collaboration with the Center for Nanoscale Systems at Harvard University. The analysis focuses on identification of a single layer coatings, mixes and multiple layer coatings used on salted paper prints through specular reflection FTIR (Fourier Transform Infrared) spectroscopy.

Speaker biography: Elena Bulat is a photograph conservator for special collections at the Weissman Preservation Center, Harvard Library since 2007. Bulat came to Harvard from the George Eastman House where she was a paper and photograph conservator. From 2001 to 2003, Bulat was an Andrew W. Mellon Fellow at the Advanced Residency Program in Photograph Conservation at George Eastman House, International Museum of Photography and Film in Rochester and the Image Permanence Institute at the Rochester Institute of Technology. Prior to that, she completed the Certificate Program in Photograph Preservation and Archival Practice at George Eastman House. Before coming to the United States, Bulat worked as a paper and a photograph conservator at the State Russian Museum in St. Petersburg.

Using Specular Reflection FTIR for Chemical Analysis of Cultural Heritage Objects

Arthur McClelland, Center for Nanoscale Systems, Harvard University

Abstract: Cultural heritage objects present a special set of challenges to analyze chemically. Often micro-sampling or even contacting the object is out of the question. Portable XRF instruments can meet these restrictions, but only provide atomic composition. Raman spectroscopy and FTIR spectroscopy can both provide molecular composition of the object. However, Raman signal can easily be overwhelmed with any fluorescence from the sample, a common problem with organic compounds. FTIR spectroscopy has long been the go to analysis technique for organic compound identification, but either in a micro-sampling or contacting the sample mode. Here we present the analytical technique of using specular reflection FTIR spectroscopy to make positive chemical identifications of historic photograph coatings in a non-sampling, non-contact way and put it in context with other analytical techniques available. Principal Component Analysis (PCA) is a powerful data processing technique that has been used analyze large analytical chemistry datasets. We present our first application of the technique to the specular reflection FTIR data of coatings on salted paper prints.

Speaker biography: Arthur McClelland received his PhD in Applied Physics from the University of Michigan in 2009. He has been a technical staff scientist at Harvard University's Center for Nanoscale Systems since 2011, where he specializes in spectroscopic analysis techniques.

Section C: Historical Use

Commercial Salted Papers in the United States, 1860-1900

Katherine Mintie, Art and Art History Department, DePauw University

Abstract: This paper examines the manufacture and circulation of commercial salted papers in the United States between 1860 and 1900. Although the salted paper print process is thought to have fallen out of use among practitioners in the United States after the mid-1850s, an examination of photography manuals and periodicals published in the United States during the subsequent decades reveals a surprising number of advertisements for and samples of commercial salted papers. Many of these publications also include discussions of the material nature and use of commercial salted papers. This paper focuses on the commercial salted papers produced by three manufacturers: Follett & Johnson of New York, who introduced a salted paper branded “Alabaster Paper” in the 1860s; John R. Clemons of Philadelphia, who produced various salted papers from the 1860s to the 1890s; and Romain Talbot of Berlin, who produced a pre-sensitized salted paper called licht-paus papier in the 1870s and 1880s.

Speaker biography: Katherine Mintie is a postdoctoral fellow in the Art and Art History Department at DePauw University. She recently completed her doctorate at the University of California, Berkeley. Her work focuses on American photography during the nineteenth and early twentieth centuries. Her research interests include photographic copyright laws, photographically illustrated texts, and early photographic art reproductions.

“Divided ye may fall –united ye must stand”: Photography in the United States Patent Office

Mazie Harris, J. Paul Getty Museum Department of Photographs

Abstract: The United States Patent Office played a crucial role in the development of early American photography. This paper contrasts the 1847 review of William Henry Fox Talbot’s American patent application with reviews produced by Titian Ramsay Peale II, the youngest son of Charles Willson Peale and a patent examiner assigned to review applications in the Fine Arts Division between 1848 and 1872. During Peale’s time in the Patent Office, highly politicized policy revisions profoundly influenced the careers and collegiality of American photographers. The notations on Peale’s photographic experiments give insight into the varied techniques that circulated in the United States in the medium’s earliest years. Peale’s efforts—both as a photographic practitioner and a patent examiner—exemplified tensions between photographers who sought to improve the medium through collaboration and entrepreneurs whose proprietary claims nudged the field toward a more competitive model of advancement.

Speaker biography: Mazie M. Harris is an assistant curator in the J. Paul Getty Museum Department of Photographs. She holds a M.A. in the history of art from Boston University and a Ph.D. in the history of photography and American art from Brown University. She is the curator of Paper Promises, an exhibition tracing the American development of negative-positive processes, which will open at the J. Paul Getty Museum in February 2018.

Early Photographic Map Reproductions

Adrienne Lundgren, Library of Congress

Abstract: While considered rare, the use of the salted paper process to reproduce maps and plans was widespread between 1855 and 1880. Beginning with William Henry Fox Talbot in the 1840's, the technique evolved and later was extensively used by government agencies in the United States and abroad for the reproduction of architectural drawings and maps. This talk briefly discusses the first large scale uses of this technique by the English Ordnance Survey (1858-1875) and the Capitol and Treasury Building Projects in Washington, DC (c.1855). More time will be spent exploring the use of this technique during the United States Civil War with a focus on photographers who provided this service to both the Union and Confederate forces. Challenges with researching these unusual objects will be explored. Variations in technique are discussed as well as avenues for future research and investigation.

Speaker biography: Adrienne Lundgren is a senior photograph conservator at the Library of Congress where she has worked for 15 years. In 2012, she received a Kluge Fellowship to create a materials-based catalogue raisonné for the photographer F. Holland Day. She has recently published on the use of glycerine in the platinum printing process, the advantages of collaboration between curators and conservators, and the printing techniques of Clarence H. White. Lundgren is particularly interested in topics that involve photographic process and technology and how it can inform our understanding of the history of photography.

"Linneaus Tripe and Lightly Albumenized Prints in the 1850s"

Sarah Wagner, Joan Walker, Matthew Clarke, National Gallery of Art

Abstract: The 1851 introduction of albumenized paper marked a period of transition in photography in which salted paper prints continued to be made and albumen recipes rose in prominence. The numerous albumen recipes, variety of paper supports, and variations in processing conditions during the 1850s resulted in surface sheens ranging from matte to glossy. Salted paper prints with a post-processing coating or surface treatment may appear similar to low-sheen albumen prints, complicating process differentiation. Additionally, describing these prints accurately using common nomenclature is challenging, especially when they are compared to mass-produced albumen papers made after the 1860s when albumen formulations, paper supports, and surface sheen became standardized.

Captain Linneaus Tripe's circa 1857-1858 photographs of India and Burma (now Myanmar) show characteristics of both plain and albumenized paper, the surface of many appearing matte or with a low sheen. Visual clues typically used to differentiate print processes may include artifacts of the albumenizing step, such as binder sheeting or flow marks, but the presence of a conventional binder layer may not be obvious even when viewed under magnification. Instrumental analysis, such as Attenuated Total Reflectance (ATR) spectroscopy, can identify the presence of protein but cannot differentiate between a binder layer and a subsequent coating. While instrumental analysis in combination with careful examination can assist in distinguishing a print created with an albumen-salt solution from that of a plain salt solution, the difference between low-sheen albumen prints and salted paper prints may remain less defined during this transition decade than in later periods.

This presentation discusses the visual and instrumental analysis of Tripe's prints in the collection of the National Gallery of Art, seventeen of which were exhibited in 2014. The results of the research, which

used a set of standardized simulacra based on the formula and processing methods published by Tripe in early 1857, helps to explain the material character of these prints.

Speaker biography: Sarah Wagner has been a senior photograph conservator in the Photograph Conservation Department at the US National Gallery of Art since 2010. Her prior experience includes 10 years in private practice providing photograph conservation services to museums and libraries in metropolitan Washington, DC, and previous employment in photograph conservation at the Library of Congress and the US National Archives in the 1990s. She received her MS and certificate in conservation with specialization in paper and photographic media from the Winterthur Museum/University of Delaware program in 1989. Her recent areas of research include manufactured platinum and faux platinum papers from the 1880s to 1920s, and the photographic prints made by Linneaus Tripe in the 1850s which is the topic of her presentation today.

Section D: Historical Use / Preservation

The Calotype Negative Process According to the Modus Operandi of Artist Luigi Sacchi (1805-1861): Technique and aesthetics of an eclectic pioneer of photography in Italy

Sandra Petrillo, SMPPhoto Conservation Studio

Abstract: Luigi Sacchi (1805-1861) was an eclectic personality with an active role in the lively artistic milieu of Milan. In 1822, he enrolled in the Brera Academy of Fine Arts and studied painting, xylography and lithography. In 1839 and 1840, he travelled to Paris several times, where he learned about the recently invented daguerreotype process. However, when he began his activity as a photographer in 1845, like many other painters and engravers of the time he preferred to use the calotype process, due to the pictorial qualities of salted paper prints and the ease of their reproduction from negatives.

Sacchi became a prominent Italian calotypist and in 1849 he developed his own technique for making paper negatives. He played an important role in introducing this process to Italy, as well as the technical improvements introduced by French photographers. Mainly urban views but also natural landscapes and portraits, particularly of his fellow artists, were the subjects favored by Sacchi. His artistic compositions were much admired and the Brera Academy acquired several examples of his photographs.

In 1851, Sacchi began the task of producing hundreds of salted paper prints documenting the rich artistic heritage of the various Italian regions, which were published as *Monumenti, vedute e Sacchi costumi d'Italia*, and sold by the artshop in Milan owned by his friend Pompeo Pozzi. Sacchi himself wrote several articles on the art and techniques of photography, as well on Italian antiquities and monuments for the Milanese journal *L'Artista*, which he founded in 1859.

The techniques of Sacchi's paper negative and salt paper printing processes will be explained and illustrated thanks to a selection of examples of his portraits, architectural views and archaeological scenes now belonging to various prestigious Italian institutions, and the aesthetic qualities of his compositions will be revealed and discussed.

Speaker biography: Sandra M. Petrillo was awarded an MA in Art History from the University of Rome and she obtained an MA in Art Conservation, with a specialization in Photography, from the Institut National du Patrimoine of Paris. Since 1996 she has worked as a professional conservator in private practice in France, Luxembourg and the USA. Her company, the International SMP Photo Conservation

Studio, established in Italy in 2010, is dedicated to the conservation and preservation of historic and fine art photographs.

The History and Chemistry of Platinum-Toned Salted Paper Prints

Joan Walker, Ronel Namde, National Gallery of Art

Abstract: Silver and platinum have long and fascinating histories in photographic practice, alone and in combination to form an image. The first example of a platinum-containing toning bath for salted paper prints was published in 1856 by photographer Ernesto de Caranza. William Willis's 1879 introduction of the Platinotype process spurred interest in using platinum to tone silver prints as an economical means of simulating the tonal range and permanence of platinum prints. Many amateurs and professionals published platinum toning recipes and tips in specialty journals, culminating in a widely cited treatise by Lyonel Clark, first published in 1890. Subsequently, a great variety of toning bath compositions were proposed to achieve a range of image tones.

Despite the wealth of period literature that promoted toning processes, relatively few examples of platinum-toned silver prints have been identified in museum collections. In order to investigate the chemical nature and range of appearances of these prints, the authors followed historic toning recipes to fabricate platinum-toned salted paper prints. Analysis of these simulacra provides a better understanding of platinum as a toning element in early photographs and places it within the context of other platinum and matte silver photographic processes, such as Satista (silver-platinum), platinum-toned matte collodion silver, and silver-intensified platinum prints.

A brief timeline of the history of platinum toning will be presented along with the results of aging studies, color measurement, and XRF analyses of the printed samples, providing data relating to metal content, appearance, and longevity. High-resolution electron micrography will reveal how the metallic nanostructures that comprise the image are influenced by the chemistry of the printing and toning processes. Ultimately, the analytical results will be tied to visual observations of prints, with the goals of contributing to process identification, the elucidation of toning methods used by early photographers, and recommendations for preservation.

Speaker biography: Joan M. Walker received a Ph.D. in Inorganic Chemistry from Indiana University in 2015, where her research focused on the interaction between metallic nanoparticles and proteins under visible light excitation. After a brief internship in the Conservation Science Department at the Indianapolis Museum of Art, she was hired as a photographic materials scientist at the National Gallery of Art. Funded by the Andrew W. Mellon Foundation, her current research activities aim to gain a better material understanding of the creation and preservation of photographs from the early photographic era. Her interest in conservation dates back to her undergraduate career at Washington University in St. Louis (B.A., summa cum laude, Chemistry and Art History) and subsequent position as conservation technician at the Indiana Historical Society.

Section E: Preservation, Use and Analysis

Strategies for Exhibiting Facsimiles of William Henry Fox Talbot's Salted Paper Prints

Dan Leers, Carnegie Museum of Art

Abstract: Because extensive exposure to light could potentially damage many of Talbot's photographs, it has become common practice to exhibit facsimiles of his work in an exhibition context. Yet, in today's digital era, institutions are placing increased emphasis on the importance of seeing original artworks in person. How can a museum balance the preservation of artworks with the needs and desires of a contemporary viewing audience?

This paper presents a brief modern history of institutional displays of facsimiles of William Henry Fox Talbot's photogenic drawings and salted paper prints. It evaluates successes and failures and explain some of the thinking behind decisions that were made.

In anticipation of Carnegie Museum of Art's exhibition William Henry Fox Talbot and the Promise of Photography (November 18, 2017-February 11, 2018), the museum is exploring its own strategies for showing facsimiles of photogenic drawings and salted paper prints. Some potential ideas are discussed in this paper along with information about didactics, labels, and programming under consideration.

Speaker biography: Dan Leers is curator of photography at the Carnegie Museum of Art in Pittsburgh, Pennsylvania. Leers graduated with a BA in Art History from Lawrence University and an MA in Modern Art/Curatorial Studies from Columbia University. He is currently working on the exhibition William Henry Fox Talbot and the Promise of Photography opening November 18, 2017.

The Exhibition of Salted Paper Prints from Italy: A technical case study from the Metropolitan Museum of Art

Lisa Barro, Katie Sanderson, Silvia Centeno, Beth Saunders, Metropolitan Museum of Art

Abstract: This presentation focuses on a selection of 12 salted paper prints from the 1840's and 1850's in the permanent collection at The Metropolitan Museum of Art and to be included in the exhibition, Paradise of Exiles: Early Photography in Italy, at The Met from March to August 2017. This group of prints - including works by Giacomo Caneva, Firmin-Eugène Le Dien and Gustave Le Gray, and Calvert Richard Jones, among others - will be studied from multiple perspectives: historical, materials and technique, and exhibition behavior. The exhibition presents a fascinating period of early photography when international visitors and local photographers converged in the cultural hub of Italy. Materials, technique and condition will be discussed based on visual characterization and technical analysis. Analytical methods will include X-ray fluorescence (XRF) and Raman spectroscopy to characterize photographic image-related materials, non-image materials and possibly deterioration products such as silver, gold, and sulfur-based materials. Spectrophotometry and microfading will be used to study light-sensitivity and real-time color-change behavior based on measurements before, during and after exhibition. This study intends to apply technical information and data over the long term to support practical considerations relating to exhibition policy and procedure.

Speaker biography: Lisa Barro, associate conservator of photographs, has been working at the Metropolitan Museum part-time since 2007. She received her A.B. magna cum laude in the History of Art and Architecture in 1997 from Harvard College, as well as an MA from the Conservation Center at

the Institute of Fine Arts at New York University in 2002. Her internship year was completed in paper and photograph conservation at the Library of Congress. She held Andrew W. Mellon Fellowships at both The Metropolitan Museum of Art and The Museum of Modern Art. Barro's research interests include salted paper prints and commercial platinum papers.

Maximum Information with Minimum Exposure: Characterization of salted paper prints with digital imaging

Jiuan Jiuan Chen, Theresa Smith, Courtney Helion, Art Conservation Department at SUNY Buffalo State

Abstract: Nineteenth-century salted paper prints have a beautiful range of image colors and were made on a diverse range of papers. Identifying the fine characteristics of the paper supports and correlating image color to manufacture may help conservators define the age and origin of unidentified prints. Properly captured and processed digital images can illustrate these distinguishing characteristics, such as color, surface texture and sheen, and elements not visible to the naked eye may also be revealed with invisible ultraviolet and infrared radiation.

A well-planned setup and workflow with a digital camera can obtain this invaluable information about salted paper prints without sacrificing their safety and the operator's valuable time. It is possible to establish affordable, applicable, and repeatable best practices from setup to capture to get the maximum information with minimum light exposure, and cumulative exposure can be easily recorded as part of each print's history.

A CMOS digital camera can be modified to record the spectrum from about 350-1050nm, expanding its application to photography of visible light, UV-induced visible fluorescence, reflected UV, reflected IR, and visible-induced IR luminescence. Digital images captured with these various methods can provide a more holistic view of salted paper prints, and these digital images can be further processed to derive other useful information and help direct analytical investigation.

Speaker biographies: Jiuan Jiuan Chen is assistant professor of conservation imaging, technical examination and documentation in the Art Conservation Department at SUNY Buffalo State. A 2001 graduate of the same program, she previously interned or worked at the Northeast Document Conservation Center, the Frederick Law Olmsted National Historic Site, the Harry Ransom Humanities Research Center, Heugh-Edmondson Conservation Services, the National Gallery of Canada, the National Archives of Canada, the George Eastman House, and Paul Messier LLC. Chen enjoys exploring new approaches to streamline the workflow and efficacy of imaging techniques. One of her notable contributions is the design of AIC PhD Targets together with Dan Kushel and Luisa Casella. While she worked as a photograph conservator at Paul Messier LLC, she was involved in the research and development of Target UV™ for which she and Messier co-hold the US patent, "Fluorescent Color Calibrator for Calibrating RGB Pixel Values." Chen has extensive experience in UV imaging and has been invited to teach numerous UV workshops both within the US and internationally.

Theresa J. Smith is assistant professor of paper conservation in the Art Conservation Department at SUNY Buffalo State. She received an MA with a Certificate of Advanced Studies from Buffalo State in 2006, and has since worked at the Kupferstichkabinett - Berlin, the Fogg Art Museum at Harvard University, and the Weissman Preservation Center in Harvard Library. She has published on the technical examination of the recently-uncovered forgery of Galileo's Sidereus Nuncius, evaluation and recreation of historical paper conservation treatments, alkaline degradation of cellulose, and technical examination of drawings by Grünewald. Her current research into Renaissance flap anatomy prints relies on the

comparison of extant copies through bibliographical analysis, while drawing on literature from the histories of art, science, medicine, and the book, as well as hands-on printing experience, and an understanding of the materials and manufacture of paper and woodblocks.

Use of High-Resolution Multispectral Imaging and Analysis Systems for the Long-Term Monitoring of Salted Paper Prints and for Evaluation of the Intrinsic Permanence Characteristics of Contemporary Salted Paper Prints Made with a Variety of Process Variations

Henry Wilhelm, Wilhelm Imaging Research, Inc., Ken Boydston, MegaVision, Inc., Mike Robinson, Ryerson University, John McElhone, Canadian Photography Institute of the National Gallery of Canada, Greg Hill and Season Tse, Canadian Conservation Institute

Abstract: Development of new multispectral imaging and image-change analysis systems allows high-resolution, full-area monitoring of salted paper prints with very large data sets consisting of ten thousand or more discrete colorimetric data points for the short-term and long-term monitoring of full-tonal-scale colorimetric changes (including in the UV and IR regions) that may take place in the full image area and in the paper support (recto and verso) over time. Irregularities in image deterioration and/or staining of the paper support brought about by localized variations in processing, washing, and drying, non-uniform contact with mounting, framing, and storage materials over time, and the effects of exposure to non-uniform lighting, environmental and “micro-climate” temperature and RH conditions can be assessed and compared in all areas of an image – including in very small image details.

In this study, salted paper prints made by William Henry Fox Talbot, Hill and Adamson, and others in the National Gallery of Canada collection were imaged with the MegaVision Multispectral Imaging and Analysis System to illustrate how multispectral imaging may be applied to long-term monitoring of salted paper prints and collections of other materials. The system builds upon and enhances the capabilities of the Dead Sea Scroll monitoring system in use at the Israel Antiquities Authority in Jerusalem. With the capture of monitoring data, high-resolution color images with a color accuracy only possible with many spectral bands are also simultaneously captured. The total capture time for sixteen spectral bands (one 365nm UV exposure, exposures for 10 spectral bands in the visible region, and 5 IR bands) is approximately one minute.

In addition, for this study, modern salted paper prints were made by Mike Robinson, an historian and contemporary maker of photographs using 19th century processes, utilizing a number of process variations, including prints “stabilized” with a sodium chloride solution but not fixed with sodium thiosulfate, and prints fixed and washed and then gold toned or left untoned.

These prints are currently being subjected to a range of accelerated aging techniques in the permanence testing laboratory at Wilhelm Imaging Research to establish baseline data for the intrinsic stability of salted paper prints. The tests include accelerated light exposure with 3000K high-CRI LED illumination to simulate museum, gallery, and archive display conditions; and tests conducted with filtered fluorescent illuminants. Tests with Hoya L-37 filtered xenon arc illumination to simulate indoor indirect daylight through window glass are also being prepared. Multi-temperature Arrhenius dark storage tests (50% RH at 57°C, 64°C, 71°C, and 78°C); ozone resistance tests; high-humidity resistance tests; and water-resistance tests are also being conducted.

The light-stability data obtained from the tests with the process variations discussed above will be compared with data generated with xenon arc and LED microfading test equipment. In addition, light-stability reciprocity relationships between the extremely high illumination level, short-term light exposure employed by microfading test units, and the much lower level, longer-term, temperature- and humidity-controlled conditions provided in the laboratory accelerated light fading tests at Wilhelm Imaging Research, will also be investigated.

Speaker biographies: Ken Boydston is the president and chief color scientist of MegaVision, Inc., based in Santa Barbara, California. Boydston led the development of the high-resolution, MegaVision Multispectral Imaging and Analysis System which was introduced in 2007 and, with Boydston's collaboration, has been used to image, monitor with very large colorimetric data sets, and conduct forensic analysis of many cultural heritage treasures in the United States and throughout the world.

Henry Wilhelm is founder and director of research at Wilhelm Imaging Research, Inc. in Grinnell, Iowa. With work beginning in 1971, Wilhelm and his colleagues have assembled the world's largest reference collection of analog and digital color print materials and associated permanence data. With contributing author Carol Brower Wilhelm, he wrote "The Permanence and Care of Color Photographs: Traditional and Digital Color Prints, Color Negatives, Slides, and Motion Pictures," published in 1993. The complete 761-page book is available in PDF-A format at no cost from www.wilhelm-research.com. Wilhelm is currently serving as Project Leader for the development of the new ISO 18937-4 accelerated test methods standard for LED illumination sources.

Section F: Analysis

Minimally Invasive Sampling of Surface Coatings on Salted Prints for Protein Identification by Peptide Mass Fingerprinting

Dan Kirby, Richard Newman, Annette Manick, Museum of Fine Arts, Boston

Abstract: The identification of the coating on salt prints is important to understand the historical context of the print and to inform conservation treatment. The most common coatings in the mid-1800's were ovalbumin and gelatin, and their detection and identification is most often attempted by FTIR with sampling by either ATR or reflection. In many cases, especially with very thin coatings, FTIR methods are confounded by the surface underlying the coating, and data interpretation becomes difficult.

Another approach to the identification of proteinaceous coatings is peptide mass fingerprinting (PMF), whereby a small sample is digested enzymatically and analyzed by mass spectrometry to reveal characteristic marker peptides that identify the protein source. A crucial consideration in this case is obtaining a sample without disturbing or defacing the surface. To this end we have investigated the use of very fine particle-size polishing films (0.3 – 15 μm , 80,000 – 1,200 grit) to remove an amount of surface material consistent with PMF requirements through micro-abrasion.

Initial attempts utilized large (~5 x 10 mm) pieces of 15 μm film manipulated with tweezers to sample coatings of ovalbumin of various concentrations deposited on printed paper. In all cases PMF could readily identify the coating but left a visible mark on the surface at the sampling site. Follow on work has focused on minimizing or eliminating visual sampling consequences by reducing the surface area and particle size of the polishing film and by providing a means of carefully controlling the location and pressure on the film during sampling. Several types of sampling devices have been evaluated on film

coupons and salt prints. This talk discusses the results from these evaluations and propose an optimized system for sampling salted print coatings for PMF analysis.

Speaker biography: After careers as an analytical chemist in semiconductor electronics, pharmaceuticals and academic research, Dan Kirby turned his interests to conservation science in 2004 and began investigating the use of mass spectrometry for the analysis of artists' materials. Kirby has over 30 years of experience in analytical mass spectrometry in a wide variety of settings and is currently in private practice specializing in applications of mass spectrometry in art, cultural heritage, and wildlife forensics.

Development and Testing of a Methodology for the Identification of Salt Print and Calotype Coatings Utilizing Py-GC/MS

Art Kaplan, Michael Schilling, Getty Conservation Institute

Abstract: Salt prints and Calotypes represent some of the earliest photographic objects on paper and date back to the very beginnings of the medium. As such, these are some of the most prized, rare and delicate objects in the medium's history. This early period of photography was highly experimental and sometimes referred to as a period of so-called "kitchen chemistry" with practitioners often preparing materials on their own and utilizing whatever was available. This inevitably led to a large variability in recipes and materials used to create images as well as the coatings sometimes applied to them in order to achieve a range of objectives.

Current practice for the identification of coatings on photographs typically relies on the use of non-destructive techniques including visual examination, microscopy, multi-spectral imaging, laser scanning, Raman spectroscopy, and IR spectroscopy. The drawback of the imaging techniques are that they often only identify the presence of a coating and not the specific type. The spectroscopic techniques can be useful in identifying the class of coatings (protein, wax, resin, etc.) but any further distinction between specific types or the identification of multi-component mixtures can be very difficult.

Pyrolysis Gas Chromatography Mass Spectrometry is a technique that rapidly heats a sample to cause its breakdown in to smaller molecules. These smaller molecules are then separated using gas chromatography and detected using a mass spectrometer. The technique is destructive but extremely sensitive and can be useful for identifying organic materials and multiple component mixtures typically found in coatings. This presentation looks to discuss the work done in method development and optimization for the identification of coatings including the creation of a library of Py-GC/MS marker compounds for a range of coating materials as well as the testing of several sampling methods.

Speaker biography: Art Kaplan is an assistant scientist with the materials characterization group of the scientific department at the Getty Conservation Institute. He has spent a decade working on the application of analytical instrumentation to the identification and study of photographic processes and materials. His research focuses on the use of noninvasive and nondestructive techniques in the identification of photographic processes and materials. His past work has focused on the use of the GCI's portable lab for the scientific analysis of photographs from numerous collections including View from the Window at Le Gras and three other images by Joseph Nicéphore Niépce for which he was co-recipient of the Colin Ford Award from the Royal Photographic Society in 2011.

A Closer Look: Photographs in Eduard Isaac Asser's Family Albums (1845-1856)

Rosina Herrera Garrido, Rijksmuseum

Abstract: The Rijksmuseum collection holds four albums with photographs made by Eduard Isaac Asser (1809-1894), one of the first figures in photography in the Netherlands. Asser was an amateur photographer but also a pioneer in the field, experimenting with the daguerreotype and calotype processes in the early 1840's. He took the earliest known photographs of Amsterdam using the paper negative – salted paper print combination. He experimented also with albumen and patented a new variation of the photolithography process in 1857.

All these processes are represented in the approximate 200 prints kept in the albums that are object of this research, but the majority are salted paper prints. The albums were arranged supposedly by Asser himself, but observations made about the mounting, reinforced the theory that prints in the last two albums were assembled by his family members, once he had passed away.

XRF analysis has shed new light into these photographs, being now better characterized. For example, some of the salted papers prints were prepared using the chemistry of the calotype process, and many were never fixed. We now also know more about his finishing techniques; when he started toning with gold or what he used for retouching.

Besides that, a number of these prints are coated. Some of the coatings have severely discolored overall, are cracked and flaking or have locally stained the opposite pages of the album. The coatings were always assumed to be beeswax or shellac, but these conclusions were made by visual examination only. This project was the first attempt to apply scientific analysis to these significant objects. With the help of FTIR, I could determine the nature of the coatings to a certain level of success. And, by using OCT, I explored the possibilities for distinguishing a coated salted paper from a later albumen print.

Speaker biography: Rosina Herrera Garrido is a junior photograph conservator at the Rijksmuseum since 2014. Prior to this experience, she was teaching at the Polytechnic University of Valencia (Spain), where she is still guest professor. She was a fellow of the 4th Cycle of the Advanced Residency Program in Photograph Conservation held at the George Eastman Museum and the Image Permanence Institute (in Rochester, NY). After this experience, she was a research fellow at the Museum of Modern Art (New York). Herrera Garrido combines her work in a museum with her strong interest in education, and has given workshops in Spain, England, Portugal, Mexico and Taiwan.

Section G: Contemporary Use

Teaching with Photographs at the Harvard Art Museums

David Odo, Laura Muir, Harvard Art Museums

Abstract: This paper addresses the ways in which photographs--ranging from historic to contemporary formats--are actively used in curricular and co-curricular engagements at the Harvard Art Museums using a number of recent case studies. In addition to installing photographs prominently throughout our permanent galleries, which are heavily used in teaching and public programs, the museum installs photographs in our curricular teaching galleries and the Art Study Center. Photographs are deployed in the teaching of art history, photography, history, literature, and other disciplines, as well as in the training of students who lead public tours for the museums.

Speaker biographies: David Odo is the director of student programs and research curator for University Collections Initiatives at the Harvard Art Museums, and has held numerous research fellowships, including at Harvard University, the Freer and Sackler Galleries at the Smithsonian Institution, the Rijksmuseum Amsterdam, and the University of Tokyo. He teaches courses at Harvard College as a Lecturer on Anthropology in the Department of Anthropology some semesters. He received a D.Phil. in Social and Cultural Anthropology and an M.Phil. in Ethnology and Museum Ethnography from the University of Oxford, and an AB in East Asian Languages and Cultures from Columbia University. He has lectured and published widely on early Japanese photography, including most recently, *The Journey of "A Good Type": from artistry to ethnography in early Japanese photographs*, Cambridge: Peabody Museum Press/Harvard University (2015), winner of gold and silver medals from the 2016 Independent Publisher Book Awards. He was previously the Bradley Assistant Curator of Academic Affairs at the Yale University Art Gallery and lecturer in the Department of Anthropology, Yale University.

Laura Muir is research curator in the division of Academic and Public Programs at the Harvard Art Museums and from 2001 to 2013 was assistant curator of Harvard's Busch-Reisinger Museum. She has organized exhibitions on photography and the Bauhaus, postwar German painting and sculpture, and Anselm Kiefer's use of photography. Her most recent exhibition and publication was the first devoted to the photographic work of Lyonel Feininger whose archive is housed at Harvard. The exhibition was presented in Berlin, Munich, Los Angeles, and Cambridge, MA. The publication was awarded the 2012 German Photo Book prize in gold. Her current research focuses on the Harvard Art Museums' extensive Bauhaus collections and will culminate in a major exhibition in 2019 highlighting the key relationship between Harvard and the Bauhaus.

Pencil of Technology: Salt prints from natural salt water with varying salinity

Courtney Johnson, University of North Carolina, Wilmington

Abstract: This contemporary art series of salted paper prints uses salt water with varying salinity from natural sources. Varying the salinity of the water used in the gelatin salt solution results in a tonal variation of the prints from pinkish gray to sepia shades. The natural salt water is mixed directly with gelatin, rather than diluting to a consistent salinity (typically 2%); therefore, the results vary considerably. One particularly beautiful effect of the unusual hypersalinity in this process is the accumulation of salt on the finished images, which sparkles in the light.

The salt water in this series originates from a variety of sources including multiple points on the Atlantic Ocean, Gulf of Mexico, Cape Fear River, which, as an estuary, varies in salinity, as well as the Great Salt Lake and Badwater Basin. The Sodium Chloride content of the water samples measured with a Salt Brine Hydrometer varies from 1% to 55% salinity.

The prints were created by contact printing digital photographic negatives of the bodies of salt water as well as making photograms of the water collection bottles. This series was generously supported by a Charles L. Cahill Research Award.

Speaker biography: Courtney Johnson has mounted solo exhibitions in New York, San Francisco, Miami, and Bogotá, Colombia where her work was featured in *Fotográfica Bogotá 2011*, the 4th International Biennale of Photography. Johnson's work is included in numerous permanent collections including the Museum of Fine Arts, Houston; the Museum of Art, Fort Lauderdale; and three large-scale site-specific cliché-verre works commissioned for the University of Central Florida.

Johnson earned her Bachelor of Fine Arts with Honors in Photography and Imaging from New York University's Tisch School of the Arts, and her Master of Fine Arts in Studio Art from the University of Miami. She is currently an Associate Professor of Photography in the Department of Art & Art History at the University of North Carolina Wilmington.

Mechanisms of Controlling Staining and Aesthetic Appearance of the Salted Paper Print

Ellie Young, Gold Street Studios

Abstract: The salt print is a significant part of photography, both in its historic value and tonal range. This tonal range is greater than any other photographic printing process available to date attributed to the inherent masking ability of the metallic silver. Intrinsic production problems have made it a difficult process to manage. There are five key problems: 1) The difficulties in achieving the potential extensive tonal range; 2) The varying color of the print; 3) Staining that appears in the print, during and after processing; 4) Instability and longevity of the salt print; 5) Contradictory and inaccurate information in material published on the process.

Although the emphasis of this research was on exploring and controlling the color and tonal range, this presentation specifically addresses the staining and fading color that affects the aesthetic appearance the contemporary salted paper print. It appears that insufficient metal silver in the salted paper print; even with the protective "archival" processing including gold toning is not enough to curb staining. Masters of Applied Science research at RMIT University was completed in 2008, *The Salt Print Manual* published in 2011 based on this research. The constant practicing and teaching clearly shows there are more problems to resolve. The physic department at RMIT Microscopy and Microanalysis Facility (RMMF) houses high-quality electron microscopy and microanalysis equipment. The advances in this technology since the initial research in 2008 allows greater insight to color shifts and staining. A set of contemporary salt prints made in 2015 was used as the test case. Selecting photographs with stains and colors shift, comparing those with no apparent change to examined: 1) Elements remaining in paper fibers; 2) Silver particles size; 3) Silver particles disputation. This presentation discusses the results of this research and concludes with steps to address the problems.

Author biography: Ellie Young is the founder of Gold Street Studios in Victoria Australia. Since establishment in 1999 gold street studios has become the center for alternative photographic print processes in Australia and New Zealand. The studio provides a resource center for photographic image-makers and attracts local and international participants seeking to advance their knowledge and skills in the art, craft and science of traditional handmade and early photographic print processes. Young self-published *The Salt Print Manual* in 2011.

Contemporary Approaches to Salted Paper

Christina Anderson, Montana State University

Abstract: *Contemporary Approaches to Salted Paper* centers upon the current practice of the salted paper process. Information is culled from questionnaires sent out to artists asking about their process and creative practice. Each artist's tips and techniques will be coupled with images of their creative work. Woven into the lecture will be salted paper information culled from 180 texts from 1839 to present day, research completed for *Salted Paper Printing: A Step-by-Step Manual Highlighting Contemporary Artists* (Focal Press/Routledge, September 2018). With technologically advanced digital

printers, new archival papers on the market, and salt's long exposure scale suited to the extended density range of modern digital inks, it is a perfect storm for the resurgence of this lovely process.

Speaker biography: Christina Z. Anderson's work focuses on the family snapshot, gender identity, the altered landscape, and the contemporary *vanitas* printed in a variety of 19th century photographic processes, primarily gum and casein bichromate, salted paper, and mordantage. Anderson's work has shown internationally in 100+ shows and 40+ publications. Anderson has authored books which have sold in 40 countries—*The Experimental Photography Workbook*, *Gum Printing and Other Amazing Contact Printing Processes*, *Gum Printing, A Step by Step Manual Highlighting Artists and Their Creative Practice*, and her newest book release *Salted Paper Printing, A Step-by-Step Manual Highlighting Contemporary Artists*. Anderson is associate professor of photography at Montana State University. To see Anderson's work, visit christinaZanderson.com.