The Glasgow Photogravure Process

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Synopsis

This paper describes a fine art photo-etching printing process which was popular at the Glasgow Print Studio in the 1980s. Some examples of work produced using the process are described. The author, an engineer and printmaker, delves into the microelectronics industry to find out more about the KPR photoresist used. An emulation of the process using a modern photo-resist is also described. The paper argues that the process is really another variant of photogravure, and takes us back to the 1860s to Henri Garnier's photogravure process which is remarkably similar in concept. The author also makes comparisons with Karel Klic's copperplate photogravure process.

KPR comes to Glasgow

In 1978, John Mackechnie was appointed as a Master Printer at the Glasgow Print Studio. This was a home coming for the Glasgow School of Art graduate who had subsequently done post-graduate printmaking at Brighton Art School and worked in the printmaking department at Newcastle Polytechnic, now the University of Northumbria. At art school John had developed a colour screen-printing process based on in-camera (35mm) colour (RGB) separations using the grain of the film to create the halftones. When at Brighton he became aware of Kodak's KPR photo-resist, and converted his colour printing process to become an intaglio process. He added another layer of sophistication by making tone separations of each colour separation. Typically three tone separations were transferred to the four (CMYK) plates with increasing size aquatint grain sizes. In total, up to twelve tone separations (on line/lith film) were transferred to four plates. Plate 1 is his 1978 print, '*58 Bonneville'*; Plate 2 is a detail showing the *Technicolor*-qualities of his work which became his trademark style at that time. Other examples of his work can be seen on his website and the Glasgow Print Studio websites. [1]

The chapter on photo-etching in Chamberlain's standard UK-published 1972 *Manual of Etching and Engraving* [2] does not mention KPR photoresist. The first appearance in the literature found by the author seems to be in the 1972 US-published Ross and Romano [3]. Saff & Sacilotto (1978) [4] and Sacilotto's later photo-mechanical printmaking book of 1982 [5] describe its use as the basis of an image transfer process. In their first edition, Ross & Romano state they 'have only begun to explore the possibilities' of KPR.

The patent for KPR [6] was awarded in 1954 for an image transfer process intended for lithographic plates. After the initial work carried out by William Shockley and his team at Bell Laboratories, for which they were awarded the Nobel Prize for Physics in 1956 for the invention of the transistor [7], the team moved on to developing the integrated circuit. Initially they tried using the bichromated gelatine transfer process in Talbot's photo-engraving process [8] to transfer the design of the transistor components to the semiconductor material, but with little success. They approached Kodak. Kodak showed them their (already developed) photolithography plate preparation process; it was a goer. In the process of adopting the product, the electronics industry seems to have adopted Kodak's intended use as its description of this aspect of its manufacturing process.[9] The Wikipedia 'Photolithography' page [10] describes the microelectronics use of the term and includes an account of Lathrop & Nall's work starting with a (1952) printed circuit board application [11] (for another photo-resist) leading up to microelectronics/integrated circuits applications. In 2013, Lathrop stated that he chose the term 'photolithography' rather than photo-etching, because 'it sounded higher tech'. However, of course, Alphonse Poitevin is credited with inventing (printmaking) photolithography in 1855; Josef Maria Eder's *History of Photography* [12] provides the full story. Eder describes the wealthy Duc de Luynes' 1855 initiative to find solutions to

producing permanent photographic prints, and printing with ink, and details the major award finally being made to Poitevin in 1862. So the name should have been a no go area for the engineers.

In 1959 Kodak published a pamphlet summarizing the industrial uses of KPR [13]. The main uses listed are for printed circuit boards and integrated circuit fabrication. The pamphlet does not list printmaking as an application, however it does describe its use as a resist to etch metal plates in making name plates. Later in 1967 Kodak published a user guidance note. [14]

Sharing the technology

After much interest from the Glasgow Print Studio's membership [15], Mackechnie ran a class on his process. In order not to test the resilience of the class members, this was limited to monochrome imagery. If a class member analysed the effort required to make a full colour, four plate work, the member would quickly realize that mastery of a monochrome image was indeed an acceptable outcome. John intends to publish some more detailed notes on the content of his classes on his website.[16] When *New Glasgow Boy* Stephen Campbell - then New York based - made his first etching with the Studio, Campbell's original outline image was sent to the studio and transferred to the plate, with gravure details added by the in-house process. When Campbell arrived in person, the plate was ready for his final additions.

In 1985, Swiss artist Ursula Jakob [17] arrived, eager to learn some photo-etching processes. An American artist friend, then based in London, had made her aware of the technology that was available in Glasgow. Plate 3 is an example of Jakob's work, Plate 4 a detail showing Ursula's signature additions: on the left hand side she has used a mezzotint rocker to add tone; on the right, detail of a dot pattern which she has transferred photographically, using KPR. Ursula took the process back to her studio in Berne. When the KPR chemistry was no longer available she moved on to Klic's copperplate photogravure process. She now works that process in four plate colour.

The process is now described in some more detail using a print made by one of Mackechnie's first students, Harry Magee. Plate 5 is one of his prints from 1990, by which time Magee has honed his approach to the process. Harry is best known for his images of Glasgow, but here we look at a landscape image, not just because it is culmination of his use of the process, but also because Harry has retained his tone separation films and notes on grain size (inferred by aquatint box entry timing), etch times, etc. He has generously allowed me to reproduce them here. Plate 6 shows just four of the six separations he used to make the plate. When KPR became unavailable, Harry explored [18] copperplate photogravure with the author, but later became more enamoured with the polymer photogravure process, with which he continues to make his exquisite images of Glasgow [19].

The demise of KPR

Moore's Law tells us that every year and a half or so the number of transistors on a chip will double. To achieve this the industry had been continuously reviewing the technology used including the photo-resist materials. By the early 1970s KPR could no longer provide the resolution performance now required by the industry; the industry had been searching for a replacement. KPR remained a supported product for the less demanding printed circuit board industry. In the 1990s environmentalists were targeting it as environmentally-unacceptable; there was also hearsay that some industrial users stopped using it because of speculation that it was carcinogenic. It was no longer available to printmakers by the early 1990s.

The *Handbook of Microlithography* [20] published in 1997 doesn't even name-check KPR. Earlier conference papers addressing the history of the industry do give it its place: Jane Shaw's *Overview of Polymers for Electronic and Photonic Applications* [21] concentrates on describing KTFR - Kodak Thin Film Resist - which evolved from KPR and became the industry standard until c 1972. [22] C Grant Willson et al, *Photoresist materials: a historical perspective* [23] describes its shortcomings when used in microelectronics, along with a potted history of photoresists prior to the development of KPR/KTFR. The

industry moved to DNQ [24] positive-working resists: these provide more resolution, and thus the ability to pack more devices into the integrated circuit. However, negative-working resists such as KPR, in common with most photosensitive emulsions, are much more convenient for the printmaker – as the required transfer films/artwork are positive images. This may explain why the new DNQ photoresists were not taken-up by the printmakers.

Although the preferred photo-resist was no longer available, various other photo transfer processes were still available. Many transferred their allegiances to the polymer photogravure process which was being becoming popular through other workshops, or indeed to Klic's copperplate photogravure.

An emulation: with some reverse engineering of the 1980s process

The Glasgow practitioners did pay some attention to the dire warnings on the bottles, and most are alive and well. The author has refreshed his knowledge by reliving the process with the artists featured in this article. The process required a number of film tone separations to be prepared. Starting with a fine aquatint a light (highlights) tone was created using a dense tone separation; see Plate 6: Separation 1. After this first transfer was etched with a very short etch time, the resin removed and second and subsequent darker greys separations were transferred to the plate, with gradually larger grain aquatints being applied. Normally at least three tone separations/transfers were used. In Magee's *Three Sisters*, six separations were used to create a monochrome print.

Mackechnie's *'58 Bonneville'* used 3 separations per colour plate; it is the unconcealed grain – a combination of film grain and the aquatint – the colour 'specks' in Mackechnie's work that gives it its character. Magee was more interested is achieving photographic-like graduation of tones.

As a lock-down project the author wondered if he could emulate the 1980s process with modern technology. He was also keen to understand the grain sizes of the individual tone separations and how they interacted. He began by trying to grade proprietary resin powder into a range of grain sizes, to then apply using pepper-pot like shakers: might the emulation include defined grain size tone separations, which could be analysed to see how gradual the a tonal range was being created? The author can now provide an analysis of the range grain sizes in a tin of proprietary resin powder, however, he soon reverted to the traditional aquatint box, in which, the aquatint grain size is defined by the entry time when the plate is placed in the aquatint box's falling cloud of grains. The later the entry, the smaller the grains settling on the plate. The future of that the traditional aquatint box is definitely secure. Plate 7 shows the make-up of grain sizes by weight. This doesn't analyse the (cloud) volume, coverage of each grain, etc., etc. The author is happy to hand this research project over to AN Other.

The emulation also explored the use of a modern spray-on photoresist - Positiv 20 - made by Kontakt Chemie [25] in Belgium, primarily targeted at manufacturers of printed circuit boards. However, this, as now seems to be the microelectronics industry norm, is a positive-working process [26] and so at odds with the printmaker's 'KPR'-preferred routine of working with positive transparencies (diapositives), though a film-photographer used to working with large format negatives, and not interested in manipulating the process would probably feel more at home. The results to date are encouraging, however 'more artistic' than photo-realistic; satisfactory to this end user, but probably too un-predictable at this stage to compete with either the original KPR process or copperplate photogravure.

Plate 8 is a process flow diagram comparing the Glasgow process with Klic's copperplate photogravure process. (Klic's copperplate photogravure uses only small grain sizes, but uses a progression of strengths of the ferric chloride mordant to create the range of etch depths.)

Some additional comparisons of the emulation technology with the KPR process

- To work with steel, the photoresist had to be resistant to nitric acid: it was, but only confirmed by experimentation.
- Would the resist stand the temperature required to fuse the resin grains when creating the aquatint? The manufacturers

only described the recommended baking temperature for the pre-exposure coating as 70°C. The resist would now be taken to *c* 150°C. It survived this test as well.

- Positiv 20 was only available in an aerosol can. Attempts to decant it and flow coat a plate were not successful, as the liquid evaporates very quickly.
- The applied layer is transparent, albeit providing a convenient colour (effect) coating thickness check when sprayed on copper, but very difficult to see on steel. (KPR had a strong purple dye which made it very easy to see each separation layer on top of the previous aquatints applied.)
- It is a positive-working photo-resist; there was a hint in the product name. This is the opposite of KPR, and as already stated, very confusing to the photo-printmaker.

The Garnier/Dujardin process

The author is also an enthusiastic photo-mechanical printing photo-historian. Mention has already been made of the Duc de Luynes' 1855 competition. Eder [27] describes Honoré Theodiric, Duc de Luynes' quest for photographic images printed in ink. Mark Katzman's photogravure.com [28] site provides an excellent history of the early development of photogravure. David Hanson, who has provided Mark with much of his material has also produced a wonderful biographical dictionary [29] of the early, pre-Klic processes and their innovators. Hanson provides information on Henri Garnier and the successor company, Dujardin Freres. Helena Wright tells us that Garnier, in association with Alphonse Salmon, first came to prominence with a pigment process which received an award in de Luynes' competition.[30] Eder explains more, telling us that their 'pigment' process recipe included chromates and sugar.

Henri Garnier's 1860s photogravure process is remarkably similar to the process developed to use KPR as the photo-resist. Hanson describes Garnier's process as using a series of bichromated gelatine photo-resist transfers with varying size aquatints to create the halftones. Dujardin Freres modified the process to create a successful printing business; they continued to work together for a time. Plate 9 is a process flow diagram comparing the final Garnier/Dujardin and Glasgow processes. Hanson [31] states that the differences between Dujardin's final process and the original Garnier process are as follows: Dujardin introduced resin aquatints, repeated for three tone separations, rather than the bichromated sugar-lift [32] photoresists used by Garnier; Dujardin used different strengths of ferric chloride for the three stages of etching. By the time KPR came along, Kodak had also developed line/lith film which of course provides an easy way to create dense tone separation positives enlarged directly from a negative. One wonders if Garnier had mastered the wet collodion process sufficiently to make (contact-exposed) diapositives for use in the three transfers to the etching plate. *c*1905, Arthur Payne describes multiple development during the collodion process to increase image intensity [33]; had this technique been identified in the 1860s? Plate 10 is a plate from Blanquart-Évrard's famous survey of photo-mechanical printing processes showing a 'from nature' photograph taken at the Great Exhibition in London, and printed by Dujardin Freres.[34] The process is attributed to Garnier by virtue of the H.Garnier *Sc.* In the magin on the bottom right hand side.[35]

Glasgow process *vs* Klic: some process parameters for discussion

The following table is the author's personal comparison of the Glasgow process with Klic's copperplate photogravure.

Criterion	***Glasgow (KPR)** cf **Klic***
Resolution	Not so good, as, in addition to a single fine aquatint as Klic would have used, the Glasgow process uses additional larger aquatint grain sizes. (Of course, polymer photogravure has a resolution on a par with copperplate gravure.)
Time to make	In general, the Glasgow process takes considerably longer, however progress can be inspected at various point by taking stage proof prints. And it allows the artist to change her/his mind on a number of occasions!
(artist) manipulability	The Glasgow process is much more flexible
Print run length	The plate is steel, with long print capability, however, copperplates can be steel faced, but at some cost.
Repeatability	Klic's process is repeatable; Glasgow, not really.
Cost	The Glasgow process is lower cost as steel is much cheaper than copper. Modern photoresists are relatively inexpensive. Sourcing carbon tissue for Klic's process is challenging.
Nasty chemistry	The emulation chemicals have been developed to meet current environmental requirement. The dichromate used for Klic's process requires health and safety management.
Fine Art Gallery patronage	The Glasgow process provides much more scope for artistic statement
Photography Gallery patronage	Klic's process can provide true photorealism
Prep prior to image transfer	Klic's process is quite needy with respect to creating the perfect diapositive
Complexity	The Glasgow process may have more stages than Klic's process, but Klic's etching process is more challenging

Is the Glasgow process photogravure?

The author obviously considers it to be so; it is certainly a gravure process, and it is photographic. The Garnier/Dujardin process, which is its closest relative in the world of photo-etching, is generally described as being a photogravure process. The process provides a range of tones. Just as Klic's process could be 'debased' to provide a limited range of tones, say using two mordant baths only - the Glasgow process can be made as fine a process as the printmaker's stamina and competence will allow.

An endnote on the rebirth of the Glasgow process

John Mackechnie's 2000s *Film Noir* series of photo-etchings - see his website - which are **not** in colour, used a then new, negative working, roll-on photoresist, *Photrak*, for which GPS now runs classes. So it would appear an (evolved) Glasgow process is alive and well.

The author wishes to thank John Mackechnie, Ursula Jakob and Harry Magee for all their help in preparing this paper.

Plates 12 and 13 show a photograph and its interpretation via the 2021 emulation process. Depending on the criteria of the viewer it is either 'interesting' or a photorealistic interpretation requiring further practice. The author is likely to move on to the more convenient 'negative working' Photrak photoresist for images which are planned to be 'interesting', but also to revert to Klic's copperplate process when photorealism is required.

Some examples of the author's work can be seen on his website: www.rogerfarnham.com.

In association with this paper, some additional/supporting images, with additional notes, are being posted on Twitter: @pmprint1826 - https://twitter.com/pmprint1826

References and notes

1 John's work can be seen at www.johnmackechnie.com, www.glasgowprintstudio.co.uk/artists and www.gpsarchive.com. John is an RSA (Royal Scottish Academician) and was awarded an MBE in 2019.

2 Walter Chamberlain, **Manual of Etching and Engraving**, Thames and Hudson, 1972

3 John Ross, Clare Romano (& Tim Ross, 2nd edition only), **The Complete Printmaker**, The Free Press, 1st edition, 1972, and also in the much revised 2nd edition, The Free Press, 1990.

4 Donald Saff and Deli Sacilotto, **Printmaking: History and Process**, Holt Rinehart & Winston, 1978

5 Deli Sacilotto, **Photographic Printmaking Techniques**, Watson-Guphil, 1982

6 LM Minsk et al, US Patent No. 2,690,966, **Photomechanical Resist**, filed 1951, awarded 1954

7 Awarded to William Shockley, John Bardeen and Walter Brattain for their researches on semiconductors and their discovery of the transistor effect.

8 WHF Talbot, British Patent No 565, 1852, **Photo Engraving**

9 The microelectronics industry has called this aspect of the creation of the integrated circuit **photolithography** or microlithography since. This has always been an anathema to the author, particularly when wearing his printmaker hat, as he considers the chemical action subsequent to the image transfer as an etching (or intaglio) process, whereas lithography – a planographic printing process – is one the key classifications of printing processes, along with relief and intaglio. Some engineering authors have claimed that the microelectronics industry coined the term as it was all about 'printing on stone', but fail to mention that Alois Senefelder had coined the lithography term in 1798. Maybe Bell Labs felt obliged to honour the photo-lithography intention of the original KPR patent.

10 www.en.m.wikipedia.org/wiki/Photolithography

11 Jay Lathrop, **The Diamond Ordnance Fuze** (sic) **Laboratory's Photolithographic Approach to Microcircuits**, IEEE Journals & Magazine, 2013, IEEE Annals of the History of Computing. 35: pp48-55

12 Josef Maria Eder, **History of Photography**, 4th edition, 1932, translation by Edward Epstean, Columbia University Press, 1945. pp555-557 provides details of wealthy French aristocrat Honoré Théodoric d'Albert, Duc de Luynes' 1855 competition to find a solution to producing permanent photographic prints and printing with ink; Eder details that the top award was finally being made to Poitevin in 1862.

13 Kodak pamphlet Q-25, **Industrial Uses of Kodak Photo Resist**, 1959

14 Kodak Publication P-79, **An introduction to photofabrication using Kodak Photosensitive resists**, 1967. The author has not seen this but has seen a number of citations to it in microelectronics papers.

15 Glasgow Print Studio is an open access organization providing classes in all the printmaking disciplines, however, most members are art school graduates. See www.glasgowprintstudio.co.uk and www.gpsarchive.co.uk

16 www.johnmackechnie.com

17 Ursula Jakob became Head of Printmaking at Bern University of Applied Sciences. She has exhibited widely with exhibitions in China, Canada and Mexico. In 2006, she was the visiting artist at the Australian National University in Canberra. With her frequent collaborator Jacqueline Baum, Jakob won the SAM Art Award in 2011. Currently she is making four colour plate copperplate photogravures. Ursula's work can be seen at: https://www.baumjakob.ch/

18 Harry Magee is the co-author with the author of **Klic: Life, Art, Invention**, blurb, 2015, **The Rise of Photogravure in the 1880s**, *The PhotoHistorian* Nos 179 & 180, 2017 & 2018. He was the co-curator of **blueprint** in 2013, and 'blueprint 2' ***Ponton to Klic to Photojournalism*** (2015) exhibited at Glasgow's Trongate 103 and other galleries in 2013 and 2015.

19 See http://harrymageeprints.co.uk/ and https://shop.glasgowprintstudio.co.uk/artists/108-harry-magee/works/

20 P Rai-Choudury (ed), **The Handbook of Microlithography, Micromachining and Microfabrication**, 1997 (Volume 1, Microlithography) co-published by SPIE Press and IEE Materials and Devices Series 12

21 Jane M Shaw, **Overview of Polymers for Electronic and Photonic Applications**, pp1-65 in Wong (Ed) *Polymers for Electronic and Photonic Applications*, Academic Press, 1993

22 A family of Kodak photoresists evolved: KPR; Kodak Thin Film Resist (KTFR); Kodak Metal Etching Resist (KMER). All were **negative** photoresists.

23 C Grant Willson, Ralf Dammel, Arnost Reisen, NJ Somerville, **Photoresist materials: a historical perspective**, 1997, SPIE Volume 3051 pp28-41

24 DNQ = diazonaphthoquinone, the basis of most **positive** photo-resists: the coating is initially insoluble, but is made soluble when exposed to light. DNQ – had been known for some time. In 1972, it superseded KPR as the standard photoresist. The positive to positive process engineering and architectural drawing blueprints in the 70s were diazo prints; the first photo-lithograph made by the author was with a commercial *Ozalid* – diazo backwards – plate in the early 1980s. They were available as negative- or positive-working.

25 http://www.kontaktchemie.com/koc/

26 A negative-working photoresist requires a positive transparency, a 'diapositive'. Positive-working processes provide better performance the electronics industry, but are counter intuitive to the printmaker.

27 Eder ibid

28 https://**photogravure.com/secondary-figures/** includes biographical details on many of the early innovators of photogravure

29 David A Hanson, **Checklist of photomechanical processes and printing 1825-1910**, blurb, 2017. This document can be read online.

30 Helena E Wright, **Photography in the printing press: the photomechanical revolution**, in *Presenting Pictures*, Bernard Finn, ed., London: Science Museum, 2004, pp-21-42

31 Hanson ibid.

32 Sugar lift is a technique where the etcher can apply a mixture of sugar and pigment directly to the plate; this can include resin powder. This then has a coat of varnish applied, and if the plate is soaked in water after the varnish has dried but not hardened, water permeates the varnish, the sugar dissolves and the pigment/resin mix is uncovered and can be etched in acid. Or, if resin is present, it could be fused with heating to create localized areas of aquatint before etching.

33 Arthur Payne, **The Wet Collodion Process**, c 1905, Mawson & Swan / Iliffe

34 Louis Désiré Blanquart-Évrard, **La Photographie, ses Origines, ses Progrès, ses Transformations**, 1869

35 *Sc = sculp., sculpsit*, engraved. Later, according to Anthony Griffiths, **Prints and Printmaking**, 1980, British Museum Press, the term *Photosculpsit* or ph. sc. was used by craftsmen hand-preparing photogravure plates.



Plate 1 John Mackechnie 1978

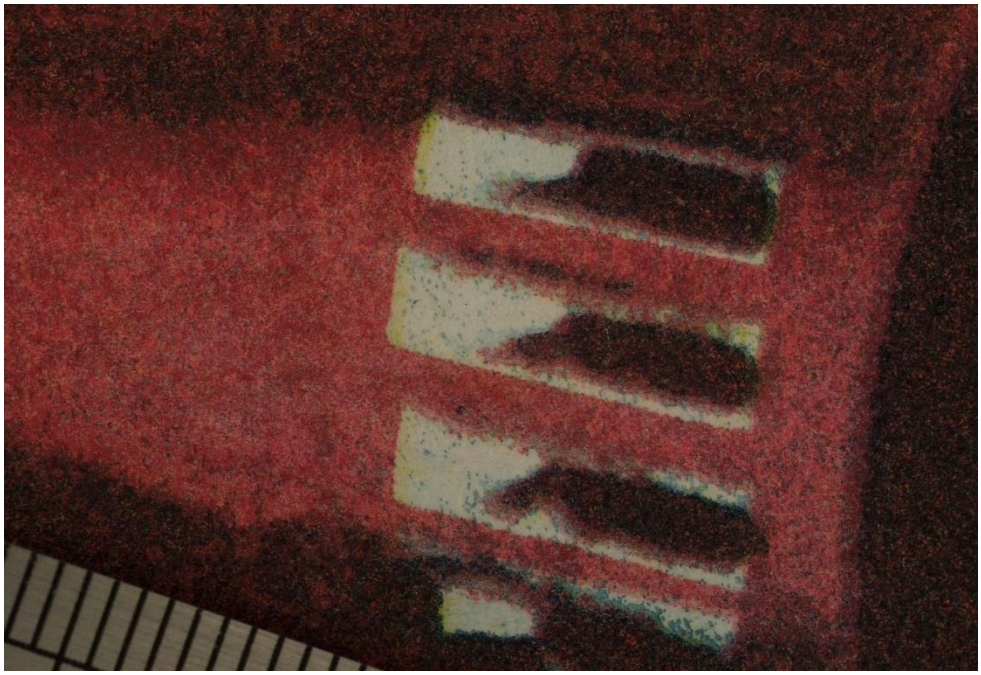


Plate 2 Detail from Plate 1



Plate 3 Ursula Jakob 1985



Plate 4 Detail from Plate 3



Plate 5 Harry Magee 1990



Plate 6 Separations for above image
(1st, 3rd, 5th & 6th, quarter size)

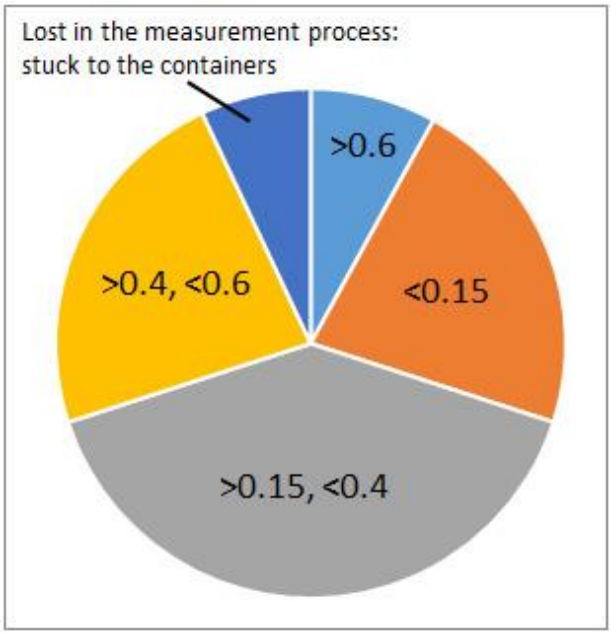


Plate 7 Ratio of aquatint grain sizes

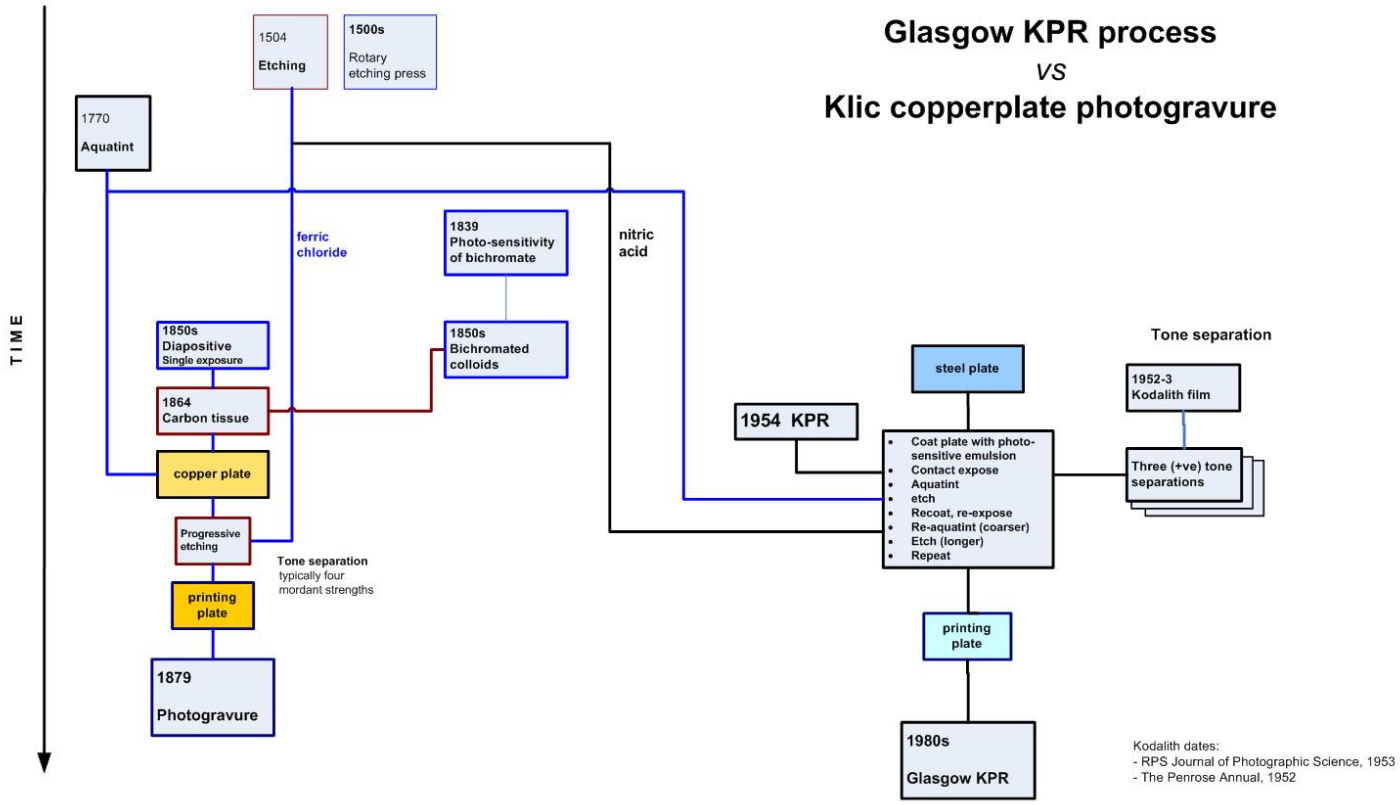


Plate 8 Process flow diagram: KPR vs Klic

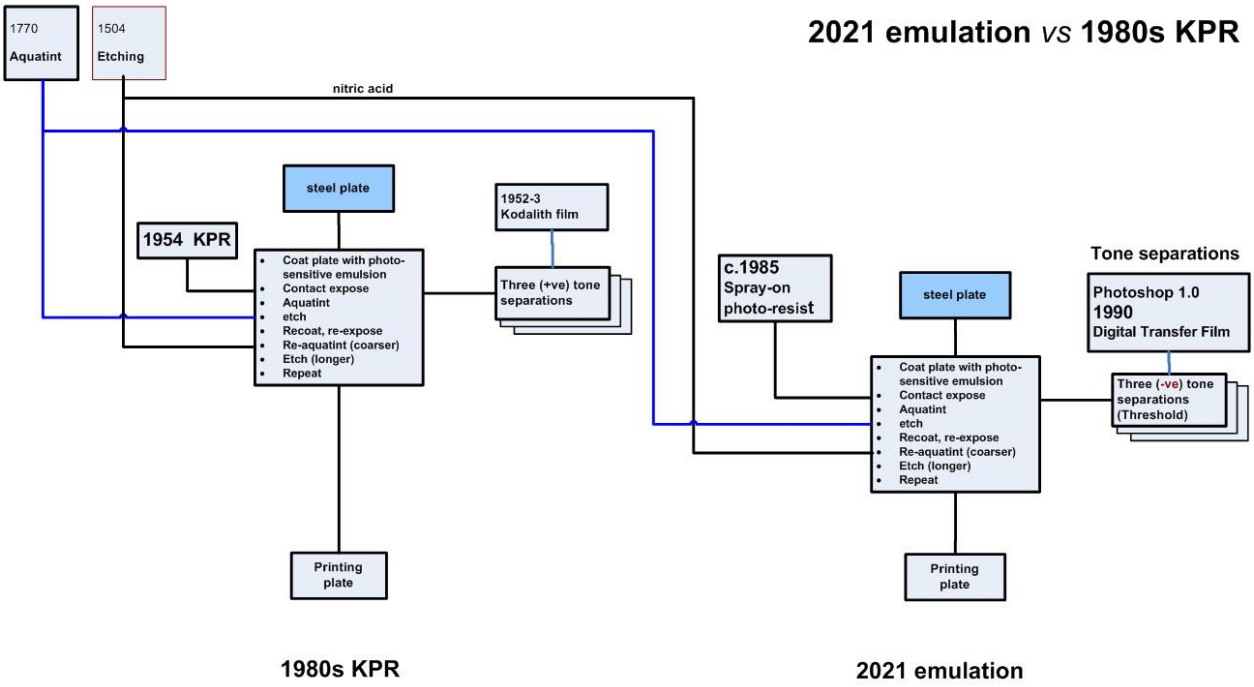


Plate 9 Process flow diagram: Emulation vs Klic

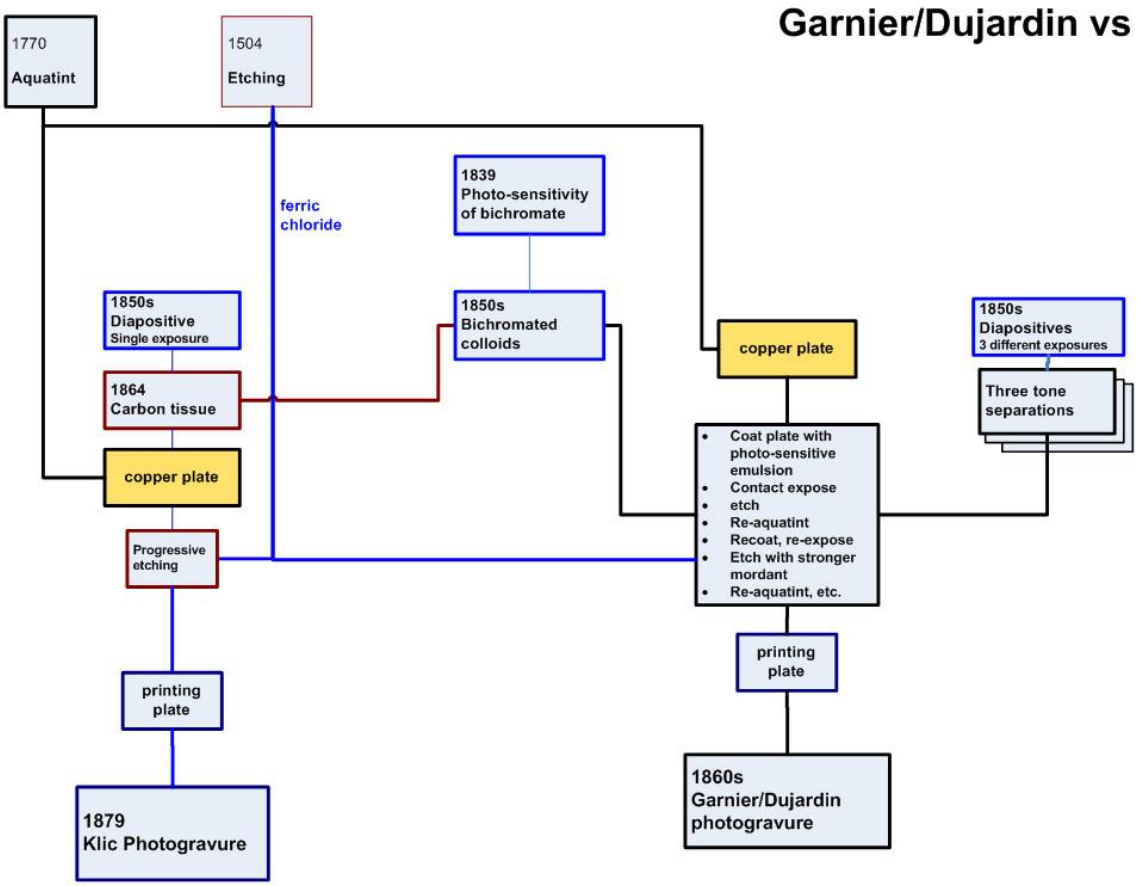


Plate 10 Process flow diagram: Garnier vs Klic



Plate 11 Garnier, Great Exhibition



Plate 12 Greenock – original

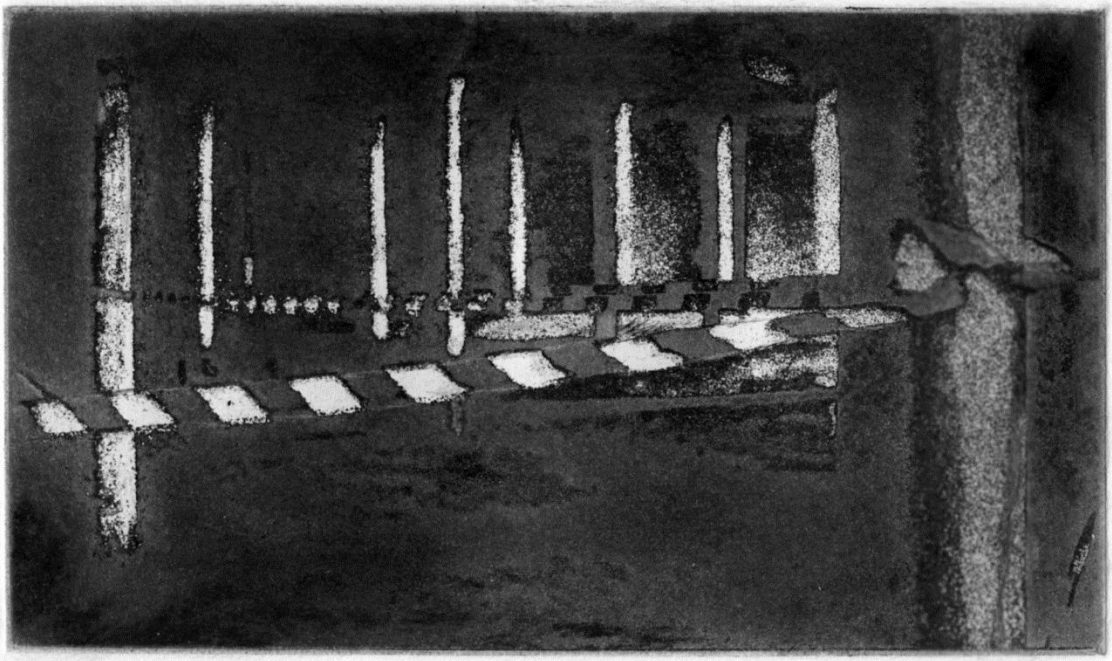


Plate 13 Greenock - Emulation

Appendix

Conference: Don't Press Print 2: De/Reconstructing photomechanical reproduction

Online: 9 and 10 September 2021

Thank you for registering for the conference.

As you know we have had to revert to a wholly online conference as a result of the continuing impact of Covid on our speakers and attendees. Although we will miss the social side of a conference, the programme promises to be engaging and illuminating covering both historical and contemporary aspects of photomechanical reproduction.

As with DPP01 the proceedings will be published after the event and will be sent to registrants. You can see the DPP01 publication on collodion here: https://rps.org/dpp01

In this document you will find details of how to access the two days, the final programme and abstracts and speaker biographies for our keynotes and presenters.

If you have any questions regarding the conference, are struggling to gain access, or have any questions please email: DPP02@rps.org

We look forward to a stimulating two days.

Associate Professor Susanne Klein
Centre for Fine Print Research
University of the West of England

Dr Michael Pritchard
Director of Programmes
The Royal Photographic Society
e: michael@rps.org / t: +44 (0)117 316 3374

The conference is supported by Taylor Brothers, Bristol.
https://taylorbros.uk.com/

Accessing the conference

The conference is being presented by Zoom. You will need to use the links below – one for day 1 and one for day 2. If you are unable to access the conference please email: DPP02@rps.org or try calling +44 (0)117 316 4474. We will monitor email and will do our best to resolve any technical issues.

Please remember our speakers are widely dispersed and may not always have fast internet connections. In the unlikely event of a major problem we will post a notice on the event page here: https://rps.org/photomech

The Zoom meeting will be open from 0915 (BST) | 1015 (CET) | 0415 (EST) on both days with the programme starting at 0930 (BST).

We will be recording the event so please choose a Zoom view that you are comfortable with.

We would encourage you to make use of Zoom chat to communicate with fellow registrants, to ask questions of the speakers (where time allows) and to contribute to the panel sessions. We may try to take live questions in which case please raise a Zoom hand if prompted and we will come to you.

We aim to keep to the timings in the programme for the benefit of those joining from different time zone and dipping in and out of the two days.

Topic: Don't Press Print Photomechanical - day 1 - Thursday

Time: Sep 9, 2021 09:15 AM London
Join Zoom Meeting
https://us06web.zoom.us/j/86371459013?pwd=L1JnR0UvamZ2RC9Eb2xFbW9qREN0Zz09
Meeting ID: 863 7145 9013
Passcode: 842626

Topic: Don't Press Print Photomechanical - day 2 – Friday
Time: Sep 10, 2021 09:15 AM London
Join Zoom Meeting
https://us06web.zoom.us/j/84685533900?pwd=bk5KaE9mcjduZzYvSlF2WG9UUmZIUT09
Meeting ID: 846 8553 3900
Passcode: 736465

Programme

Don’t Press Print 2: De/Reconstructing photomechanical reproduction

Thursday, 9 September 2021	
0915	Zoom meeting opens
0930	Introduction: **Professor Carinna Parraman** / CFPR
0945-1030	Keynote: **Professor Kelley Wilder**. Working the Photomechanical Object(s)
1030-1055	Break
	Session 1: History and application
1100-1130	**Francesca Strobino**. Reproducing Nature: W H F Talbot’s and Alois Auer’s printing processes (1852)
1135-1205	**Anthony Hamber.** Rudolph Appel: the Ordnance Survey and Photozincography
1210-1225	**Petra Trnkova**. Daguerreotype and Electricity at the outset of photomechanical reproduction
1230-1355	Lunch
	Session 2: History and application
1400-1430	**Julie Melby**. Edward L. Wilson and the Mechanical Photographers
1435-1505	**Paulo Ribeiro Baptista**. The Casa Biel role in Portuguese Collotype edition (1875-1918)
1510-1525	**Ricard Martinez**. On silver and lead: photography and press in the context of Spanish Civil War
1525-1555	Break
1600-1630	**Susanne Klein**. Fast and Furious: photolithography
1630-1715	Discussion and close of day one

Friday, 10 September 2021	
0915	Zoom meeting opens
0945-1030	Keynote: **Dr Geoff Belknap. On Photomechanical Matters**
1030-1100	Break
	Session 3: History and process
1100-1115	**Paul Elter**. One and Many: Wet-collodion and Woodburytype
1120-1150	**Roger Farnham.** The 1980s Glasgow photogravure process
	Session 4: Contemporary practice, techniques and digital
1155-1225	**Ross Mazzupappa,** Faux to gravure: affordable and accessible photo-etching
1230-1355	Lunch
1400-1415	**Philip Bovey**. The Pictorial Syntax of photogravure in the Zodiaque project
1420-1435	**Elizabete Kozlovska**. Photomechanical printing as an undervalued process: its care and distinction
1440-1455	**Li Xiaoqiao**. (Re)forming the imprint: how the digital print-matrix imprint can be augmented with computational/robotically-assisted etching and drawing
1455-1525	Break
1530-1600	**Constanza Isaza Martinez.** A question of quality? A comparison of traditional copper and polymer photogravure processes
1600-1630	Discussion and close of conference

Speaker biographies and abstracts

Following you will find information on most of the speakers and abstracts of their papers. It is presented in order of delivery over the two days. The printed conference proceedings will include full biographical details.

Professor Carinna Parraman

Introduction

Dr Carinna Parraman is Professor of Colour, Design and Print, and Director of the Centre for Fine Print Research (CFPR) City Campus, Bower Ashton. As Director of CFPR, she leads a cross-disciplinary research team comprising scientists and technologists, designers, artists, and researchers.
https://cfpr.uwe.ac.uk/people/carinna-parraman/

Professor Kelley Wilder

KEYNOTE 1: Working the Photomechanical Object(s)

Photomechanical objects do an enormous amount of work, in magazines, in journals, in newspapers, and as individual works of art. The end product, the prints, are easy to find in their hundreds of thousands. Likewise, many hundreds of the negatives exist from which the prints are made. However, only seldom do we find any evidence of the many other photographic objects that are created in the course of photomechanical printing. Sometimes they wash up in our research; often individual objects, often unconnected (or so we think) from the questions we are asking. Taking the role of such working photographs, or parts of photomechanical prints, seriously, can enlarge our notion of the object, and maybe even the working object. This presentation seeks to pull together some of the objects that make up the photomechanical object, and discusses the implications of our incomplete archives for methods of working towards, or working with the photographs that are photomechanical object(s).

Professor Kelley Wilder is Director of the Photographic History Research Centre at De Montfort University, Leicester. https://www.dmu.ac.uk/about-dmu/academic-staff/art-design-humanities/kelley-wilder/kelley-wilder.aspx

Francesca Strobino

Reproducing Nature: W H F Talbot's and Alois Auer's printing processes (1852)

This paper explores the parallels between Alois Auer's Nature Printing technique and William Henry Fox Talbot's first photomechanical process, the Photographic Engraving. Patented in the same year, 1852, the two processes were animated by the ambition to reproduce 'natural objects' on the printed page, without the aid of designers or engravers. Both practitioners claimed that nature itself was the only maker of the image, providing the most faithful and realistic reproduction of its features on the printing plate. By using the specific study case of botanical and lace specimens, I discuss how Auer and Talbot tried to give a solution to the issue of reproducing realistic ink images through contact printing of flat, three-dimensional objects.

Francesca Strobino is an AHRC CDP PhD candidate at De Montfort University and National Science and Media Museum, investigating WHF Talbot's experiments in photomechanical printing. She studied Cultural Heritages (BA, University of Urbino) and Art History (MA, University of Florence), before going to the UK for a Master's degree in Photographic History (De Montfort University). Francesca took part in inventory projects at the Scuola Normale Superiore in Pisa, Fotosammlung Ruth und Peter Herzog, and she has held a research fellowship at

University of Florence. From January 2021, she is co-founder and president of Re-vèrso, a non-profit based in Florence working on the material and cultural history of the photographic medium.

Research profile: https://t.co/3Vqc4oucmd?amp=1
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Anthony Hamber

Rudolph Appel, The Ordnance Survey and Photozincography

Rudolph Appel was born in Silesia in 1816. Having served a printing apprenticeship in Berlin, he arrived in London in 1844 to support Carl Wilhelm Siemens who had invested in a form of lithographic printing. Appel began operating as a printer of the newly named "Anastatic" process from the late 1840s. With his business failing, in 1858 Appel joined the Ordnance Survey in Southampton and was instrumental, under the auspices of its head, Colonel Henry James, in the development of the photozincographic process. This paper examines Appel's career through a number of his productions and his transition to photomechanical processes.

Dr Anthony Hamber is an independent photographic historian specialising in the reproduction of works of art, and photographically illustrated publications during the period 1839-1880. His PhD was published in 1996 by Gordon and Breach as *'A Higher Branch of the Art' / Photographing the Fine Arts in England 1839-1880*. In 2018 his study *Photography and the 1851 Great Exhibition* was published by Oak Knoll Press and V&A Publications. Anthony was a member of the advisory board of The William Henry Fox Talbot Catalogue Raisonné project at the Bodleian Library, Oxford. He is currently preparing a digital bibliography of photographically illustrated publications 1839-1880.

Petra Trnkova

Daguerreotype and Electricity at the Outset of Photomechanical Reproduction

This paper brings attention to a little known chapter of early development of photomechanical reproduction in connection with electricity, specifically daguerreotype electrotypes and galvanically etched daguerreotypes. Illustrated by several examples of figures and institutions the paper aims to demonstrate how much interest and effort both processes took in the 1840s and what were the results. Apart from elucidating technical aspects, the paper aims to shed light on some theoretical discussions behind daguerreotype electrotyping and galvanic etching of daguerreotypes, especially reflections on image quality, nature and permanence.

Dr Petra Trnkova is Research Fellow at the Institute of Art History of the Czech Academy of Sciences in Prague. Currently, she is completing a monograph on the arrival and early development of photography on paper in Central Europe, titled Inventors, Pirates, and Epigones: On beginnings of photography in Central Europe. In 2019-2020, she was MSCA fellow at PHRC De Montfort University, Leicester, where she investigated early history of photomechanical printing in the UK, France and the Habsburg monarchy.
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Julie Melby

Edward L. Wilson and the Mechanical Photographers

When the history of the early attempts to harness photography to the printing press comes to be written,' predicted Stephen Horgan of *The Inland Printer*, 'it is to the files of Wilson's … that the historian will have to go for the facts.' This paper will chronicle Edward Wilson and his photography journal *The Philadelphia Photographer* as it documents the growth of photomechanical printing in the late 19th century.

Julie Mellby is the Graphic Arts Curator at Princeton University. A weblog of the Graphic Arts Collection can be found at http://graphicarts.princeton.edu.

Paulo Reibeiro Baptista

The Casa Biel role in Portuguese collotype edition (1875-1918)

When the collotype technique was introduced in Portugal in 1875, the Casa Biel (Biel's studio), a well-established Oporto's photographic studio, started exploring it to fufil a long-term project, the publication of a large photographic survey of Portuguese heritage, art, and landscape. The survey of more than 300 photographs was published in fascicles from 1902 to 1908 and entitled *A Arte e a Natureza em Portugal* (art and nature in Portugal). The fulfilment of this project began in 1870's when the first of its photographs was published in O Occidente's illustrated journal pages as a woodcut print. Other publications appeared in following issues of the magazine. Those publications are the first proof of Casa Biel's project and later they were included in *A Arte e a Natureza em Portugal*'s collotype plate images.

In 1875 the Portuguese aristocrat and amateur photographer Carlos Relvas bought the collotype process and an Austrian technician demonstrated it in Relvas' studio to a group of photographers that included Emílio Biel, the owner of Casa Biel. Apart a few collotype experiences and some limited works by Carlos Relvas himself, it was Biel who explored the real potential of the photomechanical process in Portugal. Since 1880 he published more than 40 pubications with collotype plates. However, *A Arte e a Natureza em Portugal* and *A Arte Religiosa em Portugal* (sacred art in Portugal) stand out from the rest of the production for its size, consistency and scientific relevance.

In this paper I will discuss in detail several aspects of Casa Biel's collotype production in the context of Portuguese photomechanical production from 1875 to 1918.

Paulo Ribeiro Baptista, researcher of the Faculty of Humanities of the University of Lisbon and curator of the National Theatre and Dance Museum (photographic collection). He is an art historian, Portuguese photography historian and photographer.

Richard Martinez

On silver and lead. Photography and Press in the context of Spanish Civil War

On Silver and Lead is an overview of the uses of photography in the press media during the Spanish Civil War. It focuses on the Penninsular press. From this perspective it is possible to perceive the relevant changes that led to the current Western visual culture.

The research is accompanied by the author's visual work. It includes rephotographs and photomontages, a technique spectacularly developed in the newspapers and magazines that are the subject of the research itself. These complex images connect publications and photographs dating from different moments and places. The combination confirms the validity in the present, of the visual language that emerged in the 1930s, boosted by the urgency of such dramatic events, and supported by indispensable photomechanical developments.

Ricard Martínez is a visual artist, historian, documentarist and founder of Arqueologia del Punt de Vista. His visual production is based mainly on rephotography and is linked to the perception of the present through the analysis of documentary records from the past. His methodology involves creation and research in such results where glances, moments and spaces are connected, and projected to the future.

He performs photographic installations in public spaces, as well as works of documentation and digitising of documents for archival and exhibition purposes, for both public institutions and private entities. This wide production range reveals the link between the archive, the observer and the space where images happen.

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Susanne Klein

Fast and Furious: photolithography

Photolithography, how we know it today, has many origins. All were invented with speed of production in mind. In his book '*Vollstaendiges Lehrbuch der Steindruckerei'* (München, 1821) Alois Senefelder describes that his invention of lithography or 'chemical printing' was triggered by the failure of delivering printed material on time and the financial loss caused by it. In 1855 L.A. Poitevin had invented photolithography. He used bichromated gelatin to transfer a photographic image onto stone which sped up plate making for image reproduction. Photolithography, the printing from stone in the original sense of 'lithography', was less successful than photometallography or photozincography, following the same principles for plate making but on the more manageable and lighter zinc plates. Originally developed for the 'photocopying' of maps, it became the forerunner of modern photolithography when in 1885 the first practical halftone screen was designed by Frederick Ives. Whereas the stone in traditional lithography provides the grain or halftone in an image, the metal plate is smooth and a continuous tone photograph has to be broken up into a dot pattern of different densities to represent the tonal range of the original. The next increase in printing speed was the invention of the offset press where the image is transferred from the plate to a blanket and then to the substrate. First used in 1875 for printing on metal, it was adapted to print on paper by Ira Rubel, a paper manufacturer in New Jersey in about 1905. Today's pre-sensitized plates, developed by 3M in 1951, make photolithography one of the fastest and most cost-effective printing processes for archivable images. Because of that, it gives the practitioner the freedom to experiment. The way in which halftone is generated, the dot size and its hape can be used to create a variety of effects in the printed image influencing the tonal range and colour reproduction. Analogue black and white negatives taken through red, green and blue filters are the basis of our printmaking practice. We rely on memory to reconstruct the colour image which allows us to re-live and reflect on our experience. Remembering the colour means also remembering the weather, the temperature, the scents, noise, people as well as the emotional state that inhabits such memories. These layers 'colour the colour,' enriching the process and creating depth within the work. Through the choice of colour and halftone in the printmaking process we hope to instigate a similar state in the audience, generating a playfulness and sense of nostalgia.

Dr Susanne Klein FInstP has been appointed a 5year EPSRC Manufacturing Fellowship at the Centre for Fine Print Research starting January 2018. With her expertise in colloidal chemistry, optics and 3D printing, she is working on the reinvention of old printing technologies, such as Woodburytype and Lippmann photography, which will allow production of high quality prints for advertising, packaging, fashion and, at the same time, include fake-proof security features. By transferring the principals of historic, high quality, continuous tone printing processes to 2.5 D non-impact printing and the formulation of special inks, it will be possible to print any size on any substrate. Combining this new process with Lippmann photography will lead to a full colour, non-pixelated printing process with in-built security features.

Dr Klein has been part of collaborative projects with the University of Bristol, the University of Portsmouth, the Otto-van-Guericke Universitaet, Magdeburg (Germany), Kent State University (USA), Université du Luxembourg, the Hungarian Academy of Sciences, CNRS Université Paris-Sud (France) and the National Academy of Science of the Ukraine.

https://people.uwe.ac.uk/Person/SusanneKlein

Dr Geoff Belknapp

On Photomechanical Matters

What are the consequences of taking photomechanical process seriously? They have distinct histories of development, application and use which run both runs parallel and at times intertwining with the development, application and use of photochemical processes. Yet the history of photography has tended to value the photochemical over the photomechanical. This presentation will explore the consequences of centering

photomechanical process by looking at role of photomechanical invention has played in the development of photography; how they have been collected, stored, and preserved; what kind of material histories photomechanical objects afford; and the consequences of a new epistemology of photography through the photomechanical. The presentation aims to demonstrate that by taking photomechanical processes seriously, we get a more capacious understanding of photography as a visual media, while also resolving longstanding tensions in photographic history such as singular v. multiple; unique. replicable; art v. science.

Dr Geoff Belknapp is Head Curator at the National Science and Media Museum, Bradford.

Paul Elter

One and many: Wet-Collodion and Woodburytype

The invention of photography in the 19th century changed our perception of reality for ever. An image could be recorded within minutes representing 'unfiltered' reality, the requirement to enlist an illustrator or painter to interpret an event or location creating an artistic interpretation, no longer a necessity. Besides the scientific challenge how to capture the light and make the image permanent, the distribution of the image material became a scientific and commercial endeavour at the same time. Inventions how to capture photographic images, make them permanent and distribute them to an exited audience were numerous. Most of them are forgotten, mainly because they were too complicated at the time or they were replaced by more reliable and cheaper methods. Two of them are Wet-Collodion photography and Woodburytype, still practiced by expert groups because of their outstanding image quality. In March 1851 Fredrick Scott Archer published in *The Chemist* Fredrick Scott Archer's formula for capturing and preserving an image permanently onto a surface has become known as Wet-Collodion or wet plate. He gave to the world a process, that still to this day, has the highest resolution and the most beautiful continuous tone of any photographic process. When married with the most perfect of continuous tone printing techniques invented - the Woodburytype- it renders something of a perfect union – never since equalled. In 1864 Walter Woodbury patented a method to reproduce photographic images from intaglio moulds (British Patent no 2338), later known as Woodburytype. The print, originally pulled from a lead plate, presents no halftone dots, and the greyscale is a function of a pigmented gelatine relief transferred from the plate onto highly calendered paper. Time has not stood still for these technologies. They have been translated into modern materials and processes without losing the features which make them recognizable. We will present our approach to the 21st century incarnation of the combination of Wet Collodion with Woodburytype, and discuss the artistic freedom which comes with the use of modern materials, silicon instead of lead plates for example, and processing methods, resulting in different image variations, possibilities Archer and Woodbury could not have dreamed of.

Paul Elter is a multidisciplinary artist working in photography, painting, sculpture, drawing, and collage, working with analogue tools and techniques, handwork and process being fundamental. Born in Kitchener, Ontario to European parents, he studied animation and worked as an educator teaching art and photography. Today he lives in the village of Chelsea,Quebec, with his family in a historic cottage they have lovingly restored. Working as a photographer at the National Gallery of Canada in Ottawa, he coordinated the transition from analogue to digital and the development of its extensive digital archive.. See: http://www.elter.ca/

Roger Farnham

The 1980s 'Glasgow photogravure' process

Karel Klíč's photogravure process is generally considered the de facto photogravure process. However, there were a number of other processes which are now also described as being photogravure. Prior to Klíč's 1879 process, William Henry Fox Talbot had patented his photographic and photoglyptic engraving processes, the latter with which Klíč's process has much in common.

In the 1960s & 70s fine art printmakers' photo-etchings generally used transfers of very graphic photographic images, which were often combined with an aquatint process, as had Klíč, and Talbot before him. The copper plate could be etched to different depths to create areas of different tones. These twentieth century images were generally autographic, not photo-reproduction as had been the aim of the 1800s processes.

This paper will argue that the process which evolved in Glasgow in the early 1980s was a photogravure process; it also appears to have much in common with an earlier process predating both Klíč and the earlier Adolphe Goupil's Goupilgravure. (Goupil's process electroplated copper on to a grained gelatine relief image.)

Roger Farnham. My photography has been self-taught, however, I am indebted to workshops by Thomas Joshua Cooper, John Blakemore, Fay Godwin, Paul Hill, Pradip Malde, Dewis Lewis and others. These were mostly run by revered organizations such as Portfolio Gallery, (Paul Hill's) The Photographers' Place and the late Peter Goldfield's Duckspool; these workshops generally explored the more philosophical aspects of picture making. In the late 1980s I became involved with a group of photographers who became known as the Glasgow Photography Group which then established Street Level Gallery, now Street Level Photoworks. He joined the Glasgow Print Studio in the 1970s. See: http://www.rogerfarnham.com/rogerfarnham/Photography.html

Ross Mazzupappa

Faux to gravure: affordable and accessible photo-etching

Faux-to-gravure (electrostatic relief etching) is an exciting new process that enables even the smallest of printshops to create photo-mechanical intaglio plates with no special equipment, chemicals, films or darkroom spaces. As the name jokingly parallels the historic process of photogravure, these etchings wield quality photomechanical results, but in a fraction of the time, equipment, and toxicity. Faux-to-gravures are cheaper to produce than commercially available photopolymer films, and photopolymer plates. The later have largely replaced traditional photogravure in the modern printshop but come with a high cost and special equipment needs. With a basic intaglio studio, the only other equipment required is a quality laser printer, with a manual feed tray, and household parchment paper or silicone release paper.

For the presentation, I plan to take the audience through the entire faux-to-gravure process, and printing procedure.

Ross Mazzupappa is the Associate Teaching Professor of Photography and Printmaking Bowling Green State at the University in Bowling Green Ohio, United States. He is also the head of the photography area. Ross earned his MA, and MFA from the University of Iowa. Ross is an interdisciplinary artist who incorporates a wide range of printmaking, photographic processes, and emerging technologies. His researched consists of themes involving labor, industry, place, memory, and history. Ross is also deeply invested in research and has developed several techniques and artist tools. Ross' artwork shows nationally, internationally, and is in private and public collections. www.Rossmazzupappa.com

Philip Bovey

The Pictorial Syntax of photogravure in the Zodiaque project

His paper will examine how the specific characteristics of rotogravure give effect to the ideas behind the "Zodiaque project". This collection of more than two hundred books and other materials, published over a period of almost fifty years in the second half of the last century, is by any measure the largest ever collection of printed photography of mainly Romanesque architecture. The use of gravure was central to the presentation throughout. It was not a commercial venture and one can therefore trace how and why gravure was involved at every stage in the process.

After reading History at Peterhouse, Cambridge, where he was a Scholar, **Philip Bovey** reached a relatively high level in the UK Civil Service at an early age. However (maybe because he found it difficult to toe the official line) he progressed no further, instead leading projects for complex legislation. Since his retirement he has used these skills in research on how the portrayal of (mainly Romanesque) architecture, particularly in printed photographic books, affects our perception of the subject-matter, As part of that, he gained an ARPS for a submission of large format (10”x8”) architectural photographs.

Elizabete Kozlovska

Photomechanical printing as an undervalued process: its care and distinction

Photomechanical processes occupy a grey zone between photography and print. Whilst the image itself comes from a photographic negative exposed in to light, the end result is not photosensitive and resembles a graphic print. What then, is the benefit of photomechanical processes, and should these techniques be preserved and researched for further application in art and commerce? To analyse this question, several fields must be addressed, such as curation, art history, conservation and material studies, ethics of conservation, curation and production, as well as commercial and scientific development.

It is this authors opinion, that the relevance of various photomechanical printing processes has been undervalued from an artistic, commercial and material perspective. Being the lesser-known cousin of traditional print and photography, it is not commonly taught as an art form on its own, always attached to one of these disciplines. Commercial printing has sought to improve upon photomechanical reproduction in order to combine all of the assets of mass production with quality results. From this perspective, photomechanical processes used in mass production are historically inclusive practices, that have allowed people access to visual representations with realistic accuracy and replicability.

To conclude, the lesser-known cousin of photography and traditional print clearly warrant an in-depth investigation of value to identify historical and contemporary utility.

Elizabete Kozlovska is a Research Associate in the Centre for Fine Print Research at the University of the West of England. See: https://people.uwe.ac.uk/Person/ElizabeteKozlovska

Xiaoqiao Li

(Re)forming the imprint: how the digital print-matrix imprint can be augmented with computational/robotically-assisted etching and drawing.

Key words: Printmaking, Digital print-matrix, Imprint, Memory, Augmented Creativity

This paper examines how the printmaking process can help us understand how information is captured, retained, lost and transmitted in digital image processes. It explores the conceptual and technological transformation of the digital print-matrix imprint in the memory, trace, loss, decay and deconstruction of the image.

This research compares the imprint of the traditional printmaking matrix to the matrix of the digital print relative to their transformation and transmission of memory. It is concerned with the relationship between physical hand printmaking and digital printmaking within the digital print-matrix and uses ‘memory’ to explore the technology used for the storage, retention and retrieval of information. The term 'digital matrix' is borrowed from Thompson (2011, p.3) to refer to "a digitally stored repository of content, combined by the hand of the artist and instanced with original purpose rather than mechanism". The matrix has a formative function, making the artistic input come visible with a sense of procedure. Using printmaking as a reference point, this paper proposes that the process of image transmission not only imprints memory but builds new meaning around the memory through the transformative process of the digital print-matrix. The term 'digital print-matrix imprint' describes the physical and digital imprint and the trace of image the imprint makes.

The paper first defines key terminology, such as the digital print-matrix, digital print-matrix imprint, digital image and technicity memory. It then examines practice-based research to analyse and reflect on how traditional modes of printmaking can be augmented with computational/robotically-assisted etching and drawing. Finally, it looks at how the information function of the image is deconstructed or retained with the transformation process of the digital print-matrix.

Xiaoqiao Li is an artist, researcher and member of the Council of Macau International Printmaking Art Research Center. Xiaoqiao has received international professional awards, including the Clifford Chance Purchase Prize in the UK and the Chinese Young Artists Award at the Beijing International Art Biennale. In 2019, he was awarded the Hong Kong PhD Fellowship Scheme (HKPFS) by the Research Grants Council (RGC) of Hong Kong to pursue PhD in visual arts studies at Academy of Visual Arts, Hong Kong Baptist University.

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Constanza Isaza Martínez

A Question of Quality? A Comparison of Copperplate and Polymer Photogravure

The copperplate photogravure process, first developed by William Henry Fox Talbot in the 1850s and refined by Karel Klíč in the 1870s, is widely regarded as one of the finest and most beautiful of all photographic printing processes. Despite its complexity, the process is still in use, with only minor variations, today.

In the late 1980s, a modern variant of the photogravure process – polymer photogravure – was developed, making use of newly available inkjet printing technology and industrially produced polymer plates designed for the flexographic industry. Initially, the quality and resolution of polymer plates could not match the subtlety of copper plates. However, technical developments in both platemaking and inkjet printing mean that the quality of a well-made polymer gravure print is now comparable to that of a copperplate gravure.

While copperplate gravure remains one of the finest photomechanical processes, this paper seeks to dispel the notion that polymer plates produce prints of inferior quality to copper plates, and explores firstly the variables in both processes that directly affect print quality, and secondly the characteristics of each process – unrelated to print quality – that might lead a practitioner to choose polymer over copper or vice versa.

Constanza Isaza Martínez is a photographer, art historian and printmaker specialising in the contemporary use of early photographic processes. In 2007, she was awarded a First Class BA in Photographic Arts from the University of Westminster, and in 2012 she received a Distinction for her MA in History of Art from the Courtauld Institute of Art. Constanza is co-founder and director of Lux Darkroom, a space in London dedicated to researching, promoting, and teaching early photographic processes including photogravure, platinum/palladium printing, salt printing, and cyanotype. Constanza regularly prints for a wide range of contemporary photographers and artists, as well as continuing to make and exhibit her own work. https://www.luxdarkroom.co.uk/

Michael Pritchard

Co-convenor with Susanne Klein (see above)

Dr Michael Pritchard has been actively involved in photography for more than thirty years, as a photographer, photographic historian and educator. He was a photography specialist at Christie's auction house holding landmark auctions and setting record prices. He completed a PhD in history of photography in 2010 which examined nineteenth century British photography and has taught on a MA history of photography programme. He organised and catalogued the Kodak Historical Collection at the British Library. Michael joined the Royal Photographic Society directs the RPS's public programmes. He lectures internationally, regular broadcasts about photography and has written extensively on the history of photography. His most recent book is *A history of photography in 50 Cameras* (Bloomsbury). He edits the British photographic history blog.