

Hand-Coloring of Nineteenth Century Photographs

History and Social Context of Hand-Colored Photographs

In 1839, Louis-Jacques-Mandé Daguerre announced the development of the first successful lasting image created by the use of the sun's rays rather than an artist's brush (Towler, 1969). This first photograph was named the daguerreotype and brought wonder and amazement with its ability to capture the "true" living world. Soon after the public introduction of the daguerreotype, inventors and photographers in both the United States and Europe set out to improve upon it, and the photograph has constantly been "getting better" ever since.

After initial excitement for the daguerreotype wore off, disappointment at the lack of realistic coloring set in. The public clamored for the ability to capture the natural colors of the world through photography, and though many attempts were made, none were able to create a lasting image. The most notorious of attempts at natural color photography was by L.L. Hill who claimed to have discovered a technique to create color daguerreotypes, which he called heliochromes. He published his findings in *A Treatise on Heliography* in 1851 (Hill, 1851), but no one was able to reproduce his results. He was labeled a fraud and gave up daguerreotyping (Burns, 1995).¹

From its beginnings, photography was seen as an alternative to traditional portraiture. Clients of photographic portraiture knew that the image would be considered to be true to life, so they wanted to take every precaution to capture themselves in the most flattering way possible. As Henry Hunt Snelling once wrote, "the most dangerous enemy which the daguerreotype has to contend with, is incontestably, human vanity" (Hensch, 1996, p. 24). In the early days of daguerreotypes, exposure times were long, contrast was low, and to combat those effects, subjects were made to wear and do outrageous things. Head restraints were bolted to chairs to prevent subjects from moving and blurring the photograph (Burns, 1995). Sitters were discouraged from wearing black velvet or very light colors such as light blue and pink. Photographers powdered their clients' faces and hair, and sometimes gave them toxic concoctions to drink to make them pale. Most clients began to refuse the more uncomfortable and dangerous of the photographer's tricks, and an alternative was sought. Thus retouching of negatives and photographs began – the first Photoshop! Negatives and photographs were retouched using India ink and scratching tools to highlight the most desirable and delicate features. This served not only to enhance the features of the subject, but to maintain the image in the event of fading (Hensch, 1996; Burns, 1995).

While the world awaited the discovery of natural color photography, an alternative was sought and found in the use of pigments to hand-color photographs. Only three years after Daguerre's announcement, the first American patent for hand-coloring daguerreotypes was granted to Benjamin R. Stevens and Lemuel Morse (Rinhart, 1981; Burns, 1995; Hensch, 1996). Later that same year, a second American patent for coloring daguerreotypes was granted (Rinhart, 1981). As photographic imaging processes became more sophisticated, with photographic images appearing on everything

¹ Interestingly, Burns reports that Joseph W. Boudreau recently produced colored daguerreotypes following Hill's method.

from glass to leather (Towler, 1969) to ceramics, so did the coloring techniques (Henisch, 1996). For every photographic medium, a method for hand-coloring was developed.

Photographs were colored in one of two ways: hand tinting or hand coloring refers to a lightly painted image that is still distinguishable as a photograph; over-painting refers to an image that has been heavily painted and whose photographic origins may have been completely obscured (Hendricks, 1991; Henisch, 1996; Rinhart, 1999). Over-painted images mainly served as modern portraiture or as a way for an artist to pawn off an image as a freehand work of art, and often involved altering undesirable aspects of the original photograph. The cost of a painted photograph depended greatly on the amount of paint applied to the print (Burns, 1995). Before the introduction of the tintype, any photographic portrait was too costly for most people, but the tintype was a much cheaper alternative and brought photographic portraiture to the masses. Having a hand-colored photographic portrait became a status symbol, though most lower class people could only afford a rosy tint on the cheeks and gold paint on jewelry (Burns, 1995; Henisch, 1996).

As photography and photographic portraiture became available to people all across the United States, photographers realized their need for colorists, who were usually women artists (Henisch, 1996). Most photographers offered a hand-coloring option for their portraits whether they employed a colorist, contracted out for coloring, or colored their own photographs. When paper prints became popular, a new format began, the “crayon portrait”, and companies sprung up all over the United States to produce them. Crayon portraits were paper prints that were made by enlarging a photograph to near life-size, mainly a life-size head or head and shoulders (Henisch, 1996). All a person had to do was send in a photograph and they would be returned a life-size colored print (Burns, 1995). The first of such life-size portraits were made using large cameras, but the invention of the solar enlarger in 1857 gave better results (Henisch, 1996).

Hand-colored photographs grew in popularity to the point that people began to write in to prominent photography and art journals inquiring about methods of coloring photographs. In 1879, *Art Amateur* ran a series of articles describing in detail how to color a photograph: what preparation needed to be done to the print, what tools to use, and which colors to use for every part of a portrait (“Coloring Photographs”, 1879). Many books were written giving similar detailed instructions for novices (Tobias, 1934; Towler, 1969). Coloring photographs was no longer just for professionals.

Despite all the interest and progress in the field of hand-coloring photographs, discontent plagued both the photographic and artistic communities (Henisch, 1996). Some photographers believed that to artificially color a photograph was to alter its truth-telling nature and was considered blasphemy to the profession. Artists saw coloring photographs as an uncreative way to create works of art, and they saw the downfall of traditional portraiture in the rise of photographic works. Even though it was sneered at from both sides, the hand-colored photograph flourished, and hand-coloring kits and books are sold today. In 1907 the first widely accepted natural color photographic process, the autochrome was invented (Baldwin, 1991).

Photographic Coloring Techniques for Different Photographic Processes

Any photograph could be colored in a variety of ways, but most colorists preferred to work with photographs that were not overdeveloped and contained the entire range of tonal values (Henisch, 1996). Since the silver layer absorbed color differently

than the rest of the photograph, the colorist would often use a coating of varnish to create an even appearance. Coloring was seen as something that should enhance the photograph and not obscure it (except in the case of overpainting), so it was recommended to apply a few light layers of color until the right shade was achieved rather than one dark coating (Towler, 1969; Henish, 1996). Most colorants needed the addition of a binding material such as gum arabic to adhere to the photographic substrate. The colors most often used for coloring photographs were India red and pink madder for coloring cheeks, and gold paint for coloring jewelry (Rinhart, 1999).

The first American patent for coloring daguerreotypes involved coating the surface of the photograph with varnish or gum after fixing and washing (Rinhart, 1981; Burns, 1995; Henisch, 1996). The layer of varnish could then be easily painted. Most colorists, however, followed a previous, more complicated method of hand-coloring daguerreotypes that was invented by a Swiss photographer named J.B. Isenring. It involved tracing the image onto a transparent surface and creating stencils from this image, one for each color that was to be applied. Dry color was then mixed with a little gum arabic and sprinkled over the stencils. Breathing on the colors activated the gum arabic and fixed the colors in place. Silver jewelry was accentuated on daguerreotypes by scratching the image to reveal the silver plate below. Overall tinting of a photograph was accomplished by placing it in a chemical bath and hooking it up to a galvanic battery to create a current until the desired tone was reached (Rinhart, 1981; Burns, 1995; Henisch, 1996).

Ambrotypes, invented in 1851, were a collodion positive image on glass with very low contrast so that a dark background had to be placed behind the image glass in order to properly see the photograph (Burns, 1995). The typical material used for the dark backing of an ambrotype in America was a black-lacquered, "japanned," sheet of iron. For colored ambrotypes, a backing of maroon or violet colored velvet was recommended. Colored and painted papers were used in conjunction with black varnish as backings for ambrotypes as an alternative to painting on the image (Prescott, 1979). Ambrotypes were colored similarly to daguerreotypes, but the paint scratched and wore off easier, so a varnish layer was often applied over the color. These images were typically mounted collodion side up so that the color was viewed through the image (Prescott, 1979). Another way of coloring ambrotypes also took advantage of their transparent nature. Paint was applied to the collodion imaging side of the glass plate rather than the viewing side. For this method, the collodion was first made permeable to the pigments by applying an alabastrine solution. The major component of alabastrine solutions was mercury bichloride (HgCl_2) which "bleached the silver deposit on the glass" (Prescott, 1979, p. 21) and enhanced the whiteness of the whites. It was then painted over, coated with clear varnish, and placed collodion side down over a black background. Velvet was the recommended background so as not to scratch the image (Burns, 1995; Henisch, 1996; Towler, 1969).

Tintypes, also called ferrotypes, were direct positive collodion images on black lacquered iron plates (Burns, 1995; Rinhart, 1999). They were much less expensive than daguerreotypes and ambrotypes and were much less prone to breaking, though the image produced was much flatter. Tintypes were colored using a variety of methods similar to daguerreotypes and ambrotypes including oil-based paint, crayon, colored chalk, and pastel, but their metallic base made water color an unsuitable medium. If colored chalk

or pastel was used to color the tintype, it was usually sealed under glass to protect the coloring. As an attempt to create a fuller, warmer tintype image, Horace M. Hedden patented a process to make a colored tintype plate. His process involved coating iron plates with a combination of India red and linseed-oil (Hedden, 1870). Colored tintype plates were created in chocolate, blue and yellow. The blue and yellow plates were expensive and are now very rare, but the brown was widely used (Burns 1995; Rinhart, 1999; Henisch, 1996).

Most of the articles in journals and books written about hand-coloring photographs focused on paper prints. The paper medium was most familiar to artists, and watercolors were a natural colorant for paper prints (Henisch, 1996). Prints needed to be washed several times before painting. Albumen prints were particularly greasy and needed to be treated before pigment would adhere. The favorite method employed by photographic colorists was to lick the paper and let it dry. Most paper prints were mounted, and often the prints were varnished, before coloring to give the colors a smoother appearance. Paper prints were painted with oils, water colors, or aniline colors. Aniline colors were particularly recommended for albumen prints which needed no preparation for their use due to the albumen's affinity for the dye (Towler, 1969; Henisch, 1996). Water colors tended to leave a darker edge of color at the boundaries of the painted area. Pastels were also used to color paper prints. First the print was prepped with a thin coating of shellac, then grit was added, and finally the print was colored (Tobias, 1934). The best way to keep the color safe is under glass. Charcoal or India ink was often used to retouch paper prints emphasizing details or adding in completely new material (Henisch, 1996). Paper prints were the most manipulated since they were on the most recognizable substrate for colorists.

Preservation and Conservation Concerns for Hand-Colored Photographs

The range of nineteenth century photographic media and the hand-coloring techniques employed to enhance them is overwhelming from a conservation viewpoint. Research into the preservation and conservation of these colored photographs is limited at best. Most care manuals for photographic materials either completely bypass the issue of hand-colored images or say merely not to wash them. One guide suggests working with an oil paintings conservator on heavily overpainted photographs (Hendricks, 1991), but the first thing to determine is if an image is over-painted. It can be very difficult to actually detect the photographic base underneath, and in some cases, the photographic image underneath was bleached out (Ruggles, 1985; Henisch, 1996; Hendricks, 1991). Use a microscope, or a lupe, and study the areas of detail, such as eyes and lace, to detect any part of the photograph that was left unpainted to preserve detail (Hendricks, 1991). Scientific instruments can help in the detection of a photographic base, such as Radioisotope Excited X-Ray Energy Spectrometry (REXES) and Fourier Transform Infrared Spectroscopy (FTIR), both of which are non-destructive and expensive. While it is a wise idea to work with an art conservator, it is necessary to gain an understanding not only of how colorants and photographs deteriorate with age, but also how they affect one another.

Once a photograph has been detected as such, it should be tested for sensitivity to moisture. If either the coloring medium or the photograph itself is sensitive to moisture it

should not be washed or wetted in any way. Typical treatments for colored photographs include inpainting (retouching areas where color has faded or been lost), surface cleaning, consolidation of cracked emulsions, matting, and housing. Pigments and dyes used to hand-color photographs are most likely light sensitive, so housing the photograph is necessary. Some hand-colored photographs have a very thick binding layer to prevent the pigments from sinking into the paper. This binding layer can collect a lot of dirt and dust, so surface cleaning will take off the dirt and a little of the binding layer, leaving behind the color that had sunk into the binding layer (Hendricks, 1990).

Hendricks (1991) gives three categories into which treatments for hand-colored photographs fall. First, hand-colored albumen or silver gelatin prints, which can for the most part be treated like uncolored albumen and silver gelatin prints. If the colorants or prints themselves are unstable in moisture, they can be treated as any other albumen or silver gelatin print that is sensitive to moisture. Second, hand-colored salted paper and platinum prints should be treated as works of art on paper and a fine art paper conservator should be consulted. Third, images that have been heavily overpainted with oil should be treated with the help of an oil paintings conservator. Hand-colored daguerreotypes should not be treated, and no mention is made of ambrotypes and tintypes.

A study by the Photographic Conservation Lab at the National Archives of Canada looked closely at the conservation of hand-colored photographs (Hendricks, 1990). They determined and carried out a treatment plan for each of three salted paper prints hand-colored with water colors. Fading and loss of coloration of the prints was treated by inpainting with Winsor & Newton Artists' Watercolors. The researchers tested suitability of pigments for inpainting through accelerated aging. Pigments were applied to photographic images and then put into the artificial aging chamber. Changes in the color and intensity of the pigments were monitored as well as any changes to the photographic image itself. Only those pigments which did not fade, discolor, or bleach the photographic image were used for treatment (Hendricks, 1990).

One of the most prominent processes by which a photograph degrades is by sulphiding (Rempel, 1987). Sulphiding is a reaction between the metallic silver of a photographic image and any sulphur with which it comes into contact. This sulphur can come from atmospheric pollutants or an inadequate fixing step. The result is a yellowing photographic image. In the case of hand-colored photographs, sulphiding may be caused by the pigments that were added on top of the photographic image (Rempel, 1987).

Using F.W. Weber's book *Artists' Pigments* to compare the chemical compositions of pigments tested by the research group at the National Archives of Canada, most of the pigments that were found to be inadequate for inpainting due to bleaching or discoloration of silver contain some sulphur. For instance, vermilion (HgS) and ultramarine, which whether natural or artificial contains some sulphur (Weber, 1923), were both found to be unsuitable for conservation (Hendricks, 1990).

The preservation and conservation of hand-colored photographs is an area wide open for more research, but perhaps understanding the causes of deterioration in the first place will facilitate finding new ways to care for these beautiful images. To add color to a photograph in the nineteenth century was thought of as conservation, not so much for longevity, but as a way to add value and respect to the object (Henisch, 1996). Combining the expertise of both art and photograph conservators we can hopefully find a way to maintain these treasured prints.

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