

## Abstracts

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*Roger Taylor*

#### Conservation and Analysis

##### The Conservation Treatment of Original Coatings on Photographs: Issues and Current Practice

*Debra Hess Norris and Nora W. Kennedy*

In recent years, photograph conservators have become more attentive to the presence of coatings on photographs and its specific aesthetic, protective, and other practical functions. With this awareness has come a heightened respect for the preservation and treatment challenges of these complex objects. Without proper identification, a coating could be unintentionally removed or altered during treatment. The partial removal of a coating could cause local fading, yellowing, or silver mirroring of the image. Furthermore, the alteration or removal of original material raises ethical questions in the field of photograph conservation. This chapter will outline some of the issues of and approaches to the conservation treatment as applied to damaged or deteriorated coatings, ranging from local reformation to overall removal and replacement.

#### Chemistry and Analysis of Coating Materials

*Christopher McGlinchey, Ph.D., Christopher Maines, Ph.D., and Mads Chr. Christensen*

The complex nature of photographs requires a conservator to have an in-depth knowledge of the many materials and processes involved in their production. Among the many challenges facing photograph conservators is an understanding of the coatings that may be present, how they may have changed over time, and how their presence affects the preservation and conservation treatment options. Many conservators do not have the luxury of working alongside a scientist with analytical instrumentation, however there are a number of techniques that can be used to assist in detecting and identifying the coating on a photograph. The more complex analytical methods necessary to identify the materials used to coat some photographs require the knowledge, skills, and research tools offered by a scientist. This chapter briefly outlines some of the primary components of coatings on photographs, key features of their chemical and physical properties, along with information regarding their aging characteristics. Examination methods are described, ranging from simple visual observation techniques to complex analytical methods.

#### Materials and Practice

##### The History and Conservation of Coated Daguerreotypes

*Adrienne Lundgren*

Throughout the history of the daguerreotype, coatings have been discussed in the contemporary literature as a viable practice. Texts from the United States, England, and France reveal that various daguerreotype coating methods and recipes were actively pursued by many of the best studios. This chapter provides a brief overview of the practice of coating daguerreotypes. Coatings were applied to daguerreotype plates for three main reasons: to provide a protective layer from handling and tarnishing; to create a base for hand coloring; and to reduce reflections when viewing the images. The conservation treatment of coated daguerreotypes is addressed briefly, including the descriptions of two treatment case studies.

##### Coatings on Paper Negatives

*Lee Ann Daffner*

One of the most important modifications to the nineteenth-century paper negative process was to saturate the paper with wax, resin, or oil, which rendered the substrate translucent, thereby dramatically improving the detail of the print. Occasionally, nineteenth-century photographers applied additional coatings that appear as discrete surface layers. This chapter includes a review of the history of the basic chemistry of the paper negative process, the methods used to render papers transparent, and the coating materials and methods developed by nineteenth-century photographers. The aging characteristics, preservation approaches, and ethical considerations related to the conservation of these important artifacts are also discussed.

##### Coatings on Salted Paper, Albumen, and Platinum Prints

*Clara von Waldthausen*

From the beginnings of photography, photographers have applied coatings to their prints. Early handbooks, letters of correspondence, and specialized journals describe the technical aspects and experimentation conducted during the time. Nineteenth-century photographs were coated to achieve greater brilliance and detail, to protect the image from deterioration, as an isolating layer prior to or following hand coloring, and to alter the print's surface gloss. This chapter examines the types of materials used to coat nineteenth-century prints, and traces the influence of trends in the commercial and artistic photography markets as they impacted the practice of coating. Examples of the more common recipes are given, and the methods of application are reviewed.

## Rolling and Burnishing of Nineteenth-century Photographic Prints

*Mark Osterman*

Physically changing the surface characteristics of photographic prints dates back to the earliest days of paper photography. Along with the application of various coatings to achieve the desired surface quality, the physical manipulation of the photograph's surface was an integral part of finishing prints. By the mid-1870s, most commercially mounted photographs were rolled or burnished, and these may have been coated in the process. This chapter addresses the importance of recognizing the differences between photographs with a distinct coating and those with highly modified surfaces that are the result of a mechanical burnishing process. Understanding the traditional finishing techniques for mounted nineteenth-century photographic prints is an important part of establishing a protocol to maintain their original surface.

## Coatings on Black-and-white Glass Plates and Films

*Karen Brynjolf Pedersen, Ulla Bøgvad Kejser,  
Jesper Stub Johnsen, Ph.D., and Mads Chr. Christensen*

Coatings have been used on glass plates, film negatives, and lantern slides to protect the image or provide a receptive layer for retouching. A large number of the coatings mentioned in the literature are based on resins, but other materials, such as proteins, gums, and rubbers, have also been applied using many different techniques. Collodion plates were routinely varnished for purposes of physical protection during printing, and this tradition continued with gelatin glass plates until contact printing was no longer practiced. However, the use of coatings continued when needed to facilitate the application of retouching media to the smooth surfaces of glass and film negatives. This chapter presents a description of the materials and methods used to coat black-and-white glass plates and early film, and discusses examination methods used to detect and characterize their coatings.

## Coatings on Autochrome Plates

*Bertrand Lavédrine, Ph.D., Clara von Waldthausen,  
and Lyzanne Gann*

Introduced in 1907, the autochrome was the first commercially successful color photographic process, and the most popular of the screen plate processes. The autochrome is composed of a glass plate with a minimum of four superimposed layers including at least two varnish layers. A recipe for a final varnish, which was to be applied after processing and drying, was enclosed by the Lumière factory in every autochrome box. The complex structure of the autochrome is a source of its fragility. Deterioration of autochrome plates can take place in any of the autochrome's layers, leading to various types of damage. This chapter will provide an outline of the autochrome's fabrication process, including an overview of the varnishes used during production. Also discussed are the methods employed for finishing autochrome plates, including recipes for final varnishes, other than the one recommended by the Lumières. Finally, issues regarding the deterioration and preservation of autochromes are addressed.

## Coatings on Gelatin Silver Prints: A Historical Overview

*Julie Lattin DesChamps*

Since the introduction of gelatin silver photographs in the 1880s, practitioners have explored various materials and methods of coating these prints to enhance their appearance and permanence. During the decades that gelatin silver prints reigned as the dominant photographic medium, the composition, manufacture, and function of coatings shifted frequently in response to aesthetic trends and technological developments. The discovery of synthetic resins, particularly the cellulose derivatives, led to the use of proprietary coatings and innovations in coating application techniques. The traditional methods of rubbing, brushing, immersion, and floatation still enjoyed widespread use, and new application techniques, most importantly the airbrush and spray gun, became popular for coating gelatin silver prints. The broad array of coating materials and application methods employed for gelatin silver prints along with their approximate dates of use are summarized in this historical overview.

## An Overview of Coatings on Hand-colored Black-and-white Photographs

*Monique C. Fischer and Sarah S. Wagner*

Coatings have been used in conjunction with the hand coloring of photographs primarily to prepare a surface that was receptive to the colorant. Coatings also prevented the penetration of potentially harmful media into the support, isolated the colorant from the final image material, and provided a uniform surface appearance after coloring. Many of the same materials used to coat uncolored photographs were adopted for use to aid in hand coloring. The type of coating applied depended on both the photographic process and the nature of the colorant to be applied. This chapter discusses the types of coatings used on daguerreotypes, tintypes, ambrotypes, and various print processes both to prepare the surface for different coloring media and for the final finish treatment.

## Coatings on Kodachrome and Ektachrome Films

*Claire Buzit-Tragni, Corinne Dune,  
Lene Grinde, and Phillipa Morrison*

This chapter presents research on various film lacquers that have been applied to protect the emulsions on Kodachrome and Ektachrome films from 1939 to the present day. A literature search provided information on the period of use, compositions, and application methods of these lacquers. In addition, conservation issues are discussed, emphasizing the identification of coatings, problems and solutions described by the manufacturers, and related information reported in the field of conservation.

## Coatings on Polaroid Prints

*Teresa Mesquit and Barbara Lemmen*

During the first twenty years of production, Polaroid instant black-and-white prints required a user-applied coating after processing. In 1970, the Polaroid Corporation introduced “coaterless” films, but user-applied coatings are still required for some products that remain on the market today. “Coater” prints are very stable if the coating is properly applied and the coating forms a hard film on the surface of the print. Flaws in the application can result in a range of phenomena, from a ridged, uneven surface to substantial deterioration of the silver image. This chapter reviews coatings used with Polaroid black-and-white prints, with an emphasis on the Polaroid-brand coatings. Current treatment techniques, including overcoating and recoating, are discussed along with avenues for future research.

## Commercial Coatings for Photographs in North America, 1950 to the Present

*Gawain Weaver*

Liquid photograph coatings and their application methods have undergone rapid development since 1950. Beginning with the cellulose derivatives and followed by the introduction of acrylic coatings around 1950, the modern photograph coatings industry emerged in the 1960s with the McDonald and Lacquer-Mat brands. In 1981, 3M's UV-cure coatings were introduced for use on photographs, and finally “Liquid Laminates” came on the market in 1989, bringing waterborne coatings to photographs for the first time. Some of the reasons for these industry changes are reviewed in this chapter, including the development of coatings technology, the introduction of color photography to the commercial studio, and the growing awareness of the environmental and safety hazards of solvent-based lacquers. General trends are emphasized, from organic solvent-based coatings to waterborne and UV-cure coatings, and from hand and spray application to machine coating.

## Plastic Lamination and Face Mounting of Contemporary Photographs

*Sylvie Pénichon and Martin Jürgens*

This chapter offers a detailed examination of two finishing techniques for contemporary photographs: plastic lamination and face mounting, the latter also known as “Diasec.” A history of these practices is presented, and typical materials and techniques are described. Conservation issues for the long-term preservation of laminated and face-mounted photographs are listed, and one case study is given. The results of preliminary testing are briefly outlined.

## Case Studies

### Historical Zapon Lacquer Coatings on the Daguerreotypes in the Albertina Photograph Collection

*Andreas Gruber and Taiyoung Ha*

The daguerreotypes at the Albertina Photograph Collection were examined and evaluated to better understand the nature of a coating treatment performed on them in the 1960s that involved the documented use of Zapon, a cellulose nitrate lacquer. Although the coating protected the plate from deleterious environmental factors, in some cases the coating itself degraded or yellowed, necessitating its removal. This chapter includes a literature search, an interview with a previous restorer, and the results of a collection survey. In addition, several plates underwent scientific examination to identify the coating materials and to ascertain their current condition. This information was helpful in designing a successful treatment protocol for the removal of the coating from several daguerreotype plates.

### The Treatment of Wax-impregnated Paper Negatives

*Katherine Jennings, Jiuan-jiuan Chen, and Gary E. Albright*

A myriad of formulas and tips for making paper negatives were published in the photographic journals of the nineteenth century, leading to considerable variety and combinations that are difficult to identify. Each coating or combination may have an impact on conservation treatment. This chapter reviews the types of waxes traditionally employed in historic paper negatives, typical damages that are seen, and treatment options. A summary is presented of the results of treatment tests conducted to investigate the effects of heat, water, and acetone on modern paper negatives made using nineteenth-century recipes and methods. Finally, this study discusses the results of a survey of waxed-paper negatives at the George Eastman House in Rochester, New York.

### Identification of the Colorant on Three Paper Negatives by Dr. John Murray

*Marie-France Lemay*

Dr. John Murray, a Scottish surgeon based in India from the early 1830s to 1870, practiced photography in the 1850s through the early 1860s. Using mainly the paper negative process, he produced a large body of images of Mughal architecture, found in the northern part of India. Like many of his contemporaries, he often waxed his paper negatives after processing to increase their transparency. He also sometimes retouched selected areas using a yellow colorant, which acted as a filter to improve the shadow detail in his prints. This chapter describes the examination and analysis of a three-part paper negative panorama and the applied colorant.

## Vernis Cuir and the Photographs of Adrien Tournachon

*Julie Lattin DesChamps*

*Vernis cuir*, or leather varnish, is a photographic coating composed of layers of gelatin and tannic acid. It was introduced by Louis-Désiré Blanquart-Évrard in 1857 to meet shifting aesthetic preferences and to resolve the problem of image impermanence. Caretakers of photograph collections have speculated that Adrien Tournachon routinely employed the vernis cuir technique, liberally applying this process to a number of his early photographs. This paper discusses the results of in-depth examination of the coatings on two of Tournachon's positives, including visual and microscopic study and analysis by Fourier transform infrared spectroscopy. Comparisons are made between these coated photographs and vernis cuir samples prepared according to recipes from historical journals. A history of vernis cuir is presented, followed by an investigation of its effect on the aesthetics and protection of salted paper and albumen positives. A guide to the identification of vernis cuir photographs is also provided.

## Coatings on the Photographic Prints of Gustave Le Gray

*Marc Harnly, Martín Salazar, and Dusan Stulik*

Over the years, conservators, curators, and collectors have observed surface coatings on a significant number of albumen photographs by Gustave Le Gray. To better understand these photographs, an investigation of the coatings was conducted. This study includes a literature review of Le Gray including his own technical treatises, and visual and analytical examinations of Le Gray's prints at the J. Paul Getty Museum, and examination of collections at other institutions.

## Coatings on Photographs by Alfred Stieglitz

*Constance McCabe*

Conservators and photographers have observed the presence of coatings on prints by Alfred Stieglitz for decades, but it has been difficult to learn exactly what materials and methods he may have used to coat his photographs. Evidence regarding his use of coatings has been discovered in correspondence between Stieglitz and his associates, and recent developments in non-destructive instrumental analysis have shed some light on his working methods. This chapter briefly outlines Stieglitz's use of coatings on his platinum and gelatin silver prints and the conservation of his coated photographs.

## Photography in Natural Colors: Steichen and the Autochrome Process

*Tania Passafiume*

Edward Steichen was present at the Lumière brothers' first public demonstration of the autochrome process in June of 1907. Steichen soon discovered the limitations of the Lumières' process and proceeded to improve upon it by changing the recommended gum dammar final varnish to Zaponlac, a cellulose nitrate lacquer. The subject of this chapter is an autochrome by Steichen that had sustained moderate water damage forty years ago, and displayed delamination of the emulsion and the screen from the glass support. Technical analysis of the final coating layer revealed that Steichen had used the original gum dammar varnish, helping to date the autochrome as one of his earliest. Conservation treatment, based on current research on the autochrome process, consisted of stabilizing the delaminating emulsion and screen.

## The Holy Shroud of Turin Transparency

*Silvia Berselli and Isabella Genovese*

The Holy Shroud, believed to be the funerary sheet for Jesus, is considered by many to be the first negative image. The nature of the negative image became evident only after the shroud was reproduced photographically in 1898 resulting in a positive image of a man. Giuseppe Enrie photographed the Shroud in 1931. A cellulose nitrate transparency, presumed to be by Enrie, was displayed until 2002 in Turin and had sustained mold damage and deterioration of its varnish coating. This chapter discusses the provenance of the transparency, the results of the technical analysis of the transparency film and varnish, the removal of the mold and varnish, and the final housing of the transparency after its replacement by a modern copy.

## The Use of Wax to Reduce the Silver Mirroring on a Photograph by Lewis Hine

*Toshiaki Koseki*

This case study describes the development of a conservation treatment to safely reduce severe silver mirroring and to improve the obscured image details using a wax coating on a photograph from the "Ellis Island" series by Lewis Hine. The history and condition of the photograph, an assessment of waxes, the treatment process, and the author's observations are discussed.

## Coatings on Photographs by Ansel Adams

*Jiuan-jiuan Chen and Gary E. Albright*

Ansel Adams, renowned for printing the perfect photograph, coated some of his photographs for aesthetic reasons and to provide easy maintenance and physical protection of the surfaces of oversized prints and folding screens. For this case study, the authors conducted an investigation of Adams' use of coatings, examined a number of Adams' coated photographs, and studied past conservation treatments of coatings on Adams' prints.

## The Artist's Perspective on Coating Photographs

*Cynthia Karnes and Katherine Jennings*

In recent years contemporary artists have employed various surface treatments on photographs with ever-increasing frequency. In this chapter, several prominent contemporary photographers are interviewed about their use of a variety of surface treatments. They offer comments on their techniques, their motivations, the value of coatings to their work, and their views regarding conservation intervention. Shimon Attie and Richard Misrach describe their use of film laminates; Chan T. Chao and Sabine Hornig discuss face mounting to rigid acrylic; and Sally Mann and Joseph Mills describe their techniques of using hand-applied wax and varnish formulations.

## Glossary

*Gregory J. Hill*

## Topical Bibliography

*Sara Shpargel*