

Activate the archive: photographic art reproductions from the Bruckmann Verlag and their potential digital futures

Franziska Lampe



Figure 1 Unknown photographer, Front of the publishing house of F. Bruckmann A.-G. in Munich at Nymphenburger Strasse 86 around 1900. From Theodor Göbel, 'Eine Werkstätte der Kunst', *Das Bayerland*, 36:11, 1900, 426.

What can an image archive do beyond conveying visual information? How can we make the *knowledge of images* speak and what methods can we use to look behind their stories in order to deconstruct established narratives? How can we break the *silence* of the archive, especially with regard to the complex of non-European art? These questions can be discussed using the Bruckmann image archive as an example. It seems to be an ideal laboratory to investigate interconnections of art history, photography, and economics as well as associated aesthetic and ethical implications in the context of art reproductions. With the historical photo archive of the Munich-based Bruckmann Verlag, the impressive photographic collection of one of the largest German publishing and printing companies in the area of art reproduction has been preserved. This photo archive was offered to the Zentralinstitut für Kunstgeschichte (ZI) in Munich in autumn 2016 and then transferred because, in the course of selling-off the historic Bruckmann complex on Munich's Nymphenburger Straße, the former company buildings had to be emptied. Thanks to this fortunate circumstance, the existence of this unique

collection of approximately 150,000 photographs and photomechanical prints became known. Up until then, the archive had always been considered lost. Now this vast collection is available to researchers. In the following I will first discuss the history of the Bruckmann image archive and its relation to the publishing industry around 1900. By focusing on two particular parts of the archive, the photo collections of *Bruckmanns Pigmentdrucke* and *Meisterwerke muhammedanischer Kunst*, I will then show how digital tools and methods can help to rethink the history of photographic art reproductions.

The publisher and its programme

Founded in 1858 by Friedrich Bruckmann (1814–1898) as a publishing house for art and science in Frankfurt am Main, Bruckmann was based in Munich from 1863. (fig. 1) A photographic atelier with printing house, bookbindery and further workshops was installed and it quickly developed to one of the most important art publishers in the German-speaking area and took an international role in the publications on art with representations in Berlin, New York and Florence.¹ (fig. 2)

Bruckmann published scientific works in the fields of archaeology, art history and cultural history that became standard literature within these newly

¹ The task of the research project is also to gather fundamental new insights into the highly complex history of the publishing house. Thanks to the sources that are now accessible, in the Bruckmann Image Archive at the ZI and with the *Schriftenarchiv*, which is kept in the Main Bavarian State Archives in Munich, a new evaluation is possible. See a preliminary text on the Bruckmann Image Archive: Franziska Lampe, 'Das Bildarchiv des Bruckmann Verlags. Eine neue Ressource am Zentralinstitut für Kunstgeschichte in München', *Rundbrief Fotografie*, 2, 2022, 8-17. A selection of the titles published so far on the history of the publisher: Theodor Göbel, 'Die grossen deutschen Verlagsanstalten. Die Verlagsanstalt F. Bruckmann A.-G. in München', *Zeitschrift für Bücherfreunde*, May/June 1900, 78-92; Erich Pfeiffer-Belli, *100 Jahre Bruckmann – 100 Jahre Brücke zur Kunst. Festschrift zur Feier des 100jährigen Bestehens der F. Bruckmann KG, Verlag und Graphische Kunstanstalten*, Munich: Bruckmann, 1958; Otto M. Lilien, *75 Jahre Rollen-Tiefdruck*, Munich: Bruckmann, 1980; Anne-Cécile Foulon, "*De l'art pour tous*": *Les éditions F. Bruckmann et leurs revues d'art dans Munich ville d'art vers 1900*, Frankfurt am Main: Lang, 2002; Anne Bechstedt, Anja Deutsch and Daniela Stöppel, 'Der Verlag F. Bruckmann im Nationalsozialismus', in Ruth Heftrig, Olaf Peters und Barbara Schellewald, eds, *Kunstgeschichte im "Dritten Reich". Theorien, Methoden, Praktiken*, Berlin: Akademie, 2008, 280-311; Stefanie Klamm, 'Bruckmann Verlag', in John Hannavy, ed, *Encyclopedia of Nineteenth-Century Photography*, vol 1, New York: Routledge, 2008, 225-227; Daniela Stöppel, 'Hugo Bruckmann als Vorstand des Deutschen Museums', in Elisabeth Vaupel and Stefan L. Wolff, eds, *Das Deutsche Museum in der Zeit des Nationalsozialismus*, Göttingen: Wallstein Verlag, 2010, 127-170; Iris Lauterbach, ed, *Die Kunst für Alle (1885–1944). Zur Kunstpublizistik vom Kaiserreich bis zum Nationalsozialismus*, Munich: Zentralinstitut für Kunstgeschichte, 2010; Dorothea Peters, "'...der erste Vertreter eines neuen Typs ...". Zur Bild- und Buchproduktion des Bruckmann-Verlags in München 1858–1945, Teil I: 1858–1918', in *Rundbrief Fotografie*, 3, 2013, 10-17 and Dorothea Peters, "'...der erste Vertreter eines neuen Typs ...". Zur Bild- und Buchproduktion des Bruckmann-Verlags in München 1858–1945, Teil II: 1858–1918', in *Rundbrief Fotografie*, 4, 2013, 7-15.

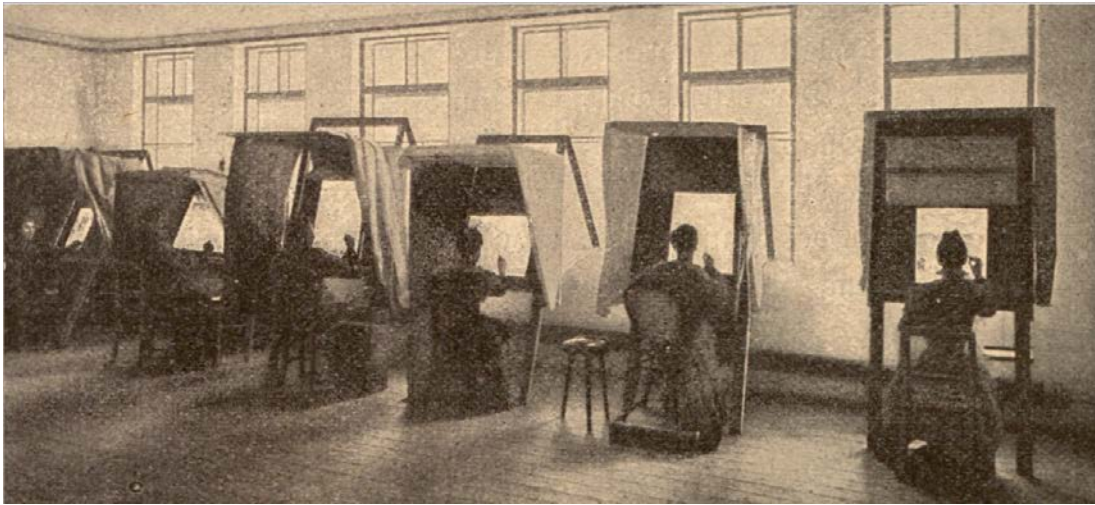


Figure 2 Unknown photographer, Studio for negative retouching in the workshops of the Bruckmann publishing house around 1900. From Theodor Göbel, 'Eine Werkstätte der Kunst', *Das Bayerland*, 36:11, 1900, 429.

institutionalised disciplines.² Beginning in 1885, the company also published the first continuously illustrated and influential art magazine in Germany, *Die Kunst für Alle*,³ which from the outset intended to address a broad audience and significantly contributed to the circulation of art images. In order to have its own and, above all, suitable image material for the various publishing projects, the publishing house also carried out independent photo campaigns. In competition with Hanfstangel, E.A. Seemann, Adolphe Braun and even Alinari and Brogi, Bruckmann distributed photographic reproductions of works of art also as single sheets, produced collection and exhibition catalogues as well as monographic portfolios. However, Bruckmann Verlag not only published works on art and cultural history. When Friedrich Bruckmann died, from 1890 his son Hugo Bruckmann was primarily responsible for business operations. Together with his wife Elsa Bruckmann, Hugo would later become one of the first supporters of the National Socialist movement in Munich and thus a vital supporter of Adolf Hitler. The publishing programme soon included populist, racist and antisemitic tracts.⁴ Also, marked by colonialism, this politically ideological dimension and responsibility should always be taken into

² The works of Heinrich Wölfflin, such as *Kunstgeschichtliche Grundbegriffe: das Problem der Stilentwicklung in der neueren Kunst*, Munich: Bruckmann, 1915, <https://doi.org/10.11588/diglit.27250> or Heinrich von Brunn's *Denkmäler griechischer und römischer Skulptur*, 1888–1947), arachne.dainst.org/entity/4281942, are among the most renowned of the publications.

³ See Foulon, *De l'art pour tous* or Lauterbach, *Die Kunst für Alle*. The entire volumes of the journal *Kunst für Alle* are accessible electronically as full texts within the Heidelberg historic literature: <https://digi.ub.uni-heidelberg.de/diglit/kfa>.

⁴ See Stöppel, 'Hugo Bruckmann' and Wolfgang Martynkewicz, *Salon Deutschland. Geist und Macht 1900–1945*, Berlin: Aufbau Verlag, 2009.

critical account when reviewing and studying the Bruckmann publishing house and its visual programme.



Figure 3 *Historical Photo Boxes in the Bildarchiv Bruckmann at Zentralinstitut für Kunstgeschichte in Munich 2021.*
Credits: Susanne Spieler.

The archive is characterised by a great diversity of material and motifs – in a time frame from about 1860 to the 1990s. It thus describes approximately 130 years of the history of art and photography and allows insights into the political sciences as well as techniques of image production. The main part of the archive consists of positives, stored in over 400 boxes (including cyanotypes, albumins, platinotypes, silver gelatin prints on various papers, pigment prints, heliogravures, etc.). They are thematically arranged by keywords and alphabetically by artists from A-Z. (fig. 3) An extensive stock of negatives (mainly dry plates and films) completes the corpus.⁵

With the production and distribution of photographic reproductions of works of art - primarily from European art history but also with a selected focus on Asian and Islamic art, Bruckmann made a decisive contribution to the popularisation of art and, in close cooperation with art historians and museum directors, also to the establishment of its canon. With the help of the hitherto unexplored photographic material and its historical, preserved archival structure, it is possible to investigate contexts and conditions surrounding the history of art, its reproduction, reception and the related ideological instrumentalization of artworks.

Bildarchiv Bruckmann as a focus for digital projects

The images reproduced in the various publications by Bruckmann show mainly paintings, but also drawings, architecture, sculpture or exhibition views. The holdings are to be distinguished from the apparatus of scientific institutions with

⁵ Insights on the variety of photo-objects of the Bildarchiv Bruckmann can be discovered, among others, in the digital project *75 Years - 75 Objects*, which was realised at the ZI on the occasion of the 2022 anniversary: <https://www.75objekte.zikg.eu>



Figure 4 F. Bruckmann A.G., ed, *Gesamt-Verzeichnis von Bruckmanns Pigmentdrucken nach Werken der klassischen Malerei vom 13. bis 19. Jahrhundert. Mit einem synchronistischen Verzeichnis der Künstler und Schulen*, Munich: Bruckmann, 1913.

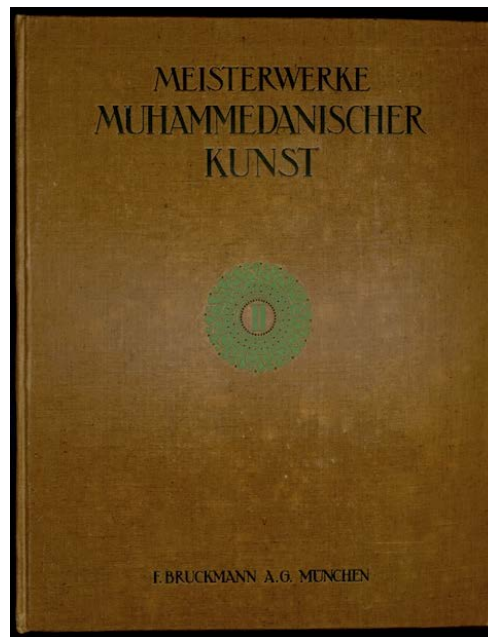


Figure 5 Friedrich Sarre and Fredrik Martin, eds, *Die Ausstellung von Meisterwerken muhammedanischer Kunst in München 1910*, Munich: Bruckmann, 1912, 3 vols.

which art historians, archaeologists or ethnologists conducted their research in the nineteenth century. The photographs are stamped, mounted, labelled, categorised and thus can be classified as visual documents of the publisher's activity. Notes and instructions on the back side, or on the photographs themselves, as well as retouchings, attest to the common practices of image processing, which was part of the usual work at the publishing house, when preparing photographs for the halftone process or colour printing, for example. It is a stroke of luck for researchers that the photo collections of the campaigns for *Bruckmanns Pigmentdrucke* and *Meisterwerke muhammedanischer Kunst* have been preserved. (figs 4–5) Due to this unique material and the importance of the two projects for the publishing house, phototechnical history and art history, these were first considered worthy of a digital project. In addition to making the sources and the associated data usable, there is also the mission of protecting the photo-objects as cultural heritage. Although the material is still in a good condition, appropriate conservation care must be taken and the film negatives and the delicate paintings on mounted photographs require timely digitisation.

Bruckmanns Pigmentdrucke

With the survival of the coherent collection of negatives for the major project *Bruckmanns Pigmentdrucke*, that lasted almost twenty years, the first visual manifestation of these photographs has been preserved. The historical development of the negative is not

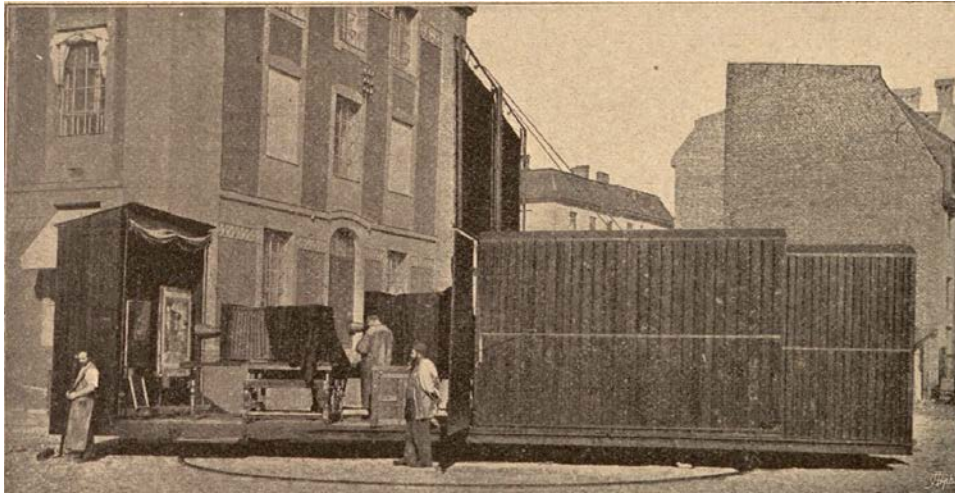


Figure 6 Unknown photographer, *Rotating open-air photo studio on the Bruckmann areal around 1900*. From Theodor Göbel, 'Eine Werkstätte der Kunst', *Das Bayerland*, 36:11, 1900, 427.

only closely linked to the birth of photography, but was its elementary process.⁶ Nevertheless, it has received little attention in photographic theory and art historical research. This is changing however: thanks above all to digitisation, the seemingly double transparency of the medium is finally gaining more visibility and the fragile objects are becoming more involved in scholarly discourse.⁷ Between 1895 and 1913, the publishing house carried out its own photo campaigns entitled *Bruckmanns Pigmentdrucke* in over 40 museums and collections throughout Europe.⁸ The works could be ordered individually in various formats and techniques through sales catalogues but also via book and art dealers. The first photographs were taken in the immediate vicinity of the publishing house: at the Alte Pinakothek in Munich. The Bruckmann company had its own mobile camera system with which the artworks could be taken on site. (fig. 6) Today, these campaigns can be used exemplary in order to reconstruct the close networks and workflows between the publishing house management, art historians, technicians, photographers or printers, thus making the multitude of actors visible.

In total, *Bruckmanns Pigmentdrucke* comprise about 7,000 different works of art, which have been preserved almost completely in the form of positives (carbon prints in various tonalities) and large-format film negatives. (figs 7–8) Since many negatives are available in duplicate, retouched and not retouched, and also prints

⁶ Cornelia Kemp, 'Einleitung', in Cornelia Kemp, ed, *Unikat, Index, Quelle. Erkundungen zum Negativ in Fotografie und Film*, Göttingen: Wallstein, 2015, 7-17, 7.

⁷ See Kemp, *Unikat, Index, Quelle* and Lukas Glajc, *Verlust des Negativs. Eine kulturphilosophische Reflexion über die Fotografie*, Oberhausen: Athena 2008 and Lukas Glajc, 'Das digitale Bildarchiv – zwischen Präsenz und Dekonstruktion', in Irene Ziehe and Ulrich Hägele, eds, *Fotografie und Film im Archiv. Sammeln, Bewahren, Erforschen*, Münster: Waxmann, 2013, 198-203.

⁸ A large part of the sales catalogues can be consulted via the digital resources of the Fototeca in Florence at the KHI: <https://wwwuser.gwdg.de/~fotokat/internet/index-de.html>

exist in different copies, the total number of photographs to be digitised is around 20,000.



Figure 7 Verlag F. Bruckmann, *Nicolas Neufchâtel, Bildnis des Nürnberger Schreibmeisters Johann Neudörfer und seines Schülers, 1561, 1895/1896*. Mounted carbon print with retouching in blue colour, 24 x 21 cm, for *Bruckmanns Pigmentdrucke – Königliche Alte Pinakothek München, 1897*. Zentralinstitut für Kunstgeschichte, Photothek / Archiv, Bildarchiv Bruckmann, ZI-BAB-191-N-NE.

Figure 8 Verlag F. Bruckmann, *Nicolas Neufchâtel, Bildnis des Nürnberger Schreibmeisters Johann Neudörfer und seines Schülers, 1561, 1895/1896*. Negative, 28 x 22 cm, for *Bruckmanns Pigmentdrucke – Königliche Alte Pinakothek München, 1897*. Zentralinstitut für Kunstgeschichte, Photothek / Archiv, Bildarchiv Bruckmann, ZI-BAB-München-Negativ-663.

It is on the large-format negatives (29 x 22 cm each) in particular, that traces of historical image optimisation techniques can be seen in the form of individual retouching. The main interventions in the negatives are pencil marks on the coated and uncoated sides, tracing of contour lines, scraping of the emulsion, masking the background. But also the unretouched negatives reveal a lot, for example about the respective shooting situation by giving an unmasked view of backgrounds. In this respect, the photo-objects reveal much about the photographic craftsmanship of around 1900. This photo collection is still sorted according to their *historical order*, marked with a Bruckmann-Number, forming a coherent unit that matches the index-numbers in the sales catalogues. (figs 9–10) In a digital database the registers, which are arranged in great detail, for example by artist, title, collection, location, region and associated art schools, can be linked interactively and groups of images can be generated.

Meisterwerke muhammedanischer Kunst in München 1910

The first major project on non-European art at Bruckmann Verlag was an extensive photo campaign for the exhibition on *muhammadan Masterpieces in Munich 1910*. The exhibition, curated by Friedrich Sarre and Fredrik Robert Martin, brought together some 3,600 Islamic art objects from international collections in this unique project displayed in 80 rooms at the Theresienhöhe in Munich. According to the contract of 18 June 1910, between the publishing house, the editors, and the exhibition planners, the Bruckmann company was entrusted with taking 400 photographs of

156		F. Bruckmann A.-G. München	
Bei Bestellungen ist außer der Nummer die Angabe der Galerie oder Ausstellung erforderlich!		Galerie oder Ausstellung	Nr.
Netscher, Caspar.			
— (nach Caspar Netscher) Das Mädchen mit dem Papagei. (Kopie nach München 1799.)		Dresden	1354
Neufchâtel, Nicolas.			
— Halbfigur eines Edelmannes.		Hannover P.	268a
— Patrizier-Ehepaar.		Karlsruhe	158
— Bildnis des Mathematikers Johannes Neudorfer und seines Sohnes.		München	663
— Bildnis eines graubärtigen Mannes.		"	664
— Bildnis der Gemahlin des vorigen.		"	665
— Männliches Bildnis.		"	666
Niccolò di Pietro Gerini.			
— (Werkstatt) Thronende Maria mit dem Kinde und Engeln (früher Sienerer Schule).		Braunschweig	1
Nickole, Isaack van.			
— Neue Kirche zu Delft.		Braunschweig	428
Niederländische Schule.			
— jetzt Vänöische Schule XV. Jahrhundert.		Amsterdam R.	342
— (XV. Jahrh.) Madonna von Jungfrauen umgeben.		Brüssel	545
— (In der Art des Meisters von Flémalle) Bildnis eines Herrn (früher Haug P.-A. Nr. 102). Berlin, W. Gumprecht.		Bonn P. M.	179
— Anbetung der Könige (Triptychon, Mittelbild).		St. Petersburg	453
— Kindermord und Beschneidung (Triptychon, Flügelbilder).		"	453a
— (um 1440) Beweinung Christi.		Berlin	520A
— (zweite Hälfte des XV. Jahrh.) jetzt Colin de Coter.		München	1455/6
— (um 1490) Bildnis eines Mönchs. Paris, L. Goldschmidt.		Brügge A.	381
— (Ende des XV. Jahrhunderts) Maria dem Kinde die Brust reichend.		Antwerpen	517
— Der Stifter und seine Frau.		"	518
— (um 1500) jetzt Gossa van der Weyden.		Hannover K.	106
— jetzt Memling: Schule.		München	122
— jetzt Kölnisch um 1500.		"	124
— Maria mit Johannes und drei hl. Frauen (früher München).		Schlusheim	123
— jetzt Gossart.		Wien	642

Hornalplättchen der Folio-Pigmentdrucke (Plein 1 M.) ist ca. 22x29 cm. Mit * bezeichnete Bilder sind auch im Format von ca. 45x55 cm abgedruckt. Preis R. IV.



Figure 9 Page with listed works by Nicolas Neufchâtel. From F. Bruckmann A.G., ed, *Gesamt-Verzeichnis von Bruckmanns Pigmentdrucken nach Werken der klassischen Malerei vom 13. bis 19. Jahrhundert. Mit einem synchronistischen Verzeichnis der Künstler und Schulen*, Munich: Bruckmann, 1913, 156.

Figure 10 View of the systemisation in the historical negative archive (campaign München Alte Pinakothek) of the Bruckmann Verlag in the Zentralinstitut für Kunstgeschichte. Credits: Franziska Lampe.

selected art objects.⁹ These 400 photographs were – initially – to be published as individual sheets, that would be sold exclusively during the exhibition. Then, in 1912, a total of 257 images were published in the three-volume catalogue as collotypes, twenty-three of them in high-grade colour prints, accompanied by thoughtful scientific essays on the respective groups of works. Published in folio format, 50 x 40 cm, the elaborately designed catalogue was an exclusive and luxurious edition with an embossed leather binding.¹⁰ For a long time, the images reproduced in the catalogue have been the only photographs of these specific art works; they were ground-breaking as visual documentation for Islamic art history.¹¹ Now that the original templates with retouching and annotations are accessible, the photographs that did not make the catalogue selection are available for the first time as well. Photographers and colourists were allowed to work directly within the exhibition grounds to colourise the platinotypes in front of the original art works. (fig. 11) Microscopic enlargements testify thick but precise layers of paint that are stuck on the photographs. (fig. 12) Both the coloured and non-coloured

⁹ Main Bavarian State Archive in Munich, Bruckmann Archiv 236.

¹⁰ The ZI was recently able to acquire one of these precious exemplars, of which only 400 were produced in 1912. The ZI volumes are also kept in a wooden slipcase that supports the character of a treasure, a. ZI-Library: 4° Kat.Ausst. München 1910/5(1.2.3 R.

¹¹ On the history of the exhibition see: Andrea Lerner and Avinoam Shalem, eds, *Changing Views: The 1910 Exhibition Meisterwerke muhammedanischer Kunst Reconsidered*, Leiden and Boston: Brill, 2010; Eva-Maria Troelenberg, *Eine Ausstellung wird besichtigt: Die Münchner "Ausstellung von Meisterwerken muhammedanischer Kunst" 1910 in kultur- und wissenschaftsgeschichtlicher Perspektive*, Frankfurt am Main: Lang, 2011.



Figure 11 Verlag F. Bruckmann, *Glass vessel, Syria, thirteenth century*, October 1910. Partially hand-coloured photograph on cardboard with annotations, 45,4 x 35 cm (sheet size), 40,7 x 29,8 cm (image size), produced for Friedrich Sarre and Fredrik Martin, eds, *Die Ausstellung von Meisterwerken muhammedanischer Kunst in München 1910*, Munich: Bruckmann, 1912, vol 2, plate 172. Zentralinstitut für Kunstgeschichte, Photothek / Archiv, Bildarchiv Bruckmann, ZI-BAB-'Moham. K.'.

Figure 12 Microscopic enlargement, detail of coloured photograph from Figure 11. Credits: Franziska Lampe.

photographs thus allow entirely new insights into the processing of the images and ultimately enable one to look behind the strategies of *mise en scène* in the volumes and their aesthetic appearance. With this digital project, the fragmented, individual aspects, could be brought into a unified perspective.

Digital futures for the Bildarchiv Bruckmann

Which digital functions are important for the analysis of the collections discussed above, and how can they serve to accelerate and deepen the research project's questions? In the case of the collections presented here, a solution for digitisation is to link the various preserved and interrelated components in a networked tool and database. For the project *Bruckmanns Pigmentdrucke* there are three key elements to be matched together: the index of the catalogue, the negatives and positives. The same is true in the case of the *Meisterwerke muhammedanischer Kunst* project, where the systematic nature of the catalogue with the selected art reproductions (collotypes), and the original templates with annotations and colourisations can be connected. Both collections are characterised by their multimedia quality and could be digitally edited according to the same principle.

Future I

Besides the standard data (e.g. artist, title, place, technique), search and sorting criteria with a browsing function by colour, a search function by similarity or side by side views would be important features for making the Bruckmann material

fruitful to researchers. But how, and to what extent, can the haptic qualities of the analogue archive be reproduced in the digital? Does that even have to be the case? The advantages of deep zoom and sidelight functions are obvious for the exploration of special photo collections and are fantastic tools. But at the same time, an enormous effort is required to produce the corresponding digital records. For precise examination, for example with a microscope, to find out which pigments were used, which grains, colour, glaze, it will still be necessary to work with the original. Digital and analogue archives remain symbiotically connected.¹² Another challenge will be how to integrate already existing databases into a digital Bruckmann project when the sales catalogues still contain old and now incorrect attributions and descriptions? And this is often the case, especially with regard to changed titles or categories, especially with the section of non-European art.¹³ Digitisation in the Bruckmann image archive in turn also generates new metadata, which are then linked to the digitised material. In the end, there will probably be different layers of historical and modern metadata that could ideally also be visualised. It would be a lovely analogy to the palimpsest of the *real* image archive if there were to be some form of historical patina in the digital archive as well (this would also allow the documentation of wrong or discriminatory terms, for example).¹⁴

Future II

The past of photography is the future of photo research.¹⁵ How can an evaluation of the archives help to map the territory of photographic images scientifically? The future lays within the archives. In the revision and discovery of the photographic images that already exists. By making them accessible as digital research objects, we can uncover the *silencing* of the holdings and recognise the objects to a much greater extent than before, as visual actors and material artefacts, each with their own functions and (social) uses.¹⁶ In the case of the Bildarchiv Bruckmann, the still

¹² Costanza Caraffa, *Florence Declaration – Recommendations for the Preservation of Analogue Photo Archives*, Florence 2009, <https://www.khi.fi.it/en/photothek/florence-declaration.php>

¹³ More on art history and digitality see: Franziska Lampe, 'Auf der Suche nach Vernetzung: Kunstgeschichte und Digitalität', in *Kunstchronik*, 9/10, 2021, 519-523.

¹⁴ For practical attempts to solve problematic historical terms in art historical image databases, see Moritz Lampe, *Diskriminierende Begriffe und Wissensordnungen im Bildarchiv: Eine postkoloniale Perspektive am Beispiel des Bildindex der Kunst und Architektur*, Berlin: Institut für Bibliotheks- und Informationswissenschaft der Humboldt-Universität zu Berlin, 2021, 10.18452/23766 and Ina Mertens, 'Vom Objekt zur Beschreibung. Die postkoloniale Notwendigkeit für spezifische Datenproduktion', in *kritische berichte*, 2, 2022, 79-85.

¹⁵ Perspectives on the future of photography, see: Anton Holzer, ed, *Fotogeschichte (Die Zukunft der Fotografie)*, 158: 40, 2020, herein especially the short essays of Stefanie Diekmann, 'Archive aktivieren', 13-14 and Brigitte Werneburger, 'Die Zukunft der Fotografie ist ihre Vergangenheit: das Fotoalbum', 58-59.

¹⁶ Elizabeth Edwards and Janice Hart, eds, *Photographs Objects Histories. On the Materiality of Images*, London: Routledge, 2004; Costanza Caraffa, ed, *Photo Archives and the Photographic Memory of Art History*, Berlin and Munich: Deutscher Kunstverlag, 2011; Julia Bärnighausen, Costanza Caraffa, Stefanie Klamm, Franka Schneider and Petra Wodtke, eds, *Photo-Objects. On the Materiality of Photographs and Photo-Archives in the Humanities and Sciences*, Berlin:

underestimated *complex of reproductions of art* as a lens for the history of photography opens up new perspectives for research – especially when taking into account the various innovations, developments and patents that Bruckmann pioneered together with his photo engineers and chemists. Not only to preserve but also to enable new resources for a forward-looking art historical research, it is important to advance the institutionalisation of photo archives, as in the case of the Bildarchiv Bruckmann – from private hands to the public institutional sector of the ZI – and to recognise photography as part of a cultural industry in which art history is intertwined in many ways and has to take on its responsibility.

These are the first snapshot ideas with regards to a possible digital future of the Bildarchiv Bruckmann, which will be followed up by the ongoing research project, aiming to open up the underlying cultural heritage of the photo archive. When the extraordinary holdings are available digitally one day and published according to FAIR principles, they themselves will of course become the basis surely for follow-up projects. In the future, hackathons and similar projects, which make use of AI, Big Data and the advantages of the Semantic Web, will go down paths that are not yet predictable.

Franziska Lampe is in charge of the research project *Bildarchiv Bruckmann: Ökonomie, Fotografie und Kunstgeschichte um 1900* at the Zentralinstitut für Kunstgeschichte, Munich (Katharina von Bora Straße 10, 80333 Munich, Germany), funded by the Fritz Thyssen Stiftung. Her PhD of 2020 was completed at University of Heidelberg; previously, as a doctoral student, she worked at the Kunsthistorisches Institut in Florenz – Max Planck Institut. She is a board member of ulmer-verein.de, editor of arthist.net and part of the working group *Foto-Thesaurus*. Her latest publication was as co-editor of 'Phänomen Farbe: Ästhetik – Epistemologie – Politik', *kritische berichte*, 1, 2022.

F.Lampe@zikg.eu



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