



Edward Steichen (American, born Luxembourg, 1879–1973)

Midnight Lake George

1904

Gum bichromate over platinum print

Alfred Stieglitz Collection

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AIC accession number: 1949.830

Stieglitz Estate number:

Inscriptions: Signed recto, on image, lower right, in graphite: "Steichen"; inscribed verso, on mount, upper left, upside down, in black pencil: "#22"

Dimensions: 39.5 x 48.7 cm (image/paper)

Print thickness: N/A

Surface sheen: Medium gloss (10.9 GU @ 85°)

Paper tone: N/A

Mount: Original

Mount tone: L*44.72, a*0.8, b*3.71

Ultraviolet-induced (UV) visible fluorescence (recto): None

X-ray fluorescence (XRF) spectrometry:

See below

Fourier transform infrared (FTIR) spectrometry:

See below

TECHNICAL SUMMARY

This photograph is a gum bichromate over platinum print that has been trimmed and mounted overall to a board faced with a dark paper. Gum-platinum printing, a unique technique that involves printing a gum bichromate image over an already developed platinum print, was frequently used by Steichen. This print is a mirror image of another Steichen print in the Art Institute's Stieglitz Collection, also titled *Midnight—Lake George* (1949.829). Unlike that work, this piece's mount is slightly larger than the photograph, and the edges of the print have been protected. The back of the mount has an inscription in graphite, "Moonlight Lake Geo. (second) Steichen," that was previously covered with a paper hinge. The verso of the mount has faded to gray, while the area recently uncovered by the removal of hinges shows the original, darker color of the mount. The artist signed the print in the bottom left corner in graphite. The print does not fluoresce when exposed to long-wave UV radiation. When the surface of the print is viewed under high magnification, a small area of the blue layer is visible at the top left corner, where a drying pin appears to have once held the work. FTIR-ATR analysis was able to detect the presence of gum arabic and the signature peak of ferric ferrocyanide (the compound responsible for Prussian blue typical of cyanotypes). Platinum, iron, chromium, and lead were detected using XRF spectrometry. Common to platinotypes, the residual presence of light-sensitive iron ions could be due to improper washing of the print after processing. However, the residual iron signal could also be due to the iron compounds present in the blue layer. Chromium is used to sensitize the gum bichromate. The presence of lead could have two sources: while lead could have been used during fabrication of the photographic paper itself, it was also commonly used during the processing of platinum prints to increase uniform development of the print. Zinc and strontium were detected in the mount; these compounds were likely used during fabrication of the paper.

X-RAY FLUORESCENCE (XRF) SPECTROMETRY

XRF spectral readings were taken from the recto of the work and from the mount when available. The elements listed below have been positively identified in the work; elements in bold have been attributed to the processing of the print.

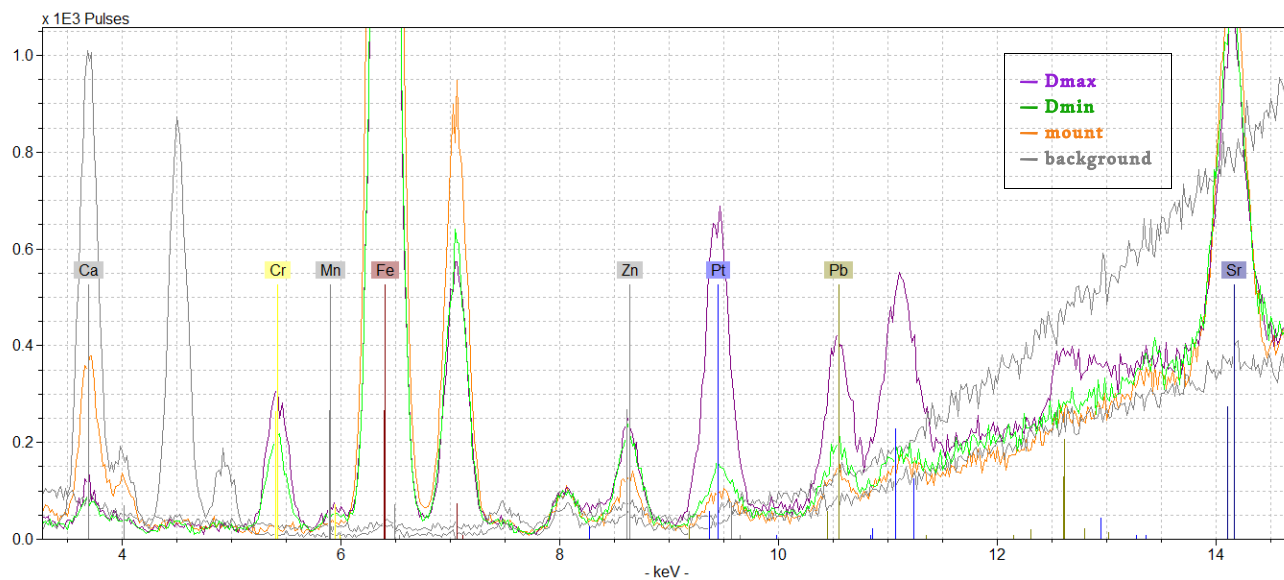
Print: **Cr**, **Fe**, **Pt**, Pb

Mount: Ca, Mn, Fe, Zn, Sr, Pb

The graph below shows XRF spectra for three distinct measurement areas on the print: the darkest, maximum-density image area (Dmax, purple); the lightest, minimum-density image area (Dmin, green); and the mount, when available (orange). The background spectrum (gray) represents the characteristic contribution of the instrument itself as measured on a Teflon reference and is included in order to discount irrelevant elements from the print's signature. Elements were identified based on the presence of their characteristic peaks. Analysis was performed with a Bruker/Keymaster Tracer III-V+ energy-dispersive handheld XRF analyzer, equipped with changeable Ti and Al filters and a Rh transmission target. Measurements were taken for 120 or 180 LT at 40 kV and 10 μ A. The spectrum below illustrates the significant peaks for this print in the energy range from 3 to 15 keV.

Figure 1. (right)
Locations of XRF measurements

Figure 2. (below)
XRF spectra from the Dmax, Dmin, mount,
and background signal produced by the
analyzer.



FOURIER TRANSFORM INFRARED (FTIR) SPECTROSCOPY

Analysis was conducted using Attenuated Total Reflectance spectroscopy (FTIR-ATR). Gum arabic and Prussian blue were identified.

Analysis was performed using a Bruker tensor 27 FTIR spectrophotometer with mid-IR glowbar source coupled to Hyperion 2000 Automated FTIR microscope with nitrogen cooled MCT detector (covering the range 4,000- 450 cm^{-1}). Samples were analyzed using a germanium ATR attachment for the microscope, collecting 512 scans at a resolution of 4 cm^{-1} .

Figure 1. (right)

Location of the spot analyzed with FTIR-ATR

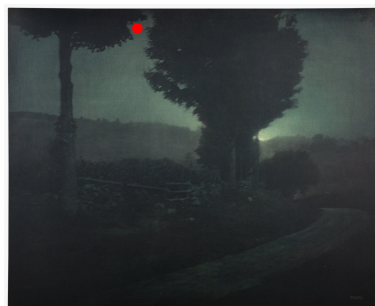


Figure 2. (below)

FTIR-ATR spectra showing the presence of gum arabic and Prussian blue (PB). The coating must be relatively thick as the contribution of the bands of the cellulose substrate are not well visible.

