True Colors

Color in Photography from 1849 to 1955

24.1.2025 TO 21.4.2025

Richard Neuhauss, *Papagei*, 1899, ALBERTINA, Wien – Dauerleihgabe der Höheren Graphischen Bundes-Lehr- und Versuchsanstalt

ALBERTINA modern

Exhibition Facts

Duration	January 24 – April 14, 2025
Venue	ALBERTINA MODERN (Basement)
Curators	Dr. Anna Hanreich Dr. Astrid Mahler
Works	approx. 130
Catalogue	Catalogue Available in the ALBERTINA Shop and at https://shop.albertina.at/ (German | English EUR 32.90)
Contact	Albertinaplatz 1 | 1010 Vienna T +43 (0)1 534 83 0 info@albertina.at www.albertina.at
Öffnungszeiten	ALBERTINA MODERN | Karlsplatz 5, 1010 Vienna Daily from 10.00 - 18.00 hrs
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Annual partner

True Colors

Color in Photography from 1849 to 1955

24 January – 21 April 2025

How did color get into photography? The exhibition *True Colors - Color in Photography from 1849 to 1955* answers this question with outstanding works from the ALBERTINA Museum's photo collection. The desire for color in photography has dominated the world of photography from the very beginning. *True Colors* traces the development of color photography, from the first experimental techniques in the 19th century to generally applicable analog color photography.

Even in the early days of photography, daguerreotypes and salt paper prints were colored by hand to create colorful images. Monochrome pigment papers, which enjoyed great popularity until the 1890s, also contributed to the broad chromatic diversity of 19th century photographs.

The first successful color process, which was reserved for an exclusive circle, was introduced in 1891. The brilliant images in the so-called interference color process are based on the physical principle of standing waves, which also allows us to see colored reflections in soap bubbles. The pieces from the ALBERTINA Museum's Collection represent a unique focal point.

The autochrome process, which was introduced in 1907, brought about a major change in image culture. It was also practicable for amateurs and helped its inventors, the Lumière brothers, to achieve great commercial success. However, it was mainly used as a glass slide for projection. At the same time, around 1900, fine art printing processes were developed that used color pigments to produce multicolored image solutions. They fulfilled the artistic aspirations of the Pictorialists and were commonplace in large photo studios until the 1930s. For a long time, the challenge was to obtain colored prints on paper. This was also achieved at the beginning of the 20th century with the use of various three-color processes, which were assembled in several steps.

Kodak finally achieved the breakthrough to easy-to-use and therefore mass-market color photography in 1936 with the first 35mm color slide films. These products revolutionized the use of colour photography in the following decades, which form the conclusion of this ALBERTINA Museum exhibition.

True Colors provides an insight into the rich holdings of the ALBERTINA Museum's photography collection, the historical part of which is based on the collection of the Höhere Graphische Bundes-Lehr- und Versuchsanstalt (GLV). The exhibition demonstrates the constant development and the various fields of application of historical photography in color. *True Colors* also explores the impact of popular color processes on the visual culture of the early 20th century.

Curators: Anna Hanreich & Astrid Mahler
ALBERTINA MODERN (basement)

Exhibition Texts

INTRODUCTION

TRUE COLORS

Color in Photography from 1849 to 1955

Today, color photography is omnipresent, but the knowledge about its complex genesis is not very familiar. This exhibition highlights the multifaceted developments that were initiated starting in the mid-nineteenth century to bring color into photography. Thanks to the extensive photographic collection of the Imperial-Royal Institution of Graphic Education and Research, the Albertina possesses unique holdings of important examples from this exciting chapter of photographic history.

As early as the middle of the nineteenth century, individual scientists managed to create unique photographs in color, which, however, were not intended for everyday use. Therefore, it was common from the early days to employ coloration or toned photographic papers. In 1891, Gabriel Lippmann achieved a crucial success in direct color photography by formulating the interferential color process, which produced brilliantly vivid images. The Lumière brothers finally accomplished the first revolution in color photography: in 1907, they brought industrially manufactured autochromes to market. It was now for the first time that photographers and amateurs could access a practicable process for the production of color glass slides. Thanks to more elaborate three-color processes and pictorialist fine art printing, which were developed around the same time, it was also possible to produce photographs in color on paper.

The desire for color in photography, which had been evident since it had existed, continued to prevail in the twentieth century. A decisive breakthrough was achieved by the Kodak Company in the mid-1930s, when it produced the first 35 mm photographic color slide film. Starting out from the USA, more practical materials for analog color photography, which had been developed gradually, also established themselves in Europe after World War II. It was now impossible to stop the triumph of modern color photography.

All objects on display here come from the holdings of the Albertina or are on permanent loan from the collection of the Höhere Graphische Bundes-Lehr- und Versuchsanstalt [Higher Federal Institution of Graphic Education and Research].

Chromatic Diversity

Before it was possible to produce color photographs, photographers made use of a number of methods to bring color into their images. Even in the early days, daguerreotypes and salted paper prints were colored by hand. While daguerreotypes were usually colored only partially, salted paper prints were sometimes heavily painted over. The so-called pigment papers, which enjoyed great popularity from the 1850s onward, enabled monochrome prints in various colors. Industrial manufacturers offered a wide range of nuances that could be variably used depending on the motif. Another way of lending prints uniform color effects were toning baths. It was thus variable methods that were employed to produce photographs displaying a rich chromatic diversity.

A vital contribution to photography in color was the introduction of the so-called orthochromatic negative plates. In 1873, Hermann Wilhelm Vogel discovered the sensitization of the photographic emulsion, so that the plates truthfully rendered the brightness values of blue, orange, yellow, and green. Earlier, the gray values of the blue areas had appeared overly bright, while the other colors had often seemed too dark. With the development of so-called panchromatic negative material it became possible from 1902 on to accurately record the entire visible spectral range according to tonal values. This progress was crucial for color photography, as an incorrect recording of the tonal values during a shot could result in a distorted color impression in the final product.

A Solitaire—the Interferential Color Process

The interferential color process, with which Gabriel Lippmann went public in Paris in 1891, is considered a first milestone in direct color photography. The method ensured permanently stable, brilliantly vivid color images. It is based on the interference of light waves caused during exposure by the reflections of incident light rays off a reflective layer of mercury behind the negative. In the photographic emulsion, the finest layers are created alongside the standing waves, in which accumulations of silver are deposited. The spacing between the layers corresponds to the wavelength of the recorded color, so that when the image is viewed

at the correct angle, the individual parts reflect their original color. Standing waves are the phenomenon that also causes the color effects on soap bubbles.

The process, which had its pitfalls, was enthusiastically received by specialists. The Lumière brothers, who as producers of photographic plates were highly interested in color photography, collaborated with Lippmann to improve emulsions. The Berlin-based scientist Richard Neuhauss also dealt intensively with this method, based on the research conducted by the Viennese photochemist Eduard Valenta. Due to its chromatic purity, the spectrum offered itself as an ideal motif for images. Neuhauss's plates fascinate us not only because of their luminous colors, but mainly for their wide range of motifs, which was facilitated by the reduction of exposure times.

Photomechanical Color Printing Processes

Since the development of chromolithography in 1837, color reproductions had been increasingly used for luxury volumes. In combination with photography, the printing plates could either be exposed directly, or the photographic images were transferred to the plates by means of transfer printing. This and related procedures led to an increase of elaborately produced publications of scholarly character. For the work *Le Trésor artistique de la France*, which contained high-quality color reproductions of art objects held by the Louvre, the French photographer Léon Vidal developed a complex process referred to as *photochromie*. Photographic prints constituted the base layer onto which he printed several tinted lithographic plates. Through the additional use of metallic colors or papers and a layer of varnish, Vidal achieved three-dimensional effects.

Another important step was the introduction of the collotype process, which, from 1868 onward, allowed printing black-and-white photographs in halftones. Institutions like the Imperial-Royal Austrian Trade Museum in Vienna published such luxurious scholarly publications as the illustrated volume *Orientalische Teppiche [Oriental Rugs],* which appeared in 1892. For this work, black-and-white collotypes and the chromolithographic plates were partly each executed across the entire surface and partly combined with each other in order to document the knotting technique and the coloration of the objects equally

accurately. A color sample based on the original rug was first painted on the collotype and then transferred by lithography. Up to thirteen individually tinted printing plates were employed in the process. Both publications stand out for the effort to imitate the object character in the colored reproduction.

Commercial Successes—the Autochrome and Other Color Screen Processes

In 1893, in search of a viable color process, the industrialists Auguste and Louis Lumière developed the ALL Chroma, a transparency made up of three colored layers. Since its production and use involved a high input of costs and time, the method did not prevail, despite the vivid colors it produced. Following further research, the Lumière brothers eventually achieved a breakthrough with the autochrome in 1907, which was to revolutionize color photography for the first time. The autochrome is also a positive transparency, yet based on the principle of additive color synthesis. A glass plate functioning as carrier material is covered with a photosensitive layer on one side. A mixture of red, green, and blue starch granules is applied on top of it, forming an irregular pattern. The image is created after exposure and negative and positive development, as the granules fuse together to form colored areas when viewed in transmitted light. Its vibrant colors and uncomplicated handling earned the inventors of this method great commercial success. The autochrome was no longer exclusively accessible to specialists. The process was not only employed for scientific images, but also and mainly in amateur photography.

In addition to the autochrome, there were numerous products relying on the principle of additive color synthesis, such as the Joly process, which had already been developed in England ten years earlier and which was based on a grid of vertical lines. By 1910, further color screen processes had made it onto the market, such as Omnicolore or the Agfacolor plate. But the autochrome remained the most widely used color process until the early 1930s because of its unsurpassed chromatic brilliance.

Color by "Indirect" Means—Three-Color Processes

Three-color photographic printing methods on paper are based on the principle of subtractive color mixing. The processes, their implementation differing in detail, followed a multistep procedure. At first, three subsequent black-and-white shots were taken behind red, green, and blue filters. The so-called color separation negatives were then inverted into positives. From the three positives, three matrices—in the complementary colors cyan, magenta, and yellow—were then produced. The color image was finally composed of these three colors.

For the pinatype, three matrices were transferred onto a sheet of prepared paper. What mattered for an accomplished picture was not only proper color adjustment, but also an absolutely precise alignment of the images. The still life of various laboratory utensils demonstrates the individual steps leading to a colorful picture. The so-called interpositives provide the basis for the colored matrices, which, printed one upon the other, provide the final version of the picture. Apart from still lifes, photographers also employed this technique, which was developed to market maturity by Ernst König in 1905, for portraits. In these photographs, they showcased their creative skills in handling color.

Pictorialist Endeavors—Fine Art Printing Processes

Artistic photography around 1900 was propagated by wealthy amateurs who wished to elevate photography to the level of fine art. Their ambition was to be able to manipulate the photographic print by hand, as the mechanical aspect of photography was criticized as being inartistic. The gum bichromate print, a so-called fine art printing process, allowed them to control the work as much as possible. A mixture of pigments, gum arabic, and photosensitive salts was applied to coarse paper and then exposed. After washing out the unexposed areas, the image became visible. For multicolor works, this process could be repeated as often as desired, each time using a different pigment. This advancement of the gum bichromate printing technique toward multicolor printing was first implemented by members of the Camera Club in Vienna, an association of amateur photographers. The possibility of creating

such colorful images that could be used as decorative works of art on the wall and sometimes reach large dimensions, was particularly enthusiastically received in German-speaking countries.

Paths to Modern Color Photography

The consequential breakthrough to mass-market color photography was achieved in the mid-1930s, when the companies Eastman Kodak (USA) and, shortly thereafter, Agfa (Germany) put so-called modern multilayer films with dye couplers on the market. By 1936, the first 35 mm color slide films and, by 1942, the first color films and corresponding photographic papers for the negative-positive process were available, the latter of which revolutionized color photography a second time. Yet the outbreak of World War II initially delayed the spread of these innovations in Europe. But from the 1950s onward, the triumph of modern analog color photography could not longer be stopped.

However, contemporary high-quality copying and printing processes were still extremely expensive and complicated. The Duxochrome and dye-transfer processes, for example, were valued not only for the brilliance and stability of their colors, but also because they could be manipulated during the production process. But due to the high cost of production, they were mainly used for commercial purposes. Product and fashion photography accommodated the needs of advertising and the press. In Vienna, the photographers Arthur Benda and Hans Madensky were very successful in these fields.

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Program

Photography in colour up close

Lectures with originals in the ALBERTINA Study Hall

Facts

Limited number of participants in each case

Participation free of charge | Registration required

Meeting point | equestrian monument in front of the main entrance to the ALBERTINA Museum

Dates

21 February 2025 | 2 pm

Dr Anna Hanreich in conversation with

Doc. Mgr. Art. Jana Blaško Križanová, Head of the Department of Restoration, Academy of Fine Arts and Design in Bratislava

&

Kitti Baráthová, Research Associate at the Department of Restoration, Academy of Fine Arts and Design in Bratislava

28 February 2025 | 2 pm

Dr Astrid Mahler in conversation with

Hanna Schneck, Director of the Library of the KHM, Vienna

ALBERTINA
modern

Press images

The following images are available free of charge in the *Press* section of www.albertina.at.
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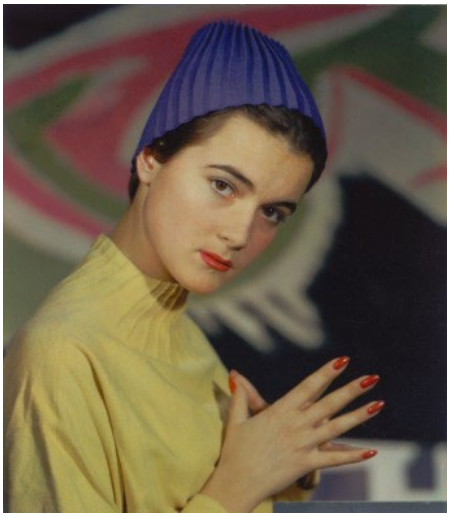

Hans Madensky
Fashion portrait – Student from the Vienna-Hetzendorf Fashion School, 1952
Kodak Dye Transferprint
27 x 22,8 cm
The ALBERTINA Museum, Vienna – Permanent Loan by Höhere Graphische Bundes-Lehr- und Versuchsanstalt
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Heinrich Kühn
The Parasol, 1912
Autochrome
18 x 13 cm
The ALBERTINA Museum, Vienna
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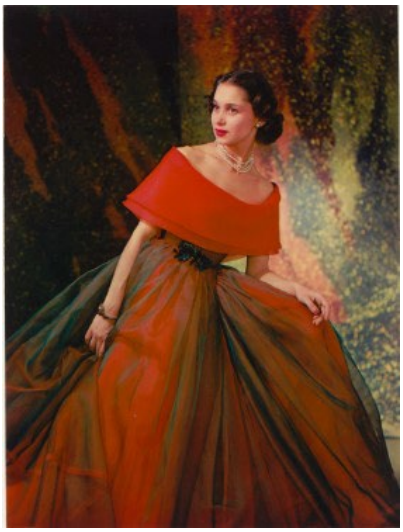

Philippe Pottier
Evening Gown by Madame Grès, 1950/1954
Kodak Dye Transferprint
22,2 x 16,5 cm
The ALBERTINA Museum, Vienna – Permanent Loan by Höhere Graphische Bundes-Lehr- und Versuchsanstalt
© Photo: The ALBERTINA Museum, Vienna

Richard Neuhauss
Parrot, 1899
Interferential color photography
8,3 cm x 6,4 cm
The ALBERTINA Museum, Vienna – Permanent Loan by Höhere Graphische Bundes-Lehr- und Versuchsanstalt
© Photo: The ALBERTINA Museum, Vienna

Anonymous
Laboratory Still Life, around 1906
Pinatype
14,2 x 11,2 cm
The ALBERTINA Museum, Vienna – Permanent Loan by Höhere Graphische Bundes-Lehr- und Versuchsanstalt
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Arthur von Hübl
Exotic Butterflies, 1908-1914
Autochrome
6,3 x 6,9 cm
The ALBERTINA Museum, Vienna – Permanent Loan by Höhere Bundes-Lehr- und Versuchsanstalt
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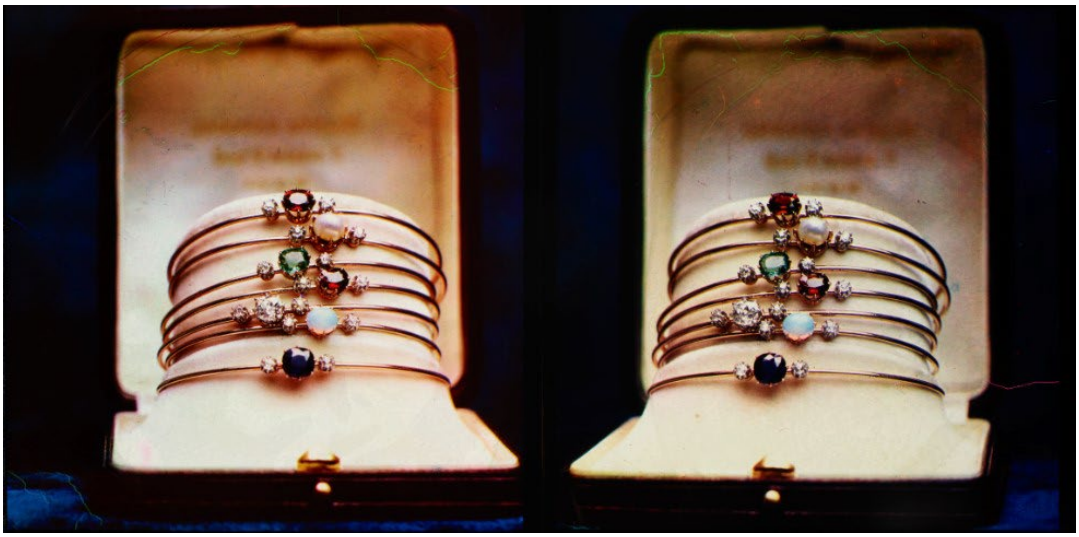
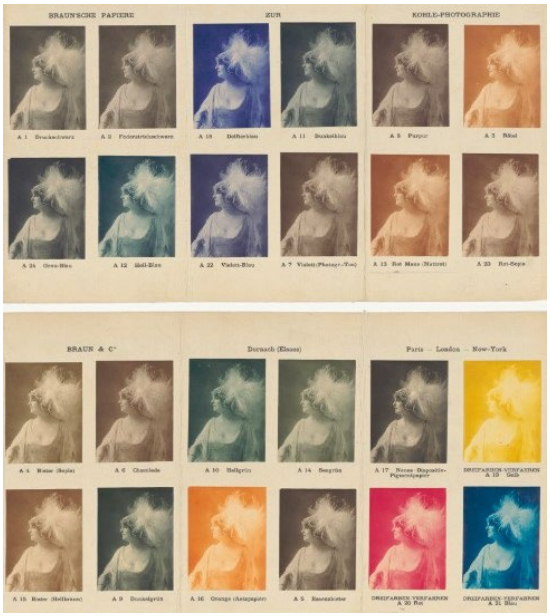


Auguste and Louis Lumière
Bangles, 1893-1900
ALL Chroma
8,4 x 17,8 cm
The ALBERTINA Museum, Vienna – Permanent loan by Höhere Graphische Bundes-Lehr- und Versuchsanstalt



Ad. Braun et Cie.
Sample board of various pigment papers from Ad. Braun et Cie., around 1910
Pigment prints
38,2 x 32,5 cm
The ALBERTINA Museum, Vienna – Permanent loan by Höhere Graphische Bundes- Lehr- und Versuchsanstalt
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