

INTRODUCTION

The idea for the *Atlas of Analytical Signatures of Photographic Processes* (hereafter the *Atlas*) originated August 2–4, 2000, when a group of international conservation scientists, photograph conservators, photography art historians, and educators converged at a meeting organized by the Getty Conservation Institute (GCI) at the Image Permanence Institute in Rochester, New York. The goal of this meeting of experts was to identify several important research ideas that were needed by the photograph conservation field but were not sufficiently covered by other, sister photograph conservation research institutions worldwide. The meeting and further discussions were integral in helping to establish the focus of, at that time, a planned and under-development research project on the conservation of photographs from the Science Department of the GCI.

During an intense and detailed discussion, several research ideas emerged as high priority, which corresponded well to the already existing expertise of GCI scientists and to the structure and equipment available for the project at the GCI's scientific and analytical laboratories. By the end of the discussion, the participating experts identified advanced research in scientifically based identification of photographs, photographic materials, and photographic processes as one of the most important research topics in need of full development in order to support the future needs of the photograph conservation field.

Without detailed knowledge and understanding of the photographic processes used in making a given photograph, it is extremely difficult to determine the environmental conditions needed for the photograph's long-term preservation, as well as the maximum light levels that should not be exceeded during display or exhibition. A detailed knowledge of the process chemistry, the processing and post-processing treatment, and the potential deterioration pathways is also needed when developing conservation and preservation treatments.

Participants in the meeting agreed that the identification of photographs and photographic processes based solely on visual and microscopic inspection of photographs can be used to answer more than 75% of identification questions successfully. The remaining portion of identification problems and puzzles would greatly benefit from the research and development of a more objective, scientifically based identification methodology for practicing photograph conservators and researchers in the technical history of photography. Advanced methods of

photograph identification might also provide new information on the darkroom techniques of individual photographers and may even provide important information to support or supplement provenancing and authentication studies of photographs.

PURPOSE OF THE *ATLAS*

The *Atlas* is intended for practicing photograph conservators, curators, art historians, archivists, library professionals, and anyone responsible for the care of photograph collections. The *Atlas* also aids individuals studying a photographer's darkroom techniques or changes in these techniques brought on by new or different photographic technologies or by the outside influence of other photographers.

Not all photograph conservators or curators have easy access to a well-equipped conservation science laboratory and staff with an in-depth knowledge of the technical and chemical aspects of photography. At the same time, most photograph conservators or curators have access to art conservation laboratories experienced in analyzing paintings or other objects, and to conservation scientists who are familiar with XRF or FTIR analysis but who lack experience in analysis and interpretation of data obtained from the analysis of photographs. Similarly, many local or accessible universities or industrial laboratories may have well-equipped analytical laboratories and scientists who are proficient in the general aspects of chemical analysis but who do not have the experience and knowledge needed to successfully interpret analytical data obtained from the analysis of photographs.

The main purpose of the *Atlas* is to help a conservator and curator formulate analytical questions related to a particular photograph and, at the same time, assist a scientist unfamiliar with analysis of photographs when interpreting the analytical data. The *Atlas* also contains a number of interpretation guides that provide help with photographs of similar analytical signatures, with identification of overlaps of spectral peaks, and with warnings of potential misidentification or misinterpretation of analytical results.

By combining the individual expertise of a conservator or curator with the analytical expertise of a scientist, and by utilizing the *Atlas* as a means of communication between various professional specializations, many difficult photograph identification problems can be successfully solved.

The following are several working strategies on how to use the *Atlas* when identifying photographs or photographic processes:

- Collect all visual and microscopic signatures of a given photograph. If it is still not clear what photograph or photographic process has been used, try to identify the imaging metal or imaging compound in a given photograph using XRF spectrometry. The XRF analysis will provide information not only on imaging material but also on the presence of toning metals and on inorganic elements contained in the substrate of the photograph.
- Using FTIR spectrometry, attempt to detect and identify the presence of an organic binder in the photograph. Be aware that the top layer of the photograph might be coated with an organic coating or varnish that might shield the analytical signal from the organic binder.
- Compare all of the collected visual, microscopic, and analytical signatures for a photograph in question with the interpretation guide located at the end of each section. Work first with

all interpretation guides that contain a combination of the imaging metal and organic binder detected in the photograph in question. This comparison will help to narrow down the search.

- Compare all visual, microscopic, and analytical signatures of a preselected group of photographic processes (those containing identical imaging metals and organic binder), looking for the best signature match between the photograph in question and a set of photographs with similar signatures.
- The final step in identification of the photographic process should be based on a close inspection and comparison of all signatures recorded with signatures and spectra of well-known and well-characterized photographs that are included in the *Atlas*.

In most cases this procedure yields an accurate and reliable identification of a photograph or a photographic process. If, after recording and interpreting all signatures, the nature of the photographic process is still not certain, methods requiring microsampling may be needed to resolve any remaining identification issues. This step, however, is rare and should not be taken without the approval of a conservator and curator or without consulting experts in advanced methods of identification of photographs.

FURTHER DEVELOPMENTS AND UPDATES

We expect that the *Atlas* will be a “living document” that will be periodically modified and upgraded whenever new quality data on signatures of photographic processes have been researched and confirmed.

The most important and most difficult part of this project has been and always will be the identification of well-characterized and well-identified examples of photographs and photographic processes. This issue has proven to be even more difficult than we could have imagined. Most photographic material in many museums, archives, libraries, and private collections is not well identified and, in some cases, incorrectly identified. Photographs or photographic processes not well identified are practically “invisible” to search inquiries of registrar databases or collection records.

Our experience has also taught us that the most valuable information leading toward unusual or uncommon photographic processes comes through the personal memories of curators, collection managers, conservators, and registrars, who possess in-depth knowledge of their collections and who can recall unusual photographs or photographs that need further investigation.

We hope that in addition to the continuing long-term support of our current project collaborators, our *Atlas* work and research will generate support from other researchers interested in old or unusual photographic processes who will help us to locate well-identified examples to include in our future analytical investigations. With input and active collaboration, the *Atlas* can be an important resource of information and analytical data on different photographic processes, one that will serve the photograph research and conservation community long into the future.

Dusan C. Stulik
Art Kaplan

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