



Article: Context and Content: Dating of Photographic Prints by Henri Cartier-Bresson
Based on Visual Examination and Chemical Analysis

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CONTEXT AND CONTENT: DATING OF PHOTOGRAPHIC PRINTS BY HENRI CARTIER-BRESSON BASED ON VISUAL EXAMINATION AND CHEMICAL ANALYSIS

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Abstract

In April 2009, The Museum of Modern Art opened *Henri Cartier-Bresson: the Modern Century*, a major retrospective of the photographer's career. In preparation for the exhibition, 220 Cartier-Bresson photographs were studied in conservation to help narrow the print dates. First, stamps on the verso and other visual characteristics were tabulated and optical brightening agents were evaluated under long wave ultraviolet illumination for all 220 photographs. Fiber analysis and X-ray fluorescence spectroscopy were carried out on a carefully selected core group and a statistical approach was used to reveal common features amongst prints. Based on this combined evidence, a large portion of the photographs were assigned more precise dates.

Introduction

Photo journalist, co-founder of Magnum Photos Agency and largely considered one of the great photographers of the 20th century, Henri Cartier-Bresson had an uncanny talent for seizing images, making him a leading figure both in photography's experimental modernism of the 1930s and the very different realm of photojournalism after World War II (Galassi, 2010).

In April, 2010, *Henry Cartier-Bresson: the Modern Century* opened at The Museum of Modern Art in New York (MoMA). Organized by then chief curator of photography Peter Galassi, the exhibition drew upon previously inaccessible information and images from the Henri Cartier-Bresson Foundation (FHCB) in Paris, which loaned 220 of the 300 photographs in this exhibition. This was the first major retrospective since the photographer's death in 2004.

The FHCB photographs arrived in New York eight weeks in advance of the exhibition for on-site matting and framing. This window of time before they were scheduled for framing, presented a rare opportunity to study the prints and assess a set of analytic techniques on a large body of work for the sole purpose of dating the prints. There was a strong curatorial interest to improve and confirm the actual print date for the exhibition labels; MoMA includes both negative and print date whenever possible. The FHCB photographs, however, had a negative date, but varied categories of print date: sometimes a date range was provided, such as "1960's 1970's" or "ca. 1970". A few had very good provenance and dates, but in general it was a mixed assortment. The project discussed in this article focuses on our attempt to refine the print dates of the FHCB photographs. We proposed to study the composition of the photographic papers to examine the prints for the presence of optical brighteners, inorganic content, and pulp type. To carry out this study, FHCB granted the conservation department permission to take a small number of paper fiber samples and carry out X-ray fluorescence (XRF). All the information, raw data and conclusions from this study was given to the FHCB at the end of the project.

There are a growing number of characterization projects on gelatin silver print materials utilizing varied analytic approaches. Listed below is a selection of studies starting with Messier and Baas (1998) on optical brightening agents in photographic papers, which grew from a series of questions in the fine art photography market. The MoMA Cartier-Bresson project is part of this continuum in characterization.

1998	Baas/Messier	Hine research; Optical Brighteners study (published 2005)
2001	RIT	Characterization identified as research priority
2001	Pollmeier/Arney	Edge reflection analysis: a new technique for the documentation and characterization of photographic and other glossy surfaces
2001	Passafiume	A Silver Gelatin DOP Sample Book and a Characteristic Catalogue
2003	Chen	Edge reflection analysis (ERA)
2004	Bertals	Fotografien auf Silbergelatinepapier
2005	Dune et al	Characterization of Black and White Silver Gelatin Fiber-based Photographic Prints
2005	Murata	An Investigation into the Silver Bromide Photographic Paper: ‘Gevaluxe Velours’
2006	GCI/Messier	Understanding 20 th Century Photographs: the Baryta layer symposium
2006	MoMA/Messier	Characterization research fiber analysis, XRF, NIR
2007	HMFA Koseki	Characterization research Hine (unpublished)
2008	Foundation Henri Cartier-Bresson /GCI Getty Conservation Institute	Henri Cartier-Bresson project
2008	George Eastman House/Messier	Hine: Powerhouse Mechanic, Notes on Photographs
2009	Messier/MoMA	Man Ray: <i>Le Violon d’Ingres</i>
2009	MoMA	Foundation Henri Cartier-Bresson
2009	MoMA	Thomas Walther Collection Project

The MoMA Survey

First the presence of optical brightening agents (OBAs) was determined by using a Stroblite Co. long-wave ultraviolet illumination light on both the recto and verso of all the prints. Eight categories were assigned using terminology determined to be descriptive for this group. To note degree of fluorescence, the descriptors “Faint”, “Moderate”, “Bright” and “None” were used. To note character of the fluorescence, a print was determined to be “Even”, “Mottled”, to have “Sheet marks”, or simply to have “Spots”. A wide range of fluorescence intensity and pattern combinations were noted, however due to pressing exhibition-related tasks, the survey results were further simplified to a “Yes” or “No”: was the fluorescence observed or not? In addition, very faint fluorescence was acknowledged in the survey to factor the early use of OBAs. Optical brightening agents are more likely to appear on recto-only in the 1950’s and by the 1960’s are

more likely to appear on both recto and verso (Messier, Baas 2005). Based on this research, preliminary dates were assigned to the HCB photographs.

It was necessary to further organize the photographs into meaningful groups. Most of the prints from the FHCB had Magnum stamps and on occasion publication markers. The goal of the back stamp survey was to identify, when possible, the earliest stamp present and attempt to assign a city or country of origin to the print. Magnum had offices in Paris, New York, London and Tokyo and historically they would produce publicity and distribution prints to send to targeted periodicals (Galassi 2010). On occasion, we encountered a dated reproduction stamp (i.e. "Copyright 1963 Vogue"). In addition, there were a group of prints with known dates supported by solid provenance. These prints proved critical in forming a core reference group. Thus, with a working premise that a given Magnum office would have prints produced which used locally available photographic papers, a core group was created that cross-referenced all possible combinations of stamps, themes and OBA observations. This core group consisted of 26 photographs which had one or more of the following characteristics:

1. Early prints with no fluorescence.
2. Prints with faint fluorescence, presumably c. 1955-1960 (Messier, Baas 2005).
3. Prints with bright fluorescence, likely to be made in the 1960's or 1970s.
4. Prints from each of the Magnum addresses, representing a different time period.
5. Prints from homogenous series which appeared to be on the same paper.
6. Prints on seemingly random, unusual papers.
7. Prints with differing physical or image characteristics such as ferrotype surface, sprocket holes visible from negative and presence of black boarders (Cartier-Bresson 2009).
8. Prints with rock-solid provenance and known dates.

Technical analysis of the photographic paper

Fiber samples were taken from the 26 core group prints and sent to Integrated Paper Services Forensic paper scientists in Appleton Wisconsin for fiber analysis. The results indicated papers composed primarily of softwood bleached sulfite fibers from Spruce or Hemlock trees. This paper composition is typical of papers made between 1940 and 1970. For the queries surrounding this group of photographs, the fiber data was of limited interpretive value.

XRF was conducted on the 26 prints from the core group with a Tracer III-V Keymaster/Bruker (Re target X-Ray tube, Si PIN detector, operated at 15 KeV and 17mA and using a vacuum pump) and was carried out on the verso for higher sensitivity to low atomic weight elements in the paper. The same characteristic elements were found in all the photographic papers: Ag is present in the image layer, Ba and Sr come from the baryta layer (Stulik and Messier 2004), and Si, K, Ca, Fe, Ti are usually associated with the presence of fillers (Martins et al 2010), pigments and sizing precipitants in the paper (Browning 1977).

Although these elements are found in practically all the papers, XRF data shows that their relative abundance varies. These variations were examined using multivariate analysis (The Unscrambler® X CAMO software) to look for similarities between the papers. Principal Component Analysis (PCA) was performed on the pre-processed spectra (baseline correction and peak normalization) to successfully differentiate the papers according to their inorganic content.

The PCA scores plot in figure 1 shows that six different clusters could be identified, corresponding to six different groups of photographic papers with common properties.

Independent studies using XRF (Martins, McGlinchey et al, 2010) have shown that Ti is found in papers after 1960, while papers prior to 1940s may contain higher amounts of Si, K, and Fe.

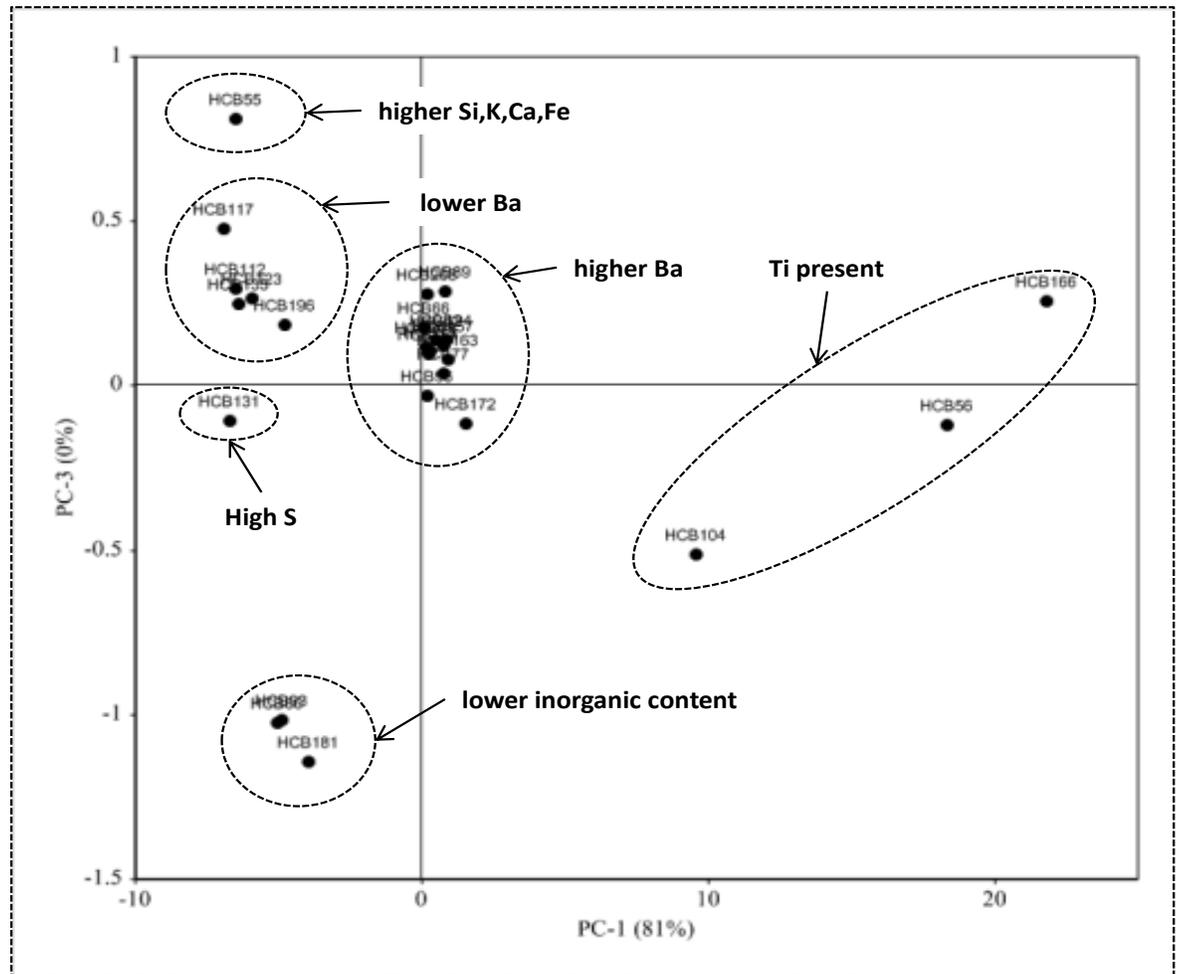


Figure 1: Results of PCA analysis on the XRF spectra evidencing six different clusters corresponding to six different groups of prints. Discrimination along PC1 is related to the presence of Ti in the papers, PC2 (not shown) discriminates paper based on the content in Ba, and PC3 according to their content in K, Si, Ca and Fe.

Results from XRF clustering, fiber analysis, ultraviolet illumination examination, provenance information, stamps and title were organized. A simple sorting system was used for core group

photographs in each cluster and distinctive properties, a partial sampling is illustrated in table 1. All combined, the information can help establish a probable date range.

Organization of findings for early prints

Example of organization for findings of two print groups.					
XRF Sub-cluster	Title	Negative Date	OBA present	Pulp mix	Stamp code
High Fe High Ba	<ol style="list-style-type: none"> 1. Nehru Announces Gandhi's Death 2. In the Getreidegasse, Salzburg, Austria 3. Jean-Paul Sartre, Paris 4. Bastille Day, Place de la Bastille, Paris 	<ol style="list-style-type: none"> 1. 1952 2. 1953 3. 1952 4. 1952 (printed later) 	<ol style="list-style-type: none"> 1. None 2. Recto/verso 3. None 4. Recto/verso 	100% SBS	<ol style="list-style-type: none"> 1. Amsterdam 4. NY "Big Magnum"
High Fe Very high Ba	<ol style="list-style-type: none"> 5. Dynamo Stadium, Moscow 6. Simone de Beauvoir, Paris 7. Uzbekistan, Soviet Union 8. Preparations for the Baris Dance 9. Hamburg, West Germany 10. Milwaukee, Wisconsin 	<ol style="list-style-type: none"> 5. 1954 6. 1946 (printed 1950s) 7. 1954 8. 1949 (printed ?) 9. 1952 - 1953 10. 1957 	<ol style="list-style-type: none"> 5. Recto/verso 6. Recto/verso 7. Recto 8. Recto 9. Recto 10. Recto/verso 	100% SBS	<ol style="list-style-type: none"> 5. (Post 1960) 6. London 7. London 8. Hillelson 9. HCB "other" 10. London
<i>High Iron content</i>		<i>Prints with established earlier print dates</i>	<i>Prints with pre- or early OBA use.</i>		

Table 1. Showing organization of data and clustering of core group photographs, which show commonalities in relatively early papers from the group.

Once the core group data was studied and reviewed, date assignments based on relationship and interconnections to all the photographs were outlined. In some cases the date assignments were sweeping, such photograph from thematic photo essays, such as Cartier-Bresson's 1959 "Red China Bid for a Future: Young and Old Join in The Great Leap Forward" which appeared in *Life Magazine* on January 5, 1959. Prints from this project in the core group appeared primarily

in one main cluster, strongly characteristic of papers produced in the late 1950s, which made date assignments straightforward. In other groups and a few individual examples, dating continued to be based on individual observations, or remained difficult or elusive.

Summary MoMA Conservation Dating for 220 Henri Cartier-Bresson Foundation Photographs

Known dates	18	8%
Narrowed date range i.e. from 1960s – 1970’s” to “early 1960s”	111	50%
More Precise date assignment i.e. from “1960s – 1970s” to “1960” or “ca. 1960”	78	35%
Total date change i.e. from “printed 1995” to “printed late 1950s”	7	3%
Left uncertain	6	3%

Eighteen prints already had known dates to begin with. For 111 photographs, the date range was narrowed from a wide span such as “1960s – 1970’s down to “1960s”. For 78 photographs, a more precise date assignment was made. In this case it could vary from assigning “1960” or “ca. 1960” or even early 1960’s. Seven prints had total date change. For example one print had date of 1995, but material findings in the print were more consistent with a print from the 1950s. And lastly, there were six prints that could not be assigned a new date based on inconclusive evidence.

Our report, raw data and date assignments have been sent to the Foundation and we anticipate ongoing refinement of this data. This short but intense project provided a real world situation to engage emerging methodologies. Through this process, we discovered this clustering approach to be both viable and appropriate for our characterization studies.

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