



Article: New Applications for Paper Fiber Analysis in Characterizing Gelatin Silver Prints

Author(s): Lee Ann Daffner and Paul Messier

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Compilers: Brenda Bernier and Camille Moore

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NEW APPLICATIONS FOR PAPER FIBER ANALYSIS IN CHARACTERIZING GELATIN SILVER PRINTS

LEE ANN DAFFNER AND PAUL MESSIER

Presented at the 2009 winter meeting in Tucson, Arizona

The core of many fine art photography collections is the gelatin silver print, the dominant process from mid 1880's to the present day. A print's origin can be elementary to understanding the work, its historical context and the creator's artistic intent. It carries implications for treatment, display and storage and can influence its market value. Tangible information, such as the presence of optical brightening agents, manufacturer back printing, paper fiber analysis, and surface texture characterization can corroborate print dates. Paper fiber analysis and detection of optical brighteners were pivotal in exposing landmark counterfeits (Man Ray in 1998 and Lewis Hine in 1999), proving that a characterization methodology based on the chemical and physical properties of photographic paper could become a valuable tool for scholarship and authentication.

In 2001 The Museum of Modern Art (MoMA) Conservation Department and Paul Messier embarked on a collaborative study to analyze a selection of papers from the Messier reference collection, identifying fiber content through forensic fiber analysis. Outlining responsible sampling techniques and protocols for works of art and evaluating statistical confidence were central to this study.

Pulp process and fiber species identification for a set of 139 reference gelatin silver papers from the 20th century were obtained. Based on this data, a trial test was carried out to determine the printing date of 20 selected prints with established provenance from the MoMA collection, with good results. The prediction accuracy was further improved by the presence or absence of optical brightening agents (OBAs). The application of statistical protocols, currently under review by MoMA conservation scientist Ana Martins, shows promise of establishing confidence intervals for results and developing an algorithm to automate the dating process based on fiber data.

Placed into a larger context, sampling – the removal of original material – should not be the starting point for dating photographs. The risks and benefits of collecting data must be weighed against information gained. An evaluation of factors is taken into consideration for each work to be sampled. The PAPER FIBER SAMPLING PROTOCOL that follows describes this process. A separate worksheet documents the quality of the sample and the sample site, to be used alongside digital documentation. The number of fibers collected varies from 22 - 300. A generous sample measures 0.3 mm x 4mm while a small sample measures 0.3 x 2 mm.

Paper fiber analysis alone is a powerful tool, but adding qualified data points to the methodology (OBAs, manufacture markings, sizing agents and surface texture) catalyzes credible dating for 20th century photographic prints. This collaborative research will have ramifications in photography scholarship that reach far beyond this one field of inquiry. For fine art collections in particular, these results will yield data that significantly enhances and refines the interpretation of individual works and, more broadly, the stylistic development of artists.

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PAPER FIBER SAMPLING PROTOCOL

1. Why is this action needed?
Are the priorities and goals clearly laid out?
Is sampling absolutely essential to investigation?
Are there alternative photographs to sample?
2. Are there records available to consult?
Is the provenance strong or circumstantial?
Have other similar works been examined?
3. Are stakeholders, peers, and other specialist available to consult?
4. What effect will my action(s) have on the evidence of the factors contributing to the identity and significance of the object(s)?
Is this a single object inquiry or part of a larger investigation?
What is the statistical strength of the group and historic time frame?
5. Is sampling the best use of resources?
Assess need vs. the cost of sampling
Can the object be sampled again: is there enough material to retest?
6. Do I have sufficient information and skill to assess and sample?
7. What are my options for sampling that will produce appropriate results with minimum intervention?
What is the condition of recto?
What is the condition of the edges?
Can the edges be readily sampled?
Do I have access to the verso?
Is the mount a barrier or could it contaminate the sample?
If sampling from a damaged edge, can the damage be effectively repaired after sampling, or are fibers critical for structure?
8. What are the benefits/risks of sampling?
What is the ratio of the object to the sample size?
Is there a coating?
Is the work mounted?
9. Can I effectively document the quality of the sample?

Adapted from the Victoria & Albert Museum Conservation Department Ethics Checklist.
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The Museum of Modern Art
Conservation of Photographs
PAPER FIBER SAMPLING WORKSHEET

Artist
Accession #
Batch/sample #
Sampling Date
Conservator

DOCUMENTATION

- Digital image
- OBA recto + / -
- OBA verso + / -

LOCATION OF SAMPLING SITE/S

- Recto
- Verso

QUALITY OF SAMPLE

- Good Fair Poor
- Surface fibers
- Interior fibers
- Near baryta
- Other

QUANTITY OF FIBER

Number of sites sampled:

- Minute
- Moderate
- Generous

QUALITY SAMPLE SITE/S

- Good Fair Poor
- Compact
- Friable
- Shaving (scalpel)
- Fiber cluster (tweezers)

FOLLOW-UP SAMPLING AND NOTES

- This photograph could be sampled again
- This photograph should not be sampled again
- Justification/s