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# THE PHOTOGRAPHS OF HEINRICH KÜHN: RESEARCH PROJECT ON ARTISTIC TECHNIQUE

ANDREAS GRUBER

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## *Abstract*

*This project is an ongoing study for an international exhibition series on Heinrich Kühn (1866-1944), an outstanding and widely influential protagonist of the Pictorialist Photography movement. Due to discrepancies in dates and processes of his prints, the focus of this project is to systematically study his photographs from a technical point of view. In this three-year project, prints from various collections worldwide are being examined. The surfaces of Kühn's prints are being documented by macro- and microscopic imaging. Image forming particles are being examined with XRF equipment. Binder layers are being examined with non destructive FTIR equipment. Key elements for interpretation of the results of the material analysis are Kühn's laboratory journals. In these he meticulously described his results and experiments with nonsilver processes at certain stages of his career, providing significant information for dating and cataloguing his works.*

From the summer of 2010 to the summer of 2011, the Albertina in Vienna, in collaboration with the Musée d'Orsay and the Museum of Fine Arts, Houston, dedicated a monographic show to the work of Heinrich Kühn (1866–1944), an outstanding and highly influential protagonist of Pictorialism [1]. Through the intensive examination of Kühn's works in preparation for the exhibition and the many resulting uncertainties and questions regarding production processes and the chronologic placement of many works, as well as through the introduction of the photographer's laboratory notebooks as new source documents, the research project presented here was developed to analyze Kühn's photographic technique. The project is being carried out by the author and is sponsored by the private Viennese foundation Bonartes.

## **Kühn's Photographic Process**

Heinrich Kühn rejected the photographic conventions of his time. Kühn criticized the aesthetic components in the works of professional photographers, but also the extreme precision of photography; he saw an exaggerated richness of detail, an unnaturally uniform focus, and an excess of grey tones in the then-common collodion or gelatin silver papers. In his opinion, the motifs were not rendered according to the subjective vision of the human eye, as the findings of physician and physicist Hermann von Helmholtz had revealed [2]. In his over fifty years of artistic production, Kühn always espoused a conscious softness in the picture, and an avoidance of too many distracting details in favor of a dissolution and summation of the pictorial elements into surfaces. He correspondingly used and modulated photographic processes that could sustain this aesthetic demand.

Alongside the commercially available photo papers based on silver, the bichromate process offered an additional system for the production of photographs.

The bichromate processes, particularly the combination gum print and later the oil transfer print, fulfilled Kühn's specific demands in the creation of paper positives. The formation of a high granularity through particular processes, the free selection of color tones, the possibility of subsequent manual working of the color layer with brushes, and the variety of papers – from strong textured hand-made sheets to the thinnest Japanese tissue – resulted in inexhaustible possibilities of materials and manipulation, very much in accord with art photography around 1900 in its attempt to adopt the aesthetic of graphic arts techniques.

In combination with the *Syngraphie*, a double negative exposure process patented by Kühn for handling large differences in light intensity [3], and the development of a camera [4] and a lens [5] according to his specifications, Kühn perfected the technical components of his conception of a perfect photography.

### **The Laboratory Notebooks**

Scientifically trained through his study of medicine, Kühn, by 1899 at the latest, recorded his attempts and experiments in laboratory notebooks, as no other photographer of the time is known to have done. Here, probably to provide for better reproducibility of his large-format gum prints, he noted the compositions of the pigment mixtures for individual works, the number of layers applied, and the respective exposure times (fig. 1). Six of these notebooks are preserved in the Albertina. These sources give detailed information on Kühn's working process, his experiments, methods, and materials. Sketches of the works often accompany these notes (fig. 2).

Kühn dominated this combination gum print process as did hardly any other artist, which is not surprising, as he perfected the process together with Hans Watzek and Hugo Henneberg in 1897, who formed the artist group *Trifolium* (clover leaf). However, we also know from Hugo Henneberg that he often required up to fourteen days to produce even one satisfactory gum print. In a postcard to Kühn from 1903, Hans Watzek likewise complained that he was incapable of producing two identical gum prints. A precise record of the recipes for individual pictures thus proved helpful for an economical working method, if multiple prints were planned of one motif.

Due to the complexity of the bichromate process, many photographers, and Kühn in particular, were constantly searching for new methods or simplified variations through which, for instance, transfer prints or multiple image layers were no longer necessary. In Kühn's laboratory notebooks, we also find extensive documentation of his many experiments with uncommon photographic methods, for instance the ozotype or the animalglue bichromate print.

Kühn's photographic techniques can also be studied in relation to his circa sixty published articles, or his book "Technik der Lichtbildneri." [6] What differentiates the laboratory notebooks from the texts meant for the public, however, is, on one hand, that the former allow the development of his methods to be precisely understood. For instance, on the basis of entries over several months, one can trace the arduous path, the setbacks and partial successes, to the point where Kühn finally found a method of preparing very thin Japanese tissue to be

dimensionally stable enough to support combined platinum gum prints. On the other hand, the notebooks help to differentiate his methodologies within individual processes more exactly. One not only learns when he produced platinotypes, but also when he produced them with which variations: additions of mercury compounds in the developer solutions, for instance, or lead sulfate, to give the platinotypes warmer tones, are exactly documented.

In addition to the techniques, the laboratory notebooks provide information on the material components of his works, such as the papers and their preparations, the binding media, pigments, colorants, and the chemistry of the processes.

Kühn preferred papers with particular characteristics, as these influenced contrast, tonal range, and color nuances in the prints. The laboratory notebooks also contain numerous labeled paper samples, which today can be used as references in the investigation of the prints. Kühn also discovered that the tone of his platinum prints was dependent to a not insignificant degree on the preparation of the papers. He thus experimented extensively with sizing agents such as arrowroot, agar-agar, chrome alum gelatin, or copaiba balsam.

In the notebooks, and in many cases also on the reverse of the photographs themselves, Kühn left detailed descriptions of the type and proportions of the pigments used. The laboratory notebooks even preserve paint and pigment samples – the icing on the cake, so to speak.

In summary, it can be said that the entries in the laboratory notebooks provide essential reference points for the understanding of Kühn's working methods and for the dating of his works, as they define the periods of technical preferences and chemical experiments. Many of the material components and chemical elements described therein can be identified in his pictures with the aid of visual and scientific analyses.

## **The Project**

### Statement of the Problem

If one compares the publications on Heinrich Kühn over the last 30 years, contradictions are evident in the dating and identification of the photographic techniques of the respective works [7]. Here must be clarified if identical motifs are actually extant in different variations of process, and were produced in different years. Even when the date of the exposure is known, the date and type of the print cannot automatically be concluded – with the exception of dated prints. An exact classification is also frequently difficult due to the assertion that Kühn often used the same negative over many years for the production of very different prints. If this is actually the case, or if the processes have been inaccurately identified, remains ground for discussion. Such discrepancies are not surprising, as Kühn's techniques are very difficult to identify with the unaided eye, even for experts.

## Goals

Investigation of the individual components of Kühn's photographs using scientific methods of analysis can aid in the clarification of such questions. While the aesthetic of the works in connection with the extensive source literature has been duly investigated, the technique of the photographs in this context has yet to be systematically examined in detail. Interdisciplinary technical investigations have long since become standard in areas such as paintings or wall painting; for photography, there are still few such projects published to date.

The technology of Heinrich Kühn's photographs are being investigated in this project in national and international, public and private collections. Of primary interest are those works extant in multiple prints and variations, for instance the portrait of Alfred Stieglitz. The data obtained is being recorded as text and images in a database.

The evaluation of the laboratory notebooks plays a central role in this project. Following a transcription of the journals, sometimes difficult to decipher due both to Kühn's handwriting, which became increasingly illegible over time, and to his habit of using technical shorthand and chemical abbreviations, a timeline is being compiled recording the periods in which Kühn used specific techniques and variations of process, when particular papers appear for the first time, and when he employed specific chemicals. This basic framework is essential for the scientific investigations. Kühn's publications and letters are also being read in connection with the study of the laboratory notebooks.

As many techniques cannot be visually differentiated at first glance due to their similar appearances, scientific analyses are being carried out on selected examples that are identified with certainty. Objects that are not clearly classified are subsequently also being examined. The analyses focus on the components of the image forming particles and the binding media in which these are embedded.

## Visual Analysis

- Photodocumentation of the front and reverse.
- Stereomicroscopy: detail photos under different lighting conditions (e.g. direct light, raking light).
- Documentation of papers used: size, surface structure, paper thickness, watermarks, embossed edges, markings, mountings, etc.
- Documentation of the photographic layers: single/multiple, monochrome/multicolored, multiple contours, microscopic detail photos of the color layers.
- Notes written on the front and reverse sides of the photographs.

A complete examination is not always possible, and is dependant on the condition of the object and its manner of its mounting. When possible, study is performed in situ in the conservation studios of the respective collections, in cooperation with curators, conservators, and scientists. The data obtained and the results are also recorded in the respective inventory systems.

## Scientific Analyses

The image-forming materials and binding media are being analyzed in Vienna, in collaboration with the Scientific Laboratory of the Academy of Fine Arts, under the direction of Manfred Schreiner [8]. Pigments, metals, and chemical elements are being investigated using non-destructive micro-X-ray Fluorescence Spectrometry on selected works. No samples need to be taken from the objects, nor will these be otherwise altered. The XRF device used allows for the analysis of the elements present in the photographic layers, particularly those in the uppermost layer, in an area ca. 1 mm in diameter, through which the technique employed can be determined. [9].

Sizing agents and binding media are likewise being investigated non-destructively using the FTIR (Fourier Transform Infrared spectroscopy) Reflection technique [10]. The advantage of this technique over XRF is that both inorganic and organic components, particularly organic binding media, can be detected. Unfortunately, the spectra thus obtained are not directly comparable with those of the widely available FTIR transmission analysis, for which, however, small samples must be taken from the objects [11]. The first examinations have shown that the various overlapping organic binding media, the preparatory sizing, emulsion, and various coatings, complicate the results. In the future, reference materials of painted out samples with typical material compositions and stratigraphies will be produced, in order to be able to obtain comparative data.

## Current Status and Outlook

The Kühn holdings of the Albertina, the Preus Museum in Horten, Norway, the Folkwang Museum in Essen, the Museum of Modern Art and the Metropolitan Museum in New York, the George Eastman House in Rochester, the National Gallery of Canada, the Rijksmuseum in Amsterdam, as well as numerous private collections have been documented by the author. XRF-analyses were carried out on selected examples at the George Eastman House. XRF analyses of selected works were also begun in the Metropolitan Museum.

The newly discovered material will allow us to complement, verify and correct our view of photography at the turn of the 20th century in many respects, and the analysis will generate new knowledge on the materials used in Kühn's work.

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## References

1. Monika Faber and Astrid Mahler (Ed.), *Heinrich Kühn. Die vollkommene Fotografie*. [exh. Cat. Albertina Museum], (Ostfildern, 2010). English (*Heinrich Kühn. The Perfect Photograph*) and French versions (*Heinrich Kühn. A la recherche de la photographie parfaite*) available.
2. Hermann von Helmholtz, “Über das Sehen des Menschen,” in: Hermann von Helmholtz, *Vorträge und Reden I*, (Braunschweig 1884).
3. Syngraphie. Andreas Gruber: “Glossary of Heinrich Kühn’s photographic Technology,” in: Faber and Mahler: 266.
4. Kühn-Stegemann-Studienkamera C; Andreas Gruber: “Glossary of Heinrich Kühn’s photographic Technology,” in: Faber and Mahler: 262.
5. Imagon. Andreas Gruber: “Glossary of Heinrich Kühn’s Photographic Technology,” in: Faber and Mahler: 261.
6. Heinrich Kühn: *Technik der Lichtbildnerie*. (Halle a.d. Saale 1921).
7. Eg: Peter Weiermair, Peter (Ed.), *Heinrich Kühn (1866–1944. Photographien*, (Innsbruck 1978). *Heinrich Kühn 1866–1944. 110 Bilder aus der Fotografischen Sammlung Museum Folkwang Essen*, (Essen 1978); Rudolf Kicken, (Ed.), *Eine Ausstellung von hundert Photographien von Heinrich Kühn*, (Köln 1981); Ulrich Knapp, *Heinrich Kühn, Photographien*, (Salzburg, Wien 1988); Christine Kühn, *Kunstfotografie um 1900. Die Sammlung Fritz Matthies-Masuren 1873–1938*. (Berlin 2003).
8. Univ. Prof. Univ. Doz. DI Dr. Manfred Schreiner, Institut für Naturwissenschaften und Technologie in der Kunst, Academy of Fine Arts Vienna, Schillerplatz 3, 1010 Vienna, Austria.
9. Manfred Schreiner, Analysisreport, November 2009.
10. FTIR-Spectrometer, Type Alpha, Bruker Germany with Reflexionmode. Parameters: Meßmodus Reflexion, Meßbereich 4000–580 cm<sup>-1</sup>, Detector DTGS, Auflösung 4 cm<sup>-1</sup>, Number of Scans 32.
11. Manfred Schreiner, Analysisreport, Mai 2010.

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Appendix

Figure 1. Laboratory Journal 1, 1900-1906, page 47. Courtesy Albertina.

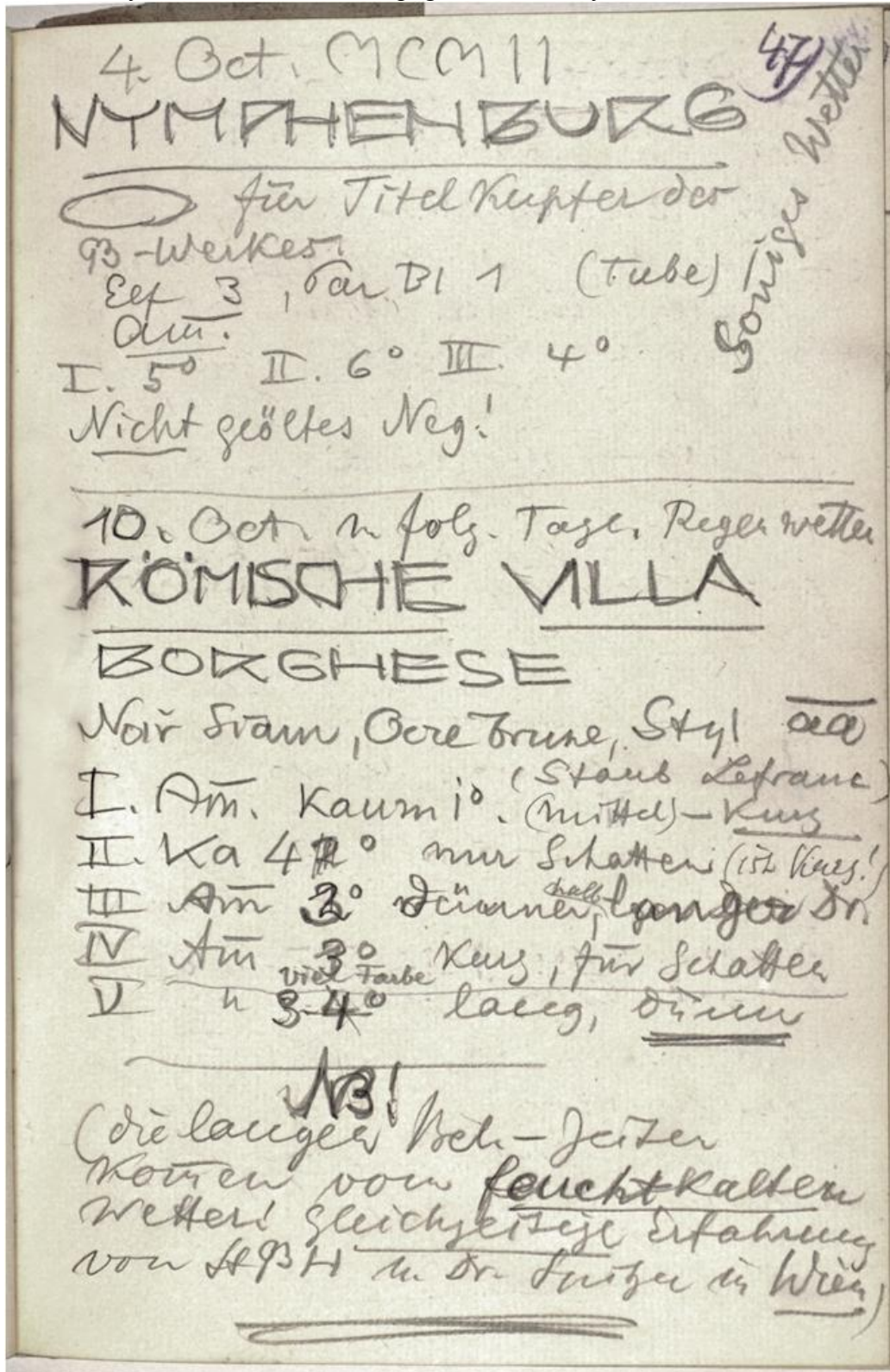




Figure 2. Laboratory Journal 1, 1900-1906, pages 8-9. Courtesy Albertina.

