





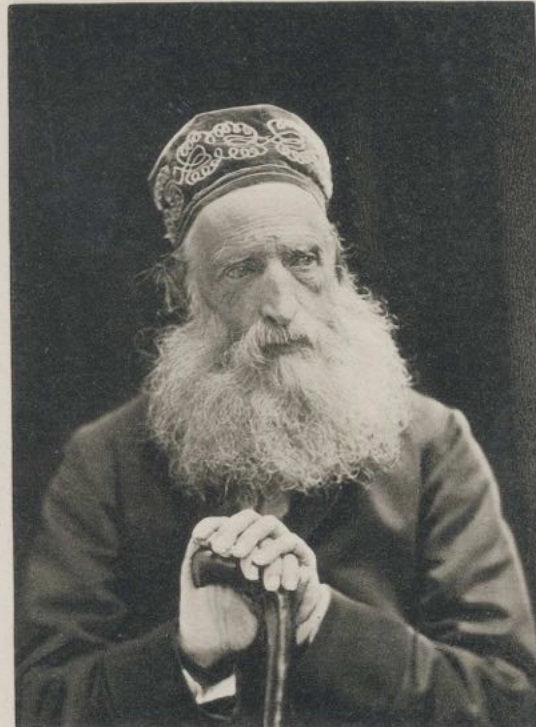


## CHECKLIST OF PHOTOMECHANICAL PROCESSES AND PRINTING 1825 - 1910





Before photography it was necessary to produce art for publication by hand as this wood engraver is doing.



Printed in Heliogravure by Klic, Vienna.

*Presented with the Year-Book  
of Photography 1882.  
Mungo Ponton 1801-1880.*

Pressure by M. Kargl, Vienna.

See pages 74 & 112

## CHECKLIST OF PHOTOMECHANICAL PROCESSES AND PRINTING 1825 - 1910



# THE DAILY GRAPHIC

AN ILLUSTRATED EVENING NEWSPAPER

39 & 41 PARK PLACE

VOL. XXII.

All the News,  
Four Editions Daily.

NEW YORK, THURSDAY, MARCH 4, 1880—TWELVE PAGES.

\$10 Per Year in Advance.  
Single Copies, Five Cents.

NO. 2164.



THE GRAPHIC'S SEVENTH ANNIVERSARY.

IF IN THESE FLEETING YEARS  
WE HAVE THESE WONDERS DONE,

WHAT GREATER MARVELS SHALL BE BROUGHT  
IN SEVEN YEARS TO COME!

## INTRODUCTION

When William Henry Fox Talbot published *The Pencil of Nature* he wanted to show the possibilities of the new invention to illustrate the world at large. Unfortunately, the positive images he produced had a serious failing. They faded because of a variety of issues: insufficient washing, depleted fixing agents, harmful acids in paper and glue, atmospheric pollutants. Talbot wanted to find a permanent solution and so he turned to the stability of carbon based ink. The goal was to find a method that would allow photographs to be printed with type; those, along with Talbot, who sought the answer, wanted the beauty of the original photographic image to remain unaltered. The workable typographic methods produced recognizable images but not aesthetically pleasing ones. Ultimately a method was found that allowed the image to function with type, and those that wanted pictures for illustrative purposes finally used it. William Augustus Leggo from Montreal, Canada created a mode, first with typographic printing but ultimately with photolithography. He, with his partner, produced the first photomechanically illustrated weekly, the *Canadian Illustrated News*, and then, in New York, *The Daily Graphic*. Both men returned to Canada but what they had started continued; the seventh anniversary front page of that paper is what you see opposite. This is the point at which photomechanical reproduction achieved what Talbot had hoped for. The pages that follow show the myriad possibilities for printing photographs and illustrations derived from them with ink.

David A. Hanson



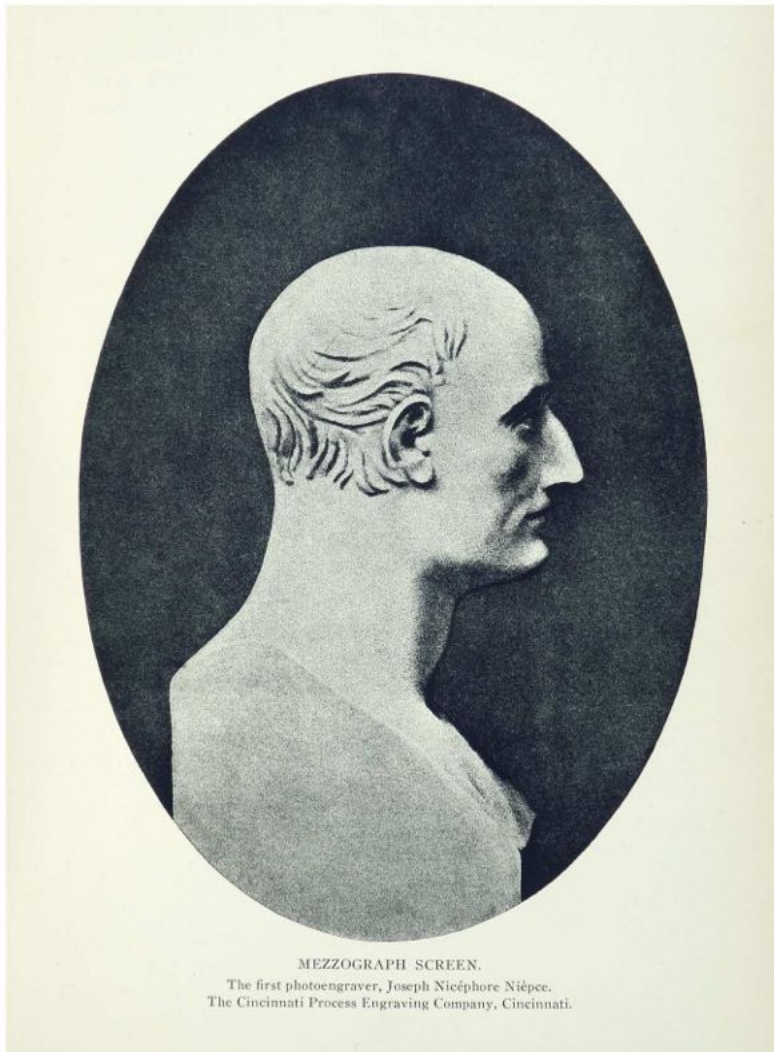


## On Photomechanical Printing

"The number of substitute processes is legion. There is no end of inventors. Many have invented the same thing, but have called it by different names; others have invented different processes, and given them one and the same name. Some have endowed their inventions with the most absurd, high-sounding titles. A complete catalogue and description of these processes would make up a good-sized book."

Hans W. Singer, and William Strang, *Etching, Engraving and other methods of printing pictures*, 1897.

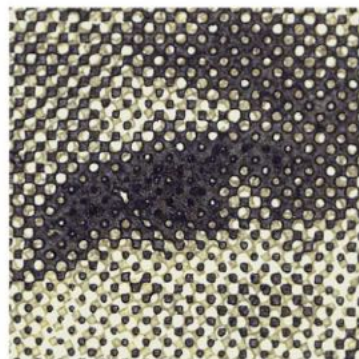




Both, *Horgan's half-tone and photomechanical processes*, 1913



15X



15X



The two portraits of Niépce and Daguerre are examples of methods attempted at the turn of the twentieth century looking for relief halftone processes that would produce a less rigid screen pattern. The Mezzograph method was invented by James Wheeler in 1897 and the Duograph was a method like the Chemigraph of 1893. In terms of photomechanical history Niépce deserves to be recognized as the father of it all.

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This alphabetical list is organized so that the Persons and Processes listed in bold are illustrated with examples and the Persons and Processes not in bold are in a separate alphabetical section following the first. Some of the Persons and Processes in the first section cover more than one page. In those instances when they are not opposite each other there will be an asterisk \* to indicate that the material follows to the next page.

ALBERT, AUGUST  
**ALBERT, DR. EUGEN**  
**ALBERT, JOSEPH**  
**AMAND-DURAND, CHARLES**  
**ANGERER, CARL & GÖSCHL, ALEXANDER**  
**ASSER, EDUARD ISAAK**  
**AUBEL, CARL**  
**AUER, ALOIS**  
**AUSTIN, A.C. and ANDERSON, MACFARLANE**  
AVET, H.  
**BALDUS, ÉDOUARD**  
**BAUDRAN, AUGUSTE ALEXANDRE**  
BEATTIE, FRANCIS & T. ALEXANDER  
BELL, GEORGE CHARLES  
**BELLOC, AUGUSTE with JACOTT, JEAN-JULES**  
**BERCHTOLD, ALFRED JEAN**  
**BERNARD, J.**  
**BERRES, CHRISTIAN JOSEPH EDLER VON**  
**BILORDEAUX, ADOLPHE**  
**BLANQUART-EVRARD, LOUIS DÉSIRÉ**  
**BOND, HENRY CHARLES**  
**BRADBURY, HENRY**  
**BRADFORD, LODOWICK H. with CUTTING,**  
**JAMES AMBROSE**  
BRANDWEINER, ADOLPH  
**BROWN, BARNES & BELL**  
BROWN & CO., LOUIS  
**BULLOCK BROS., EDWARD & JAMES**  
**BURCHARD BROTHERS**  
BURNETT, C.J.  
**Carbon printing** – Alphonse Poitevin, John Pouncy,  
Garnier & Salmon  
**CARLEMAN, CARL GUSTAF WILHELM**  
**CHEMIGRAPH CO., NATIONAL**  
**COLLAS, ACHILLE**  
COLOMBAT and COUVEZ  
**COMTE**  
COURTENAY, ROBERT HENELADE  
**CHRÉTIEN, GILLES-LOUIS**  
DAGUERRE, LOUIS JACQUES MANDÉ  
Daguerreotypes, Printing

**DALLAS, DUNCAN CAMPBELL**  
**DAWSON, ALFRED**  
**DAY, BENJAMIN HENRY, JR.**  
**DAY & SON**  
DIXON, JOSEPH  
**DONNÉ, ALFRED**  
DRAPER, JOHN WILLIAM  
**DRIVET, FRANÇOIS**  
**DUCOS du HURON, LOUIS ARTHUR**  
DUFRESNE, HENRY  
**DUJARDIN FRÈRES**  
DULOS  
**DUMONT**  
**EDWARDS, ERNEST**  
**EGLOFFSTEIN, FREDERICK WILHELM, VON**  
**EVELY, LÉON**  
FALK  
FAULKNER, ROBERT  
**FIZEAU, LOUIS ARMAND HIPPOLYTE**  
FONTAINE  
**FRANKLIN, BENJAMIN**  
**GARNIER, HENRI**  
**GARNIER, HENRI & SALMON, ALPHONSE**  
**GEBBIE, GEORGE and HUSSON, LOUIS**  
**GEMOSER, MAX**  
**GIESSENDORF, KARL VON**  
**GILBO, W.H.**  
**GILLOT, FIRMIN**  
GOODWIN, REV. HANNIBAL  
**GOVERNMENT PRINTING OFFICE (Berlin)**  
**GRIGGS, WILLIAM**  
GROVE, SIR W.R.  
Halftones after Leggo and before Petit, Ives and  
Meisenbach  
HALLEUR, C.G. HERMAN  
HOESCH, F.C.  
**HORGAN, STEPHEN HENRY**  
**HUSNIK, JAKOB**  
**IVES, FREDERIC EUGENE**  
**JACOBI, MORITZ HERMAN VON**  
**JAFFÉ, MORITZ & MAX**  
**JAMES, SIR HENRY**  
JOBARD  
**JOUBERT, FERDINAND**  
KELLNER  
**KLÍČ, KAREL**  
**KOBELL, DR. FRANZ VON**  
**KURTZ, WILLIAM**  
LABORDE, L'ABBÉ

**LAFOLLYE, C. DE**  
**LEGGO, WILLIAM AUGUSTUS**  
**LEMERCIER, ROSE-JOSEPH, LEREBOURS,**  
**NICHOLAS-MARIE-PAYMAL, BARRESWIL, LOUIS-**  
**CHARLES, DAVANNE, ALPHONSE**  
**LEVY, LOUIS EDWARD and MAX**  
LEWIS  
LUYNES, HONORÉ D'ALBERT, DUC DE  
MACORQUODALE, T.  
MACPHERSON, ROBERT  
**MAGNE, JEAN JACQUES**  
**MANTE, LOUIS-AMÉDÉE**  
**MARIE, J.**  
**MARIOT, EMIL**  
**MARQUIER**  
**MEISENBACH, GEORG**  
**MIETHE, ADOLF**  
**MORVAN, ARTHUR GAY**  
**MOSS, JOHN CALVIN**  
MUMLER, WILLIAM  
**NÈGRE, CHARLES**  
**NIÉPCE, JOSEPH NICÉPHORE**  
**NIÉPCE DE SAINT VICTOR, CLAUDE FELIX ABEL**  
**OBERNETTER, JOHANN BAPTIST**  
**OESTERREICHER, IGNATZ**  
**ORELL FÜSSLI & CIE**  
**OSBORNE, JOHN WALTER**  
**PALMER, EDWARD**  
**PETIT, CHARLES-GUILLAUM**  
Photomechanical periodical publications  
Photomechanical reproduction of art  
**Photoxylography**  
**PILLAT, JULES MARIE SIMON**  
**PINEL-PESCHARDIÈRE, FRANÇOIS**  
PIZZIGHELLI, G.  
**PLACET, EMILE**  
PLUMBE, JOHN, JR.  
**POITEVIN, ALPHONSE**  
**PONTON, MONGO**  
**POUNCY, JOHN**  
**PRETSCH, PAUL**  
**PUMPHREY, ALFRED**  
RAMGE and NELSON



**REGNAULT, HENRI VICTOR**  
**REGNAULT, THOMAS CASININ**  
**REICH, THEODORE**  
 RENAUD, SAILLARD  
**RIFFAUT, MME. PAULINE**  
**ROCHE, THOMAS**  
 ROUSSEAU & MUSSON  
**ROUSSELON** (Goupil)  
 SAALBURG, CHARLES W.  
**SAWYER, J.R.** (Autotype Co.)  
 SENEFELDER, ALOIS  
**SCAMONI, GEORG**  
 SCHOLY, JOSEPH  
**SPENCER, THOMAS**  
**SPRAGUE & CO.**  
**SWAN, JOEPH WILSON**  
**TALBOT, WILLIAM HENRY FOX**  
**TESSIE DU MOTAY, CHARLES-MARIE** with  
**MARÉCHAL, CHARLES-RAPHAËL**  
**THÉVENIN**  
**THIEL AINÉ & CO.**  
**TOOVEY, WILLIAM**  
**VIDAL, LEON**  
 VOGEL, HERMANN  
**WATERHOUSE, COL. JAMES**  
 WHEELER, JAMES  
 WINSTANLEY, DAVID JR.  
 WOLFE, M.  
**WOODBURY, WALTER BENTLEY**  
**ZANDER, C.G.**  
**ZURCHER**

### The Portraits:

**1825 - Niépce** produces the bitumen of Judea sensitized plate for the man leading a horse. pg. x

**1839 - Ponton** – discovers the light sensitivity of potassium dichromate when combined with organic material. pg. iv

**1852 - Lemerrier** produces photolithographs from photographs with graining of the stone using light sensitive bitumen based on Niépce's discoveries. pg. 82

**Talbot** discovers gelatin mixed with potassium dichromate can produce a photoresist. This property of dichromated gelatin eventually leads to the discovery of its relative ability to absorb water and reject ink based on its exposure to light. Talbot also discusses the use of a screen, the "photographic veil." pg. 178

**1853 - Niépce de St. Victor** produces heliogravures of photographs with an aquatint grain and light sensitive bitumen. pg. 119

**1854 - Pretsch** invents photogalvanography. pg. 114

**1855 - Poitevin** uses dichromated colloids to vastly improve photolithography. pg. 30

HONORÉ D'ALBERT, DUC DE LUYNES



*Notice sur M. le duc de Luynes, 1868*

The Duc de Luynes created a competition in 1856 to find a solution to the problem of photographic print fading. The first part of the prize was to find a method of creating more or less permanent photographic prints. The second part of the prize was to find a way of printing photographic images using ink based methods.

## **ILLUSTRATED LIST OF PROCESSES AND PRINTERS**



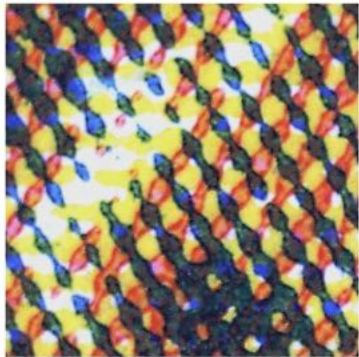
**ALBERT, DR. EUGEN** (1856-1929), (worked from 1893 into the 1900's) Son of Joseph, Germany — three-color halftone process *Albertochromie*. In 1891 he patented a method for rotating line screens at 30 degree angles for three-color printing. Eder incorrectly dates the patent to 1901 in the 3rd edition, 1905, of his history. Albert published an example in 1893, the same year as Kurtz. Eder, in the *Jahrbuch*, for 1893, where this print is published, makes reference to the Kurtz (pg. 524) so that the Kurtz (pg. 77) was somewhat earlier. The illustration published from the 1891 patent is a typographic halftone in three colors.

Dr. Albert had previously developed a photographic emulsion that Eder (pg. 379) stated: “This invention of Albert’s ‘isochromatic [single color] collodion emulsion’ proved to be of permanent value in certain classes of reproduction photography (paintings, three-color process, halftone negatives).”

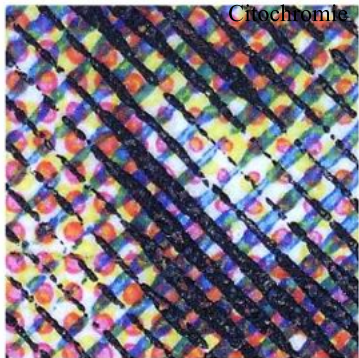
By 1907 he had perfected a four color process he referred to as *Citochromie* which could be printed without drying the ink between each color. The *Graphic Arts and Crafts Yearbook* (1908), gives a full explanation. **Relief**



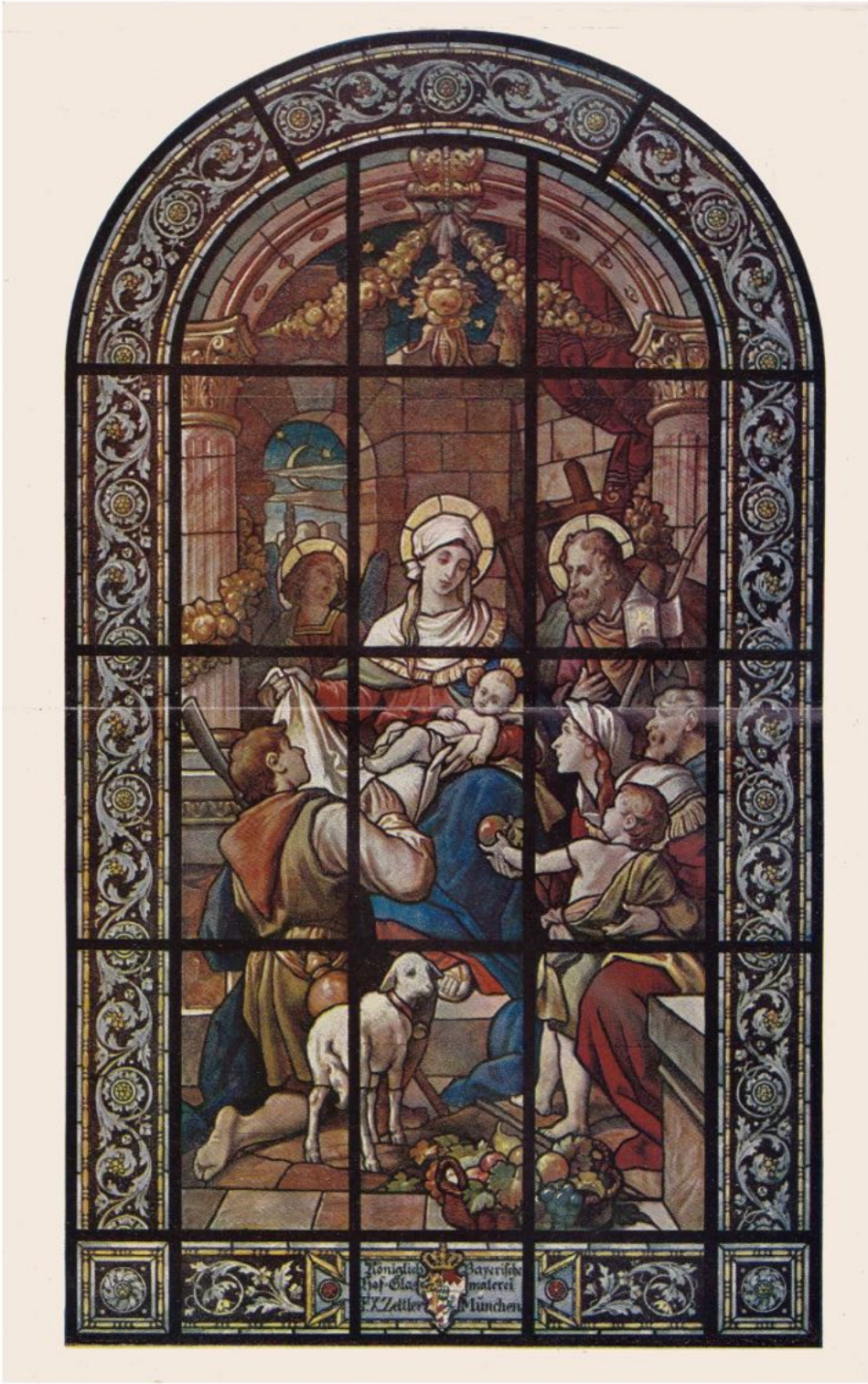
Graphic Arts Yearbook, 1908



30X Albertochromie



30X Citichromie



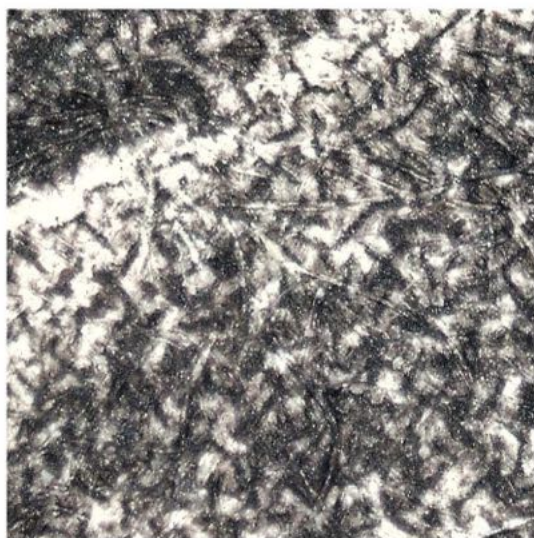
Eder, Jahrbuch für Photographie, 1893

Steven F. Joseph

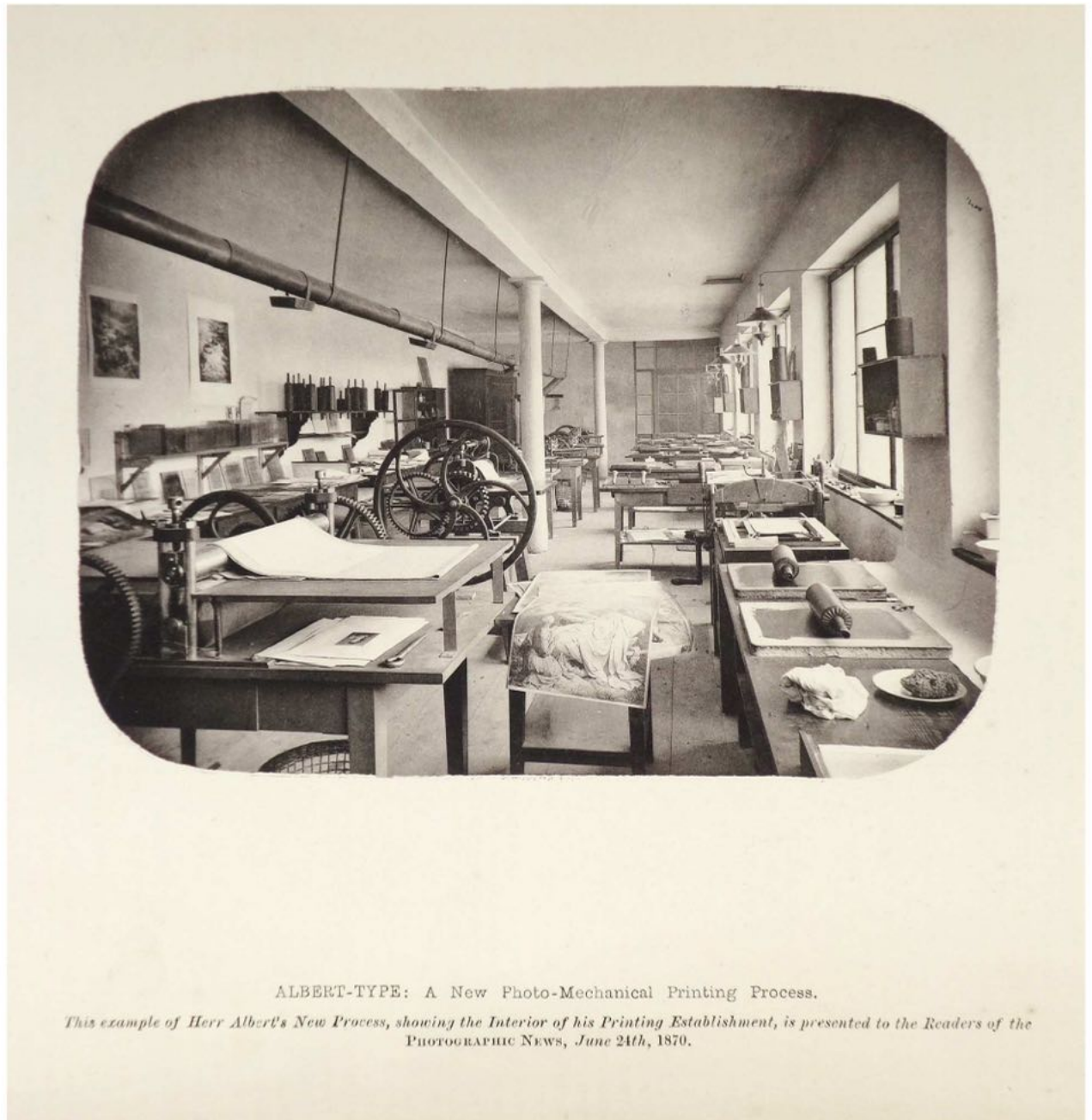


**ALBERT, JOSEPH** (1825-1886), Germany (Bavaria) — (worked from 1868 on but he may have altered the process by the 1870's.) "*Albertype*", "*Albert-type*", "*Albertotypie*", Perfected the collotype process using a ground glass support and two layers of bichromated gelatin, one exposed through the back of the glass for adhesion and the other bichromated gelatin layer for exposure and printing. Albert did this by exposing the bichromated gelatin layer on the ground glass support before coating the sensitized gelatin over it which made the printing layer adhere so that a longer print run was possible, 1868. As published in the *Photographic News*: "He commenced in 1868; and after numerous experiments for fixing to the plate on which it is spread the film of gelatine from which the pictures are printed, the happy thought occurred to him to use the sensitive qualities of the chromic gelatine itself for a cement. He consequently used a plate of glass, spread upon it a coating of gelatine, then—while the front surface was protected by an underlayer—exposed the back or glass surface to light, which rendered it insoluble, and hence adhesive to the plate in presence of water. He hardened the sensitive surface by chrome alum, chlorine water, and other coagulating solutions; and to make it as tough and hard as possible, he spread several films one upon another, hardening each in its turn, till he had made a sensitive plate so hard and durable that thousands of impressions could be printed from one plate. For printing the impression transferred under a negative, he uses a lithographic press [in the illustration his workshop is outfitted with etching presses as well], and the ink commonly made to accompany it. Any kind of paper, and any coloured ink, may be used; titles, descriptions, dates, &c, can be printed at the same impression; and one negative can be stereotyped ad infinitum. The Photo-Plate Printing Company, of New York, and the Albert-type Printing Company, of Boston, are sole proprietors of this patent" (in the US), (*The Photographic News* 1875, vol.19, July 16. pgs. 340-41.). As early as 1871 he used the term "Lichtdruck" for line work leading a person to wonder if he had come to an accommodation with Ohm & Grossmann (Gemoser). Also the two images on the right hand page are referred to as "Lichtdruck" choosing what became a generic term for collotype.

It should be noted that Désiré Van Monckhoven published a method of collotype printing in 1870, opening up the ability for anyone to practice this method of printing without obtaining a license. (Joseph pg. 36) **Planographic**



90X

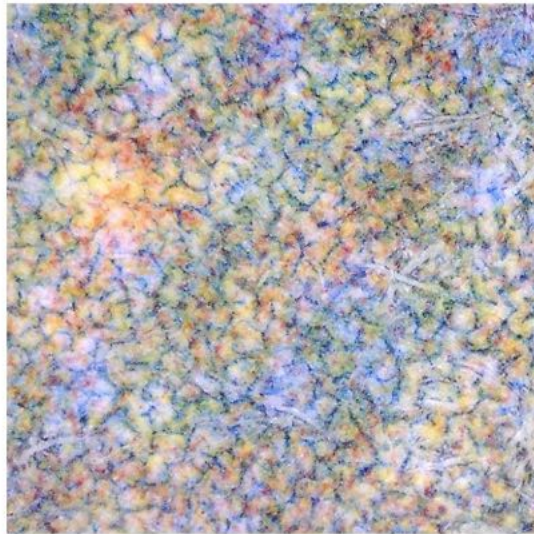


ALBERT-TYPE: A New Photo-Mechanical Printing Process.

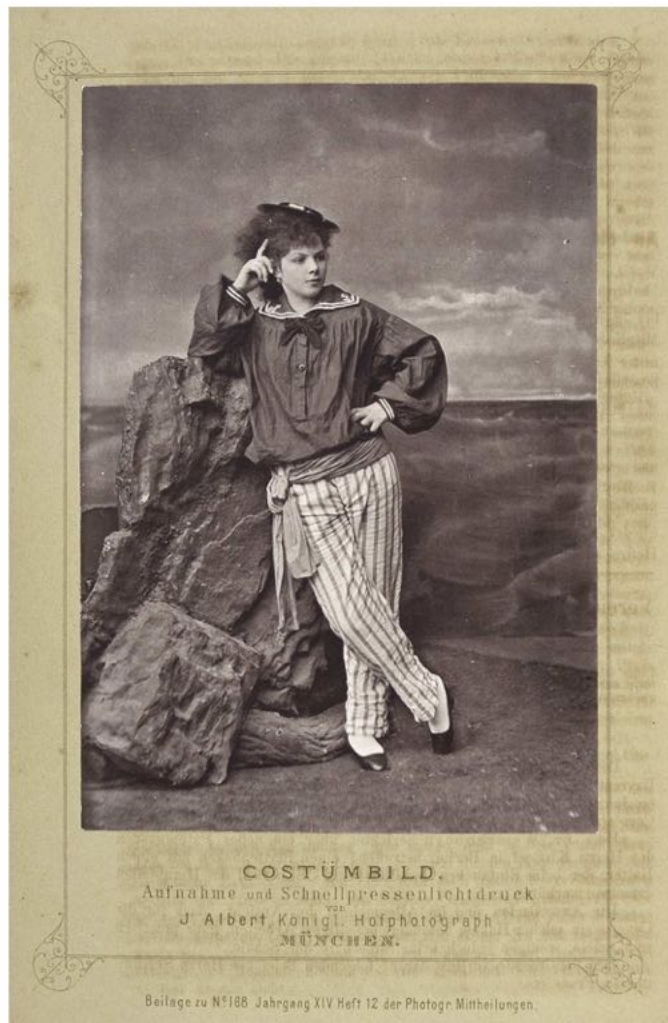
*This example of Herr Albert's New Process, showing the Interior of his Printing Establishment, is presented to the Readers of the PHOTOGRAPHIC NEWS, June 24th, 1870.*

*The Photographic News, 1870*





90X



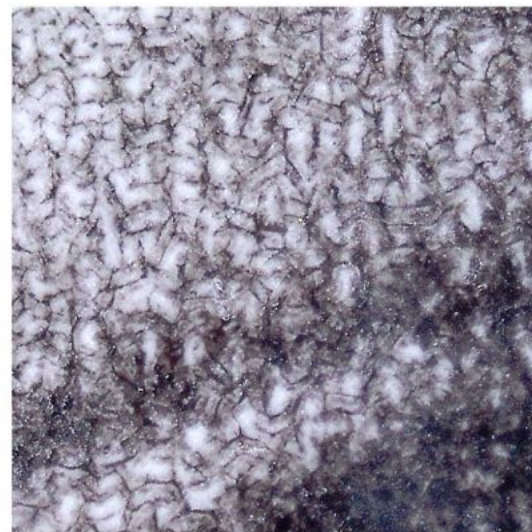
Photographische Mittheilungen, 1878

Schnellpresse



Photographische Mittheilungen, 1877

Three color collotype



90X

In 1873 Albert adapted the power press for lithography to be used in Albertype (Schnellpresse).

Albert also experimented with three-color photography and three-color collotype starting as early as 1873. It was only in 1873 that Hermann Vogel found a way to add a dye to the photographic emulsion to make it sensitive to the green part of the spectrum. Before that emulsions were only sensitive to the blue. It wasn't until 1884 that emulsions were made sensitive to the red part of the spectrum. Albert published this color example in 1877.



**AMAND-DURAND, CHARLES** (1831-1905) (worked from 1865 on) Began using a *Heliographic process*, based on Niépce's (asphalt) method, that he did not divulge, in 1865. All of his work was the careful reproduction of classical etchings and engravings. Georges Duplessis, the Louvre's curator of prints, had Amand-Durand take the museum's collection of Rembrandt material, prints and plates, and very carefully restore them by creating new heliographic plates from them. These were produced from 1865 on. All of the prints made by Amand-Durand starting in 1865, by request from the Louvre, have on their back a red stamp. **Intaglio**



To an untrained eye, Amand-Durand's reproductions are so similar to the originals that sometimes only the stamp printed on the middle of the back makes it possible to distinguish them.



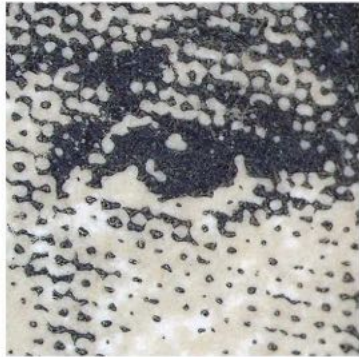
*La Art Pour Tous*, vol. 5, 1865



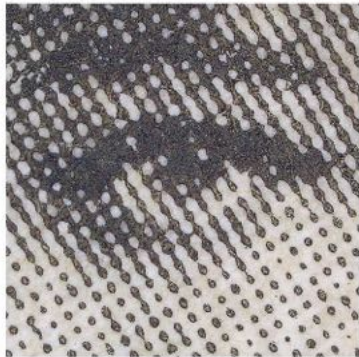
*Catalogue de L'Exposition de Gravures Anciennes et Modernes*, 1881



**ANGERER, CARL** (1838-1915) & **GÖSCHL, ALEXANDER** (1848-1900), Austria — *Halftone* method developed in 1879, patented in 1884. The system was a ruled glass single line screen turned 90 degrees after one half of the exposure in front of a sensitive plate to create a crossline negative. Angerer was forced to give up his patent in Germany because Meisenbach's patent preceded his. In an 1883 sample book *Probedrucke von Chemigraphien und Heliotypien* he referred to the halftones as "*Heliotypie*." In the sample book the four halftones are each done with a different screen pattern indicating that the method was not fixed at that time. The crossed line screens on the four illustrations were 125 lines per inch to 133 lines per inch. **Relief**



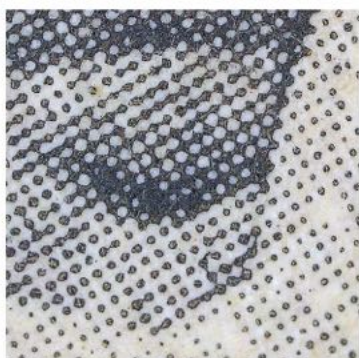
15X girl



15X woman



15X horses



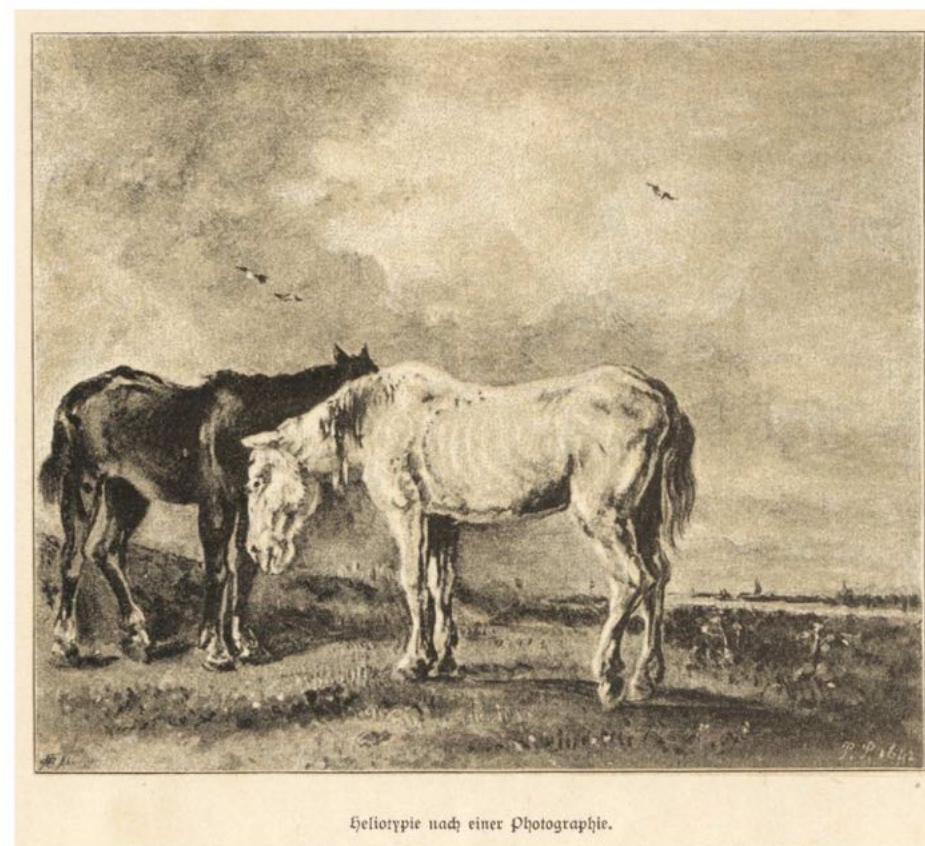
15X statue



Heliotypie nach einer Photographie.



Heliotypie nach einer Photographie.



Heliotypie nach einer Photographie.



Heliotypie nach einer Photographie.



**ASSER, EDUARD ISAAK** (1809-1894), (worked from about 1860 – 63 by Simonau and Toovey) Belgium — *Photolithographic transfer paper*, 1858. Asser made photographic prints with greasy ink on paper coated with starch paste and sensitized with bichromate for transfer onto stone. The de Luynes committee report states “His method utilizes the action of bichromate on cellulose and starch; these substances, under the influence of chromic acid, become impermeable to water. Paper impregnated with starch and bichromate, after being exposed, is washed, dried at a high temperature, then exposed again to the action of moisture; this penetrates wherever the bichromate has not acted, and arrives at the surface; if an ink roller is passed over the paper, the ink sticks only to the dry parts, and leaves those which are moist. If transfer-ink has been used, it is sufficient to place this paper on lithographic stone to fix there a design of which a large number of copies may be taken.” (*The Journal of the Photographic Society of London*, vol. 12, June 15, 1867). Waterhouse (*Loan Exhibition*, 1905, pg. XV) simplifies this: “He coated unsized paper with starch, and then floated it on a strong solution of bichromate of potash. When dry it was exposed to light under a well-intensified negative. The print was next heated with a flat iron, then moistened and inked in with transfer ink by means of a roller, and thus an impression was obtained which could be transferred to stone or zinc.” The Belgian firm of Simonau and Toovey produced virtually all of the photolithographs by Asser’s process beginning in 1861. **Planographic**



*La Bienvenue de Jean de Hembyze*, 1861

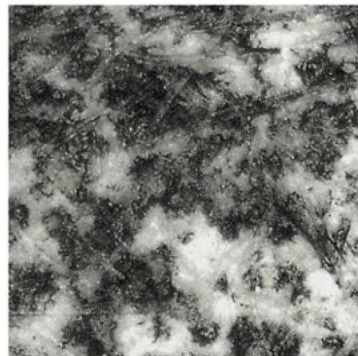


Asser embossed stamp

rotated



30X



*Spa et ses Environs*, ca. 1863



**AUBEL, CARL** (1837-1882), Germany — “*Aubeldruck*,” a collotype (?) variant directly from a collodion glass plate, circa 1875. Also there are descriptions that say that the procedure is for typographic use. The *Photographic News* explains the process thus: “The manner in which M. Aubel converts a negative into a printing block is still maintained a close secret; but a German journal, the *Arbeitsgeber*, professes to have found out the secret. A negative of any design, sketch, or writing in black and white, is secured; and the silver deposited upon the glass plate to form the image is then strengthened by further deposition of silver by means of the electrotype process. A couple of hours suffices to make the deposit of metal thick enough, and then the image upon the glass is submitted to the action of hydro-fluoric acid vapour. This vapour attacks the glass in all parts where it is not covered with silver, and in a little while there is produced upon the glass the image in relief.” (*The Photographic News*, Feb. 16, 1877 pgs. 79-80, vol. XXI no. 963.) Eder (pg. 613) explains a planographic process: “So-called Aubel prints were produced by coating a collodian negative with chromated gelatin, drying it and exposing it through the glass, then the print was washed like a collotype plate, dried, dampened, and inked and either printed directly or transferred to paper and printed from stone.” **Relief / Planographic**

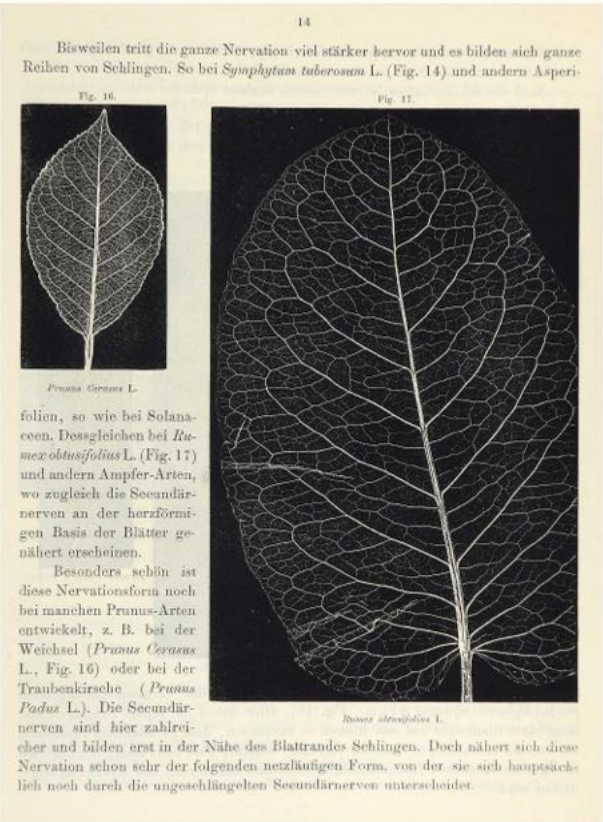


*Bulletin de L'Association Belge, vol. II 1875-6*



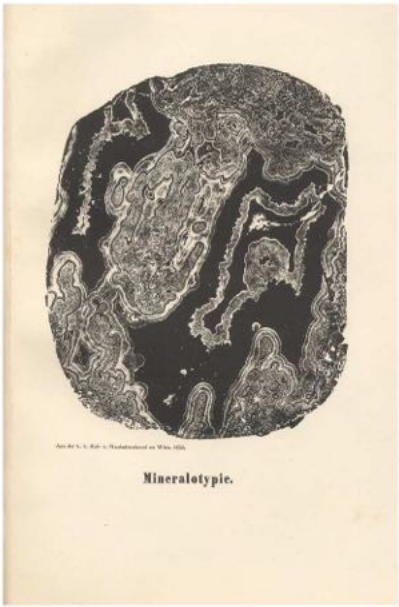
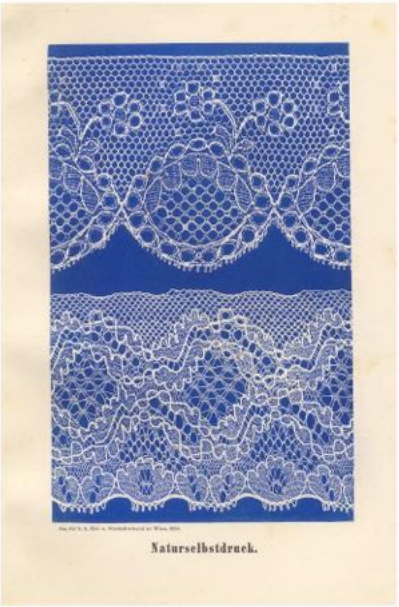
**AUER, ALOIS** (1813-1869), Austria — Nature printing “*Naturselbstdruck*”, circa 1852 “...the object to be copied is coated with a mixture of Venice turpentine and spirit of wine, to fix and allow it to be spread out on a very smooth and highly polished steel or copper plate. Over this a clean smooth plate of pure lead is placed and the whole passed through a copperplate press under very great pressure. A plate is thus obtained bearing on its surface an exact imprint of the object. The lead being too soft to print from, a mould must be made from it and then electrotyped in copper to yield a printing plate.” (*Illustrated Catalogue*, 1898, pg. 22). The very first attempts were done with pieces of lace. In the case of plants, colors could be applied to the printing plate. In reproducing the patterns in stone, first the stone is bitten into with acids to produce a relief, which is then subjected to the process. In producing prints from fossils, the original being too delicate to put in the press, softened gutta percha is pressed into the fossil to obtain the matrix. **Andrew Worrung**, working for Auer, has been also discussed as the actual creator of the process (*The Photographic and Fine Art Journal* pg. 75, 1854, Robert Hunt). Nature printing was also used to create blocks for typographic printing. Ettingshausen and Pokorny were active users of this method.

The eight plates, seven by nature printing, one of which is two-sided, and one by a form of lithography illustrated here are from *Die Vereinigung der Graphischen Künste*, 1853. The publication also includes two original photographs, lithographie, chemotypie, chalkographie, sidereographie, hyalographie, numismatische guillochirung, guillochirung, stilographie, galvanographie, xylographie, typographie, and typometrie.



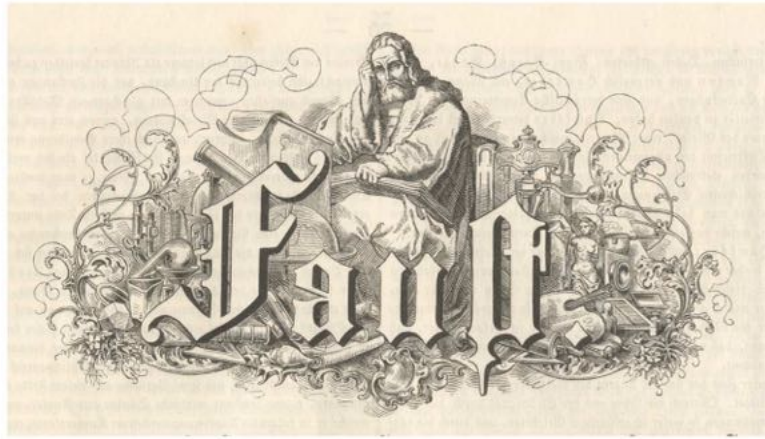
Über die Nervation der Pflanzenblätter, 1858

RELIEF



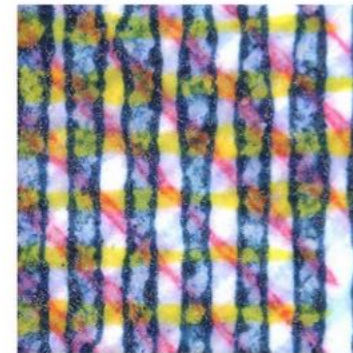


Starting in 1854 Auer published a twice-monthly magazine *Faust*, illustrated with examples of printing processes used in the State Printing Office, Vienna. Each issue included 3 prints with 24 issues each year. *Faust* was published for eight years. Even though the magazine only used photographs in 1855, and those were original prints, it stands as possibly the first periodical, not directly related to the photographic trade to systematically use nature prints as well as so many other printing methods. In the banner illustration *Faust* looks out from his desk and below him are a wealth of symbolic objects: microscope, telescope, chemical beaker, globe, seashell, a painter's pallet and brushes, a sculpture, a camera, a printing press and engraver's tools telling us what this periodical will survey. And the headline reads: "A poligraphically-illustrated magazine. Accompanied by art supplements from more than 30 printing methods." And goes on to say in the prospectus: "The illustrations, by which means this magazine aims to distinguish itself from all other similar [publications] on the market..." will be produced by the noted "...director enjoying a European reputation from our world-famous State Printing Works, Councilor Alois Auer, [and this] is the best indication of what we intend to achieve in this regard."



*Faust*, vol. I, 1854

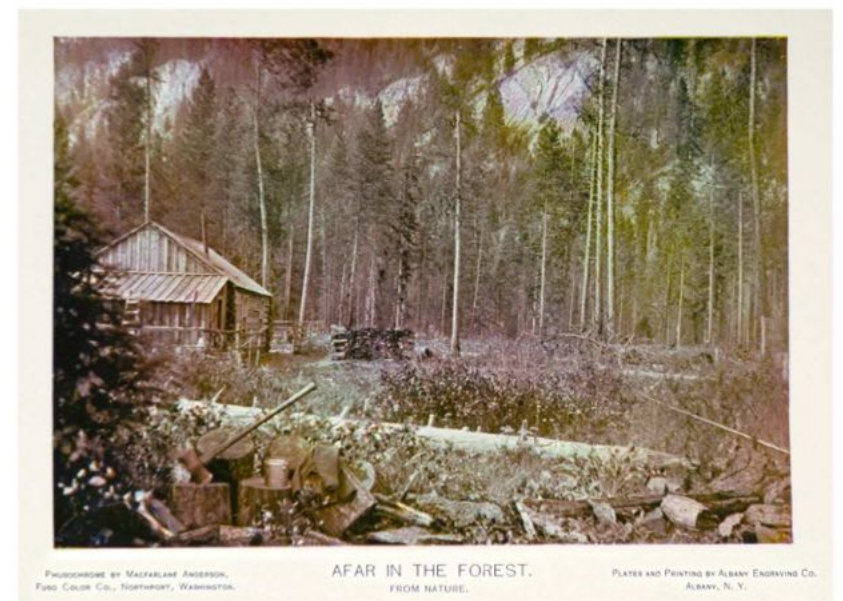
**AUSTIN, A.C., U.S.** — "*Adamantine Process*", a secret *Halftone* process. "*Phusochrome*" a three color halftone process with **Macfarlane Anderson**, circa 1895. **Relief** Wall discusses (pg. 475) Anderson's idea to "use a frame carrying a number of parallel wires with interspaces half the diameter of the wires, the color filters were placed in front of the lens, and after an exposure with one filter, it was changed and the wire frame shifted so as to cover the exposed part and this operation repeated with each color filter." This process was to be used for photomechanical printing. Anderson believed the order of printing should be yellow, red, blue. **Relief**



45X



Wilkinson, *Photo-Engraving, Photo-Etching*, 1895



*Anthony's Photographic Bulletin*, 1895



**BALDUS, ÉDOUARD** (1815-1886), France — (worked from the 1850's to about 1884) *Heliogravure* at first utilizing bitumen on copper in 1854. **Intaglio. Relief** (in line) with Gillot was demonstrated in *La Lumière* 1854. Mertle (pg.23) indicated that “Baldus also was the first to etch such images [in line] on copper by means of electrolysis. Attached to a galvanic battery and serving as an anode in a cupric sulfate electrolyte, the copper plate with its aquatint ground and bitumen photoresist could be etched to varying line depths by locally staging sufficiently etched parts of the drawing or design.” Waterhouse (*The Photographic News*, 1878, pg. 592) explains the process as applied to **line work** as of 1878: “M. Baldus has successfully employed a modification of the photoglyphic process for line work. He coats a copperplate with gelatine and bichromate and exposes it under a negative or a positive, then etches in a solution of perchloride of iron, which attacks the copper in all the parts not acted upon by the light, and thus a first relief is obtained. As this relief is not sufficient, the plate is inked in with a printing roller, when the ink attaches itself to the parts in relief and protects them from the action of the etching liquid. This procedure is repeated till the desired effect is produced. If a negative is used an incised plate is obtained, which may be printed in the copperplate press. If a positive be used the image is in relief and suitable for being printed with type. I have found that the reliefs obtained in this way are exceedingly sharp, though the gelatine films will not stand the action of the etching fluid very long.” Louis Figuier, who had been Baldus' assistant, wrote in 1869 (pgs.135-137) “Baldus no longer used the electroplating process or bitumen of Judea. He covered his plate with chromium salt, and exposed it using his glass negatives. It was then etched in a bath of ferric chloride and was then ready to be printed using intaglio methods.” The use of Chromium salt would suggest a gelatin or albumen and bichromate mixture. The limited explanation does not indicate how he created the grain structure in his plates. From the late 1860's to after 1884 Baldus devoted himself to his photogravure productions producing 7 works some with as many as 300 photogravures. His most significant volume *Les Principaux Monuments de la France, Reproduit en Héliogravure par E. Baldus* was published ca. 1875 and consists of plates as large as 335mm X 425mm. **Intaglio**

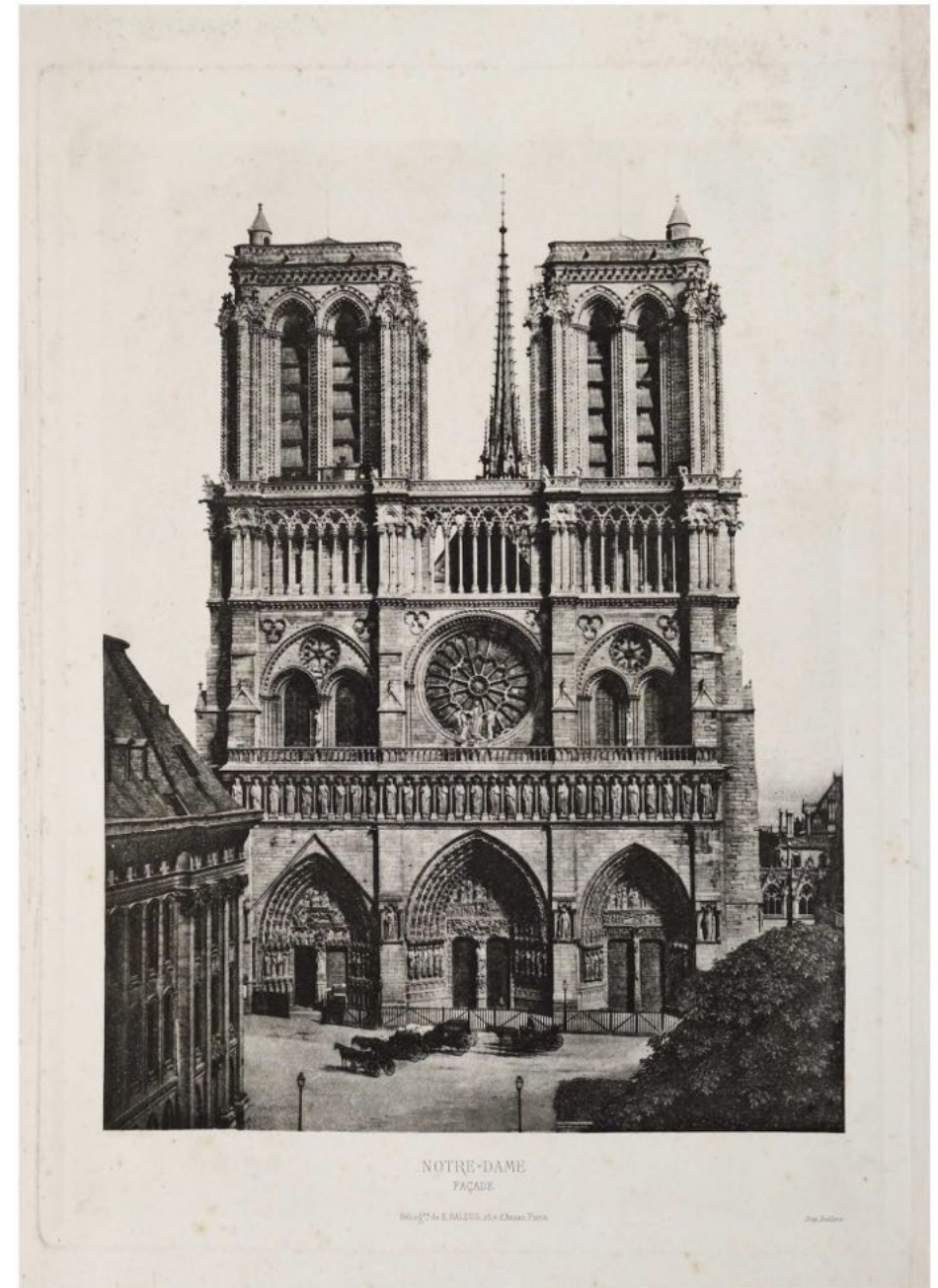


Blanquart-Evrard, *La Photographie*, 1870



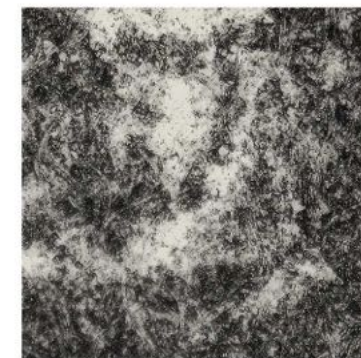
Figuier, *Les Merveilles de la Science*, vol. III, 1869

Relief



*Notre Dame*, printed by Delâtre ca. 1867-69

Baldus produced his first heliogravure portfolio in 1866. For his first three works, *Recueil d'Ornements*, *Oeuvre de Marc-Antoine Raimondi* and *Oeuvre de Jacques Androuet dit Du Cerceau*, Meubles, Baldus sought out the noted etcher and printer of fine art Auguste Delâtre. He also had Delâtre print at least one of his own photographs. Delâtre's studio at 171 rue St. Jacques was only a short distance across the Jardin du Luxembourg from Baldus' at 25 rue d'Assas. It raises the question that Delâtre may have played a role in Baldus perfecting his method of heliogravure, just as had other photographers sought out printing experts. A second possibility is that Baldus decided to print himself when Delâtre's studio was destroyed in the siege of Paris, 1870, and he fled to England.

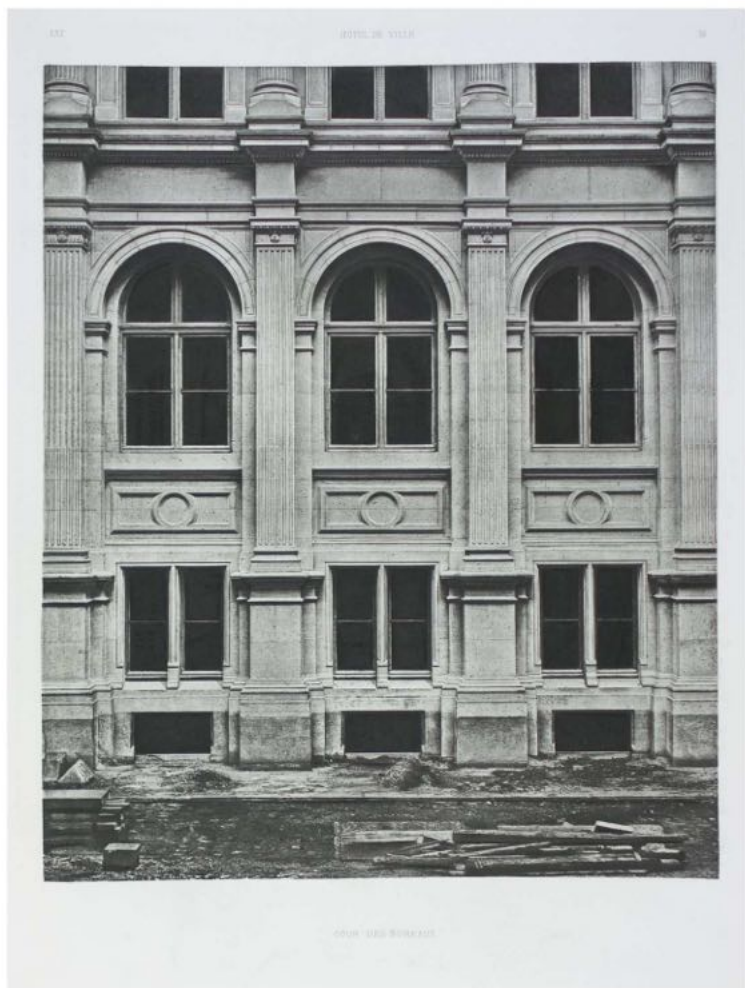


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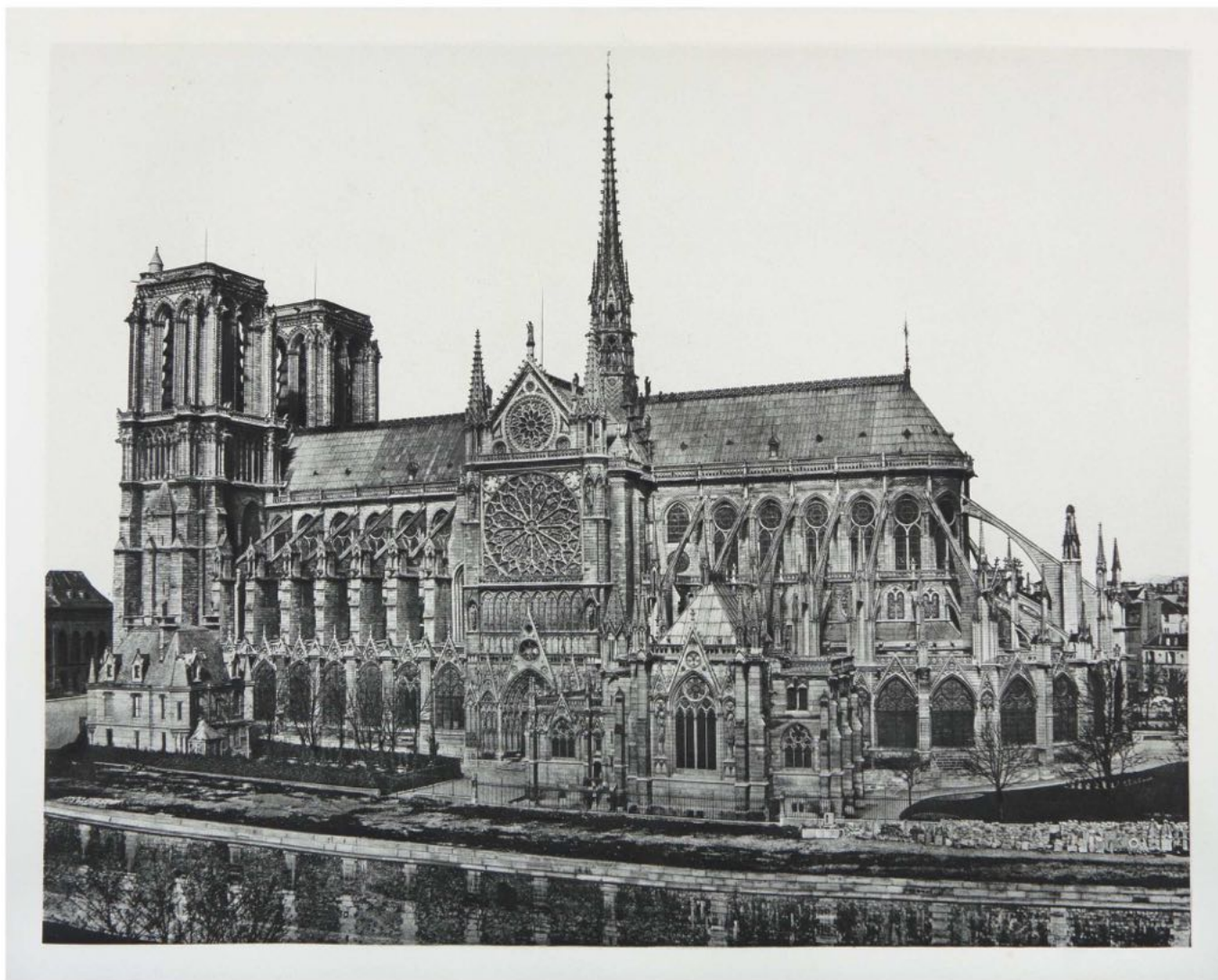


90X





*Reconstruction de L'Hôtel de Ville de Paris, 1884*



*Les Principaux Monuments de la France, 1875*

**Baldus heliographic publications:**

*Recueil D'Ornements* – 1866 100 plates (Imp. Delâtre)

*Oeuvre de Marc-Antoine Raimondi* – 1867 25 plates (Imp. Delâtre)

*Oeuvre de Jacques Androuet dit Du Cerceau* – 1869

a. *Meubles* – 52 plates (Imp. Delâtre)

b. *Recueil D'Ornements d'apres les maitres les plus celebres des XV<sup>e</sup>, XV<sup>e</sup>, XVII<sup>e</sup> et XVIII<sup>e</sup> siecles* - 93 plates

c. *Oeuvre de Jacques Androuet dit du Cerceau : coupes, vases, trophées, cartouches, fleurons, balustrades, ferronnerie* - 134 plates

d. *Oeuvre de Jacques Androuet dit du Cerceau* - 35 grandes arabesques

e. *Jacques Androuet dit du Cerceau : oeuvre.* 64 dessins en 15 planches

f. *Oeuvre de Jacques Androuet dit du Cerceau*

I. 62 petites arabesques, série complète

II. 20 cheminées, série complète

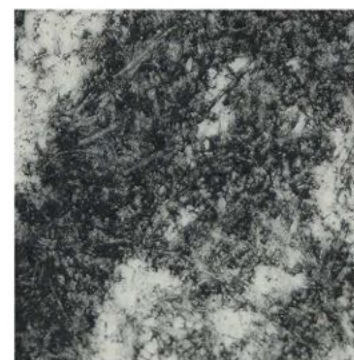
III. 35 grandes arabesques, série complète

*Palais du Louvre et des Tuileries* – 1869 – 71 (some plates marked Imp. Delâtre) 200 plates, (second edition, 1875 300 plates)

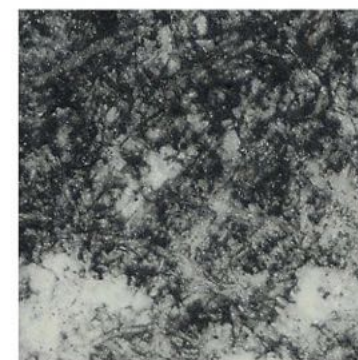
*Palais de Versailles* – 1870's 100 plates (second edition Imp. Morel)

*Les Principaux Monuments de la France* – 1875 45 from a projected 60 plates

*Reconstruction de L'Hôtel de Ville de France* - 1884 60 + 10 supplementary plates. Copies with 100 plates exist.



45X



90X



**BAUDRAN, AUGUSTE ALEXANDRE**, France, (worked primarily through the 1860's) Baudran was an engraver and translated art into intaglio plates for the *Gazette des Beaux Arts*. Baudran, at a meeting of *la Société des Sciences Naturelles et Médicales de Seine-et-Oise*, February, 1864, outlined the various processes he employed starting in 1855. "...he conceived transferring drawing onto steel that he called glymmatographie, and which he immediately applied. The portrait of Cardinal Marlot, that he passed round, was produced as follows by this process: drawing, done on white paper, in black crayon or pencil, is applied to the plate, which has previously received a slight oily coat, and it leaves its impression by the action of the press; a coat of a certain substance is then applied to the impression, and covered with a gelatin plate applied to the polished side; it is run through the press again, and the removed gelatin receives all parts of the drawing in black, while the plate only retains the blank parts. There remains only to plunge this plate into an ordinary bath of dilute nitric acid, so that it is etched. The plate sometimes has blotches, but they are removed with a burin. Mr. Baudran showed a proof of a cow, from the collection of the Ministry of Agriculture and Commerce..." "Mr. Baudran also placed before the eyes of members a series of portraits produced by another process - and having quite the look of engravings; this process he calls glymmatographique engraving consists of replacing drawings by the above process with hand engraving, made by metal tip or pen on plain paper or on gelatin. Mr. Baudran then moved on to his gravure etching processes. After paying tribute to Messieurs Niepce for the discovery of important properties of bitumen of Judea, he pointed out the inadequacy of this bitumen coating, and stated that he had made changes to the preparation, so that he could use concentrated nitric acid up to 40 [degrees Baumé]. and thus produce deep cuts allowing a large print run. He passed round some of the plates comprising copies of twenty-one paintings from the chapel of St. Philippe du Roule. Started by the gravure process, and completed by glymmatographie, giving a mixed process of lithography-engraving. Mr. Baudran also works heliographic engraving in intaglio; he gave some details about ordinary machines for engraving hatching and described the machine he had invented, and whose use is so fast, the substance that covers the plate does not have time to dry. He gives it the name heliographic machine because of its characteristic of raising the burin on the blank parts, using a special device. He passed round a series of untouched portraits, produced by this machine, as well as views of Versailles and the Trianon, a plate of which was examined under the magnifying glass, then another series of portraits from the collection of Nadar contemporaries for which all heliographic processes were used." The last procedure was the one he and **De La BLANCHÈRE** used to make the *Heliogravures* (photogravures) from Nadar portraits during the mid-eighteen sixties. The plates have a pronounced grain and appear to be heavily retouched. Also the Nadar signature is clearly evident on the plates and so they must have used copy negatives or reversed positives for their plates. **Intaglio**



15X



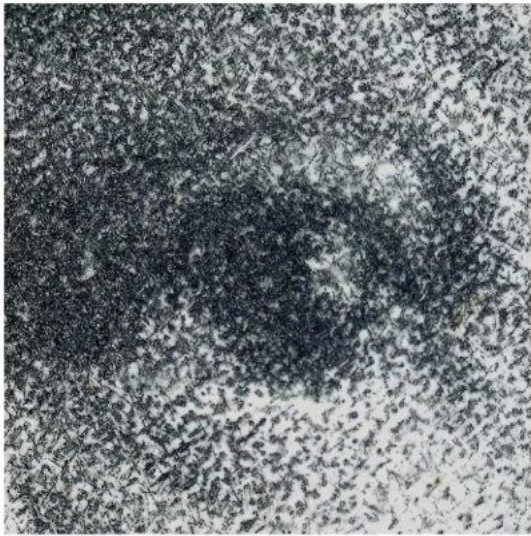
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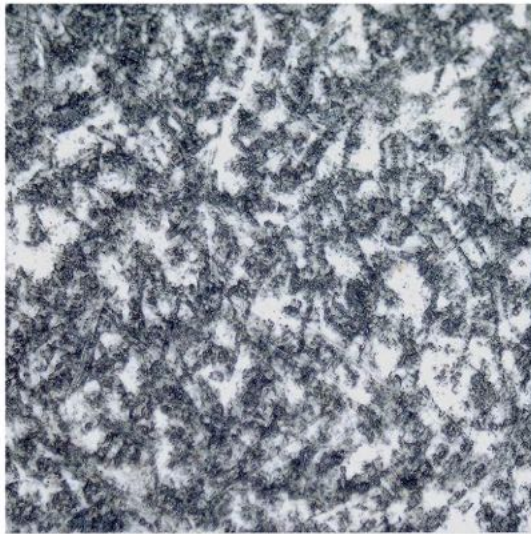
Les Races Bovines au Concours Universel Agricole de Paris en 1856, 1862

Mark Katzman





15X

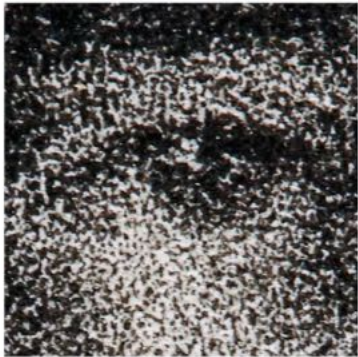


45X





**BELLOC, AUGUSTE** (1800 -1867) with **JACOTT, JEAN-JULES**, France – *Photolithography* 1855. Belloc, in the introduction to his book *Les Quatre Branches de la Photographie*, 1855, states: “The image we give is currently somewhat retouched, and we hardly claim to have first reached the highest degree of perfection, but we do every day make new progress...” Belloc continues by saying that he has asked Jacott to help him with this system and that they continue to get closer to perfection. Jacott was a lithographic artist who had studied under Charles-Laurent Maréchal (father of Charles-Raphael). He produced the photolithographic portrait of himself and Belloc. They did not participate in the Luyens competition and their process was not published. **Planographic**



15X



*Les Quatre Branches de La Photographie*, 1855

Mark Katzman



**BERCHTOLD, ALFRED JEAN** (d. 1859), France — Ruled *Halftone* screen in 1855 & 1857. According to Louis Levy (pg. 387) Berchtold ruled a screen of parallel lines onto glass. Then a metal plate was coated with asphaltum and first exposed under a positive followed by exposing the ruled screen through a series of diminishing exposures as the screen was turned for each. The exposed plate was then cleaned of the unexposed asphaltum and then etched. The de Luynes report (Waterhouse 1868) states “he used bitumen or bichromate of potass; but he points out a device which, as he says, while giving the grain necessary for engravings renders all the various methods possible. This method consisted in making on the plate after exposure a series of hatchings, more or less crossed, by means of a glass plate mechanically covered with fine parallel lines; these lines by their successive crossings and suitable combination give a grain which, by its too great regularity, suggests mechanical engraving. This improvement did not seem to the Commission sufficiently important to be taken into account.” Gamble (pg. 8) concludes, after an extensive explanation from the French patent, no. 19,628 that “...read in the light of subsequent inventors, it will be seen that it suggests most of the ideas on which the half-tone process was afterwards worked out.” (Marbot states the patent number as 34719) **Intaglio / Planographic / Relief**

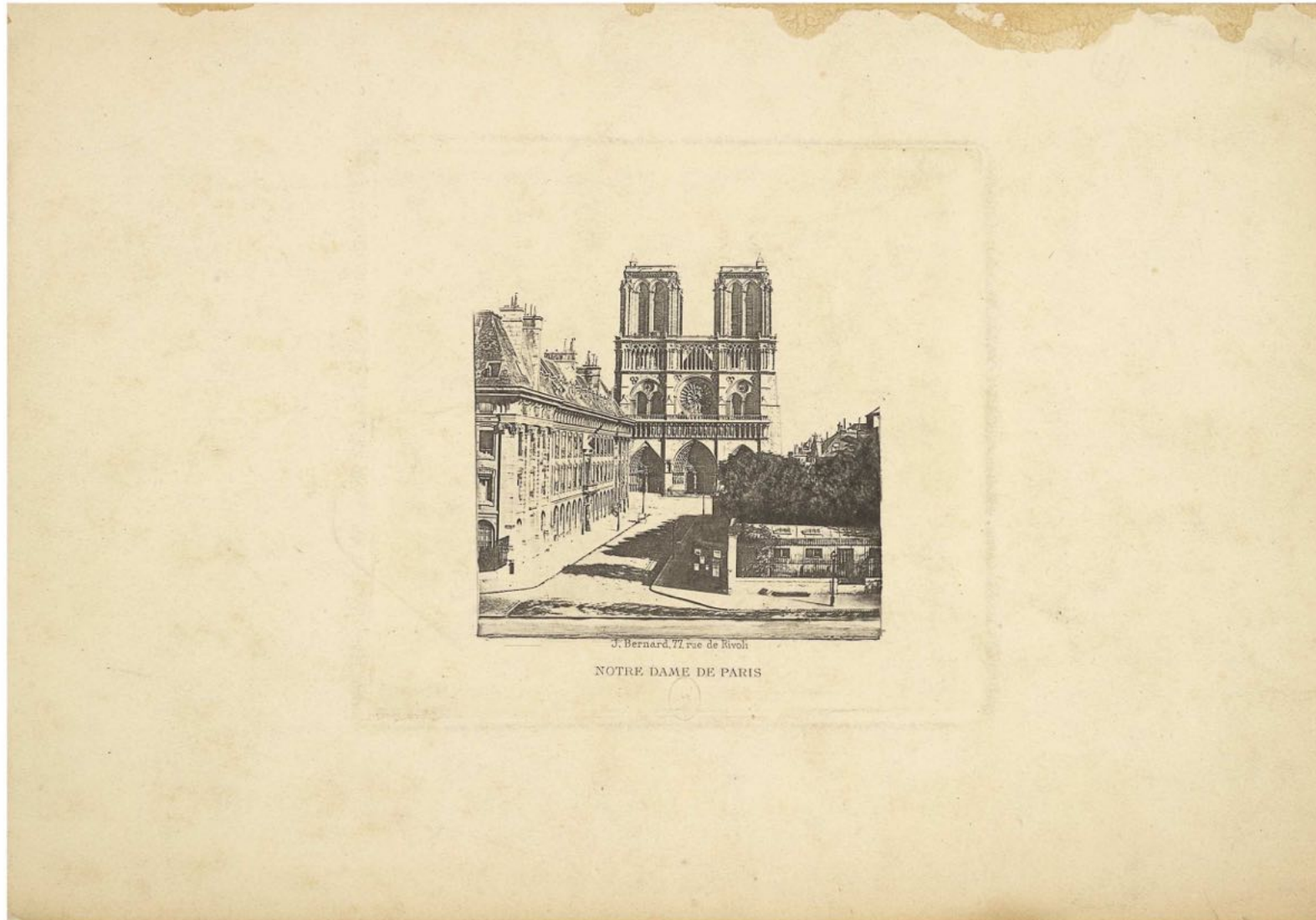


Mark Katzman



**BERNARD, J.**, France, (77 rue de Rivoli, Paris) produced a number of plates by *Photogravure* as early as 1859. This photogravure of Notre Dame is without the spire that was added starting in 1859. He may have been a professional lithographer as well. **Intaglio**

Bernard produced few prints, those currently known are portraits of Madame Marie Sasse, artiste à l'Opéra, Gustave Dore and Mademoiselle Moreau, artiste du Théâtre Lyrique as well as the view of Notre Dame illustrated.



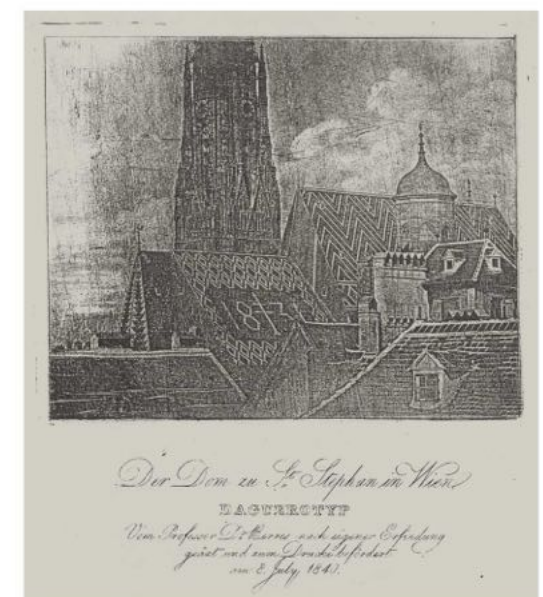
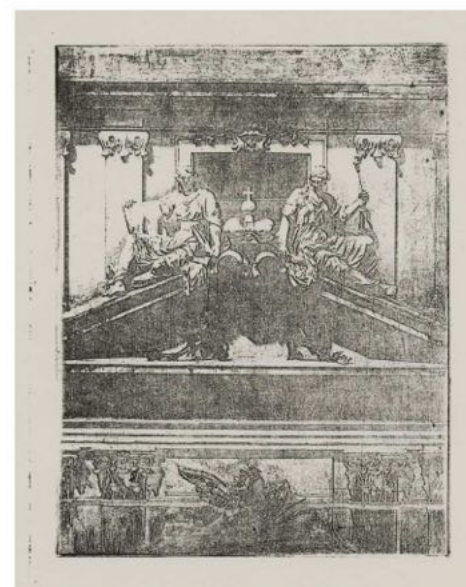
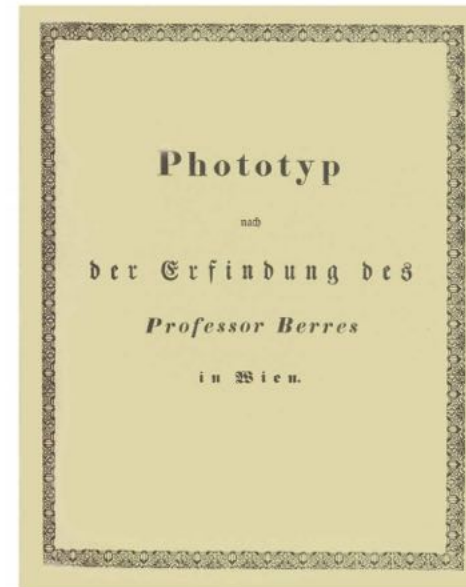
The J. Paul Getty Museum, Los Angeles



**BERRES, CHRISTIAN JOSEPH EDLER VON**, (1796-1844), Austria — Etched solid silver daguerreotype, 1840. He explains: “I take the pictures produced in the usual manner by the Daguerreotype process, hold them for some minutes over a moderately-warmed nitric acid vapor or steam, and then lay them in nitric acid of 13 to 14 degrees (Reanmur [sic Reaumur]), in which a considerable quantity of copper or silver, or both together, has been previously dissolved. Shortly after being placed therein, a precipitate of metal is formed, and can now be changed to what degree of intensity I desire. I then take the heliographic picture coated with metal, place it in water, clean it, dry it, polish it with chalk or magnesia, and a dry cloth, or soft leather. After this process, the coating will become clean, clear, and transparent, so that the picture can again be readily seen. The greatest care and attention are required in preparing the Daguerreotype impressions intended to be printed from. The picture must be carefully freed from iodine, and prepared upon a plate of the most chemically pure silver. That the production of this picture should be sure of succeeding according to the experiments of M. Kratochevila, it is necessary to unite a silver with a copper plate; while upon other occasions, without being able to explain the reason, deep etchings or impressions are produced without the assistance of the copper plate, upon pure silver plate. The plate will now, upon the spot where the acid ought not to have dropped, be varnished; then held for one or two minutes over a weak, warm vapor, or steam of 25 to 30 degrees (Reanmur) of nitric acid, and then a solution of gum arabic, of the consistence of honey, must be poured over it, and it must be placed in a horizontal position with the impression uppermost, for some minutes. Then place the plate by means of a kind of double pincette (whose ends are protected by a coating of asphalt or hard wood) in nitric acid at 12 or 13 degrees (Reanmur). Let the coating of gum slowly melt off or disappear, and commence now to add, though carefully and gradually, and at a distance from the picture, a solution of nitric acid, of from 25 to 30 degrees, for the purpose of deepening or increasing the etching power of the solution. After the acid has arrived at 16 or 17 degrees (Reanmur), and gives off a peculiarly biting vapor which powerfully affects the sense of smelling, the metal becomes softened, and then generally the process commences of changing the shadow upon the plate into a deep engraving or etching. This is the decisive moment, and upon it must be bestowed the greatest attention. The best method of proving if the acid be strong enough, is to apply a drop of the acid in which the plate now is, to another plate; if the acid make no impression, it is of course necessary to continue adding nitric acid; if, however, it corrode too deeply, then it is necessary to add water, the acid being too strong. The greatest attention must be bestowed upon this process. If the acid has been too potent, a fermentation or white froth will cover the whole picture, and thus not only the surface of the picture, but also the whole surface of the plate will be quickly corroded. Whereby a proper strength of the etching powers of the acid, a soft and expressive outline of the picture shall be produced, we may hope to finish the undertaking favorably. We have now only to guard against an ill-measured division of the acid, and the avoidance of a precipitate. To attain this end, I frequently lift the plate out of the fluid, taking care that the etching power shall be directed to whatever part of the plate shall have worked the least, and seek to avoid the bubbles and precipitate by a gentle movement of the acid. In this manner the process can be continued to the proper points of strength and clearness of etching required upon the plates from which it is proposed to print. I believe that a man of talent, who might be interested in this art of etching, and who had acquired a certain degree of dexterity in preparing for it, would very soon arrive at the greatest clearness and perfection; and from my experience I consider that he would soon be able to simplify the Whole process. I have tried very often to omit the steaming and the gum arabic, but the result was not satisfactory, or the picture very soon after was entirely destroyed, so that I was compelled again to have recourse to them.” (*Monthly chronicle* pgs. 553-4) Berres published the first photographically illustrated book in 1840, *Phototyp nach der Erfindung des Professor Berres in Wien*. It contains five plates.

#### Intaglio

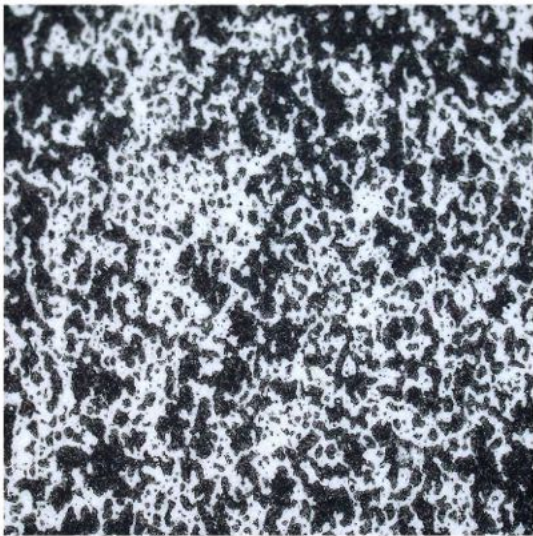
The only complete copy as shown here was in the Hohere Graphische Bundes-Lehr-und Versuchsanstalt, Wien, now (2016) transferred to the Albertina Museum, Vienna. A second copy with 3 plates is in the Rijksmuseum, Amsterdam.



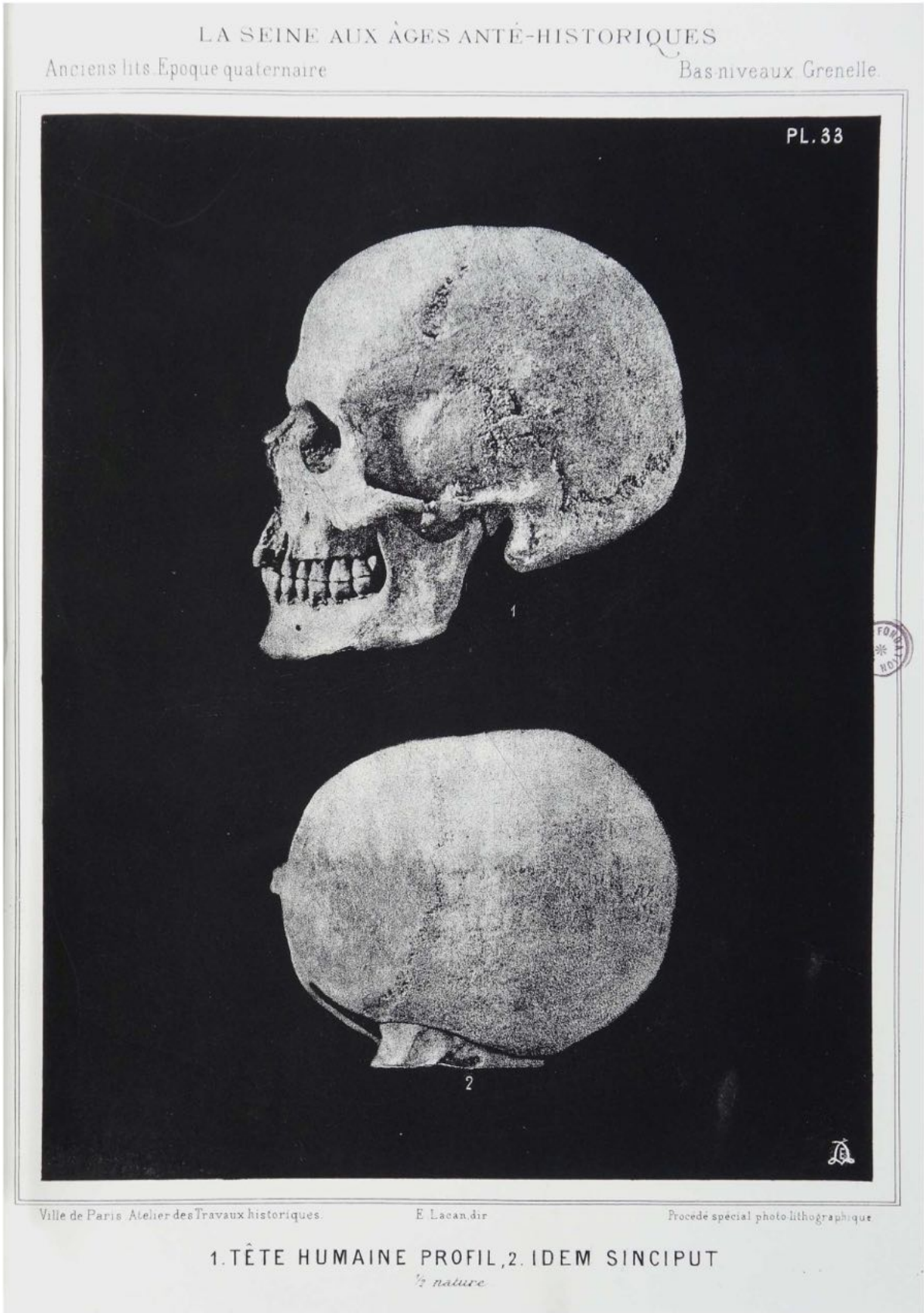
Complete in the Albertina Museum, Vienna



**BILORDEAUX, ADOLPHE** (1807 - 1872), France. 1869. "*Procédé photolithographique*" Bilordeaux, a lithographer, studied photography with Gustave Le Gray. He initially proposed working with photography and lithography in 1855 and worked with photolithography in 1857. (Larousse 74.) The following brief explanation of his process was presented at a meeting of *la Société d'encouragement pour l'industrie nationale*, December 11, 1868: "Monsieur Amédée-Durand, the chairman, read a letter from Monsieur Ernest Lacan, head of the photography section at the historical service of the city of Paris, who informed the Society of the processes used by Monsieur Bilordeaux for producing directly on stone photographic images that can be printed in the press by ordinary processes; a transparent positive image having been made is used to produce a negative image on stone previously covered with a [light-] sensitive coating. This image, after removing the parts of the coating that are not impressed, is inked with fatty ink that adheres to the stone and not to the coating [that has been] impressed by light. The result is a sort of positive print, possessing the properties of ordinary drawings on lithographic stone and, like them, able to produce a regular print run in the lithographic press. Photolithographic plates can now be routinely produced which combine the qualities of remarkable execution with the advantage of being very cheap. Monsieur Lacan, present at the meeting, displayed ten prints representing specimens of paleontology produced with no retouching, a crucial aspect of great importance, particularly for subjects of natural history." **Planographic**



15X



*Histoire Generale de Paris, la Seine, 1869*



**BLANQUART-EVRARD, LOUIS DÉSIRÉ** (1802-1872) France – Blanquart-Evrard, was a major figure in the history of photographic publication with the creation of his printing company in Lille. His Imprimerie Photographique began publishing in 1851 and produced material until 1855. His own major publication *La Photographie, ses Origines, ses Progrès, ses Transformations*, first published in 1869 and finally in a deluxe edition of 50 copies in 1870, stands as prophetic in his exploration of the use of photomechanical printing for the dissemination of art and photography in publishing. In this book he compiles a history of photomechanical procedures to that day with examples of work by Niepce, Zurcher, Baldus, Placet, Poitevin, Garnier, Dujardin Frères, a grained typographic halftone by Garnier, a woodburytype by Goupil, and carbon prints by Edwards and Kidd, and Marion. He understood, maybe better than most others in his day that in these methods lay the future of photographic publication. His last publication was in 1871 when he demonstrated three-color carbon printing from a photograph of leaves and flowers, one of the earliest published examples. Blanquart-Evrard at a meeting of the Société Impériale des Sciences, de l'Agriculture et des Arts de Lille, discussed the use of Ducos de Hauron's method of creating a carbon print by the use of mica sheets or sheets of collodion by superposition. He signed a contract with Ducos du Hauron in 1870 to exploit Ducos du Hauron's patent (Isler De Jongh). Ducos later recalled, according to card files held at the Société Française de Photographie, that the offprint of Blanquart-Evrard's communication on color photography had had a print-run of 50 copies, but could not confirm that all copies necessarily contained the bound-in color separation prints. Had Blanquart-Evrard not died he would surely have led the way in the development of photomechanical printing.

The following is a translation by Steven F. Joseph of an extract from Blanquart-Evrard's short article, included here considering that it is the first published example of color photography and color printing.

"You are acquainted with the printing process known as carbon; you may be aware that this designation has been adopted as a specific term but carbon can be replaced by any other inert coloured substance. It is so-called carbon photography that M. Ducos du Hauron has used to make infinite copies of images in all their colours.

On a sheet of mica (1) (or any other translucent and very thin substrate), he deposits a coat of dichromated gelatin mixed with a transparent colouring substance, red-yellow or blue, the tint of which must be chosen in function of that of the subject to be copied. After drying, he places on the back of the substrate the negative corresponding to the tint of the mixture to be printed, then he exposes it to daylight and develops it according to photographic practice. Only the colored gelatin made insoluble by the action of light remains on the substrate. He repeats the operation a second and third time with the two other negatives. He then has three transparent sheets each containing a portion of the colouring of the image; in combining them by superimposition, he obtains, by reflection or transparency, a polychrome image reproducing the subject in its full colouring, as you can see from these prints I am submitting to you.

If we look back to the beginnings of photoengraving, and we compare Nicéphore Niepce's print with those by the likes of Garnier, Baldus, Placet, Asser, Dujardin and many other skilled technicians and inventors, the heliochromatic print which I show to you, however rudimentary it may be, does it not bode well for the future?

1. We indicate this method as it makes the practical method easier to explain. If mica is replaced by commercially available sheets of collodion film (Marion, Paris), the positive is printed on paper, as in carbon photography, and transferred onto the translucent film."

Blanquart-Evrard, Louis-Désiré, "Les Couleurs en Photographie," *Mémoires de la Société Impériale des Sciences, de l'Agriculture et des Arts de Lille*, 3rd series, vol. 9 Lille, L. Daniel, 1871. pgs. 9-10.

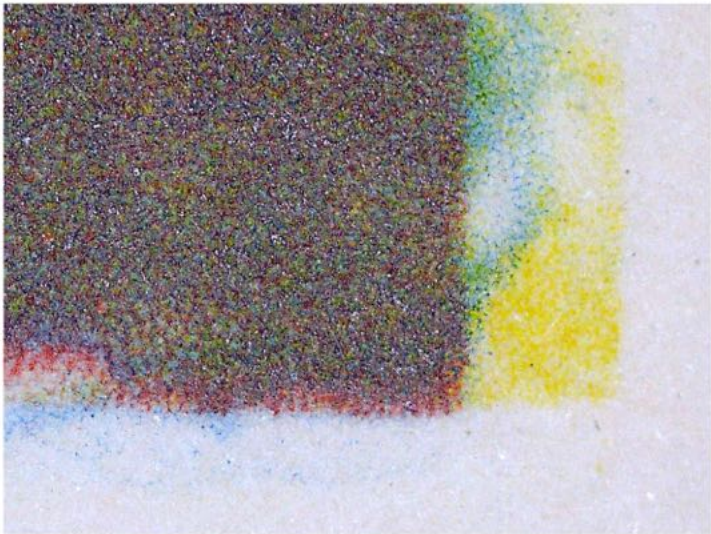


*Les Couleurs en Photographie*, 1871

Steven F. Joseph



**BOND, HENRY CHARLES**, England, Three color photography and printing 1888. This patent described the use of carefully created color screens placed in the camera to obtain the correct color information of the primaries on dry plates and then using these to create complimentary bichromated gelatin prints to be placed on glass for collotype or on stone for lithography. Once placed as bichromated gelatin matrixes "Each of the three images is now inked up with the suitable coloured ink and each colour is printed in turn on the same piece of paper as in chromolithography." (patent abstract Pat. #13,301, 1888). Wall's *History of Color* (pg. 340) states that the Bond patent, was used by WATERLOW & SONS Ltd., England, who referred to it as "*Chromotype*" 1892. Wall (pg. 321) also quotes Bond, "These colored pictures may also be printed in gelatin tissue, stained to the required colors after development with anilin dyes or other dyes, and the three skins superimposed, for the Magic Lantern slides." (Joseph Albert and Johann Obernetter experimented with three color collotype in the 1870's as did Edward Bierstadt). **Planographic**



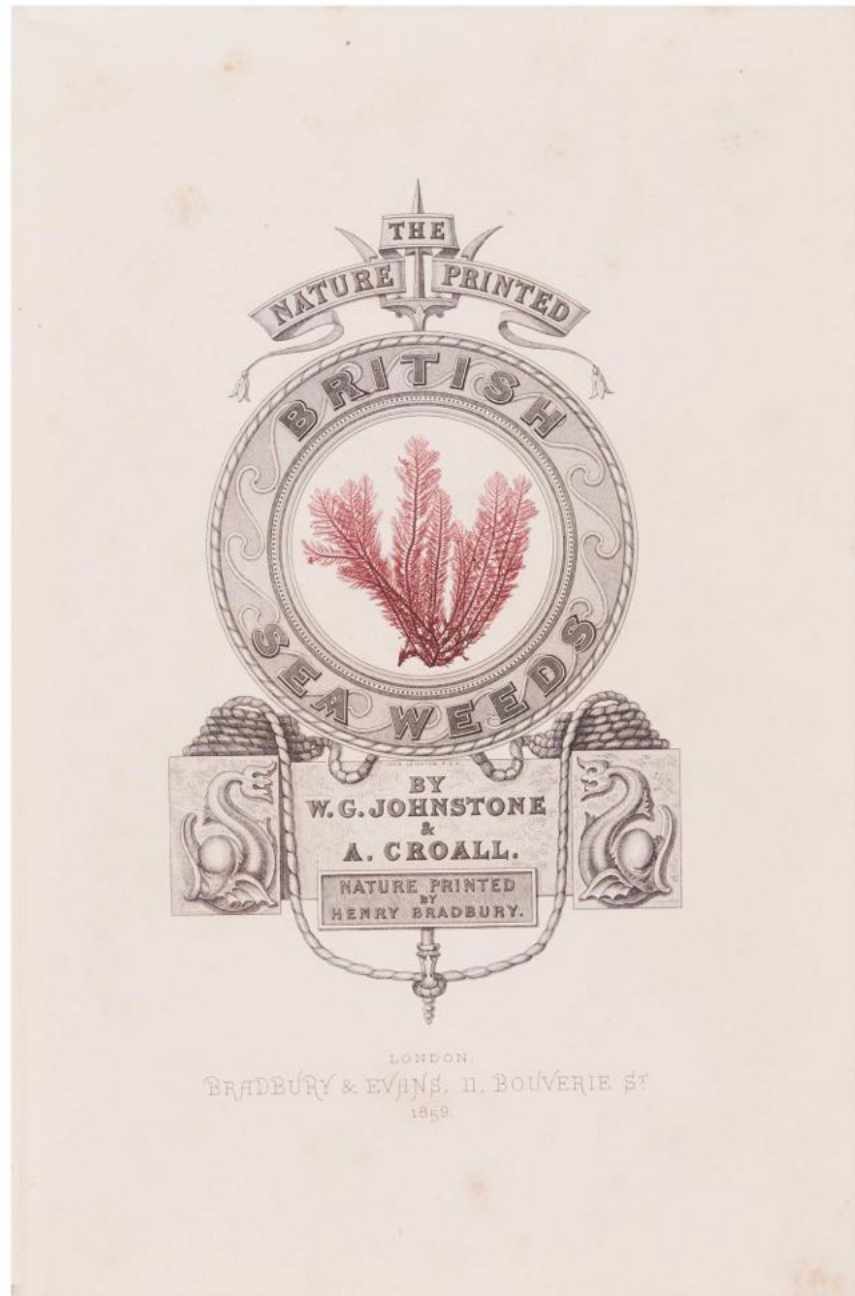
30X



Brothers, *Photography*, 1892



**BRADBURY, HENRY** (1831–1860), England, also claimed the invention of nature printing however he studied under Auer and then returned to England and did not produce his portfolio on ferns until 1854. He then went on in the early 1860's to produce multivolume sets on English ferns and seaweeds.

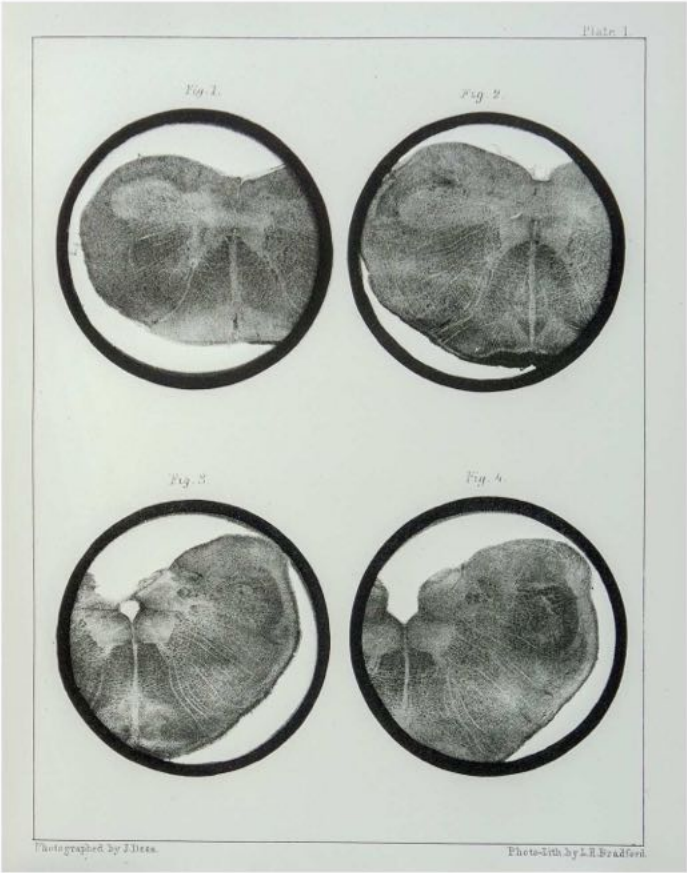


both Mark Katzman





**BRADFORD, LODOWICK H.** (1820-1885), with **CUTTING, JAMES AMBROSE** (1814-1867) U.S. (worked from 1858 until about 1864) — This *Photolithographic* process was patented in the US in 1858. “A lithographic stone, or a zinc plate, (which has been grained for tonal work) is coated with a solution composed of 1 quart of water, 4 ounces of gum Arabic, 160 grains of sugar, and a like quantity of bichromate of potassa. The stone thus prepared is kept in the dark until dry, and is then exposed in the camera, or the picture is laid upon it and printed upon it, by the action of light. The effect of the luminous action, is to render the gum almost insoluble. The stone is then washed with a solution of soap, the coating is readily removed from those parts which have not been acted upon by the light, the soap is decomposed on the surface of the stone, and a printing surface is formed: the action of the soap being inversely proportionate to the extent to which the gum was fixed by the light. The stone thus prepared is washed with water, and when dry receives a coating of printer’s ink from the roller, which, by uniting with the soap, gives body to the picture.” (*The Photographic News*, 1858 pg. 125) The process was primarily used by Austin A. Turner, and also by Isaac Rehn in Philadelphia as well as by Bradford. **Planographic**



The Gray Substance of the Medula Oblongata and Trapezium, 1864



The Photographic and Fine Art Journal, 1858



A. A. Turner - The Stereoscope for the Million no. 2



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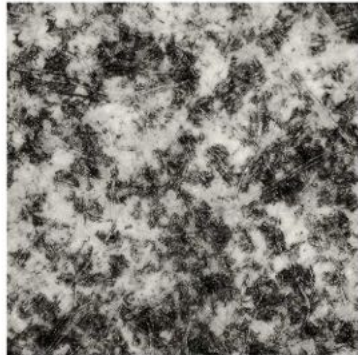


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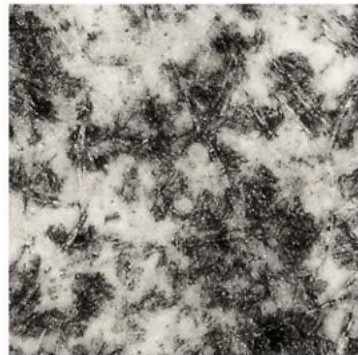


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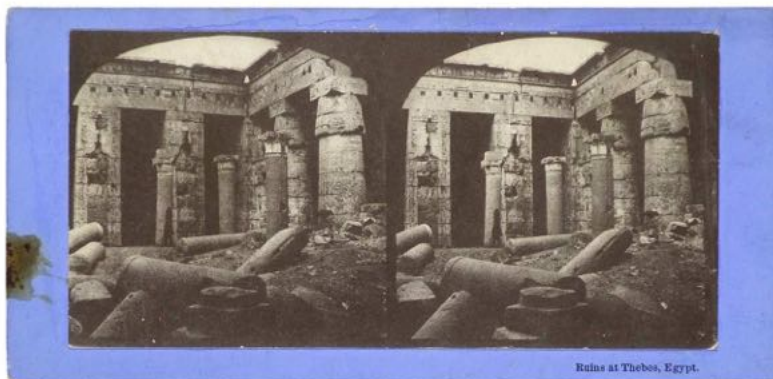




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Ruins at Thebes, Egypt.

Isaac Rehn - Langenheim - Stereoscopic History



15X



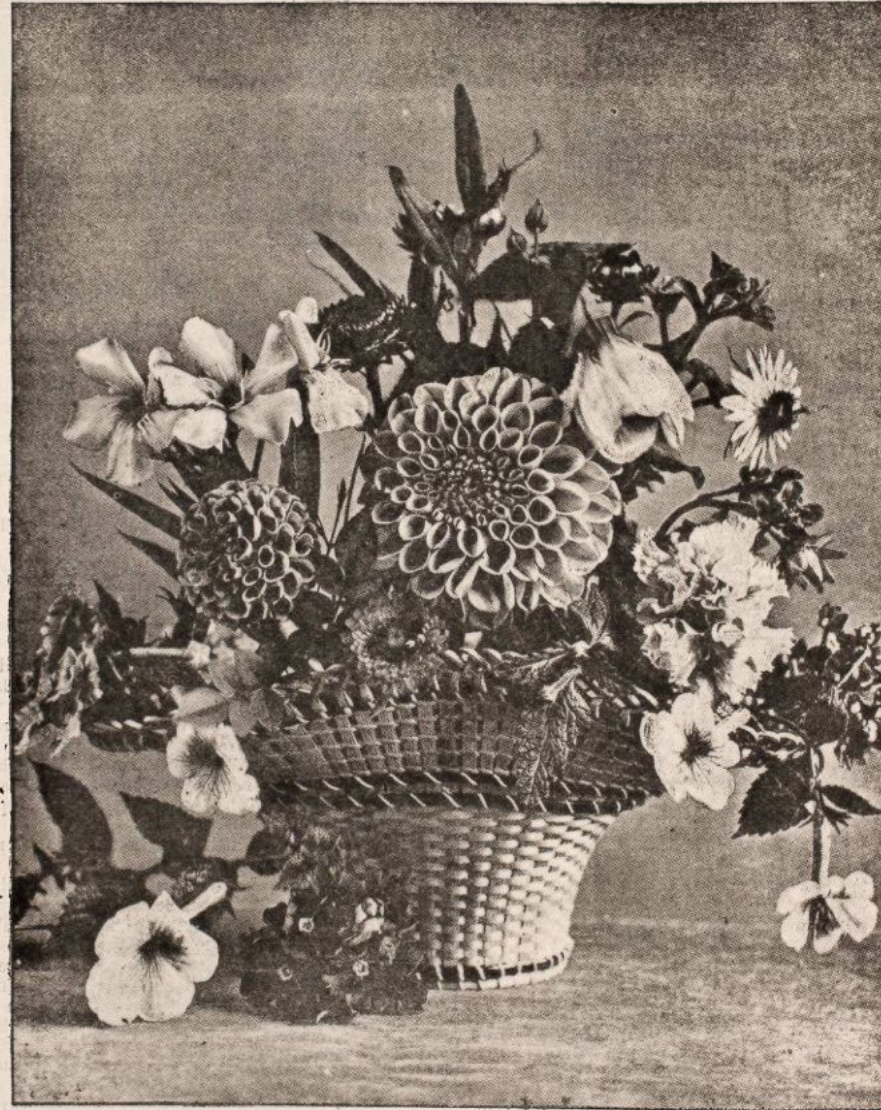
**BROWN, BARNES & BELL**, England — "*Luxotype*" *Halftone* using a wire screen impressed into a print and then re-photographed to make the printing plate, 1883. Jones *Encyclopedia* (pg. 343) "A photographic print was pressed against a metal plate engraved with a stipple in relief, it thus becoming embossed with a stipple. It was then strongly lighted from one side so that the stipple could be photographed, and a negative suitable for a making a half-tone block was thus obtained. A modification of the process was to rub the sunk parts of the embossed surface of the print with pigment, so that it could be copied by direct light." Apparently it was used for newspaper illustrations in England at this time. **Relief**



**LUXOTYPE.**

WE have the pleasure of placing before our readers an example of Luxotype, the photo-typographic process of Messrs. Brown, Barnes, and Bell, of which our readers have heard a good deal of late. The picture resembles in many respects, in its finished aspect at least, the results furnished by the Ives' process, of which we have given examples both in the columns of the NEWS and in the YEAR-BOOK.

As a photo-mechanical process, Luxotype is not yet in a perfected condition, and Messrs. Brown, Barnes, and Bell promise, before many weeks have passed, to produce printing-blocks from photographic negatives far superior to the one from which our print to-day is taken. There is very little reason to doubt this, and certainly it speaks well for the energy of the firm that they have brought matters thus far. As we stated last week, already photographs by the Luxotype process have appeared in daily papers in Liverpool and Bradford, and although the prints



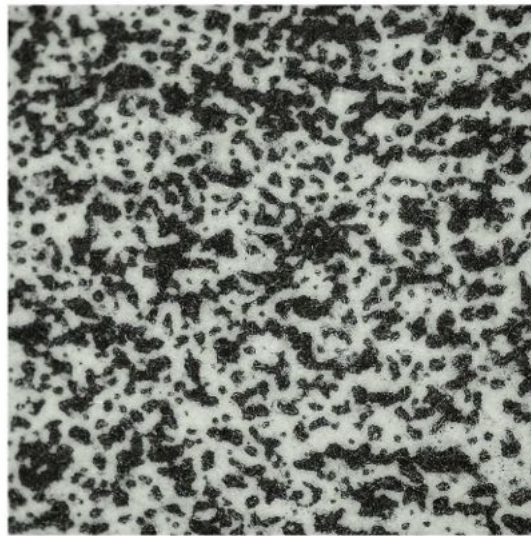
cannot yet compete in clearness and vigour with the ordinary wood-cut, the former possesses the eminent qualification of truth.

The problem of producing from photographs printing blocks that may be machined with type in the ordinary printing press, is one that is attracting the attention of many practical men just now, and very shortly we shall show examples of other inventors. In the meantime, we would point out that progress in this particular branch of

photography is exceedingly slow. The example we published the other day by the Pretsch process, which was produced twenty-three years ago, has not, so far as we have seen, been materially excelled by any photo-typographical pictures of later days, although Mr. Dallas' well-known photo-blocks, which have appeared in the *Garden* with tolerable regularity since 1872, may be instanced as one of the best commercial method at present before the public.



**BULLOCK BROS., EDWARD & JAMES**, England — *Photolithography* with grained paper (“lines or dots”), 1865. Louis Levy (pg. 399) wrote that the Bullocks took a transparent positive and placed it together with a gauze or other material and made a new negative. The Bullocks also described a method of photographing a negative through a screen with lines ruled on a glass plate. In the *Photographic News* (1866 pgs. 232-3) they explained: “The methods employed have been elsewhere described, and no doubt are familiar to most here. In one instance, we granulate or reticulate the negative by copying a negative with a piece of ground-glass, or, a negative copy of a reticulated surface on glass in contact with it, thus producing a reticulated transparency, from which we take a negative, by again copying or printing, which has for its half-tones a number of lines or specks, an aggregation of which form the pure blacks of the picture. With this negative we print on transfer paper...” Using the standard methods to transfer the image to stone for printing. “The other method we employ is, to imprint upon paper prepared with a gelatinous surface a number of fine specks or lines crossed in different directions...after exposure under a negative, we treat it in the same manner as in the former instance.” **Planographic**



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LITHO-PHOTOGRAPH, FROM NATURE.

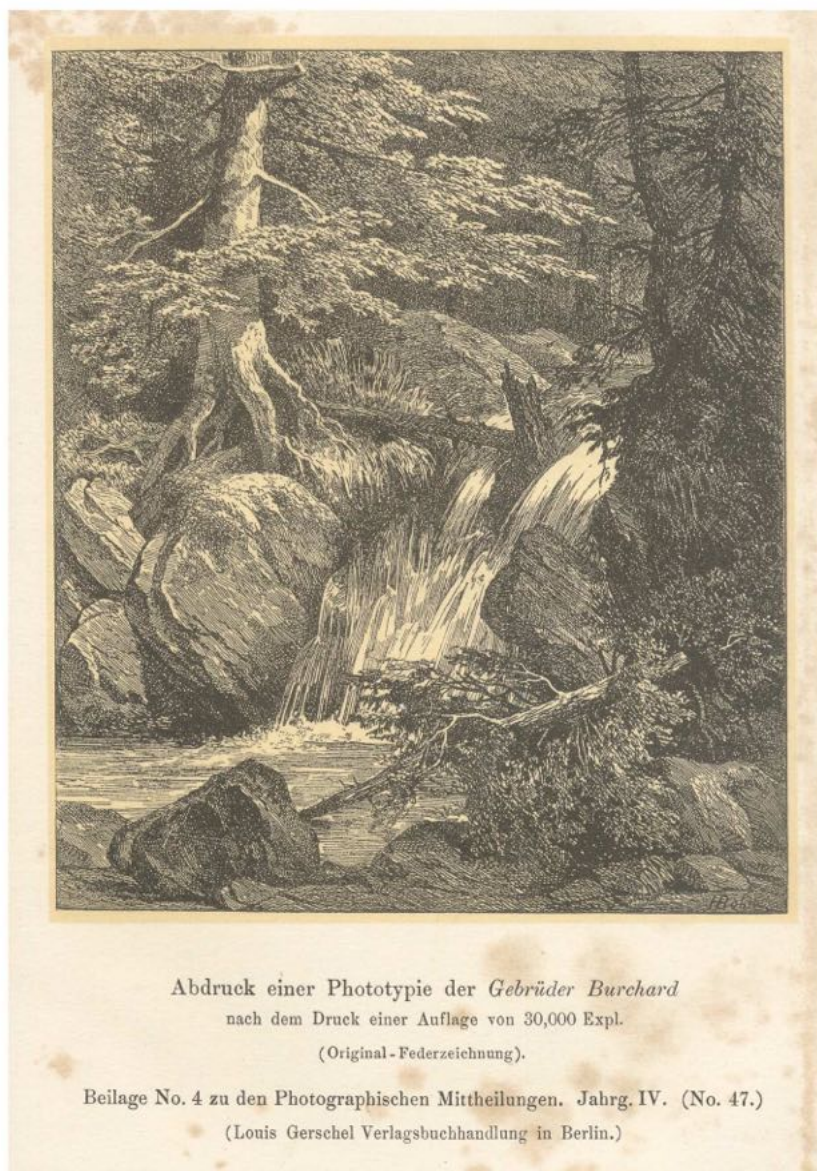
Printed by Messrs. Bullock Brothers' Patent Process.

From a Negative by Major Greasley.

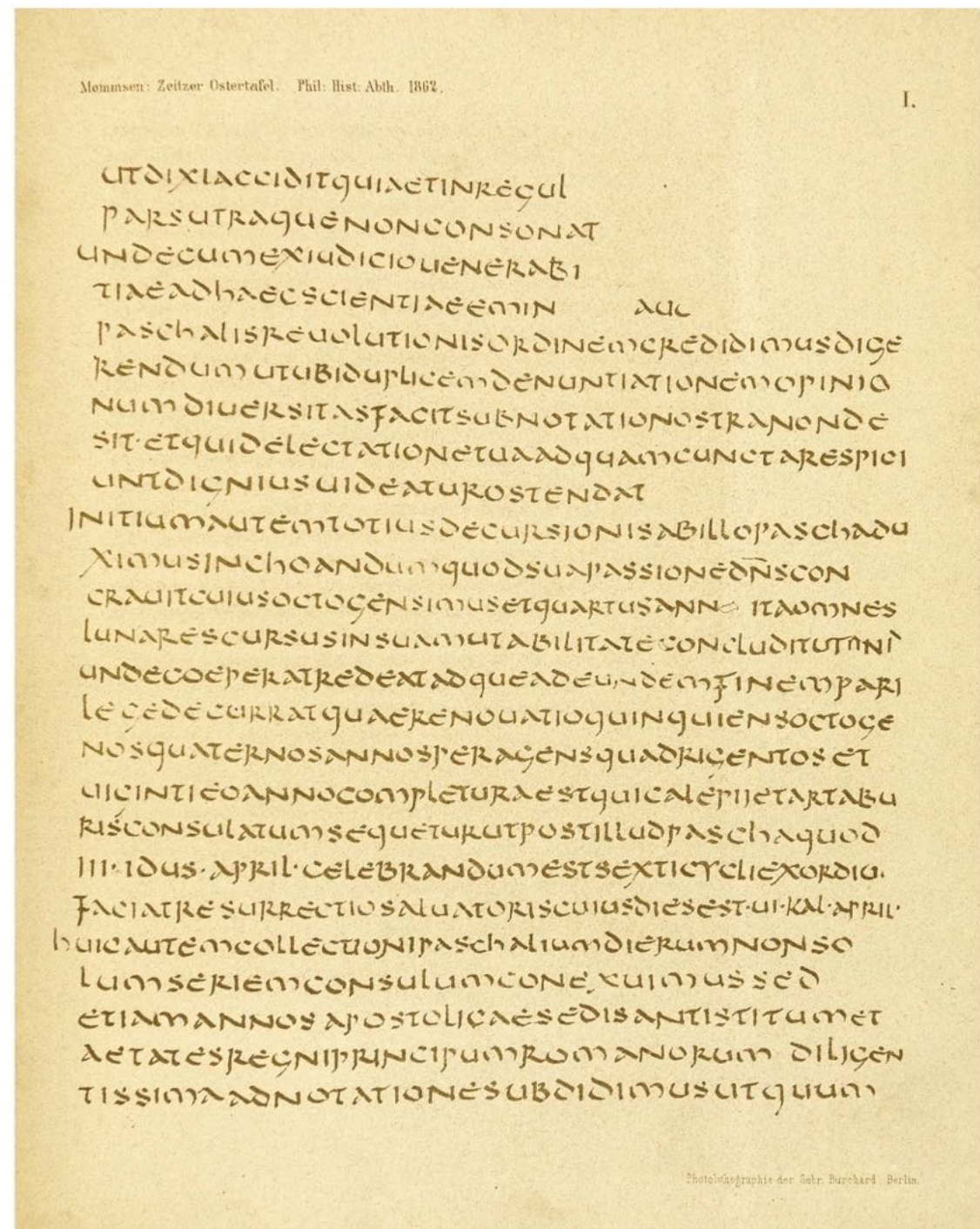
PRESENTED WITH THE PHOTOGRAPHIC NEWS, APRIL 20, 1866.



**BURCHARD BROTHERS**, Germany, *Photolithography* as early as 1862. Waterhouse (*The Photographic News*, vol. 14 pg. 247) visited in 1870: They did not want to disclose their method, "They said, however, that they worked direct on the stone and did not require a cliché (negative or positive transparency); their proofs were exceedingly sharp and good. Their apparatus was very simple; consisting of a large camera resting on a firm stand, at one end of which the plan-board was fixed. The lenses used were by Busch, of Rathenow. They operate in a partially glazed room, so as to have a direct light on the plan. Their lithographic presses were mostly of the French pattern, and Herr Burchard told me they were better than the German. ... I also saw a zinc plate in relief, which was very successfully done, and almost without re-touch; it was far superior to the work of the same kind I saw at Paris." Th. Goldschmitt points out, "The price of the reproduction of an engraving on stone is 37 fr. 50, and the printing of one hundred copies, 7 fr. 50." (pg.248) Goldschmitt also stated that they could print a tone on the paper to match the original as they have done with this example. **Planographic**



*Photographische Mittheilungen*, January 1868



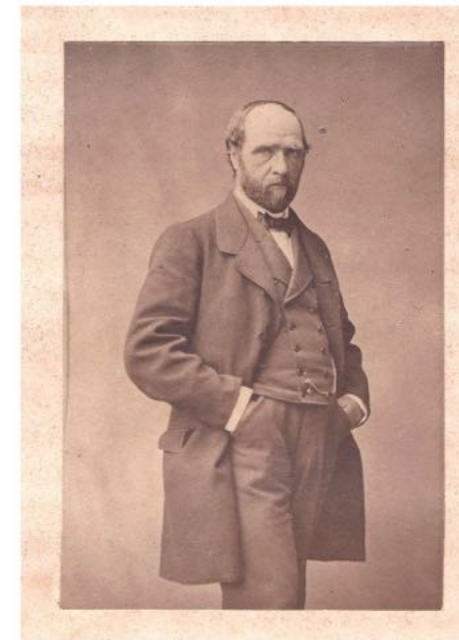
*Zeitler Ostertafel vom Jahre 447, 1863*

The Burchards also produced zinc relief plates for the typographic press in 1868. "Phototypie" Again they did not divulge their method for producing relief plates on zinc however the editor of *Photographische Mittheilungen* made this observation, "Probably the plate [zinc] was coated with a light-sensitive substance, exposed under a negative and then washed and etched. Mr. Burchard remarks that Paul Pretsch has already pursued similar methods." (vol. IV, pg. 110) The plate was printed 30,000 times with no degradation in quality. **Relief**



**Carbon printing** – A non-photomechanical photographic printing system requiring a separate exposure for each print. With the discovery of the difficulty of permanence in printing of silver based photographs a number of individuals sought a printing system that would be permanent. The first to produce prints using carbon based methods were Testud de Beauregard, Alphonse Poitevin 1855, John Pouncy 1858, and Garnier & Salmon 1858. Further work was executed by Fargier in 1860 where he discovered the transfer, of an exposed pigmented bichromated gelatin, to a second surface allowing the gelatin to be washed from the back preserving the image for transfer to a final support. In 1864 Joseph Wilson Swan perfected the carbon transfer process and produced the necessary carbon tissues for the process. This became the standard method of producing carbon prints. It was also this carbon tissue that became the standard photographic resist in Klíč's method of photogravure.

The Duc de Luynes prize for developing a permanent photographic print was awarded in 1862 to Alphonse Poitevin with secondary prizes awarded to John Pouncy and Garnier & Salmon. Each of the processes solved the problem differently. Poitevin (1863 English patent) prepared paper with perchloride of iron and tartaric acid, exposing this under a positive or a negative and then immersing the exposed paper into a bath of caseine or albumen mixed with a carbon coloring agent for a positive or a bath of gelatin with the coloring matter. After the above bath the print is immersed in a bath of water with hydrochloric acid which will clear the print. After which the print is washed in plain water. John Pouncy's method was to coat paper with a mixture of gum arabic, potassium bichromate, and vegetable carbon. This is exposed under a negative and then washed in water to remove the unexposed gum and coloring. This print has the ability to be easily transferred to stone or zinc for lithographic printing. Or to be left as is. The Garnier & Salmon method was to expose the surface coated with a relatively sticky substance and after exposure to dissolve away the unexposed material and then dust the remaining material with a carbon coloring agent. This was referred to as the "dusting on process."

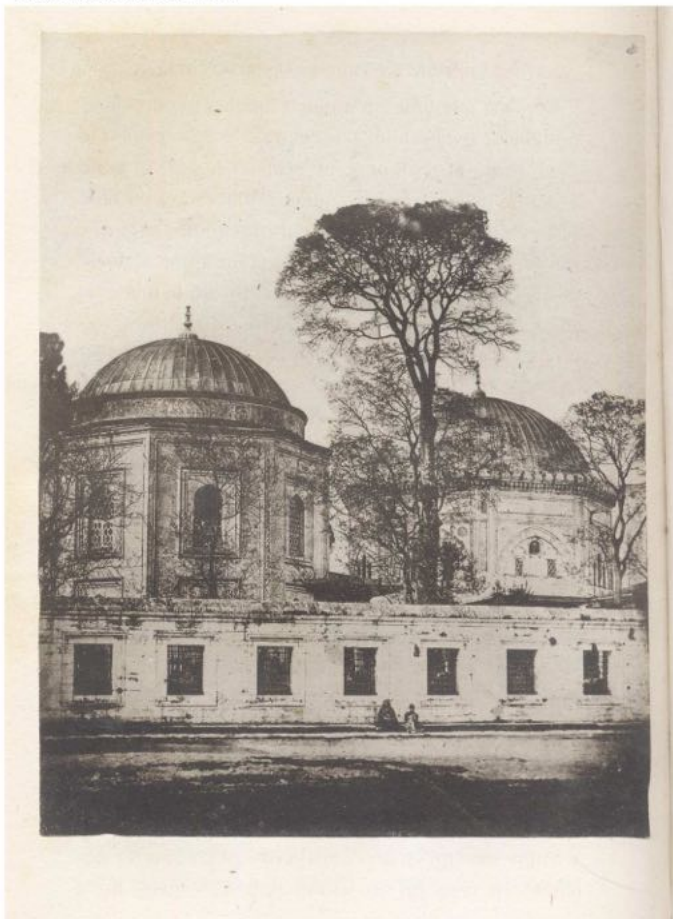


ALPHONSE  
POITEVIN

*Traité de L'Impression Photographique sans  
sels d'argent, 1862*

Steven F. Joseph

GARNIER & SALMON



Robiquet, *Manuel Theorique et Pratique de  
Photographie*, 1859

JOHN POUNCY



*Photographic Notes*, January 1863 - photolithograph made from a transfer to stone of a carbon print

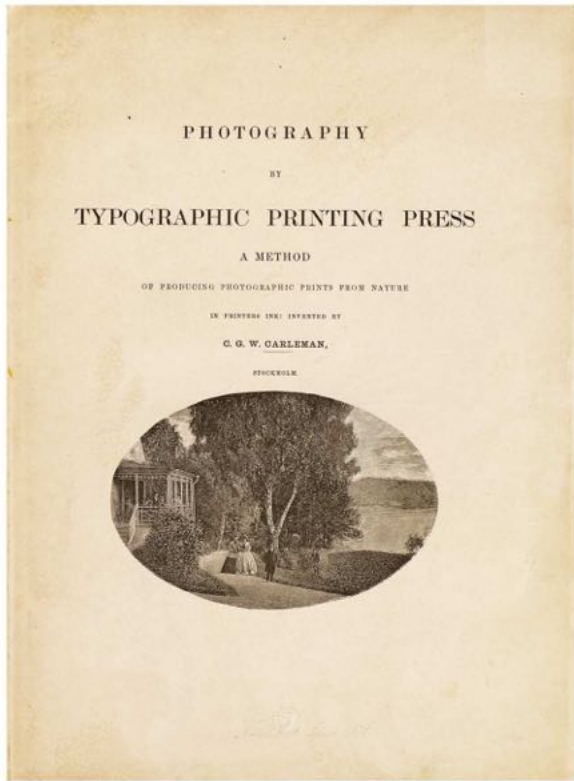
Graphic Arts Collection, National Museum of  
American History, Smithsonian Institution



**CARLEMAN, CARL GUSTAF WILHELM** (1821-1911), Sweden – Carleman produced typographic relief *Halftones* with a single line screen by a method he did not divulge, in 1871. These were published in Swedish periodicals, in relief and with the text, but they did not attract much attention. He attempted to sell his process by publishing an illustrated pamphlet in 1871 *Photography by Typographic Printing Press a method of producing photographic prints from nature with printing ink*. In it he wrote: “Cheapness [of printing] cannot be obtained until a method has been discovered of pressing photography into the service of typography. This might be accomplished by employing photography in the production of tablets or plates which, like wood cuts, might be printed in the text, and admit of as many impressions as metal casts taken from wood cuts. It is only by this means that photography can penetrate to the masses of the people, and enable them to view with mathematical accuracy, exterior objects as they are seen by the human eye. When this is accomplished, photography will prove the most powerful lever for elevating the real and universal culture of humanity; and not until then will it be possible to appreciate the full and immeasurable value of this remarkable art. This book contains proofs of the manner in which I have endeavoured [sic] to solve the above problem. The method is simple, cheap, and certain. Nothing more than an ordinary negative photographic impression is needed to produce the requisite printing table or plate, both quickly, and at a price incomparably cheaper than that of ordinary wood cuts. The invention is open to sale, and offers for Letters Patent for any particular country may be forwarded to me; subsequently to which, if the patent is purchased, I am willing to give complete and practical instruction in the method” He also tried to market the method by sending prints to London and visiting Paris to try to interest engravers such as Goupil. As a professional photographer outside of the printing industry he was not able to commercialize the process. Carleman’s single line screens were consistent at 100 lines per inch. By 1877 he produced an illustration for *Le Monde Illustré*, which was a cross line halftone of about 90 lines per inch. **Relief**



Ny Illustrerad Tidning, December 30, 1871



Swedish National Library



Photography by the Typographic Printing Press, 1871

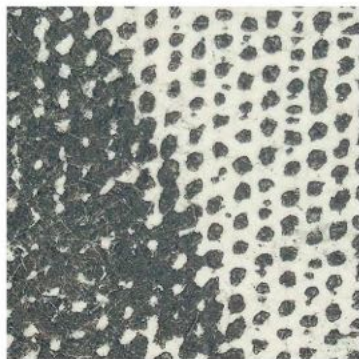
Swedish National Library



Ny Illustrerad Tidning

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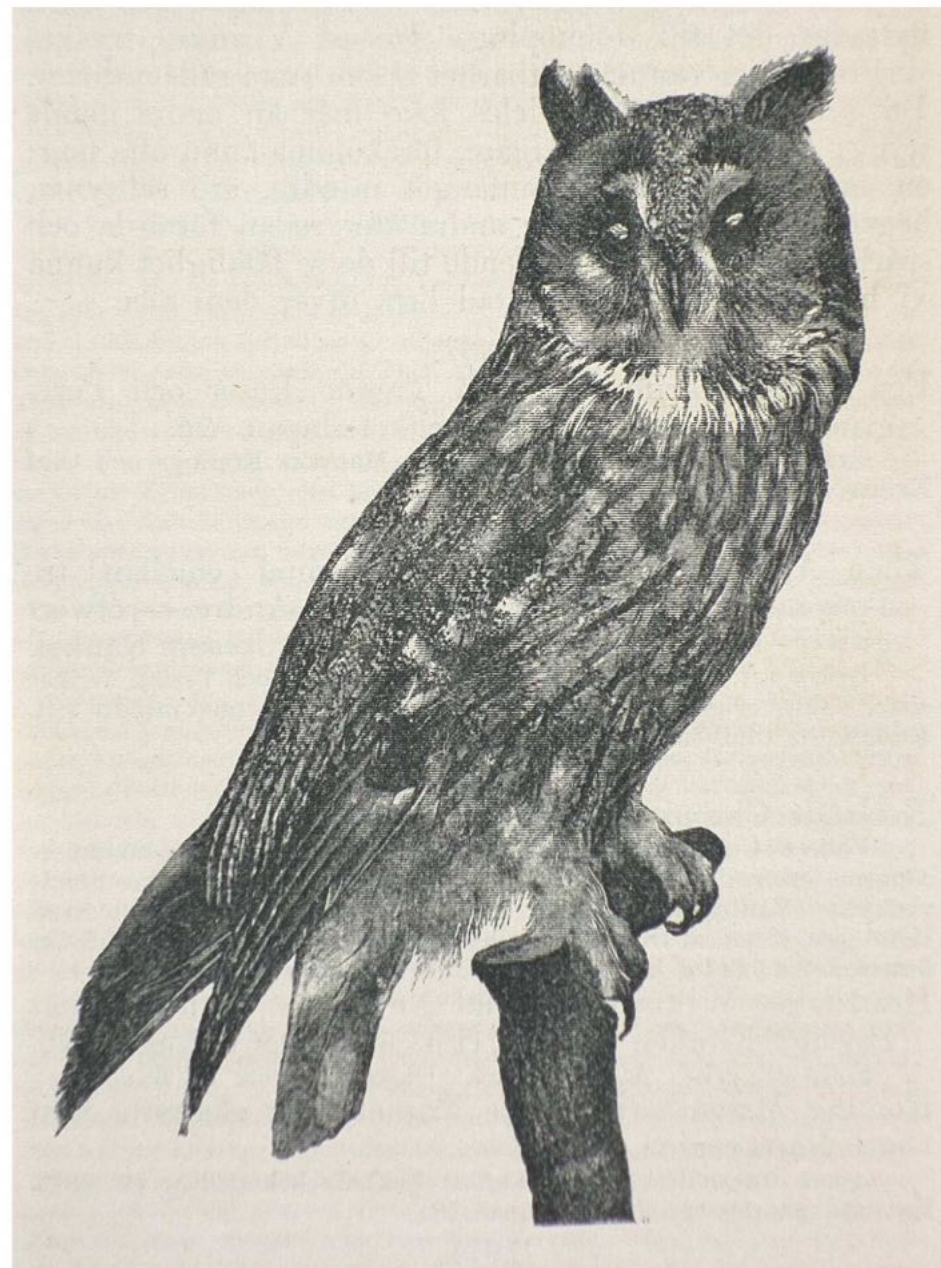




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*Le Monde illustré*, March 10, 1877



*Nordisk Boktryckeri-Tidning*, July, 1871



*Paris Ruiner*, 1871



15X



**CHEMIGRAPH CO., NATIONAL, U.S.** — Two color (Duotone) *Halftone* method, 1893. This method used two screened images one for each color with one for the highlights and the other for the shadows. “...a peculiar and pleasing effect being obtained by two printings in different inks complimentary to each other, but printed slightly out of register.” (*American Process Worker*, the New York photo-mechanical exhibition. 1895, pg. 35) Also see page x for an example using a system like this one. **Relief**



COPYRIGHT 1892, BY C. D. ARNOLD.

CHEMIGRAPH. PATENTED MARCH 21, 1893.

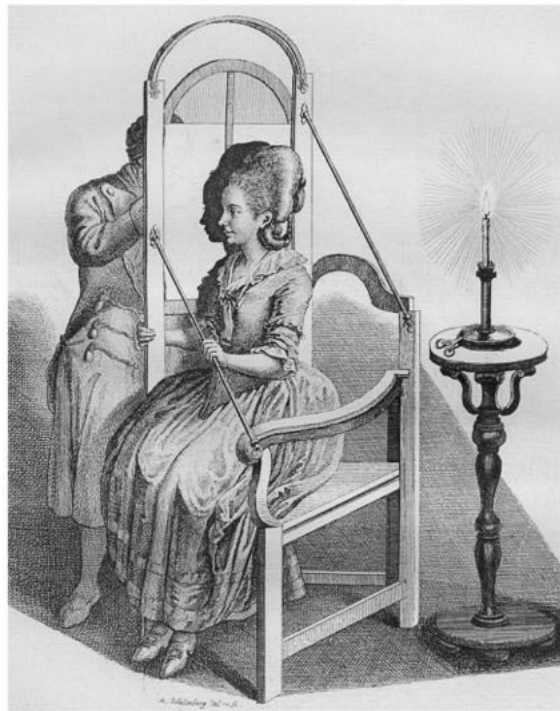
#### FISHERIES BUILDING.—FROM THE SOUTHWEST.

Architect, Henry Ives Cobb, of Chicago. The main building is 363 by 163 feet, and the annexes have a diameter of 135 feet. The floor area is about three acres. The architectural details are rich and elaborate, and are ingeniously adopted from various forms of marine life.

*The World's Columbian Exposition, Portfolio of Views, 1893*



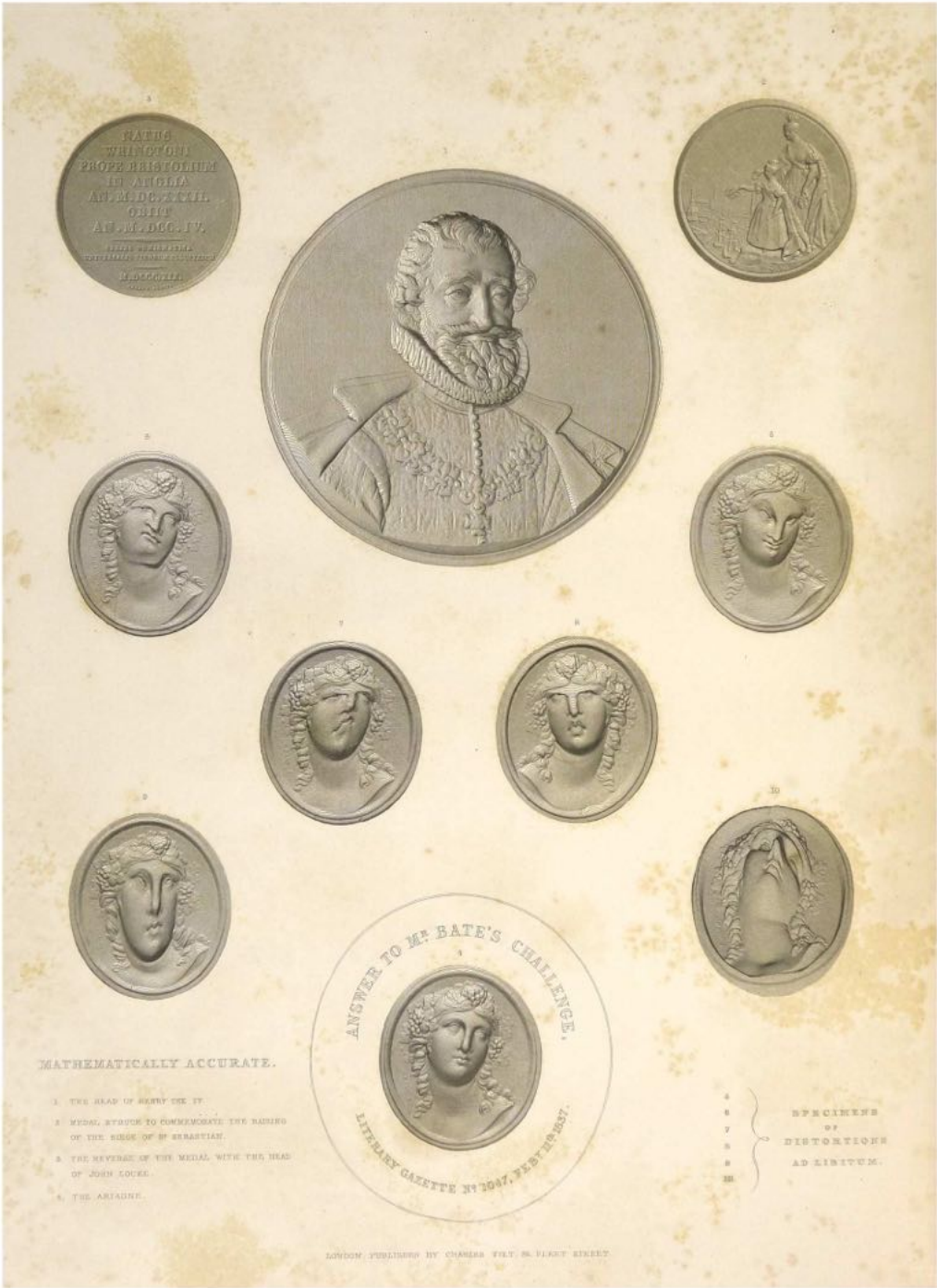
**CHRÉTIEN, GILLES-LOUIS**, (1754-1811), France – “*Physionotrace*,” Invented in 1783-1784. It is a system of copying the illuminated shadow outline of a person’s face: Then transferring the outline drawing to a plate using a pantograph to reduce it for printing, finally, by hand filling in the details to produce the final engraved plate. **Intaglio.**



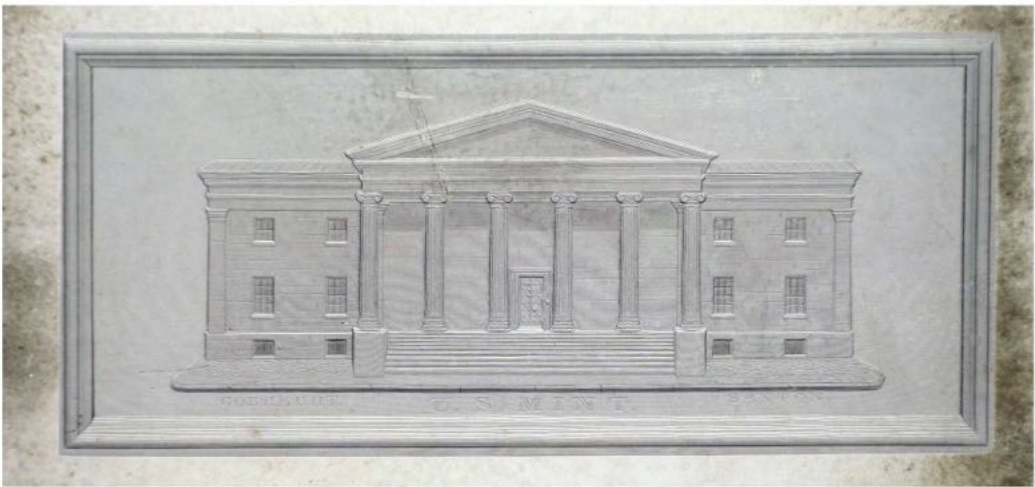


**COLLAS, ACHILLE** (1795-1859) - Perfected a ruling machine to create images from medals and coins. *Medalic Engraving*. As the needle of a pantograph moved across the uneven surface of a coin the tracing point would engrave an uneven line that would translate as a representation of the coin's surface. These images were quite effective, almost photographic; they could be as high as 300 lines to the inch. **Mr. Bate** in England claimed priority but Collas was the true inventor. The illustration below is Collas' answer to Bates's challenge on accuracy.

**Joseph Saxton** (1799 – 1873), of the Philadelphia mint, used the machine, with his own modifications, to translate a bas relief copy made by Christian Gobrecht, from Saxton's original daguerreotype into a medal engraving. 1842. **Intaglio**



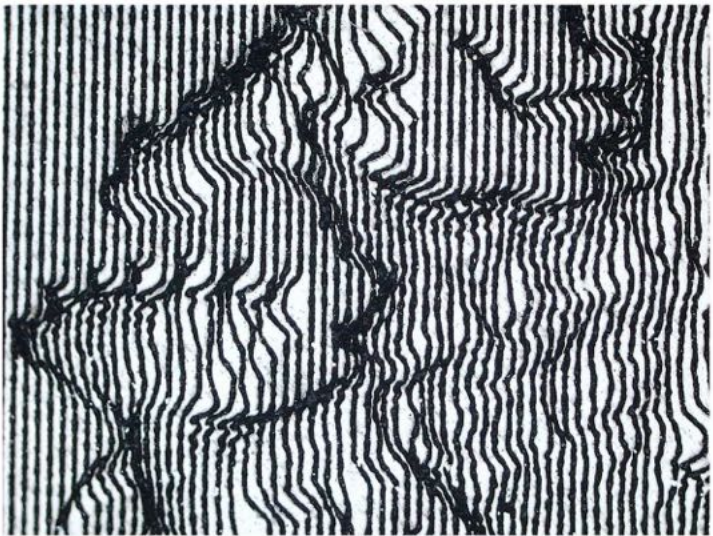
Collas, *The Authors of England*, 1838



*The Manual of Gold and Silver Coins of all Nations*, 1842



*The Manual of Gold and Silver Coins of all Nations*, 1842



15X



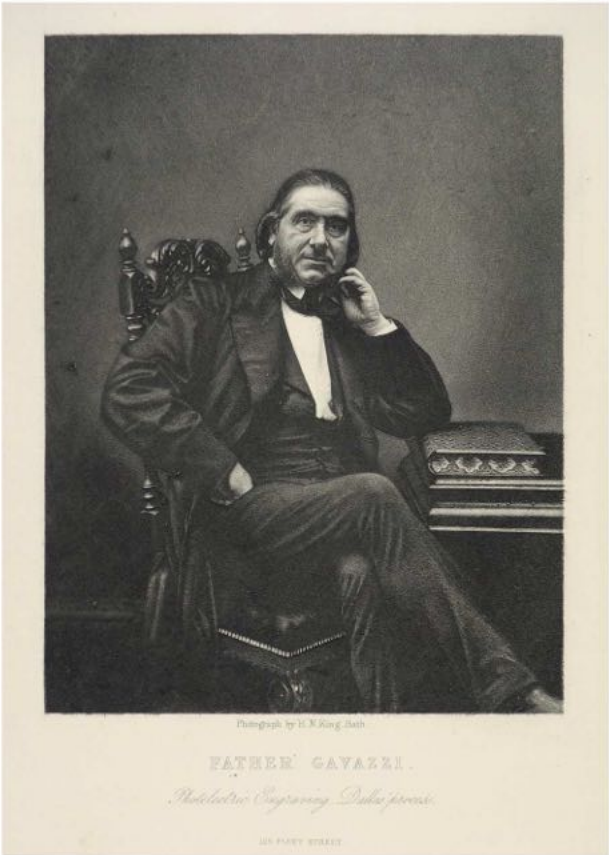
**COMTE**, France, "*Neography Comte*" ca. 1861. "The process of M. Comte, for producing a typographic plate, is somewhat similar to that of M. Dulos. He used the following solution: Gum Arabic, Zinc-white, Avignon-yellow. Mixed to a convenient consistency. This solution is placed on a zinc plate, which has been carefully prepared. The lines are removed with a quill or an ivory point, leaving the naked metal. Lithographic ink is daubed into the lines, and the plate is cleaned with benzine, so as to remove all of the varnish, after which the plate is dampened and inked anew. The ink is received only by the lines which have previously been in contact with the greasy ink. A resinous powder is now carefully sprinkled on the greasy ink, and the plate is subjected to the action of dilute acid, until the desired relief is obtained. The greasy resinous varnish protects the lines of the drawing from the action of the acid." (Pettit pg.52)



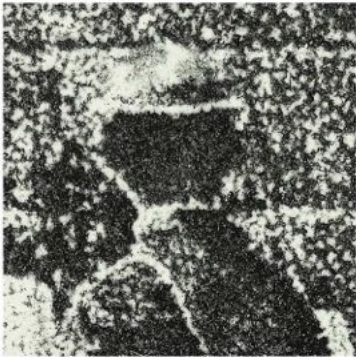
*L'Art Pour Tous*, 1861



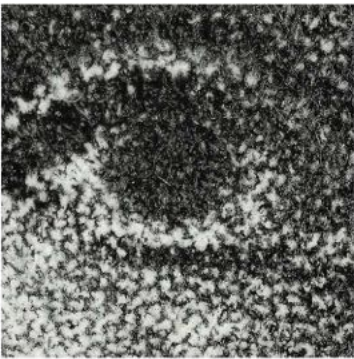
DALLAS, DUNCAN CAMPBELL, England — *Photo-electric engraving*, circa 1863, (worked from 1864 into the 1880's) (modified **Pretsch** method), As explained by Dallas in 1863, "It was after experimenting some time with photogalvanography that it occurred to me to strike out in a different direction. Anyone acquainted with engraving is aware that aqua-tint and 'chalk,' or stippling, produce fine grain, half-tones, and detail. The problem I set myself was how to imitate this combination....It is something similar to this [aquatint grain] which I have succeeded in imitating, with peculiarities *sui generis*, by photography and the electrotype. I can also, as it were, modify the size of the dots, obtaining them so fine as to carry almost microscopic detail; but if too fine there will be deficient depth in the dark. In this, as in all things, there is a happy medium, and this I believe I have secured. I commence with a negative: this should be reversed. From the negative a positive proof is taken: this I prefer not toned, but merely fixed in the sepia colour of the 'hypo.' I cover the negative, which must be varnished with a material from which I obtain a latent positive. This latent positive I turn by a simple process into a suitable negative, and it is with this negative that I subsequently manipulate....If necessary, I can electrotype direct upon my material; but, as this might lead to the discovery of part of my process, I prefer to make a different kind of matrix." (*The Photographic News* 1863, pgs. 363-364). **Intaglio**, *Dallastype*, *Dallastint* circa 1885, was a typographic modification of his process. Dallas claimed all of these processes as his. Dallas was originally the manager of the Photo-Galvano-Graphic Co. of Pretsch. A falling out had Dallas dismissed. **Relief**



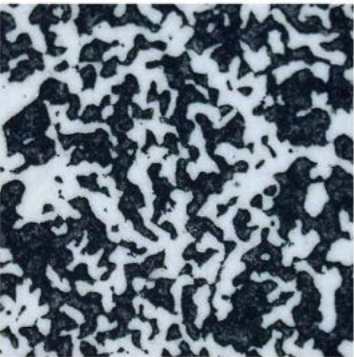
News of the World



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The Photographic News, 1864



The National Encyclopedia, vol. X



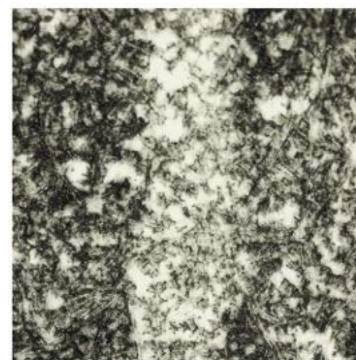
**DAWSON, ALFRED**, England, Dawson was a well-known artist and etcher who developed a *Photogravure* method in 1871 which was not patented, as was his 1872 non photographic etching method. The process as explained by H. W. Rowland (*Anthony's* 1891 pg. 182) was that a fully exposed and developed wet plate negative was placed on a leveling stand and coated with a solution of gelatin and when dry was stripped from the plate and the film side was covered with a very thin coat of varnish. While the varnish was still tacky it was dusted with a metallic powder. A mold was next made by coating a glass plate with bichromated gelatin and then exposed under the grained negative for two to four hours in the shade. After exposure it was washed free of the bichromate and allowed to dry. This was then coated with a deposit of gold to render it conductive. The edges covered in tin foil and the back with wax. This was connected to a Bunsen's battery but just before the mold was placed in the copper solution it was dipped into tepid water for a minute or so and then carefully placed in the copper solution so that no bubbles would form. When well covered with copper it was transferred to a larger vat with a modified Smeis'(sic) battery and allowed to remain for four to six weeks. When it reached the desired thickness it was removed and the copper plate was separated from the glass-gelatin mold, filed smooth, trimmed and beveled. By the late 1880's Peter Henry Emerson (*Naturalistic Photography* pgs. 208-9) noted that Dawson's plates, in conjunction with Walter L. Colls, were bitten rather than grown and so possibly only plates prior to about 1880 were done in the original process. It is likely that only photogravures after art were done in the original process. **Intaglio**



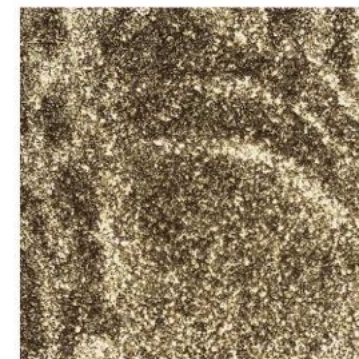
An example of this image was exhibited in Boston by Koehler in 1892



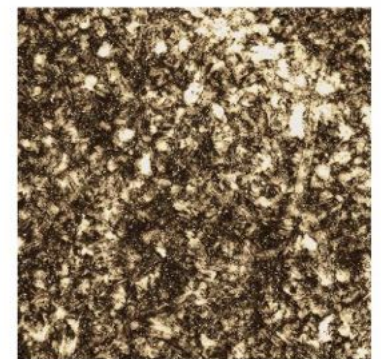
Brothers, Photography, 1892  
 Photogravure by Dawson



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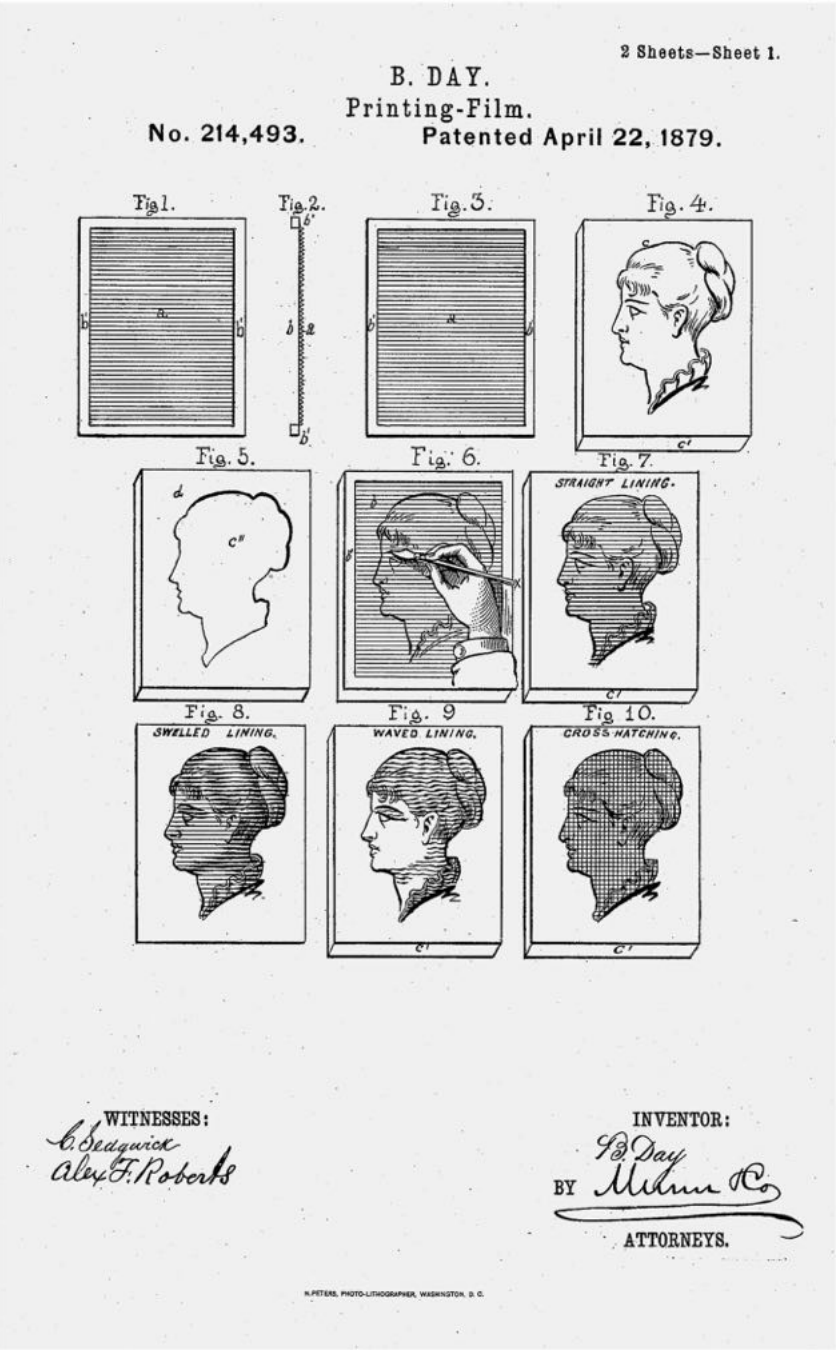


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**DAY, BENJAMIN HENRY, JR.,** (1838-1969), US, Day invented a system of adding shading to areas of drawings by creating same size dots that were spaced at different intervals to create the illusion of different tones; they could be shaped to fit an area of the drawing. These were popular from the time of the invention in 1879 to well into the middle of the 20th Century. Today they are known as **BEN-DAY DOTS**. **Non-photographic.**

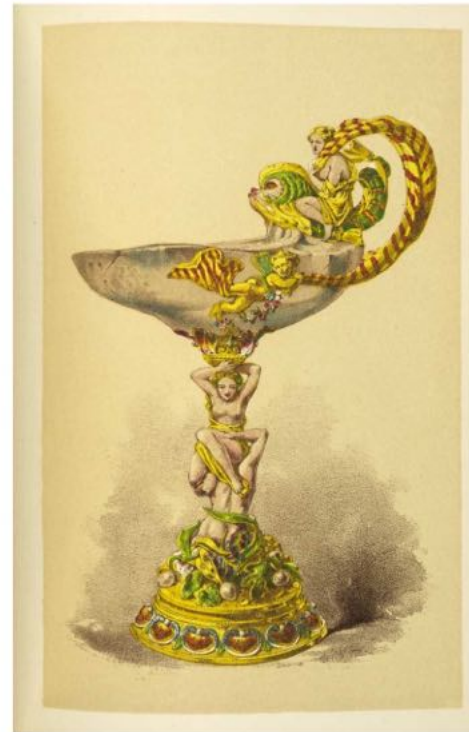
The example shown, of an advertising card, uses more than one Day Shading Medium and has been enlarged to be able to see them clearly. William Augustus Leggo used his line screens on art work to create a similar effect as early as 1870



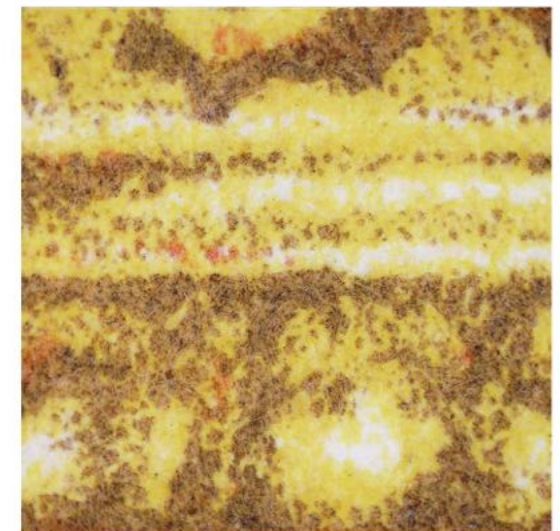


**DAY & SON**, England, lithographers to the Queen, began to print *Photolithographs* overprinted with color in 1866, not discussing their methods; these were printed in the short lived magazine *Nature and Art*. Day & Son was bought up in 1868 and continued as 'Vincent Brooks, Day & Son.' Day & Son in 1857 printed a book produced for them by **Francis Bedford**, the lithographer and photographer, *The Treasury of Ornamental Art*, many of the plates are very clearly not hand drawn. The title page states "Photographed from the originals and drawn on stone by F. Bedford." In the introduction I. C. Robinson writes "Every specimen was specially photographed for this work, the unerring fac-similes thus obtained being then copied on stone, with an amount of care and attention dictated solely by the endeavour to carry the art to its extremest limits." "Bedford began working as a lithographer in the 1840s, before he took up photography. From about 1850, he was employed by Day & Son, 'lithographers to the Queen', and worked on some of the most important illustrated art books of the nineteenth century." (Royal Collection Trust) Under **Robert Macpherson's** method (pg. 149) find an interesting reference to the possible use of his method in chromophotolithography that ties to this work. **Planographic**

Three examples from *The Treasury of Ornamental Art* two of which strongly indicate Bedford's use of photolithography.



Clearly hand drawn



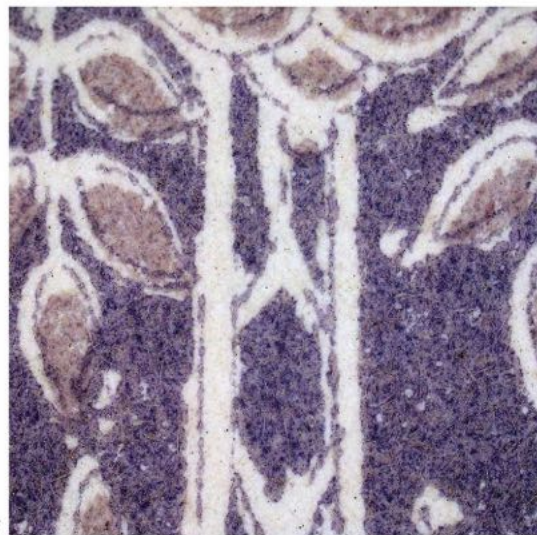
15X





Nature and Art, July 1, 1866.

*Nature and Art*, 1866



15X



**DONNÉ, ALFRED** (1801-1878), France - Etched daguerreotype, 1840. Joseph Berres (*Monthly Chronicle*, pg. 556) states, "M. Donné, in Paris, was also occupied with the same object, viz. that of endeavoring to etch the heliographic pictures; and that he had laid the proof sheets of a plate, from which he had taken twenty impressions, before the Institute at Paris, and the Imperial Academy at St. Petersburg. From the same journal I also learned that M. Daguerre had loudly expressed his displeasure upon the subject; and that he had declared, at a meeting of the Institute, the utter impossibility of ever attaining any perfection in etching, and, consequently, in multiplying, his pictures." Then Berres continues, "It was only at the latter end of May we were informed that M. Donné had sent a sealed packet to the Institute in Paris containing his secret of etching from the daguerreotypic plates, but accompanied by the condition that the packet should not be opened until the French government had informed him what remuneration he was to receive for his discovery; so that the public is still in ignorance as to the degree of perfection which M. Donné has reached in his invention." Niépce de St. Victor (1856 pg.VII) noted that Donné surrounded the image area of the plate with varnish and then covered the plate with an etchant in four parts water which he allowed to etch for some minutes. The acid biting into the silver without affecting the whites. Once he thought the bite was enough He bathed the plate in water and removed the varnish. Once it was dry it was ready to be printed. However no more than 40 prints could be achieved. **Intaglio**

Dr. Alfred DONNÉ (French, 1801-1878)

Bust of Dionysius, late 1839

Photogravure

15.9 x 11.9 cm plate mark (plate clipped on left corners) on 27.5 x 17.9 cm paper

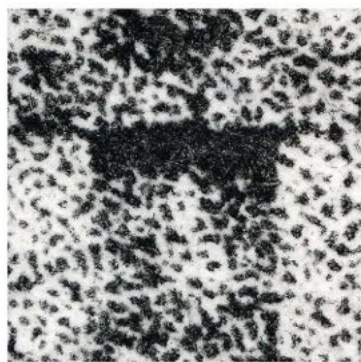
"Lerebours" and "10" printed in reverse on plate. Inscribed "Essai de photogravure par M. Donné" and "9." in pencil on paper.



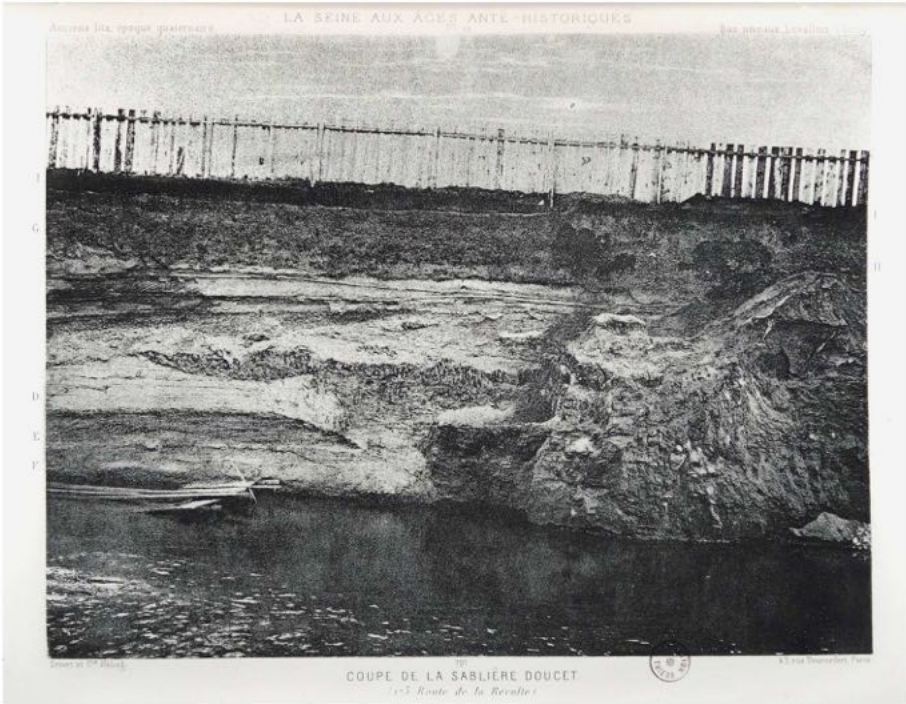
New York Public Library



**DRIVET, FRANÇOIS**, France — A system of both a halftone line screen *Photogravure*, and a random dot halftone photogravure, circa 1869. “The process of Drivet for engraving plates is not described, but the principle of it can be gathered from the specification of the patent. At the same time that the image of the object is thrown on the prepared collodion plate in the camera, the image of a sheet of white paper, covered with closely ruled black lines, is thrown upon the same plate, and at the same time, through another opening from an exactly opposite direction. A negative is thus obtained which would print a positive picture, have the required lines in the high lights obliterated, and intensely developed in the deep shadows. A gelatin picture printed as in woodbury’s process, gives the matrix from which an electrotype plate is produced, to be printed from as an engraved copper plate. It will be seen that we have here the very elements of mezzotint engraving, and the results are undoubtedly the most beautiful and practical yet achieved.” (1867 report of the Paris commission, Waterhouse) **Intaglio**



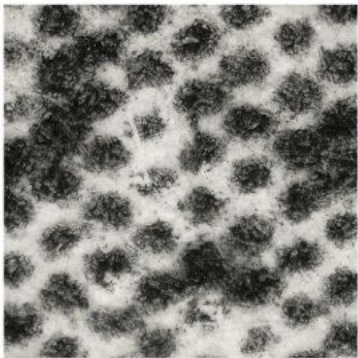
15X



*Histoire Generale de Paris, la Seine, 1869*



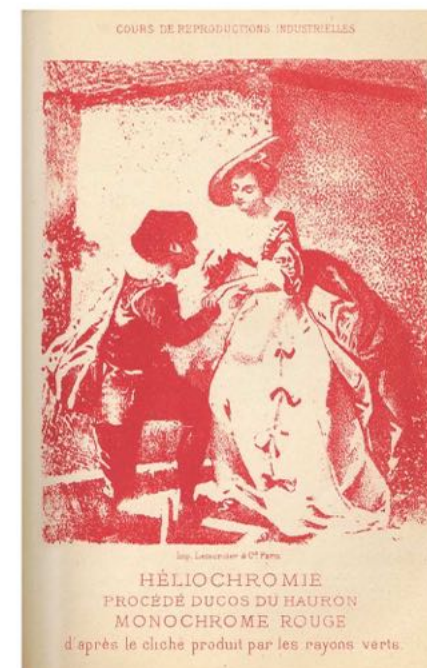
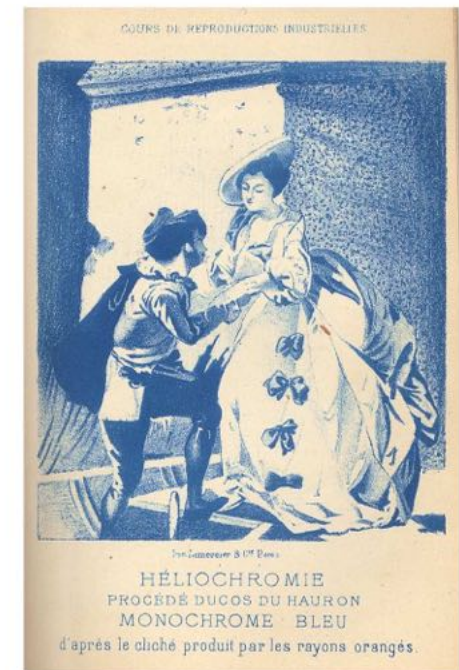
15X



45X



**DUCOS du HAURON, LOUIS ARTHUR**, (1837 – 1920) France, Ducos du Hauron patented his concept of color photography in 1868 and published his treatise *Les Couleurs en Photographie, solution du problème*, in 1869. He at first considered the primary colors to be Red, Blue, Yellow but by the time he published he had settled on Red, Blue, Green. The application to printing involved using each of the primary negatives, transferred to a plate, to print using the secondary color for each. The red exposure negative printed with blue ink, the blue negative with yellow ink and the green negative with red ink. The problem initially was that the emulsions of that time were only sensitive to the blue part of the spectrum so that exposure for the other two colors was problematic. Vogel was the first to discover dyes to be placed in the camera emulsions to make them sensitive to the green and red wavelengths of the spectrum in 1873 and 1884. (See also Blanquart-Evrard) The plate here was printed in 1882 by Lemercier lithographically in Leon Vidal's *Cours de Reproductions Industrielles*. Eventually the method was used for every printing system.

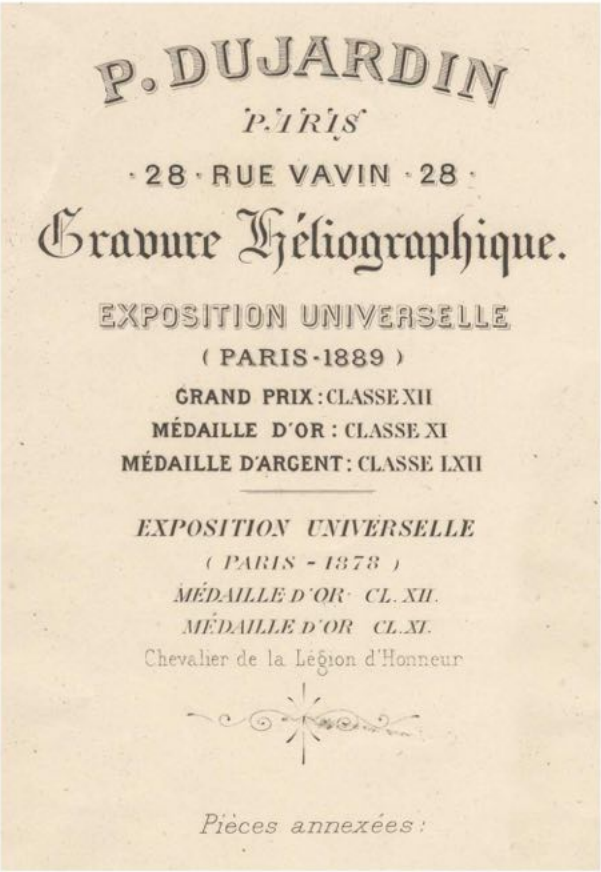


Vidal, *Cours de Reproductions Industrielles*, 1882

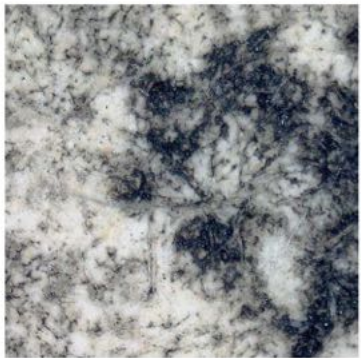


**DUJARDIN FRÈRES**, France – *Heliogravure* Dujardin frères, in Paris, modified the Garnier system by using three separate diapositives, one for the highlights, one for midtones and one for shadows. Each was exposed in register and etched separately on the plate with different strengths of ferric chloride, the weakest for the highlights and the strongest for the shadows. They also used a resinous ground adhered to the plate by heat and over this a bichromated gelatin sensitive layer. This was done for each of the three exposures and etches. (Dujardin also used a coarser system for inexpensive reproduction, for this see Parker’s Rome books). Dujardin, along with Goupil was a major producer of photogravures in France. **Paul Dujardin** (1843-1913) purchased the business from Alexandre Gustave Dujardin in 1875. **Intaglio**

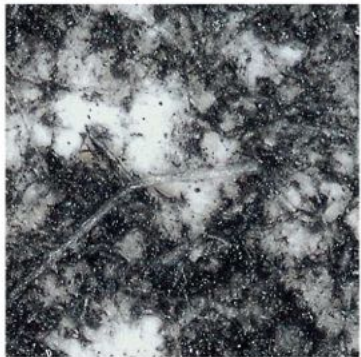
Dujardin also created a process titled “hyalograph” ca. 1892. This process was a method of transferring a drawing on a specially prepared glass plate to copper for printing. The artist drew with pencil, stump and brush with diluted India ink onto a glass plate polished with a very fine grain. This was placed in contact with a “sensitized etching ground,” exposed, etched and then printed from. It produces an image of rich tonality and detail. (Hamerton, *Man in Art*, pg. xvi) It should be noted that Peter Henry Emerson remarked that he did not like that Dujardin and Goupil retouched their plates. **Intaglio**



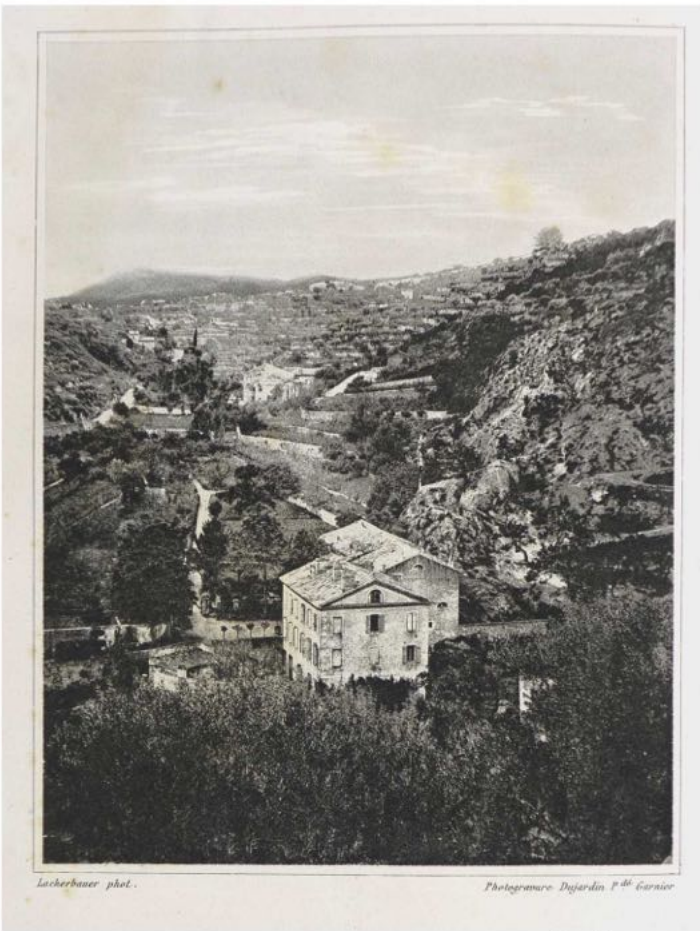
45X



90X

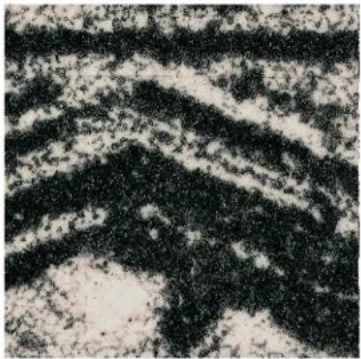


Parker, *The Archaeology of Rome*, vol. I, 1874

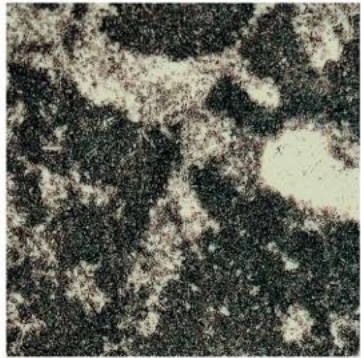


Etudes sur la Maladie des vers à soie, 1870

Garnier process

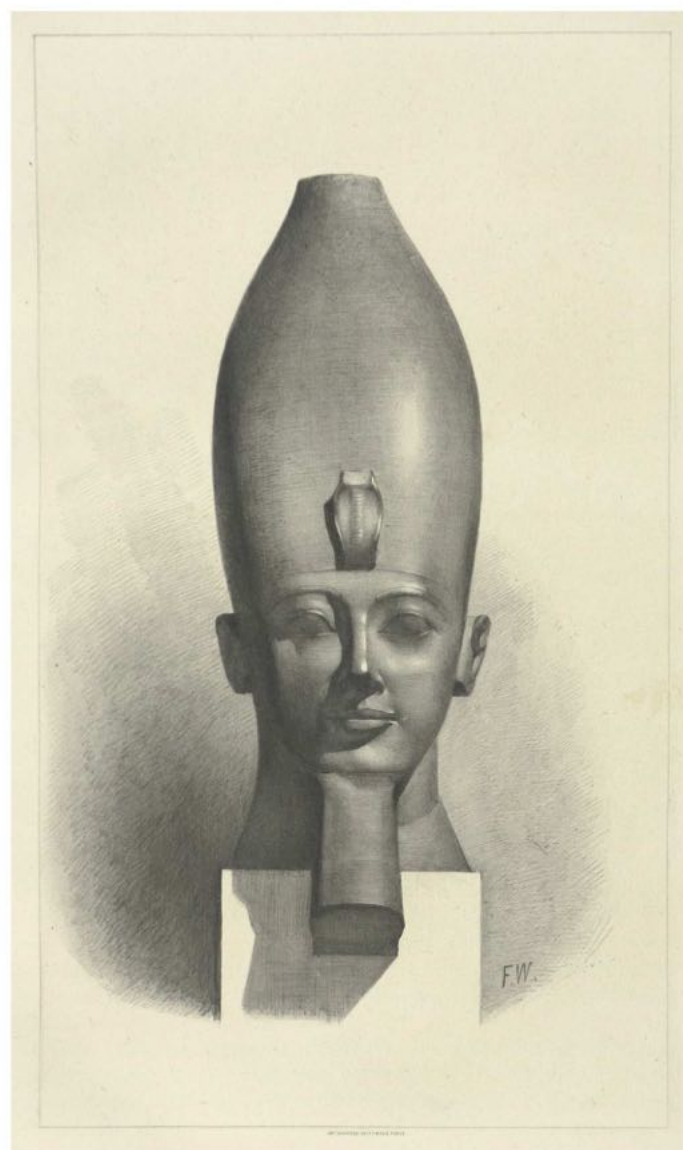


15X  
Porta



15X  
Amphitheatrum



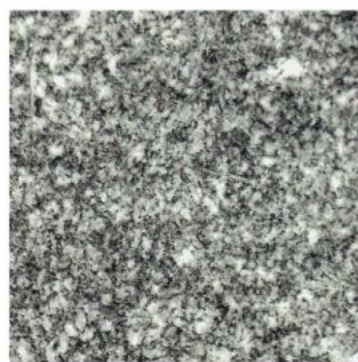


HYALOGRAPH

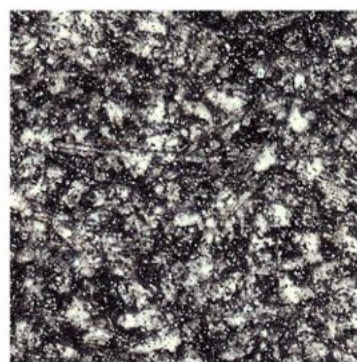
Hammerton, *Man in Art*



*Paysages et Monuments de la Bretagne*



45X Hyalograph



45X

Roulette to add texture



Halo caused from severe dodging





**DULOS**, France, “Procédé Dulos” ca. 1864. “A plate of copper is covered with the following mixture: Ordinary Benzine, Caoutchouc [vulcanized natural rubber], Zinc-white [all] to saturation. This coating can be easily cut with steel or ivory points. The drawing finished, the plate is plunged into an iron bath, which deposits the iron only on the uncovered copper. If we desire to obtain an engraved plate, the varnish is removed and the plate is silvered. The silver is deposited on the copper, to the exclusion of the iron, by pouring a dilute solution of sulphuric acid on the plate. The iron is eaten out, and, by treating the plate with the ammoniacal sulphate of mercury, the relief of the silvered parts is slightly increased, and we have the lines in intaglio. A relief plate may be obtained of the same drawing by depositing silver in place of the iron.” (Pettit pg. 51)



*L'Art Pour Tous*, vol. III, 1863



**DUMONT**, France — Grained relief process 1854 as published in *La Lumière*. Leon Vidal (*Cours de Reproductions Industrielles* pg. 71) writes that Dumont took a zinc plate carefully leveled and grained with fine sand. Then using a lithographic crayon drew on the plate and covered it with a dusting of bitumen which was heated and melted. He then etched the plate with a solution of copper sulfate at 15 degrees. This plate could then be used typographically. Writing in *La lumière*, Nov. 1855 Dumont states “The plate is then bitten in by means of a galvanic battery... I have also obtained photographs in relief...” **Relief**

The Lithophotographie shown may be an example, slightly cropped, of what Dumont used to create his plate. It is placed here to show the difference in the two contemporaneous methods.

*La Lumière*, 1854

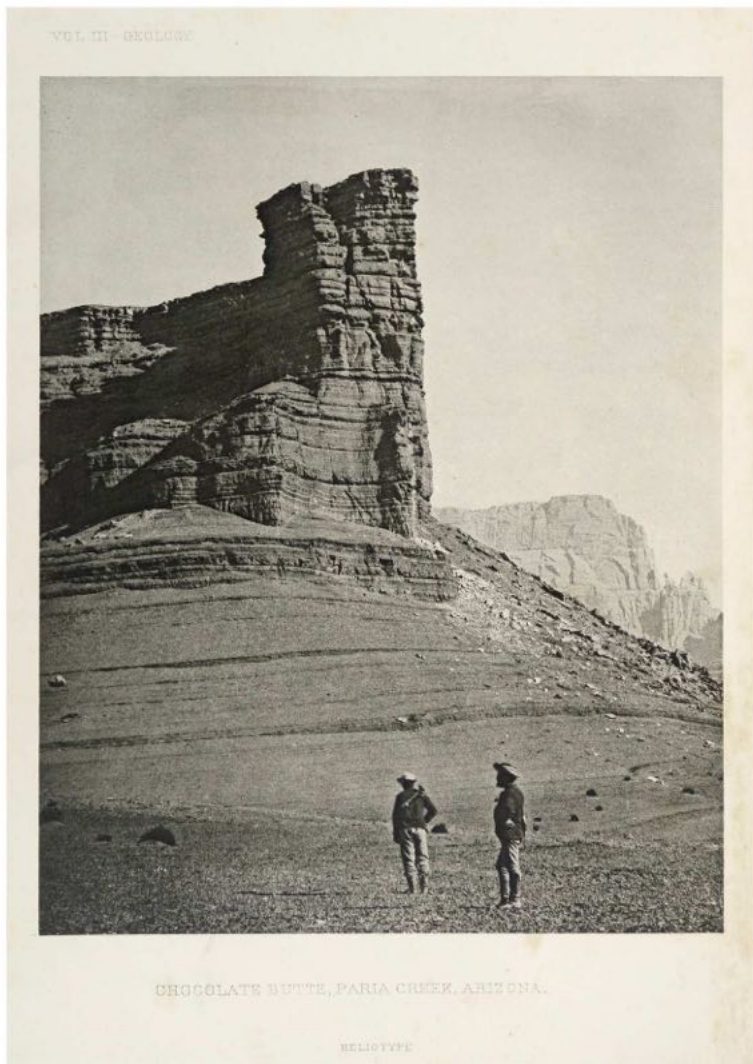


*Société D'Encouragement*, 1854





**EDWARDS, ERNEST** (1837-1903), (worked 1871 through the early 1900's) England/U.S. — “*Heliotype*”, “...some perfectly flat surface is first coated over with wax; upon this is then poured a hot solution of gelatine, after which bichromate of potassa is added, then burnt alum or tannin, to make the surface fine and durable. After it has hardened, the sheet is stripped off and set up in an achromatic [without light] chamber to dry. Then the wax is removed, and the sheets are ready for the reception of light under the ordinary photographic negative in the ordinary photograph printing frame. The sheet of gelatine is then forced by pressure under water upon a flat plate of metal; and when the water has been pressed out, it is ready for printing in any ordinary printing press. Several thicknesses of ink are used, and for the deepest shades a little oil is added, which will adhere only to the deeper shadows. The plate must be kept moist in printing, and if moistened with coloured water or Indian ink, a picture resembling a Rembrandt or Indian ink picture can be obtained.” (*The Photographic News* 1875, vol. 19, July 16, pgs. 340-341). Waterhouse (pg. 500) adds: “In this process the peculiarities were the use of chrome alum for hardening the gelatine; the separation of the colloid film from its original support, by which perfect contact with the negative was secured, as well as less risk of breakage of the latter; the subsequent transference of the film to a metal plate, by which the liability to breakage of glass plates in the progress of printing was obviated; and, lastly, the substitution of vertical instead of a scraping pressure in printing, by which the gelatine films were not exposed to injury by wear and scraping of the surface.” 1869. Edwards eventually left the Heliotype Printing co. and started the New York Photogravure Company where he produced photogravures and collotypes using the “Indotype” method of Thomas Roche. Edwards also experimented with three color photography and collotype in 1890's calling his prints “chrome-gelatine.” **Planographic**

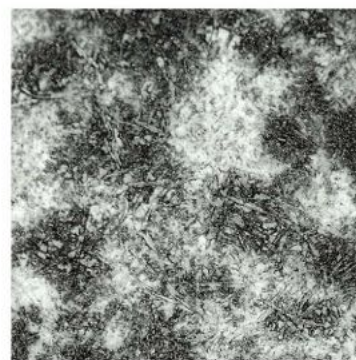


Note that even at 90X magnifications Heliotypes do not show a typical collotype reticulation pattern. However by the 1880's American Heliotypes started to also have conventional reticulation patterns.

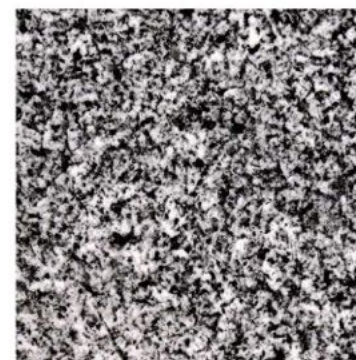
Report Upon Geographical and Geological Explorations and Surveys West of the One Hundredth Meridian, vol. III, Geology, 1875



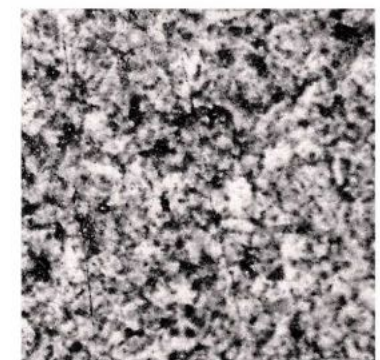
Art Pictorial and Industrial, vol.III, 1872



45X



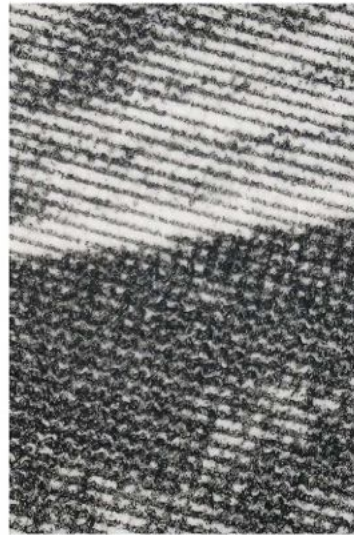
45X



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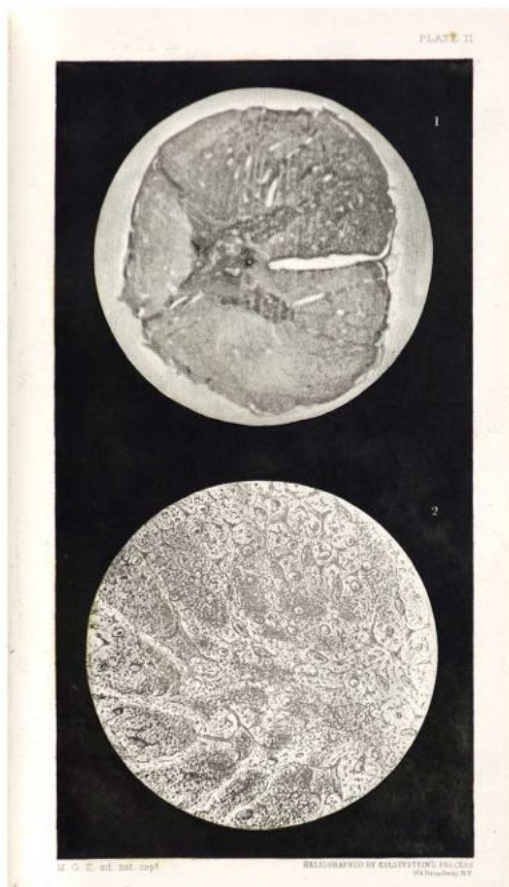
**EGLOFFSTEIN, FREDERICK WILHELM VON**, (1824–1885), Germany/U.S. (worked 1865 to about 1869) — “*Heliographic engraving*” intaglio halftone, ruled screen, wavy and straight, in 1865. He formed the Heliographic Engraving Company in NYC, with each employee knowing only one step in the process to keep it a secret. One of the unusual features of his plates is that they will use more than one type of line screen in the same image. The Heliographic Engraving Co., was the first company to utilize the halftone method as a distinct business. In a reminiscence written by John Sartain (*Wilson's* pg. 132) about his work with Von Egloffstein in 1861, he stated “His method consisted in photographing on a sensitive coating of asphaltum, through the glass screen plate ruled in one direction only, and also through the glass photographic copy of his subject; then dissolving out the unlit portions, and etching into the steel with acids, to produce the intaglio printing surface.” And also, “Baron Egloffstein and I differed much in our opinion as to the proper number of lines to the inch for the screen-plates. He wanted them made over 250 lines to the inch, which I told him could not be well printed with the ink in common use. My arguments and the proving of his plate induced him to let me make the latest screens, about 220 lines to the inch; but he contended that special ink should be made, ground fine enough to print anything that could be engraved.” After the work was done in 1861 Von Egloffstein entered the Union Army and did not resume work on his method until 1863. John Sartain was America’s premier mezzotint engraver from Philadelphia. Louis Levy stated that John Sartain’s son created the ruled screens under his father’s supervision. **Intaglio**



Sunnyside 15X

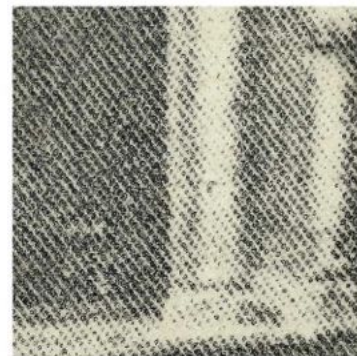
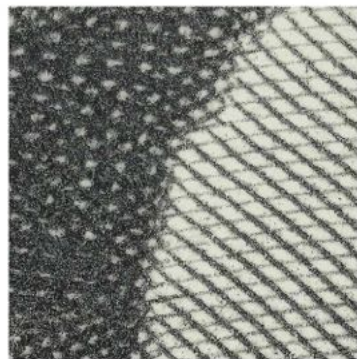


Beers, *Atlas of New York and Vicinity*, 1867

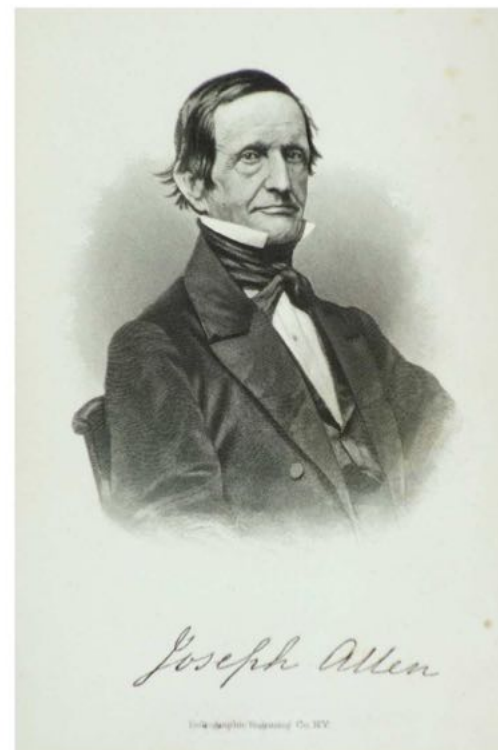


Echeverria, *Reflex Paralysis*, 1866

Allen 15X



Atlantic works 15X



*Genealogical Sketches of the Allen Family of Medfield*, 1869



*The Babcock & Wilcox's Patent Stationary Steam Engine Illustrated*, 1868

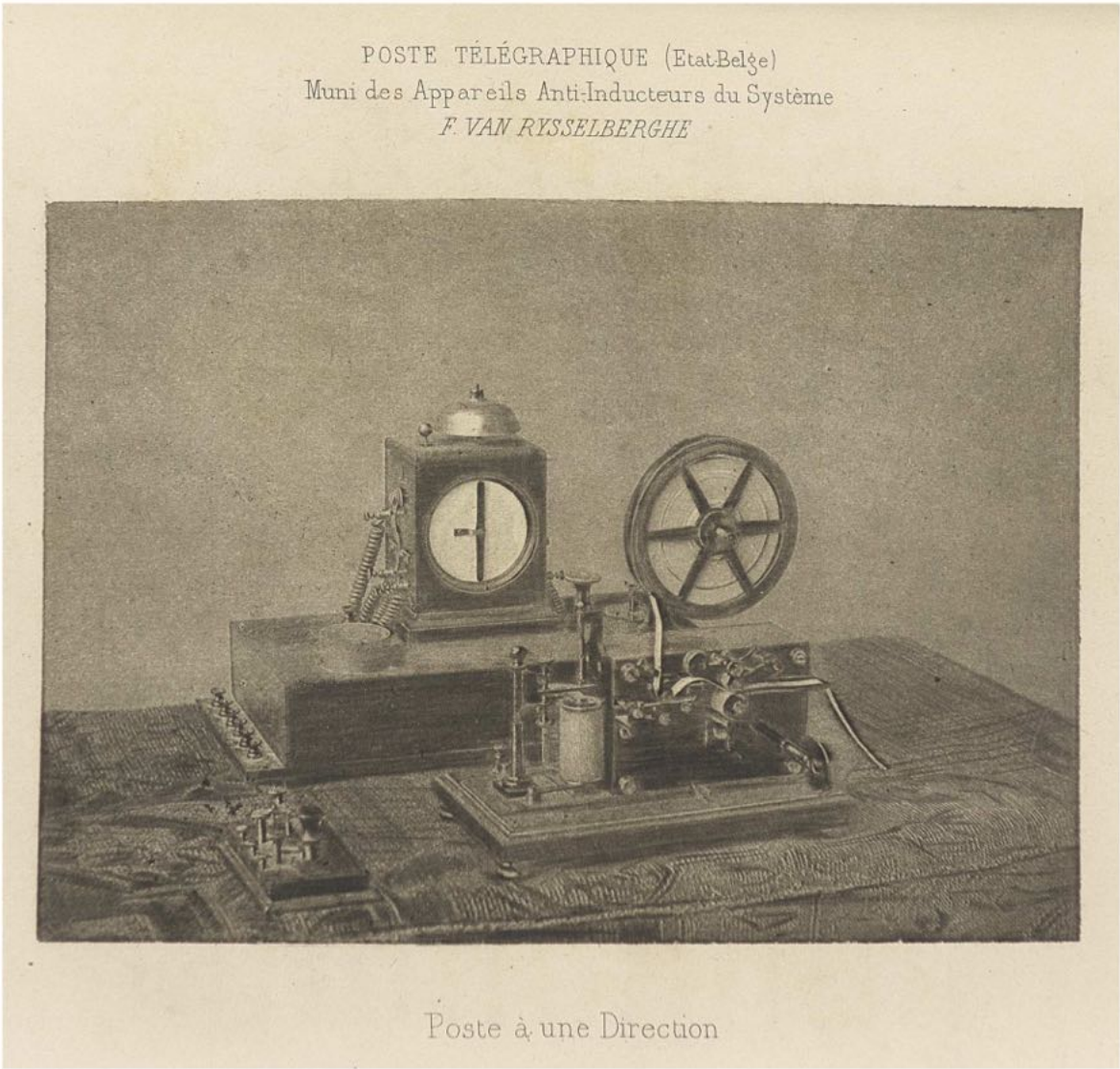


**EVELY, LÉON** (1849 – 1927) Belgium. A noted Belgian engraver who used a photogravure process *Heliogravure Evely*, starting in about 1880 and continuing through the rest of the decade. Most of his work was with artists such as Félicien Rops (*Diaboliques*). Evely collaborated with Rops in an unusual way. Rops initially made drawings which Evely converted into heliogravures and then Rops reworked the plates by hand producing a mixed process final plate; one of the first artist-photomechanical collaborations. He also produced prints from photographs for a number of publications. His method was never published. **Intaglio**



AKÉDYSSÉRIL

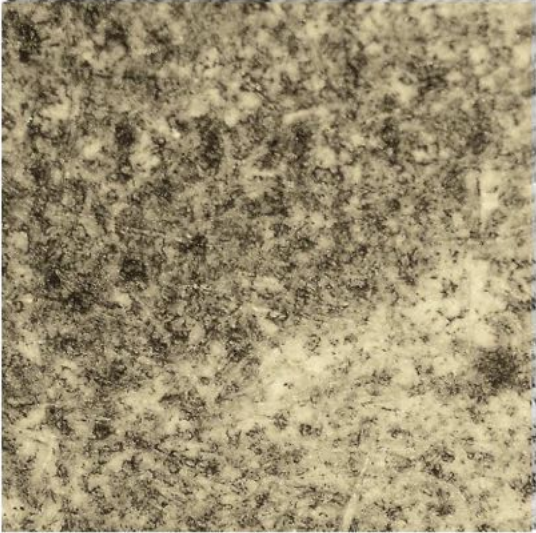
Félicien Rops



La Téléphonie à Grande Distance, 1885



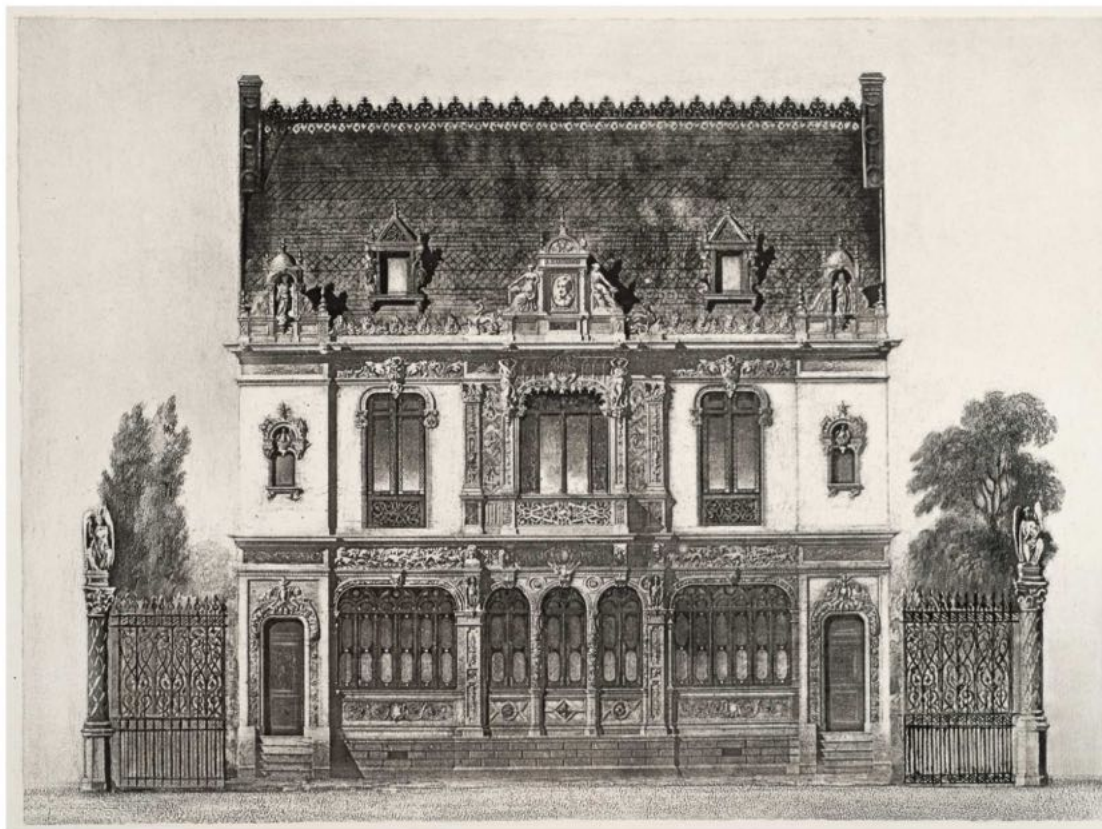
15X



90X



**FIZEAU, LOUIS ARMAND HIPPOLYTE** (1819-1896), France — Gilding an etched daguerreotype with gold on the highlights and a second bite with aquatint (This is not explained as a dusting on or a liquid process) was sometimes added, 1841. Large print runs possible with copper plating. Three Fizeau process plates were published in *Excursions Daguerriennes*, 1842. The Luynes committee stated, “M. Fizeau's method consisted in etching the metallic plate by nitric acid to which a chloride was added (hydrochloric acid or common salt, etc.). This mixture attacks the blacks formed by pure silver, while it leaves the amalgamated whites. After a first etching, the hollowed and attacked part was preserved by means of a drying-oil, and the whites were gilded by the battery; they thus became more resisting, and the metal could be further etched by acids. These plates, which at first only yielded a limited number of prints, owing to the small resistance of the silver, yield now an unlimited number of prints, thanks to galvanoplastic reproductions in copper and other metals.” (Waterhouse) Gernsheim (pg. 540) gave this explanation: “[Fizeau] perfected his method of etching daguerreotypes by depositing chloride of gold on the highlights, which enabled the plate to bear repeated etching in the dark parts (of the bare silver). Strengthening the printing plate with a deposit of copper enabled him to pull at least ten times as many impressions as Berres, for when the copper deposit had worn off, the plate could be electrotyped again.” **Intaglio**



*Maison Élevée Rue S. George*

*Charles Wood*



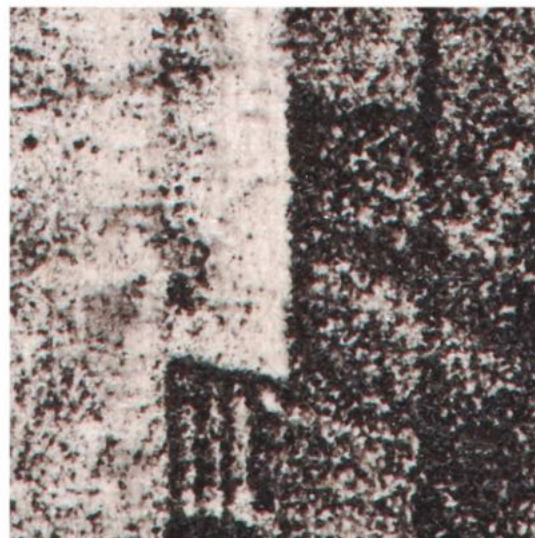
*Bas-relief Notre Dame de Paris*

*Charles Wood*





Mark Katzman



15X detail from *Hotel De Ville de Paris*



**FRANKLIN, BENJAMIN, US, 1737** – Nature printing –“Soon after establishing himself as an independent printer, Benjamin Franklin was awarded the ‘very profitable Job’ of printing Pennsylvania bills of credit, partly because he had written and published a pamphlet on the need for paper currency in 1729. He was similarly employed by New Jersey and Delaware. Aware of the threat from counterfeiters, Franklin devised the use of mica in the paper and leaf imprints as ways to foil counterfeiters--...[These were] printed by Franklin and his partner David Hall and later by the firm of Hall and William Sellers.” (Library of Congress web) Franklin and the Philadelphia naturalist, Joseph Breintnall, who began making prints from inked leaves in 1730, sent examples together.

There were eleven issues of Continental Currency and all were printed by Hall & Sellers in Philadelphia. The first issue was dated May 10, 1775 and the last shows the date January 14, 1779.

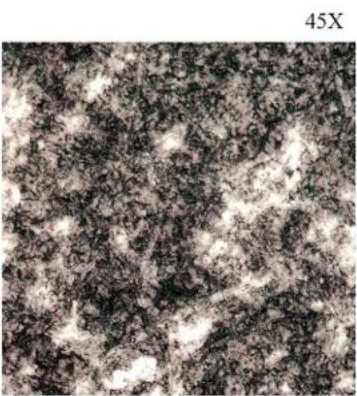




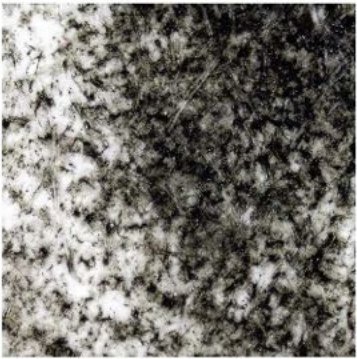
**GARNIER, HENRI**, France – (worked himself from 1865 to about 1870 – Dujardin then from 1870 on until the early 1900’s) *Heliogravure*. Mertle (pg. 22) explains, “A copper plate, sensitized with an aqueous solution of bichromated sugar... exposed under a positive. The unexposed areas of the coating remain hygroscopic and retained a mildly alkaline powder (magnesia) dusted on the plate. The image was then heated (burnt-in) to convert it to a photoresist, whereupon the plate was etched with a ferric chlorid solution to record the deep shadows of the original. At this stage the photoresist was completely removed.” The procedure was again followed but the exposure time was halved for the middletones, again the plate was cleaned and the procedure was repeated with the exposure being one-fourth of the original for the highlights. All of the exposures had to be in perfect register. circa 1864. The process was difficult because of the need for careful registration. According to Bridson/Wakeman (pg. 168, E94) Leitch in England used Garnier’s process. See **Dujardin** for the commercialization of the process. **Intaglio, Relief**



*Les Métaux Précieux Considérés au Point de vue Économique, 1865*



*La Photographie*



*Les Métaux Précieux*



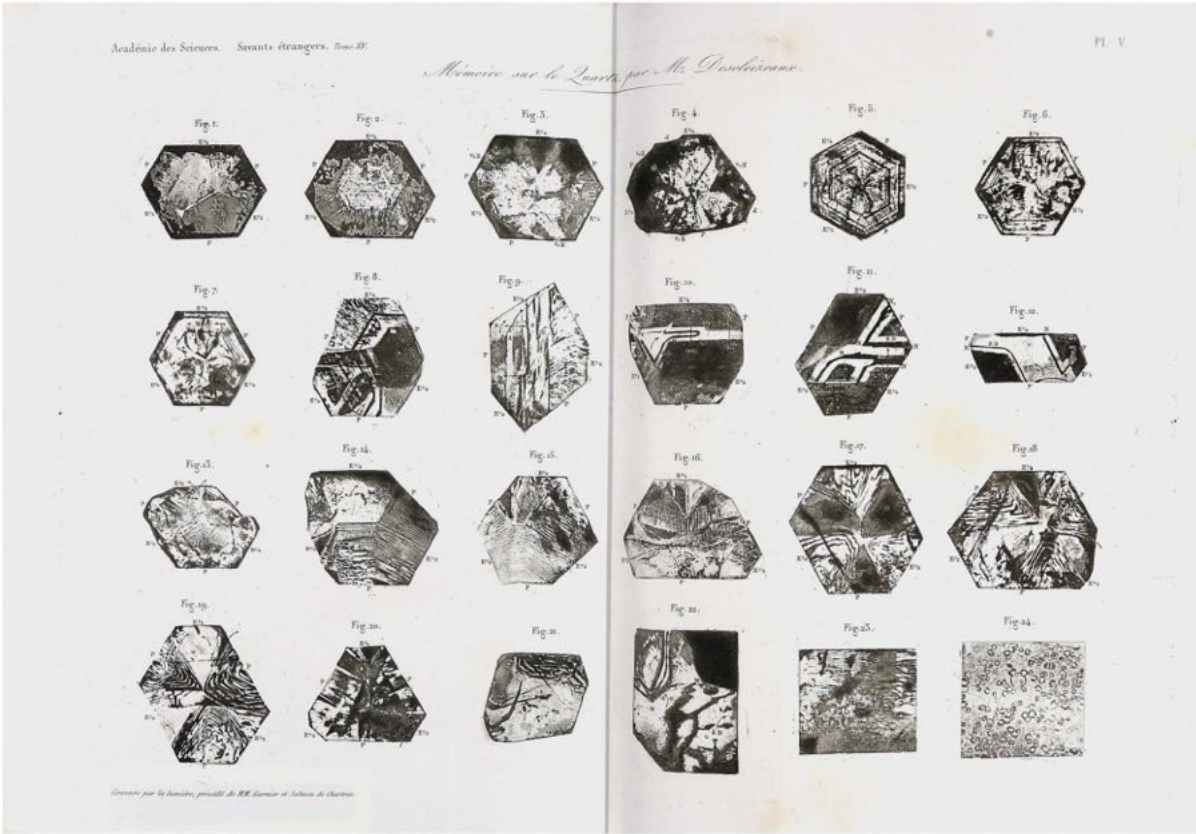
Blanquart-Evrard *La Photographie*, 1870



Figuier, *Les Merveilles de la Science*, vol. III, 1869



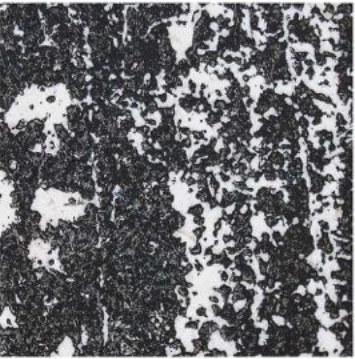
**GARNIER, HENRI & SALMON, ALPHONSE**, France — A brass plate is fumed with iodine and after exposure it is rubbed with mercury which forms an amalgam with the exposed iodine; ink adheres only to the unexposed brass, and is repelled by the mercury amalgam. The Luynes committee report explains “1. If a brass plate be taken and exposed to the vapours of iodine in darkness, and over the plate be passed a cloth containing globules of mercury, the plate will quickly amalgamate; it will not do so if it has first been exposed to the action of light. 2. If over a brass plate amalgamated in places, an ink-roller be passed, the mercury, acting like water, repels the ink, which becomes fixed wherever there is no mercury. An iodized brass plate is placed under a photographic positive; the parts corresponding to the lights will not amalgamate; those, on the contrary, which correspond to the darker parts will be depicted on the white of the amalgam. Pass over this plate an inked roller, the mercury repels the ink, which only takes on the parts influenced by light, and consequently gives an inverse proof of the model. This ink forms at the same time a reserve; and all the non-reserved parts may be etched by means of a solution of nitrate of silver. With this first etching, a copper-plate engraving is produced like the model; the ink must be removed, and it can be printed from. But a lithographic plate may also be made by immediately following the first etching with a coating of iron, without removing the ink. When the iron is once deposited where the amalgam originally was, the ink forming the reserve is removed, the brass exposed is iodized and immediately coated with mercury. The mercury does not take upon iron; but it takes on the iodized brass; and when the roller is passed over, proofs may be taken; for the ink attaches itself to the iron parts and not to the amalgamated ones. To print from as a block, instead of forming galvanically a deposit of iron, a deposit of gold should be made, and then, by means of an acid, the parts not gilded should be hollowed out.” (Waterhouse, 1868) 1855. The process as used in 1855 and in 1858 is **Intaglio**. The plates in *L'Art Pour Tous*, vol. IV, 1864, are claimed by Marbot in *Une Invention*, (catalog item no. 289, p.83), to be by this process and are **Relief**.



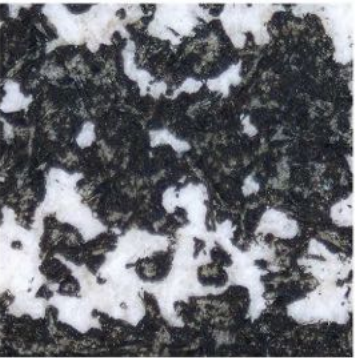
*Mémoire sur la Cristallisation et la Structure Intérieure du Quartz*, 1858 - this is a new plate which varies somewhat from the 1855



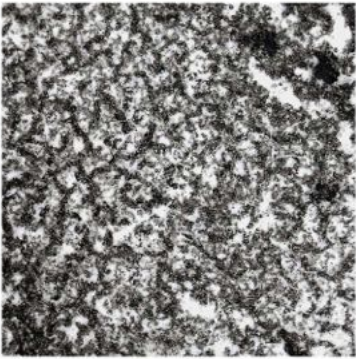
*L'Art Pour Tous*, vol. IV, 1864



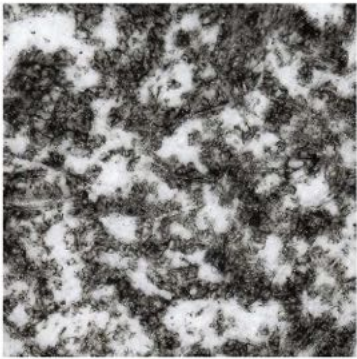
15X



45X



15X



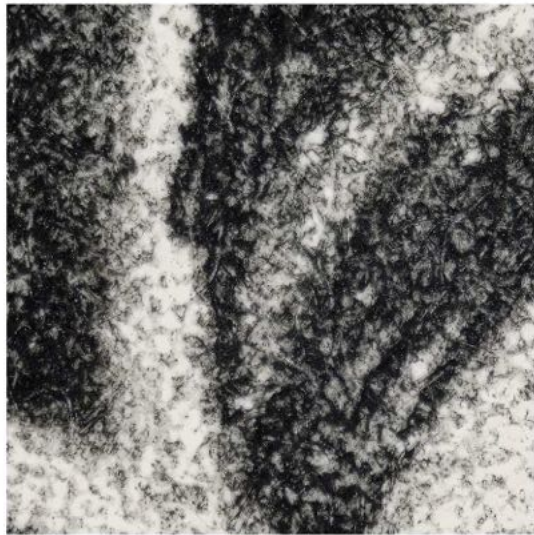
45X

As M. Descloizeaux explains in *Mémoire sur la Cristallisation* (pgs. 405-406): "After much trial and error attempting to obtain durable copies of the photographed images that I had shown at the Académie and which featured most of the phenomena produced by various varieties of quartz viewed under polarized light, I opted for the process by Messrs Salmon and Garnier of Chartres as offering the greatest chances of success.

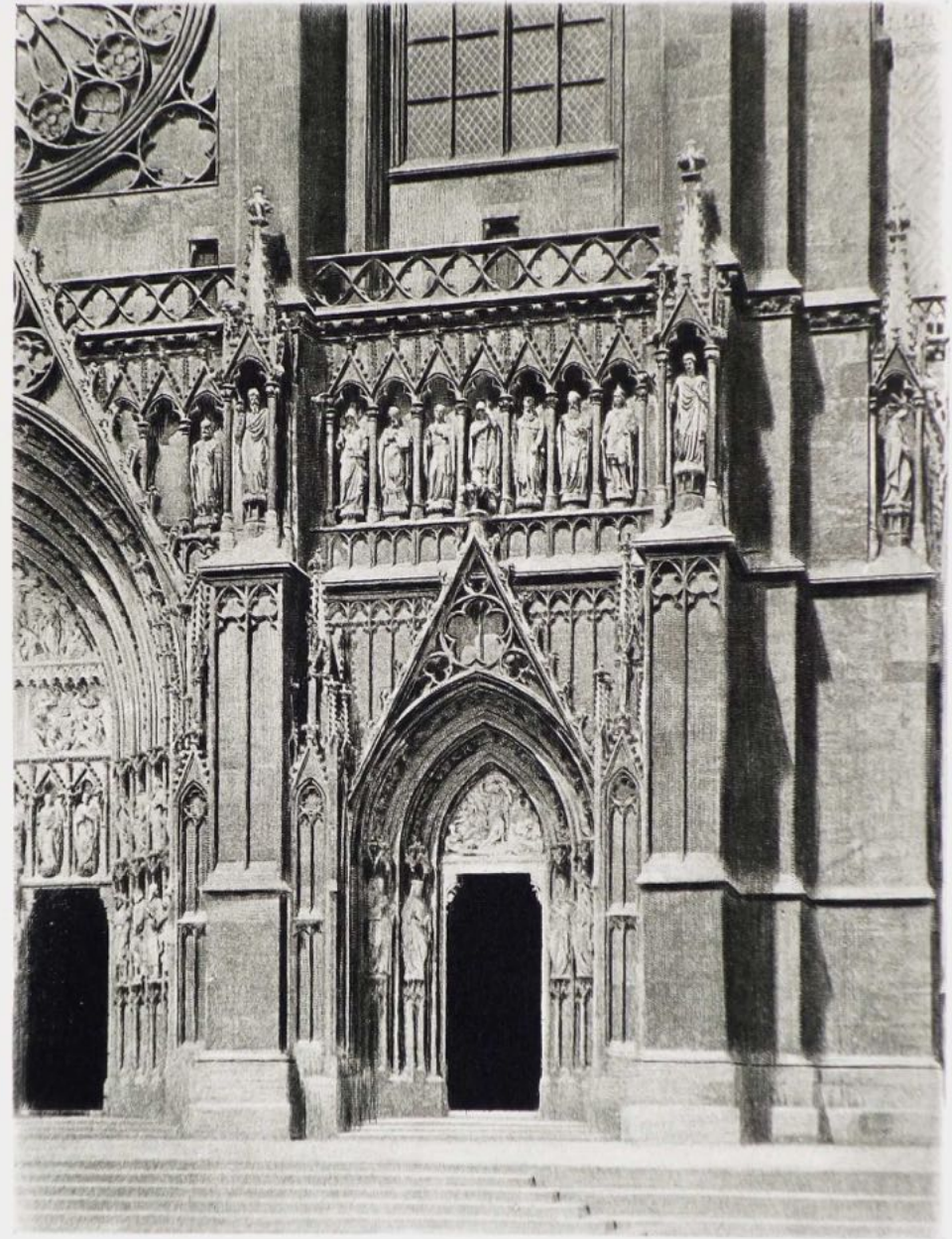
The process produces, *without any reworking*, an intaglio metal plate, by means of glass positives, produced with the original negatives, and which can be printed off by ordinary intaglio methods. Unfortunately, this heliographic engraving has so far failed to retain all the subtleties and sharpness of photography but it at least satisfies the painstaking accuracy of detail that, impressed by light, can then be transferred onto properly prepared metal plates." (translation by Steven F. Joseph)



**GEBBIE, GOERGE** and **HUSSON, LOUIS**, US – (Gebbie and Husson Photogravure Co., Philadelphia). George Gebbie was a Philadelphia publisher who produced art books with *Photogravures* printed in the United States from plates made by Goupil in Paris. In 1887, Gebbie, in partnership with Husson, began to produce their own photogravure plates using the Goupil method that they modified for their use. Mr. Husson stated “Without using the same means [as Goupil], but the same basis, we obtain the same results to-day, and the success of the Goupil process and of ours comes of the strength of the growing copper plate by electricity and the grain— which is not obtained by any other biting acid.” The electrotyping of the printing plate took between 15 and 25 days to complete. (*Public Ledger*, 1888) **Intaglio**



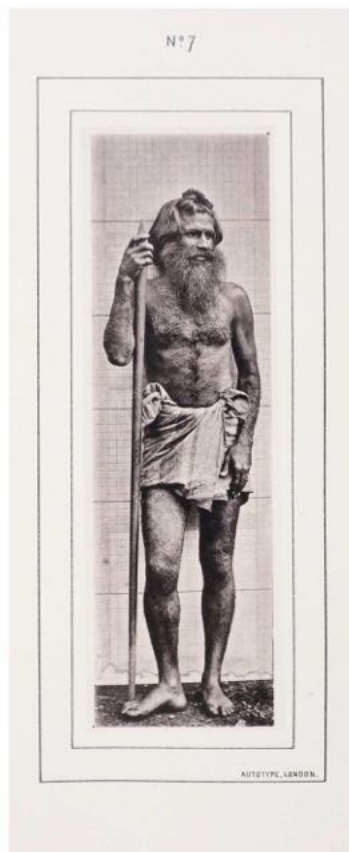
45X



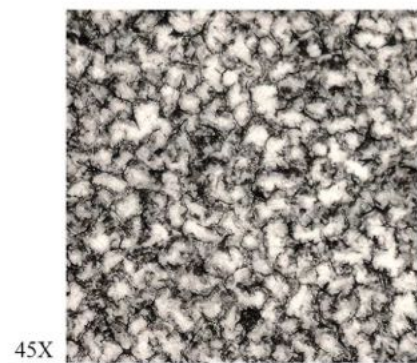
Longfellow, *Nuremberg*, 1888



**GEMOSER, MAX**, Germany — “*Lichtdruck*”, 1867. This collotype method used glass as a support layer, as did Albert. Gemoser called the process “*photolithography*.” Gemoser, became associated with Ohm and Grossmann in Berlin, where it was referred to as “*lichtdruck*.” Waterhouse (*The Photographic News*, Oct. 11, 1878, pg. 488) explains: “According to some authorities, MM. Ohm, Grossmann, and Gemoser, of Berlin, took out a patent, in 1867, for a method of photocollographic printing, comprising, in addition to the use of glass as the support of the gelatine film, of the double coating of the plate and of the hardening of the film by exposure of the back surface, the introduction into the sensitive gelatine mixture of certain resinous compounds dissolved in spirit, by which the gelatine film is rendered quite insoluble and admirably adapted to form a fine printing surface. It is said, on the other hand, that the credit of all these improvements is due to Albert; but, in any case, it is certain that until after the publication of Albert's process, early in 1869, Ohm and Grossmann's was almost unknown, and had not come into general use.” Edward Bierstadt argues in an article (*British Journal of Photography*, p. 441) that the method was overly complicated: “...instead of using the simple bichromated gelatin he added seventeen other substances.” Bierstadt then goes on to list all of them in the formula – Gum myrrh, Gum ammoniac, Liquorice root, Manna, Beet sugar, Milk sugar, Bichromate of potash, Bichromate of ammonia, Lupulin, Gum benzoin, Tolu balsam, Spirits of wine, Nitrate of silver, Iodide of cadmium, Iodide of zinc, Bromide of potassium, Gold solution, White of egg. These are used in seven solutions which are mixed together with the gelatin to form the sensitive layer. “In October, 1869, the **Autotype Company** in London acquired the patent, and have since worked the process with the greatest success.” G. Warton Simpson in *The Portfolio* added: “The modification consists in the totally novel addition to the gelatinous and albuminous bodies hitherto used of some haloid salts and gum resins. These, when combined with the film, render it not only tough but non-absorbent to a much higher degree than the compounds previously used for the purpose. At the same time the relief is much less and the impressions more perfect, being without those white or light grey lines frequently observed in some processes of the same kind.” **EMIL RYE** of Denmark was the agent for this patent in England (Newton was the English patent holder) where it was used by the Autotype Co. In the U.S. George Rockwood initially purchased the rights. **Planographic**

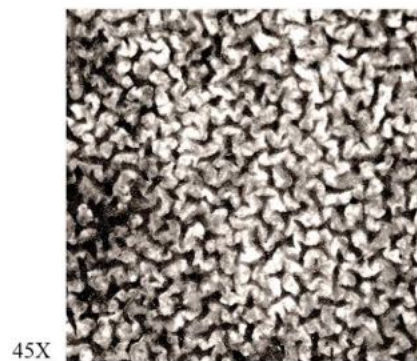


*A Phrenologist Amongst the Todas*, 1873



45X

Portal



45X

Portal



*The Portfolio*, vol. I, 1871

Taking photomicrographs of different areas of the same print produced grain or reticulation patterns quite different from each other. The print used is one of the earliest that the Autotype company produced.



**GIESSENDORF, KARL VON** (1825-1866), (Government Printing Office, Vienna) Austria - *Photolithography* with bitumen mostly for line work. Eder states (pg. 611) “[Karl von Giessendorf] who devoted himself exhaustively to Lemerrier’s asphaltum process.” And also “He improved the method of making asphaltum prints on grained stones by the halftone method in the early sixties and introduced the process in the lithographic plant of **Reiffenstein and Rösch**, Vienna...” Waterhouse writes of a visit to Reiffenstein in 1870: “He employs asphaltum dissolved in turpentine as the sensitive coating of his stone, and for the solvent, after exposure, turpentine, to which a little ether is added. He prints directly on to the stone. I did not see anything of the process, but saw a finished stone ready for printing, which had every detail on it with the greatest delicacy.” (pg. 286) **Planographic**



**PRINZ EUGEN MONUMENT.**  
Modellirt und gegossen von A. Ritt. v. Fernkorn.  
in Wien 1865.  
Photolith. der artist. Anst. v. Reiffenstein & Rösch - Übertragen v. Giesendorf.  
„Beilage der photographischen Correspondenz.“

*Photographische Correspondenz*, vol. III, 1866

George Eastman Museum,  
Rochester, NY



Heider, *Jahrbuch der K.K. Central-Commission zur Erforschung ...*, 1859

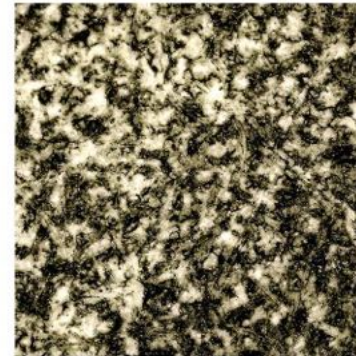


*Photographische Correspondenz*, vol. IV, 1867

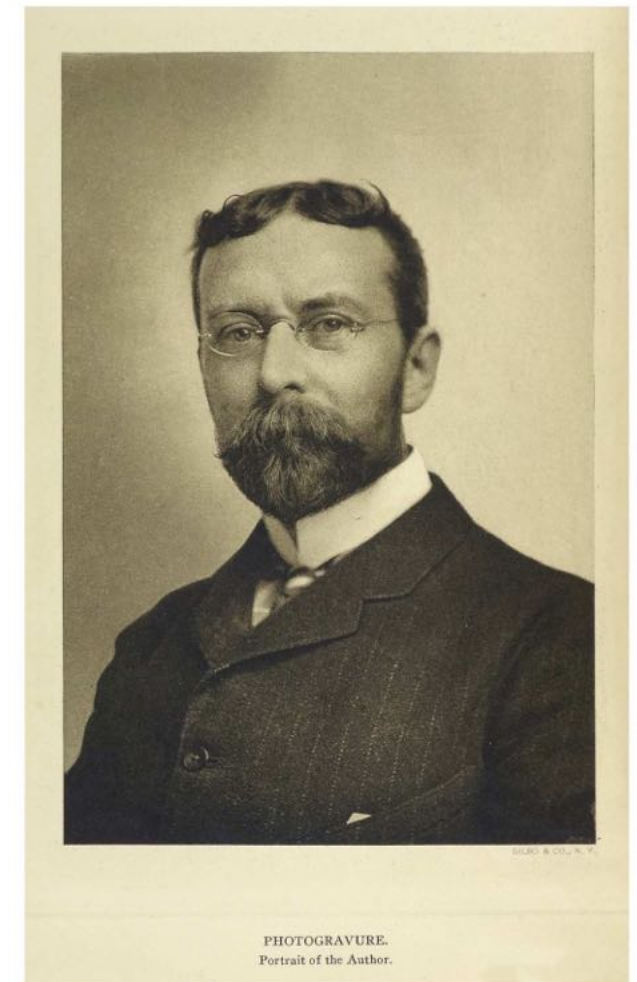
George Eastman Museum, Rochester, NY



**GILBO, W. H.**, United States, - *Photogravure Gilbo* – ca. 1890. Gilbo used, instead of a carbon tissue laid over a dust screen ground, “...a swelled-gelatine relief formed on the plate itself, by exposure under a positive, and the aquatint ground is laid on top of the film. The mordant, again perchloride of iron (or nitrate of silver), as a matter of course, penetrates more readily through the unaltered gelatine, i. e., the swelled parts of the relief, the resistance increasing with the effect of the action of light, until, where the exposure has been longest and there is no swelling, it is practically complete. To obtain the lighter shades upon the plate, a film is formed on it with a fine aquatint ground, and the etching begun with weak solutions. The film is then removed and a proof taken. A second film is now formed on the plate, a somewhat coarser aquatint ground is laid over it, and the biting is repeated with stronger solutions, which leave the most delicate shades as they were obtained by the first biting, but increase the depth of the middle tints. The operation is repeated a third time, with a still coarser aquatint ground, and still stronger solutions, to give the final strengthening of the blacks. If necessary this sequence of operations may, of course, be continued until the effect desired has been reached. The plate is completed by burnishing, rouletting, etc., as before.” (Boston catalogue pg. 62, S.R. Koehler) The A. W. Elson Co., of Boston, initially used this method, but by the turn of the century had switched to the Talbot-Klitch method. (see *The Making and Printing a Photogravure*, 1904). W. H. Gilbo moved eventually to Brooklyn, New York and formed Gilbo & Co. **Intaglio**

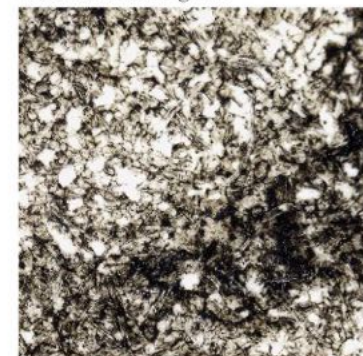


Horgan 45X



Stephen Horgan, *Horgan's Half-tone and Photomechanical Processes*, 1913

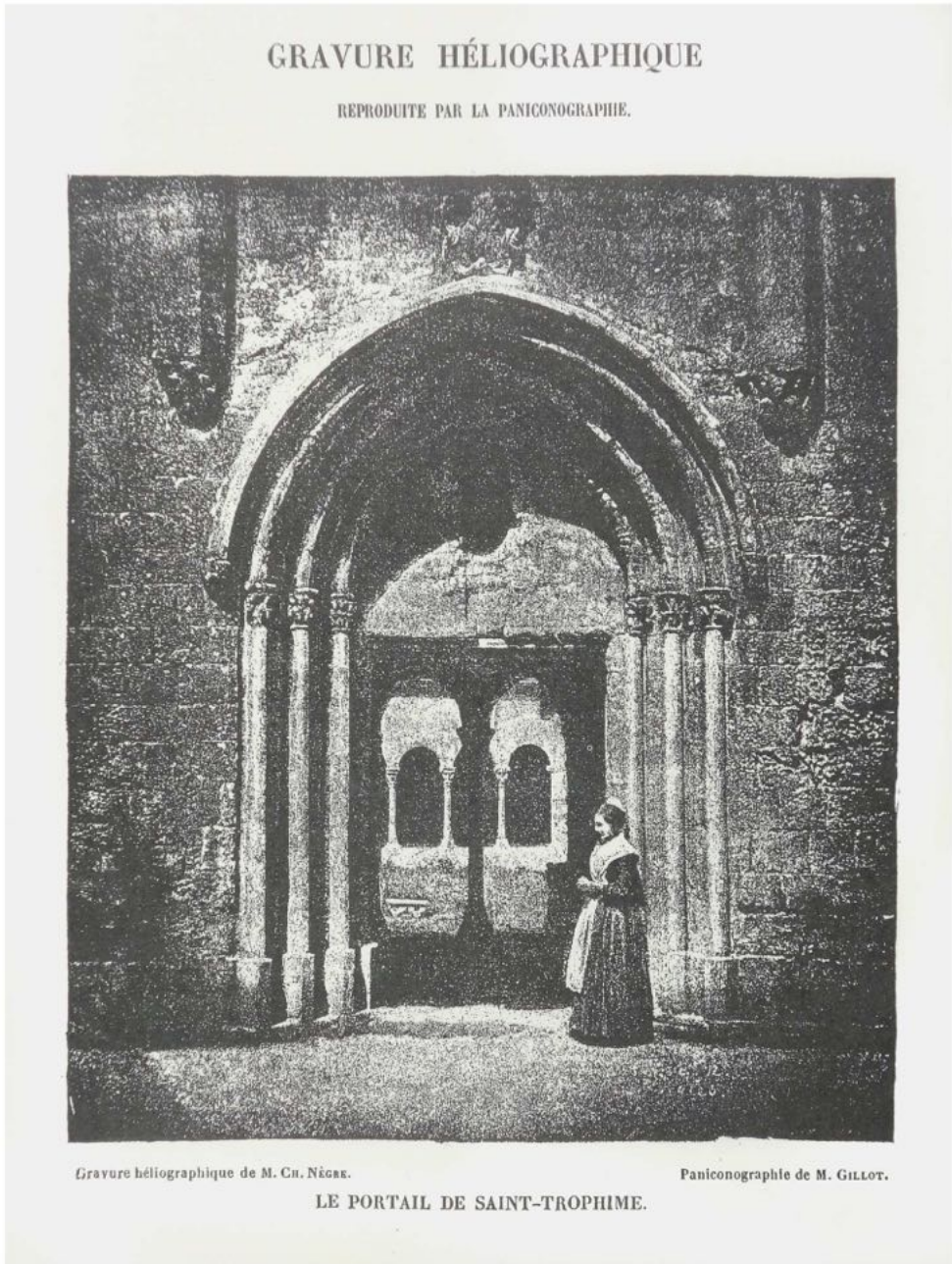
45X *Our New England*



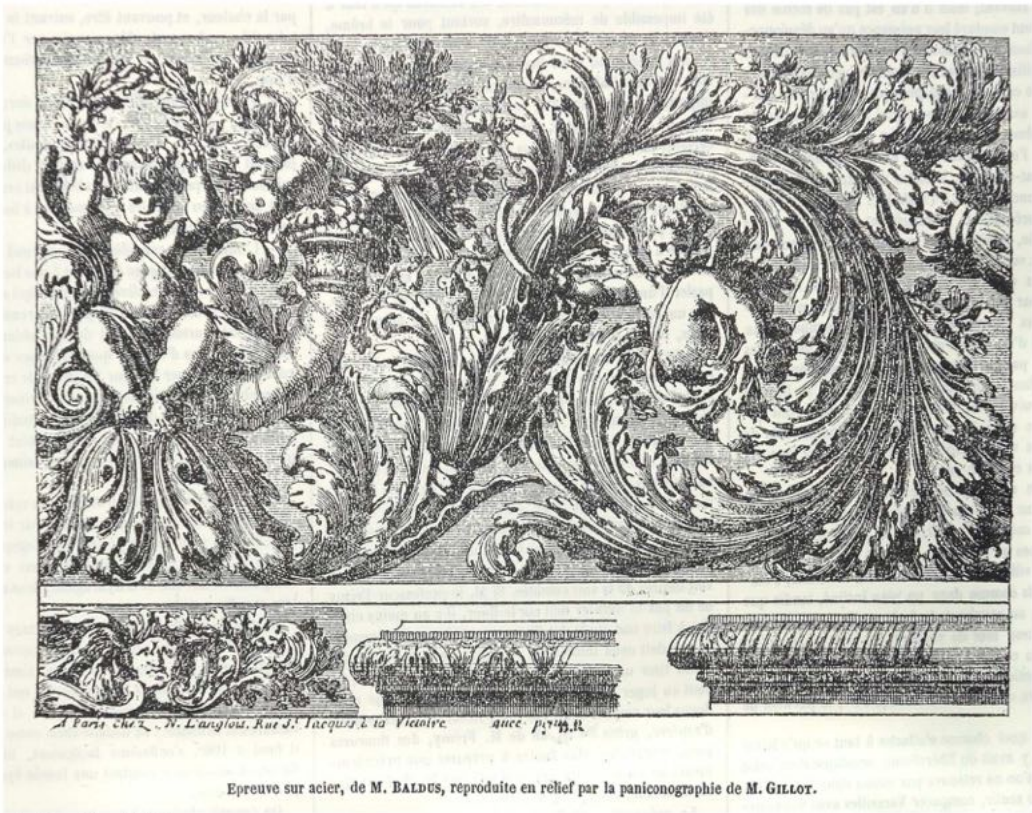
*Our New England, 1892*



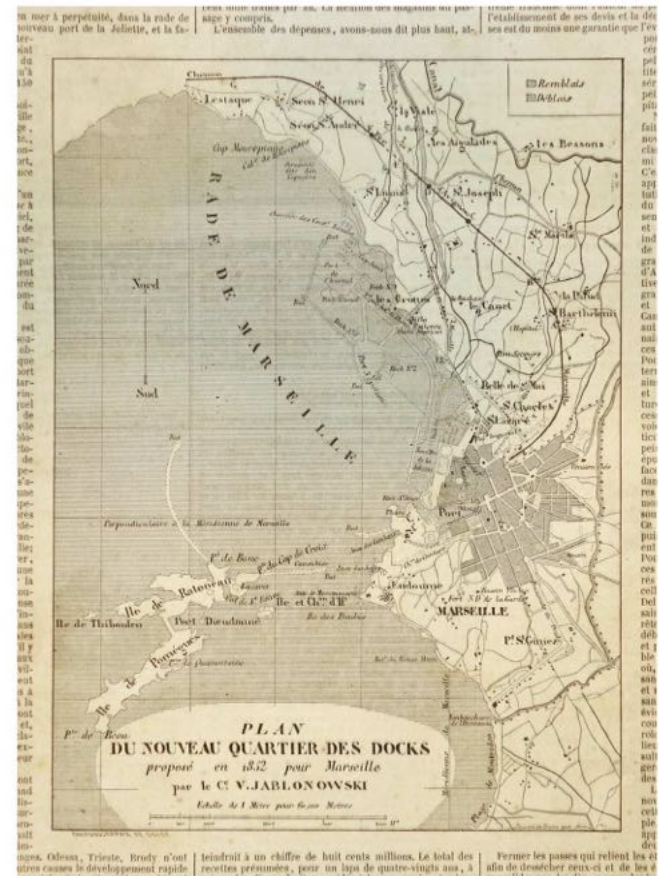
**GILLOT, FIRMIN** (1820-1872), France — “*Paniconograph*”, “*Gillotage*”, a method of inking and dusting a relief plate. Heating the plate allows the dusting to melt and run down the sides of the engraving so that the lines are not undercut, 1850. In 1854, with **NÈGRE**, produced a photographic image with the process. Gillot also worked with **BALDUS** during the same time. **Relief**. . Louis levy (pg. 397) gives this description: “In this process [a] photo-lithographic print was transferred to the surface of the polished zinc plate, the transfer strengthened with asphaltum powder melted into the ink and the plate then etched with nitric acid, leaving the surface protected by the inked design standing in relief. As the etching proceeded the vertical sides of the standing lines required to be protected against the action of the acid, and this was effected by applying additional ink and powder to the surface of the plate and then heating it to make the ink run down over the sides of the exposed lines. This was repeated usually seven or eight times until the etching had reached sufficient depth for the requirements of the printing press.” Firmin’s son Charles (1853 – 1903), in about 1872, began to produce the images directly on the zinc plate using albumen and bichromate. The sensitized zinc plates were exposed under a negative, rolled up with greasy ink, developed in water, dusted with resin and etched. (Eder pg. 612)



La Lumière, 1854



La Lumière, 1854



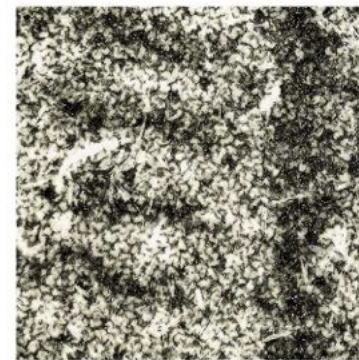
L'Illustration, Journal Universel, 1853



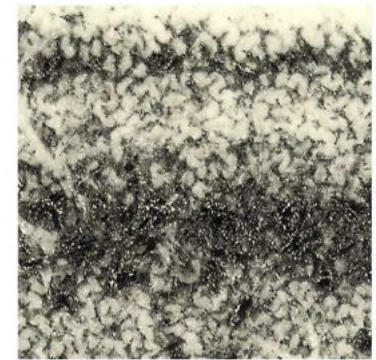
**GOVERNMENT PRINTING OFFICE**, (Reichsdruckerei, Berlin) Germany — “*Chalkotype*” is a reverse photogravure for typographic printing. “The ‘resist’ is a gelatine film and the grain is secured by an aquatint ground, but a reversed negative is used instead of a positive, so that the whites are bitten away instead of the blacks.” (Boston exhibition, 1892) – 1886. Eder (pg. 637) states that Klič called his method “cuprotypes.” This system appears to have been used in the United States as “*Mezzotype*” by the Lithotype Printing Company in their New York branch and the Art Publishing Co., Boston (worked during the mid to late 1880’s). **Relief**



15X



45X

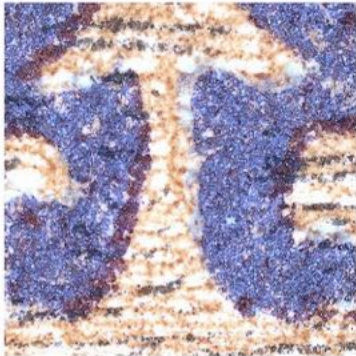


90X



**GRIGGS, WILLIAM** (1832-1911), England. (worked from 1867 into the early 1900's) He developed a system of *Chromophotolithography*. From the *Dictionary of National Biography 1912 supplement*: "He had familiarized himself with the processes of photo-zincography discovered by the director-general of the Ordnance Survey, General Sir Henry James. By careful experiment he found that the use of cold, instead of hot, water in developing the transfer left the gelatine in the whites of the transfer, thus giving firmer adhesion to the stone and serving as a support to the fine lines. He also invented photo-chromolithography by first printing from a photo-lithographic transfer a faint impression on the [transfer] paper to serve as a 'key,' separating the colours on duplicate negatives by varnishes, then photo-lithographing the dissected portions on stones, finally registering and printing each in its position and particular colour, with the texture, light and shade of the original." **Planographic**

The plates shown here are all from Griggs, *Portfolio of Italian and Sicilian Art*, 1885-90



15X



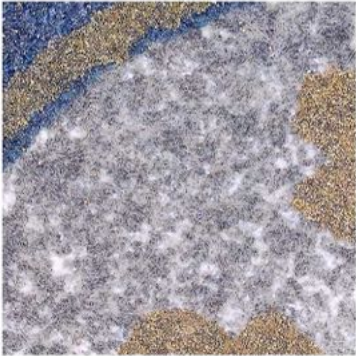
BIOCADÉ. Sicilian (Palermitan). 13th Century.  
S.K.N. 8296-02.

chromo photo lithograph



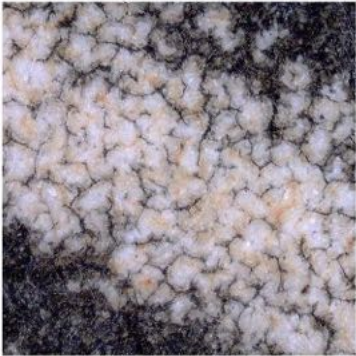
BRONZE MEDALLION—THE INFANT HERCULES.  
Attributed to Sperandio. North Italian, about 1490. 58—1881.

chromo collotype



15X

45X

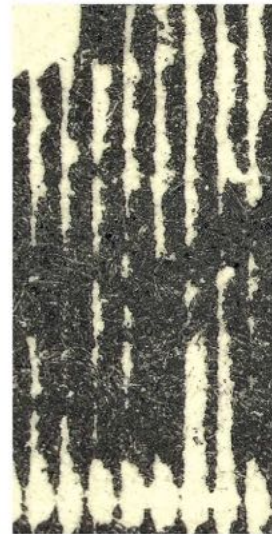


DISH. Enamelled Copper. Italian (Venetian), about 1500.  
Diameter 12 1/2 inches. S.K.N. 8300-05.

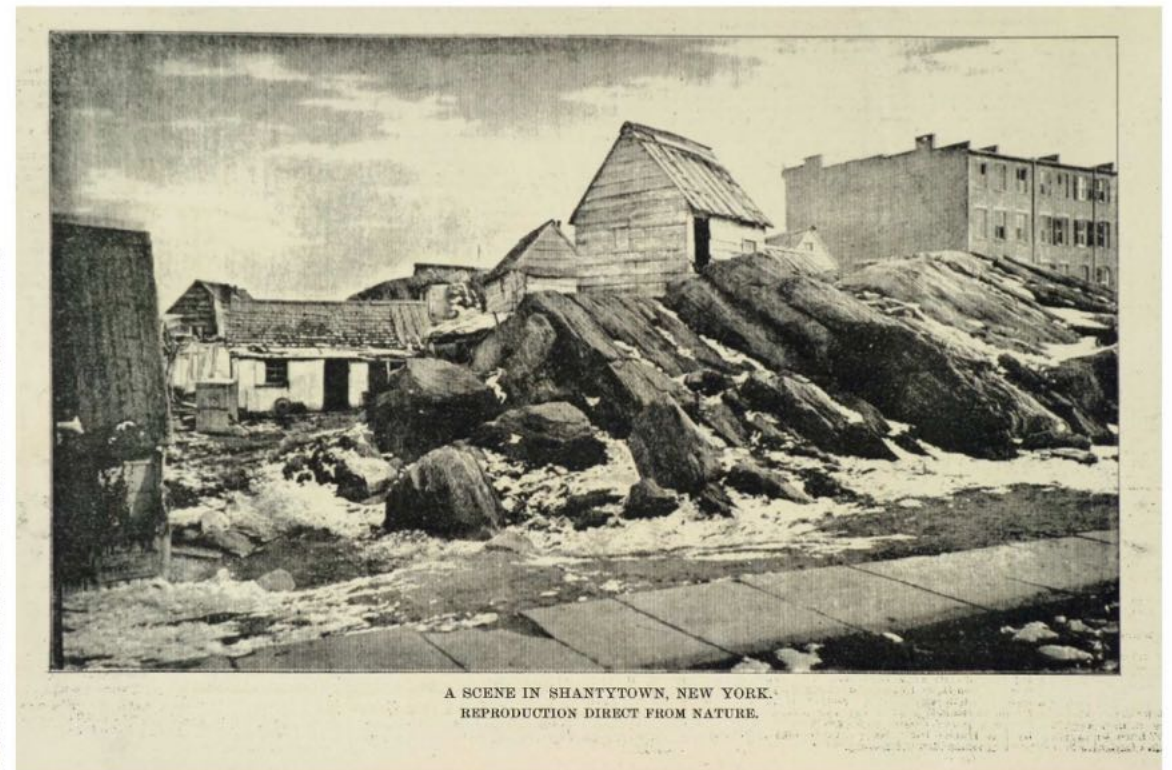
chromo photo lithograph



**HORGAN, STEPHEN HENRY** (1854-1941), U.S. — *Halftone*, 1880. He claimed that the process of placing the ruled screen out of focus so as to create a better halftone was his idea as presented to the photographic section of the American Institute in NY on March 2, 1880. The secretary of the institute, Mr. Mason stated: "The method of producing it [the shantytown print] may be described as follows. The negative is made from a series of line rulings slightly out of focus. The negative, if transferred by the use of collodion – or rather taken off and placed between the negative from nature and the bichromated gelatin film – a print made and treated as the ordinary photo-lithographic prints are treated, the effect is to produce detail in the shadow parts, and where there is a light portion the ruling shows very slightly." (*Anthony's* 1880, pg. 123) The ultimate perfection of the halftone negative was the placement of the screen a carefully controlled distance from the film in the process camera. This slight separation created an optical dispersion of the screen's image called the "Optical V" this resulted in a more perfect halftone plate. Horgan himself gave the credit for this procedure to Frederic Ives. Horgan's image titled "Shantytown" was published in the New York *Daily Graphic*, March 4, 1880 (which was printed by photolithography) from a Leggo single line screen. It was not the first halftone published in a daily paper; the Leggos published a number in late 1873, also in the New York *Daily Graphic*, which they founded. Horgan was not easily forthcoming about the screen, or the method of printing and the story altered a number of times. As can be seen from the typographic printing plate and Horgan's note on the back, he dissembled about it constantly. **Planographic**

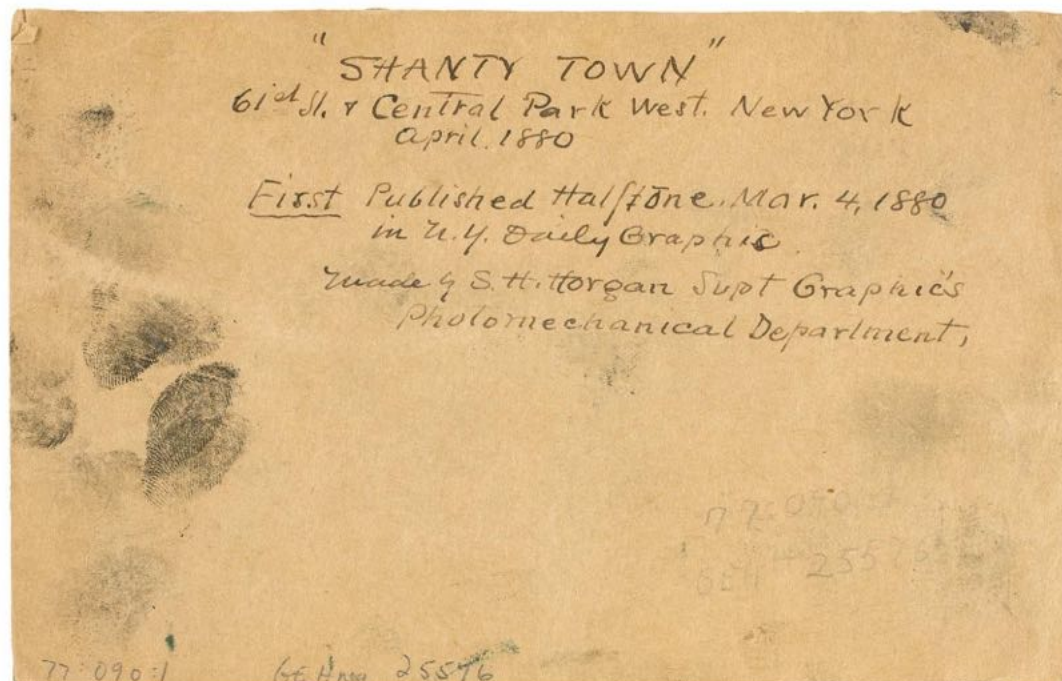


15X



*The Daily Graphic*, New York, March 4, 1880

Note that the original shown above has more of the image showing on the left side than is shown on the printing plate below.



The verso and recto of Horgan's "Shanty Town" block



George Eastman Museum

This note in Stephen Horgan's hand falsely indicates that this halftone block was used to print the "Shanty Town" plate in the New York *Daily Graphic* of March 4, 1880

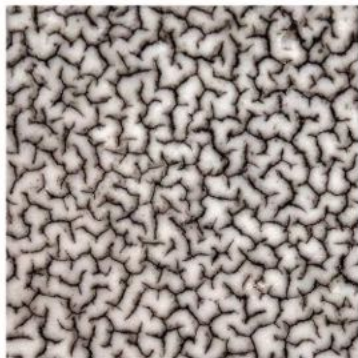


**HUSNIK, JAKOB** (1839-1916), Bohemia — *Collotype*, 1868. Albert purchased the rights to Husnik's system to eliminate competition. According to Liébert, in *La Photographie en Amérique*, Husnik did not expose the printing plate through the back for adhesion but mixed the first coat using albumen with a solution of sodium silicate. He didn't level the plate but coated from one side and left the plate nearly vertical to dry. The second coat of gelatin was made with water and alcohol so that drying could be faster. This time the plate was coated from the opposite end to even out the two layers. After it was dry it was exposed and printed from as with all collotypes. The U.S. rights were obtained by Frederick Gutekunst in Philadelphia, who called his prints "phototypes." **Planographic**

Husnik's "*Leimtype*", 1887, used a thick layer of bichromated gelatin which was exposed under a line or halftone negative. The gelatin sheet was then attached to zinc with resin and developed into a high relief with a solvent. This gelatin surface was then used directly to print from. The halftone pictured is 120 lines per inch.. **Relief**



Husnik, *Gesamtgebiet des Lichtdrucks*, 1880



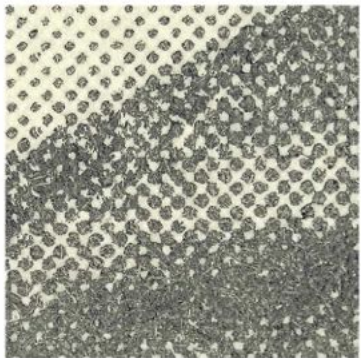
45X  
As can be seen in this enlargement from Husnik's book the original method has been adjusted to a more conventional collotype procedure



*Jahrbuch für Photographie* 1889

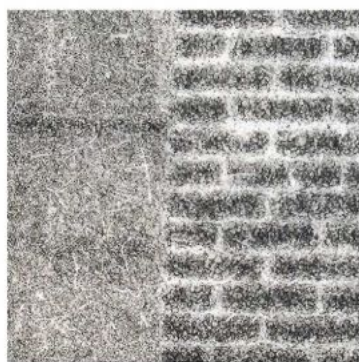


*Jahrbuch für Photographie* 1889



Leimtypie 15x





15X



45X

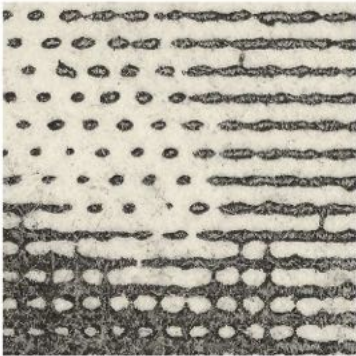
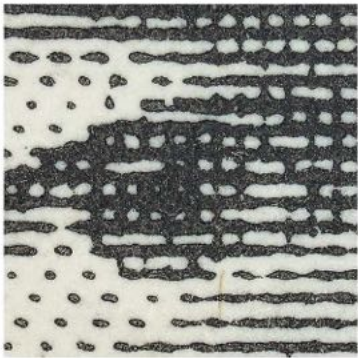
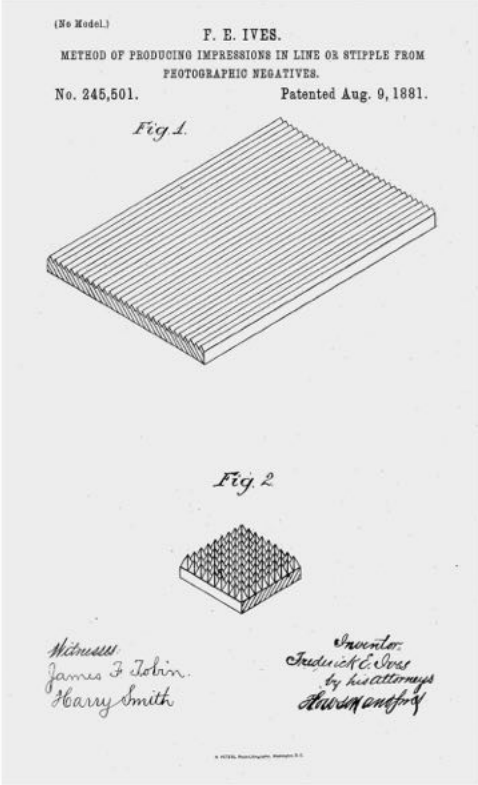


Frederick Gutekunst, Philadelphia, ca. 1880

Examination of Gutekunst phototypes from the late 1880's indicate that his company had switched over to a more conventional system of collotype production as well.



**IVES, FREDERIC EUGENE** (1856-1937), U.S. —*Halftone*, first referred to as “*Phototypography*.” Halftone patent utilizing a paper pattern for the screen February 8, 1881. First a gelatin relief is produced as in the Woodbury method “...and then inking it with printer’s ink, and making an impression upon a suitable surface of raised lines or stipple.” (Ives *Philadelphia Photographer*; March, 1881, pgs 89-90). Professor Wm. A. Anthony of Cornell University testified to the patent office that he saw the process in the summer of 1878 this gave Ives an 1878 priority claim. Ives’ second 1881 patent, August 9, was for a complicated process, this time involving a plaster relief from a chromated gelatin original, then pressing down on that with an inked grooved rubber matrix which produced big dots in the high portions and little dots in the low portions of the plaster cast. This plaster cast, with the inked dots, was then photographed to produce the halftone negative. It was not until later that he switched to using a line screen as did the earlier halftone inventors. He also credited himself with making the first cross line screen by cementing two single line screens together with Canada Balsam (same refractive index as glass – Jones, pg. 88). Sipley (pg. 11) places the date at 1885. However Stephen Horgan (pg. 13) dates the Leggo brothers in New York, producing line screens cemented with Canada Balsam at 1883. The ultimate perfection of the halftone negative was the placement of the screen a carefully controlled distance from the film in the copy camera. This slight separation created an optical dispersion of the screen’s image called the “Optical V” that resulted in a more perfect halftone plate. It can be seen because the dot size in the highlight is quite small and gets progressively larger in areas with progressively darker tones. This concept is generally recognized as Ives most important contribution to halftone theory. Ives was employed by the Crosscup and West Company in Philadelphia and his first published halftones were by them. Crosscup and West charged \$1 per square inch in the first years. (*Am. Photo Eng.* pg. 146) (\$25 in 2016 dollars – average daily US wage in 1890 was \$1.50) Ives was also producing experimental three color halftones in 1885, claiming later that he developed the procedure of rotating the screens for the colors to avoid moiré patterns. **Relief**



*The Philadelphia Photographer*, 1881  
Example of Ives’ stippled paper method



*The Philadelphia Photographer*, 1881  
Example of Ives’ second method as seen in the patent drawing

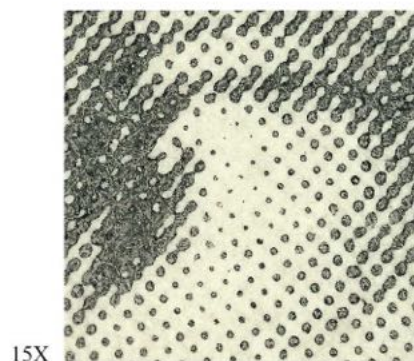


Advertising handout ca. 1890





*Jahrbuch für Photographie 1889*



15X

The principle of the "Optical V" can be clearly seen in this 1889 example by Crosscup and West, the firm Ives was associated with.

Ives is also credited with the development of the copper-enamel process of halftone plate production. See page 164



*Illustrations in Color, Ives Process Company, 1904*



45X

The Ives Process Company operated in New York City for a short period in order to commercialize three-color work as well as partner with the Sigmund Ullman Company in using a combination of three inks that could be printed in any order.



**JACOBI, MORITZ HERMANN VON** (1801-1874), Germany, working in Russia—*Electrotyping*, 1838, announced in 1840. This method of creating a duplicate printing plate was done by electric deposition onto a prepared carbon surface such as a copy stereotype in plaster molded from an original. "If the cathode was a three-dimensional object or mould in wax, plaster of paris, or metal, coated with plumbago [black lead] or graphite to conduct electricity, then the copper formed a solid negative mould over the object. The utility of this was immediately recognized and enthusiastically used to reproduce small seals and other objects by the process that became known as electrotyping or galvanoplasty. Later the process was elaborated to produce much larger objects by applying a direct current from a galvanic cell to a separate cell containing a couple of metal plates in a metallic salt solution, which dissolved metal from the anode (+ve) and deposited metal on the cathode (-ve). The process of electrotyping became very widely used for creating printing plates, plating metal objects, gilding objects, decorating silverware and steel cutlery." (Walker) It was used primarily for relief printing. This procedure opened up the ability to use copied illustrations, along with type, in traditional presses. **Relief**

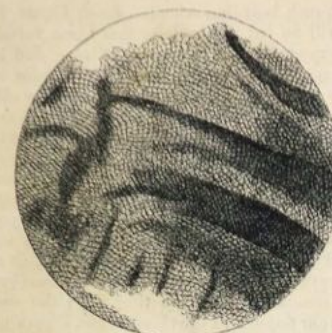


FIGURE 17.

In Figure 17 is a photograph of the lining membrane of the stomach of a beetle. It would answer very well for that of a man. Nature does not make much difference in the two cases.

By way of a change of subject, we present, in Figure 18, one of a delicate shaving of pine

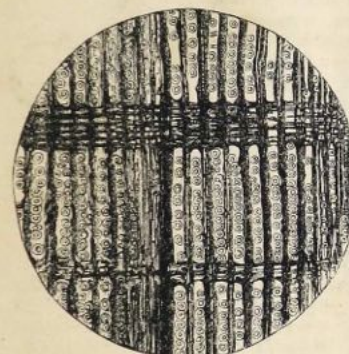


FIGURE 18.

wood, in which may be remarked the rows of round objects, each with a dot in the centre, characteristic of the wood of coniferous trees, and of which geologists sometimes take advantage in determining the nature of fossil speci-



FIGURE 19.

mens. Figure 19 is a photograph of vegetable cellular tissue.

So much for the application of the microscope to photography in the illustration of scientific books. We may next point out the advantages in ordinary photographic copying of large, expensive, or complicated engravings; such, for example, as those which from time to time have been published by European anatomists and artists. Some of these, which are of whole or half life size, from their extreme complexity it would seem almost impossible to succeed in copying on a reduced scale. But this photography accomplishes without any kind of difficulty, enabling us to present to the student, at a cheap rate, these great master-pieces of science and art. The annexed figure of the pneumo-

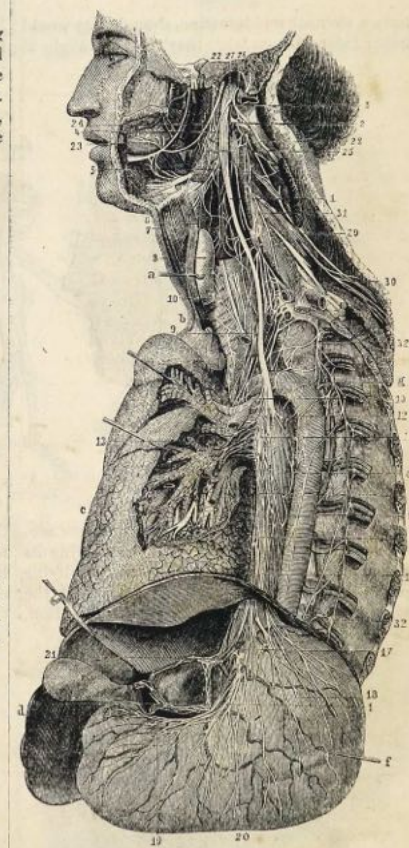


FIGURE 20.

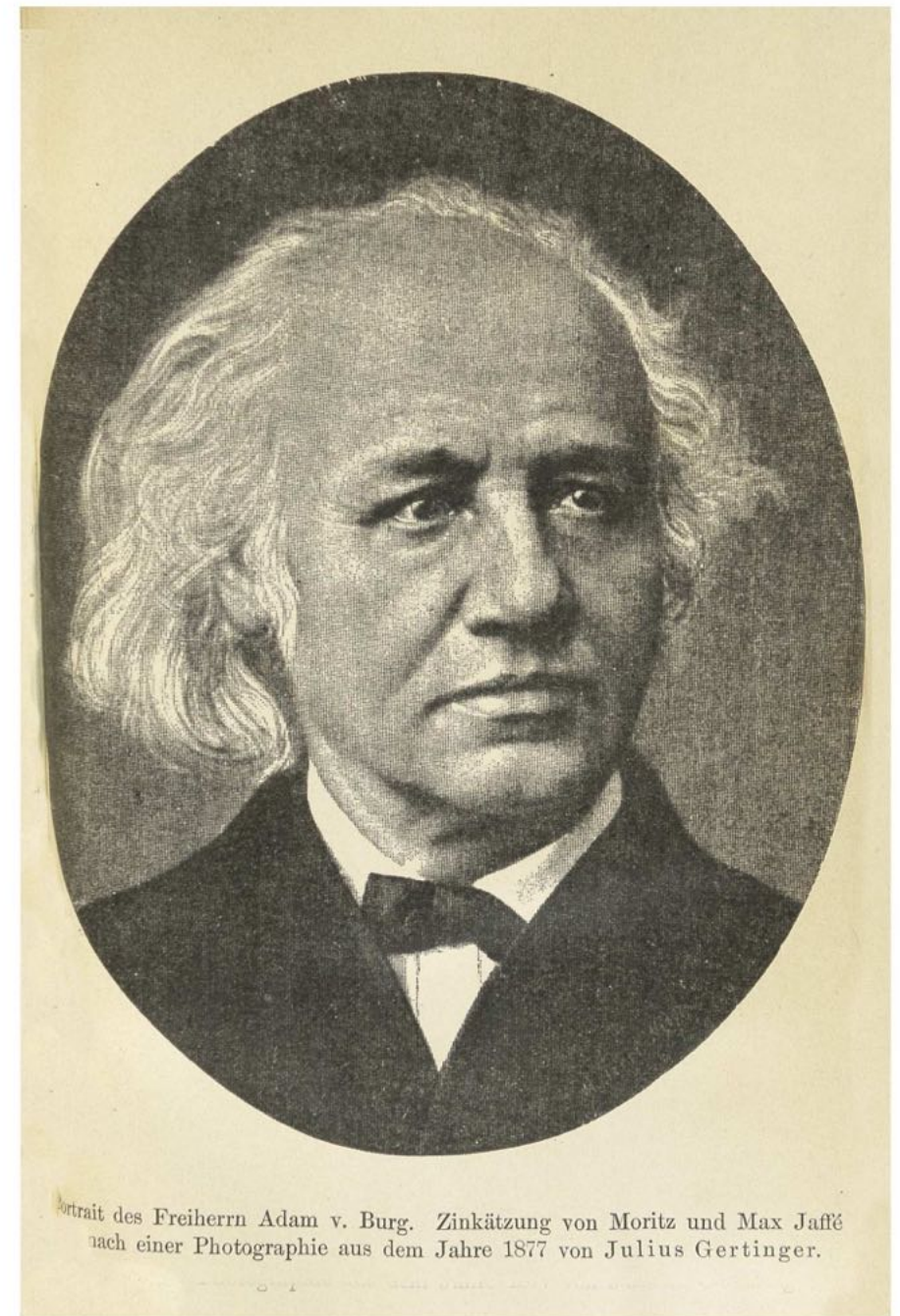
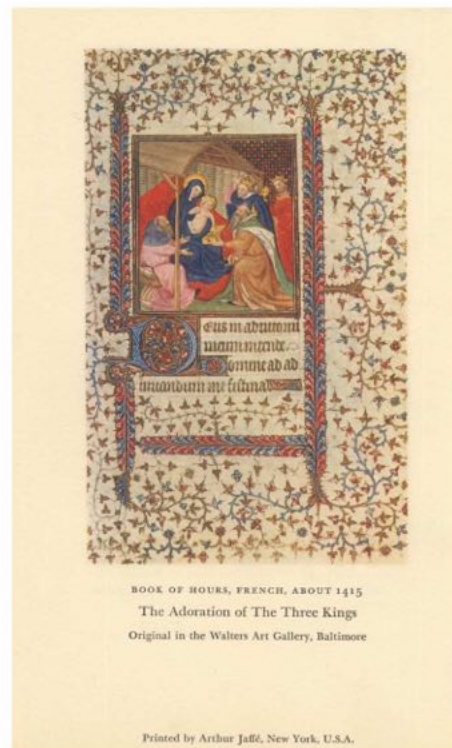
gastric nerve, Figure 20, is an example of the kind. Here, indeed, we encounter a new difficulty, typography not being able to keep pace with photography and engraving. Where large editions, such, for instance, as 168,000 of this Magazine, have to be struck off, it becomes ex-



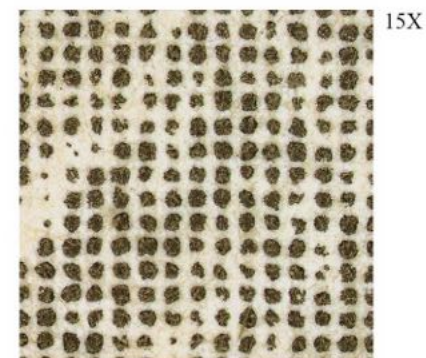
**JAFFÉ, MORITZ & MAX**, Austria — *Photolithographic Halftone* screen process that used a screen of cloth between the negative and the plate, 1877. From Jones' *Encyclopedia* "...consisting of printing from an ordinary continuous tone negative on to a collotype prepared plate, with a piece of gauze interposed. Thus a kind of half-tone print was obtained from which lithographic transfers were pulled and put down on metal for etching in relief." (pg.313) Jaffé's firm was one of the printers of the finest collotypes, and chromo collotypes particularly of art subjects, well into the twentieth century. The example, as reproduced in the *Jahrbuch für Photographie* 1889, has an 85 lines per inch screen. **Planographic / Relief**



*The House of Jaffé*, 1951 Both above and right



*Jahrbuch für Photographie* 1889

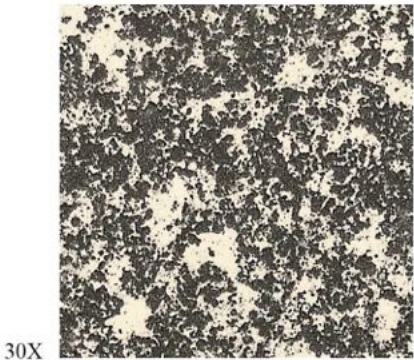




**JAMES, SIR HENRY (1803-1877), CAPT. A. De C. SCOTT, England** — (worked from 1859 to at least the 1890's in England and India) *Photozincography*, — A method where the stone is replaced with a zinc plate and the plate acts as a lithographic stone, either smooth for line art, or grained for halftone. The image is transferred to the plate using a paper based image and transfer ink. The de Luynes committee explains, "Colonel James uses... [a] mixture of gum and bichromate, with which he coats a sheet of paper. After exposure the paper is covered with lithographic ink in a uniform manner; it is then washed with warm water, which detaches the ink wherever the light, not having struck, has left the gum soluble and consequently prevented the complete adherence of the ink to the paper. The resultant print is then placed on stone, on zinc, or on copper." (Waterhouse, 1868) Used for both line and tone work including photographs 1859. James Waterhouse, who headed the Photographic Department of the Survey of India, at Calcutta modified the process in 1886 for photographs. **Planographic**



Notes on the Great Pyramid of Egypt, 1869



On Photo-Zincography, 1862



**JOUBERT, FERDINAND**, (Ferdinand Jean Joubert de la Ferté, 1810–1884) France/England — Joubert was a noted engraver who also ran a photographic studio. He was connected to the firm De La Rue in London for which he did the 1855 Queen Victoria stamp as well as the 1862 Jefferson Davis stamp for the Confederate States of America. He first invented and patented “Acierage”, steel [iron] plating of engraved copper plates to lengthen the plates’ ability to print large editions. As the plating wore down it could be reapplied to continue at the same high quality - 1858. Joubert in describing the process credits a M. Jaquin of Paris and also Henri Garnier with helping him with his system. (*The Photographic News*, Dec. 3, 1858, pg. 147 which gives a detailed explanation of acierage) (For **Talbot’s** “*Photoglyphic engravings*” of 1858, the process had not yet been announced.) Once this system was announced it was used to produce long print runs even until today.

**Joubert** also created what he referred to as a “*Phototype*” image, one of which was published in 1860 but never disclosed. In, *Photographic Notes*, June 1860 the following was published: “Towards the end of last year M. Joubert exhibited at a meeting of the Photographic Society some specimens of a new method of Carbon Printing; and about the same time made a promise to supply 3000 copies of a Carbon Print, as an illustration for their Journal. It appears that each print has to be separately exposed to light under a matrix, and this has occasioned so much delay in consequence of the bad weather which prevailed this Spring...” It continues, “The sensitive surface is exposed under the matrix for a few seconds only, and the effect produced upon it by light can be seen through the transparent parts of the matrix without opening the pressure frame – so that by watching the printing with a little care there is no risk of a[n] over exposure. The carbon, or other pigment, is made to adhere to the image by means of contact in a press, which is a somewhat costly piece of apparatus; and the pigment, which may be of any color is not ground in oil. The sensitive surface is extremely sensitive, and is not composed of any of the ordinary chemicals used in photography.” In the *Photographic Journal*, in the January number, 1860, this partial explanation appeared: “It appears that a certain amount of light is absolutely necessary to produce good impressions; and when the large number required [viz. 3000 impressions] is considered, those who are practisers of the photographic art will appreciate the difficulty of its accomplishment at this period of the year, when, with the ordinary silver processes, it has been found very troublesome to obtain a few impressions per diem.” Joubert wanted to sell the process and since no one came forward he never released it. The *Photographic News*, Nov. 16, 1860 (pg.337) “...we may add that the amount at what he values his discovery, as, from his conception of the capabilities and probable results of the process, he regards it as worth 2000 pounds.” (Today’s figure of 228,000 pounds)

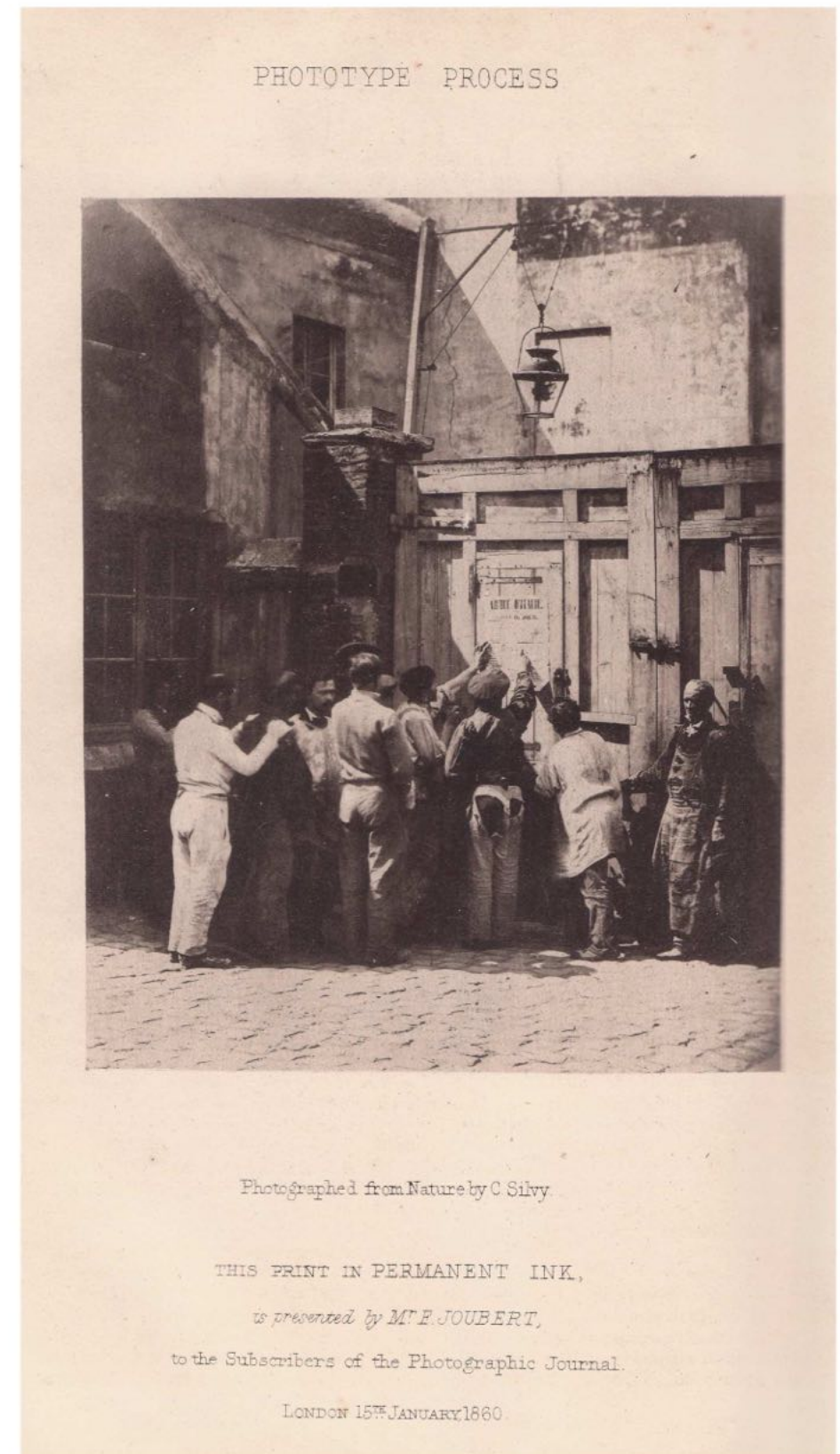
Thomas Sutton, in a letter to the *British Journal of Photography*, published June 12, 1874, (p. 283), makes clear that the “Phototype” is a **carbon print**: “I remember also, and so may many of my readers, a print called a “phototype,” done by M. Joubert by his dust process upon paper, and which was presented to the journal of the Photographic Society in the same year, representing a group of Frenchmen reading a bill upon a wall. In short, the dust process is as “old as the hills;” and, if we may believe the very strong assertion once made to me by M. Garnier in a personal interview, he was the discoverer of it about the year 1856, and M. Joubert got it from him. He even went to London in order to show the latter gentleman how to print his specimens for the journal, and aided him in doing them.” The only issue is that they look dissimilar. Koehler in 1892 stated that the Joubert was a dusted on method carbon print. See page 30 for an example of a Garnier & Salmon carbon print.

Finally in 1866 Joubert contacted Henry Fox Talbot and showed an interest in the photoglyphic engravings that Talbot was doing at that time. Explaining that he could be of service to Talbot in correcting some of the problems Talbot encountered with contrast. Talbot replied explaining his position on retouching and the type of image he found ideal for the process. (see further under **Talbot**)

Until Helmut and Alison Gernsheim published their *History of Photography* in 1955 the Joubert plate was generally listed as a dusted on carbon print. The Gernsheims may have confused the use of the term “Phototype” with the later use of the term to denote a collotype and thus assumed the print to be that. Also the use of “Permanent Ink” may have caused the confusion.



Jefferson Davis  
actual size



*Journal of the Photographic Society of London, January, 1860*

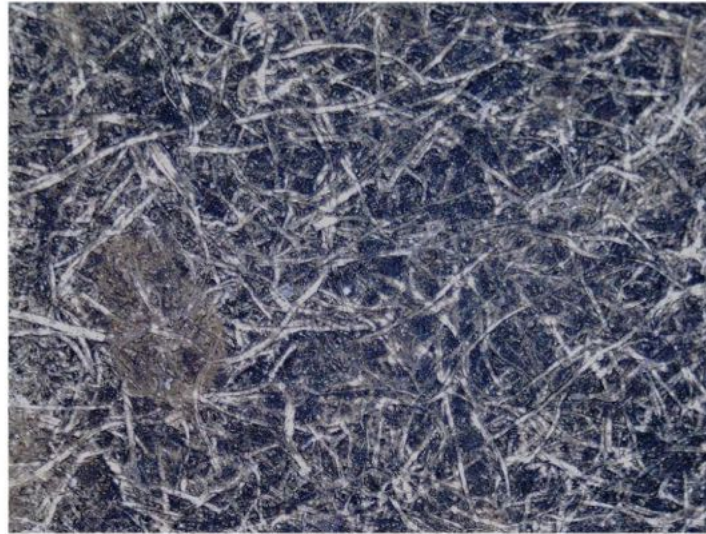
Steven F. Joseph



JOUBERT - GARNIER & SALMON COMPARISON



JOUBERT 15X



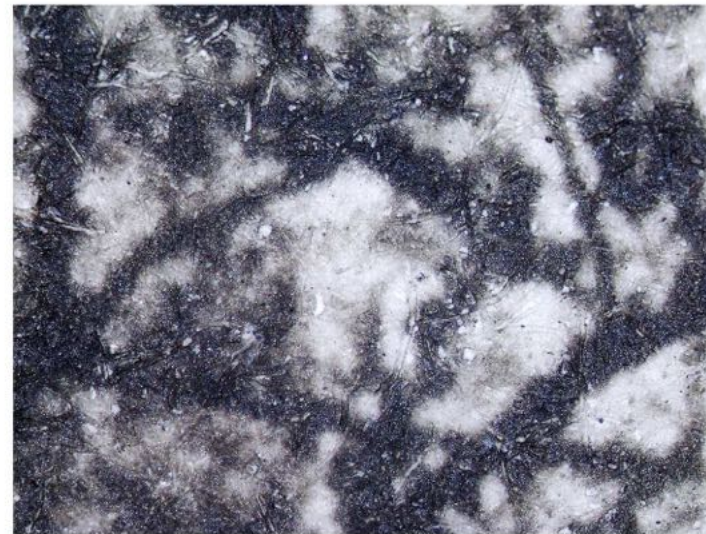
45X



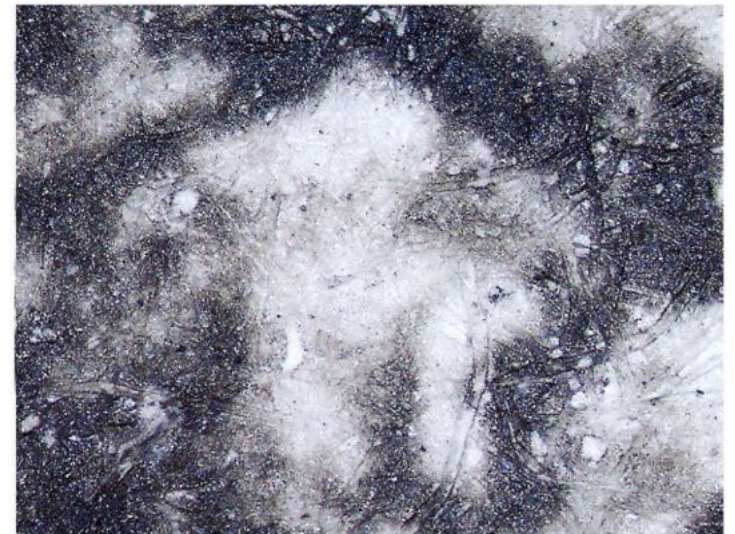
90X



GARNIER SALMON 15X



45X



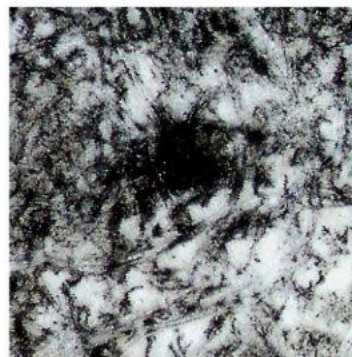
90X



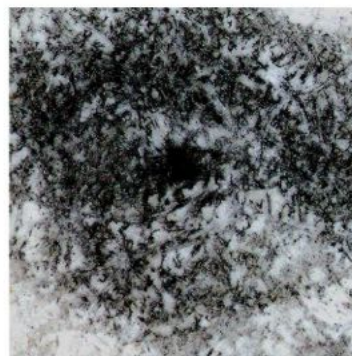
**KLIČ, KAREL** (1841-1926), Austria — *Photogravure*, which he perfected in 1879. Waterhouse (*Loan Exhibition* 1905, pg.XI) explained, “A clean, well polished copper plate is covered evenly in a dusting box with a grain of very finely powdered bitumen or resin, which is fixed on the plate by gently heating it. This grain serves to hold the gelatin image firmly to the plate and to prevent spreading and uneven action of the etching solution. Instead of impressing the photographic image directly to the plate, Klič printed it from a *reversed transparency* on the gelatinous tissue used in ordinary pigment printing (Swan’s process). The exposed tissue is transferred to the grained copper plate under water, and, after a short interval, developed in warm water, as in ordinary pigment printing, leaving a skin of insoluble gelatin, showing the lights and shadows of the picture reversed and in more or less relief, the lightest parts being darkest and thickest, the intermediate tones lighter and thinner, and the darkest shadows nearly bare copper. The margins and back of the plate being varnished, it is etched with a strong solution of perchloride of iron, which at once attacks the copper in the bare parts, and at the same time hardens the gelatin, though gradually permeating it and attacking the copper beneath to varying depths corresponding to the thinness of the gelatin film. The deepest shadows of the picture which are nearly bare are strongly bitten, the intermediate shades less and less as they become lighter, and the highest lights under the thickest gelatin should be bright copper. For line work one etching is usually sufficient and some operators prefer to use a single solution throughout for half-tone work, but it is better to first etch the deep shadows with a strong solution and then use a series of three or four diluted solutions, which will more readily penetrate the thicker layers of gelatin.” This method was a refinement of the Talbot “photoglyphic engraving” process, and it became the standard method of hand pulled photogravure, to the present day.

*Rotogravure* - A screened photogravure method invented in 1890. The method allowed the photogravure process to be used on rotary presses, thus enabling print runs in the tens of thousands, if not the millions. A line screen forms cells of varying depth, which hold the ink as excess ink is mechanically wiped away from the cylinder with a “Doctor” blade. This was commercialized in 1895. Klič had started working with the Storey Company in England in 1890, as they were printers of cloth with the use of rotary presses, they were ideal to attempt this method. It took the Storey’s until 1893 to work out the procedures to make the copper cylinders, the system of etching and the ability to print on paper. Klič eventually moved to England and became the superintendent of the Rembrandt Intaglio Printing Co. Ltd., which the Storey’s had set up to produce rotogravures. (Mertle pgs. 34-36). Both processes were secret and the first process was the only one sold to individual producers such as the Annans’ in Glasgow and Fred H. Allen in the US. *Vandyke Gravure* was an American name for a screened rotogravure method like the Rembrandt process. **Intaglio**

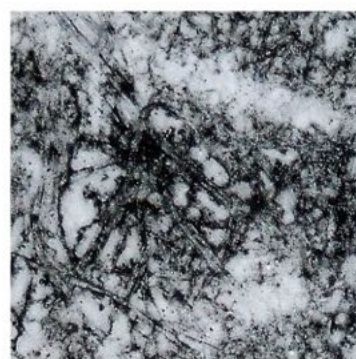
James Craig Annan, later known as J. Craig Annan, and his father Thomas traveled to Vienna to study with Karel Klič. They had purchased the right to use his method and to train under him. James was primarily the student and also eventually the Annan’s chief photogravurist. They worked with Klič from February 28 to March 14, 1883.



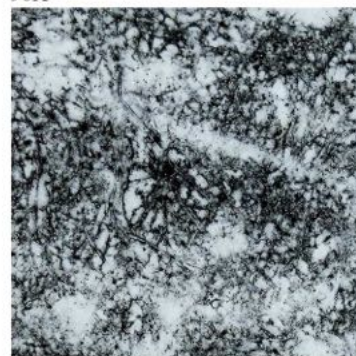
90X



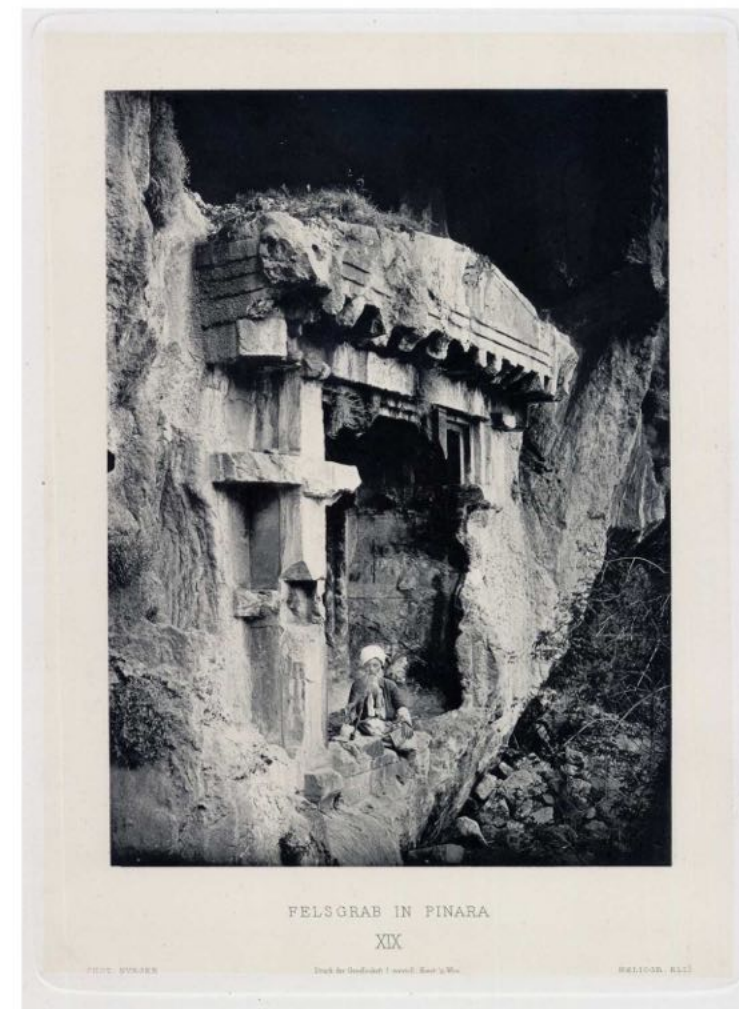
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90X

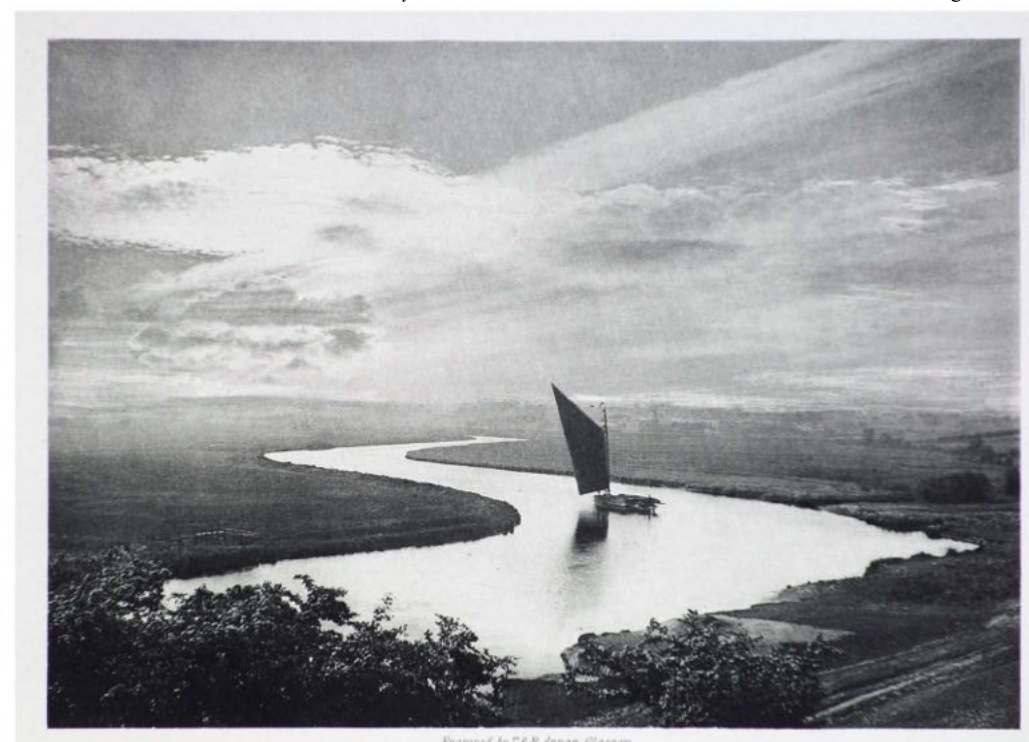


45X



*Reisen in Lykien und Karien*, 1884

Heliog. Klič



*The Scenery of the Broads and Rivers of Norfolk and Suffolk*, 1883



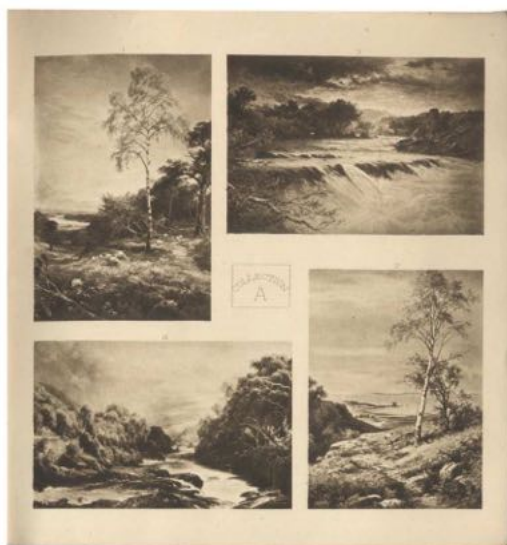


15X



copper rotogravure cylinder

From the catalog for the  
*Burlington Proofs* made by  
the Rembrandt Company in  
large format in a 35" X 24"  
mount.



Queen Alexandra's Christmas Gift Book photographs from my camera, 1908



**KOBELL, DR. FRANZ VON** (1803-1875), Bavaria, *Electrotyping* by deposition; (Boston, 1892) "The design is painted upon a metal plate, with colors which dry with a lusterless or granular surface, and laid on thinly in the lights, and more thickly as the shadows increase in depth. Pen-and-ink and crayon drawings can be made in a similar way. Electrotyping furnishes an intaglio plate, which can be printed in the roller press." Walker (pg. 66) explains: "It consists in painting on white metal [silvered copper] with etching ground or varnish: the several shades are obtained by the relative thickness of the layers of varnish; the whole is then plumbagoed [dusting on with graphite]; and the deposit [electrotype] obtained on it is used as a plate to furnish prints." Eder (pg. 581) states that this is the foundation for Pretsch's method. The two plates shown are from *Die Galvanographie*, 1842.



*Die Galvanographie*, 1842



*Die Galvanographie*, 1842

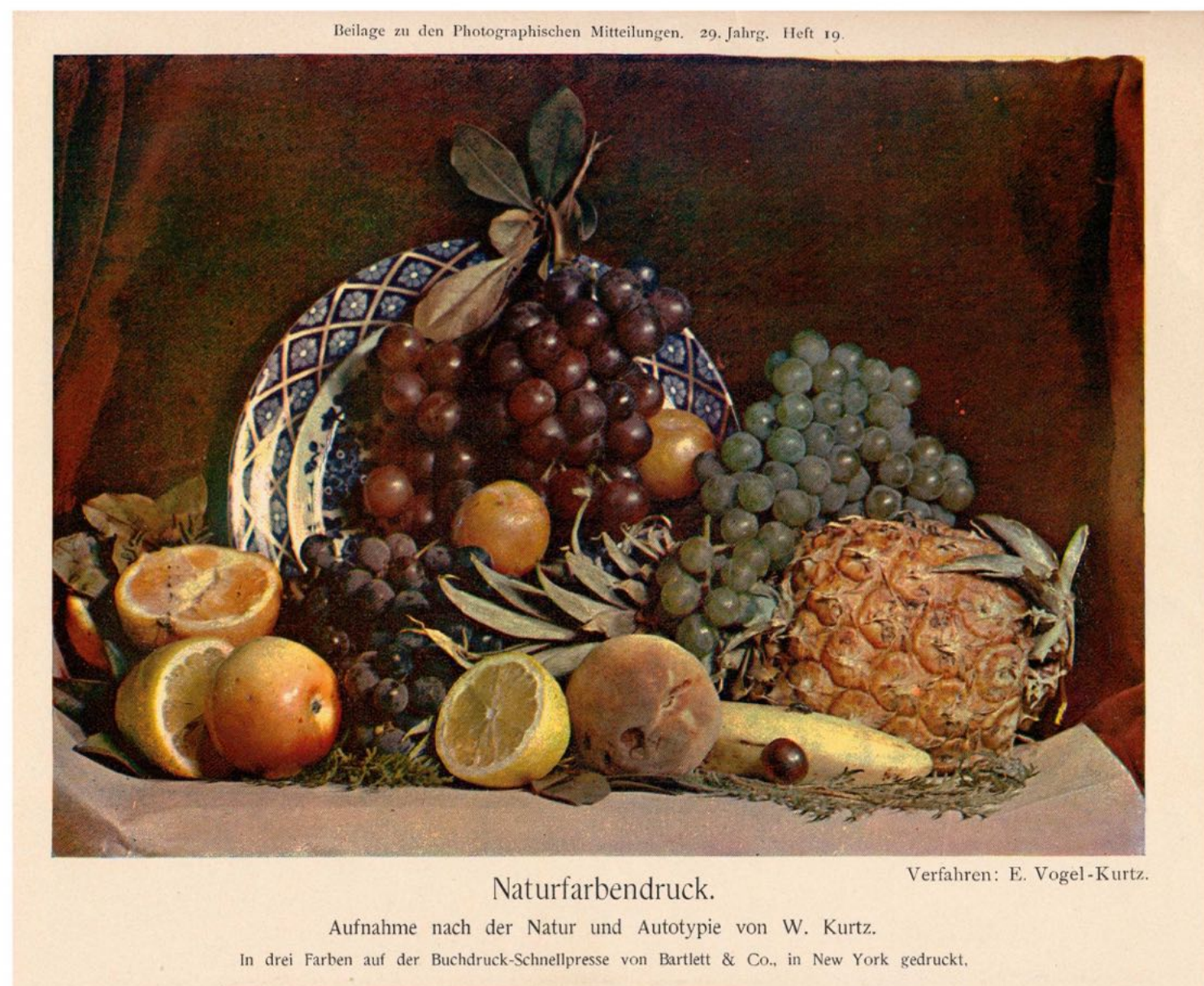


**KURTZ, WILLIAM**, (1833-1904) U.S. and **ERNST VOGEL**, Hermann Vogel's son, Germany — Kurtz patented a method of producing color prints from *Halftone* single line screens. After photographing the image on three negatives, through color primary filters – red, blue and green, three relief printing plates were prepared through single line screens set at specific angles. The blue plate from the red negative at 45 degrees left of vertical, the red plate from the green negative at 45 degrees right of vertical and the yellow plate from the blue negative at 90 degrees to the vertical. (Sipley, pg. 17) This was done to stop the formation of moiré patterns in the prints. At this time ink manufacture was imprecise and the exact nature of the secondary colors was not arrived at. This process was sometimes referred to as the “Vogel-Kurtz method.” 1893. (This method having been anticipated years before, Kurtz' patent was challenged and he lost.) Kurtz was the first to commercialize three-color halftone printing in the US. **Relief / Planographic**

When Vogel and Kurtz were working on producing a full color photograph with typographic line screens there was also Dr. Eugen Albert in Munich (pg. 4). Both of these photographic professionals developed systems that were almost identical at about the same time. The Vogel – Kurtz photograph was published in January of 1893 and the Albert appeared within a month. It would be unfair at this point to give all of the credit for this accomplishment to Kurtz and Vogel. It should also be noted that Ives showed examples of relief three-color prints in Philadelphia in 1885 but no examples have survived.



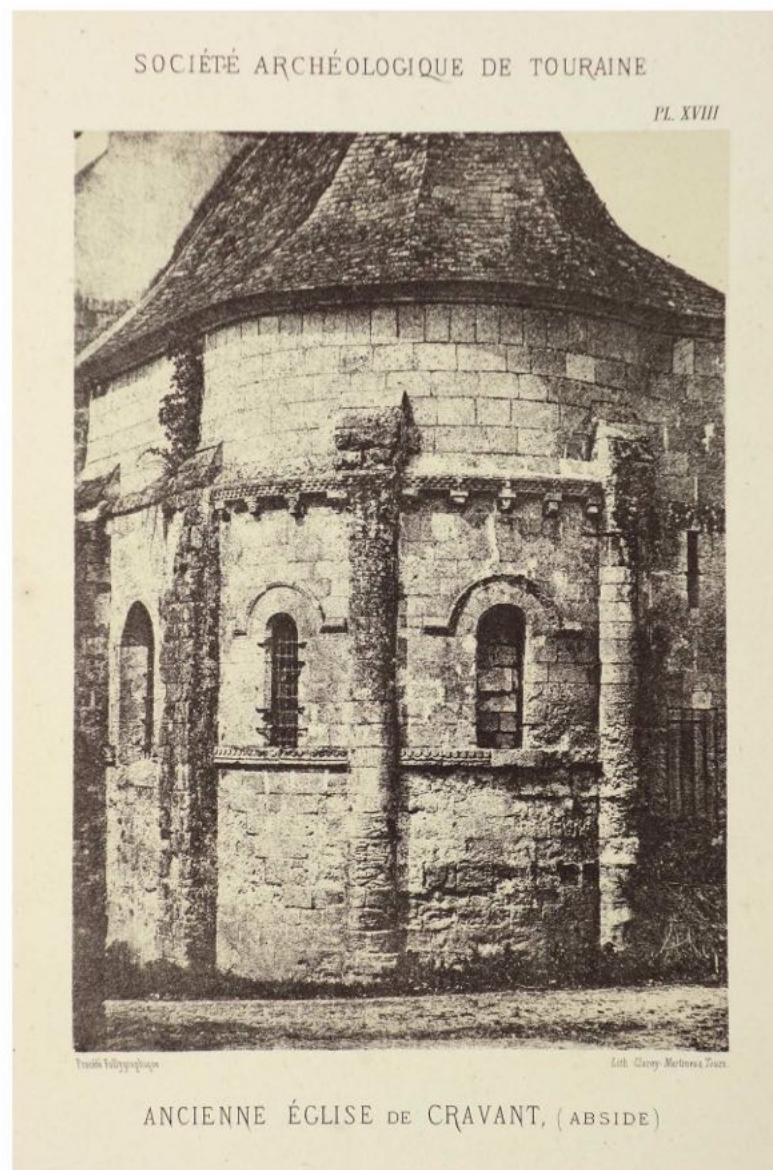
15X



*Photographische Mittheilungen*, 1893



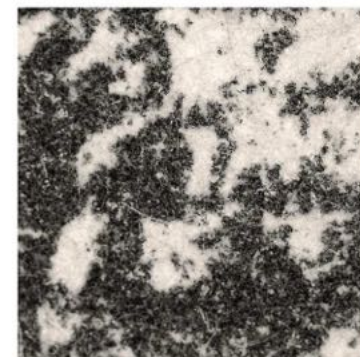
**LAFOLLYE, C. DE**, France — (worked only briefly during the 1860s) “Follygraphique” *Photolithographic* method. The de Luynes committee states, “M. de la Follye also uses the mixture of gelatine (or of gum) and bichromate, with which he covers a sheet of paper, as do MM. Asser and Toovey. After exposure, he puts the sheet on water, and then places the moist sheet on lithographic stone, which, according to its permeability, it leaves more or less gummed; he then inks this stone by placing on it a sheet of paper previously covered in ink by means of a roller. This small detail in manipulation would not constitute a new invention—any more than a second device, by which he proposes to ink the sheet of paper on which is the image, by applying it directly on a stone previously blackened in the same manner.” (Waterhouse 1868 pg. 73) **Planographic**



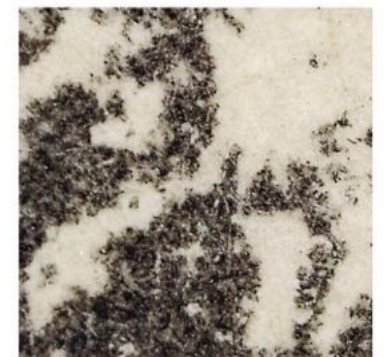
*Recherches Historiques et Archéologiques sur les Églises Romanes en Touraine, 1869*



PL. XVIII 15X



PL. I 15X



PL. I 30X

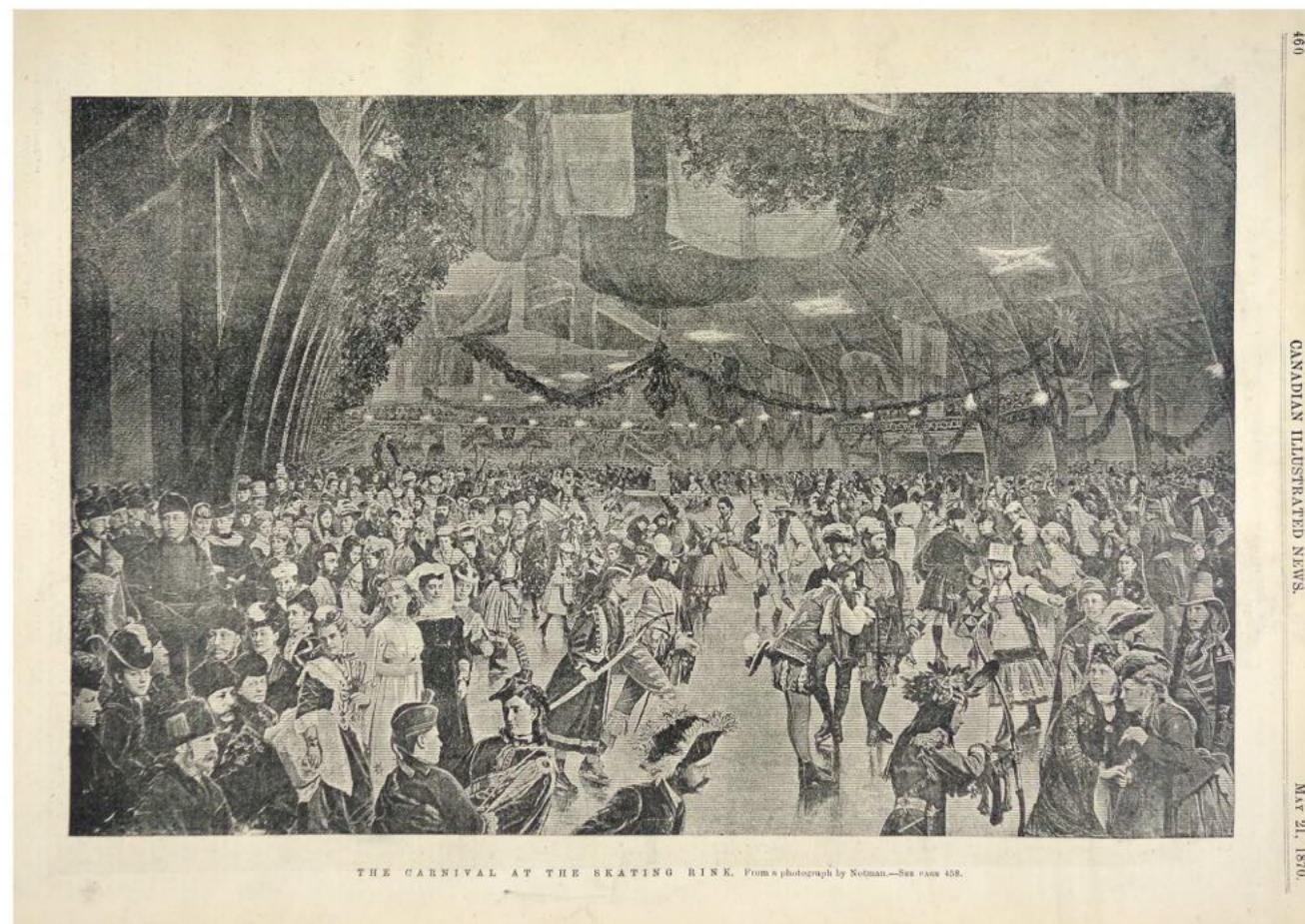


**LEGGO, WILLIAM AUGUSTUS** (1830-1915), & **GEORGE E. DESBARETS**, Canada/U.S. — (worked from 1867 to at least 1873) “*Leggotype*” Canadian patent, 1865; he and George Desbaretts were producing these as early as 1867. The method was a form of photoelectrotype. The method was to take a glass plate negative, varnish it and when dry coat it with a thick coating of bichromated gelatin, exposing this to light and then soaking it in water allowing it to swell based on its exposure. While still damp take a stereotype of it and then produce an electrotype from that for printing. Next Leggo patented “*Granular photography*” in Canada in 1869 and in the US in 1871. It utilized both random dot and line screen halftones. Leggo produced the first halftones in a weekly paper, the *Canadian Illustrated News* (1869 – 1872) and in a daily paper the *New York Daily Graphic* in 1873-74. The process was primarily photolithographic, though some examples 1869-1870 are printed in relief. Leggo’s Canadian patent CA67A explains the process whereas his American patent is quite vague. From the 1869 patent, which was handwritten: “The basis of the process is the combination in the photograph of lines or dots or of lines and dots with the natural shadows and lights of the object to be copied, and breaking the uniform surface of the lights and shadows by mingling these ... [illegible] of light and shade, as follows. Leggo’s Granulated photograph negative is produced by exposing a sensitized film, first to the object to be copied and subsequently to a roughened, lined or dotted surface; or, more practically by exposing the sensitized film, first to a positive or a reverse negative of the object, and then to a transparent lined or granulated plate, or the positive and granulated plate may be used in conjunction. The granulated plate referred to may be produced by spreading on the sheet of glass any opaque or dark substance, brown varnish for instance, and ruling with a point or closely dotting it with a graver or other instrument: also by grinding irregularities into the surface of a sheet of glass, by friction or pressure with sharp sand and then rubbing ink into the cavities so made, or by any other means which will lead to a similar or equivalent end.” From the US patent of 1871: “By these improvements I produce a new style of photograph, in which the gradations of light and shade of the picture are shown in granulation, in lines and dots instead of the usual unbroken shades of greater or lesser intensity. This style of photograph I use in the manufacture of Leggotypes from natural objects, from mezzotints, from brush, stump, pencil, and other drawings, and prints such as not already composed of lines and dots. I further employ this style of photograph in the manufacture of transfers for zinc, stone, from subjects of the above-mentioned classes. To make a granulated positive I copy, by known photographic manipulation, an ordinary photographic negative, combined with a granulated plate of known or ordinary construction. The two being placed together act as one plate. From a positive so made I produce, by the art of Leggotyping, a surface-printing type, capable of being printed from in any type printing press.” Leggotypes in 1871 were 90 lines per inch. The 1872 halftones varied between 120 and 133 lines per inch. In 1873 they were 100 lines per inch. **Planographic / Relief**

Leggo also used his line screen to create toned areas on art work, in a similar manner as Ben-Day Dots as early as 1870.

It has also been noted: “In 1875 they [Leggo Bros, New York] made the first screen on glass etched with hydrofluoric acid and sold this product on the market.” (Imgram pg. 440) Also Stephen Horgan (pg. 13) dates the Leggo brothers in New York, producing line screens cemented with Canada Balsam in 1883.

Leggo also patented a rising front camera in 1869 to combat Keystoning distortion (parallel lines converging) in architectural photography – the results can be seen in many of his photographs for the *Canadian Illustrated News*.



THE CARNIVAL AT THE SKATING RINK. From a photograph by Notman.—See page 458.

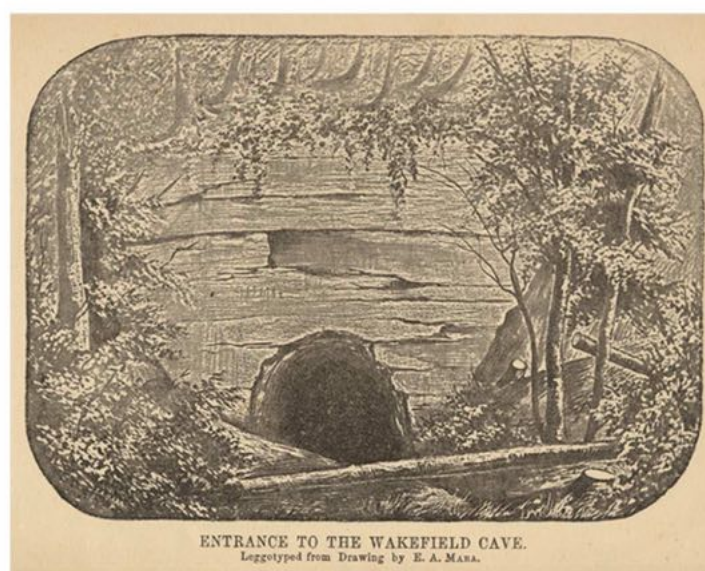
Given that the lines and dots have light centers it appears that this is a relief halftone. This odd mix of crossline halftone and the single line “shading” is unusual



The Canadian Illustrated News, vol.1, 1870



Skating rink 15X



ENTRANCE TO THE WAKEFIELD CAVE.  
Leggotyped from Drawing by E. A. MARR.

*Superficial Geology of the Valley of the Ottawa, and the Wakefield Cave.*  
*Transactions of Ottawa Natural History Society, 1869*  
This Leggotype is in single line and printed in relief.



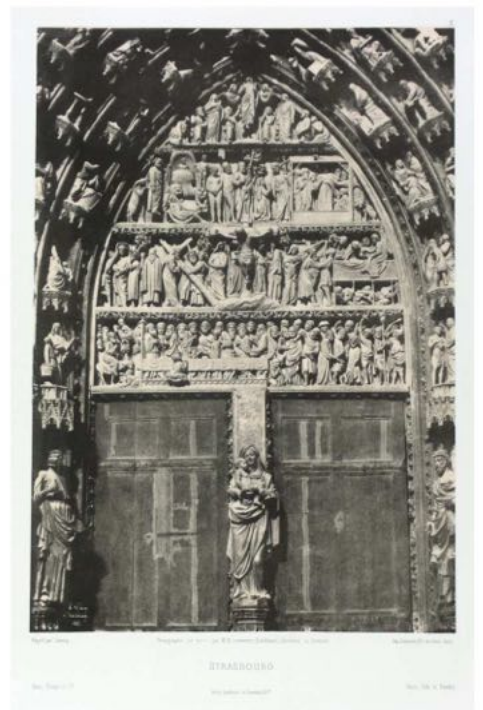
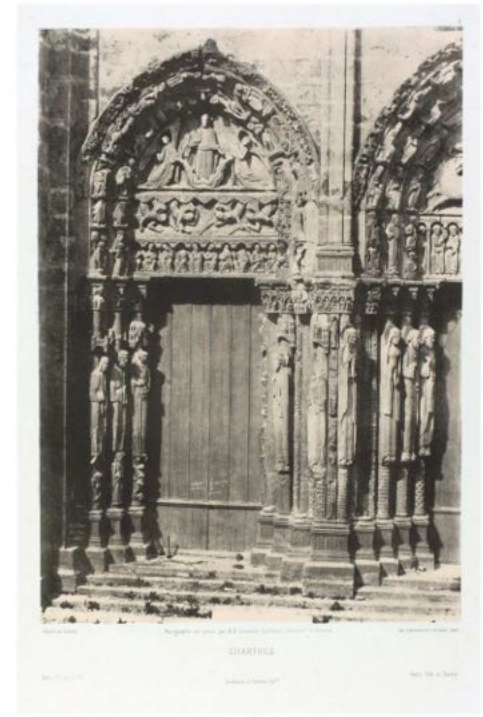
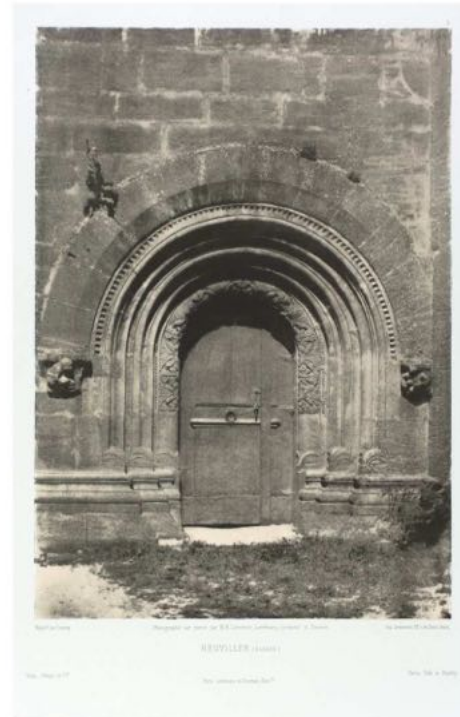
Leggotype 15X







**LEMERCIER, ROSE-JOSEPH** (1803-1887), **LEREBOURS, NICHOLAS-MARIE-PAYMAL** (1807-1873), **BARRESWIL, LOUIS-CHARLES** (1817-1871), **DAVANNE, ALPHONSE** (1824-1912) France – The first references in August, 1852 only reference the first three men and not Davanne. (worked briefly from 1852 to 1857) “*Lithophotographie*” *Photolithography* with bitumen utilizing Niépce’s method. Lemer cier used a grained stone with the process of coating the stone with a light sensitive mixture of Bitumen and lavender oil to produce the printing surface. “Lemer cier, Lerebours, Barreswil, and Davanne proposed a method of lithophotography in which a stone was coated with a solution of bitumen in ether, exposed to light under a reversed negative, and developed with ether, which dissolves the parts not affected by the light, while the exposed parts, being insoluble, remain and form the image. (Benzole, chloroform, or turpentine may also be used instead of ether.) After development the stone was prepared with acid and gum, and inked in the same way as an ordinary lithographic drawing.” Waterhouse (*BJP* 1878 pg. 427). Also, to give the prints a sense of a longer tonal scale, they used chine-collé. The first prints were titled “*Essais de Lithophotographie*” and then in late 1853 (Dépôte Légal - December) the portfolio “*Lithophotographie ou Impressions Obtenues sur Pierre, à l’aide de la Photographie..*” with 6 photographs by Le Secq was published. Lemer cier abandoned the process in 1857 when he purchased the rights to Poitevin’s method, which was much easier and cheaper. **Planographic**



*Lithophotographie ou impressions obtenues sur pierre, à la aide de la photographie*  
as submitted for copyright deposit, December 1853



*Essais de Lithophotographie 1852*

Mark Katzman

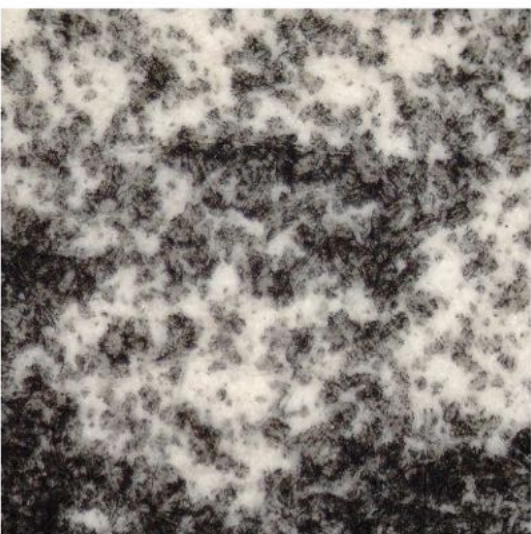




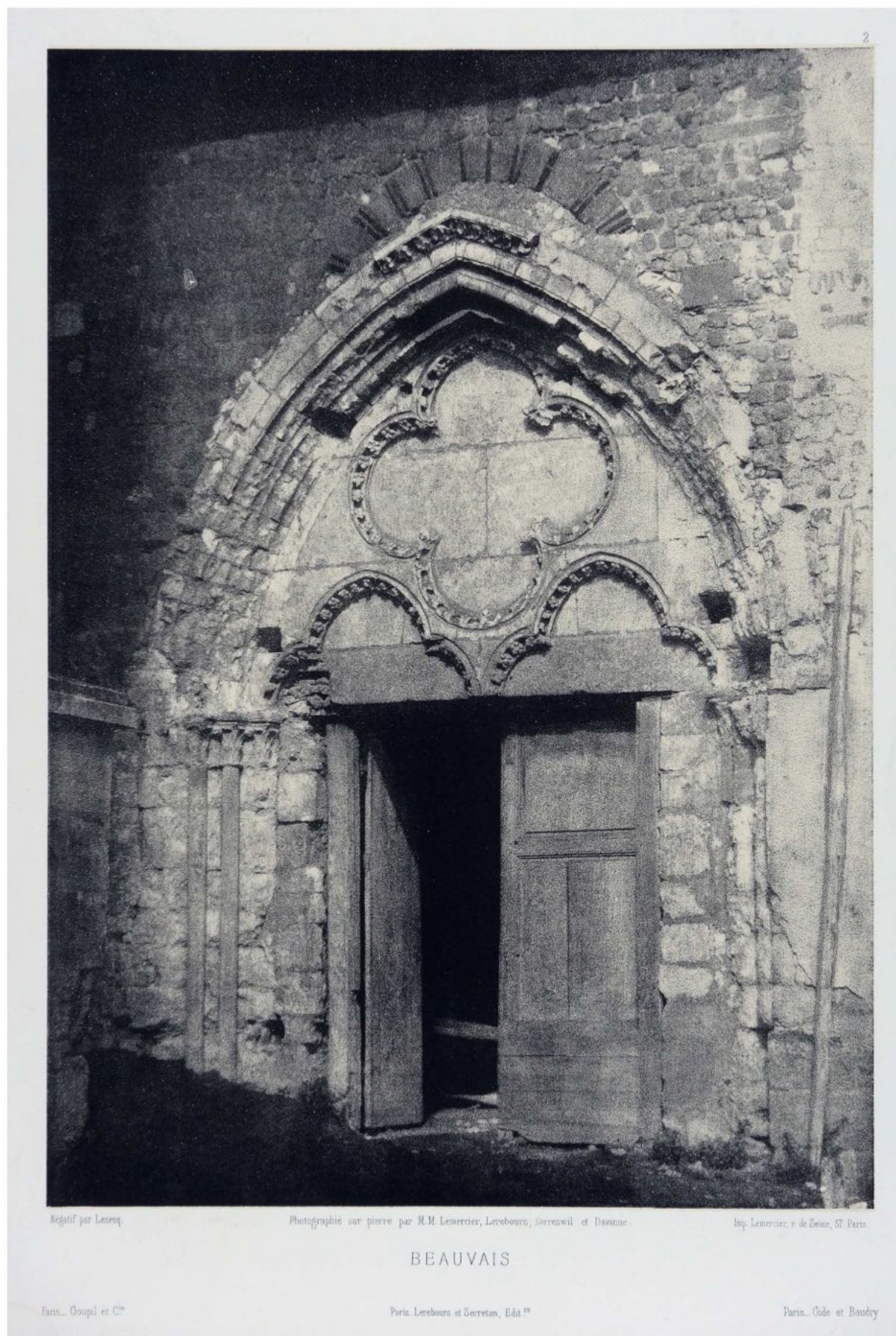
*L'Artiste*  
1887



15X



45X





**LEVY, LOUIS EDWARD** (1846-1919), U.S. — Louis Levy and David Bachrach Jr. patented a photoengraving process in 1875 which was termed “Levy Type.” It was a system of creating photo-electrotypes from swelled gelatin molds. David Bachrach detailed the patented part of the process that just after the exposed gelatin plate began to swell “we plunge it into a 20 grain silver solution until the relief is high enough, *but not a minute longer*, for if the action is carried too far the lines become rounded at the bottom and sharpness is lost.” (*Photographic rays of light*, pg. 69) This relief is then made electrolytic and can be electrotyped to make a printing plate.

Louis, with his brother Max, went on to create *Halftones* and halftone screens and they conceived the idea of ruling lines crosswise and etching into glass in 1887. Louis Levy (*Franklin Institute*, pg. 401) explained that he had manually crossed the line screen as Meisenbach had done “...as early as 1883, but the possibility of obtaining varied halftone effects with the single-line screen by varying the proportions of the divided exposure, coupled with the difficulty of getting a sufficiently perfect cross-line screen of any size, kept the single line screens in use. These were generally produced by photographing a sheet of parallel lines printed from steel plate or lithographic stone ruled by machine, reducing the size to get closer rulings. But the clouding of the open lines through halation, which left those lines most transparent in the middle and gradually less so towards their edges, though an apparently desirable feature, proved in practice to be a hindrance, and even where the lines were cleared as much as possible these photographed screens kept out so much light as to necessitate considerably prolonged exposure, and when doubled to make cross-line screens the difficulty was correspondingly increased. The way forward was manifestly through proper ruling on glass. To get this crosswise and to overcome the diffraction effect of surface rulings [I] conceived the idea of etching the ruled lines with hydrofluoric acid and blackening the depressions, which would give theoretically perfect screen and correspondingly perfect halftone reproduction. Small screens of this kind were put to use in 1887, and with the collaboration of my brother Max in this direction the idea was finally realized in full and patented by us in 1891.” These screens then became the standard of the industry worldwide. **LEVY, MAX** (1857-1926), U.S. — Halftone screens were perfected for manufacture in 1893. Along with Louis, Max perfected the spray etching machine to produce sharp relief halftones. **Relief**

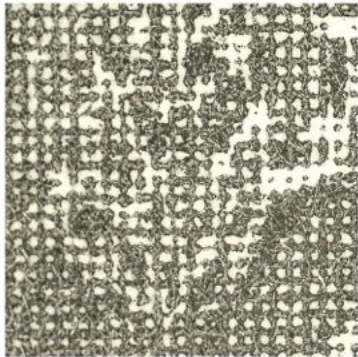
**In Process Examples** on page 163 is a Levytype halftone plate.



*History of the Johnstown Flood Illustrated, 1889*



Flood 15X



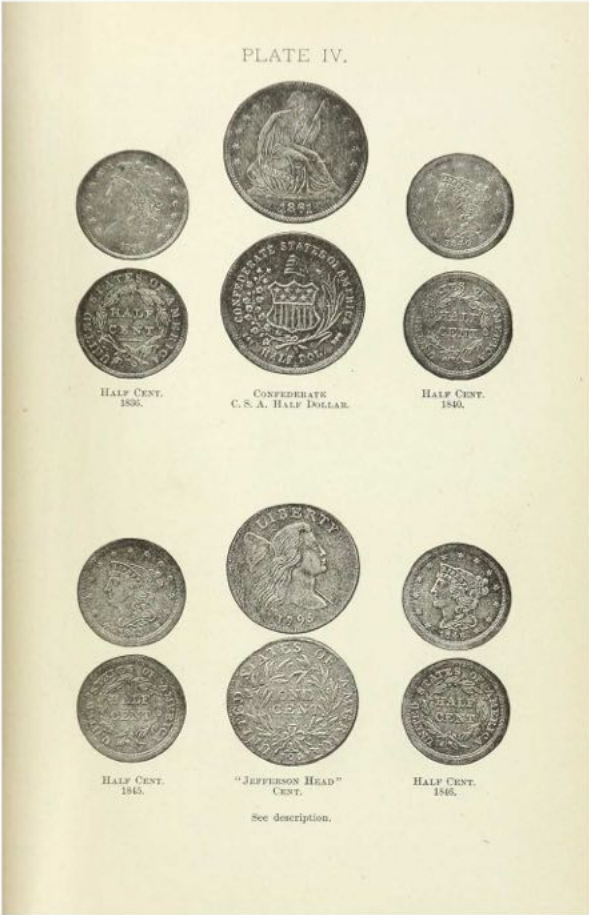
Mint 15X



The difference in the representation of the line screen between the 1886 coins and the Johnstown flood of 1889 may show the beginning of the use of the concept of the Optical V. The highlight dots are much smaller than the surrounding ones.



*Biblical History in Biblical Language, 1875*



*Illustrated History of the United States Mint, 1886*



**MAGNE, JEAN JACQUES**, France, "*Magne Process*" This process is not photomechanical but is discussed in a number of sources. It is a process whereby an original document or drawing can be transferred to a printing surface without damaging the original. From the patent: "The essential characteristic of the process is the employment of a certain composition which protects the paper from the action of the ink and does not injure the cellulose." French patent, August 23, 1881, No. 144,494.

# FORGET-ME-NOT.

A POEM BY

C. Jay Smith.

ILLUSTRATED BY

FRANK C. BROMLEY.



Published by.

PHOTO MECHANICAL PRINTING CO.

(MAGNE PROCESS.)

CHICAGO.

COPYRIGHT.

1882.



It was late one calm, delightful summer's  
day,  
In years that long have passed,  
The sun was shedding forth its last faint ray  
And night was falling fast.

Beside a running brook, that murmured low,  
And flowed through meadows fair,  
A lone youth dreamed, and waited long ago -  
Why doth he tarry there?





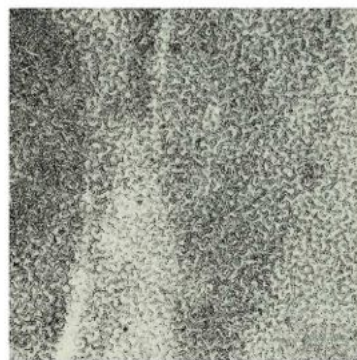
**MANTE, LOUIS-AMÉDÉE**, (1826 – 1913). France. Mante was a professional musician with the Paris Opera from 1848 to 1895 as well as a photographer. The Luynes committee, in 1867, noted that Mante had begun an engraving process as early as 1852 and wrote “About the same time M. Mante also made attempts at engraving, which he has since then improved and perfected, but without publishing his mode of operating.” (Waterhouse pg. 69) Mante was the first person to produce really fine results in 1853 using Niépce de St. Victor’s heliogravure process. It is possible that Mante recognized that Niépce de St. Victor’s process held greater possibilities than his own and so he applied his own method of creating the light sensitive varnish to it. Niépce de St. Victor (*Traite Pratique*, pg. X) notes Mante was instrumental in developing the sensitive asphaltum varnish for heliogravure. Mante worked with Riffaut producing plates from Bisson photographs for *Photographie Zoologique* at least eleven of which bear his inscription “Photochalcographie par Mante” or “Photographie sur acier par Mante.” Lacan, in his introduction to *Recherches Photographiques* makes mention of the plate of the two lizards as being by Madame Riffaut with the help of St. Victor. However the plate shown here, given by St. Victor to his uncle is by Mante. The 1854 plate of the two lizards is inscribed by Mme. Riffaut. And finally Niépce de St. Victor in his introduction to his 1856 treatise wrote: “A few months after the first call I made to the Academy of Sciences, an artist I am pleased to name Mr. Mante, won first remarkable results. I mean the beautiful engraving gravure tests on steel forming part of the book published under the title of *d’Iconographie zoologique*.” (pg. X) **Intaglio** 1853

Much later Mante also produced prints titled “Lithophototypie” – “procédé Mante” – He produced this form of printing for *Catalogue des Pièces du Musée Dupuytren. Vol. II*, 1877. These prints are usually referred to as collotypes, however they show an unusual reticulation pattern. According to his great-granddaughter, Jacqueline Millet, he was driven into severe debt because Paul Dupont, publisher of the *Catalogue*, didn’t pay him. **Planographic**, 1877

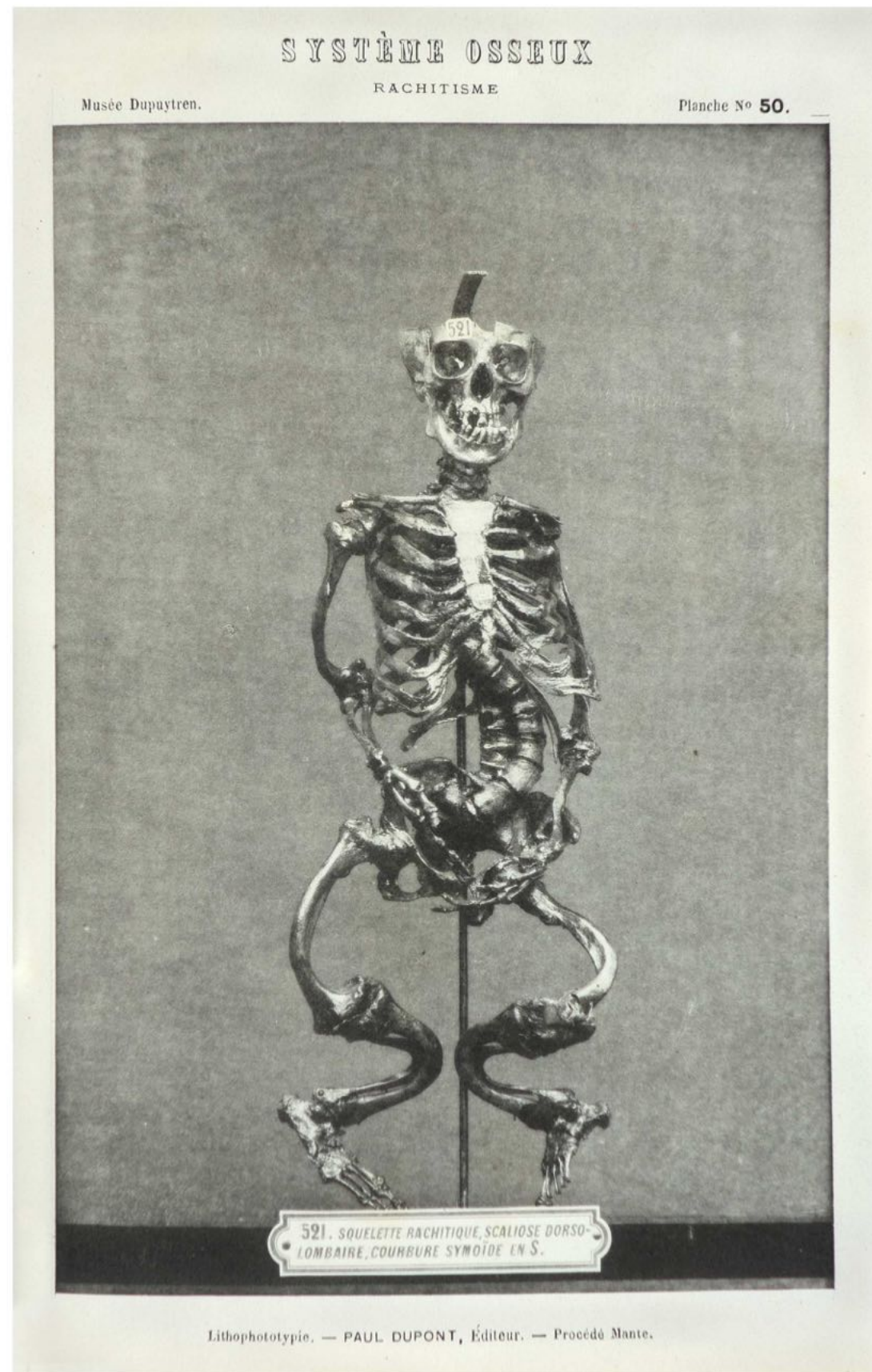
He eventually joined with Edmond Goldschmidt, who married one of his daughters, and together they created a series of elaborate orientalist autochromes.



45X



15X



*Catalogue des Pièces du Musée Dupuytren, vol. 2, 1877*



Dr. Alfred Boulongne, in his 1854 book *“Photographie et Gravure Héliographique”* (pgs. 57-8), gives the exact method of Mante’s improvement: “Describing M. Niepce’s process, we intentionally emphasized the process that he uses for coating steel plates with varnish. We stated that he employs a roller out of hide. This method, unsatisfactory on several counts, has fortunately been corrected by M. Mantes [sic]. This is the rest of his method. The basis of his process is to make a liquid varnish, the only means for achieving pristine prints. He dissolves hot virgin wax in adjusted essence of lavender (a small quantity suffices, since the essence dissolves very little of it); he also finely grinds asphalt, which he dissolves hot in the previous mixture of wax and essence of lavender and added benzine, in equal measures. He firstly makes this varnish very thick in order to adjust it afterwards to the required consistence. The most satisfactory thickness is one that leaves a golden yellow hue to the plate once it has dried.

Once the varnish is made, he mounts on a turn a steel plate polished with soft chalk and pours a small amount of this liquid onto the plate, which he coats as evenly as possible with a glass rod. This operation is furthermore facilitated by the various movements transferred to the plate by the turn. When the varnish is completely dry, he applies to the surface the proof obtained on albumenized glass or on collodion, exposes the whole to the light, as stated above, and dissolves the unaffected parts in a solution of 500 gr. of naphtha oil, 100 gr. of benzine and 5 grams of essence of lavender. Once the proof has been thoroughly cleansed, it is left to dry completely. All that remains now is to etch it, but that is the engraver’s job.” (translated by Steven F. Joseph)

As found in *L’Illustration*, October 22, 1853: “In publicizing their process, Messieurs Niépce’s nephew and Lemaître were enabling the many involved with photography today to multiply their experiments and produce new improvements. That is what the photographer Mr. Mante has achieved. Soon he associated in his efforts Mr. Riffaut for the process of engraving. This time, the results achieved are most remarkable. They are the fine plates of the zoological iconography published by Messieurs L. Rousseau and A. Deveria. If the process as a whole belongs to Messieurs Niépce and Lemaître, the most satisfactory application that has been made until now is due to Mr. Mante and Mr. Riffaut, engraver...”

The print to the right was given by Niépce de St. Victor to his uncle but note that it was created as a heliogravure by Mante. It also has been noted that the designation “Héliographie sur acier,” or “Chalcographie sur acier” denotes the person who coated and exposed the plate and that the “Sculpt” denotes the person who etched the plate.

The Muséum National D’Histoire Naturelle, Paris has the most complete set of prints from *Photographie Zoologique*. They have 28 prints, assuming that 10 are salt prints from the first group it would indicate that there are 18 left to be Heliogravures. At present they are digitizing the set. I have been able to confirm from other sources that there are at least 11 that were produced by Mante. It also appears that the production was stopped before the end of 1853.





**MARIE J**, France, *Photolithography* His address was 61, rue du Faubourg St Denis, Paris. He was a lithographer who did a number of prints for *L'Artiste* in 1855 and also printed the Marquier photolithograph (page 89). Waterhouse in a visit to Marie in 1870 writes: "He uses three or four stones for each subject, and thus obtains the necessary gradations. I believe he works with asphaltum; and, after the development of the images on the stones, they are gently rubbed, so as to give pictures of different degrees of intensity with a very fine grain. He says he can print 2,000 copies from the stones. The process gives beautiful results, but cannot be considered of very practical utility: in the first place, because it is a secret; and in the second, because it depends very much for success on artistic skill and dexterity, which M. Marie possesses in high degree." (pg. 184) In 1866, before the Société Française de Photographie he stated that he did not use gelatin bichromate in his process. (pg. 170) **Planographic**



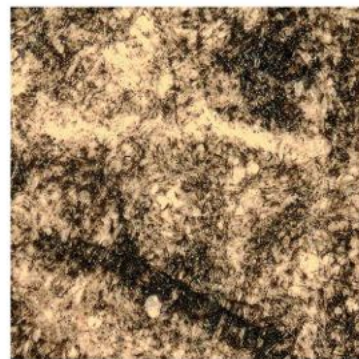
Société Française de Photographie



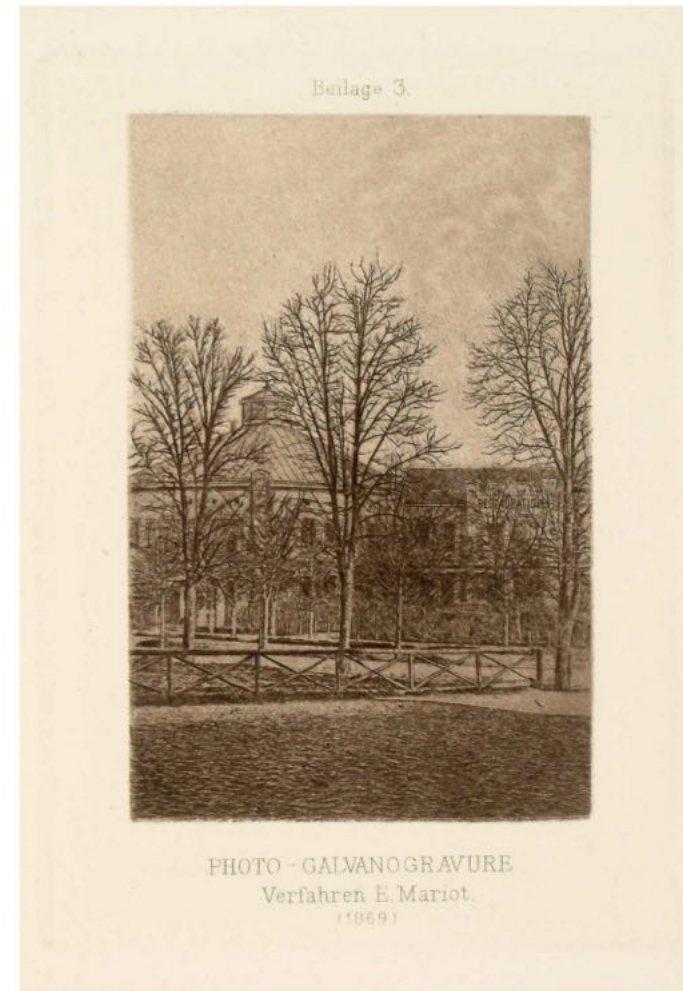
**MARIOT, EMIL** (SCHIELHABEL), Austria — *Photo-electrotypes* for maps in 1867 “*heliogravure*”. “A photographic gelatin relief was transferred to a silver-surfaced copper plate, whereon an intaglio printing surface was produced by photogalvanography.” (Mertle pg. 23) The process may have also been used for photographs as one example exists. **Intaglio**



15X



45X



Volkmer, *Die Photo-Galvanographie*, 1894



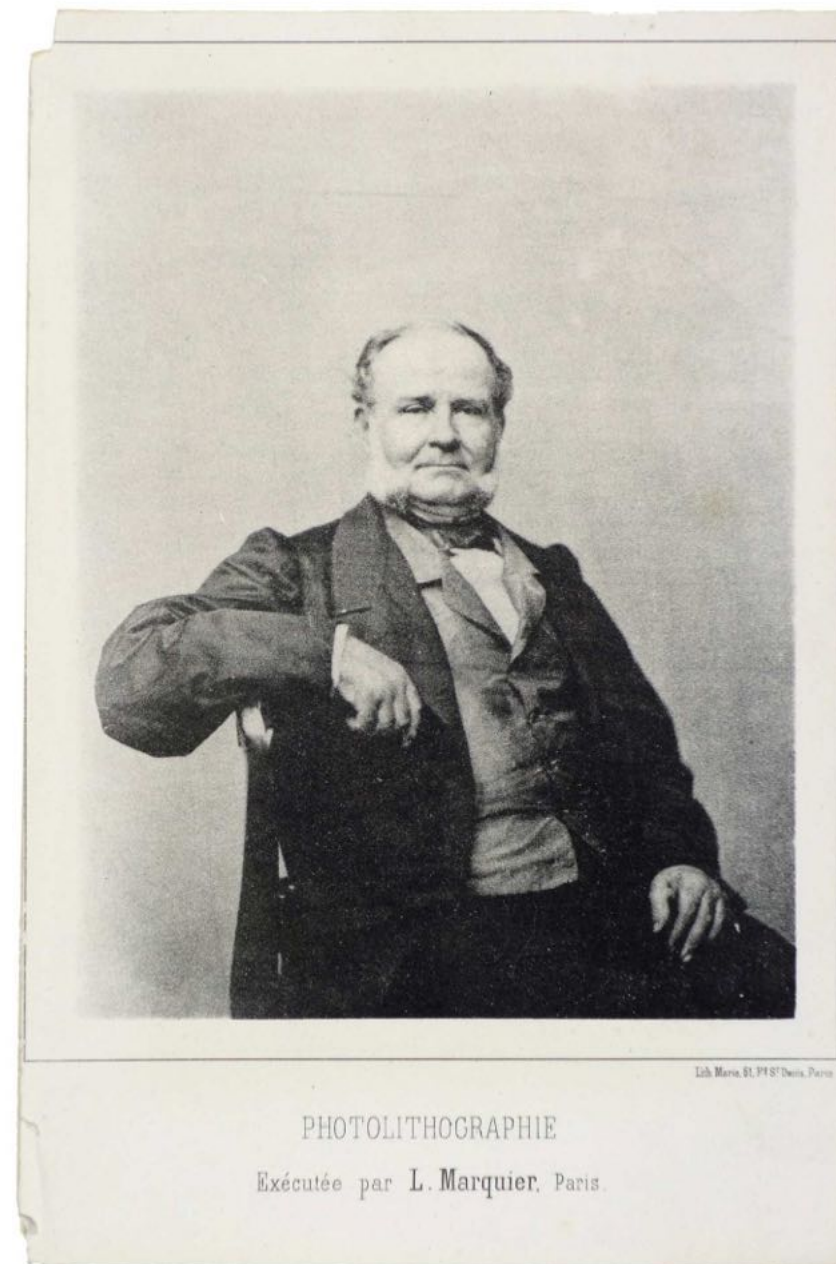
**MARQUIER**, France — *Photolithography*, 1862. The Luynes committee noted that “according to Mr. Poitevin, the process involves the use of a rubber compound and potassium dichromate.” Marquier secured a Belgian patent no. 13364 for his process of photolithography, November 15, 1862. He began with a finely grained stone and he coated this with a sensitive solution mixed in equal amounts of a saturated solution of bichromated water combined with a thick solution of gum Arabic. The coating was thinly placed on the stone and buffed smooth and dried with a cloth. A transparent positive was exposed in sunlight and then developed in the dark with a solution of “potash at 3 degrees on the salt scale.” This will remove the gum that was not exposed in the shadow areas of the picture and it will cause a slight engraving to the stone. After this a sponge soaked in soap foam, “preferably white soap of Marseilles” was rubbed into the stone and was taken up with the engraved areas produced by the potash. The stone was then dried with a soft cloth and then it was gummed as it would be for a crayon on stone. The stone was then washed and gummed a second time. After a period of rest it was ready to be printed.

The photolithograph here was printed by Marie, who also devised a method of photolithography (pg. 87).

Marquier also contested Morvan's priority before the Académie des Sciences in 1863 (pg. 696). **Planographic**

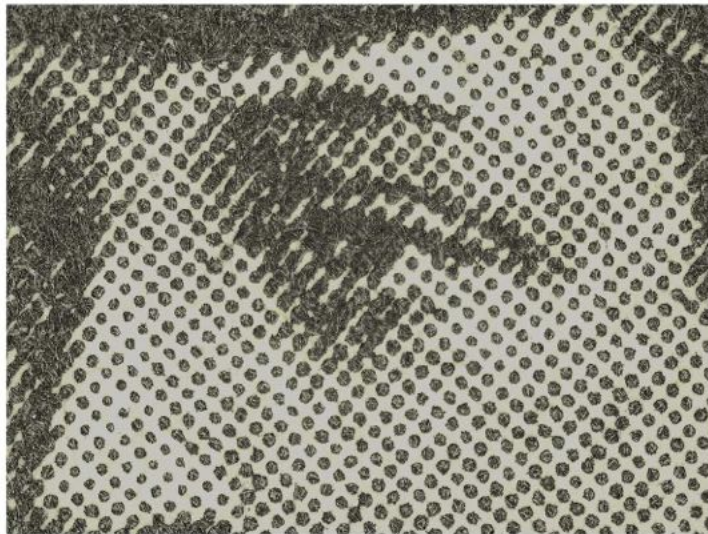


15X





**MEISENBACH, GEORG** (1841-1922), Germany — “Autotypie” single line screen crossed after half the exposure in the copy camera, to create a crossline dot *Halftone*, in 1882. The Meisenbach system became the standard halftone system throughout Europe. His partner **Joseph Ritter von Schmaedel**, in 1884, succeeded in ruling through a black coating on a glass plate, using a specially made ruling machine, producing a clean screen for halftone. Once the perfected Levy screens became available after 1893, Meisenbach, as well as everyone else, used them. The image shown has a screen of 120 lines per inch. **Relief**



15X

# Neueste Erfindung.

(Patent Meisenbach.)

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Fliegende Blätter Jahresband, 1884



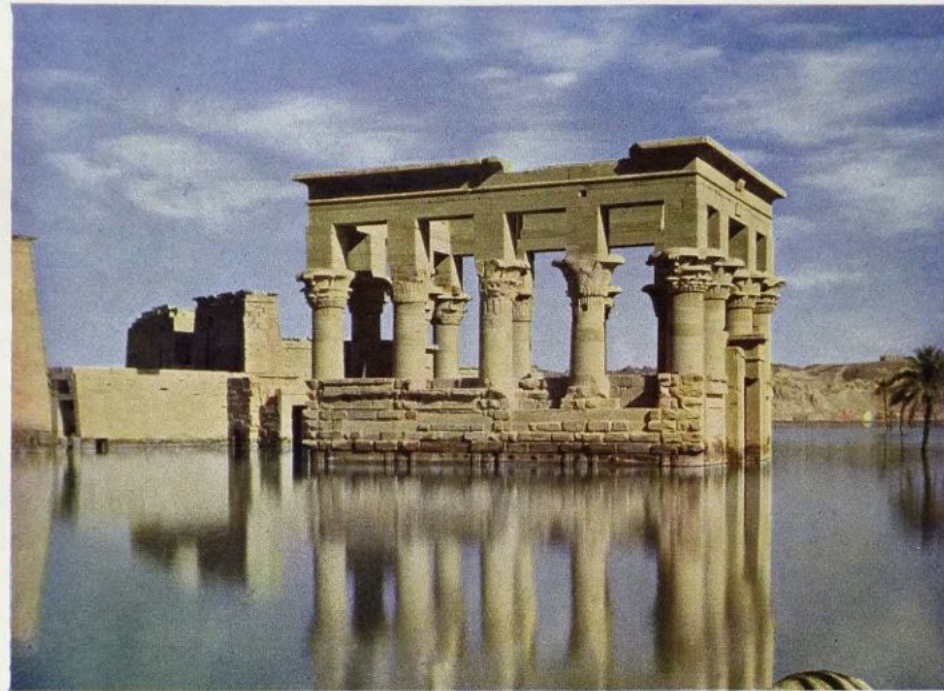
**MIETHE, ADOLF**, (1862-1927) Germany - Invented color dyes for creating films sensitive to only one of the primary colors, which led to the invention of color films. Miethe also invented a camera that would quickly shoot three successive panchromatic negatives through primary filters. From these he was successful in producing excellent color halftones for his books. His color photographs were being reproduced as three-color halftones as early as 1902.

By the time his Egypt book was produced it was possible to incorporate the color images with the text successfully. Prior to this color illustrations were set in separately because the printing technologies could not reliably accommodate both the text and the color print.

und dem ägyptischen Vineta

69

wasserlosen Wüste, gehen Siechtum und Tod ebenso entgegen wie das ägyptische Vineta, das sie früher mit ihren herrlichen Fiederkronen schmückten. —



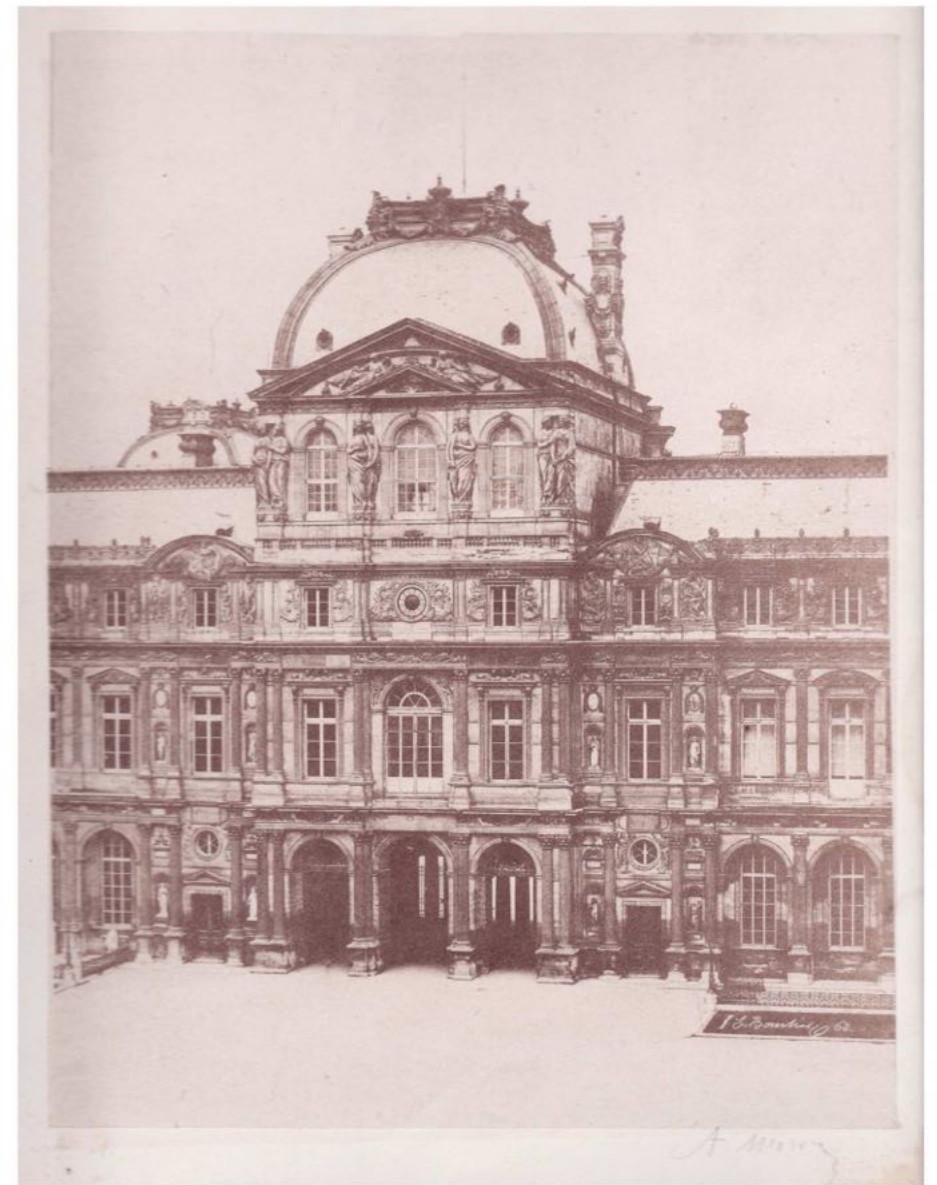
TRAJANS-TEMPEL IN PHILÄ

Zum Glück naht sich die befehlende Macht im richtigen Augenblick in Gestalt eines Polizisten, der seinen Knüppel auf die schwarzen Köpfe der ärgsten Schreier knackend sausen läßt und uns ein Boot besorgt. Gepriesen sei die ägyptische Polizei. Nie ist uns vorgekommen, daß

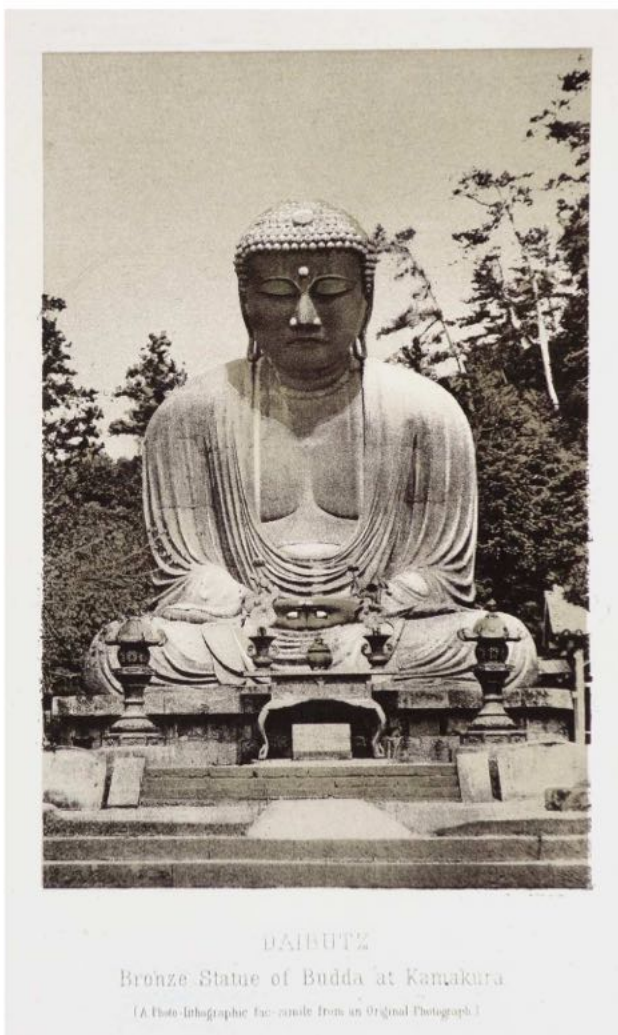
*Unter der Sonne Ober-Ägyptens, 1909*



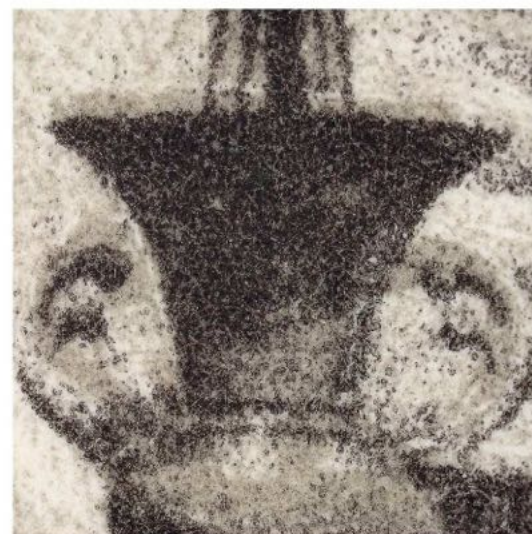
**MORVAN, ARTHUR GAY** – France/US – *Photolithograph*, 1862. Morvan patented his photolithographic process in England (no. 640) March 10, 1862. The process as described was for images in line. A drawing was exposed to a sheet of silver sensitized paper. The provisional patent reads: “The stone is prepared with acid, washed in water, dried, coated with a sensitive varnish, allowed to dry, and exposed to the action of light; it is then washed with white wine, with water, allowed to dry, washed with soapy water, again washed, ‘and then dried in a stove or otherwise.’ Ink is then applied and the stone is allowed to rest 24 hours, then washed with essence of turpentine. Again ink is applied, and the subsequent inking operations are facilitated with phosphoric acid and gum, so as to bring out the design; impressions may then be taken from the stone. The [sensitive] varnish contains white of egg and bichromate of ammonium, and those parts exposed to light become more or less insoluble.” The Luynes committee noted that the process was to coat the stone with bichromated albumen and then expose it under a transparent positive. The exposed stone was then washed with a soap mixture to remove the unexposed albumen. The stone could then be printed from. They noted that the process was identical to that of Newton (Bradford and Cutting). Morvan moved to the United States about 1865 and settled in New Jersey. In 1867 he took out an American patent (no. 66,102) which was to create a photolithographic transfer paper for photomechanical printing in any form. Sylvester Koehler notes on a Morvan print (GA 03766 – Graphic Arts Division – Smithsonian) that Julius Bien adopted Morvan’s photolithographic system in the United States. Bien was a noted lithographer who published maps and other lithography. During the 1870’s on he produced heavily reworked photolithographs for US government publications (see pg. 179). In 1870 Bien produced a technically fine example of an unretouched photolithograph. **Planographic**



Steven F. Joseph



*Across American and Asia*, 1870



15X  
Note Bien’s use of a second photolithographed tint to add depth of tone.



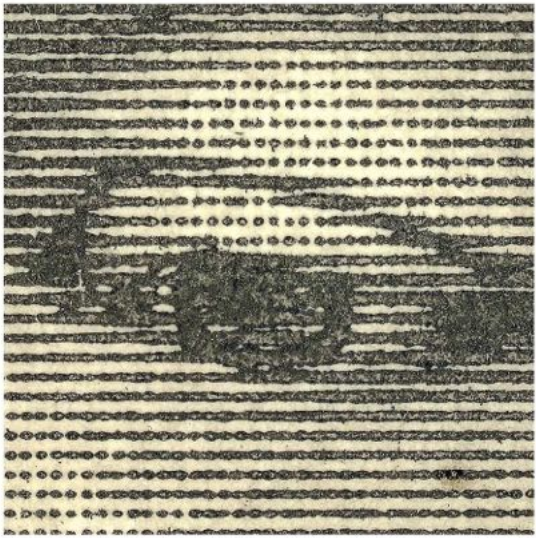
**MOSS, JOHN CALVIN** (1828-1892), U.S. — *Photoengraving* method developed in 1868. Horgan in the *Inland Printer* (pg. 77): “In brief his method was this: Plate glass was coated with a rather thick film of sensitized gelatin. After long exposure to light under an intense negative the gelatin was soaked in water, when the unacted-on portions swelled, and while in this state a plaster or wax cast was taken from the gelatin relief. A plaster mold was made from this plaster cast, and finally a cast in stereotype metal from the plaster mold.” The short-lived company created to use the process was the Actinic Engraving Co. about 1872. One important adjunct to his method was how he created reduced copies of art from photographs. To start a large photographic print was made. Over this an artist would draw a line copy in India ink. The photographic image would then be bleached out and from the resulting line art a reduced high contrast photographic copy would be made to produce the printing plate. Moss then became associated with the Photo Engraving Co., but eventually opened his own business. He then developed the “Moss-type” a single line screen *Halftone* method in 1885. Both were secret processes. **Relief** Examples of Moss photoengraving blocks are on pages 161-162.



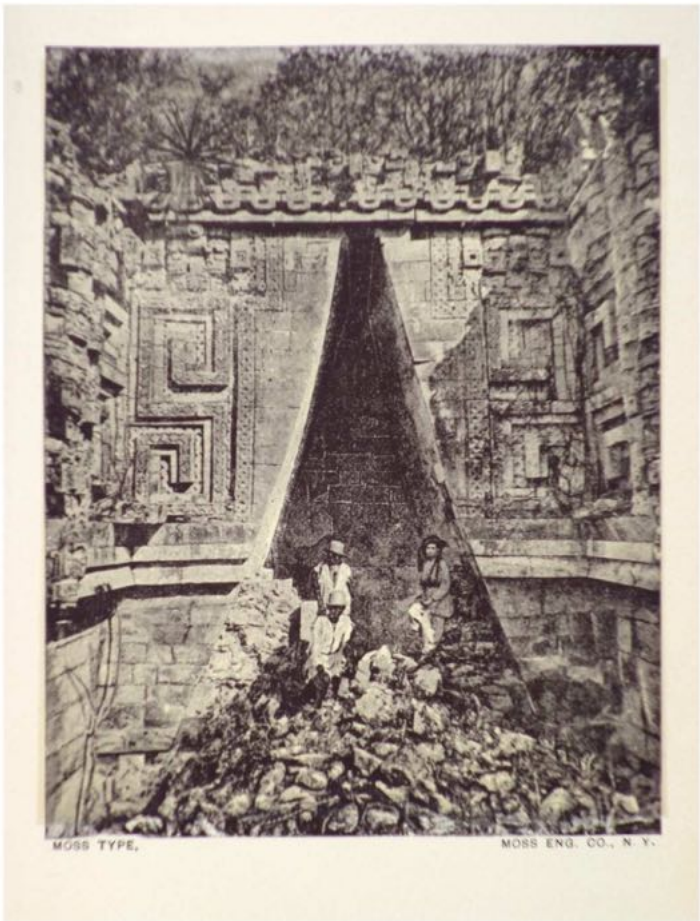
Luzerne, The Lost City! 1872



Photo-Engraving Co. circular 1874



15X



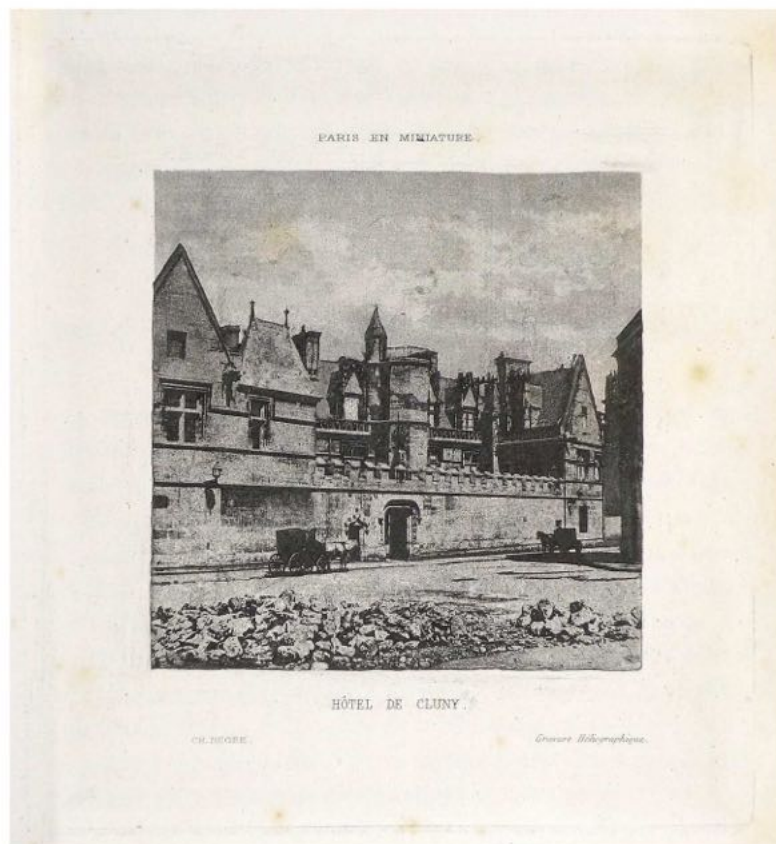
Sacred Mysteries among the Mayas and Quiches, 1886  
note the use of a tint plate



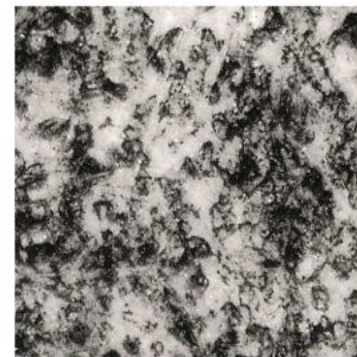
**NÈGRE, CHARLES** (1820-1880) France — *Heliogravure* (worked from about 1854 to about 1874) *Heliogravure* on steel, Nègre initially studied with **Niépce de St. Victor**. Highlights gold plated in 1854, patented in 1857. A good explanation of the process appeared in *The Chemical News and Journal of Physical Science* vol. 15 March 1867 pg. 101: “The steel plate, covered with Judeau asphalte, or a layer of gelatine mixed with bichromate of potash, is printed upon by the sunlight through the wrong side of a negative obtained directly in the camera; thus, the coating of varnish being impressed by the parts which correspond with the shadows of the proof, the steel plate is exposed in the parts which correspond with the lights. Steeped in a gold bath, and submitted to the action of a current of electricity, the steel plate receives a uniform layer of gold on the parts corresponding to the lights of the proof; while the portion covered by the shadows, covered with sensitized varnish, only becomes covered with the particles of the gold in proportion to the intensity with which the light has acted in the different tints and in the tones of the shadows. On removing the coating of varnish from the steel plate, it presents only an image formed by a deposit of gold, perfectly inherent—a truly shaded sort of Damascus work. The gold being unattackable by acids, all that is necessary is to pour on the plate diluted acid, in order to obtain an engraving presenting all the shades of tint, from the clear white of the paper to the deepest black, at the same time preserving the precision, fineness, and sharpness of outline of the photographic proofs.” It appears that Nègre was attempting to commercialize his process as there are at least two book projects from 1857 for which he supplied prints after early engravings. After an interval from about 1857 to the mid 1860’s because of illness, the Luynes committee noted “M. Nègre, after a rest of several years, necessitated by the state of his health, has lately presented to the Society some heliographic engravings made on clichés [negatives] which the Duc de Luynes brought from his journey to the East. If these plates exhibit numerous retouches, ought these not rather to be attributed to photographic imperfections than to the engraving?” (Waterhouse pg. 75) This is in relation to the portfolio of prints from photographs by L. Vignes that Nègre produced in the late 1860’s. **Intaglio**



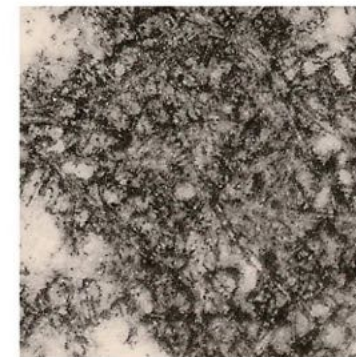
*Monographie de la Cathédrale de Chartres, 1861*



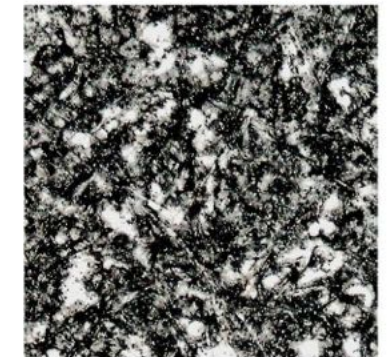
*Traité Général de Photographie, Deuxième édition, 1856*



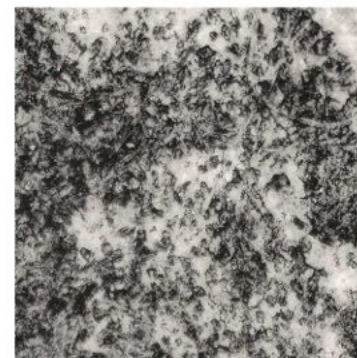
Cluny 90X



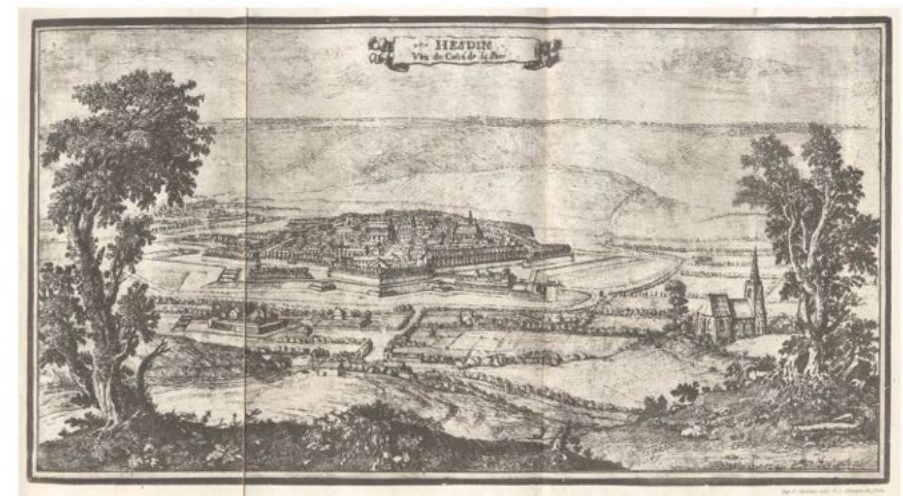
Fondation 90X



Chartres 90X



Cluny 45X



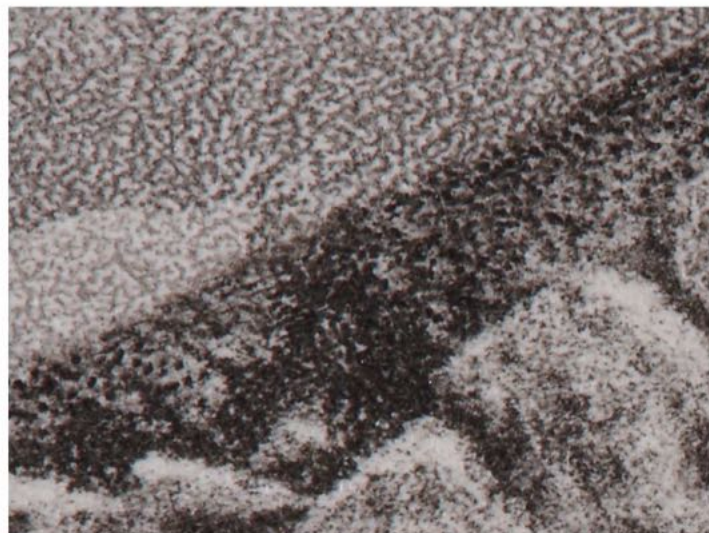
*Fondation D'Hesdinfert, 1857*



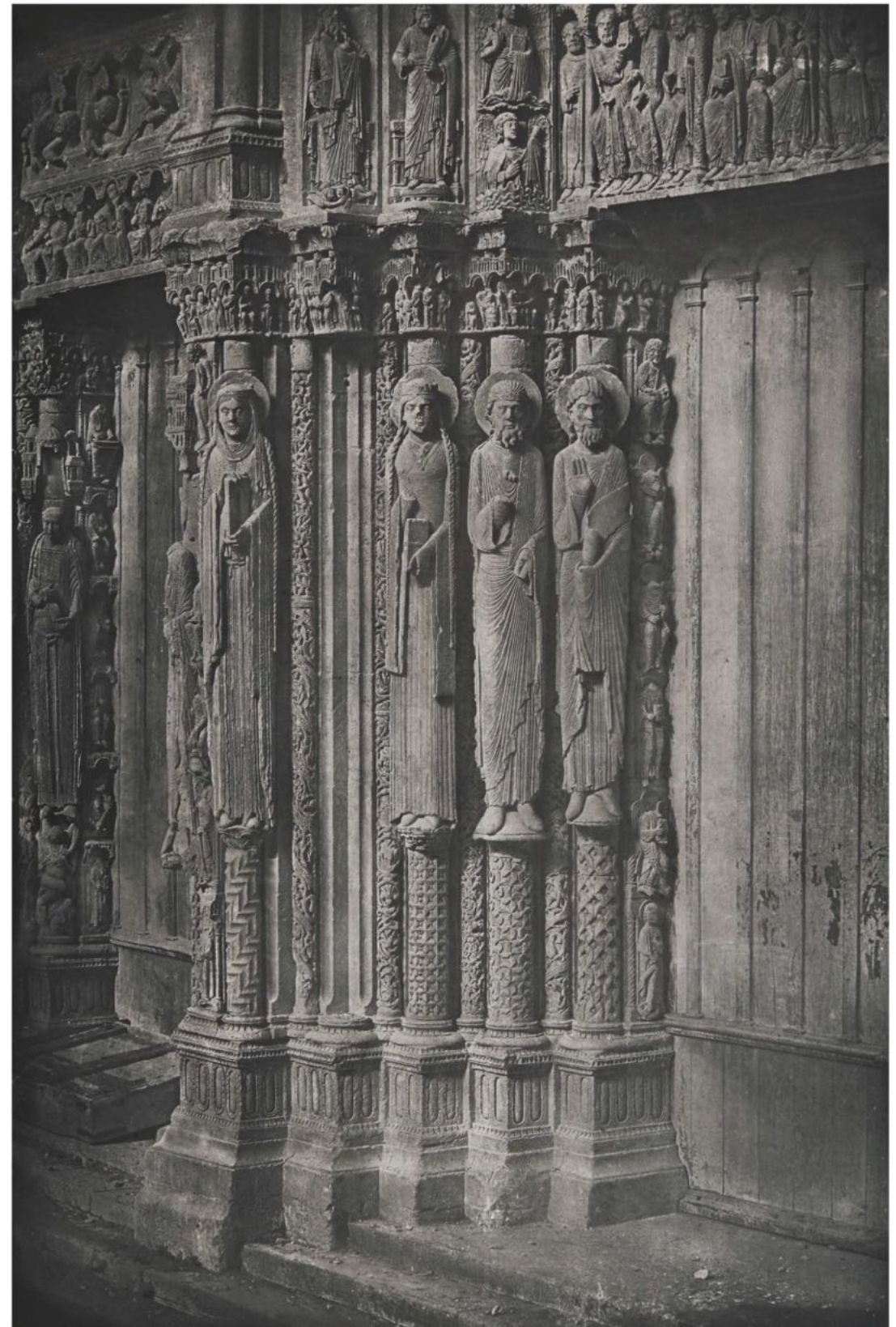


*Voyage D'Exploration à la Mer Morte, à Petra, 1868*

Mark Katzman



The original negatives by L. Vignes were of such low quality that Nègre had to resort to a great deal of hand work to make them acceptable. In a number of the 64 plates, Nègre added hand drawn skies, which he had done with his own images.



This proof print is from one of Nègre's largest plates which measures 780mm X 590mm, probably the largest heliogravures attempted to this date, 1857.

Mark Katzman



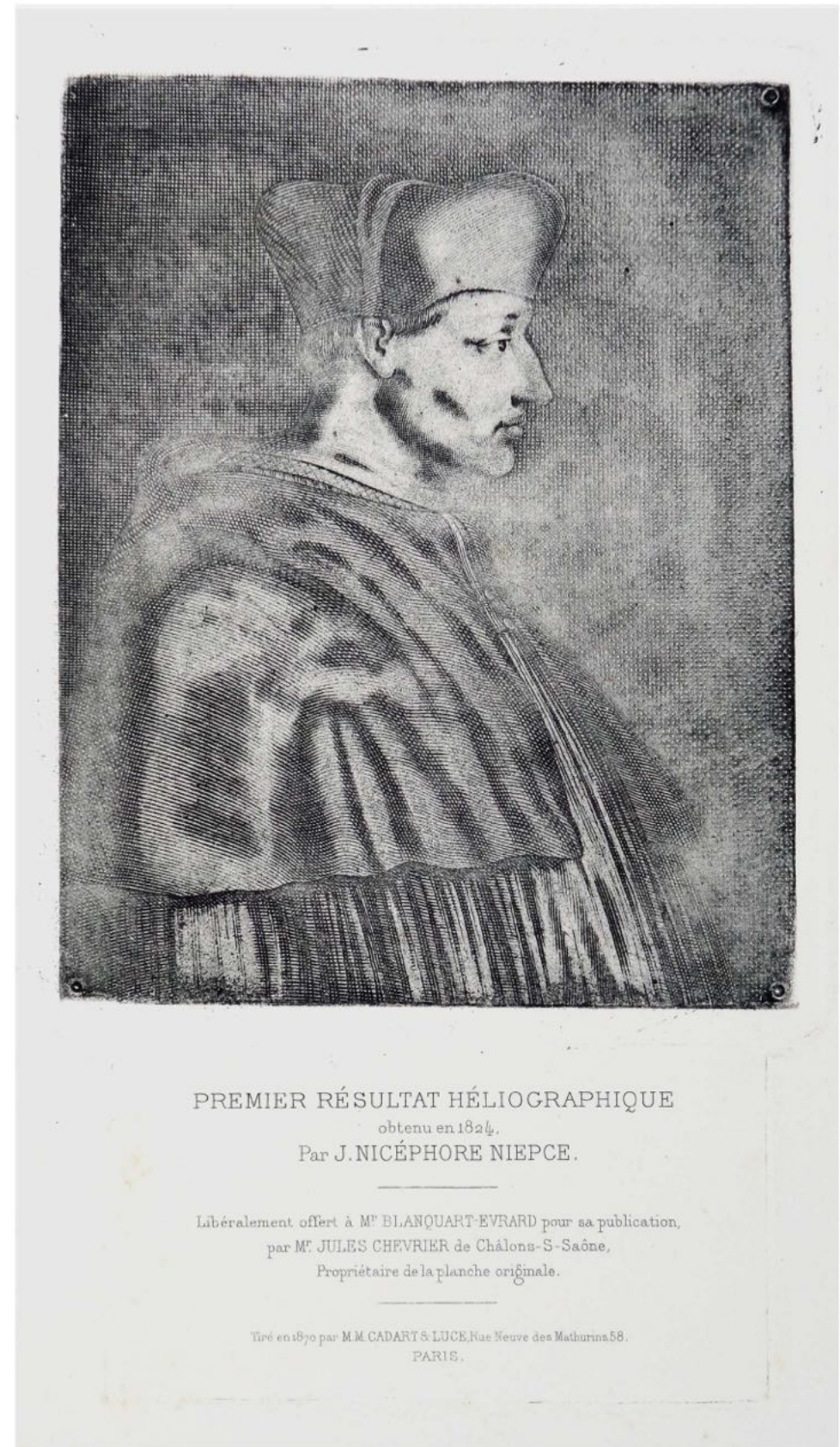
**NIÉPCE, JOSEPH NICÉPHORE** (1765-1833), France — “*Heliographie*”, bitumen thinned with Lavender oil and coated on pewter, when exposed to light the bitumen will harden and where not it can be dissolved with the oil. The plate can then be etched and printed from, 1825-26. Eder (pg. 205) states that Niépce switched from copper to pewter in 1826, that the bitumen was dissolved in Dimple’s animal oil, which also was slightly light sensitive, after exposure it was processed with ether which washed away the unexposed bitumen and left the bitumen that had become hardened from exposure. The plate of Cardinal D’Aboise, after a light etch, was given to **Lemaître, (Augustin François)**, the engraver, who deepened the lines by hand and then printed from the plate. Mertle (pg. 8) states that the solvent used to clear the plate of unexposed bitumen was petroleum and that the plate was etched with acetic acid. **Intaglio**. The first workable photomechanical system in line. **NIÉPCE, ISIDORE** (1805-1868), France — assumed his father’s patent right.



[gallica.bnf.fr](http://gallica.bnf.fr) / Bibliothèque nationale de France

In March of 2002 at the second sale of the Andre and Marie-Thérèse Jammes collection a shift in the knowledge of Nicéphore Niépce’s history of his work was revealed. This was a group of letters and a previously undisclosed heliogravure from 1825. The print of a horse led by a man was produced as early as August 7, 1825 as disclosed in a letter to his brother Claude (in the archives of the Academy of Sciences of Saint Petersburg): “I am currently engraving on copper a horse with its driver.” And the print from this copper plate in the Jammes’ sale was attached to a letter of March 12, 1826, Isidore had sent to a cousin “You will find, my dear cousin, with the price list for pumps, a trial proof of my father’s engravings; the print is rather weak in colour; this comes from the copper being insufficiently bitten; but it is an easy fault to correct and which has nothing to do with my father’s process.” (Steven Joseph translated this material from the Sotheby’s catalog) It was shortly after this date that Niépce switched from copper to pewter and produced the plate and print of the Cardinal D’Amboise that, until now, was considered the first heliogravure.

Niépce then went on to place a sensitized plate in a camera obscura and make the first photograph; a view of a roof and dovecote. Since this is an etched plate it would stand to reason that Niépce would have struck prints in ink from it. No prints exist so it is difficult to know his intentions.



Blanquart-Evrard, *La Photographie*, 1870

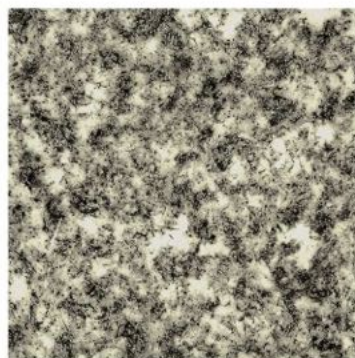


**NIÉPCE DE SAINT VICTOR, ABEL CLAUDE FELIX** (**MARIE FRANÇOIS** incorrectly) (1805-1870), and **LEMAÎTRE, (AUGUSTIN FRANÇOIS)**, France — (worked from 1853 to about 1862. Please see the note on **MANTE**) “*Heliography*” on steel, modified Nicéphore’s method in 1853 and did not patent the process. The de Luynes committee report states, (Waterhouse, *Photographic Journal* pg. 69) “M. Niépce de St. Victor resumed also the investigation of bitumen, and, modifying the method of his uncle Nicéphore Niépce, prepared, with benzole, pure essence of lemons, and bitumen, a layer of extreme sensitiveness; and he produced, with the aid of M. Lemaître, several engraved plates, on which the bitumen forming a reserve was printed behind a positive proof. After washing with benzole or any other solvent, a first etching was made with acid; then it was covered with a granulation of resin, after which the etching was continued. Several plates were produced by this method, which too frequently required retouching.” As Eder (pg. 592) points out Niépce de Saint Victor was the first to employ an aquatint grain using a dusting on method to produce an image in halftone. Adolph Riffaut (1821-1859), with his wife Mme. Pauline Riffaut (1827-1889), were the primary producers of prints by this process after 1853. It has been commented that a great deal of hand retouching was necessary. In fact Lacan, in his introduction to the 1855 edition of *Recherches Photographiques* stated: “The plates engraved with the processes of Mr. Niépce de Saint-Victor were in general in need of the burin, at least the intelligent application of repeated bites in parts, and burnishing in other; but one must take into account the short time that has elapsed since the publication of these processes; if, as everything suggests, their future progress are due to those they have already done, one can believe that before long they will give complete results.” (pg. XX) However it was noted in an article in the *Photographic and Fine Art Journal*, 1854, that Riffaut showed the *Bibliothèque du Louvre* print and said that it was done with absolutely no retouching. Niépce de St. Victor noted himself that Mante’s method of creating a sensitive varnish influenced his own research. The direct attribution of the individual plates is difficult because only a few bear Niepce de St. Victor’s name as the producer of the plate. **Louis-Amédée Mante** and **Madame Pauline Riffaut** may wind up being significant participants since some of the plates are signed first in 1853 “Photographie sur acier par Mante” and thereafter in 1854 “Photographie sur acier par Mme Riffaut.” Please also see Mante and Riffaut. **Intaglio**

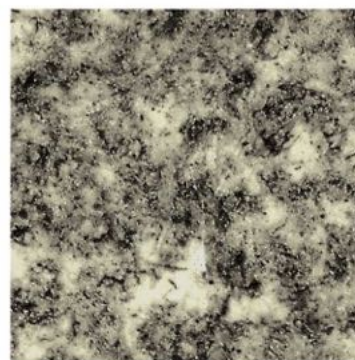


Empress Eugenie, Mayer Freres

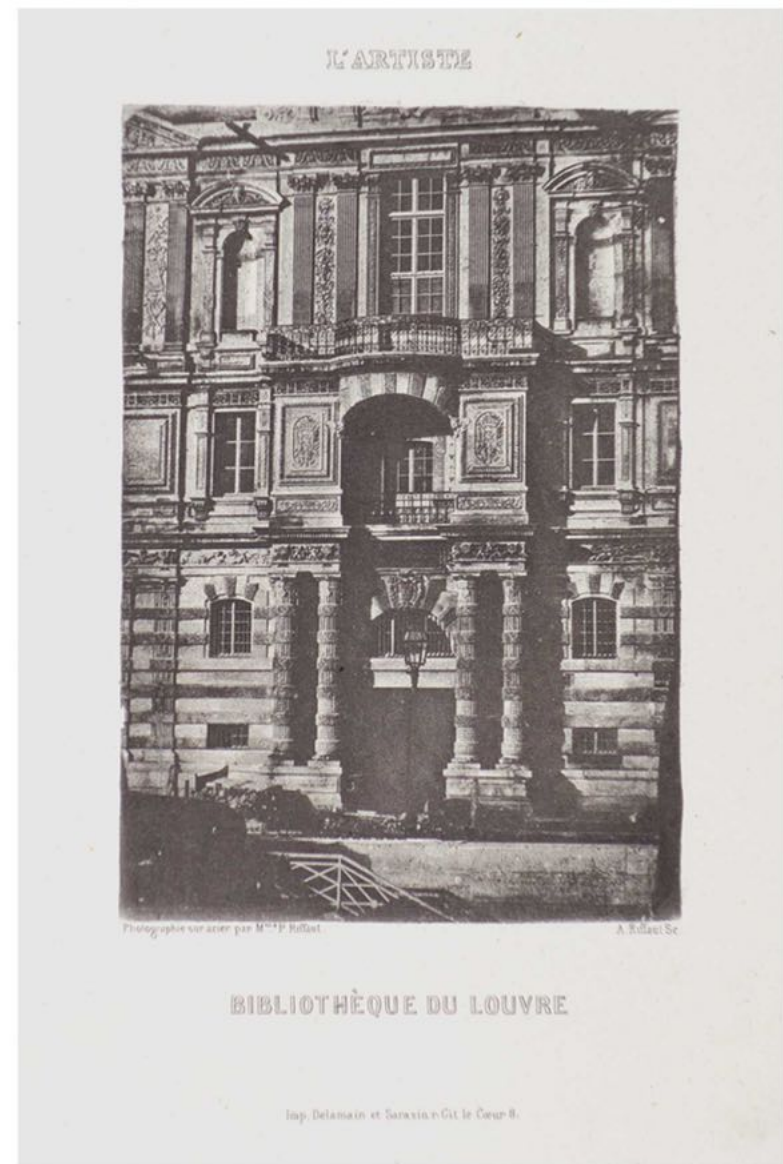
One of three plates signed "Héliographie" by Niépce de Saint-Victor



Eugenie 45X



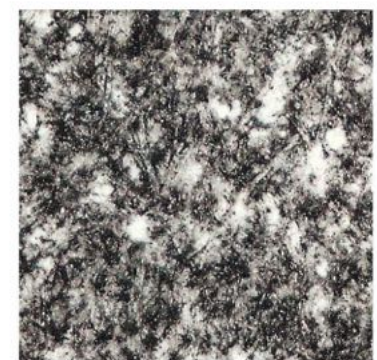
Eugenie 90X



Bibliothèque du Louvre



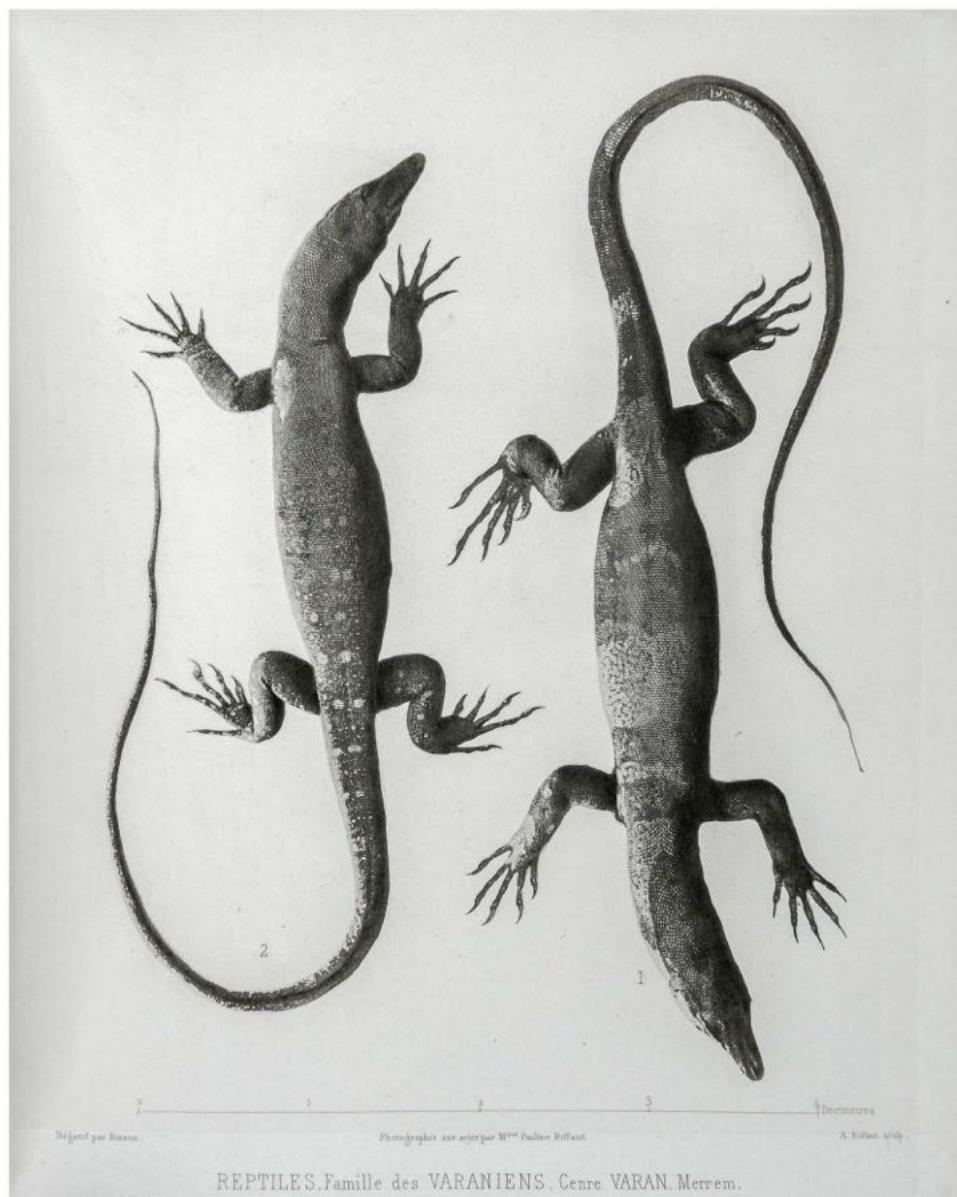
Bibliothèque 45X



Bibliothèque 90X

It was common for Riffaut to add a coarse aquatint to the background of the portrait photographs to produce an even tone. He did this by first silhouetting the portrait. He also added a sky to outdoor photographs as in the Louvre print opposite

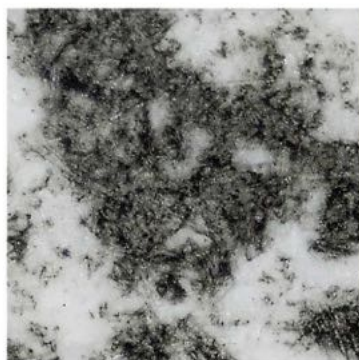




*Société D'Encouragement, 1854*



45X



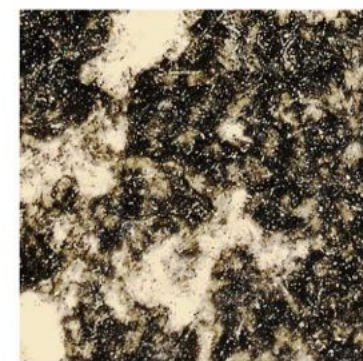
90X



*Bisson Freres, Louvre, 1854 - 40 X 29 cm*



45X



90X



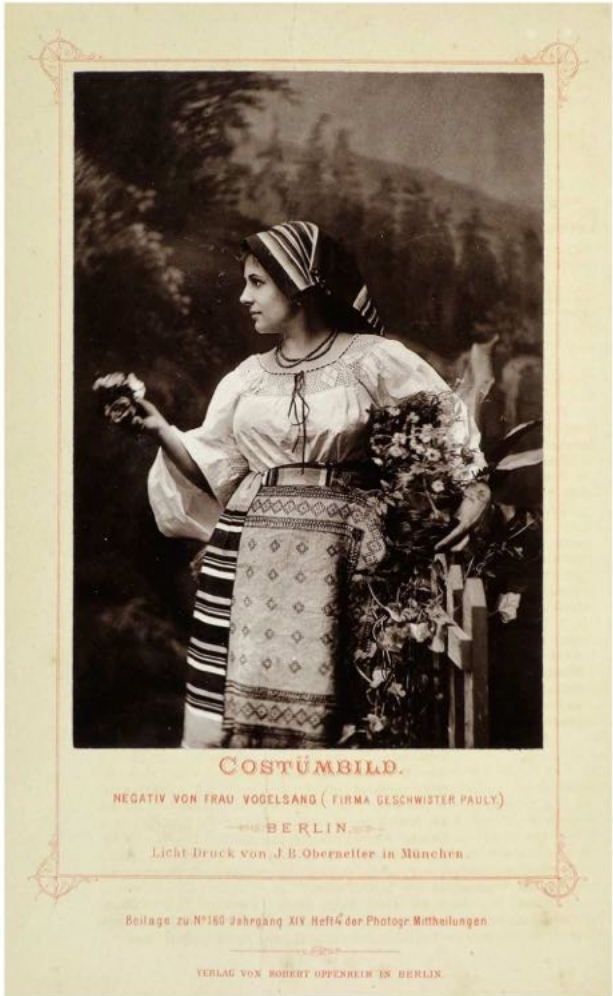
**OBERNETTER, JOHANN BAPTIST** (1840-1887), Germany — *Collotype*, chromated gelatin dusted with zinc powder. Waterhouse (*Photographic News*, 1878, pg. 500) explains: “A sheet of glass is coated with a mixture of gelatine, albumen, sugar, and bichromate of potash, dried, and exposed to light under a negative. The plate is then dusted over with finely-powdered zinc, which attaches itself only to the parts protected from the light, and in proportion to the amount of protection they have received. The plate is then heated to about 369° F., or exposed to light till the whole surface of the film has been rendered insoluble. Before printing the plates are treated with dilute muriatic or sulphuric acid. By this operation the parts of the gelatine film covered with zinc are rendered, by the formation, of hydrogen, susceptible of attracting water to a greater or less degree, while the other portions, upon which no zinc has settled, are capable of receiving a fatty ink. The printing is then proceeded with in the usual manner.” 1870. In the early plate pictured there is virtually no reticulation pattern, however by 1878 Obernetter’s plates exhibit the standard reticulation of collotype and it was probably this method that the American purchasers called “Artotype.” Obernetter also experimented with color reproduction in the late 1870’s. **Planographic**

“*Lichtkupferdruck*” (1883) was Obernetter’s *Photogravure* method, which appears to have been little used and stopped after his death in 1887. A positive is first produced on a film of gelatino-bromide of silver, very rich in the silver salt. The silver of the developed and fixed image is then converted into silver chloride by the action of a mixture of perchloride of iron and chromic acid. The film is then stripped and applied to the surface of a copper plate, and, under the influence of a voltaic current, the silver chloride is decomposed, and the chlorine unites with the copper and etches it to a greater or less degree, according to the depth of deposit of silver chloride. The result is a grained intaglio plate of “extreme delicacy and beauty,” which is inked and printed from the same as any other intaglio plate. (Wall, *The Dictionary of Photography*, 1902 pg. 473). **Intaglio**

Obernetter’s *Collotype* patent was purchased in the US by a group in 1878 and named “Artotype.” Licenses were sold to a number of individuals, however the major users were Edward Bierstadt and a group of small companies in Gardner, Massachusetts using the names “Lithotype and Autoglyph.” The plates from these companies have a reticulation pattern more like standard collotype than Obernetter’s first prints. **Planographic**

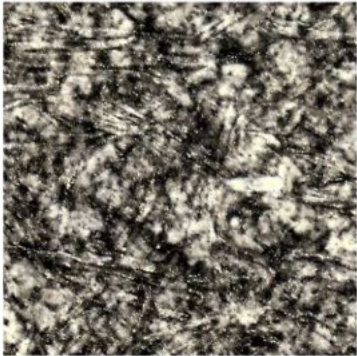


The Philadelphia Photographer, 1872

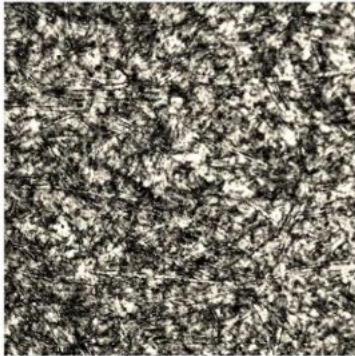


Photographische Mittheilungen, 1877

The Philadelphia Photographer  
1872



90X



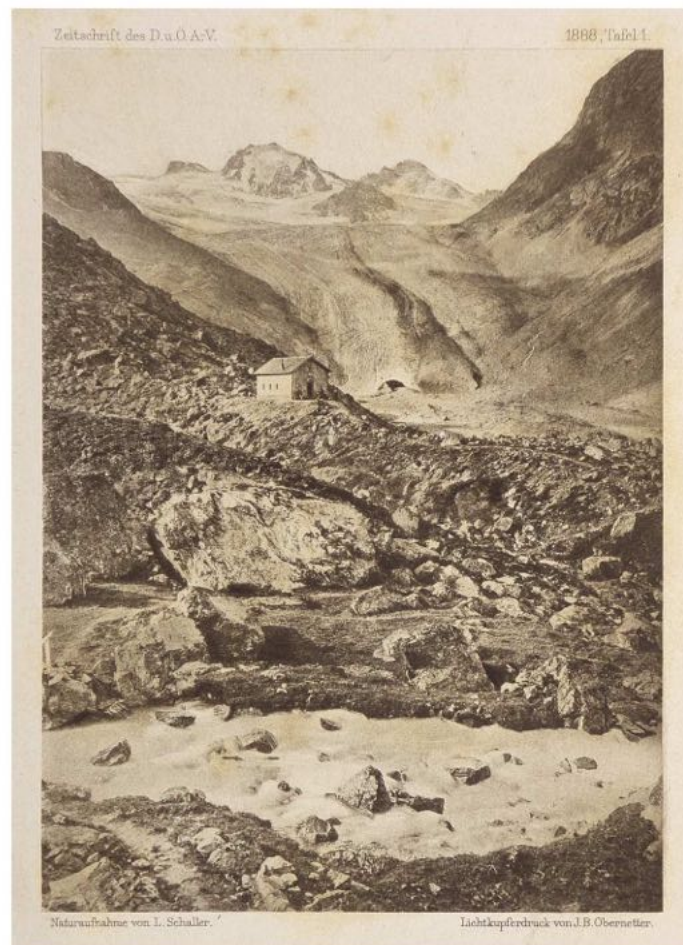
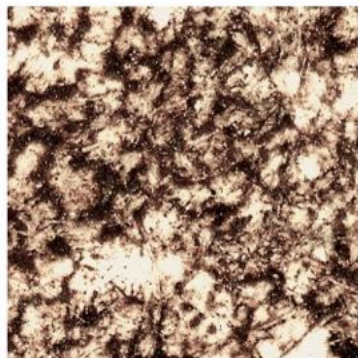
45X



45X

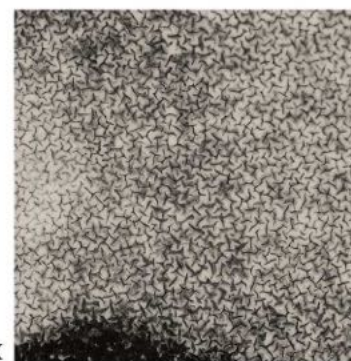


90X



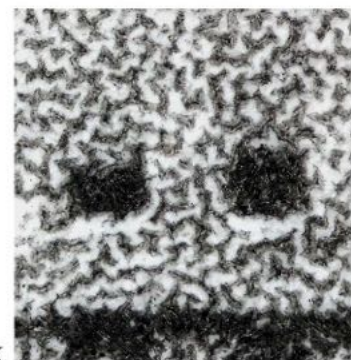
*Zeitschrift des Deutschen und Oesterreichischen Alpenvereins, 1888*

45X



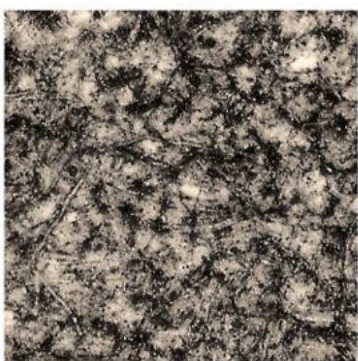
The magnification for these two sample Artotypes is correct for each. The size of the pattern is dependent on a number of factors including thickness of coat, drying time and temperature.

45X



69 individual photographers and printing companies purchased or traded rights for the use of the Artotype patent in 1878-9. Among them were Edward Bierstadt, the Heliotype Printing Company, Chamberlain in Denver, Fitzgibbon, and W. H. Cowee of Gardner Ma. who formed the Lithotype Company in both Gardner and New York City.

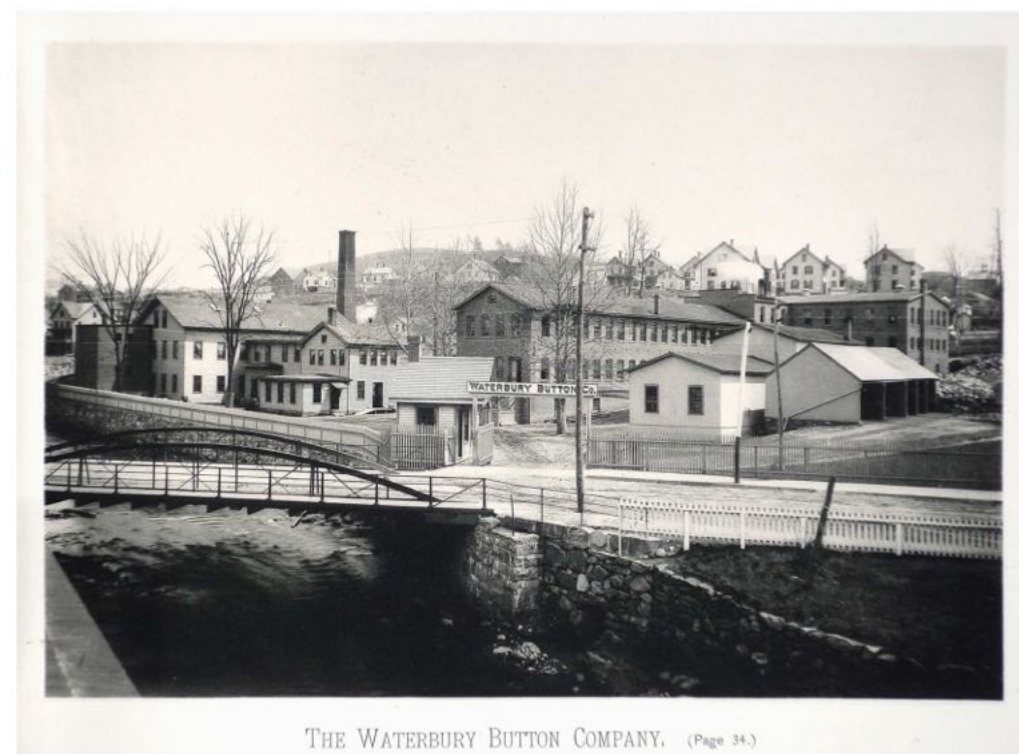
90X



This image of a dog in its' kennel was used by Koehler in his 1892 exhibition in Boston as a representative of Obemettor's process. Item number 412.



*Jahrbuch für Photographie und Rproductiontechnik, für das jahr 1889,*



*Waterbury and Her Industries, Lithotype Printing and Publishing Co.*

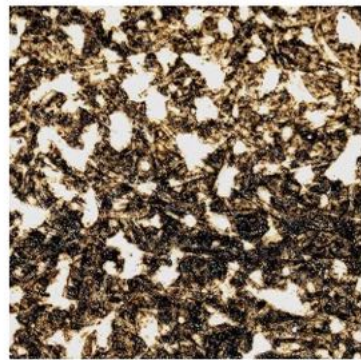


**OESTERREICHER, IGNATZ**, US – *Photogravure*, in advertisements in the *Philadelphia Photographer* (1886), placed by Ernst Edwards for his new company in New York City, The Photo-Gravure Company, Edwards stated that he used “The process of Mr. Ignatz Oesterreicher.” In *Pettengill’s Newspaper directory and advertisers’ hand-book for 1878* Oesterreicher has a four page advertisement for his Photo-Plate Company at 63 Duane Street, New York where he produced photoengravings by “Oesterreicher’s Process.” The photoengravings are like those produced by Moss and Levy. Other than this reference, there seems to be no other discussion of him in the photographic literature. **Intaglio**

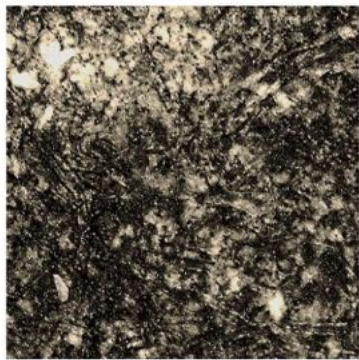
Ernest Edwards in a short article in *Anthony’s Photographic Bulletin*, 1889, (pg. 172) discussed various methods of photomechanical printing including photogravure. He briefly outlined the method of using an aquatint grain on a copper plate with an exposed bichromated layer above to act as a resist. The description is basically the Talbot-Klič method, but not discussing the use of a carbon tissue. It may be that the Oesterreicher method was just a way of circumventing ownership of a license to use the Klič method.



Ada Rehan: *A Study*, second edition, 1891



Ada Rehan 45X



90X Yellowstone



The Yellowstone National Park, 1887



**ORELL FÜSSLI & Cie**, Switzerland — “*Photochrom*” **Hans Jakob Schmid**, an employee of Orell Füssli invented the process. Orell Füssli founded the stock company Photochrom Zürich to produce the prints. In the US the **Detroit Photographic Co.** produced plates by this process. “A tablet of lithographic limestone called a “litho stone” was coated with a light-sensitive surface composed of a thin layer of purified bitumen dissolved in benzene. A worker then pressed a reversed half-tone negative against the coating and exposed it to daylight for 10 to 30 minutes in summer, or up to several hours in winter. The image on the negative caused varying amounts of light to fall on different areas of the coating, causing the bitumen to harden in proportion to the amount of light. The worker then used a solvent such as turpentine to remove the unhardened bitumen, and retouched the tonal scale of the chosen color to strengthen or soften tones as required. This resulted in an image being imprinted on the stone in bitumen. Each tint was applied using a separate stone that bore the appropriate retouched image. The finished print was produced using at least six, but more commonly 10 to 15, tint stones.” (Steven F. Joseph in Hannavy) 1898. **Planographic**

The vast output of photochromes produced by the Swiss firm in the years before the first world war is very distinctive and can be roecognized by the initials P.Z. (for *Photochrom Zürich*) next to an inventory number, often printed in gilt on the lower edge of the print. (Steven F. Joseph) The Detroit Photographic Company also printed their indentification and the title of the print in gilt.



COPYRIGHT 1898, BY DETROIT PHOTOGRAPHIC COMPANY

GRAND COURT, LOOKING WEST



**OSBORNE, JOHN WALTER**, Australia/England/U.S. —  
*Photolithography* in line with transfer paper, 1859. Horgan (*Inland Printer*, 1900) writes: “Osborne's process consisted in coating a linen paper with a mixture of gelatin, albumen and bichromate of potash. After this paper was exposed to the action of light under a negative its surface was coated with lithographic ink. Then the ink-coated paper was floated, back down, on boiling water, the heat from which coagulated the albumen and kept the gelatin unhardened by light from dissolving away in later operations. The ink-coated surface was now rubbed over with a soft wet sponge, when the ink would adhere only to the portions of the gelatino-albumen surface which had been hardened by light, thus making a perfect lithographic transfer for transferring to lithographic stone.”  
**Planographic**



*Putnam's Magazine*, vol. 1, 1868

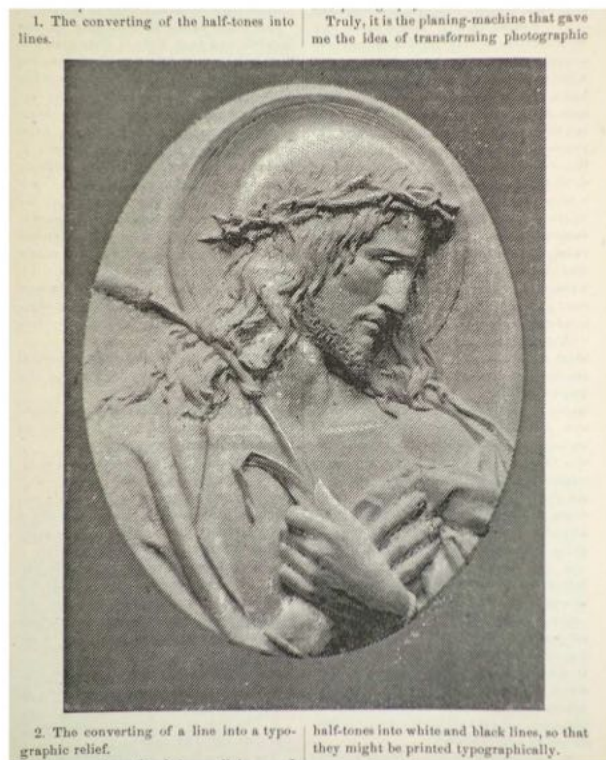
**PALMER, EDWARD**, England. *Glyphography*, 1843.  
 Electrotpe from a form created by drawing with a stylus which cut into a soft matrix that could be expanded. The French processes of **Jobin** and of **Baron de Corvin** in *L'Illustration Journal Universel*, vol. X, Jan. 1848 were similar



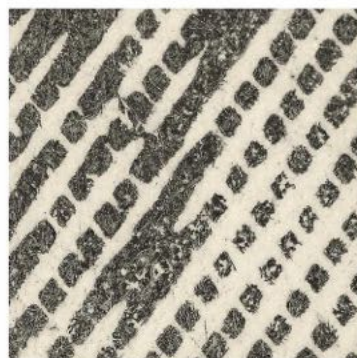
Palmer, *Glyphography; or, Engraved Drawing, for printing at the Type Press*



**PETIT, CHARLES GUILLAUM** (1848-1921), France — “*Similigravure*” also “*Phototypographique*” single line *Half-tone*, 1878. He may have discussed his method as early as 1870. Petit first created a high chromated gelatin relief from which he created a plaster copy. “He inked the surface of the plaster cast and then cut across it in a ruling machine with a V-shaped tool. As this cut deepest into the raised portion of the relief representing the lights of the picture it also left the depression more or less untouched, there was produced an effect of halftone which was then photographically reproduced in the form of a printing plate.” (Levy pg. 398) It was stated in 1881 that the advantage of the Petit similigravures was that the cutting tool could be adjusted to cut lines closer or farther away in a single plate depending on the detail required. The term “*similigravure*” became the French equivalent to “halftone” even after the use of line screens became common. In examining halftones marked as similigravure from 1900 there does not seem to be an indication of placing the screen away from the negative to produce the “Optical V” as the relief dots remain the same size from light to dark areas. **Relief**



*The Philadelphia Photographer, 1881*



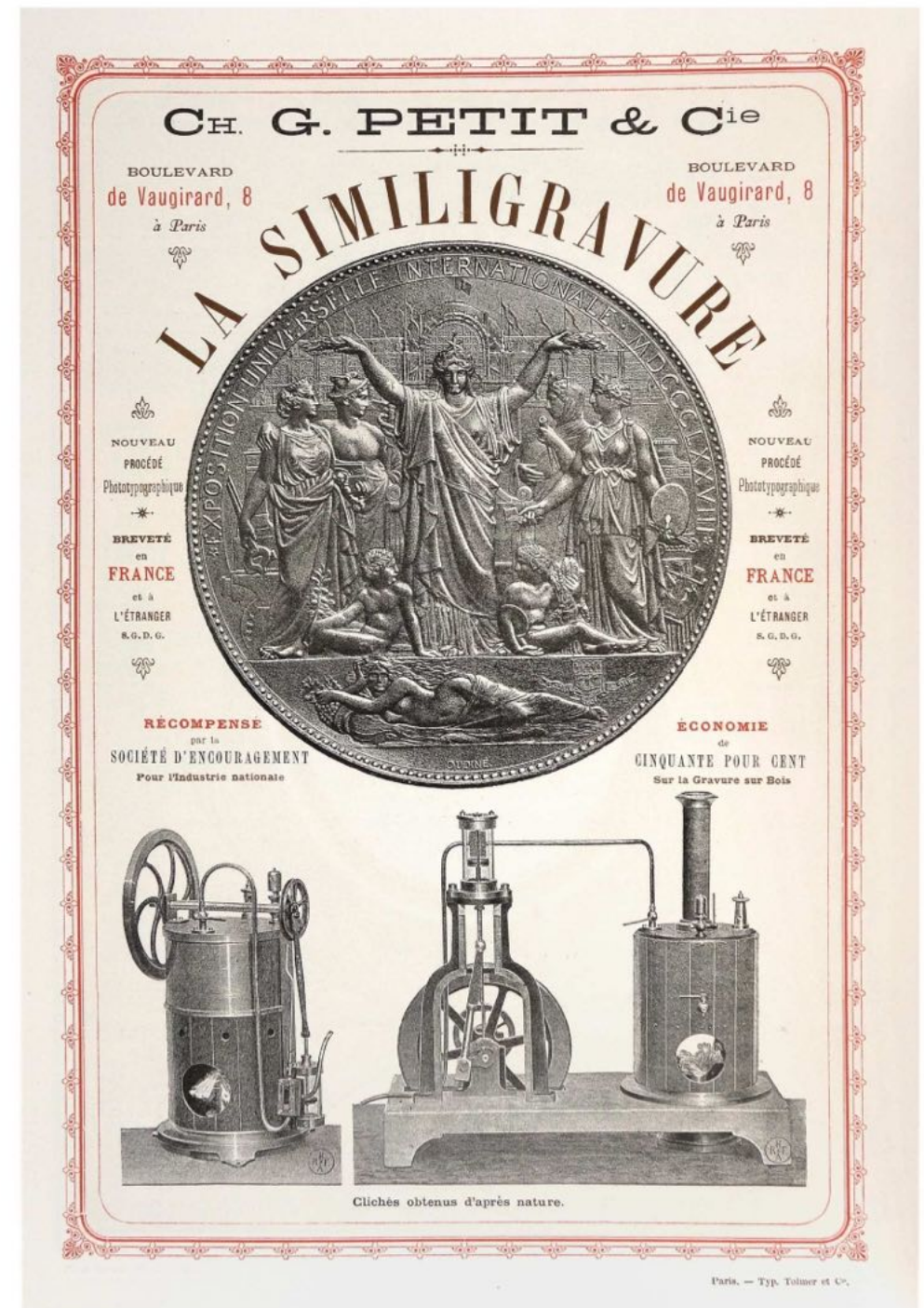
15X

“The plate which you have printed from is one of the first I had made, and when Mr. Vidal asked me for it, I had already, at that time, been furnishing plates to the trade for at least fifteen months, and much superior to the one I sent you – a subject you chose for yourself” Charles G. Petit *Philadelphia Photographer*, 1881 (pg. 153)

Note how in this print more than one width of the cutting tool was used.



15X



*Catalogue de L'Exposition de Gravures Anciennes et Modernes, 1881*

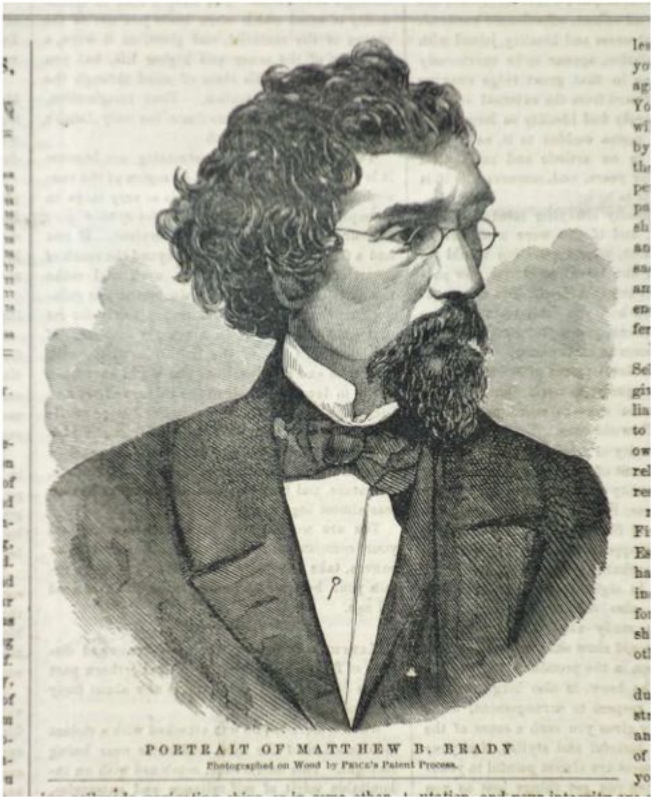


**Photoxylography** – 1839 forward. No single person can be pointed to as the inventor of creating woodblocks cut directly from photographic images produced on the block itself. However on April 20, 1839 a photogenic drawing was cut and printed in *The Mirror of Literature, Amusement, and Instruction*. The method was explained “To take a Photographic Copy on Boxwood. Place the smooth side of a block of boxwood in a shallow dish or plate, containing a solution of salt, twenty grains to an ounce of water. When it has remained in it for about five minutes, take it out and dry it, and then put the same side in another plate containing sixty grains of nitrate of silver, dissolved in an ounce of water. After the elapse of a minute, take it out, and dry it. It will then, on exposure to light, assume a fine brown colour. If it be again immersed in each solution, for a few seconds only, it will become so sensitive, as to be affected by a very slight degree of light. To obtain a drawing of a view, or a copy of a picture, &c. proceed with the prepared block, precisely according to the instructions already given for using the photographic paper. In this manner, a drawing upon a block may be most expeditiously obtained, and without the services of a draughtsman. It only needs the wood-engraver.” (pg. 317 May 18, 1839, no. 949)

After this date a number of individuals showed examples: Robert Langton, England 1854; J. De Witt Brinckerhoff in the US, 1855, as well as Robert Price, U.S. — whose process was commercialized in 1857. Even as late as 1861 A. Bolton, England, was credited as the inventor. **Relief**



*The Mirror of Literature*, 1839



*The Phrenological Journal*, 1858



Lyra Germania: second series. The Christian Life, 1861

Mark Katzman



*The Photographic and Fine Art Journal*, Smithsonian 1855



*The Photographic and Fine Art Journal*, Smithsonian 1854

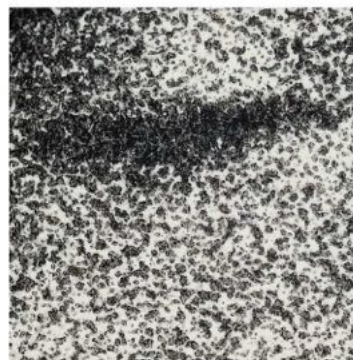


**PIALLAT, JULES MARIE SIMON** (1832- ), France —  
*Photolithography, “Système Piallat,”* circa 1864. Piallat was a professional photographer and many of his CDV portraits exist. He originally worked at 9 Rue Chaptal, Paris and then from 1865 to about 1870 he worked from 49 Rue Rodier, Paris. It was at this location, near the printer Bertauts that he produced his photolithographs. **Planographic**

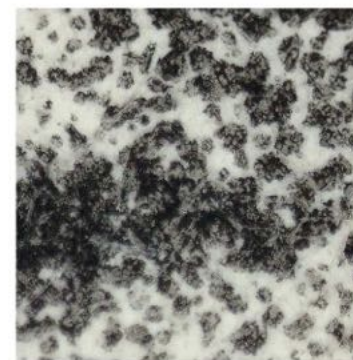


*Mémoires de la Société Impériale Des Antiquaires de France, 1865*

“Mr. Piallat, has sought to transport to stone and metal, photographic images. He employs, in his drawing, salts and chemicals which his predecessors had not used. Mr. Piallat executed a plate that I place under the eyes of the assembly. This plate, executed in April 1865, contains seven red wax seals from bottles. It was paid to the author 100 fr. inclusive of expenses for a print run of five hundred copies.” Vallet de Viriville (pg. 251)



15X



45X

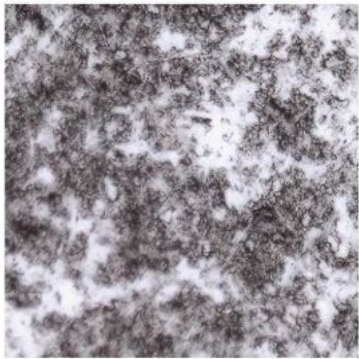




**PINEL-PESCHARDIÈRE, FRANÇOIS** (born 1823), France, “*Helio-lithographie*” a *Photolithographic* process with a fine grain. “Pinel-Peschardière exhibited examples of photographic engraving upon metals, and upon lithographic stone; photographic relief plates for printing and lithography, and specimens of colored photographs vitrified in ceramic enamels.” In the Paris Exposition of 1867 (pg.6 D’Aligny). He produced “Pantotypie” photolithographs in 1869 that had a stronger grain than the examples from 1870. His use of the term “Pantotypie” does not seem related to Thiel’s. **Planographic**



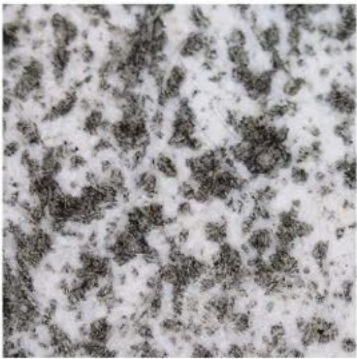
*Etudes sur la Maladie des vers a Soie*, 1870  
Helio-lithographie



45X



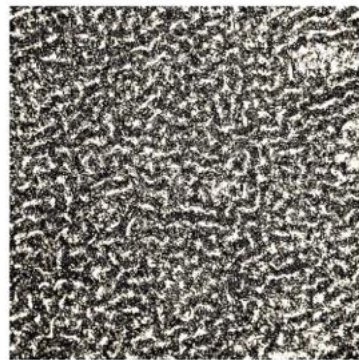
Farb  & Gouzien, *Oeuvres In dites* , premier volume, 1869  
Pantotypie



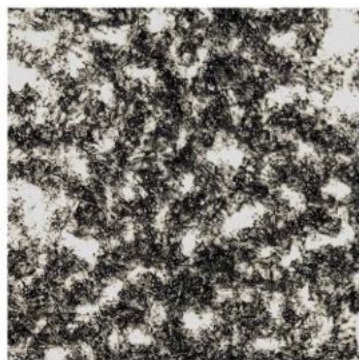
45X



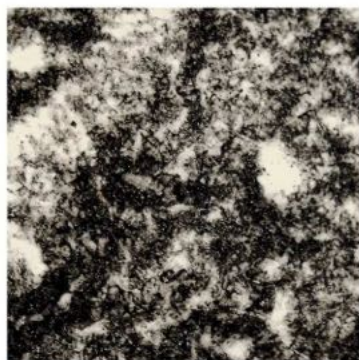
**PLACET, PAUL EMILE**, (b. 1834), France — (process used as late as 1886) *Heliogravure* by electrotpe, circa 1859. "Placet, of Paris, seems to have been the first to recognize, in 1862, the necessity of exposing the collochromate film from the under side through a transparent support, so as to be able to wash away the unaltered gelatin from the unexposed side and thus obtain a relief matrix in hardened and insoluble gelatin, which could be metallized and electrotyped at once. He also treated his half-tone reliefs with chemical solutions to produce a grain on them." (*Catalogue of the Loan Exhibition of Process Engraving*, 1905, pg.XII, Waterhouse.) The de Luynes committee stated the following, "M. Placet alone among competitors who have arrived since the prorogation of the competition, has successively presented to the Society engraved plates, which indicate sustained and persevering labour. His method is, at bottom, the moulding indicated by M. Poitevin or M. Pretsch; but he has protected it by using a device of M. Fargier, which consists in washing and swelling the proof, not on the side on which the light has struck it, but, on the contrary, on the opposite side—the only means of obtaining delicacy in the half-tints, as has been mentioned by M. Laborde. By means of devices (or rather, we may say, of methods) which are peculiar to him, M. Placet obtains galvanoplastic plates which may serve for copper-plate, for letterpress, and, by transference, for lithographic printing. The specimens presented by M. Placet are sufficiently remarkable to entitle his name to a place among the important candidates." (Waterhouse *Photographic Journal*, pg. 74) All of Placet process plates state "sans retouche" meaning that no hand work was done to the plate. See also - Placet, "Improvements in photo-engraving," *The Photographic News*, vol. 20, 1876, pgs. 196-197, describing his patent for natural graining of bichromated emulsions. At the Paris universal exposition in 1878, Placet displayed objects decorated by "heliographic engraving" and in 1882, he founded a joint-stock company to exploit his photomechanical process both for printing and for the "ornamentation and decoration of objects." (Steven F. Joseph) **Intaglio**



15X



45X



45X



Blanquart-Evrard, *La Photographie*, 1870



**POITEVIN, ALPHONSE** (1819-1892), France — “*Gravure Photochimique*” photogalvanic action to daguerreotype plates, prints in line as well as in tone, 1847. Hodson in *An Historical and Practical Guide to Art Illustration*, (pgs. 173/4) explains: “A Daguerreotype having been taken upon a plate, and the picture developed in the mercury box, and while the unchanged iodide of silver still remains upon the “blacks” of the image, the plate is connected with the negative pole of an electric battery and placed in the electrotype bath. A layer of copper is thus deposited upon the parts of the plate which are unprotected by the coating of iodide of silver. The iodide of silver is next removed by the application of a solution of hyposulphite of soda. The copper is now oxidized by heat and quicksilver applied over the surface of the plate, which having affinity for the silver, leaves the oxide of copper untouched. The plate is next treated with gold leaf, and a like result is produced, the gold being attracted to the amalgamated parts, leaving the oxide of copper in its former condition. Nitric acid, or aquafortis, being now applied, the parts unprotected by the gilding are bitten away, leaving the subject of the picture in relief, and a “surface block,” as it is technically termed, capable of being printed at a type-press, is the result.” The same method may be applied so that an intaglio surface is created as in the example shown.

“*Photolithographie*” (worked 1855 to about 1872, first by Poitevin and then by Lemerrier) which was awarded the Duc de Luynes prize in 1867, was photolithography with chromated albumen or gelatin. The English patent is on page 183. For line work, the hardened film holds the ink and the smooth stone surface repels the ink. In tonal work, the stone must be grained to create a series of small pits to hold the ink. “...that bichromatized gelatine, acted on by light, had the properties of a lithographic stone, and might be used as such. Since the parts on which the light has acted are impervious to water, upon moistening the plate some of it will be dry, some wet; and where light partially acted it will be part dry and part wet. Now, as oil and water repel each other, by putting grease upon this plate it will adhere entirely to the dry parts—those which were exposed to light—partially to those under partial light, and not at all where it took up moisture. And now, by rolling over this plate a cylinder of lithographer’s ink, the plate is ready to make a lithographic print.” (*The Photographic News* 1875, vol. 19, July 16. pgs. 340-41). Poitevin produced plates for a small number of books and single prints, but he found it hard to commercialize the process and so he sold his method to Lemerrier in 1857.

He also created a process, “*helioplastie*” which is an electrotype from molded gutta percha in line, also in 1855. “*helioplastie*” was apparently identical to Pretsch’s method. **Planographic** and **Relief**. Poitevin also invented a system of carbon printing which yielded fine results and for it he was awarded the first of the Luynes prizes for stabilized photographic prints. (See page 30 for an example)



J. Paul Getty Museum,, Los Angeles



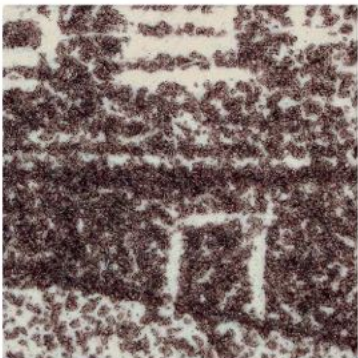
Gravure Photochimique



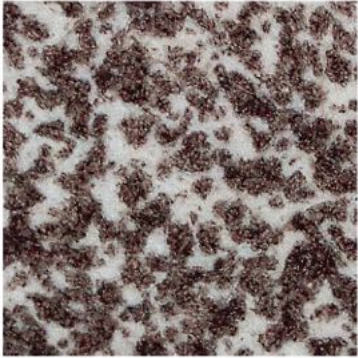
Helioplastie Steven F. Joseph



Revue Générale de L'Architecture, 1856



15X

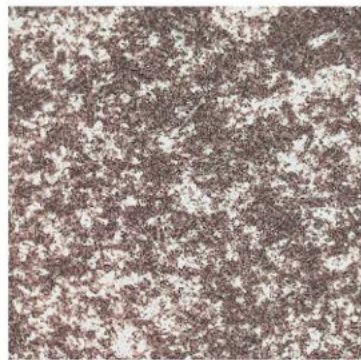


30X

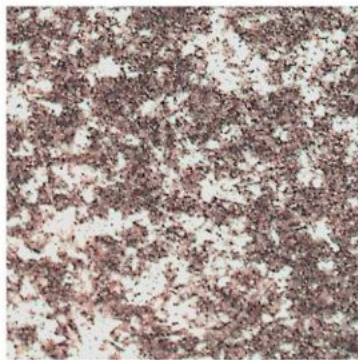




Ville, *Recherches Expérimentales sur la Végétation*, 1857



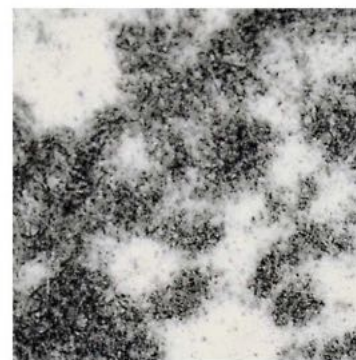
15X



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30X



Charney *Cités et Ruines Américaines*, 1862





Labarte, *Histoire des Arts Industriels au Moyen Age*, 1872



Labarte, *Histoire des Arts Industriels au Moyen Age*, 1864

Jules Labarte, *Histoire des Arts Industriels au Moyen Age*, was published in two editions. The first was published between 1864 and 1866, the second between 1872 and 1875. The first edition was printed using Poitevin process photolithographs and the second, using the same photographs, in this instance by Berthier, some were printed in photogravure by Dujardin. The left is by Dujardin and the right by Lemercier. They clearly demonstrate the difference in rendering by the two methods.



**PONTON, MONGO** (1802-1880), Scotland — Discovered the light sensitivity of dichromates in combination with organic materials in 1839. As Louis Levy writes (pg.392): “At this very time another important discovery in the field of photographic chemistry was formally announced through the Royal Society of Scottish Artists by Mongo Ponton and published in the New Philosophical Journal of Edinburgh in May, 1839. Ponton had experimented on the lines indicated by the French chemist Vauquelin, who had discovered chromic acid in 1795 and had observed that the red color of chromate of silver became purple on exposure to light. Ponton found that paper impregnated with bichromate of potassium was very sensitive to light. By placing a translucent object on such sensitized paper and exposing it to light he produced a picture of the object in tones of brown, modulated according to the varying amount of light passing through the object, and could fix the picture by simply washing it in water. At another juncture this discovery would have attracted universal attention, but the dramatic announcement and governmental publication of Daguerre's discovery produced such furor among the general public, and in the scientific world as well, that not only did Ponton's discovery go unnoticed but the promising results in photo-engraving that had been obtained by Niépce were also entirely overlooked.” However thereafter “Niépce's method, further developed and improved by his cousin, Niépce de St. Victor, about 1850, came gradually into extensive use and remains so to this day [1915], and the photo-engraving processes based on Ponton's discovery have become universally applied.”



Potassium Dichromate crystals



A single coat of Potassium Dichromate on paper exposed to sunlight. The print remains unwashed

The portrait of Mongo Ponton which is the frontispiece to this project was produced by Karel Klíč at the request of Captain Baden-Pritchard through the intermediary of Josef Maria Eder (pg.599). This early heliogravure by the Klíč process was the connecting link between the important discovery of the light sensitivity of dichromates and their almost universal use in photomechanical printing well into the 20th century.



**POUNCY, JOHN** (1820-1894), England—*Photolithography* in 1857. His production was *Dorsetshire Photographically Illustrated*. *The detail and touch of nature faithfully reproduced by a new process on stone, by which views are rendered truthful, artistic and durable.* All of his prints are heavily retouched. The Luynes committee stated: “He obtains them, according to his patent, by a mixture of sensitive substance (bitumen, or bichromate, or a mixture of the two) with colouring-matter; then, after exposure, he washes, as much as possible, on the inverse side to that of the exposure, so as to remove by a suitable solvent the parts not fixed by light. If either engravings or lithography be required, he adds to the colouring a fatty substance, and then transfers to metal or stone.” (Waterhouse, pg. 74) It appears, when examining the 45X photomicrograph that Pouncy was not using the standard method of graining the stone in his process. What he was doing is unclear.

Pouncy patented a carbon printing process in 1863 but did not patent his method of photolithography for 1857. “Pouncy, of Dorchester, was the first to work in England the carbon process in the form it was invented by Poitevin, the French pioneer in photo-mechanical work. Pouncy invented several processes in photo-lithography. In 1863 he patented a carbon tissue for photo-lithographic transfers. The tissue was made by coating tracing-paper with a mixture of printing ink, asphaltum, benzole, and fatty matter, with or without potassium bichromate. The paper is exposed to light with the plain side next to the negative, developed in turpentine, dried, and transferred to a damp, cold stone.” (*Encyclopedia of photography*, Jones, Bernard Edward, 1911 ed. pg.437) **Planographic** Please see an example of his carbon transfer on page 30.



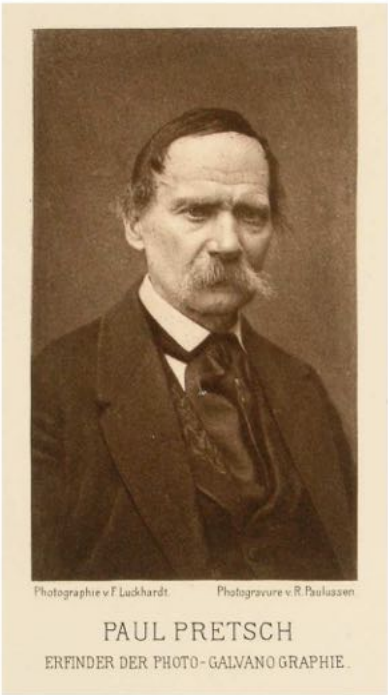
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45X



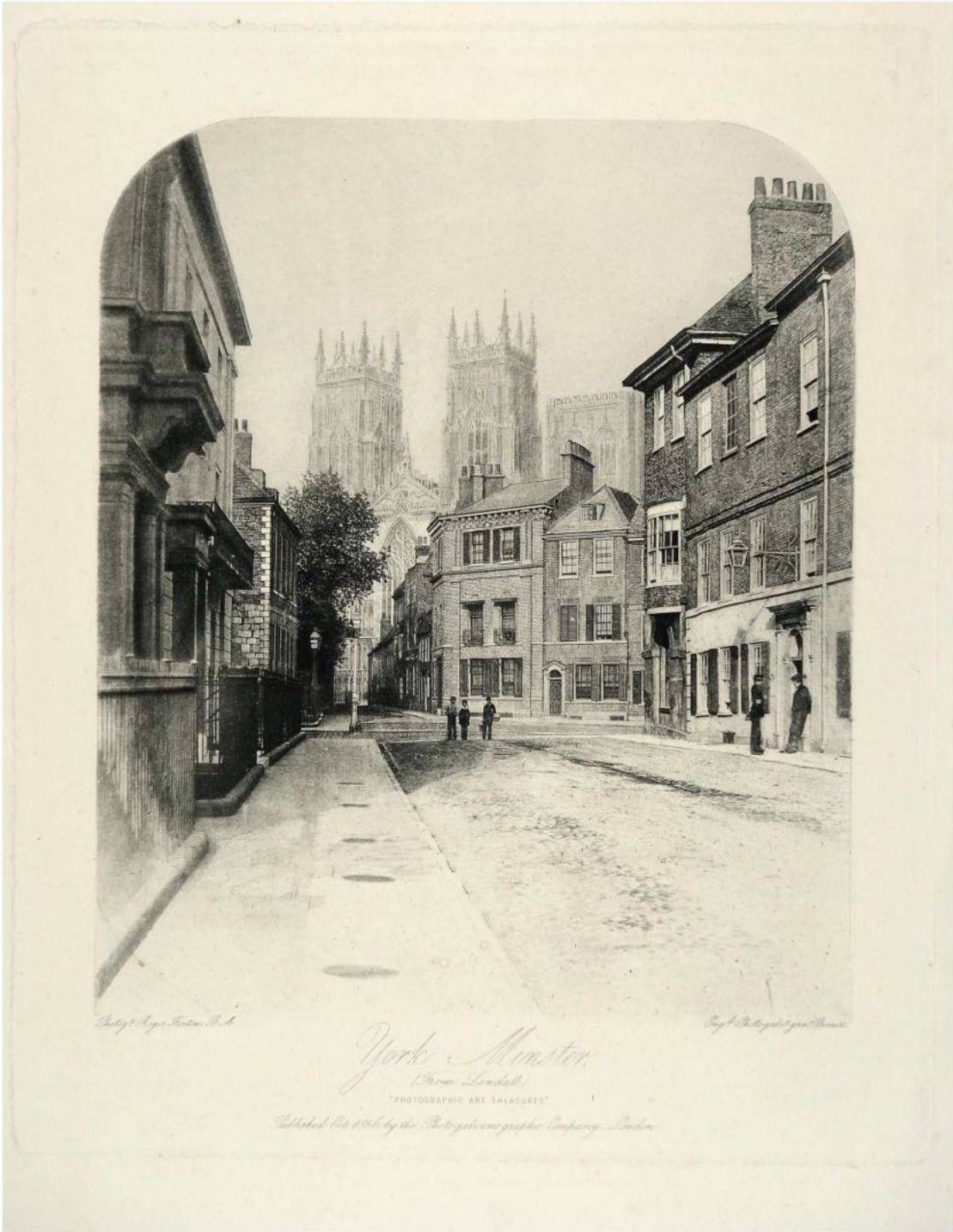
**PRETSCH, PAUL** (1808-1873), Austria/England — “*Photogalvanography*” 1854. According to Hunt (*Manual* pgs. 269/70) a well cleaned plate of glass is coated with a glue which has been dissolved in three different solutions: The first with nitrate of silver, the second with iodide of potassium and the third with potassium bichromate. More glue is dissolved in the third than the other two. These are mixed together and then “floated” over the glass plate and then dried. This plate is placed with the negative in a copy frame and exposed. The plate is then placed in a water bath where the glue expands depending on its exposure. When this is dried soft gutta percha is pressed into it and then the resulting copy is rubbed with bronze powder or black lead to make it conductive. This is then connected to a battery and placed in a solution of sulphate of copper to create an electrotype ready for printing. (after 1858 the copper plates were steel faced). Pretsch’s original company, the Photo-galvano-graphic company, which produced the periodical *Photographic Art Treasures* beginning in 1856 failed within two years. Talbot, ever litigious, threatened to sue Pretsch for patent infringement. Pretsch produced some plates in the intervening years but eventually left England. **Intaglio.** In about 1862 he demonstrated with Warren De La Rue a modified process that produced a plate that could be printed with type. Horgan (*Inland Printer*) explains: “Nitrate of silver, chloride of calcium and glycerin were added to the bichromatized gelatin with the result that after being acted on by light through an ordinary negative and soaked in water, the gelatin film reticulates in a most peculiar manner. The printing-block is an electrotype from this reticulated gelatin film.” **Relief**



Volkmer, *Die Photo-galvanographie*, 1894



Hunt, *A Manual of Photography*, 5th edition, revised, 1857

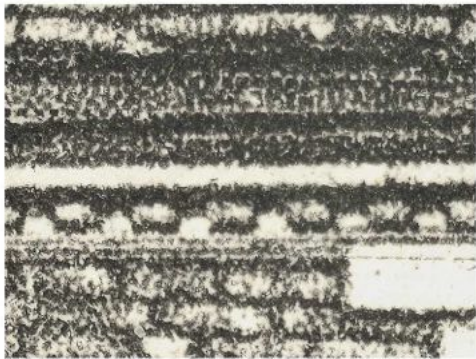
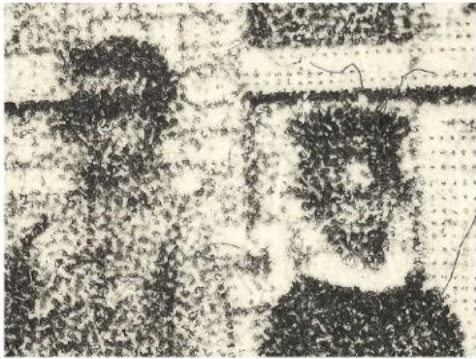


*Photographic Art Treasures*, October, 1856

Please note the extensive retouching with the roulette on this small illustration



15X

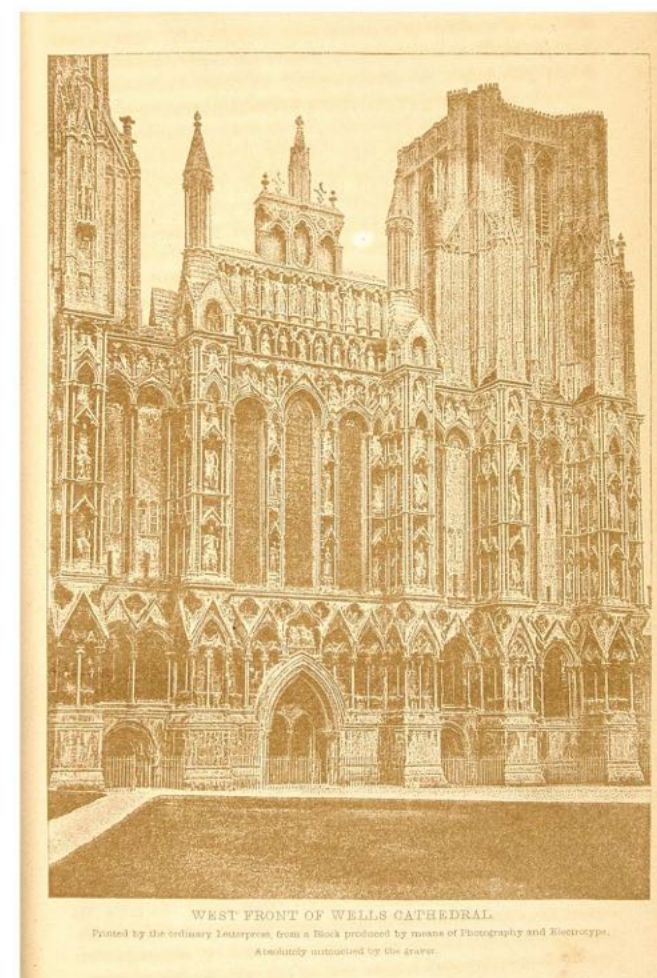


both 15X





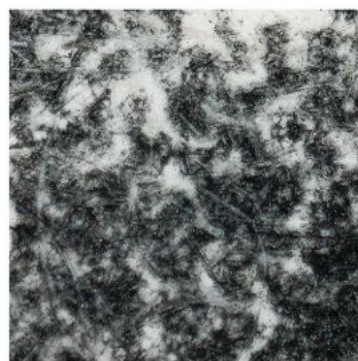
"I Pays", *Journal of the Photographic Society of London*, September 15, 1859



Urban, *The Gentleman's Magazine*, July, 1862 - Relief



15X

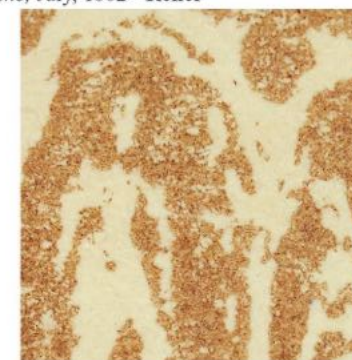


45X

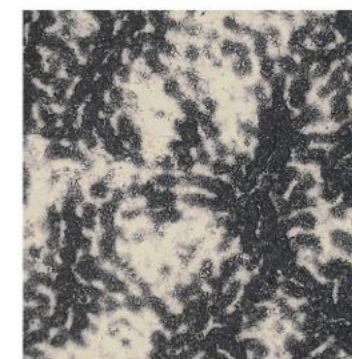
As can be seen in the prints presented, Pretsch's methods produced a number of different reticulation patterns. The print of the Moon from 1865 being the most pronounced of the intaglio prints.



*Monthly Notices of the Royal Astronomical Society*, March 10, 1865




15X



15X



**PUMPHREY, ALFRED** (1816-1894), (Birmingham)  
England — “*Permanent Ink Photograph*”, *Collotype*  
variant, 100—200 prints per plate, circa 1878. Pumphrey  
was one of the first in England to set up a printing  
operation that would solicit business from anyone needing  
prints. (Gernsheim) **Planographic**



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The sample above is produced by my new process, in which all the advantages of the correctness of ordinary photographs are secured, at a less cost, with greater speed, and with permanent results.

[OVER.]

Tissandier, *A History and Handbook of Photography*, 1878

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16/6	27/-	53/-	93/-	With fly leaf, Printing on 1st, 3rd and 4th pages.			
POST 4to CIRCULARS, INCLUDING PRINTING & PHOTOGRAPHS.							
100	250	500	1000				
13/6	25/-	50/-	90/-	Printing and Photograph on the same side.			
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The above price is for Photography and Printing when the Negative is supplied.

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**A. PUMPHREY, CAMP HILL WORKS, EMILY STREET, BIRMINGHAM.**

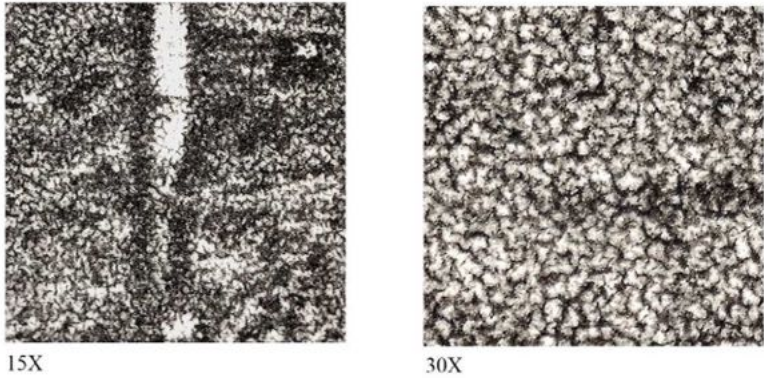


**AT KENILWORTH.**

**A. PUMPHREY, PHOTO-MECHANICAL PRINTER, BIRMINGHAM.**

**PERMANENT INK PHOTOGRAPH.**

Tissandier, *A History and Handbook of Photography*, English 2nd revised, 1878



15X

30X







**REICH, THEODORE**, (b. 1861-), Austria/England — “*Mezzotinto-gravure*,” Screened *Photogravure* process on flat-bed presses. This allowed for single plates to be printed from using a plate that could be wiped with a doctor blade speeding up the printing process for individual photogravure plates. F. Bruckmann and company, in Munich, bought the process and introduced it in 1905 using the trade name *Mezzo Tinto Gravure* (Eder pg. 602). Mertle (pgs. 40-41) relates a somewhat different narrative and refers to Reich’s process as being rotogravure as sold to Bruckmann.

Reich became a good friend of Klíč, according to Karl Albert, Klíč’s biographer. Albert also notes that Reich was paid by the Rembrandt Intaglio Company for technical improvements in rotogravure. **Intaglio**



15X



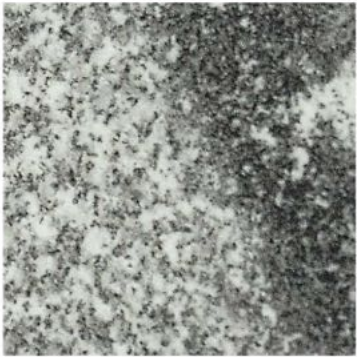
*Goethe-Jahrbuch* vol. XXVI, 1905



**RIFFAUT, MME. PAULINE** (1827-1889), (Paris) France, together with her husband produced many of the early French *Heliogravures* from 1853 to the early 1860s. She worked with her husband **Adolphe Pierre Riffaut** (1821-1859) until his internment for madness and then by herself. Adolphe Riffaut was a noted engraver, etcher and printer. He was involved with Lemaître, Mante and Niépce de Saint-Victor. Madame Riffaut is singled out on a number of early plates with the imprint “Photographie sur acier par Mme Riffaut.” A portrait of Niépce de Saint-Victor bears the inscription “Photographie sur acier par Mme Riffaut d’après les procédés de Mr. N de St V.” There is at least one plate that was originally imprinted with Mante’s credit and then in a subsequent printing imprinted with her credit. Full authorship of these early heliogravures may never be sorted out. **Intaglio**



15X

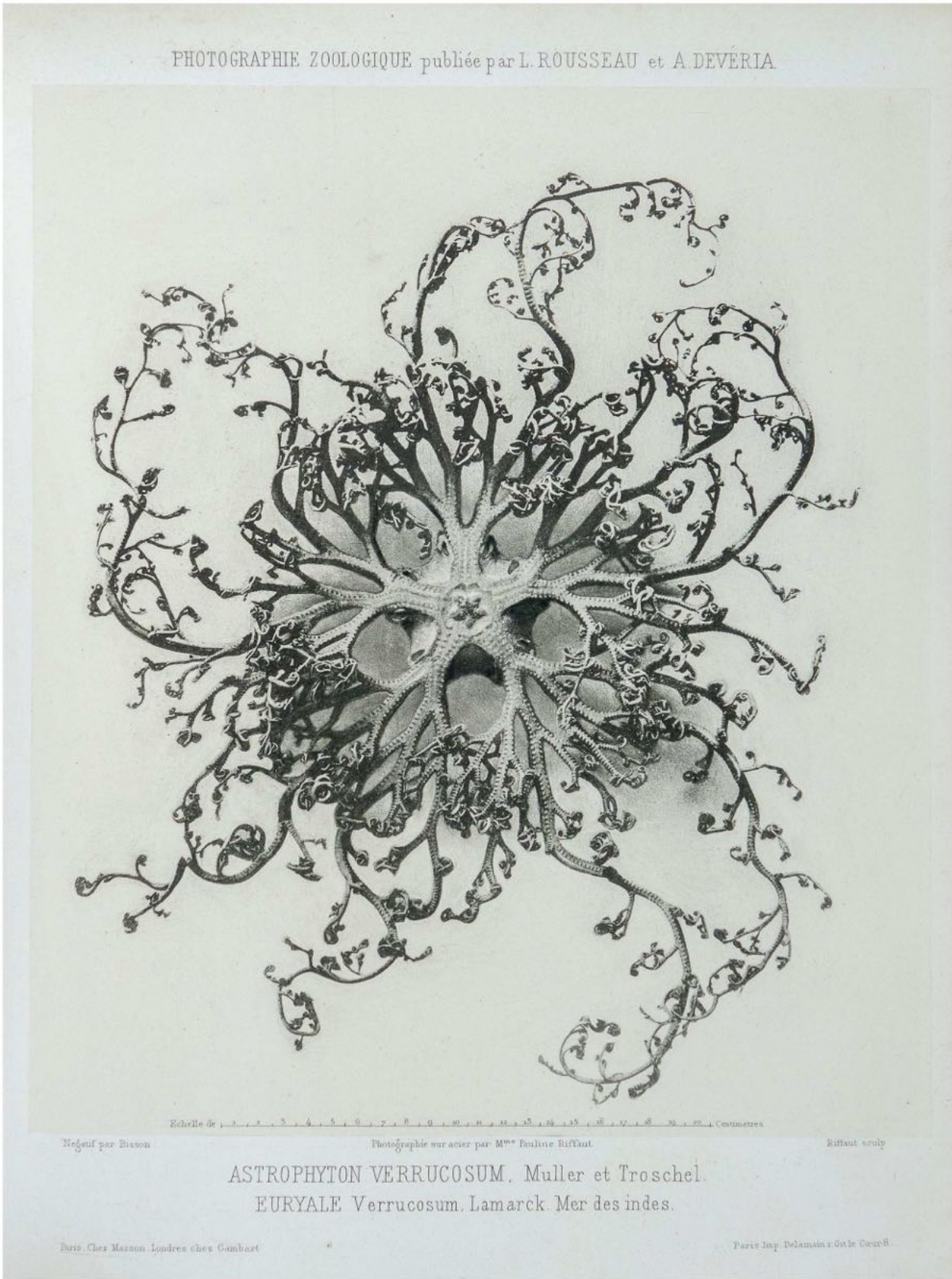


30X



Recherches Photographiques, 1855

Mark Katzman



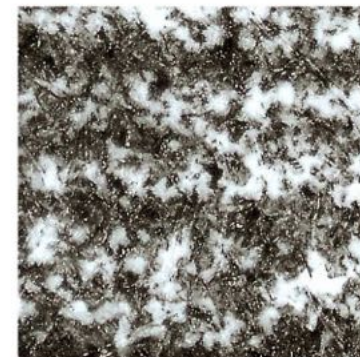
Société D'Encouragement, 1854



**ROCHE, THOMAS C.** (d. 1895), U.S. - "Indotint" Collotype on a grained copper support in 1879. "In this process, invented by T. C. Roche, of New York, the plate usually of copper, is roughened or pitted by exposure to the sand-blast, in order to cause the sensitive film to adhere tenaciously. Extra toughness and tenacity are also produced in the film by the addition of alcohol to the chromatized gelatine. After exposure under the negative, the unchanged bichromate is washed out and the plate is dried. These plates can be used in the power press, and 1000 copies an hour may be printed from them." (Charles F. Chandler, *The Manufacturer and Builder*, 1891, pg. 39). The NY Photogravure Co. used this method, as did the Indotype Co. NY., and the American Photo-lithograph Co. NY. **Planographic**



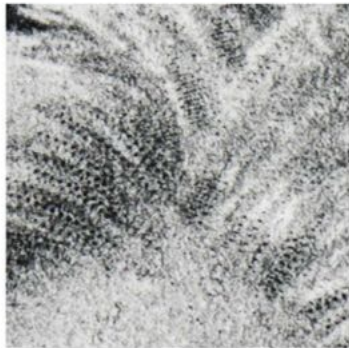
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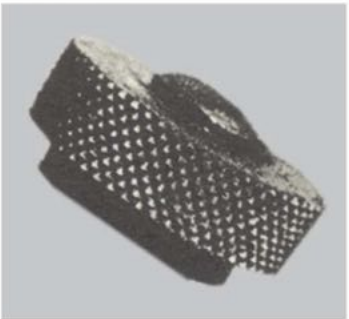
**ROUSSELON, HENRI MARIE** (1822-1902), Asnières (France) — “*Goupil Gravure*” Woodbury claimed it was from his idea. Swan’s son claimed it was his father’s photo-mezzotint process. The plate is produced from an electrotype of a colloidal surface. Rousselon stated in 1872, “Our process is founded on the discovery of a chemical substance which crystallizes under the influence of light, the crystals becoming larger the longer they are exposed to it. After exposure it only remains to make a deposit of copper, by means of the electric battery, on the crystalline surface, and thus a plate is obtained yielding proofs in which every detail and gradation of tone is faithfully reproduced.” According to Eder this could take weeks. The process as described by Mertle “comprised sensitization of a steel or zinc plate with a hygroscopic mixture of gum, glucose and bichromate, the surface then exposed under a continuous tone positive. The plate was next dusted with emery powder or ground glass particles of different degrees of fineness, the coarsest particles adhering to the shadows and the finest to the highlights of the hygroscopic image — a principle obviously borrowed from the Garnier-Salmon process. The grained gelatin relief was then molded in sheet lead in the woodburytype manner, after which an electrotype was produced for the mold and intaglio impressions taken from the electro.” Which Mertle indicates is directly from Woodbury patents. (Mertle pg. 23) According to an article in the *Catalogue of the Exhibit of the American Book Trade* for the Exposition Universelle Paris, 1889 (pg. 15), Rousselon learned the woodburytype process from Mr. **Louis Husson**, who worked for Woodbury in 1871. Rousselon went on to perfect his system of photogravure in 1872. The Goupil family eventually retired in 1884 and the company became Boussod, Valadon & Cie. It should be noted that Peter Henry Emerson remarked that he did not like that Goupil and Dujardin retouched their plates. **Intaglio**



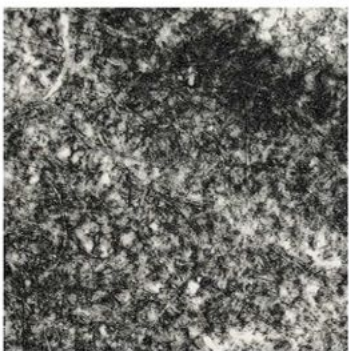
Hair roulette



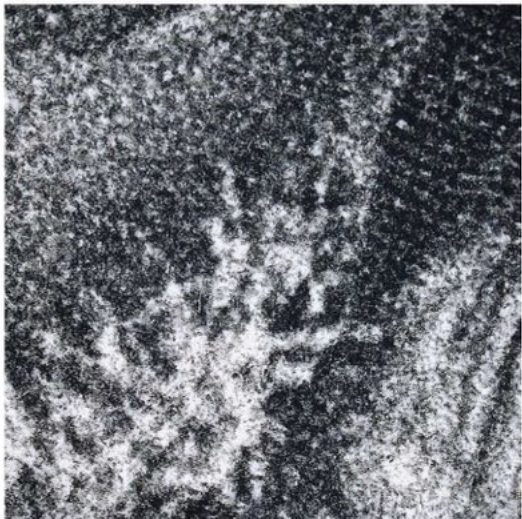
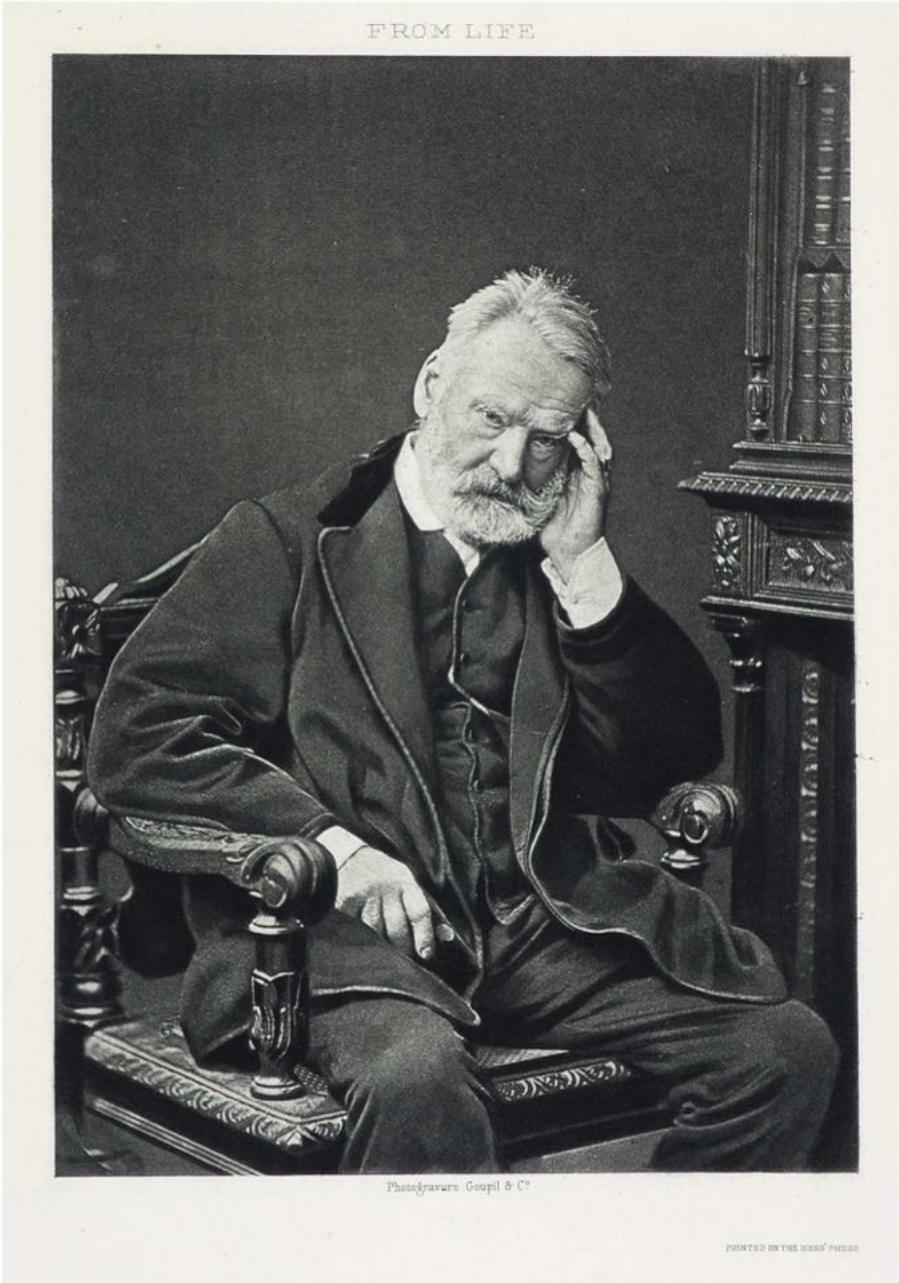
Sleeve roulette



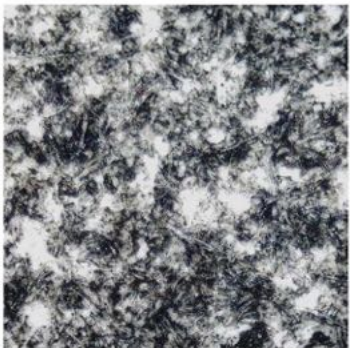
Roulette wheel



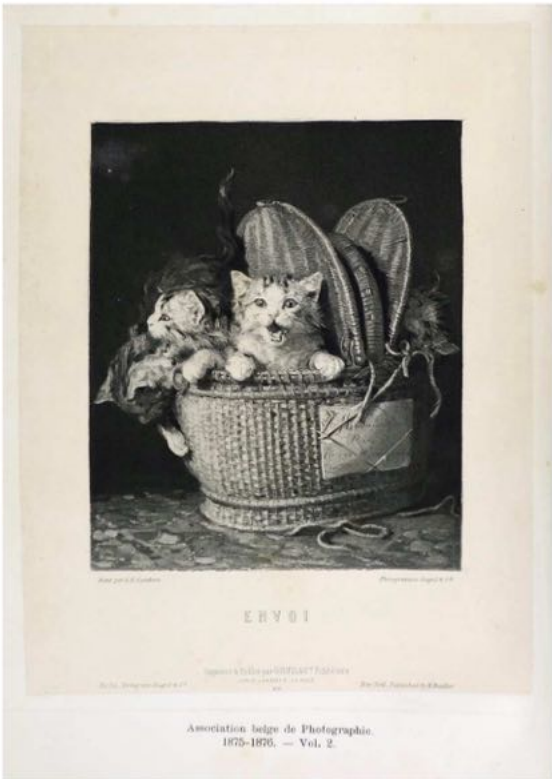
45X



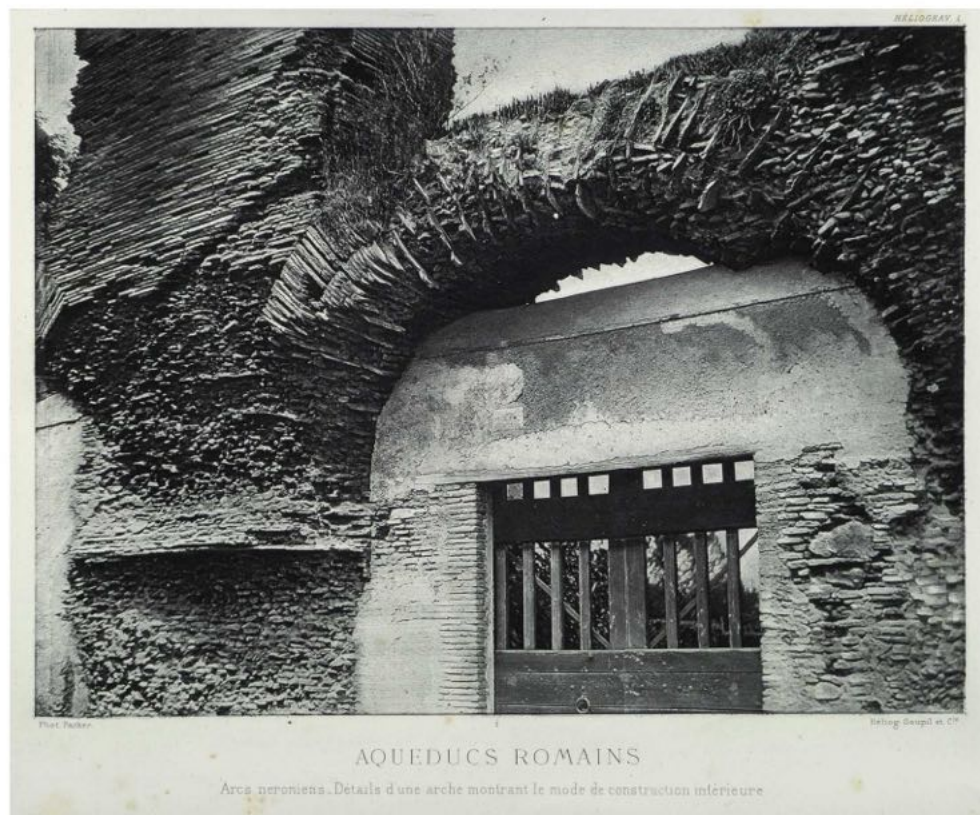
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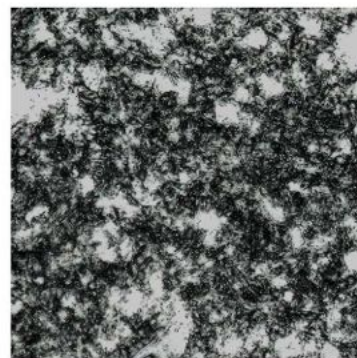
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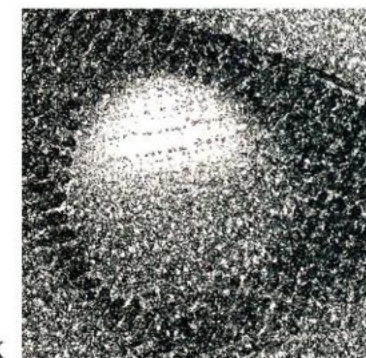
*Les Eaux Introduction les Aqueducs Romains, Atlas, 1875*



45X



*Houssaye, La Comédie Française, 1880*



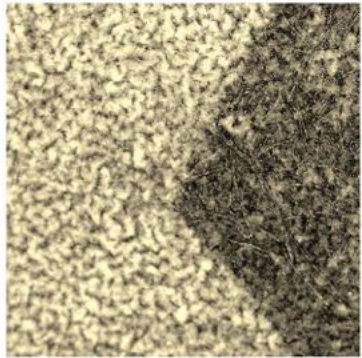
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Rousselon was working with both art and photography from his earliest photogravure productions. I have not been able to see a significant number of Goupil photogravures to see when extensive retouching began. As can be seen from the two examples, the photograph from 1875 has no retouching but the example from 1880 has. There is a significant tonal range difference which might be from the quality of the original photographs but also may be from the careful, but extensive, use of retouching.

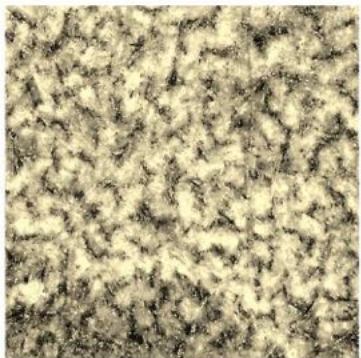


**SAWYER, J.R.** (d. 1889), England — *Collotype*. circa 1870. In 1876 he showed prints at the *Special Loan Collection of Scientific Apparatus at the South Kensington Museum* (pg. 211). “Glass plates prepared with gelatin and isinglass, potassium dichromate, &c., hardened by a spirituous extract of gum resins, upon which the photograph is impressed by the action of light; after which they are placed in a type printing press, damped, and inked by lithographic rollers.” Sawyer was a principal in the Autotype company. **Planographic**

In 1885 Sawyer produced a method he called “*Autogravure*” He wrote in *The Photographic Journal* (pg. 29) “Many methods have been tried to overcome this difficulty, but the only successful one as far as I know is one invented by my friend Colonel Waterhouse, and worked out with him by Mr. Foxlee and myself at the Autotype Works. This method consisted of covering the gelatinous image (using an exposed and washed out carbon tissue) whilst still wet with very finely-powdered glass. As this powdered glass is laid upon the moist and yielding surface of the picture, its minute points and angles penetrate it, and as the gelatin contracted in drying it became still further embedded, the glass being then brushed out of the film, a series of minute holes was left, which when reproduced in the process of electrotyping gave the necessary ink-holding grain.” **Intaglio**



45X



90X



The "A.B.C." Guide to the Making of Autotype Prints in Permanent Pigments, 3rd edition, 1895



Peter Henry Emerson describes his involvement with photoengraving by discussing how he arrived at the firm that did his most successful photogravures. One of his earliest productions was done at the Autotype Company in the process of Autogravure. Emerson explains his search for a company to produce his plates (pg. 208), “Having at last settled on the four apparently most suitable processes [probably referring to the names the firms gave to their individual form of photogravure], we began our studies. Negatives were sent to each of these firms, of whom only one had ever attempted reproducing a landscape direct from a negative from nature. The proofs came, and were in every case most unsatisfactory; they had all been barbarously retouched, all the tonality had been falsified, faces against the sky were made lighter than the sky, faces were roughly outlined with an etching-needle, high lights were scraped away needlessly, and shadows barbarously deepened with the roulette.”

I think that the comparison of the two plates presented amply demonstrate his problems. However I wonder what firms he contacted as Annan in Glasgow had already done superb work with G. Christopher Davies' photographs of the Norfolk Broads in 1883, and Dujardin and Goupil had produced photogravures from landscape studies from the early 1870's on. In many cases the Dujardin and Goupil work showed no or very little retouching. At any rate the Autogravure of the Water Lilies shown here is a disaster.



“Water Lilies” Autogravure by the Autotype Co.

The Victoria and Albert Museum, London



“Water Lilies” platinum print

J. Paul Getty Museum, Los Angeles

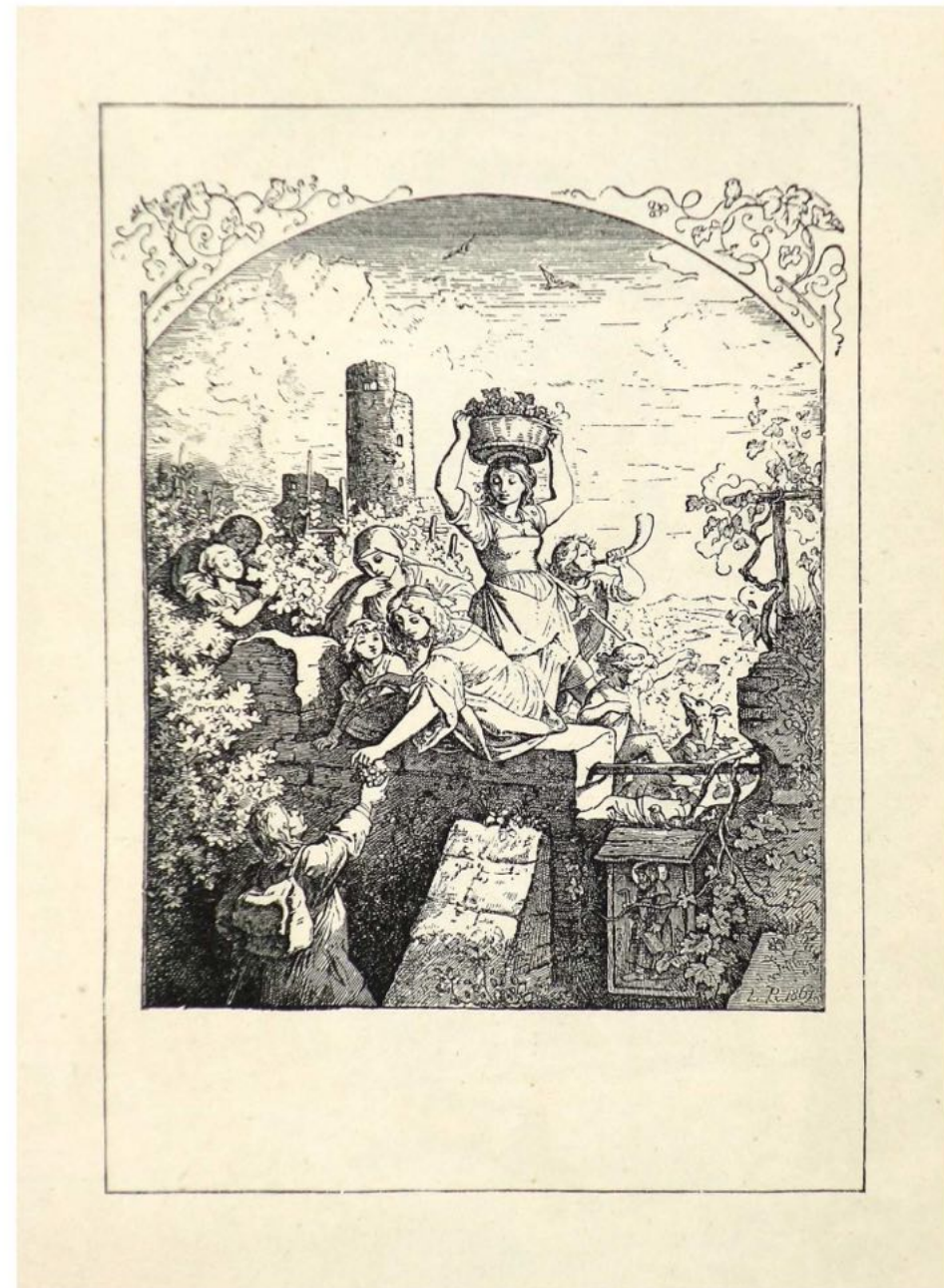


**SCAMONI, GEORG** (1835-1907), Germany - Russia — *Heliogravure, Photoelectrotype* in line. “Georg Scamoni, chief of the photographic section of the Russian Imperial Printing Office at St. Petersburg, added materially to the progress of the Technographic Arts during this period. He worked out, about 1865, a method of photo-intaglio-reproduction by electrotyping on the metallic deposit which forms the image on the developed collodion plate, after first building this up to a sufficient relief by repeated redevelopment and intensification.” (Levy pg. 396). Scamoni realized that the image on the collodion negative was actually in slight relief. He saw that if he intensified with silver and redeveloped he could create a relief sufficiently deep to be electrotyped to produce a printing plate. **Intaglio, Relief**



Vogel, *The Chemistry of Light and Photography*, 1875

Intaglio



Relief



**SPENCER, THOMAS**, England — *Electrotyping*, etched with a galvanic current. 1839 (1840) Davis states Spencer experimented as early as 1837 (pg. 199) “Thomas Spencer of Liverpool made the discovery that copper was deposited on the copper plate or negative metal and that the zinc plate was corroded or etched...” Spencer described a method which was later used extensively for making large copper plates for printing Ordnance Survey maps. Lines were drawn through a thick ground with a special tool, and then copper was deposited slowly into the cleaned lines, producing a linear relief plate. This method was widely used for other printing purposes besides maps, including the illustrations of Spencer's original description.



ORIGINAL.



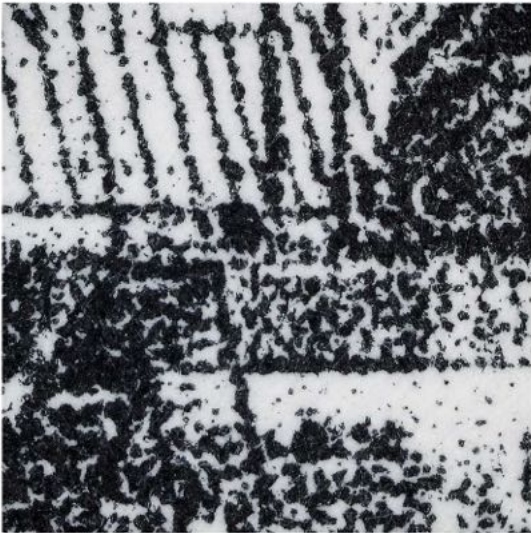
ELECTROTYPE COPY,

*by*  
*Daniel Davis Jr.*

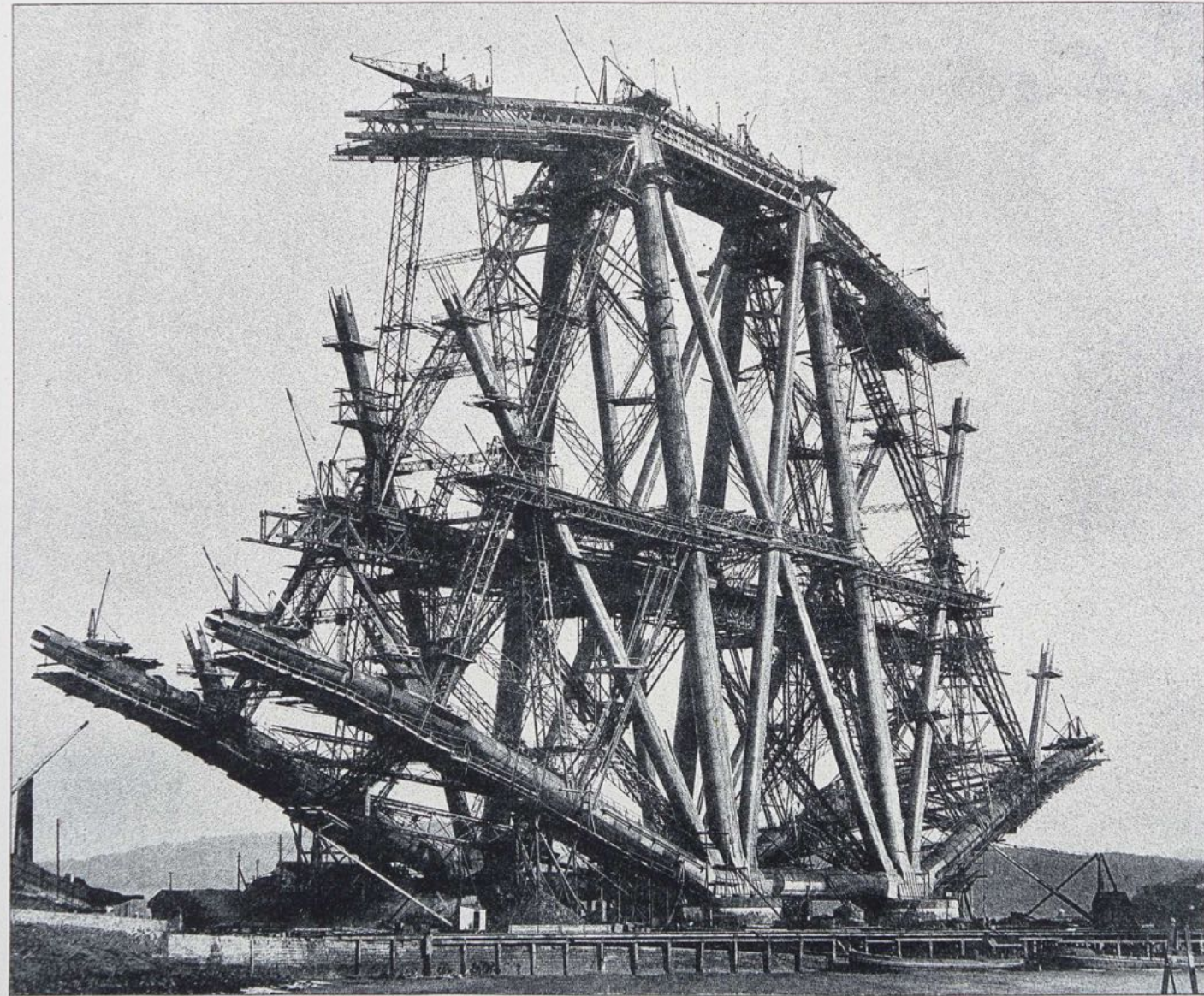


**SPRAGUE & CO.**, England — (worked 1879 to about 1900) "*Ink Photo*" a secret process; whereby a photographic negative was exposed onto a transfer paper with a very strong chromocollotype grain. This image was transferred to stone and printed from. According to a note that Sprague & Co. sent to *The Process Photogram* (pg. 48) in 1898: "We inform you for your edification that we commenced using the "Ink-photo" process in the year 1879, and have continued doing so ever since—by what means we obtain our results we have no intention of discussing."

**Planographic**



15X



INK-PHOTO, SPRAGUE & CO LONDON.

FIVE CANTILEVER.—COMPLETING 1ST TIES.—MAY, 1888.

*The Forth Railway Bridge, being the Expanded Edition of The Giant's Anatomy, 1890*



**SWAN, JOSEPH WILSON** (1828-1914), England — Under the title “A New System of Printing” in *The Photographic News*, October 14, 1864 (pg. 493) is given a short description of Swan’s method of producing a photomechanical print using different levels of tinted gelatin to produce a photographic image. His method was to electrotype a gelatin relief and use that, with varying depths, to produce a printing plate. According to the article the images he showed at that time produced better results than were shown by **Woodbury**. He subsequently did not adequately pursue this work.

“*Photo-mezzotint printing*”, a *Photogravure* system of electrotyping a gelatin relief, in 1865. Eder (pg.586), “...pigment images were transferred to glass or metal, developed in warm water, and the hardened pigment relief electrotyped. He produced thus halftones for lithographic and typographic presses, which could be printed with ordinary greasy inks.” Waterhouse wrote in 1905 (pg.XIII) “... a method of photo-engraving in which he impressed the photographic image on to a coloured chromogelatine tissue from a negative bearing a ruled grain, transferred this tissue face downwards on a glass or other suitable support, and developed it in warm water from the back, dissolving all the unaltered gelatin and leaving a positive image in relief, corresponding to the lights and shades of the picture. After hardening with alum or iron solutions, it was dried, rendered conductive and electrotyped.” Swan’s son believed that the Goupil firm used his father’s process, but in fact they used a modification of Woodbury’s.

In 1879 Swan obtained an “English patent in which he describes a method of producing halftone negatives through screen, the lines placed either before a transparent positive or before the sensitized plate in the camera, and turning the screen at an angle between each of several partial exposures of the plate.” (Levy pg. 399) **Intaglio**.

Swan also perfected the carbon tissue transfer for **carbon printing**, patented in 1864. This method of producing carbon prints and the tissue was further improved by John Robert Johnson in 1869 and 1870. Carbon tissue being essential as the image forming and resist material in the Klíč photogravure process.



*Rip Van Winkle, A Legend of the Kaatskill Mountains, illustrated with original designs by eminent artists and photographs in carbon of Jefferson as Rip Van Winkle by Sarony, 1870*



**TALBOT, WILLIAM HENRY FOX** (1800-1877), England - Talbot became disillusioned with photography because of the impermanence of silver based photographs. He turned his attention to a method that would be as permanent as ink on paper. Talbot discovered that gelatin would harden when mixed with potassium dichromate in proportion to the light striking it. He was the first to see the importance of this and it led him to coat steel plates with this mixture and place leaves over the sensitive coating and expose the plate to the sun. Where the sun struck, the gelatin hardened and where the leaf protected the plate the gelatin remained soluble. He first washed off the soluble gelatin and then brushed the plate with an etching solution made of platinic chloride. Where the leaf had been the plate was etched and could be inked. When wiped unfortunately the ink was pulled out of the flat areas that were etched and caught along the edges which produced when printed an imperfect rendition of the leaf. This led him to his second discovery, that by first exposing the whole plate to a thin gauze fabric and then exposing the plate with the leaf in place, the resultant etched image had the pattern of the gauze reproduced in the image of the leaf which produced a more accurate tone rendition. His first photomechanical patent was for “*Photographic Engraving*” 1852. The problem with this method was that pictures in continuous tone could not be adequately reproduced. However historians point to this as the first reference that later led to the halftone process.

This led Talbot to his second method - “*Photoglyphic Engraving*” 1858. (Talbot in a letter to William Crookes of Sept. 15, 1858 wrote of the term Photoglyphic, that it was “an appellation suggested by the analogy of Hieroglyphic and some other words...” ( Mertle states that “...the term coined from glyphikos, the Greek word for carving or engraving.”) Photoglyphic engraving was a copper, steel, or zinc plate process with an aquatint, primarily through dusting on of the resin, but also at least one of the 1858 plates used the liquid method. The aquatint was used to better retain the sense of a continuous tone photograph. This method of aquatint had previously been used by Niépce de St. Victor in his heliographic process of 1853. The resin grain was placed over the already exposed bichromated gelatin layer which had been exposed through a transparent positive. The etching of the exposed plate was done with ferric chloride and because the gelatin layer was fragile the resin had to be placed over it otherwise the etching fluid would destroy the gelatin too quickly. Talbot did not use his own photographs for his plates but relied on glass positives primarily from stereoviews by Clouzard and Soulier. His goal was to produce photographic images, with no retouching. This led to incomplete results as can be seen in his prints.



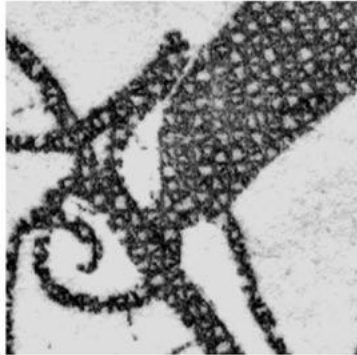
Fern Hans P. Kraus Jr., New York



Glass stereoview, Clouzard & Soulier, Paris



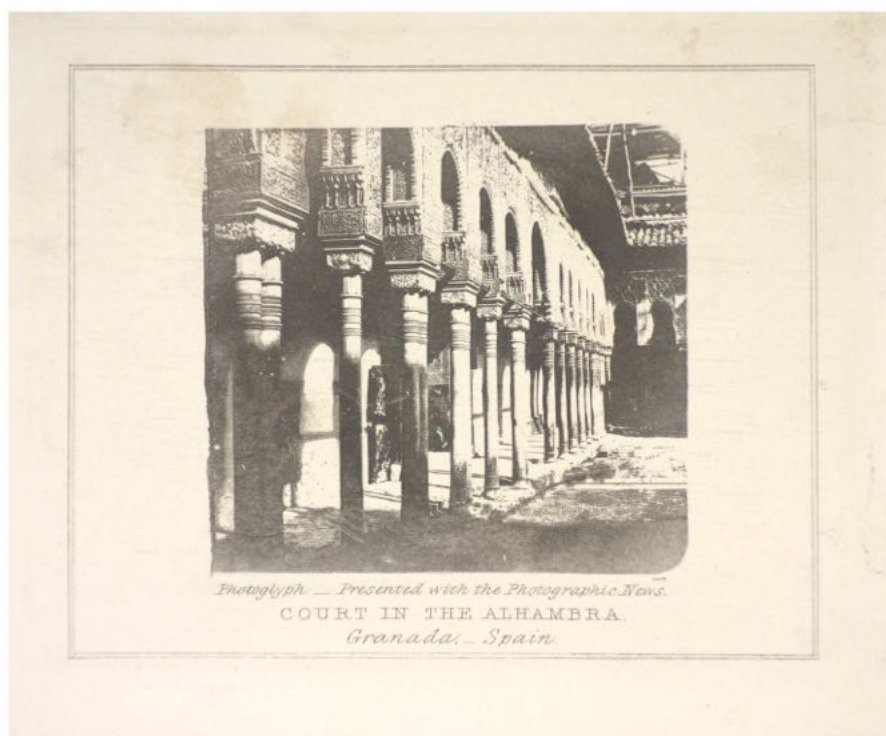
Both magnifications courtesy, Hans P. Kraus Jr., New York



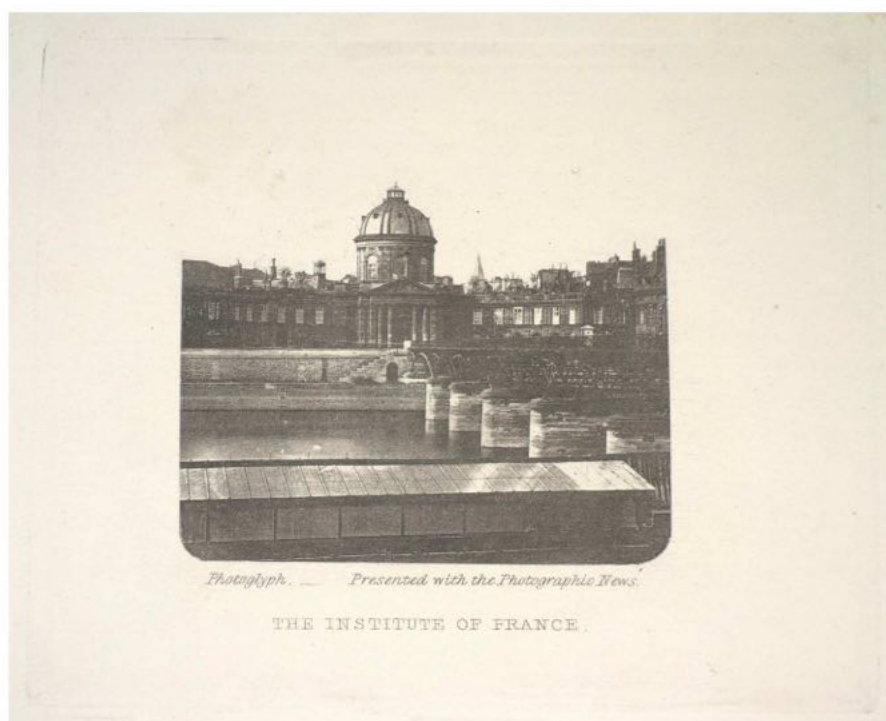
Same image as in *The Photographic News*, November 12, 1858  
A separate printing by Thomas Brooker

Steven F. Joseph





*The Photographic News*, November 12, 1858



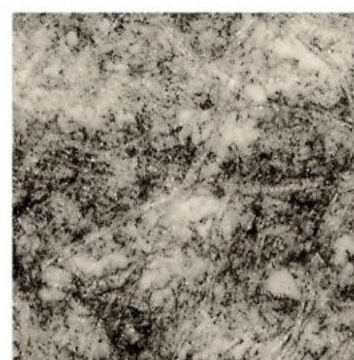
*The Photographic News*, November 12, 1858



15X  
Liquid Aquatint



45X



90X

When Talbot made the plates for his first *photoglyphic engravings* he used a mixture of metals to create them. When the seven photographs were chosen to be included in the November 12, 1858 issue of *The Photographic News*, the choice included plates from copper and from steel. Copper being a much softer metal than steel the number of good prints from a copper plate were much fewer than from steel. Crookes, the editor of the magazine, needed a print run of 6,000 for inclusion so it was decided to use seven as that was easily possible in the time required for the publication date. How many prints from each plate is unknown, the invention of steel plating of copper for more durability was not published until 1859, it is possible that more prints were made from the steel plates than from the copper. The prints from the various plates have small marks below the right hand side of the picture area. The number of marks on the prints vary and on each picture there can be from zero to nine marks. Larry J. Schaaf (Kraus, pg. 40) has surmised that the marks indicate the number of plates that were produced for each photograph which would indicate that up to eight individual plates were made for at least two of the photographs and one with nine. One problem with this theory is that Thomas Brooker, Talbot's printer, makes no reference in his letters to Talbot about how many plates were delivered. On November 2nd, 1858 (letter 7724 in the online data base [www.foxtalbot.dmu.ac.uk](http://www.foxtalbot.dmu.ac.uk)), Brooker wrote to Talbot that he doubted that he could produce the 6,000 prints from a single plate. On November 9th (letter 7739) Crookes wrote to Talbot that the copper plates were nearly worn out and he asks if they can use a steel plate to complete the run. Two days later, on November 11 (letter 7743) Brooker wrote to Talbot announcing that the prints were finished. By my count at least 35 metal plates would have been used given the number of check marks on extant prints. I believe that the check marks could also mean that the number of marks indicate the number of prints that have been struck from each plate, say 100 for each check mark, the higher number of marks indicating which of the plates were steel as opposed to copper. There are very few extant prints from this publication, but it can be seen that there are more of some than of others. The most common image in extant prints being the bridge over the Moldau at Prague. The steel printing plate for this image is at the National Media Museum, Bradford, UK (1937-534/1) and it has eight check marks. However two of the other photographs have at least eight marks on each, one of those with nine. There may be a problem with this interpretation, also in the collection of photoglyphic plates at the National Media Museum, there is a steel plate of the Court in the Alhambra that has the *Photographic News* inscription but does not detail whether there are marks present (1937-502).

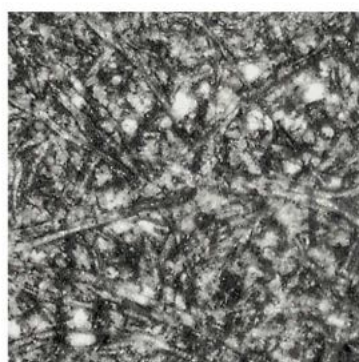




The Photographic News, September 16, 1859

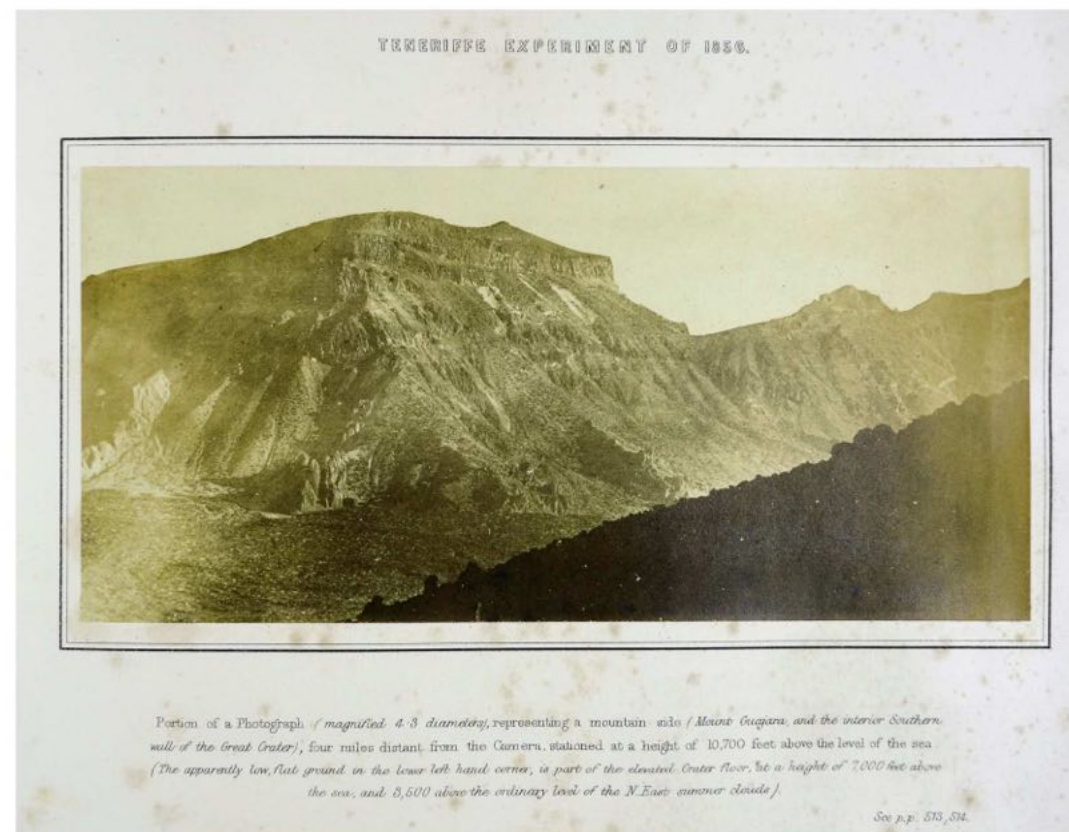


45X

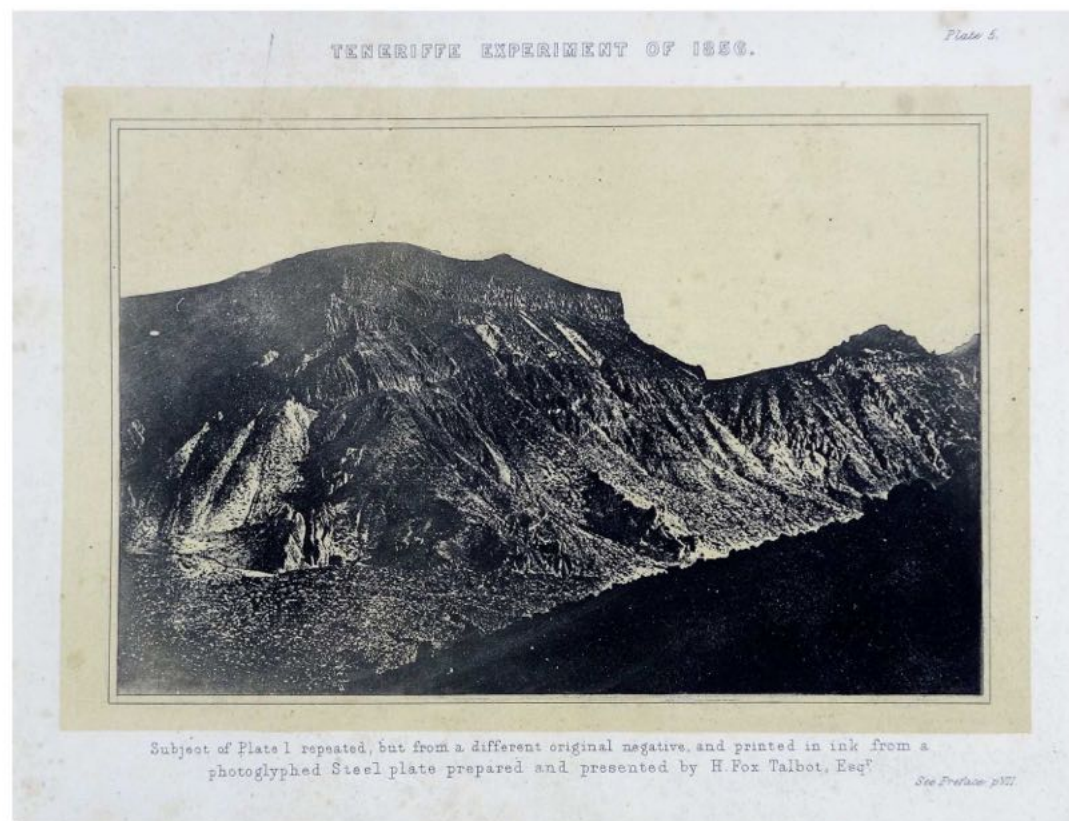


90X

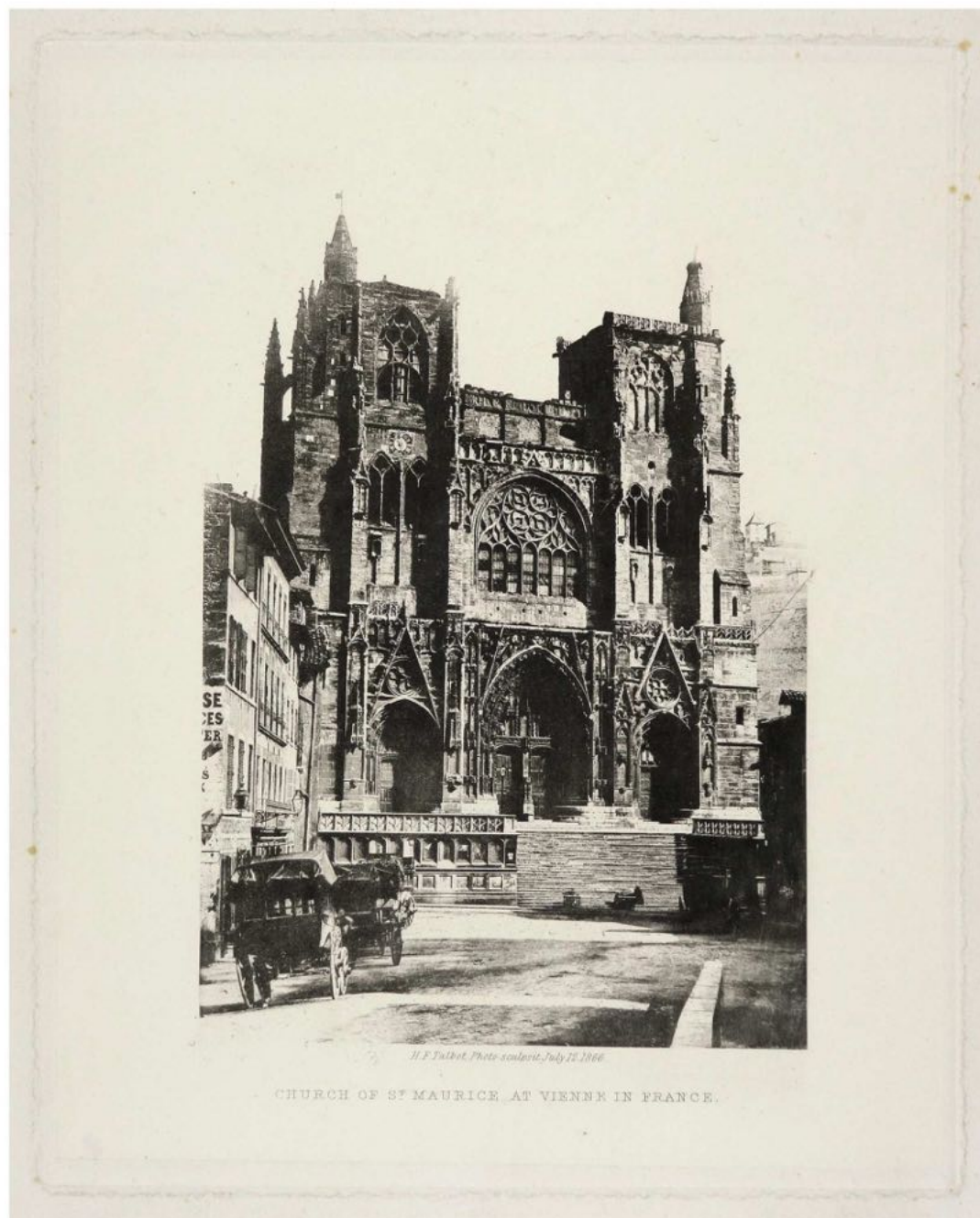
In 1859 Talbot made a larger plate for *The Photographic News*, an image of the Tuileries by Clouzard and Soulier. By this time Joubert had published his process of Acierage, the steel (iron) plating of copper plates to extend their ability to print very large editions. The Tuileries plate was used to print all of the copies for the publication on September 16, 1859



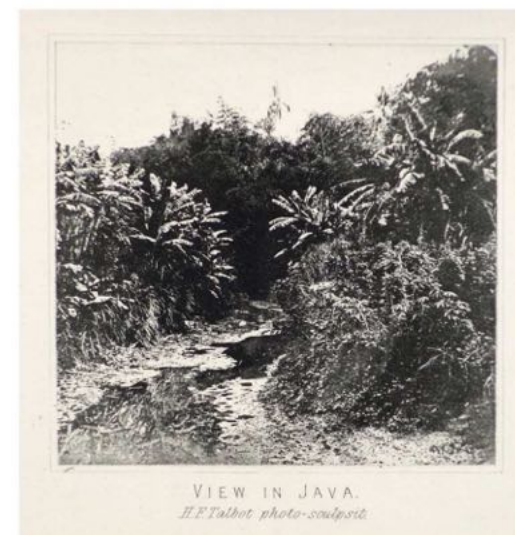
Smyth, *Astronomical Observations*, vol. XII, 1863



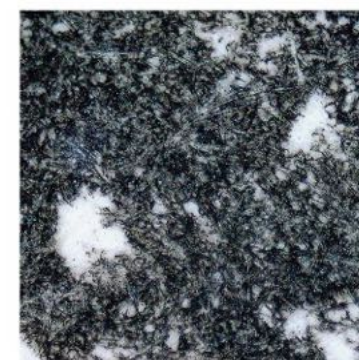




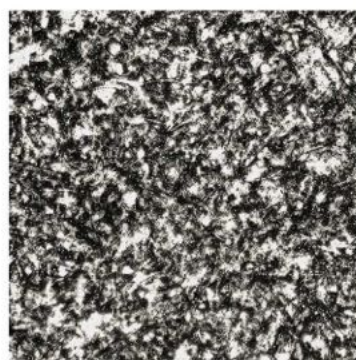
One of a possible three images for an unrealized project 1866



both - Tissandier, *A History and Handbook of Photography*, English ed. 2nd revised, 1878



45X



45X



90X

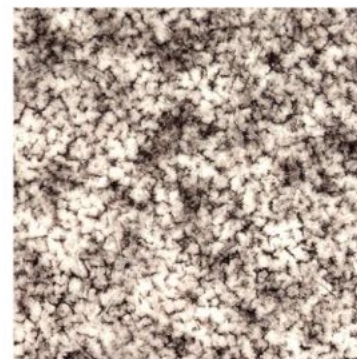
In a letter responding to F. Joubert, Talbot wrote about the three 1866 plates he had completed as part of a publication that was never realized, "The specimens I now send are done by a process somewhat different, which appears to give a much greater degree of certainty – in fact one that is practically sufficient. ... This improved process of which I speak, cannot of course be communicated until secured by patent which I have now under consideration." Talbot never completed the patent mentioned in the letter. In the letter he also pointed out that photographs with soft contrast worked far better than ones done in bright sun. (Joubert, Talbot letters #9126 and 39128: <http://foxtalbot.dmu.ac.uk/letters/correspondents.php>) The last prints, from 1866 and 1878, were titled "photo-sculpsit" and it is unknown whether Talbot chose this term. The three 1866 plates were offered and may have been printed for *The Photogram* in 1900. **Intaglio** The two Talbot patents are printed on pages 179 - 182.



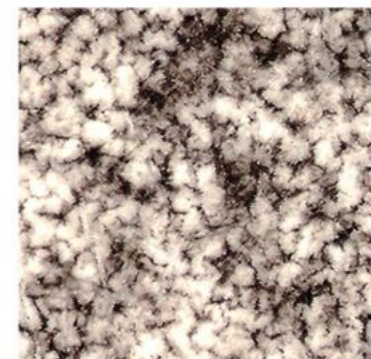
**TESSIÉ DU MOTAY, CYPRIEN MARIE** (1818-1880) with **MARÉCHAL, CHARLES-RAPHAËL**. (1801-1887), France — (worked 1865 to about 1875) “*Phototypie*” *Collotype*, chromated gelatin on a copper base. Waterhouse (*BJP*, 1878, pg. 523) explains: “In 1866 MM. Tessié du Mothay [sic] and Maréchal, of Metz, discovered that the stone or metal plate hitherto used as a printing surface might be replaced by a mixture of isinglass, gelatine, and gum, treated with an acid chromate, and evenly spread upon a well-polished metal surface; because if, after exposure to light under a photographic negative, such a gelatinous surface were moistened greasy ink applied upon it with a roller would adhere well to the parts of it that had been acted upon by light, and would be taken up by those parts in proportionate quantities, according to the intensity of the gradations of light and shade produced on them by the action of light, and their consequent impermeability to water. Photographic prints in fatty ink, reproducing the most delicate gradations of Black without any apparent grain or break of continuity, could thus be produced.” As published in the *Photographic News*, 1870, “A plate of copper is grained with sand and then coated very evenly with a mixture containing gelatine and the trichromate of potash, and possibly some other substances, and is dried by exposing it in an oven to a heat of 122° F., for some hours. These plates may be kept two or three days, sometimes more, before use. The plates thus prepared are exposed in diffused daylight under a reversed negative for about half-an-hour; they are then taken out of the printing-frames and washed under a rose jet of water until all the chrome salt is dissolved out, and then dried in the open air. After they are dry, it is better to put them away to harden for a day or two than to proceed to print them at once. However, to show me the process copies were printed off the two plates I saw exposed. The dried plate is taken to a lithographic press and placed on a stone, which serves as a support. It is damped with water in the usual way, which causes those parts of the gelatine film which have not been acted upon by light to swell freely, and the exposed parts to swell up according to the degree of protection they have received, and thus the plate presents the appearance of a graduated mould. It is next rolled in with a roller and lithographic ink, modified to suit the process; the rolling in takes longer with a stone, and requires some skill and care. The effect of the inking is that the water contained in the pores of the higher parts of the gelatine film, which have undergone little or no change by the action of the light, repels the ink, while the insoluble parts, which have been acted on by light and remain sunk, take up the ink in proportion as the action of light has rendered them impenetrable by water. The more the gelatine has been altered the thicker will be the coating of ink taken up. The paper is laid on dry, and the proofs are pulled in the ordinary way; they are then trimmed and mounted. The effect of printing the plates too soon is that the paper sticks to the film and is torn in pulling off, leaving little white spots over the print. I saw a great many perfect specimens of the process, the most delicate details being rendered with a perfection seldom seen in any other process. Messrs. Maréchal have not as yet practiced the process on a commercial scale; it has, however, been in use for a long time for making copies of the drawings and designs of their paintings on glass, and they are now desirous of extending its use.” In a 1928 article Emile Prillot, a professional photographer in Metz, wrote that Maréchal produced prints from 1865 to 1867 on his own and that the company, Arosa et Cie was designated to print their phototypies in 1867. He also states that only about 50 prints of high quality could be done from a printing matrix. Lemerrier was also involved in printing some of the books by this process. 1865. **Planographic**



Embossed stamp from the print of the art work  
of the local Metz artist Auguste Mennessier  
ca. 1865



45X



90X





Grand Autel des Douze Dieux Musée du Louvre, , 1870



Terres Cuites d'Asie Mineure, 1881

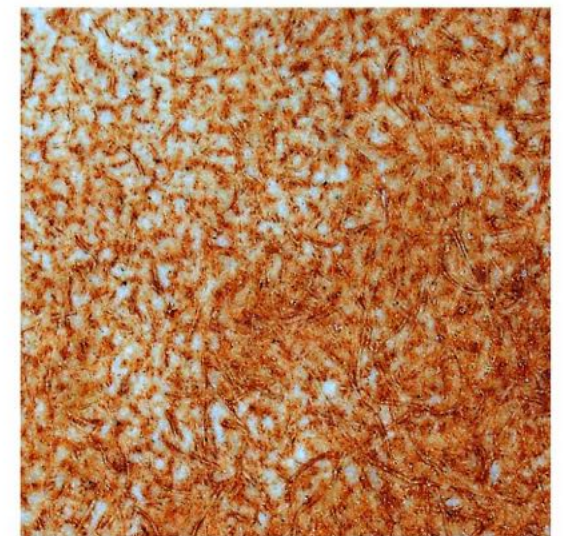


45X



90X

This illustration from Froehner's *Terres Cuites d'Asie Mineure* has been illustrated here to raise the issue of whether Arosa published Marechal and Tessié du Motay Phototypies after the mid 1870's.



30X



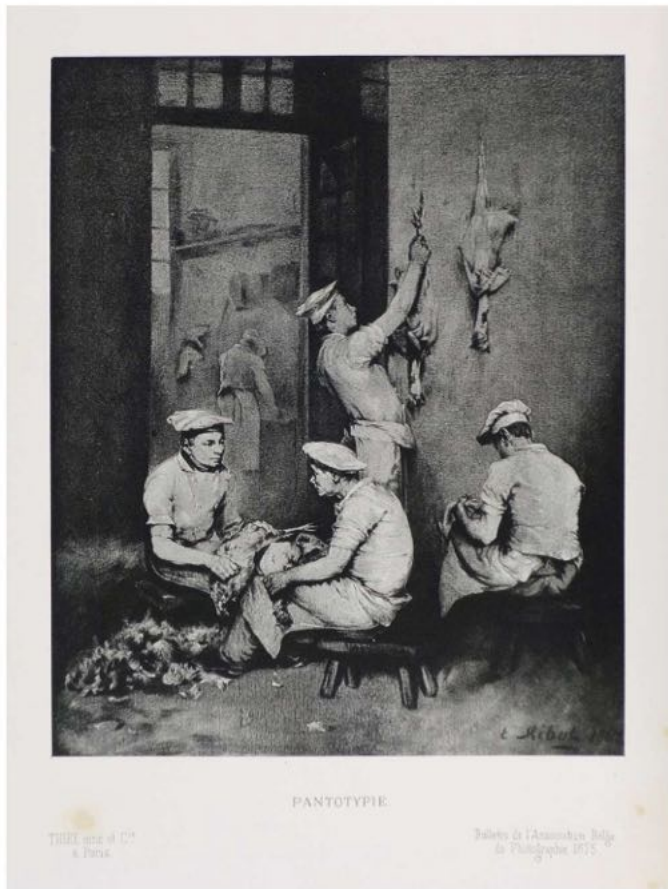
**THÉVENIN**, (Rome) Italy, 1856. Thévenin's *Heliographic* engravings in line were submitted to a meeting of the Société Française de Photographie, at their June 1856 meeting. "Mr. Thévenin, from Rome, addresses to the Society three new prints of chemical etching. About this shipment, Mr Girard announced that the Committee of the SFP had written to Mr. Thévenin to learn about his processes; the latter replied that he had several, and that he placed them at the disposal of the SFP. Mr. Girard thinks the description of them will reach the Committee in time for the July meeting. Moreover, one can gain a general idea based on the following sentence published in *Corrispondenza scientifica di Roma*; "The worthy M. Thévenin, applying the processes of the photographers mentioned above [Niépce de Saint-Victor, Talbot, Beuvière, Baldus, etc.], after many experiments, has managed to improve, by means of new chemical agents, the delicate operation of heliographic engraving, forming on any plate in intaglio or relief, and employing in preference for this an electric current." No further explanation of the process was published. **Intaglio**



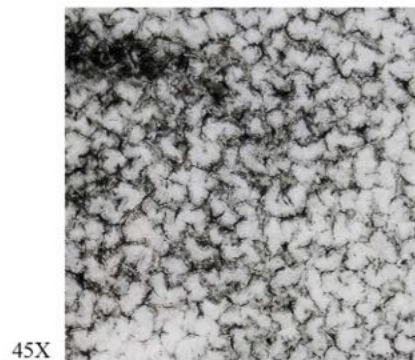
Société Française de Photographie



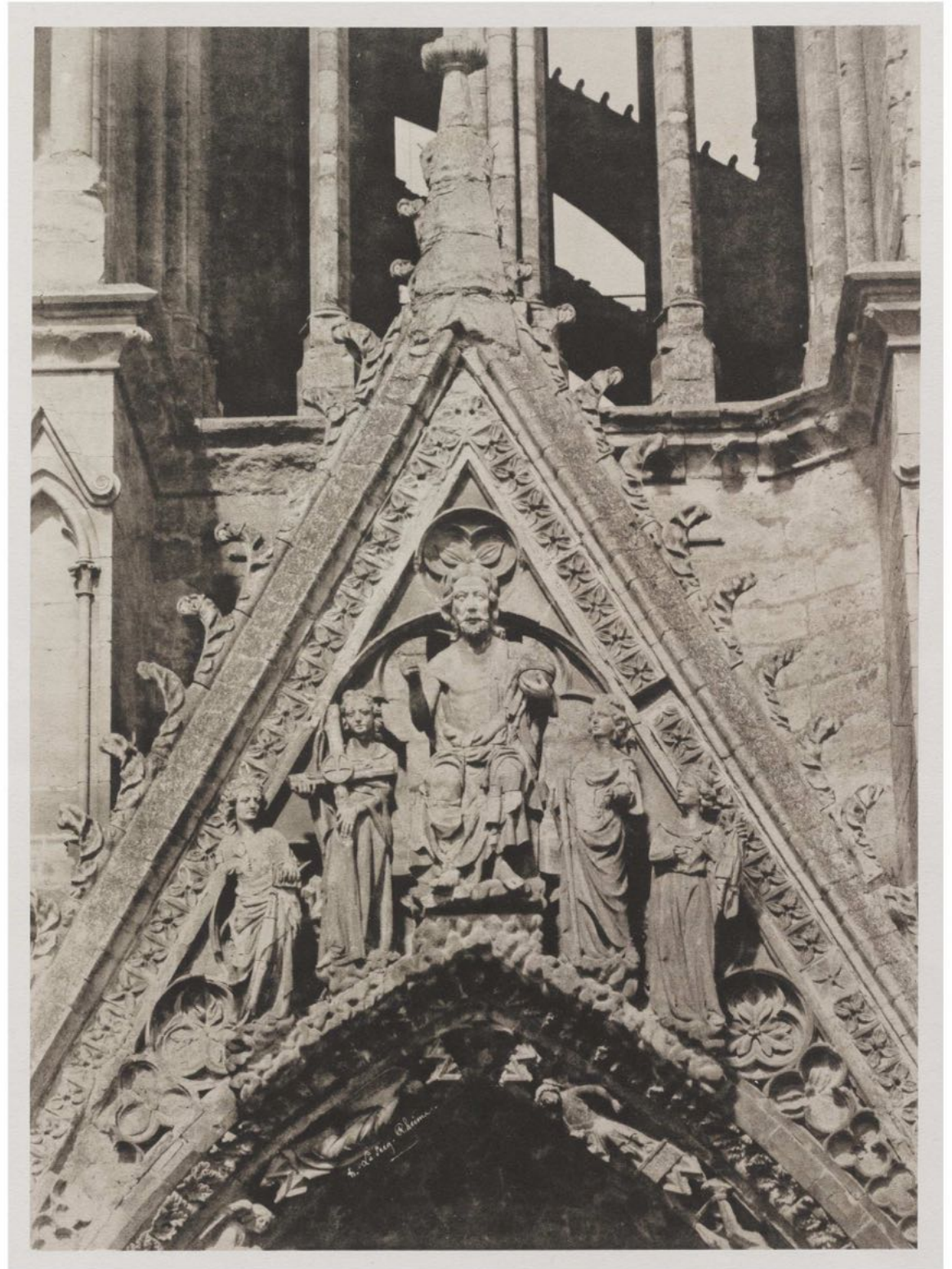
**THIEL, CHARLES ANÎÉ & Co.,** (1836-1902), Belgium/France – “*Pantotypie*,” “*Panotype*” ca. 1874 as described in *La Photographie en Amérique* (pgs.374-79), the process appears to be a *Collotype* variant of Albert’s in that it used a glass plate to hold the bichromated gelatin. In the description Thiel credits Poitevin’s use of bichromate and gelatin. His own formula was spread on a piece of glass cleaned with hydrofluoric acid. The formula for it included “Nelson” gelatin, Isinglas (fish gelatin), potassium bichromate and ammonium bichromate for the sensitive layer. Also the sensitized plate was exposed through a negative using diffused sunlight. He achieved over 20,000 prints from a single plate but more often 6 to 10,000. In 1869 Pinel Peschardière produced prints referred to as “*pantotypie*.” It is unlikely that this was the same process. **Planographic.**



*Bulletin de L'Association Belge de Photographie, vol. II, 1875-6*



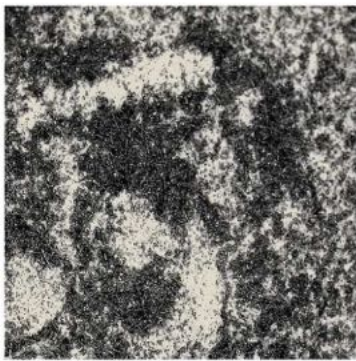
45X



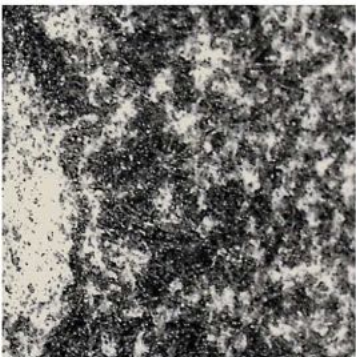
Reims Cathedral: Details of the Portal - paper negative by Henri Le Secq



**TOOVEY, WILLIAM** (1821-1914), Brussels (Belgium)—(worked by Simonau and Toovey from about 1864 to about 1872, Simonau died in July, 1870) Modifications to Asser's *Photolithographic* process in 1863. The de Luynes committee report (Waterhouse 1868) states, "The description he gives of his method, only applies with greater care the method of M. Asser of Amsterdam. He coats an unsized paper with gum and bichromate of potass, exposes it to light, and puts this paper on a lithographic stone; he covers this paper for a few minutes with some folds of moist and compressed bibulous paper; wherever the mixture of gum and bichromate has not been acted upon, the gum dissolves, and, penetrating the stone, prevents the ink from taking; wherever, on the contrary, the gum has become insoluble, the lithographic stone remains clear and takes the lithographic ink." Waterhouse (pg. 459) explains: "A method of photolithography by transfer, which yields excellent results in line, and even reproduces half-tones fairly well, is a modification of Asser's process, invented by Mr. Toovey, of Brussels, who coats paper with a solution of gum arabic mixed with bichromate of potash, and, after exposure to light under the negative in the usual way, places the transfer-print face downwards on the stone with several thicknesses of wet blotting-paper over it, and leaves it under pressure for some hours in a powerful press. The gum on the parts not exposed to light being soluble is forced into the stone and prepares it, while the lines, being hardened and rendered insoluble, leave the stone quite free from gum and ready to take printing ink from a roller when passed over them, thus producing an image which may be printed from as soon as the soluble bichromate salt has been washed out, because the bichromated gum is a most powerful preparation for the stone, and, indeed, is difficult to remove without grinding the stone down to some depth. This process requires care in adjusting the amount of moisture to be applied to soften the gum so that it may not be squeezed under the lines and block them up, and it has not, I believe, come into general use." **Planographic**



15X



30X



Weale, *Instrumenta Ecclesiastica Choix d'Objets d'Art Religieux*, 1866



**VIDAL, LEON** (1833-1906), Paris (France) — “*Photochromie*”, 1872 and 1874 patents using a woodburytype with chromolithographic under printings, on specially prepared Woodbury paper (*Society of Arts* pg. 2) – the Photochromie used a series of registered lithographic colors manually separated, to produce a color image, not necessarily accurate to reality, printed over each other and then have a Woodburytype, in registration, placed over them yielding a color print. The use of metallic inks or papers, when dealing with metal objects, such as armor, can create startling results. One of the drawbacks was that the prints had to be mounted inside stiff mats due to the need for them to expand and contract with atmospheric conditions. This made it nearly impossible for the process to be used in books. However there are examples of small photochromies that were glued directly to a mount. Maybe it was the size of the large prints that caused the problems. **Woodburytype** (Photoglyptie). This procedure was also done with *Collotype* or *Photolithograph* with less success as the base image was printed first and then the lithographic colors were overlaid resulting in a print that was less distinct. (see Laureline Meizel in bibliography for extensive information)



Monographie de la Cathédrale de Nancy, 1882

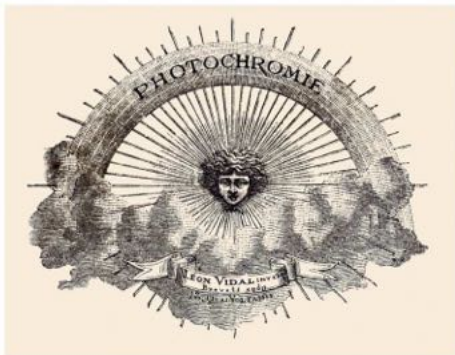


Vidal, Cours de Reproductions Industrielles, 1882





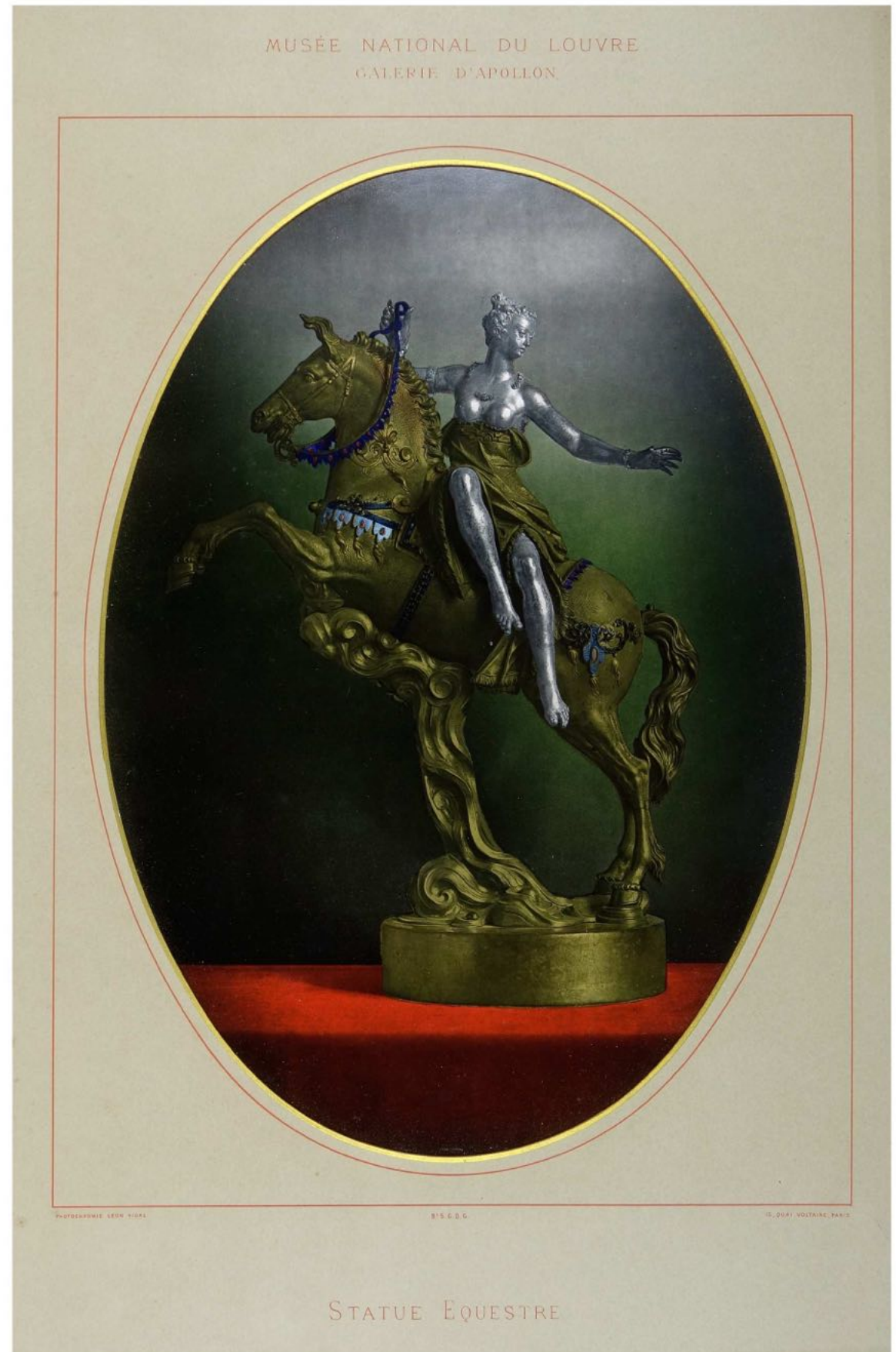
Chromolithograph, *Photochromie*



Vidal logotype



15X



*Le Trésor Artistique de la France*

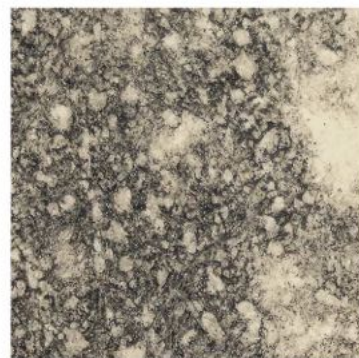


**WATERHOUSE, COL. JAMES** (1842-1922), England, India, Director of the Survey of India Photographic Office, Calcutta. *Photogravure* process detailed free in 1882. Waterhouse, “found, in 1881, a satisfactory method of obtaining a suitable grain by powdering the wet reliefs with fine sand, glass or emery powder, which had been previously well washed and treated with stearine or wax to prevent adhesion to the gelatin. As these powders sank into different depths in the moist gelatin surface, according to the thickness of the gelatin, they produced a graduated grain coarser in the shadows than in the lights.” (*Loan Exhibition*, 1905, pg. XIII). Please see **Sawyer** “Autogravure” which is the same process.

Waterhouse exhibited a number of plates at the 1898 exhibition and outlined their methods: A. Heliogravure by the waxed sand method, photoelectrotyped, B. Thio-carbamide reversal method, C. Photo-Etching from a direct positive reversed with phenylthio-carbamide, D. Collotype using a paper support with a coating composed of gelatine tannin and soap, sensitized with bichromate of potash, E. Photo-zincograph by transfer from an electrotyped sand grain photogravure plate to zinc and also a transfer with collotype grain. 1885. The three plates shown are a “Photo-Etching,” “Photogravure” and a “Photozincograph” all done at the Survey of India in Calcutta. The photo-etching and the photogravure represented here are problematic in that Waterhouse used these terms for practically all of his permutations of photogravure. Also **A. W. TURNER**, of the survey developed a photogravure process for the Survey, ca. 1889. This process as explained by Waterhouse was a modification of the Klíč process entailing five levels of etching with perchloride of iron. The plate used an Autotype carbon print resist. (*Photographic News*, Waterhouse pg. 714). The photomicrographs of the two intaglio plates suggests the Klíč method, but it will need examining many more examples to draw any conclusions. The photozincograph is clearly the transfer from an electrotyped sand grain. **Intaglio, Planographic**



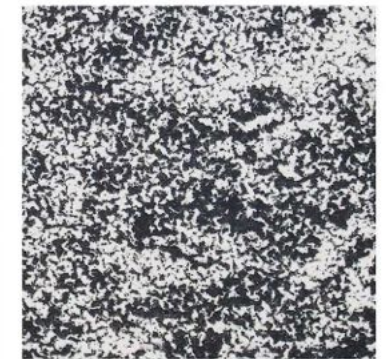
*Proceedings of the Asiatic Society of Bengal, May/June, 1894*



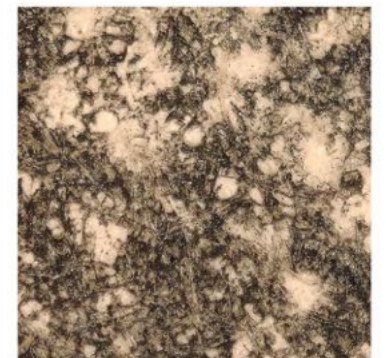
photoetching 15X



*Proceedings of the Asiatic Society of Bengal, August, 1891*



photozincograph 15X



photogravure 45X



photogravure 15X

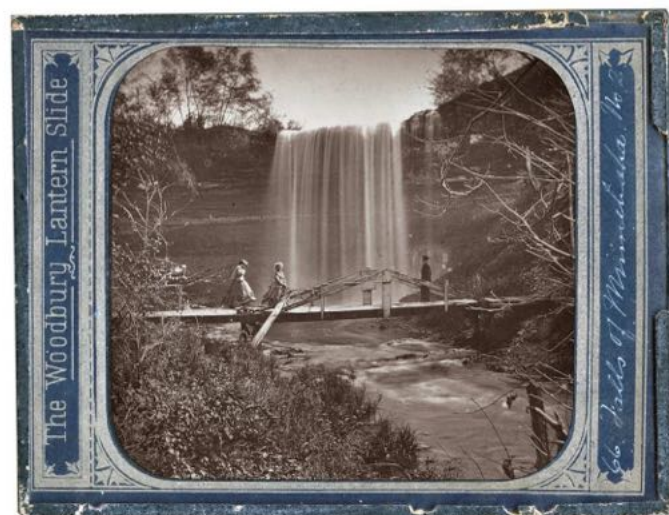


*North View of Belvedere Calcutta, negative by A.W. Turner, January, 1891*

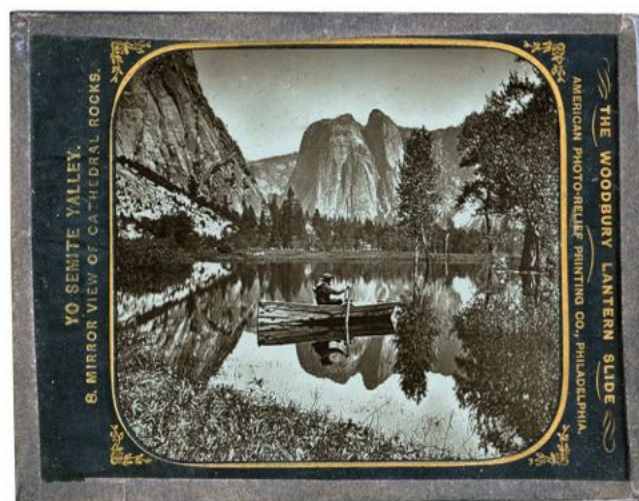


**WOODBURY, WALTER BENTLEY** (1834-1885), England — (worked 1864 to about 1900) *Woodburytype* (*Photoglyptie* - France) - The method consists of a thick film of bichromated gelatin, over a glass plate coated with a tough film of collodian, which when dried is stripped from the glass. Next it was exposed to light under a negative next to the collodian side. When fully exposed, it was temporarily attached to a glass plate and developed in warm water to dissolve the soluble portions not acted on by the light. Next, the film, removed from the glass, was soaked in alum to harden it and dried. When dry, the gelatin relief was placed in a press between two perfectly parallel steel planes. Lead was placed on top of the gelatin relief and the two surfaces brought together under over one hundred tons of pressure. The lead perfectly conformed to the gelatin form under this pressure. Many lead molds could be made from each gelatin matrix. The lead now became a mold; this was placed in a press and a portion of warm liquid gelatin with coloring was poured into it; a piece of special paper was put on top and the press closed conforming the liquid gelatin to the mold and when cooled was removed. The image now was formed by various thicknesses of the gelatin making up the tones of the picture. The picture was finally trimmed (the extra gelatin squeezed out) and then mounted to its' final support. 1864. Both Woodbury and **Joseph Wilson Swan**, at the same time developed almost identical systems. The woodburytype was short lived in the US (1871-75) but was produced in England and Europe until about 1900. The woodburytype was also used to make lantern slides since the colored matrix blocked light where thick and allowed light through depending on its density, woodbury lantern slides were produced throughout the nineteenth century in England.

*Stannotype*, was Woodbury's permutation of the woodburytype where the gelatin relief, from a positive, is pressed with tin foil in a roller press and this relief is then used to print from. This may have been attempted to market to amateurs or to printers who could not afford the expensive presses. *Woodburytype gravure*, *Woodburygravure*, (1891) was a method where the woodburytype was laid down onto the final support without it being on a separate support sheet. Nadeau – “consisted in transferring the trimmed woodburytype onto the page and peeling off the temporary support paper (waxed and shellac coated) on which it had been made.” **Woodburytype**



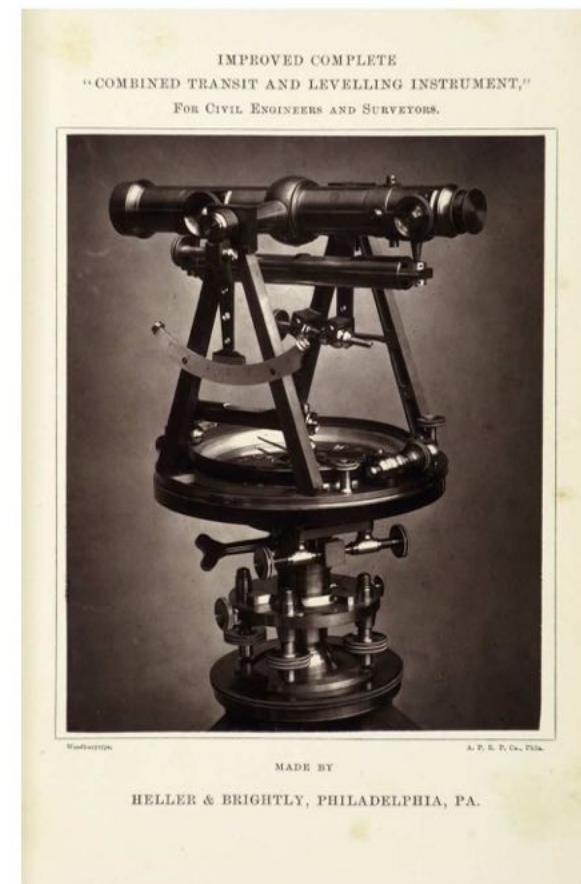
English Woodbury Lantern Slide from a photograph by John Carbutt of Minnehaha Falls



American Woodbury Lantern Slide by John Carbutt's American Photo Relief Printing Company



Baldwin Locomotive Works Illustrated Catalogue of Locomotives, 1871-2



Remarks on Engineer's Surveying Instruments, 1874





Juvenile Gallery, F. Bruckmann

Because the woodburytype so carefully matched the quality of an albumen silver photographic print it was used extensively in all sorts of sizes: cdv, cabinet card, advertising brochures, single prints, theatrical illustrations in periodicals, etc.

Because of the extreme pressures necessary to produce the molds the maximum size for images was about 8X10 inches. The Photochromies made by Vidal however came close to 11X14 inches.



Vidal, *Traite Pratique de Photographie*, 1881  
"Sans Hydraulique"

The Stannotype print to the left was produced by Walter Bentley Woodbury to show that the process produced a print equal in quality to the standard hydraulically produced prints. There is no indication that this form was used for publication.

The Woodburygravure method came late in the use of the printing of woodburytypes and was not used extensively. The four volumes about Ceylon by Henry Cave constitute one of the significant uses of the process.



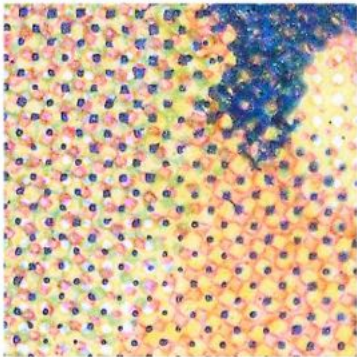
Cave, *The Ruined Cities of Ceylon*, 1897



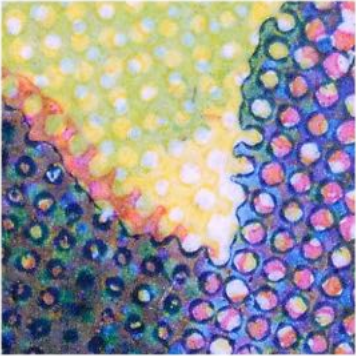
**ZANDER, C.G.,**England — “*Complementary color process*” in 1905; four fundamental colors: red, yellow, green, & blue. According to Wall: “[He] proposed magenta red, lemon yellow, emerald green and ultramarine blue; but variation in these colors was permissible.” (pg. 39) Wall also stated that Zander “was a practical ink maker, [and] stated that good lakes, that is dyes precipitated on an earthly base, such as aluminum hydrate, are the most suitable, as they distribute well, print even and do not clog up the interstices between the dots of the printing block.” (pg. 26)



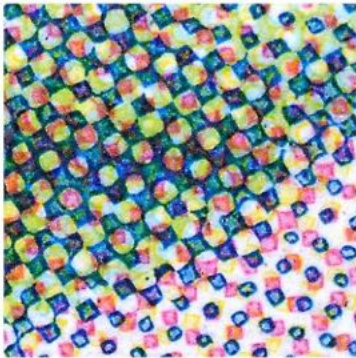
The Graphic Arts and Crafts Yearbook, 1907



30X



30X



30X



Burch, Colour Printing and Colour Printers, 1911



**ZURCHER**, France - *Photolithography* in 1842. Louis Désiré Blanquart-Evrard included two Zurcher plates in his book *La Photographie* 1870. **Planographic**



Blanquart-Evrard, *La Photographie*, 1870



## **UNILLUSTRATED LIST OF PROCESSES AND PRINTERS**



**ALBERT, AUGUST** (1854-1932), Austria — Photolithographic transfer paper in 1888. **Planographic**

**AVET, H.**, France, line screen patents for *Half-tone* 1865-66. Gamble (pg. 10) “[Avet] speaks of making negative screens of white lines on black ground and placing these in contact with a negative of the subject in a transparency camera, thus securing an image in lines or dots at one operation.”

**BEATTIE, FRANCIS S. & T. ALEXANDER**, Ireland -*Photolithography* using a ruled or grained plate, 1860. **Planographic**

**BELL, GEORGE CHARLES**, United States. In 1880 he patented a system of *Half-tone* production. “He placed a metal screen, preferably wire gauze, in a photographic printing frame, between a negative and a sensitized plate. The screen might be placed at the front or at the back of the negative. An image in lines or dots similar to those in fine-line engravings is thus produced.” (Gamble pg. 14) **Relief**

**BRANDWEINER, ADOLF** (born 1866), Austria — Developed, independently of Klič, a *Rotogravure* method in 1892. **Intaglio**

**BROWN & CO., LOUIS**, Philadelphia, were awarded a medal by the American Institute in 1878 for their process “*autoplates*.” Koehler in the Boston catalog, 1892 (p. 78), references this and says the details of the process are unknown. **Intaglio**

**BURNETT, C.J.**, England — *Half-tone* glass screen with crossed lines in 1857. In March of 1857 Burnett gave a paper to the Edinburgh Botanical Society wherein he proposed to alter Talbot’s method of etching zinc, iron, or steel plates which had been coated with a bichromated gelatin, gum, or an allied substance. After exposure in a contact frame the exposed plate was to be placed in a bath of weak sulphuric, muriatic, nitric or other acid. The exposed plate was attached to a plate of silver, platinum, or platinized silver. Watching the etching that it didn’t proceed too far. A second method was to attach the plate to be etched to the oxidizing pole of a galvanic battery and the other pole to a plate of the same size of silver, copper, or other less “oxidable” metal. Place both plates, opposite each other, in the acid and the strength of the etching can be controlled by the power of the battery or the strength of the solution. This method causes no gas bubbles to form on the plate to be etched. Also no resin powder can be placed on the plate because Burnett didn’t think it would work well. Burnett then arrived at how he proposed to add the necessary grain to the image: or “follow out a plan or plans suggested to me by the shade of fine gauze, mentioned by Mr. Talbot as adopted by him in one of his old processes. I would recommend a set of fine crossed or uncrossed lines or dots, photographically or otherwise produced we may get very fine lines or dots by photography, on a smaller scale, from those accurately drawn on a much larger scale, - they may be either on a separate glass or on the print itself, from which we are printing on the metal....” “The same set of lines, if on a separate glass, may answer for printing from any number of different prints.” (Thomson pg. 87) **Intaglio, Planographic, Relief**

**COLOMBAT and COUVEZ** - *Photolithography*. (Anton Martin 153-55). The method as detailed by the Luyne’s committee: “MM. Colombat and Couvez have applied to engraving the hygrometric properties of a mixture of tartaric acid and perchloride of iron, already pointed out by M. Poitevin for photography with coloured powders. They cover a metal plate with a slight

layer of gum, then passing over this dried layer the solution of tartaric acid and perchloride of iron, they expose it, and dust it with resin; the parts acted on by light become hygrometric, and retain the powdered resin. This granulation of resin, very plentiful in the lights, less so in the half-tints, and scarcely existent in the blacks, is made adherent by strong heat; it forms the reserve; after which the etching is done in the ordinary manner. However intelligent be this inverted application of a known method which has been described by M. Poitevin, the Commission has not thought right to keep the names of MM. Colombat and Couvez on the list of competitors. This method, moreover, appears to have had no results; and the authors have not kept us acquainted with the course of their labours.” (Waterhouse 1868 pg. 73)

**COURTENAY, ROBERT HENELADE**, England, He listed himself as a “Heliographic Engraver” Patent No. 1965, 1869. “One of the principal features of my improved process of photographic or heliographic engraving relates to photographing direct upon a plate prepared to give the required mechanical conditions suitable for printing with ordinary presses in use, by pure and simple photography, negative or positive, without vesting, transferring, or introducing a tint, grain, or line of any kind to interfere with the delicacy of the photograph taken from nature or otherwise. ... the chemistry in my process giving the required gradation of tone in a very fine stipple or grain, transparent in the shadows and gradually blended with the half tints and lights,...” The method is to use a powder made of “silicate of potash and precipitate the silex from the liquor” and this is dried and added to collodion. Also glass pounded into a fine powder and mixed with the collodion to produce a grain. This is exposed and developed. It is then placed in contact with a plate with a bichromated compound, exposed and treated to form a matrix that will be electroplated to produce the printing plate. **Intaglio, Relief, Planographic**

**DAGUERRE, LOUIS JACQUES MANDÉ** (1787-1851), France —Inventor of the first useful system of photography utilizing silver plated copper with an image formed of a silver-mercury amalgam published in 1839. Some early attempts at photomechanical reproduction used daguerrian plates. Daguerre saw Donné’s prints and thought nothing could come of it.

**Daguerreotypes, Printing**, Herman Hammann (pgs. 412-20) lists a number of individuals who were involved in attempts to produce printable plates from daguerreotypes. Many involved the reproduction by electrotype. The various names and dates are: Dr. Krasner 1840, Hurlimann (using Fizeau’s method), Grove 1841, John Draper 1843, Leon Foucault 1844, Beuviere (1852, employing a method by Alphonse Poitevin), Charles Chevalier 1841, Dr. Heller, Vienna 1842, Boscawen-Ibbetson, London 1840, Rondini, Rome 1842. Claudet, London (perfection of Fizeau process – Gernsheim), Poitevin in 1848 (see an example under his name).

**DIXON, JOSEPH** (d 1869), U.S. — *Photolithography*, 1841 (published in *Scientific American*, 1854 pg. 242) “On reading in a late number of the 'Scientific American,' of a discovery recently made in France, by which a lithographic stone may be prepared, by the action of light, to print, it occurred to me that a description of a process invented by myself, in 1840, may be of some interest to your readers, and perhaps be the means of leading to greater results. My process was simply to polish a stone in the usual way with a fine surface, as for a transfer, and when dry, wash it over in a dark room, with a mixture of bichromate of potash and gum arabic; wipe the superfluous liquor from the stone with a fine soft sponge, and the stone is then prepared for the picture. If put into the camera in this state, as a silver plate is for a daguerrian picture, and left exposed to the light for twenty or thirty minutes, then removed and submerged, face up, in a trough of water, for a few seconds, then rolled up, it will produce a negative picture of the character of a mezzotint. This may be afterwards changed to a positive or natural one, by



various methods known in the art, such as slight biting with acetic acid, washing well in pure water, filling in with 'composition work,' then carefully rubbing down the surface to remove the first (light drawn) picture, and the stone is then ready to receive the common preparations of acid and gum, and is soon ready to work. The above will give a general idea of the manner of proceeding; a skillful workman will soon see what will be the best mode of working. In some few trials made at the above period I had very hopeful results, but various other things of more immediate importance occupied my attention and requiring all my time, I laid this subject by until a more convenient season, which has not yet arrived. Seeing no better prospect for resuming it, I have hopes that someone will take it up and perfect it. Before giving the rationale of the process, I will add one variety of my experiments. I took a small picture of convenient size, varnished or oiled it, in order to render it as translucent as possible; this was laid with the printed side on the prepared stone, and a piece of plate glass on the top, to press the picture into as close contact as possible; the whole was then laid in the sun, and after an exposure of some fifteen minutes, treated as before in the water, &c. You will readily perceive the causes active in the production of photography. Chromic acid in combination with an organic substance as gum, is rapidly decomposed by the action of light, into green oxyd of chromium, with the destruction of the gum, while the base (potash) is left in the stone. By this operation the gum which resists the ink from the roller is removed and a strong mordant for the ink left in its place." Joseph Dixon. Jersey City, April 3, 1854." **Planographic**

**DRAPER, JOHN WILLIAM** (1811-1882), U.S. — "*Tithonotype*", (ca. 1843) copper relief electrotyped from the surface of a daguerreotype. (Jones *Encyclopedia* pg. 543) "The daguerreotype was gilded, and left exposed to the air for a few days. The back and edges were next varnished, and copper was electro-deposited upon the daguerreotype image, this taking from twelve to twenty hours. If the work had been done properly, the tithonotype was readily detached without injury to the original, of which it formed a perfect copy. Duplicates could be made from the tithonotype if required." Horace Greeley in his book on the New York Fair of 1853 makes clear "Fitzgibbon exhibits a very interesting case, which is a frame of electrotype copies from daguerreotype plates, very beautifully executed. .... It is to be regretted that Fitzgibbon did not complete this frame by the insertion of a third plate, by taking a second copy from the copper copy. This would be in relief, like the original silver plate, and is susceptible of being treated like an engraved plate, yielding, when inked, prints resembling mezzotint." (pgs. 176/7) Draper was not the only person investigating this concept. **Intaglio**

**DUFRESNE, HENRY**, France — Damascened steel plates. "Mr. Dufresne discovered the use of the bicromate of potash for damasqueeing [sic]... With the voltaic pile, cover with a first coat of copper the surface of the metal you wish damasqueened, the silver, for instance: spread over it a coat of nickel, antimony, iron, or any unamalgamable metal, then you cover it with another coat of copper, on which you operate photographically, as on steel with the bichromate of potash. Nearly all photographic processes answer to this damasqueening, provided they retain a sufficient resistance to the action of acids, with which you take off the copper." (*Photographic and Fine Art Journal*, 1857 pg. 105) **Intaglio**

**DULOS, PIERRE E.S.** (1820-1874), France, "Procédé Dulos" ca. 1864. "A plate of copper is covered with the following mixture: Ordinary Benzine, Caoutchouc [vulcanized natural rubber], Zinc-white [all] to saturation. This coating can be easily cut with steel or ivory points. The drawing finished, the plate is plunged into an iron bath, which deposits the iron only on the uncovered copper. If we desire to obtain an engraved plate, the varnish is removed and the plate is silvered. The silver is deposited on the copper, to the exclusion of the iron, by pouring a dilute solution of sulphuric acid on the plate. The iron is eaten out, and, by treating the plate with the ammoniacal sulphate of mercury, the relief of the silvered parts is slightly increased, and we have the lines in intaglio. A relief plate may be obtained of the same drawing by depositing silver in place of the iron." (Pettit pg. 51)

**FALK, R.**, Germany, *Phototypographie* in relief on copper for typographic printing. Germany, 1867. **Relief**

**FAULKNER, ROBERT**, England — *Half-tone* screens made of wire gauze inclined or separated during copying from an original, 1872. Gamble (pg. 13) "His object was to produce dotted, stippled and lined effects on photographs by using a wire gauze screen. ... Softened effects in parts could be obtained by placing the wire gauze screen out of focus, or in part only by inclining the screen, or by using a lens which would leave a part out of focus. This was an intelligent anticipation of the idea of separating the screen from the plate which is the basis of modern half-tone methods."

**FONTAINE**, Marseille, France — The de Luynes committee explains, "He takes, in fact, the mixture of gelatine and soluble bichromate already mentioned, spreads it upon a metallic plate, [after exposure to light] and washes with warm water. There only remains on the plate the relief of insoluble gelatine; this he hardens and makes more regular by treatment with a solution of pyrogalllic acid; He then obtains a very fine cast by means of a solution of gutta percha in bisulphide of carbon. After evaporation, he completes the mould by pressing warm gutta percha upon it, and on this fine impression he deposits a galvanoplastic plate. This part of the process is a repetition of that of M. Pretsch. To obtain, lastly, the grain, when photographs, or other objects which only possess tints, are to be copied, M. Fontaine interposes a perforated metal leaf, which resembles the finely striated glass plate of M. Bertschold." (Waterhouse 1868, pg. 73)

**GOODWIN, REV. HANNIBAL**, U.S. — "Deep etch lithography" The purpose of deep etch is to provide an image which is slightly below the general plane of the non-image area. Although this depth is considered to be 0.0002 or 0.0003 of an inch deep, the life of the plate is materially extended on the press. 1881. **Relief**

**GROVE, SIR WILLIAM ROBERT** (1811-1896), England — Etched daguerreotype with printing facsimile made by electrotype, 1841. **Intaglio**

**Halftones** after **Leggo** and before **Petit, Ives** and **Meisenbach** — I have encountered a number of halftone publications post 1873 and before 1880. H. Adlard sc. — 1873 (reprinted 1878), Scientific American — 1876, Heliotype Printing Co. - 1877, Hoen and Co. — 1879, Walter Woodbury British patent 3654 - 1872. There are probably many more that were tried. **Relief Planographic**

**HALLEUR, C.G. HERMAN**, Germany — *Photolithography*, 1854. In his book *The Art of Photography*, Halleur discusses two methods, "1. Select a stone of moderate weight, and fit it into the frame of exposure (if the stone is very heavy you will find it difficult to fix it properly); treat the stone in the usual way, to give it the grain required for a fine crayon tracing. Imbue it now repeatedly with a weak neutral solution of oxalate of sesquioxide of iron, taking care to make the solution as neutral as possible, and to make it penetrate into the stone as deep as can be. A stone so prepared may be kept a very long time without losing its sensitiveness, provided, of course, it be properly secluded from light. The best way is to expose the stone still moist, but not wet; the time of exposure depends upon the power of the sun, and the nature of the object to be depicted. If the exposure has been sufficient, the image may already be seen in all parts in a brownish color. A solution of carbonate of ammonia is now poured over the stone, which will bring out the picture to the greatest advantage, and will at the same time serve to fix it. The stone is then floated over with water to wash away the soluble salts. In order to multiply the picture by the press, the stone need simply be made to take the printer's ink on the drawing only brownish color. A solution of carbonate of ammonia is now poured over the stone, which will bring out the picture to the greatest advantage, and will at the same time serve to fix it. The stone is then floated over with water to wash away the soluble salts. In order to multiply,



the picture by the press, the stone need simply be made to take the printer's ink on the drawing only, leaving the other parts perfectly clean; this is effected by etching with an acid in the usual way, and the acid best suited for the purpose is highly diluted oxalic acid. The remaining operations are conducted in the same way as is generally done in lithography. By means of this method, impressions may be taken of architectural objects, and multiplied by the press.

2. Prepare the stone in the same way as in No. 1, and coat it over with a solution of asphaltum in ethereal oil (an oil that evaporates readily); place on it the object to be copied (a drawing, or a negative photographic picture on paper or glass), and press this closely against the prepared surface by means of a strong glass-plate; expose now to the light. The resinous coating loses its coherence in the parts corresponding to the lights of the negative picture. Upon blackening the stone now with lithographic ink, the saponaceous ink adheres to the stone in all these denuded parts, but not in those where the resinous coating remains intact; upon treating this surface afterwards with an acid, the decomposed soap leaves a fatty layer on the denuded parts and on the resinous coating; and on washing the stone now with alcohol or ether, the resinous coat, together with the layer of fatty matter covering it, is removed; whilst in the parts where the fatty layer adheres directly to the denuded stone, no change takes place. By means of this method, and the common etching with an acid, copies of drawings, &c, may be taken by the lithographic press in the usual way. Gummi guaiacum and other resins may be used instead of asphaltum to coat over the stone.” **Planographic**

**HOESCH, F. C.**, Nuremberg, Germany, *Hoeschotype*, 1882, A multi-color collotype method separating a single B&W negative, by hand, into 5 collotype separations to print using inks of “the three primaries, a neutral, and a brown, and with these five tints any combination can be produced.” The article in *The Photographic News* (1882, pg. 515) also explains: “To ensure absolute accuracy in the matching of tints, the inventor has prepared a scale in which every combination of the five colours in certain proportions is shown. Herr Hoesch divides his five colours into fifths, and having thus twenty-five portions to ring the changes upon, he gets 1,600 tints, each of which has a number attached to it which shows on reference to a table that it is composed of so many fifths of one colour and so many fifths of another, as the case may be.” Given the complexity of this false color method it is doubtful that it was ever implemented. **Planographic**

**JOBARD, J.B.A. MARCELLIN** (1792-1861) (Brussels) Belgium — Waterhouse (*Photographic News* 1858, pg. 268) states: “The first photolithographic process on record is that proposed by Jobard, of Brussels, who, in 1839, obtained lithographic proofs from stone or zinc plates that had been treated with iodine or bromine.” “M. Jobard has written a letter from Brussels [1858] requesting that a sealed packet deposited by him with the *Academie des Sciences* on the 2nd November, 1840, might be opened. This packet bore the superscription — ‘Description of Processes of Lithographic Printing of Heliographic Pictures,’ and the following were its contents: - ‘Ever since my first essays in daguerreotype, which I was the first to import in Belgium, I saw the possibility of lithographing heliographic pictures, by receiving the impression of the solar rays on a stone or on a zinc plate covered with iodine. Being myself a lithographer, it was not surprising that I should be one of the first to think of it. The stone or zinc plate, instead of being submitted to the mercury, should be immediately covered with a thick solution of gum Arabic, blackened with lampblack, and protected from the light until the coating of gum is dry; then you should plunge it into water to dissolve and wash it. It is afterwards placed in the press, and the roller passed over it; and the result is, the parts of the iodine decomposed by the light have been removed by the gum which has introduced itself beneath, and has *prepared the stone*, - that is to say, has communicated to it the power of repelling the greasy ink, while the undecomposed parts of the iodine take grease perfectly, whether the iodine remains, or whether it vanishes under the sponge used to damp it; purewhites are thus obtained, and proofs perfect in all their parts: but this operation is a delicate one, and can only be accomplished by a very able photographer. The zinc plate is treated in precisely the same way as the stone. The great feat consists in scarcely charging the roller with ink. The

whites are thus obtained, and proofs perfect in all their parts: but this operation is a delicate one, and can only be accomplished by a very able photographer. The zinc plate is treated in precisely the same way as the stone. The great feat consists in scarcely charging the roller with ink. The design may even be charged with greasy ink, if it tends towards impasting, and prepare it with acid, or rather with chloride of lime. I take the precaution of sending this process sealed, because I have communicated it under the seal of secrecy to Colonel Wittert, of Liege, who is present making experiments, which I have not had time to make for a year past.” **Planographic**

**KELLNER, EMIL**, also **KELLNER & GIESEMANN**, Germany. *Photolithography* in tone from photographs. 1866. As shown in *Photographische Mittheilungen* vol.III, April, 1866. **Planographic**

**LABORDE, CÉSAR EDME** known as **CHARLES, L’ABBÉ** (1808-1883) France — Linseed oil for photogravure. (Martin pg.175) The following has been translated and corrected for me by Steven F. Joseph.

Laborde "On photographic engraving with linseed oil varnish"

"Instead of a solution of asphalt, Laborde applies a solution of linseed oil varnish in ether to his photographic engravings. The method of preparing this solution may be found in the description of enamel pictures under the heading "Laborde". Laborde coats a copper plate with this varnish and exposes it for half an hour in sunlight; those parts not affected by the light are then bitten away with acid and a recessed [SFJ: ie, intaglio] etching is achieved by means of this process. This manipulation basically enables line drawings to be produced by photographic means. Halftones that only become insoluble on the outer surface, may be lightly washed and thereby removed from the image area with the washing water or etching agent. Laborde also treats these images with ether, whereby the ether, so it appears [since Laborde's description is unclear] has the same function as in the asphalt process. It is thus used to dissolve those parts of the linseed oil varnish that have not been altered by light. Laborde pours lead oxide [SFJ: suspended in ?] acetic or nitric acid over these images that have been treated with ether, whereby the images receive a vigorous and relief-like appearance. Laborde has remarked that although the lead is not deposited sharply at the borders of the drawing but also on adjacent parts of the lineaments, the application of this salt, a [previously] unexploited idea, has nonetheless demonstrated its effectiveness." **Intaglio**

**LEWIS**, Ireland — Photolithographic experiments in 1841. **Planographic**

**LUYNES, HONORÉ D'ALBERT, DUC DE** (1802-1867), France — Created a competition, in 1856, of 2000 fr. for a form of permanent photographic prints which was awarded to Poitevin in 1862 for his form of carbon printing, with Garnier and Salmon along with John Pouncy sharing a part of the prize. The second part of the competition for 8000 fr., was for a method of photomechanical printing that could translate the tones of the photograph for printing in the press. The prize was awarded in 1867 to Poitevin for his method of photolithography primarily because it was able to be commercialized.

**MACORQUODALE, T.**, US, Boston. He was a producer of photogravures for Charles Pollock souvenir view books, 1892 – 1896 (approx.). Macorquodale produced what were termed “*copper plate photogravures*” from photographs of the White Mountains of New Hampshire and of the city of Boston. Pollock had a business in Boston that sold a wide variety of photographic items from his store. Macorquodale is the only photogravurist, at least to me, who has printed the images on a very highly calendered paper that may be baryata (barium sulfate) coated. The images have a very high degree of polish and reproducing them does not show their distinctiveness. The pure whites look as if the picture area has been varnished and the middle tones and shadows have an iridescent quality when moved in the light. They are like attempting to reproduce the look of ferrotyped gelatin silver prints with standard reproduction on a matt paper. The grain structure, of the plates, clearly suggest the Talbot-Klíč method.



There is also a Hugh Maccorquodale who was a photographer in Boston at this same time. Whether they are related is not clear. **Intaglio**

**MACPHERSON, ROBERT** (1811-1872), England/Italy - *Photolithography* showed results in 1856. Macpherson, himself, explained his process to the Photographic Society of Scotland, at its December 6, 1856 meeting. He used bitumen carefully prepared using sulfuric ether. This is poured over a grained stone allowing no air movement while it is done. A glass negative is very carefully placed on the stone and then it is sealed all around with pasted paper. It is then exposed to the sun. Development is done in a shallow bath of sulfuric ether. The stone is placed face down in the ether for 10 seconds and then turned face up and more ether is poured down the face that has been tilted. After the stone is clear of bitumen particles it is stood up and allowed to dry. At this point it is ready for the printer. The complete explanation is published in *Photographic Notes*, vol. 2, 1857, pgs. 6-8. Other than a few display prints the process does not seem to have been used. In regards to its use in chromophotolithography, an interesting description of its “possible” use was published in the *Photographic Journal*, August 16, 1859. In an article copied from the Edinburgh Photographic Society an un-named member gives a rather detailed description of how Macpherson’s method might be used to produce photolithographs with multiple stones for chromolithography. (Look at Bedford’s work for Day and Son pg. 40) **Planographic**

**MUMLER, WILLIAM** (1832-1884) US – *Photo-electrotype* patent 1877, This is the Spirit Photography photographer from Boston. As explained in the patent (US163514 A), Mumler started with a 1/4” bichromated gelatine plate which is dried and freed from a support. It is exposed under a negative and then attached to a block and carefully sanded with emery cloth to produce a level surface. It is then washed with acetic acid to produce a relief. The lines that are in relief are filled with “boneblack and any suitable gum, or with India ink, black shellac-varnish, or other opaque or semi-transparent substance” and the plate is then placed in the sun to harden the raised lines. After the exposure the material is removed from the lines and the relief is electrotyped, which produces a printing surface level and true. The Photo-Electrotype Engraving Co. used his patent from 1878 on. **Relief**

**Photomechanical periodical publications** – Auer’s *Faust* may have been the first general interest periodical to use a variety of printing methods. Previous to 1854 only single photographic examples found their way into non-photographic publications. Pretsch in 1856 attempted to issue a periodical with entirely photomechanical prints *Photographic Art Treasures* (pg. 114), but failed very quickly. Price’s photoxylographs were printed in *The Phrenological Journal* (pg. 105) starting in 1857, then *L’At Pour Tous* in France in the early 1860’s and again in 1866 Day & Son attempted *Nature and Art* (pg. 41) which ran for two years. William Leggo then produced the first photomechanically illustrated weekly newspaper *The Canadian Illustrated News* (pgs. 79-80) starting in late 1869 followed by *The Daily Graphic* (pg. 80) in New York in 1873, both by photolithography. In France a whole group of periodicals related to the stage and art appeared in the 1870’s using the woodburytype; *Paris Theatre*, *Paris Portrait*, *Les Contemporaines Célèbres*, etc. Both *The Portfolio* (pg. 58), and *Art Pictorial and Industrial* (pg. 49), started in 1870-71 in England. *The Theater* and William Griggs massive *Journal of Indian Art and Industry* are also clear examples. From early in the 1880’s more and more publications began to use halftones. This area of research has not really been examined in depth.

**Photomechanical reproduction of art** – In order to reproduce tonal art before photography it was necessary to copy by mezzotint or aquatint and later lithography the tones of the original.

With photography it was possible to actually photograph the original, however since the emulsions were only sensitive to blue the tonal values were severely inaccurate. It was necessary for the original artist or a copyist to translate the original color into more or less correct gray scale translations. This allowed the photomechanical reproduction to have a relative accuracy in tones of gray. Attempts were made to produce three-color reproductions (pg. 6) but because of the inaccuracy of the emulsions, color reproduction was not possible until the availability of panchromatic emulsions (pg.77). A number of labor intensive methods were done in chromolithography by printing multiple separate colors well into the early years of the Twentieth Century.

**PIZZIGHELLI, GIUSEPPE** (1849-1912), Austria —“A gelatine silver bromide negative, after having been developed with oxalate of iron, fixing, washing and drying, was bathed in a potassium bichromate solution, dried, and exposed through the glass, as in the Aubel method. The black lines in the negative prevented the light from penetrating, and these parts took on water when the greasy transfer ink was rolled on, so that the printing ink was retained only on the transparent parts of the negative. This greasy picture could be printed directly or transferred to a lithographic stone.” (Eder pg. 614) Also created the “*Anthrakotype*” process whereby a line drawing could be copied, first described by Dr. Sobacchi and then elaborated by Pizzighelli. (Jones pg. 31).

**PLUMBE, JOHN JR.** (1809-1857), U.S. — “*Plumbeotype*” (hand transcribed.) Basically hand drawn lithographs after Plumbe’s daguerreotypes, circa 1847

**RAMAGE and NELSON**, England, Printing blocks or plates in line, 1866. This from the announcement in the *Photographic News*: “This invention has for its object improvements in the production of blocks and plates for printing. A solution of bichromate of potash, mixed with gelatin, dissolved in water, or other similar preparation, is poured upon a sheet of suitable material, and, when dry, exposed under a negative of the drawing, engraving, or print, for a given time; it is then immersed in water till the parts not acted on by the light swell up to the desired extent. The surface water is then removed, and a solution of gutta-percha, bitumen, and wax, or other such materials, is poured over the surface, forming a skin thereon. The back of this skin is then filled up to a proper thickness with melted wax, or other materials, and, when set, the mould thus produced is separated from the gelatin and electrotyped, or stereotype cast is taken. For copper or other plate, a transparency of the drawing, engraving, or print is used, the same processes gone through, and the plate produced is used for printing in the ordinary way.” (December 28, 1866 pg. 615)

**ROUSSEAU & MUSSON**, France — *Photolithography*, 1856. The de Luynes committee report (Waterhouse) explains, “In this same sitting of December 1855 MM. Rousseau and Musson also produced a method of lithography, based on the use of a mixture of soluble bichromates and of organic matter. This mixture spread on stone is exposed, then first washed with water and afterwards with a solution of gallic and pyrogallic acids. Washed again with pure water, and then with a solution of white soap, after a last washing the stone goes through the ordinary lithographic processes. This method, which is more complicated than M. Poitevin’s (which acts directly on stone without these successive manipulations), only appears to have given prints of doubtful merit.” The complete process is published in *BSFP* 1856 pgs. 1-14. **Planographic**“

“MM. Rousseau and Musson have also given a mode of engraving on steel and other metals, using as a reserve the mixture of soluble bichromate and gelatine. After washing they render these reserves more resisting by a solution of gallic acid; they then pour on the plate a weak



solution of nitrate of copper; this metal deposited on the unprotected parts increases the thickness, and the design is represented by the sunk surface of the steel. It appears that this method, however simple from the chemical point of view, does not easily succeed in practice; or the dark parts of the engraving, corresponding to the smooth steel, must take ink very badly for want of grain, while the copper deposited, which corresponds to the whites, must tend greatly to become stippled.” **Planographic, Intaglio**

**SAALBURG, CHARLES W.**, U.S. — *Rotogravure*, 1909. Mertle (pgs. 43-50) details that Saalburg had no claim to an invention of a system of rotogravure and that the eventual company the Van Dyck Company did not use such a method even though Saalburg was successful in having patents granted. **Intaglio**

**SAILLARD, RENAUD** (1806-1873), (London) England — Galvanic current applied to photogravure. Priority of which was contested by Pretsch at the Société Française de Photographie, 1858. **Intaglio**

**SENEFELDER, ALOIS** (1771-1834), Germany — *Lithography* (printing with greasy inks from stone), 1798. **Planographic**

**SCHOLY, JOSEPH**, Germany — “*Algraphy Process*” *photolithography* on aluminum plate, 1892. **Planographic**

**VOGEL, HERMANN WILHELM**, (1834-1898) Germany – Photographic emulsions were sensitive only to the blue part of the spectrum until Vogel discovered the use of sensitizing dyes that made the emulsion sensitive to the green part of the spectrum in 1873 and the red in 1884, paving the way for producing accurate renditions of natural color (Eder pgs. 457 - 464). His son, **Ernst Vogel** worked with **William Kurtz** to perfect three-color halftone printing.

**WHEELER, JAMES**, England - *Metzograph* (mezzograph) screen, the screen was a random dot pattern much like a collotype grain, 1897.

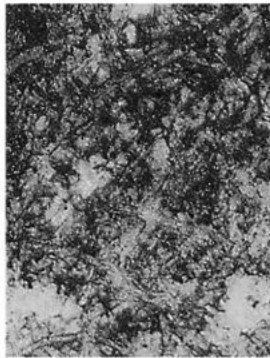
**WINSTANLEY, DAVID, JR.**, England — Patent for novel idea of creating a dot pattern of varying sizes by utilizing a grid of conical pins which when pressed into a gelatin relief and ground down to the deepest pins’ point produced dots of varying size. 1866. Or a longer explanation as published in the *Photographic News* “It is unfortunate that the specification is characterized by such excess of verbiage, and unnecessary use and repetition of geometrical terminology, that it will be difficult for the majority of readers to disentangle its meaning from the labyrinth of words in which it is hid; but we may introduce it by briefly indicating the general purpose and plan of the invention. An image in relief having been obtained in chromated gelatin, it is proposed to take a bundle of wires with sharpened or tapering points, and place these points on the image in relief. It will necessarily follow that the points of those wires resting in the deepest hollows will project the most from the bundle, and all the other points will project in exact relation to the depression or elevation of surface in relief on which they rest. If the sheave or bundle of wires be firmly bound when in this position, and then all the points ground off so as to form a plane surface, that surface will consist of a series of dots, varying in size in proportion to the amount of the tapering point removed by grinding. Those which had sunk deepest will have a large portion of the tapering end removed, and so producing a surface which will form a large dot; those resting in the shallower depression will have a small portion removed, and the end will produce a small dot, and so on; the result being a series of

dots of different sizes, the larger ones, when reproduced in black ink, representing the shadows of the picture, and the smaller ones the various gradations of half-tone. It will be seen that the gradation in the image consists of a stippling surface of dots of various sizes.” (pgs. 498-9) It is obvious that this method is hardly any different than the Ives patent of 1881. **Relief**

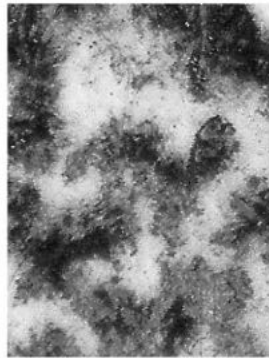
**WOLFE, M.** (Dayton, Ohio) U.S.- Created line screens for black and white, and three-color in the 1890s.



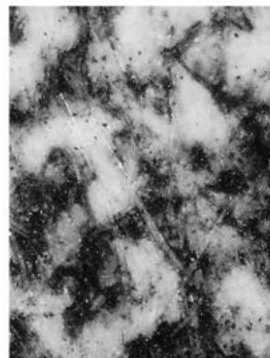
## Heliogravure and Photogravure



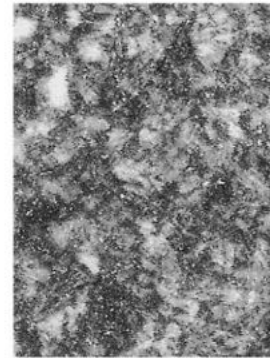
Baldus



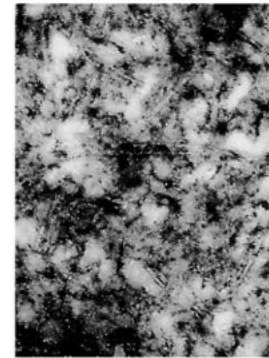
Baudran



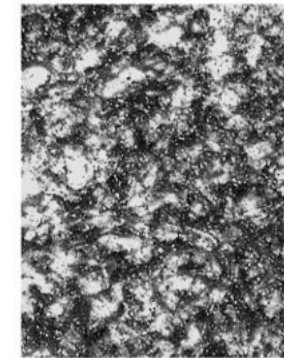
Dallas



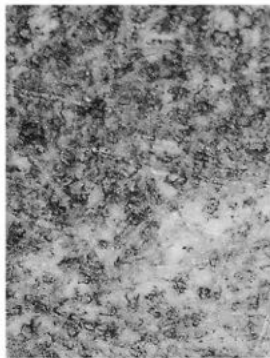
Dawson



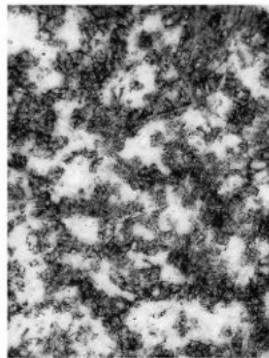
Dujardin / Garnier



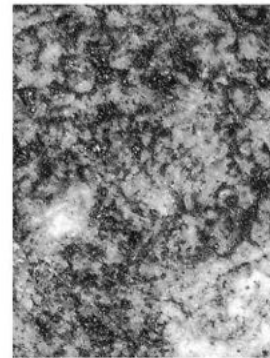
Dujardin



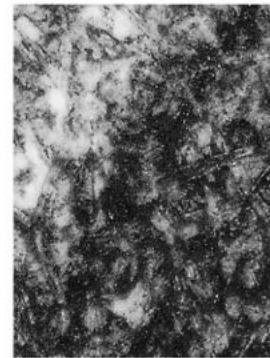
Evely



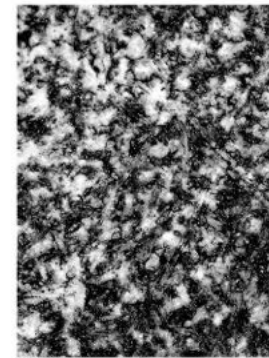
Garnier & Salmon 45X



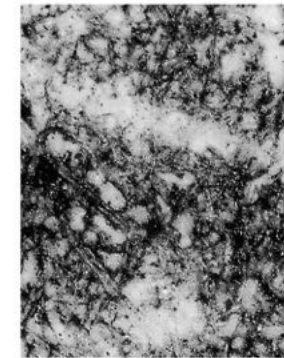
Garnier



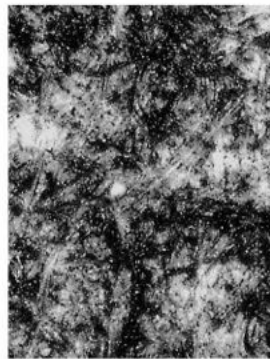
Gebbie - Husson



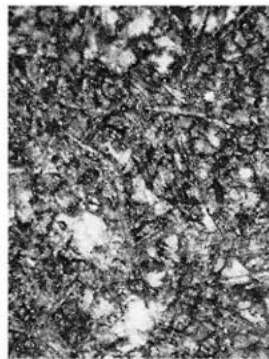
Gilbo



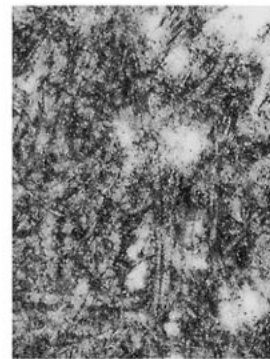
Klič - Annan



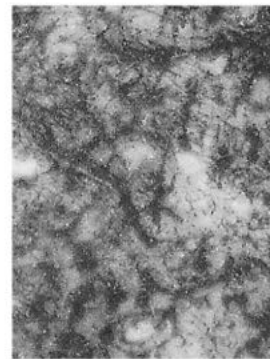
Mariot



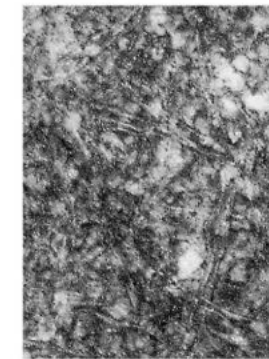
Nègre



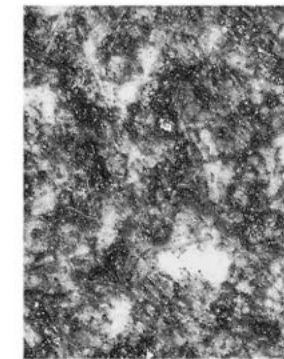
Niépce de St. Victor



Obernetter



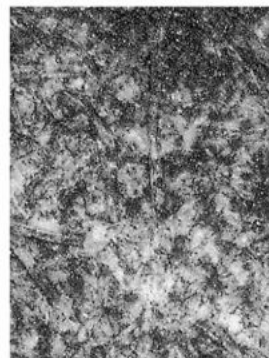
Oesterreicher



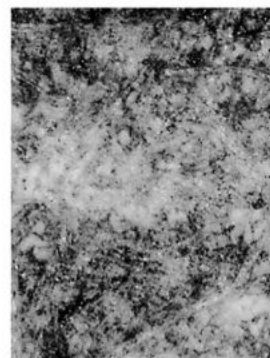
Placet



Pretsch - "I Pays"



Rousselon / Goupil

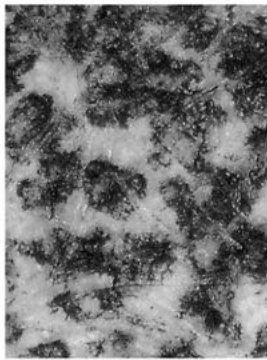


Talbot - 1858

The twenty one examples shown do not completely cover the varieties that may be found with individual methods. It was necessary to use the 90X photomicrographs in order to see the distinct patterns in the various processes before the advent of the Talbot-Klič method became almost universally used near the end of the Nineteenth and the beginning of the Twentieth Centuries. The Garnier & Salmon process was enlarged 45X because of how coarse the pattern is.



## Photolithography



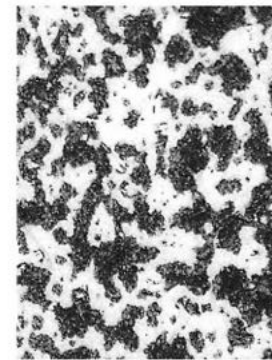
Asser



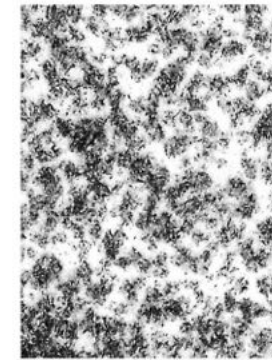
Bedford - (Macpherson ?)



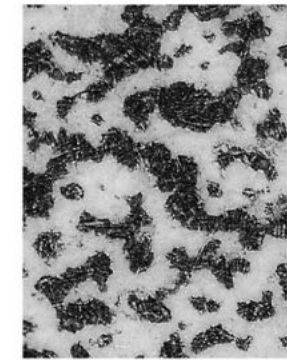
Belloc / Jacott



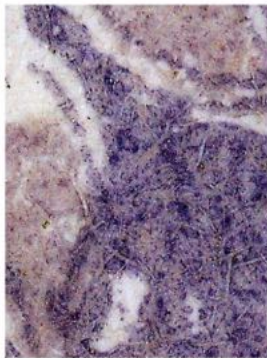
Bilordeaux



Bradford / Cutting



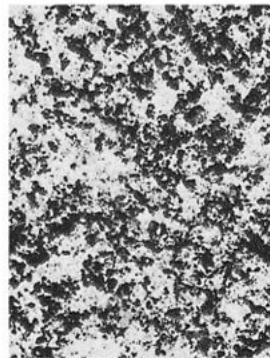
Bullock Brothers



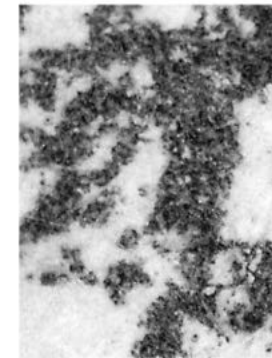
Day & Son



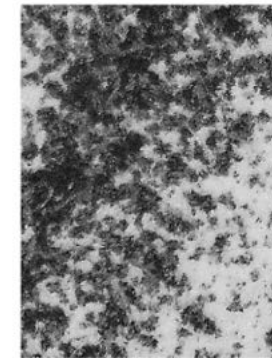
Griggs



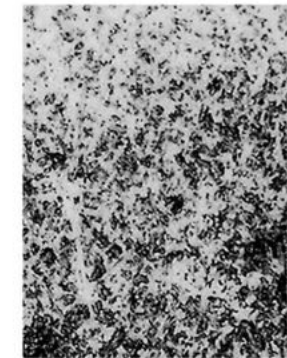
James - Zinc



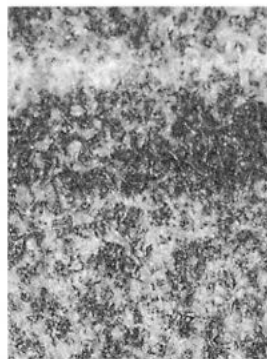
Lafolnye



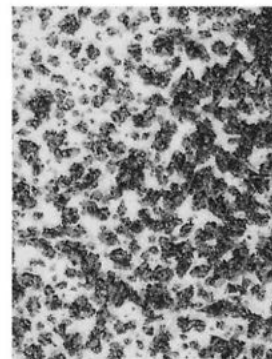
Lemercier



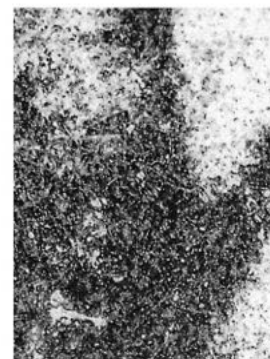
Marquier



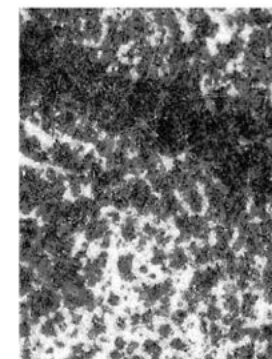
Morvan - Bien



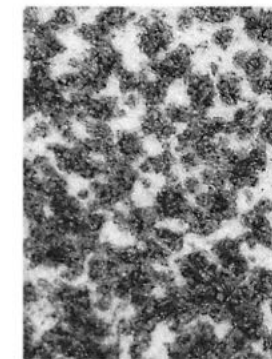
Piallat



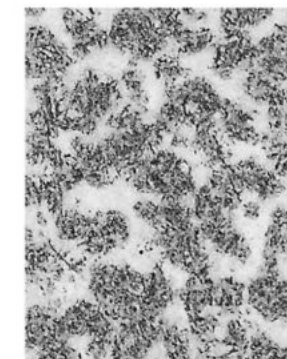
Pinel-Peschardière  
Helio-lithographie



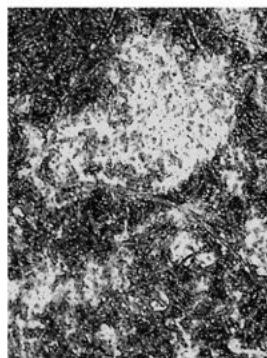
Pinel-Peschardière  
Pantotypie



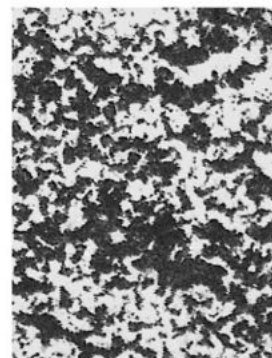
Poitevin



Pouncy



Toovey

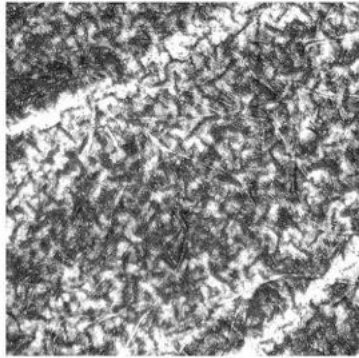


Waterhouse - Zinc

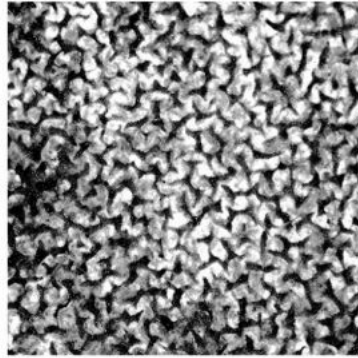
A number of photolithographic methods were attempted from 1852 into the late 1880's. As can be seen from the patterns, at 30X magnification, of twenty examples created by the graining of the stone or the texturing of the zinc plate there are a number of possible shapes and sizes. Even within each method the pattern will be different with each stone or plate used. Three of the examples are reproduced in color since the originals were created using methods that involved chromolithography. One of the most interesting is the pattern created by John Pouncy's process. Since only the one book was ever published using it and since he never published an explanation it will remain a mystery.



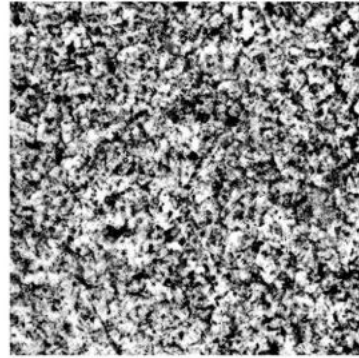
## Collotype



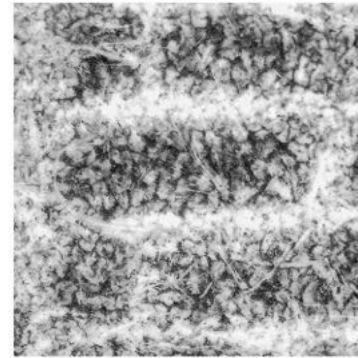
Albert



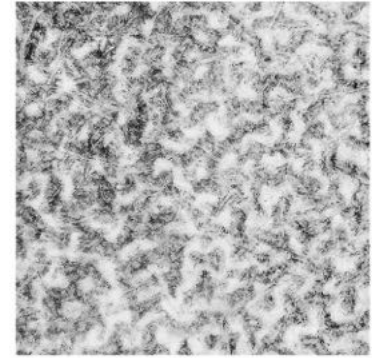
Gemoser - Autotype Co.



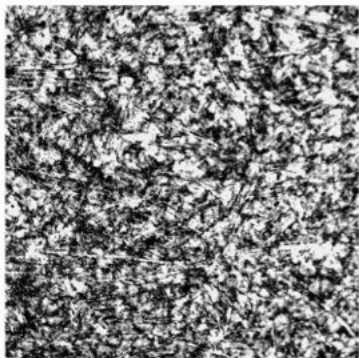
Edwards



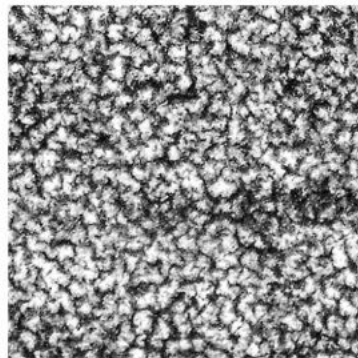
Husnik - Gutekunst



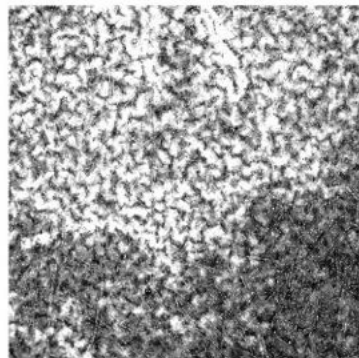
Mante



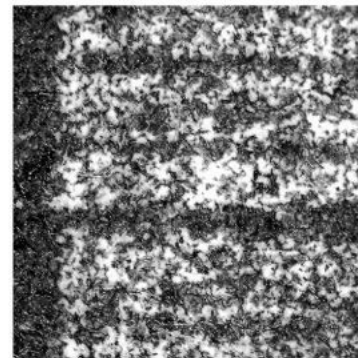
Obernetter



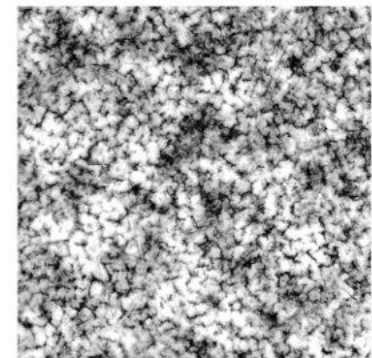
Pumphrey



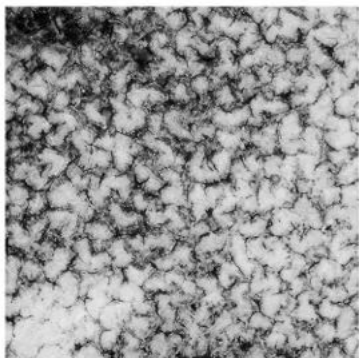
Sawyer



Roche



Tessié Du Motay / Maréchal

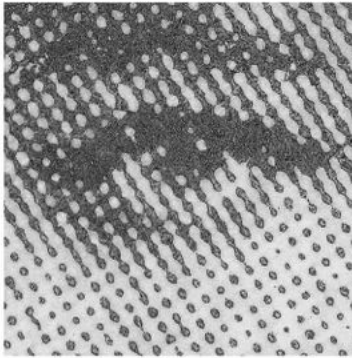


Thiel

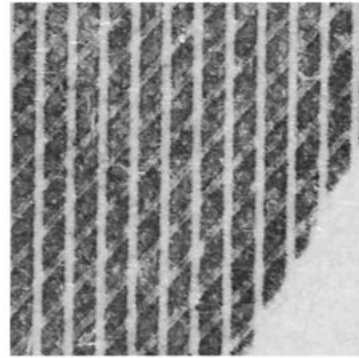
All of the eleven photomicrographs from the producers' pictures were done at a 45X magnification. Below that magnification many of the examples would have only a very faint reticulation pattern. Of the first commercial methods, Albert, Gemoser, Obernetter, Edwards and Husnik subsequent to the first years of production seem to have changed their methods to match the generic collotype pattern found after the late 1870's. Edwards' original Heliotype, even at 90X magnification, does not show a reticulation pattern consistent with other methods. Mante only produced one publication with his method but from the example shown it also looks much different than the others. Also the size and sharpness of the reticulation depended on the thickness of the gelatin coat, its drying time and the heat used in drying the sensitized plate. Each of these factors could influence the final pattern.



## Halftone



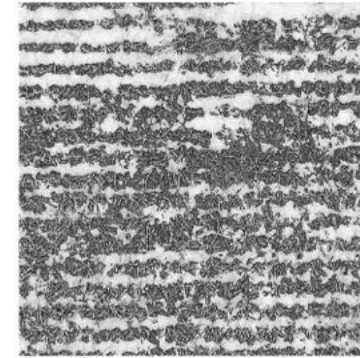
Angerer / Göschl



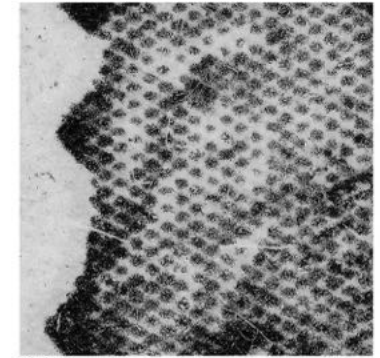
Berchtold



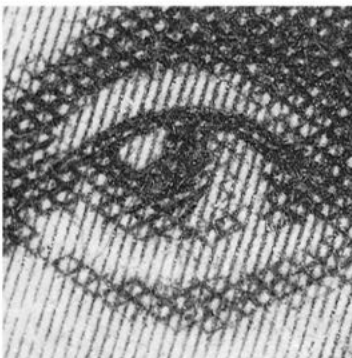
Brown, Barnes & Bell



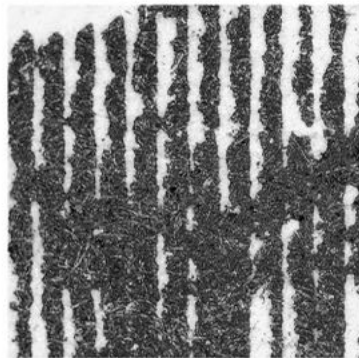
Carleman



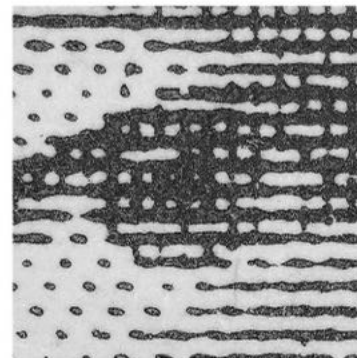
Drivet



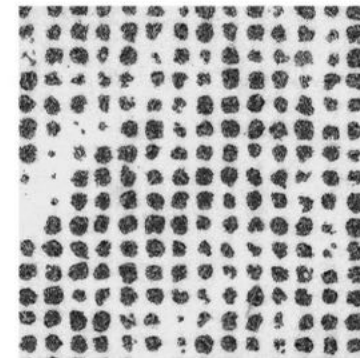
Egloffstein



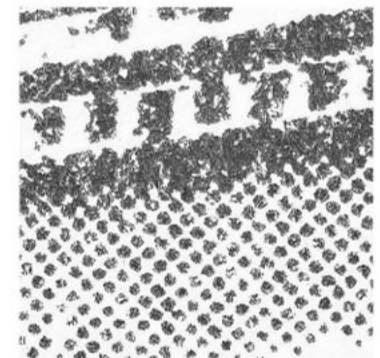
Horgan



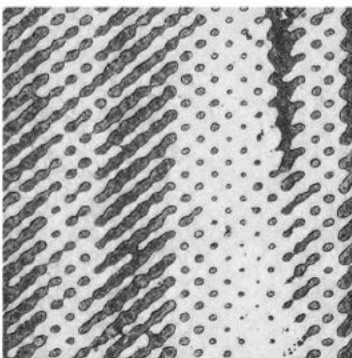
Ives



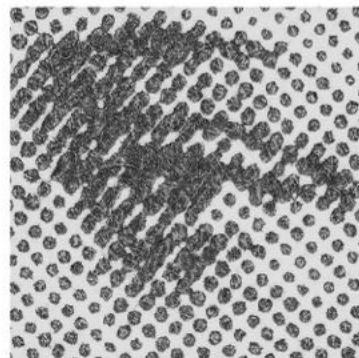
Jaffé



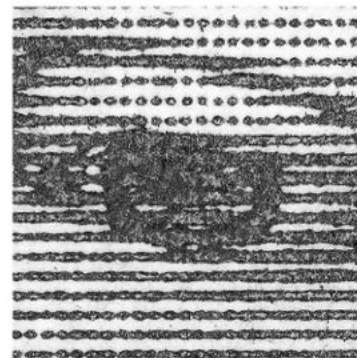
Leggo



Levy



Meisenbach



Moss



Petit

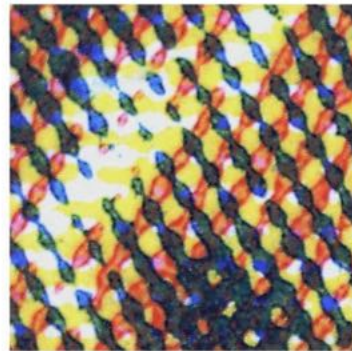
All of the fourteen halftone examples shown are for line screen methods at 15X magnification. All forms of printing are represented: intaglio, planographic and relief. Throughout the time of its development to the date that the relief typographic halftone was perfected a number of patterns were tried from random dots to wavy lines. The example halftone block shown on page 164 used the Levy crossline screen and Ives glue enamel resist coupled with the use of the "Optical V." This became the standard for type compatible halftones into the late 1950's. Today halftones are printed by offset lithography which finally was perfected in the late Twentieth Century.



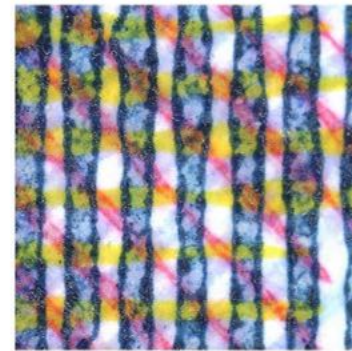
## Color Halftone



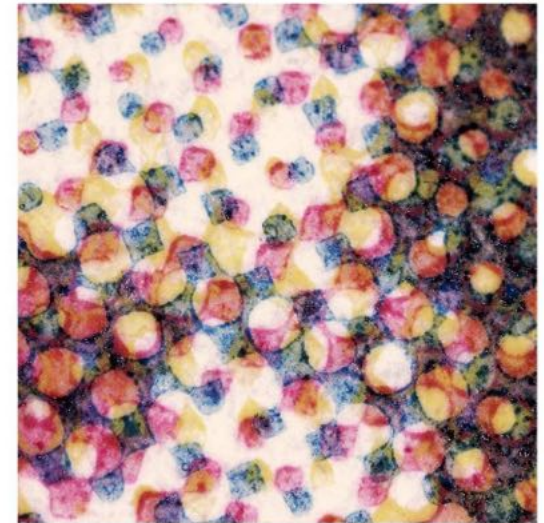
Kurtz 1893 15X  
Line screens at 45 degree angles -  
yellow at 90 degrees



Eugen Albert 1893 30X  
Albertochromie  
Line screens at 30 degree angles -  
yellow at 90 degrees



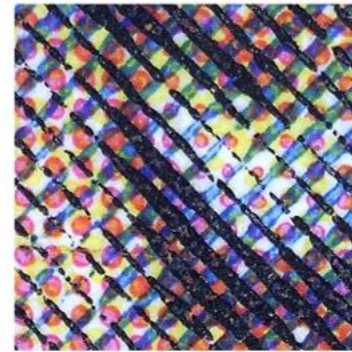
Anderson 1895 45X  
Phusochromie



Ives 1904 45X



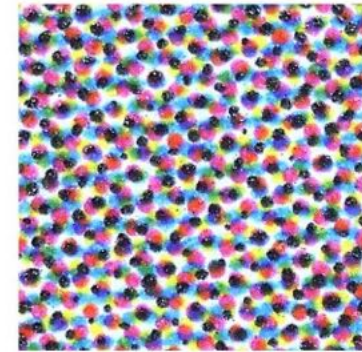
Zander 1907 - Four color 30X  
Green layer difficult to see



Eugen Albert 1908 30X  
Four color  
Citichromie



1951 four color CMYK 30X



2017 Print-on-demand 30X  
Four color offset  
lithography

All of the processes up to 1908 seem to show a printing order of Yellow - Red - Blue. The order of the Green in the Zander is difficult to tell. The Citichromie has the Black ink layer on the top. Actual ink color was based on particular colors of Yellow, Red and Blue established by the individual printing company. In 1906 the colors of Cyan, Magenta, and Yellow were established for printing inks for three color printing. Two more contemporary examples have been added. The example from 1951 is a relief halftone with the printing inks in CMYK order. The 2017 example is from this project and is a print on demand four color offset lithograph in possibly CMYK order as digital printing is difficult to determine based on the printing firm and the digital printer used.



## PROCESS EXAMPLES



This is a view of the interior of the printing department of the New York Photogravure and Color Company as it existed just after the turn of the Twentieth Century.

An image of Theodore Roosevelt as President is on a pillar to the left



# Steel Engraving after a daguerreotype



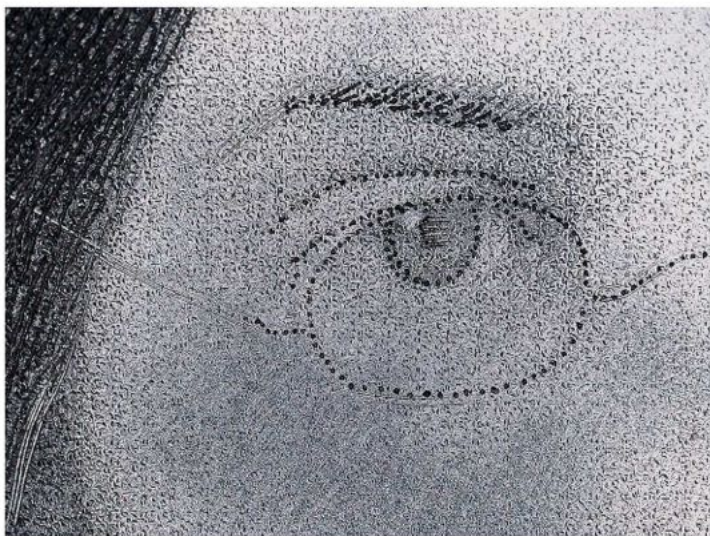
Plate photographed by direct light



Plate photographed by side light



Printed by Paul Taylor, Renaissance Press



Approximate 6X enlargement

This mixed process engraving by T.B. Welch after a daguerreotype by (Frederick DeBourg) Richards of Philadelphia is of Mrs. William Henry Green, his first wife, who died in 1855 after two years of marriage. A great many engravings were made to illustrate magazines and books from 1842 on. This steel plate uses stipple, line and mezzotint. Prominent among American engravers of this period, who did portraits after daguerreotypes are Samuel Sartain, Thomas Doney, A.H. Ritchie, and Welch. Paul Taylor of the Renaissance Press, New Hampshire carefully cleaned and printed the plate.



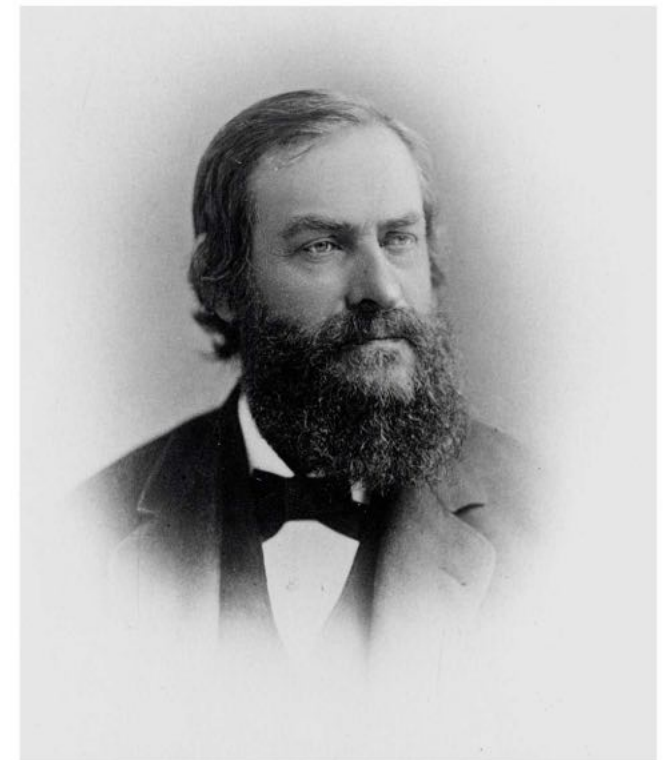
## Gutekunst Phototype (Collotype)



Albumen print cabinet card

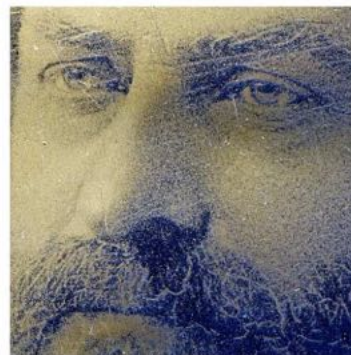


Inked glass collotype plate



Gutekunst produced print  
All examples - Graphic Arts Division, Smithsonian Institution

Frederick Gutekunst gave this group of original plates and prints to the National Museum, Smithsonian Institution, in 1888. Original collotype glass matrixes were rarely saved. Helena Wright, Director of the Graphic Arts Division graciously produced high level scans of the original cabinet card of Dr. Joseph Leidy, the inked glass collotype matrix and the Gutekunst phototype. Also detail scans were made so that approximately 10X enlargements could show the reticulation on the plate and print.



Approx. 4X



Approx. 10X



Approx. 10X



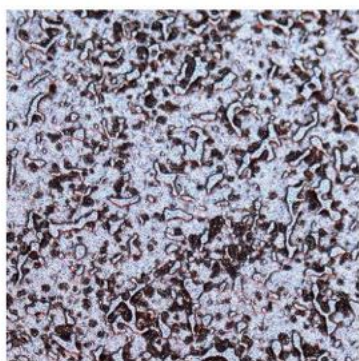
## Copper Plate Photogravure



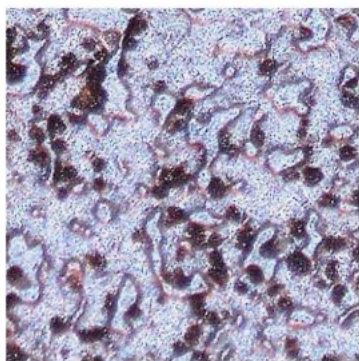
Steel faced copper dust grain photogravure plate by Jon Goodman, 1978 - photographed by side light



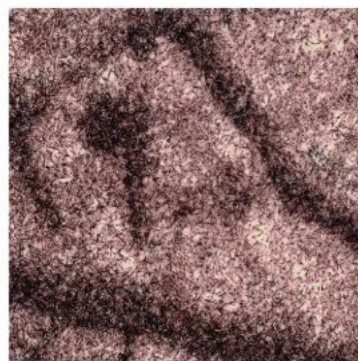
Modern photogravure print produced by Jon Goodman - 1978



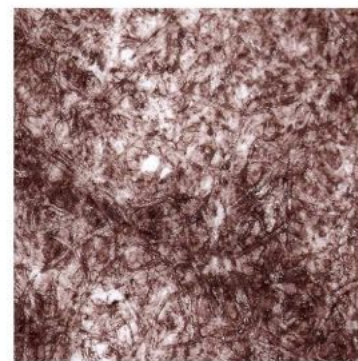
45X



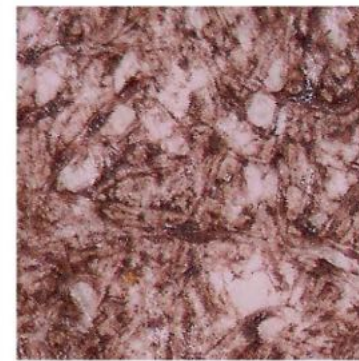
90X



15X



45X



90X

The process of photogravure or heliogravure using an aquatint to create a pattern for the appearance of continuous tone was first established by Niépce de St. Victor's process of 1853. The process was also developed by William Henry Fox Talbot with an aquatint grain by 1958, but using a light sensitized coating of gelatin rather than light sensitive bitumen. In 1879 Karel Klíč modified the Talbot method by using a carbon print transfer to the aquatint ground. This method is what remains in place today for high quality hand pulled photogravure as shown here on a copper plate. The plate has been steel faced, invented by Joubert in 1859. Jon Goodman, Massachusetts produced this plate and print from an 11"X14" negative in 1978.



Photolithograph on stone from a photograph



As printed



15X

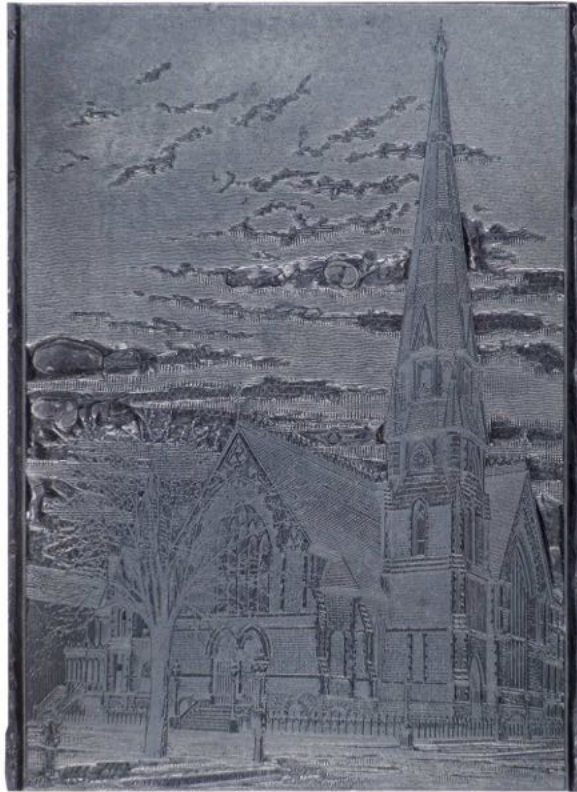


Lithographic stone, smooth for line work. The image on the left is the Round Tower, Newport, Road Island.

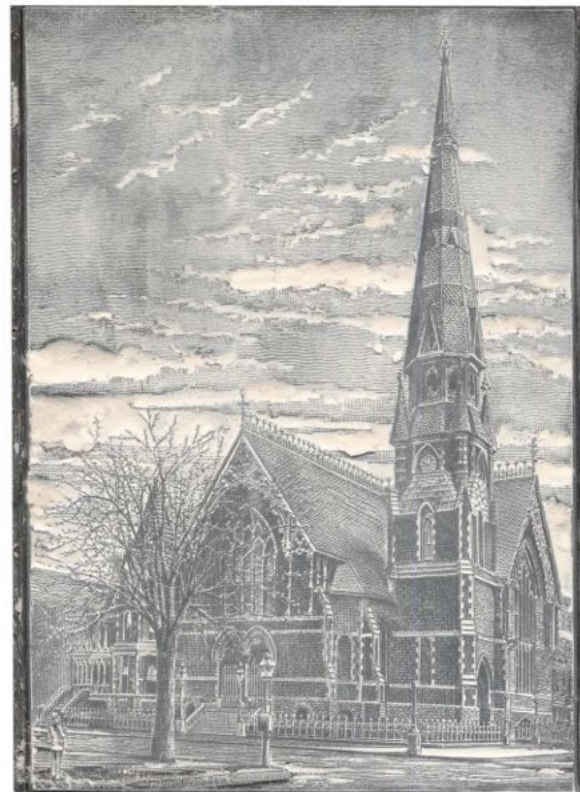
This photolithograph is a line image translated from a photograph using a method similar to Moss's process whereby a photographic print, from nature, is drawn on directly and then the silver image is bleached away leaving the line drawing. The line drawing is then photographed to the size used for printing and transferred to the stone. This stone is dated in one of the images 1896.



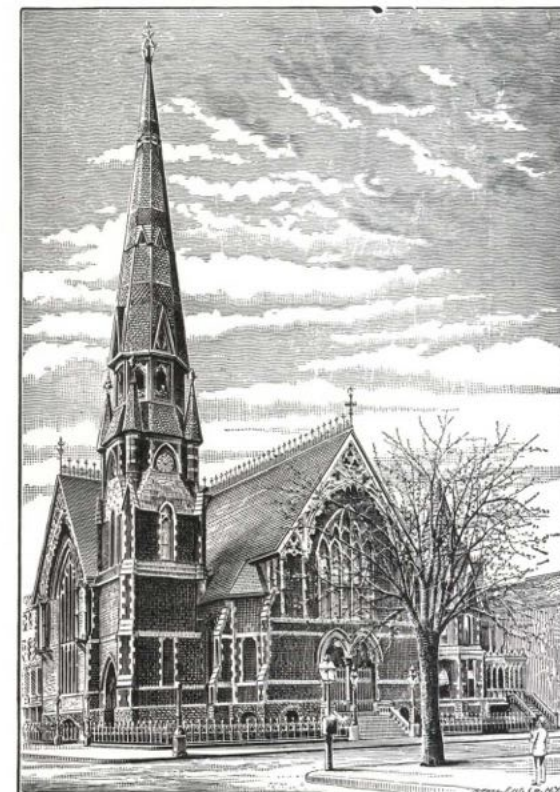
# Moss Process Stereotype from a photograph



Photographed with direct light



Photographed with plate dusted with talc



Printed by Leonard Seastone of the Tideline Press, NY



15X

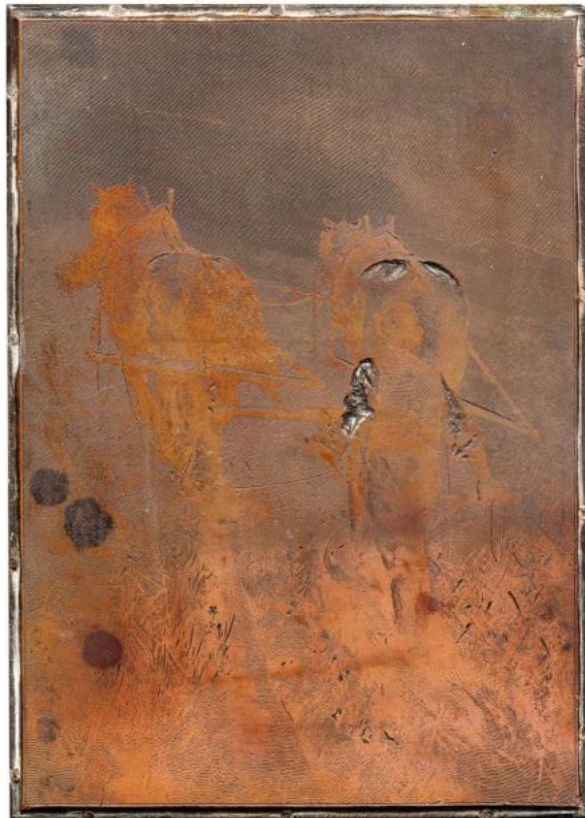


Edge of print block

This stereotype, in line, produced by the Moss Engraving Co., in the late 1880's – 1890's utilized his method of using a large photographic print from nature, tracing the image with line in ink, bleaching the photographic image away and then copying the line drawing to the size needed for reproduction. This method has the ability to convey a very concise and detailed rendition of the original object.



# Photoelectrotype from art by the Moss Process



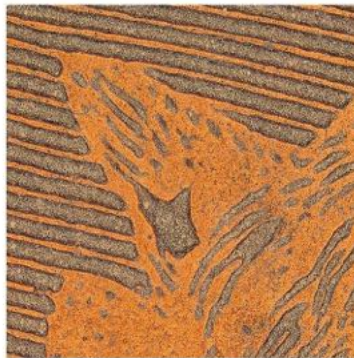
Photographed with direct light



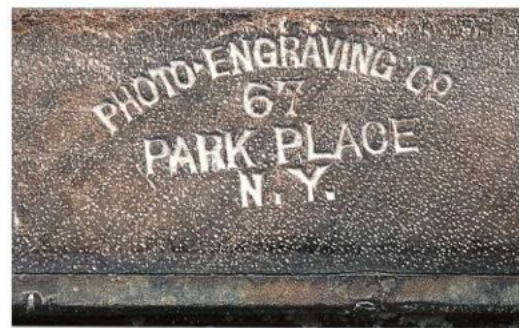
Photographed with plate dusted with talc



Printed by Leonard Seastone, of the Tideline Press, NY

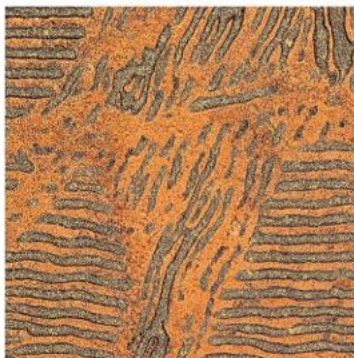


15X



Edge of print block

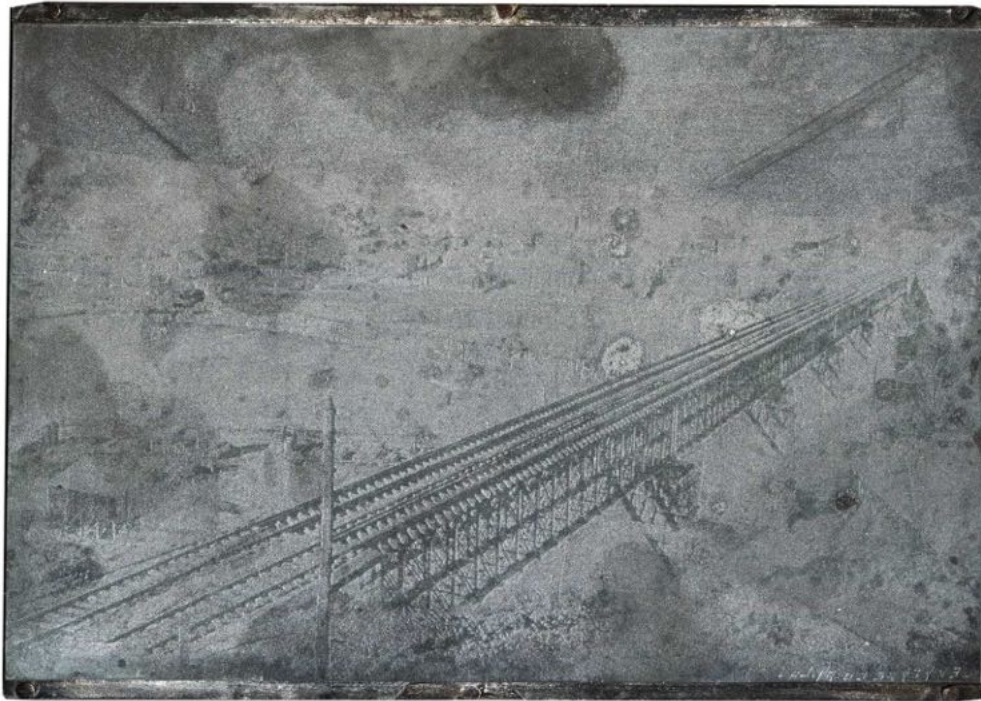
This copper electrotype produced by the Photo-Engraving Co., New York used John Moss's method of creating a gelatin relief from a photographic copy of art and then by electrotype making a relief block for typographic printing. The use of routing to create a perfect white area is typical.



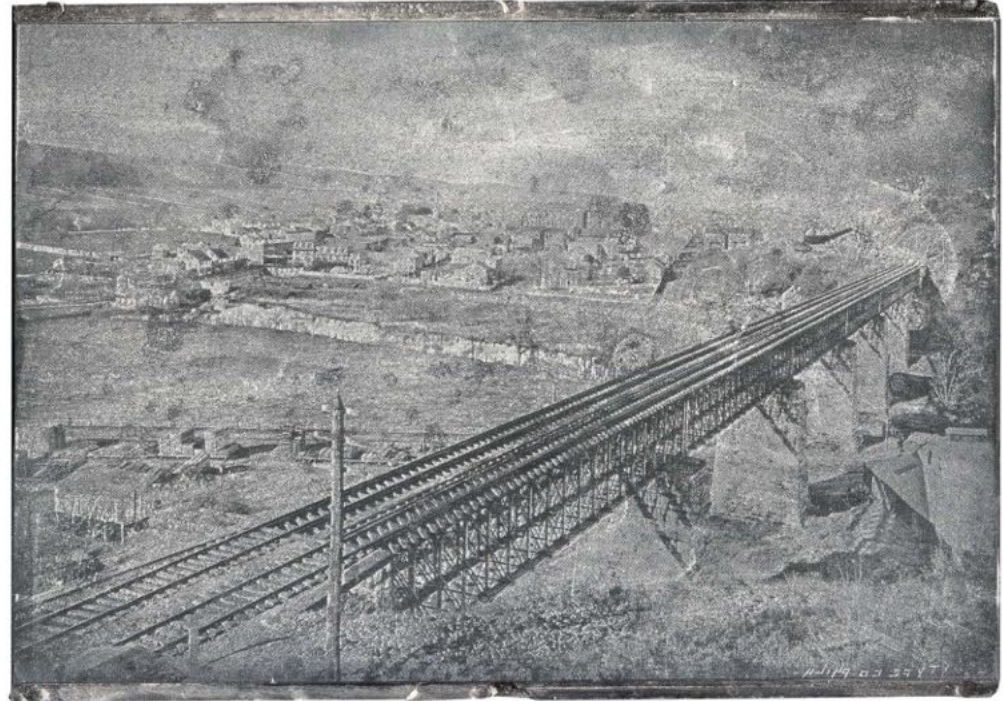
15X



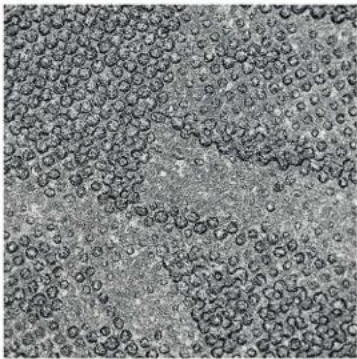
# Levytype halftone stereotype



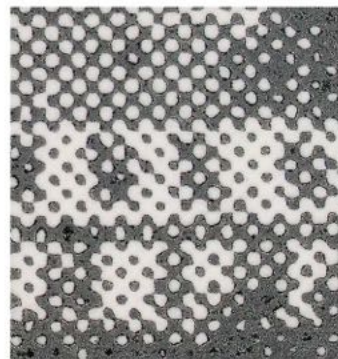
Photographed with direct light



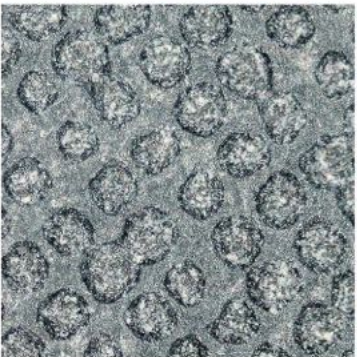
Photographed with plate dusted with talc



15X

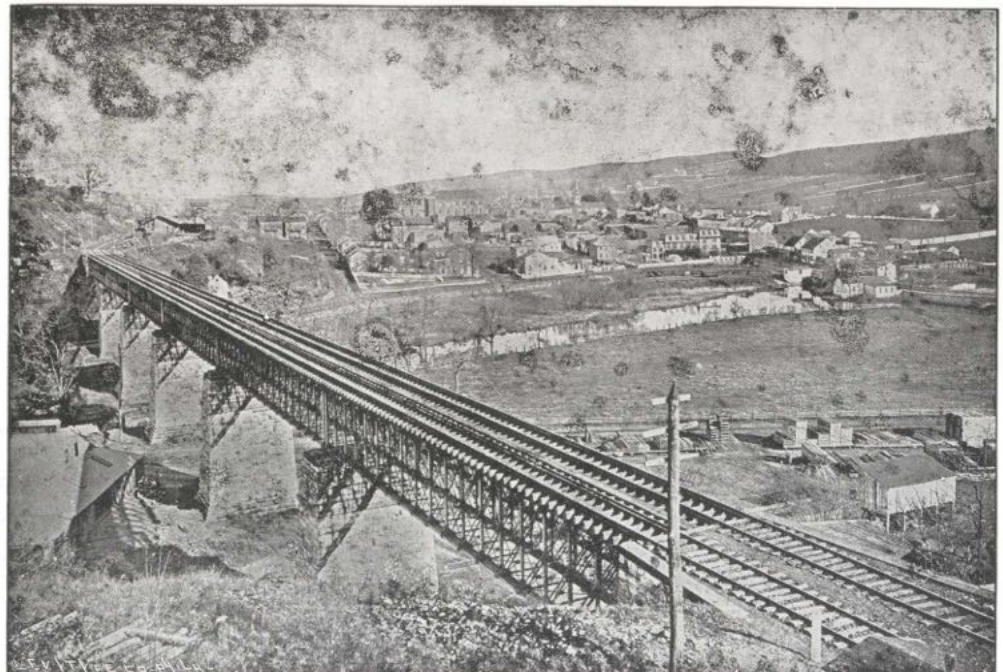


15X



45X

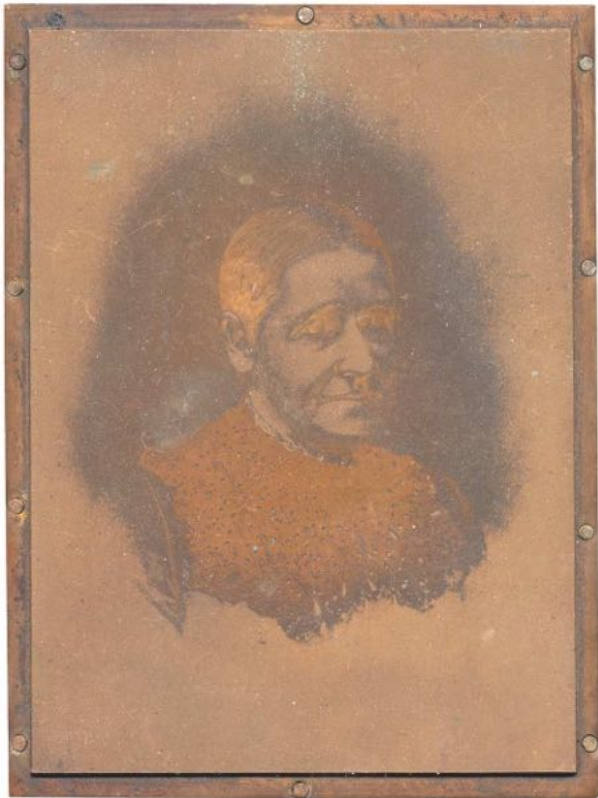
This Levytype halftone block done in stereotype was produced in the mid to late 1880s as can be seen by the coarseness of the dot. The Levy's did not discuss their method but it is obvious that it is from a crossline screen.



Printed by Leonard Seastone of the Tideline Press, NY



Copper-Enamel Process halftone



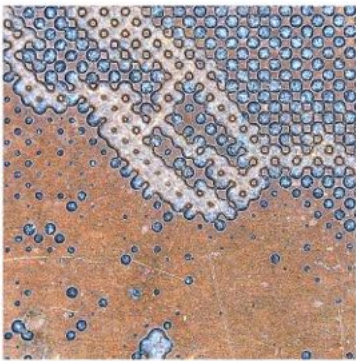
Photographed with direct light



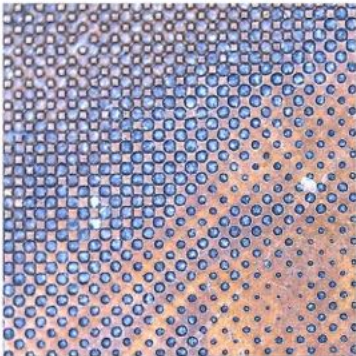
Photographed with plate dusted with talc



Printed by Leonard Seastone of the Tideline Press, NY



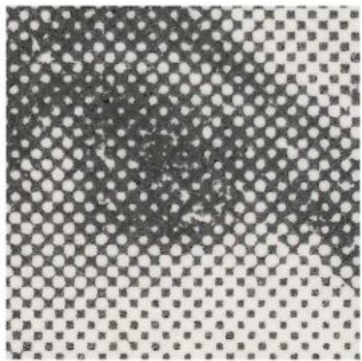
15X



15X



Commemorative Biographical Record of Dutchess County, New York, 1897



15X

This halftone block from 1897 uses the then perfected “fish-glue” or copper-enamel process developed by Frederic Ives, coupled with the perfected Levy screens and Ives discovery of the principle of the “Optical V” which were in common use by that date. Eder explains the copper-enamel process (pg. 635) “In this process a copper plate is coated with bichromated glue solution, which is dried, printed under a cross-line screen, developed in water, dyed in a methyl violet bath, burned, and etched with iron chloride.”



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# GLOSSARY

ACIERAGE — The steel facing of copper plates by electrotyping for long print runs. Developed by F. Joubert in 1858.

ALBERTYPE (ALBERT-TYPE, ALBERTOTYPE) — First successful collotype method invented by Joseph Albert in Bavaria, using a ground glass support and two layers of gelatin, one for adhesion and the other bichromated gelatin layer for exposure and printing.

ALBUMEN - Organic material, the purest form in which it can be obtained is the white of eggs. Sometimes found in photomechanical formulas instead of gelatin.

ARTOTYPE — The name given to Obernetter’s collotype method patented in the U.S. in 1878 by Artotype Co., N.Y. and sold to Edward Bierstadt in 1879. During its year in business it sold printing rights to territories throughout the U.S. The prints produced in the US have a reticulation pattern that is more consistent with generic collotypes.

AUTOTYPE — Term used by Autotype Co., England to denote their carbon prints and also their collotypes. They also used AUTOTYPE MECHANICAL PROCESS for their collotype prints.

AUTOTYPIE - The term used in german speaking countries for halftone.

AQUATINT — To create an even tone on engravings and etchings a fine powder was laid down and bitten through with acid. Two methods were used — one used the ground rosin in a volatile liquid (Paul Sandby ca. 1770), the second dusted the powder on in a special box (Jan van de Velde 1650 – rediscovered 1773-80). Both methods were employed in laying down the ground for photogravure printing.

BAUMÉ - The Baumé scale is a pair of hydrometer scales developed by French pharmacist Antoine Baumé in 1768 to measure the density of various liquids. The unit of the Baumé scale has been notated variously as degrees Baumé, B°, Bé° and simply Baumé (the accent is not always present). One scale measures the density of liquids heavier than water and the other, liquids lighter than water. (Wikipedia)

BICHROMATE – see Potassium Dichromate

BITUMEN (ASPHALTUM) — Resinous substance of which the best is found in Syria and Trinidad. Bitumen must be purified by dissolving in turpentine, then the thick material is dissolved in sulfuric ether. The thick sediment is dried and then dissolved in benzene or chloroform for use. First used by Niépce for his heliographic experiments, then by a series of experimenters in photomechanical processes. Much used in halftone block making and also in original powdered form as the random dust pattern in photogravure (AQUATINT).

CARBON PRINT — A non-photomechanical print with bichromated gelatin. A sheet of paper with a gelatin surface, which contains a carbon pigment, is sensitized in bichromate and is exposed in a frame with a negative. Where the light strikes the gelatin hardens. This “carbon” paper can then be attached to another piece of paper under water and the first support peeled away. As the unaltered gelatin washes away, a permanent print made up of gelatin and carbon is left on the support (single transfer).

CHALKOTYPE - The Government Printing Office in Berlin created this method of reversing a photogravure plate into a grained typographic block. The term MEZZOTYPE was used in the US for this process.

CHROMO-COLLOTYPE — Used to denote a three-color collotype color print, or a collotype with more than one other color applied. Waterlow & Sons in England made three-color collotypes “Chromotype”.

CHROMO-PHOTOLITHOGRAPH — A photolithographic base print with many registered color overprints. Such as Orell Füssli “Photochrom”.

COCKLING – The term used to denote undulations in paper. When a photographic or photomechanical print is hand-mounted on a paper or card support, the drying or adhesive process may cause the fibers in this backing sheet to swell, provoking a characteristic wrinkling or rippling effect.

COLLODION – A mixture of gun cotton, ether and alcohol, in a formula applied by Frederick Scott Archer in 1851, that made it possible to have a sensitive photographic emulsion placed on a glass support. Most negatives until the advent of accurate dry plates in the 1880’s were taken on collodion wet plates. Because collodion plates produced a cleaner, sharper and contrastier image, they were used for process work long after they stopped being used for general photography.

COLLOTYPE (PHOTOTYPIE, PHOTOTYPE, LICHTDRUCK, ALBERTYPE, HELIOTYPE, PHOTOPHANE, PHOTOTINT, ARTOTYPE, etc.) - A photomechanical printing process founded on the action of light to harden a bichromated gelatin film. When this film is exposed to light through a negative those areas that are struck by light become insoluble in proportion to the exposure. The resulting film contains a reticulation pattern that captures the ink and the relative swelling of the film from the exposure produces a surface that repels the ink where wet and captures the ink in proportion to its dampness. Final grain pattern is dependent on the thickness of the gelatin film, thick film - coarse reticulation, thin film - fine reticulation, also drying time and temperature are factors. It is difficult to know how long any one patent was used by the originator or by licensees. Comparison can show dramatic differences with the same originator.

COPPER-ENAMEL PROCESS - Eder explains the copper-enamel process (pg. 635) “In this process a copper plate is coated with bichromated glue solution, which is dried, printed under a cross-line screen, developed in water, dyed in a methyl violet bath, burned, and etched with iron chloride.”

DALLASTINT - A modification or appropriation of Pretsch’s method of producing a typographic printing surface from a reticulated glue, albumen, gum, or gelatin relief. Used primarily in the 1880’s as a random halftone method of poor quality.

DALLASTYPE – Dallas’s photogravure method using Pretsch’s process with possible modifications he kept secret.



**DIAPOSITIVE** – A transparent positive photographic image made from an original negative.

**ELECTROTYPE** — Making a reversed duplicate of a surface by galvanic action, which can be used to create another surface practically identical to the first.

**FERRIC CHLORIDE (PERCHLORIDE OF IRON)** – A crystal which dissolves in hot water and in a saturated solution of approximately 46 degrees Beaumé serves as a stock solution to be diluted for use as the etching medium in photogravure.

**FRILLING** — The term used to denote the separation of the gelatin from its support in wrinkles, etc., which can be similar in appearance to the craquelure encountered on varnish and ceramics. Found on Woodburytypes.

**GELATIN** — An animal substance obtained by boiling bones, hoofs, horns, and other animal substances. In cold water it has the ability to swell and absorb five to ten times its weight. The alkaline dichromates in a solution of gelatin render the latter, after exposure to light, insoluble and incapable of absorbing water in proportion to its exposure. This action is the basis of the carbon and nearly every photomechanical printing process.

**GILLOTAGE** - Invented by Firmin Gillot in the early 1850s and used extensively in relief block making for both line art and halftone processes. The method laid down a resin on the surface of a relief plate and then melted the resin so that it would flow down the sides of the relief to protect them from being undercut by subsequent acid etch to deepen the relief.

**GUM ARABIC** — A gummy exudation from the stems of various species of acacia. Sometimes used in place of gelatin in some photomechanical methods.

**GUTTA-PERCHA** - a hard, tough thermoplastic substance that is the coagulated latex of certain Malaysian trees. In its use in photomechanical printing it was used to make molds from softer material so that casts in metal could be made for printing.

**HALFTONE - (HALF-TONE)** — Term used for the relief method of printing involving the breaking up of the image into lines or dots. Many methods lead to the final development of the relief halftone which finally used a crosslined screen spaced away from the photographic plane so that dots of varying sizes would be created (the “Optical V”). By the middle of the twentieth century as offset lithography began to replace letterpress the process changed to one that was lithographic.

**HELIOGRAVURE** — Niépce de St. Victor, Nègre, Baldus, Drivet, Garnier and Dujardin used a variety of methods including an aquatint grain and images formed of bitumen or dichromated gelatin, albumen or gum arabic, to produce intaglio printing plates. Also this term is used in France as a generic term for photogravure.

**HELIOTYPE** — Ernest Edward’s collotype process utilizing a strippable gelatin film, hardened with alum, and printed when affixed to a metal support. Patents also discuss using different stiffnesses of ink, stiff for the shadows and deepest tones, thinner for the highlights, even tinted water for the pure highlight areas.

**INK MANUFACTURE** – Lorilleux & Cie, Paris became in 1818 the first commercial ink manufacturer in Europe. George H. Morrel became the first in the United States in 1830. In 1906 the Eagle Printing Ink Company of New York City incorporated the four-color wet process inks for the first time. The inks allowed the printing of the four colors without drying the paper between each color. These four colors were cyan, magenta, yellow, and black (also known as key), hence the name CMYK.

**INK PHOTO** — Sprague & Co. in England produced prints whereby a photographic negative was exposed onto a transfer paper with a very strong chromocollotype grain. This image was transferred to stone and printed from.

**ISOCHROMATIC** – A single color. Having a plate sensitive accurately to one of the primary colors was essential for accurate three-color printing.

**KEYSTONING** – In photography, when the camera is pointed up at an object, parallel lines appear to converge, such as when looking at railroad tracks they seem to converge in the distance. This can be corrected by keeping the back of the camera parallel to the object photographed but in order to show more of the top area the lens must be moved higher.

**LAKE PIGMENT** – A lake pigment is a pigment manufactured by precipitating a dye with an inert binder, or "mordant", usually a metallic salt. Unlike vermilion, ultramarine, and other pigments made from ground minerals, lake pigments are organic. Manufacturers and suppliers to artists and industry frequently omit the lake designation in the name. Many lake pigments are fugitive because the dyes involved are unstable when exposed to light. Red lakes were particularly important in Renaissance and Baroque paintings; they were often used as translucent glazes to portray the colors of rich fabrics and draperies. (Wikipedia)

**LEIMTYPE** — A thick layer of bichromated gelatin is exposed under a line negative and then attached to zinc or wood, developed into a high relief with a solvent and then printed from directly. In the U.S. it was referred to as the “washout process.”

**LEVYTYPE** – the term was developed by Louis and Max Levy for their first photoengraving method for line and then later for their relief halftone process. It can be seen either as Levy-type or Levytype.

**LICHTDRUCK** — Gemoser’s collotype method used by Ohm and Grossman in Berlin. Emil Rye of Denmark was the agent for this patent in England (Newton was patent holder) where it was used by the Autotype Co. In the US. George Rockwood initially purchased the rights. In German speaking countries this word was the generic term for collotype.

**LICHTKUPFERDRUCK** — Obernetter’s photogravure process. A metallic image of silver from a positive is converted into chloride of silver, and the film is then stripped and applied to the surface of a copper plate. Under the influence of a voltaic current, the silver chloride is decomposed, and the chlorine unites with the copper and etches it to a greater or lesser degree, according to the depth of deposit of silver chloride.

**LITHO-CAUSTIC (PHOTO-CAUSTIC)** — Screened halftone printed from stone (Hoen of Baltimore and Bien of New York used this term in the US.)



MEZZOTYPE — Term used in the US to denote prints made from a reversed photogravure, applied to typographic printing. See CHALKOTYPE.

PAPYROTYPE, PAPROGRAPHY - A modification of photolithography in which paper is used as the support, instead of stone or metal.

PHOTOCHROM (PHOTOCHROME) - see CHROMO-PHOTOLITHOGRAPHY.

PHOTOCHROMIE PROCÉDÉ LÉON VIDAL - This process uses a series of registered lithographic colors to be printed and then have a Woodburytype, in registration, placed over them yielding a color print. Vidal also used the term when the underlying layer was collotype or photolithography.

PHOTOELECTROTYPE – A method of creating a relief electrotpe for printing by taking a bichromated gelatin relief, casting it in plaster then making it conductive by coating with black-lead and creating through electro-deposition a printing plate.

PHOTO-ENGRAVING — A general term usually applied to half-tone blocks for typographic printing, but before that to line-cuts produced photomechanically.

PHOTO GALVANOGRAPHY — First patented by Paul Pretsch of Vienna in 1854. An intaglio printing method whereby a reticulated film of gelatin or glue having been sensitized with bichromate and exposed under a negative, swelled in water, and when dried a metal film is made to adhere to its surface by galvanic action. This plate forms the final printing surface. This process, much changed, formed the basis for the Goupil Gravure process in France.

PHOTOGLYPHIC ENGRAVING — Talbot's photogravure method of 1858 on copper or steel using an aquatint grain and a chromocolloid (gelatin sensitized with potassium bichromate) resist.

PHOTOGRAPHIC ENGRAVING — Talbot's photogravure method of 1852 on steel. First use of the line screen concept, "the photographic veil."

PHOTOGRAVURE — Normally this refers to the Talbot-Klíč method of intaglio copper plate printing. However at least three different approaches might be taken: 1. a. Bitumen with dust grain or an evaporated aquatint, b. the same with chromated gelatin, and c. the Klíč method with a carbon print transfer to the dusted plate; 2. The photogalvanographic method of Pretsch, or the Woodbury method that Goupil used; 3. The odd methods such as Obernetter's, or Garnier & Salmon's mercury method (1853).

PHOTOLITHOGRAPHY — First commercially tried by Lemercier using a modification of Niépce's bitumen method but on stone. Later much improved by Poitevin in 1855 by the use of bichromated albumen or gelatin films. For line work, the hardened film holds the ink and the smooth stone surface repels the ink. In tonal work, the stone must be grained to create a series of small pits to break up the surface. The process can be done either on stone, or on metal, zinc being common.

PHOTOMECHANICAL PRINTING — The term is given to all processes in which, by the aid of light and in connection with chemical and mechanical treatment, printing surfaces are prepared to be used for multiplying impressions without the further aid of light. (Prof. Charles F. Chandler, Ph.D., definition 1890)

PHOTOTYPE — Jacob Husnik's collotype method. Albert purchased the rights to eliminate competition. The US rights were obtained by Frederick Gutekunst in Philadelphia. Not to be confused with the French PHOTOTYPIE, which was first used to designate Maréchal and Tessié du Motay's process but later became the French generic term for collotype.

PHOTOTYPIE - Tessié du Motay and Maréchal's early collotype process where the bichromated colloidal film could only bear about 100 prints before it became damaged. Gustave Arosa was the only publisher to produce many items in this process; Quinsac, the French printer, was also said to utilize this process. Later used to denote collotype.

PHOTOTYPOGRAPHIC – Used in the US to designate first halftones published by Petit and Ives in 1881. This was rapidly changed to HALFTONE.

PHOTOTYPOGRAPHIQUE – First used in France to identify Petit lined halftones in 1878. Later used to identify halftones known by the French generic term "Similigravures".

PHOTOZINCOGRAPHY — A method where the stone is replaced with a zinc plate and the plate acts as a lithographic stone, either smooth for line art, or grained for halftone. The image is transferred to the plate using a paper based image and transfer ink.

POTASSIUM BICHROMATE. Syn.: Dichromate of Potash — Prepared from chrome iron ore. Orange-red crystals which dissolve easily in water. It decomposes in light when in contact with organic matter (Mongu Ponton, 1839). Used extensively in photo-mechanical printing.

RÉAUMUR - The Réaumur scale (°Ré, °Re, °r), also known as the "octogesimal division", is a temperature scale in which the freezing and boiling points of water are set to 0 and 80 degrees respectively. The scale is named after René Antoine Ferchault de Réaumur, who first proposed a similar scale in 1730. (Wikipedia)

ROTOGRAVURE — A screened photogravure method first invented by Karel Klíč in 1890. It allowed the photogravure process to be used on rotary presses, thus enabling print runs in the tens of thousands, if not the millions. A line screen forms cells which hold the ink as excess is mechanically wiped away from the cylinder with a "doctor" blade.

SIMILIGRAVURE– Charles Petit used this term for his halftone process. It later became the standard French term for relief halftones

STEREOTYPE – A cast facsimile of an original in type metal which yields a relief printing plate. In photography usually a mold was made in plaster from a photo-relief created with bichromated gelatin. This plaster mold was then used to cast the final relief plate.



**STANNOTYPE** — Walter Woodbury's last permutation of the woodburytype where the gelatin relief, from a positive, is pressed with tinfoil in a roller press and this relief is then used to print from. Despite the inventor's best endeavors in the early 1880's to bring it to market, this author knows of no commercial use of this process. May have been attempted to market to amateurs.

**THREE-COLOR** — Generally means that the original scene or art has been photographed through three separate color filters, one each for the primaries: red, green and blue. These negatives are then converted to printing plates, collotype, relief halftone, or photolithographic halftone, and printed using the three secondary colors: blue (cyan), red (magenta), and yellow. It should be noted that photographic emulsions were only sensitive to the blue part of the spectrum until Vogel discovered a method of dyeing the emulsion to make it sensitive to green in 1873. It was not until 1884 that Vogel again, worked out a method to dye the emulsion to make it sensitive to red. In printing, the manufacture of the correct ink colors for three-color work continued to be a major problem for printers into the early 20th Century. *The Process Engraver's Monthly*, Vol. XV, 1908 had a number of articles on the subject. In 1906 the colors of Cyan, Magenta, and Yellow were established for printing inks for three color printing.

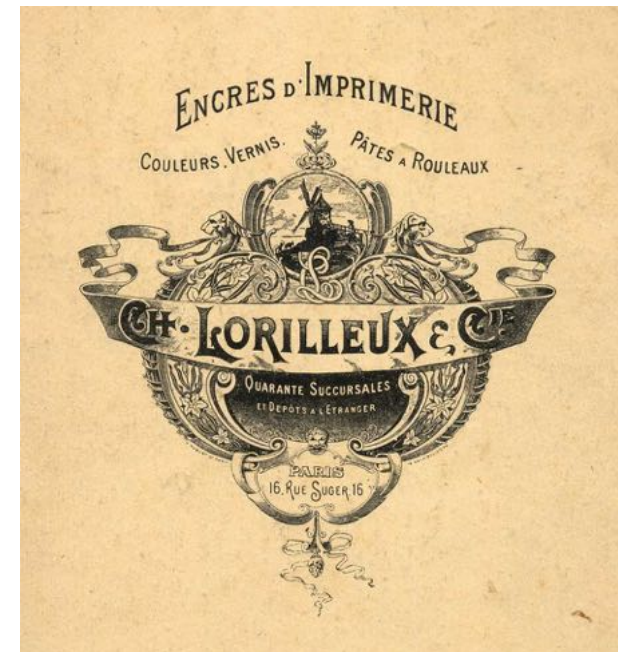
**TINT BLOCK (TINT PLATE)**— A solid plate to be used in printing a flat color.

**TYPE-HIGH** - 0.9186 of an inch. A plate is said to be "Type-High" when it is mounted on wood or metal to the proper height to be used on a relief printing press.

**VARNISH** — A solution of resinous bodies in a volatile solvent. Sometimes used to brighten photomechanical prints. (Strand portfolio of 1942 used this method.) Now used in offset printing to brighten and improve the tonal scale of the illustration.

**WOODBURYTYPE (PHOTOGLYPTIE, France)** — The method consists of exposing a thick film of bichromated gelatin to light under a negative, and when fully exposed, washed to dissolve the soluble portions not acted on by the light. Next, the film is soaked in alum to harden it and dried. When dry, the gelatin relief is placed in a press between two perfectly parallel steel planes. Lead is placed on top of the gelatin and the two surfaces brought together under over 100 tons of pressure. The lead perfectly conforms to the gelatin form under this pressure. Many lead molds can be made from each gelatin matrix. The lead now becomes a mold; it is placed in a press and a portion of warm liquid gelatin with coloring is poured onto it; a piece of special paper is put on top and the press is closed conforming the liquid gelatin to the mold and when cooled is removed. The image now is formed by various thicknesses of the gelatin making up the tones of the picture.

**WOODBURYGRAVURE** — A later method, sparingly used into the 1890's, where it was possible to place the woodburytype onto a larger sheet with clean edges and avoid trimming and mounting.



Charles Lorilleux et Cie was the most important producer of inks for photomechanical reproduction in Europe. The company was formed by Charles' father (René) Pierre Lorilleux in 1818.



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THE  
**Philadelphia Photographer.**

EDITED BY EDWARD L. WILSON.

Vol. XVIII.

JUNE, 1881.

No. 210.

**THE DEATH OF M. ADAM  
SALOMON.**

It is with most profound sorrow that we announce the death of Mons. Adam Salomon, the famed sculptor, the master photographer, and our beloved friend, whose name and fame are well known to our readers. He died last month at his home in Paris, near the Bois de Boulogne.

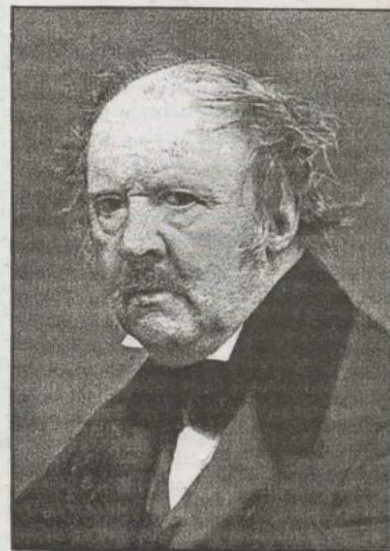
Further details may be found in our French correspondence.

In our next issue we shall give a sketch of his life and work, and "Our Picture" will be a "mosaic" made up of some of his best works, and include a portrait of our lamented teacher also.

**FOX TALBOT.**

THE *Photographic News*, of March 11th, was accompanied by a photo-engraving of the distinguished photo-scientist, Mr. Fox Talbot, which we have caused to be reproduced and present below, that our readers may become familiar with the features of one to whom they owe so much. Mr. Talbot was born in 1800 and died in 1877. He began in 1839, with Daguerre, to publish his discoveries to the world, and we are in-

debted to him for the paper-printing process substantially as used now; the development-printing process; the albumen-porcelain



lain process; an instantaneous negative process, and a fifth invention was a method of photo-engraving. The process by which the above picture was made, belongs to this last family, and may be appropriately used here to help keep alive the memory of one who has done so much towards the growth of our art.

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**PATENTS:**

**TALBOT - 1852 and 1858**

**POITEVIN - 1855**



15X

The portrait of Talbot published in *The Philadelphia Photographer*, is one of the earliest typographic halftones printed in the United States. It is reproduced from a photogravure published in England and since it appears in the same issue as an Ives halftone it is very likely by him. Talbot discovered the important ability of line screens to hold ink in areas of tonality in creating printing plates. This, in turn, gave the impetus for inventors to use line screens to break up the gray scale of the image so that only black ink spots or lines, when grouped closer or further apart, or larger and smaller, will result in the perception of various tones.





A.D. 1852 . . . . . N° 565.

## Engraving.

**LETTERS PATENT** to William Henry Fox Talbot, of Lacock Abbey, in the County of Wilts, Esquire, for the Invention of "**IMPROVEMENTS IN THE ART OF ENGRAVING.**"

Sealed the 24th January 1853, and dated the 29th October 1852.

**PROVISIONAL SPECIFICATION** left by the said William Henry Fox Talbot at the Office of the Commissioners of Patents, with his Petition, on the 29th October 1852.

I, WILLIAM HENRY FOX TALBOT, of Lacock Abbey, in the County of Wilts, Esquire, do hereby declare the nature of the said Invention for "**IMPROVEMENTS IN THE ART OF ENGRAVING,**" to be as follows:—

The metallic plate which is to be engraved is first coated or covered with a substance which is easily changed or altered by being exposed to the light of the sun or to daylight. Then, by the methods which are employed in the art of photography, an image or picture is formed by the light acting upon the coating of the plate. This being done, chemical substances are employed which have the property of etching or biting into the metallic plate in those places only which have been protected from the light, or upon which the light has not acted strongly. The plate is then washed and cleaned, and then its surface exhibits a

*Talbot's Improvements in the Art of Engraving.*

distinct etching or engraving resembling the picture or image which was originally formed upon it. Copies are then struck off from the engraved plate in the usual way of copper plate or steel plate printing.

**SPECIFICATION** in pursuance of the conditions of the Letters Patent, filed by the said William Henry Fox Talbot in the Great Seal Patent Office on the 29th April 1853.

**TO ALL TO WHOM THESE PRESENTS SHALL COME.** I, WILLIAM HENRY FOX TALBOT, of Lacock Abbey, in the County of Wilts, Esquire, send greeting.

**WHEREAS** Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-ninth day of October, in the year of our Lord One thousand eight hundred and fifty-two, in the sixteenth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said William Henry Fox Talbot, Her special licence that I, the said William Henry Fox Talbot, my executors, administrators, and assigns, or such others as I, the said William Henry Fox Talbot, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**IMPROVEMENTS IN THE ART OF ENGRAVING,**" upon the condition (amongst others) that I, the said William Henry Fox Talbot, by an instrument in writing, under my hand and seal, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

**NOW KNOW YE**, that I, the said William Henry Fox Talbot, do hereby declare the nature of the said Invention, and in what

*Talbot's Improvements in the Art of Engraving.*

manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof (that is to say):

The metallic plate, which is to be engraved is first coated or covered with a substance which is easily changed or altered by being exposed to the light of the sun or to daylight. Then, by the methods which are employed in the art of photography, an image or picture is formed by the light acting upon the coating of the plate. This being done, chemical substances are employed which have the property of etching or biting into the metallic plate in those places only which have been protected from the light, or upon which the light has not acted strongly. The plate is then washed and cleaned, and then its surface exhibits a distinct etching or engraving resembling the picture or image which was originally formed upon it; copies are then struck off from the engraved plate in the usual way of copper plate or steel plate printing. The particular methods by which this photographic etching of the plate is effected are believed to be entirely new.

Having thus given in my Provisional Specification a general outline of my Invention, I now proceed to describe more particularly the details of the process.

The following is my method of engraving steel plates. I take a good steel plate prepared as it usually is for the use of engravers; and, first, I dip it for a minute or two into vinegar acidulated with a little sulphuric acid, then wash it and wipe it quite clean and dry. Then I prepare a solution of gelatine or common isinglass in water. It should be made of moderate strength, such as when cold coagulates into a firm jelly. Having warmed this solution, and strained it through a linen cloth, I add to it about half its volume of a saturated solution of bichromate of potash in cold water, and stir the mixture well. This mixture is to be kept moderately warm while in use to prevent its conglutination; and since this warmth causes it gradually to part with its water, and grow thicker or more viscid, therefore it is necessary that the operator should from time to time add so much water as he judges necessary to replace what has been lost. The steel plate being first slightly warmed, I pour some of the prepared gelatine upon it, and with a glass rod held horizontally I spread it over the whole plate. I

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then incline the plate, and pour off the superfluous gelatine. I then place it on a stand, which should be kept as nearly horizontal as possible to prevent the gelatine from flowing to one side of the plate. I then place a spirit lamp beneath the plate, and warm it gently till the gelatine is dry. This process should not be performed in very strong daylight, because the prepared gelatine would be injured by the light. The film of prepared gelatine, when properly dried upon the steel, has a uniform bright yellow colour, and a smooth surface. If too much bichromate is employed in proportion to the gelatine, the surface of the dried film appears clouded in various parts, owing to the formation of minute crystals. This defect is easily remedied by adding some more fresh gelatine to the mixture. After a little practice the operator will have no difficulty in obtaining a uniform film. When the steel plate has been in this manner coated with a regular and uniform film of prepared gelatine, it is ready to receive a photographic image of the object which is intended to be engraved. I will suppose, in the first place, that the object is capable of being applied in close contact with the surface of the prepared steel plate; for example, a piece of lace, or the leaf of a plant. I place the object upon the steel plate; then a sheet of glass is laid over it, and screwed into close contact with it, which is best done by means of what is commonly called a photographic copying frame. The plate is then to be exposed to the sun's rays for a certain time, varying according to circumstances from half a minute to five minutes or more, until the operator judges that a sufficiently strong image has been produced. The effect of the sun's rays is to turn the colour of the plate from yellow to brown, but the parts shaded or protected by the object of course retain their original yellow, the result is therefore the formation of a yellow image of the object upon a ground of a brown colour. The plate is then taken out of the frame, and the object being removed from it, it is seen whether a good image has been obtained. In that case the operator proceeds as follows: The plate is taken and dipped into cold water for one or two minutes, which removes all the bichromate of potash, and the greater part of the gelatine also, from the parts of the plate upon which the sun's rays have not acted, while on the contrary it removes but little

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from those parts which have been fully exposed to the sunshine: the consequence of this is that the image is whitened. The plate is then removed from the water, and dipped into alcohol for one minute. It is then removed, and placed in a vertical position in some warm place, and in the course of a few minutes it becomes entirely dry. This completes the photographic part of the process; and the plate is, generally speaking, now seen to be impressed with a white image of the object, often very perfect and beautiful, placed upon a ground of a brown or brownish yellow color.

It now remains to etch the photographic image thus obtained. For that purpose I take some bichloride of platinum, containing a little free acid, and dissolve it in cold water, taking care that the solution is quite saturated. I then add to four parts of this saturated solution one part of water. This part of the process requires attention, for if the quantity of water is in a material degree either too great or too little, the etching process is liable to failure. The best way is to proceed experimentally by adding water gradually to a considerable quantity of the saturated solution, and making trial of the results until they become satisfactory. When this is attained the solution is to be kept in a well stoppered bottle for immediate use at any time. A solution of the proper strength having been carefully prepared and tested as above mentioned, the etching process is executed as follows:—The plate is laid horizontally on a table, and a small portion of the platinum solution is poured upon it, and quickly diffused and spread over the whole plate with a camel's hair brush. It is hardly necessary to surround the plate with a wall of wax, as practiced by engravers in the usual mode of etching copper plates, although this may be done if preferred. But the liquid does not often flow off the plate, in consequence of the small quantity of it which is used. If a greater depth of it were poured on, it would, from its great opacity, prevent the operator from discerning the effects produced by it upon the plate of metal. The platinum solution then being poured on the plate it produces no effervescence or escape of gas, but in the course of a minute or two the whole photographic image of the object which existed upon the steel plate is seen to blacken, and when this change is com-

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plate there is seen a very distinct and regular black image of the object. The operator watches until it has a satisfactory appearance to his eye, and looks finished, or as perfect as he judges it likely to become, which generally happens in one or two minutes. When he thinks it is finished, or not likely to be further improved or developed, he inclines the steel plate gently, and pour off the platinum solution by one corner of the plate into a bottle placed to receive it; the surface of the plate is then dried with blotting paper, and then a stream of water, or, what is better, a strong solution of salt in water, is poured over the plate, which carries off the remainder of the platinum solution. The plate is then rubbed with a wet sponge or linen cloth, which, in a short time, detaches and removes the film of gelatine from the steel, and enables the operator to see the etching which has been obtained. The plate ought then to be coated with wax, because a newly prepared etching is very easily oxidized or rusted by the atmospheric air. Impressions can be printed off from the steel plate thus engraved in the mode usually employed by copper plate and steel plate printers.

When the etched parts are both broad and uniform, as in the case, for instance, when the object is an opaque leaf of a plant, although the etching holds the ink pretty well, yet when printed off, the effect is not always satisfactory. I proceed therefore to explain a useful modification of the process. In order to which I must observe that when the object placed on the steel plate to be engraved is a piece of black crape or gauze, an engraving of it is obtained in the way above mentioned, which truly depicts the object, representing every thread in its proper place by a corresponding engraved line; but when two or three thicknesses of this gauze are employed instead of one, and are placed obliquely to each other at various angles, then the resulting engraving offers a mass of lines intersecting each other in different directions which cover the hole plate, and which, when printed off upon paper, produce a result which, to an eye at a little distance, appears like a uniform shading. Now let us suppose that we have in this way covered a prepared steel plate with two or three folds of black crape or gauze, and placed it in the sunshine. When taken out of the sunshine and the crape removed, let the broad leaf of a plant, or some



other object of irregular outline, be placed upon the centre of the plate, and then let the plate be replaced in the sunshine for three or four minutes. When it is removed for the second time, and the object detached, it will be seen that the light of the sun acting upon the parts of the plate exterior to the object has wholly obliterated the previous effect produced by the gauze, and has converted that part of the plate to a uniform brown colour, while the central part of the plate offers, the image of the leaf, upon which the crowded intersecting lines produced by the gauze are still seen. The plate is now to be etched as previously described, and the result is, that an etching of a leaf is produced covered with engraved lines, which lines are entirely wanting on the rest of the plate. When this is printed off, the impressions offer the appearance of a leaf nearly uniformly shaded. But in order to obtain greater perfection in this respect, it is only necessary either to manufacture on purpose some pieces of more delicately woven fabrics, or to cover a sheet of glass by any convenient method with fine opaque lines to intercept the light, or with a powder adhering to the glass, consisting of distinct opaque particles, and very uniformly diffused over the surface. These things, which I believe have not been heretofore used in the fine arts, I would denominate photographic screens or veils.

Another method is to cover the steel plate with an aqua-tint ground, consisting of particles of resin, before coating it with the gelatine; but in that case the dipping of the plate into alcohol, which occurs in the foregoing description of my process, must be omitted: and moreover, a fresh aqua-tint ground requires to be laid upon every plate: whereas a single veil, such as I have above described, serves for any number of plates in succession. The method of engraving which I have here described as applied to steel plates is also applicable to plates of zinc. Lithographic stones are also readily engraved by the same process.

When the object to be engraved is not of a nature to be placed in contact with the steel plate, it is necessary first to form a negative photographic image of it on paper or on glass by the usual methods employed in photography: then to make from this negative photograph a positive copy, either upon glass or upon paper of good uniform texture and moderately transparent: and, lastly, to put this positive copy in



Foliage with pattern of gauze Hans P. Kraus Jr., New York

close contact with the steel plate, and then to place the plate in the sun's rays, when it will take an image of the object, as above described. The prepared steel plate may also be placed in the focus of a camera, and the camera directed to the object, but as the film of prepared gelatine is not very sensitive to feeble lights this process in general would occupy a considerable time.

I have stated that I employ in this process a solution of gelatine mixed with bichromate of potash, but I do not confine myself to the use of gelatine. Other substances may be used, especially albumen or white of egg, and gum arabic, or mixtures of these and other analogous substances in various proportions. But notwithstanding that I have found some of these mixtures to afford good results, yet on the whole I think it answers best to employ only gelatine mixed with the bichromate of potash: and throughout this Specification I have used for brevity the term "gelatine," to denote a solution of isinglass in water, carefully strained and made as free from impurities as possible. And I have used the terms positive and negative as they are usually employed in the science of photography. I have described the solution of platina which seems to me the best, but I do not confine myself to this etching liquid. Other liquids may be employed capable of etching surfaces of metal or stone, provided they possess the essential quality of not penetrating the film of prepared gelatine which cover the portions of the surface not intended to be etched.

The processes described in this Specification which I claim to be new inventions are:—

First, the producing or obtaining etchings or engravings by photographic and chemical means alone upon plates of steel.

Second, the method described of covering surfaces of metal or stone with a coating of gelatine, rendered sensitive to the action of light by being mixed with a solution of bichromate of potash or other liquid which possesses photographic properties, and which unites freely with gelatine, producing, when the gelatine is dried, a coating sensitive to light, and which by the action of the solar rays upon it becomes either less soluble in water than before, or altogether insoluble in that liquid.

Third, the removal by the action of water of the more soluble parts of the photographic image, for the purpose of rendering them permeable to an etching liquid.

Fourth, the employing a chemical liquid for the purpose of etching the surface upon which the photographic image has been formed, as above mentioned, which liquid possesses the requisite etching property, but has not the property of penetrating the coating of gelatine which covers and protects the portions of the surface not intended to be etched.

And whereas in reciting these claims I use for brevity the word "gelatine," and I have already stated that albumen and gum possess analogous properties; I would therefore be understood to include them in my claim as being capable of replacing the gelatine in the above described process.

Fifth, the employing an apparatus for partially intercepting the sun's rays, which in my present Specification I have called a photographic screen or veil, for the purpose of producing a change or alteration in the final character of the etching.

In witness whereof, I, the said William Henry Fox Talbot, have hereunto set my hand and seal, this Twenty-third day of April, in the year of our Lord One thousand eight hundred and fifty-three.

W. H. F. TALBOT. (r.s.)

Witness,

S. CARPMAEL.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.  
[Wt. 35—25/6/1914.]



6X magnification

Hans P. Kraus Jr., New York





A.D. 1858, 21st April. N° 875.

Engraving.

LETTERS PATENT to William Henry Fox Talbot, of Lacock Abbey, in the County of Wilts, Esquire, for the Invention of "IMPROVEMENTS IN THE ART OF ENGRAVING."

Sealed the 15th June 1858, and dated the 21st April 1858.

PROVISIONAL SPECIFICATION left by the said William Henry Fox Talbot at the Office of the Commissioners of Patents, with his Petition, on the 21st April 1858.

I, WILLIAM HENRY FOX TALBOT, of Lacock Abbey, in the County of Wilts, Esquire, do hereby declare the nature of the Invention for "IMPROVEMENTS IN THE ART OF ENGRAVING," to be as follows:—

I take a very clean metal plate, either of copper, zinc, or steel, as prepared for the use of engravers, and I pour upon it a mixture of gelatine with bichromate of potash. When this film is dry I place upon it the object to be copied, which may either be an actual substance, as the leaf of a plant, a piece of lace, &c., or it may be an engraving, or a printed page, or else it may be a photograph representing any object. This is to be placed in a copying frame, and screwed into close contact with a film of gelatine on the metal plate, then placed in daylight or sunshine till a photographic impression is effected on the gelatine. So far the process is identical with

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Provisional Specification.

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that described by me in the Specification of my Patent for improvements in the art of engraving, bearing date the 29th day of October, in the year 1852. The novelty of the present Invention is in the mode of etching the image or picture obtained in the manner before mentioned, and which is done as follows:—I do not wash the picture or image, which I find not to be necessary, but 5 as soon as it is removed from the copying frame I cover or sprinkle the whole of its surface with very fine powder of copal or other resin. Then I melt this powder by heating it over a lamp. When the plate has grown cold I pour upon it a solution of perchloride of iron in water nearly saturated, and yet not quite saturated, which soon effects an etching if the process is well conducted. Sometimes I use other metallic chlorides and other salts with an acid reaction capable of etching the metallic plates. When the etching is effected the etching liquid is washed off with a rapid current of cold water; the plate is then cleaned with warm water, whiting, &c. Although as I have said it is not necessary to wash the photographic image when first taken out of the copying frame, nevertheless that process may be adopted, if preferred. 10 In that case it is best to wash the image on the metal plate with a mixture of water and spirits of wine in equal portions, then to wash it with spirits of wine alone, then to dry it, then to dip the metal plate into warm water for half a minute, and then to dry it again thoroughly, after which the powdered resin is to be put on, and the rest of the process conducted as it is above described, except that the etching liquid ought to be more diluted with water. I also employ the perchloride of iron for the purpose of ordinary etching, in lieu of aquafortis or nitric acid, which is commonly employed by engravers. 15

Another part of my Invention is as follows:—I take a plate of copper, zinc, or steel, and engrave or etch it all over, so that it will print a dark and uniform shade upon paper; I then cover it with a mixture of gelatine and bichromate of potash, and make a photographic image upon it, as above described; I then wash the picture in the manner above described, 20 by which the parts of the metal plate on which light has not acted are denuded of the gelatine, or partly so, exposing when the plate is dry the etched surface of the metal, while the parts on which light has acted strongly remain smooth, being covered with a thick coating of gelatine; I then take a slab of rather warm gutta serena and press it on the metal plate in a press; it will take the impression of the design or picture on the metal plate; I then electrotype the gutta serena, having first made its surface conductive of electricity, and thus I obtain an electrotyped etching; and to the processes herein described I have given the name of photoglyphic engraving. By a nearly 25

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object removed from the plate, a faint image is seen upon it, the yellow colour of the gelatine having turned brown wherever the light has acted. This process so far as I have yet described it is in all essential respects identical with that which I have described in the Specification of my former Patent for improvements in engraving, bearing date the 29th October 1852.

The novelty of the present Invention consists in the improved method by which the photographic image obtained in the manner above described is engraved upon the metal plate.

The first of these improvements is as follows:—I formerly supposed that it was necessary to wash the plate bearing the photographic image in water, or in a mixture of water and alcohol, which dissolves only those portions of the gelatine on which the light has not acted. And I believe that all other persons who have employed this method of engraving by means of gelatine and bichromate of potash have followed the same method; viz., that of washing the photographic image. But however carefully this process is conducted, it is frequently found when the plate is again dry, that a slight disturbance of the image has occurred, which of course is injurious to the beauty of the result. And I have now ascertained that it is not at all necessary to wash the photographic image. On the contrary, much more beautiful engravings are obtained 10 upon plates which have not been washed, because the more delicate lines and details of the picture have not been at all disturbed. The process which I now employ is as follows:—When the plate bearing the photographic image is removed from the copying frame, I spread over its surface, carefully and very evenly, a little finely powdered gum copal (in default of which common resin 25 may be employed). It is much easier to spread this resinous powder evenly upon the surface of the gelatine than it is to do so upon the naked surface of a metal plate. The chief error the operator has to guard against is that of putting on too much of the powder; the best results are obtained by using a very thin layer of it, provided it is uniformly distributed. If too much of the powder is laid on, it impedes the action of the etching liquid. When the plate has been thus very thinly powdered with copal, it is held horizontally over a spirit lamp, in order to melt the copal; this requires a considerable heat. It might be supposed that this heating of the plate, after the formation of a delicate photographic image upon it, would disturb and injure that image, 35 but it has no such effect; the melting of the copal is known by its change of color; the plate should then be withdrawn from the lamp and suffered to cool. This process may be called the laying an aquatint ground upon the gelatine, and I believe it to be a new process.

In the common mode of laying an aquatint ground, the resinous particles

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similar process a photoglyphic etching may be made upon the surface of the stones usually employed for lithography.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said William Henry Fox Talbot in the Great Seal Patent Office on the 14th October 1858.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, WILLIAM HENRY FOX TALBOT, of Lacock Abbey, in the County of Wilts, Esquire, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-first day of April, in the year of our Lord One thousand eight hundred and fifty-eight, in the twenty-first year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said William Henry Fox Talbot, Her special licence that I, the said William Henry Fox Talbot, my executors, administrators, and assigns, or such others 15 as I, the said William Henry Fox Talbot, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN THE ART OF ENGRAVING," upon the condition (amongst others) that I, the said William Henry Fox Talbot, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the 25 same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said William Henry Fox Talbot, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following 30 statement thereof, that is to say:—

The process described in this Specification, to which I have given the name of photoglyphic engraving, is performed in the following manner:—In this Invention I employ plates of steel, copper, or zinc, such as are commonly used by engravers. Before using a plate, its surface should be well cleaned. It 35 should then be rubbed with a linen cloth dipped in a mixture of caustic soda and whiting, in order to remove any remaining trace of greasiness. The plate

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are laid upon the naked surface of the metal, before the engraving is commenced. The gelatine being thus covered with a layer of copal disseminated uniformly and in minute particles, the etching liquid is to be poured on; this is prepared as follows:—Muratic acid, otherwise called hydrochloric acid, is saturated with peroxide of iron, as much as it will dissolve with the aid of 5 heat; after straining the solution to remove impurities, it is evaporated till it is considerably reduced in volume, and is then poured off into bottles of a convenient capacity; as it cools it solidifies into a brown semi-crystalline mass; the bottles are then well corked up and kept for use.

I shall call this preparation of iron by the name of perchloride of iron in the present Specification, as I believe it to be identical with the substance described by chemical authors under that name. For example, see Turner's Chemistry, 5th edition, page 137, and by others called permuriate of iron. For example, see Brande's Manual of Chemistry, 2nd edition, vol. 2, page 117; it is a substance very attractive of moisture. When a little of it is taken from a 15 bottle in the form of dry powder and laid upon a plate, it quickly deliquesces, absorbing the atmospheric moisture; in solution in water it forms a yellow liquid in small thicknesses, but chestnut brown in greater thicknesses. In order to render its mode of action in photoglyphic engraving more intelligible, I will first state that it can be very usefully employed in common etching, 20 that is to say, that if a plate of copper, steel, or zinc is covered with an etching ground, and lines are traced on it with a needle's point so as to form any artistic subject, then if the solution of perchloride of iron is poured on, it quickly effects an etching, and does this without disengaging bubbles of gas or causing any smell, for which reason it is much more convenient to use 25 than aquafortis, and also because it does not injure the operator's hands or his clothes if spilt upon them. It may be employed of various strengths for common etching, but requires peculiar management for photoglyphic engraving, and as the success of that mode of engraving chiefly turns upon this point, it should be well attended to. 30

Water dissolves an extraordinary quantity of perchloride of iron, sometimes evolving much heat during the solution. I find that the following is a convenient way of proceeding:—A bottle (No. 1) is filled with a saturated solution of perchloride of iron in water; a bottle (No. 2), with a mixture consisting of 5 or 6 parts of the saturated solution and 1 part of water; and a bottle (No. 3), 35 with a weaker liquid consisting of equal parts of water and of the saturated solution. Before attempting an engraving of importance, it is almost essential to make preliminary trials in order to ascertain that these liquids are of the proper strengths. These trials I shall therefore now proceed to point out. I have already



*Talbot's Improvements in the Art of Engraving.*

explained how the photographic image is made on the surface of the gelatine, and covered with a thin layer of powdered copal or resin, which is then melted by holding the plate over a lamp; when the plate has become perfectly cold, it is ready for the etching process, which is performed as follows:—A small quantity of the solution in bottle, No. 2, namely, that consisting of 5 or 6 parts saturated solution to 1 of water is poured upon the plate, and spread with a camel hair brush evenly all over it. It is not necessary to make a wall of wax round the plate, because the quantity of liquid employed is so small, that it has no tendency to run off the plate. The liquid penetrates the gelatine wherever the light has not acted on it, but it refuses to penetrate those parts upon which the light has sufficiently acted.

It is upon this remarkable fact that the art of phototypic engraving is mainly founded. In about a minute the etching is seen to begin, which is known by the parts etched turning dark brown or black, and then it spreads over the whole plate, the details of the picture appearing with great rapidity in every quarter of it. It is not desirable that this rapidity should be too great, for in that case it is necessary to stop the process before the etching has acquired sufficient depth (which requires an action of some minutes' duration). If, therefore, the etching on trial is found to proceed too rapidly, the strength of the liquid in bottle No. 2 must be altered (by adding some of the saturated solution to it), before it is employed for another engraving. But if, on the contrary, the etching fails to occur after the lapse of some minutes, or if it begins, but proceeds too slowly, this is a sign that the liquid in bottle No. 2 is too strong, and too nearly approaching saturation. To correct this a little water must be added to it before it is employed for another engraving; but in doing this the operator must take notice that a very minute quantity of water added often makes a great difference, and causes the liquid to etch very rapidly; he will therefore be careful in adding water not to do so too freely. When the proper strength of the solution in bottle No. 2 has thus been adjusted, which generally requires 3 or 4 experimental trials, it can be employed with security. Supposing, then, that it has been ascertained to be of the right strength, the etching is commenced as above mentioned, and proceeds till all the details of the picture have become visible, and present a satisfactory appearance to the eye of the operator, which generally occurs in two or three minutes, the operator stirring the liquid all the time with a camel hair brush, and thus slightly rubbing the surface of the gelatine, which has a good effect. When it seems likely that the etching will improve no farther, it must be stopped; this is done by wiping off the liquid with cotton wool, and then rapidly pouring a stream of cold water over the plate, which carries off

*Talbot's Improvements in the Art of Engraving.*

all the remainder of it. The plate is then wiped with a clean linen cloth, and then rubbed with soft whiting and water to remove the gelatine. The etching is then found to be completed.

I will now describe another etching process very slightly differing from the former, which I often use:—When the plate is ready for etching, pour upon it a small quantity of the liquid (No. 1) (the saturated solution); this should be allowed to rest upon the plate 1 or 2 minutes; it has no very apparent effect, but it acts usefully in hardening the gelatine. It is then poured off from the plate, and a sufficient quantity of solution No. 2 is poured on. This effects the etching in the manner before described. And if this appears to be quite satisfactory, nothing further is required to be done. But it often happens that certain faint portions of the engraving, such as distant mountains or buildings in a landscape, refuse to appear, and as the engraving would be imperfect without them, I recommend the operator in that case to take some of the weak liquid No. 5 in a little saucer, and without pouring off the liquid No. 2 which is etching the picture, to touch with a camel hair brush dipped in liquid No. 3 those points of the picture where he wishes for an increased effect. This simple process often causes the wished for details to appear, and that sometimes with great rapidity, so that caution is required in the operator in using this weak solution No. 3, especially lest the etching liquid should penetrate to the parts which ought to remain white. But in skilful hands its employment cannot fail to be advantageous, for it brings out soft and faint shadings, which improve the engraving, and which would otherwise probably be lost. Experience is requisite in this as in most other delicate operations connected with photography; but I have endeavoured clearly to explain the leading principles of this new process of engraving according to the mode which I have hitherto found the most successful.

With respect to the second invention mentioned in my Provisional Specification, in which the electrotypo process is employed, I have found that it gives less successful results than that which I have fully described above, and I have therefore omitted it from this Specification, and make no claim with respect to it. In conclusion, I would remark that besides the process of phototypic engraving considered as a whole being new, I believe the following points also to be new, viz:—

First, the etching a photographic image formed upon a surface of gelatine and bichromate of potash without first disturbing that surface by washing it with water or alcohol.

Second, the laying an aquatint ground of resin or copal upon a surface of gelatine, and not as usual upon the naked metallic surface of the plate.

*Talbot's Improvements in the Art of Engraving.*

Third, after forming a photographic image on gelatine, the heating it strongly over a spirit lamp or otherwise.

Fourth, the use and employment of perchloride of iron as an etching liquid for the production of phototypic engravings.

Fifth, the use and employment of the same as a substitute for aquafortis in common etching.

In witness whereof, I, the said William Henry Fox Talbot, have hereunto set my hand and seal, this Twenty-second day of September, in the year of our Lord One thousand eight hundred and fifty-eight.

W. H. F. TALBOT. (l.s.)

Witness,

JNO. ALCOCK.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.  
[G. 8337—22—10/1900]



*The Photographic News, November 12, 1858*



15X



45X





A.D. 1855 . . . . . N° 2815.

### Photographic Printing.

LETTERS PATENT to Alphonse Louis Poitevin, Civil Engineer, of Paris, in the French Empire, for the Invention of "IMPROVED PHOTOGRAPHIC PRINTING."

Sealed the 25th April 1856, and dated the 13th December 1855.

PROVISIONAL SPECIFICATION left by the said Alphonse Louis Poitevin at the Office of the Commissioners of Patents, with his Petition, on the 13th December 1855.

I, ALPHONSE LOUIS POITEVIN, do hereby declare the nature of the said Invention for IMPROVED PHOTOGRAPHIC PRINTING, to be as follows:—  
I print photographically with ink of a greasy nature on paper, lithographic stone, metal, glass, wood, or other suitable material, in the following manner:—  
I apply upon the surface which is to receive the design one or more layers or films of a mixture of equal parts of a concentrated solution of albumen, fibrine, gum arabic, gelatine, or similar organic substance, and a concentrated solution of a chromate or bichromate of potash, or of any base which does not precipitate the organic matter of the first solution. This single or compound layer or film is then dried if the photographic impression is to be produced by contact; or it may be used in a moist state when the photographic impression is to be produced in the camera obscura. In producing the impression by contact, the surface is covered with a photographic negative picture, or an engraving, or other transparent or partially transparent object, or screen, and

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### Poitevin's Improved Photographic Printing.

and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man an Invention for IMPROVED PHOTOGRAPHIC PRINTING upon the condition, (amongst others) that I, the said Alphonse Louis Poitevin, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Alphonse Louis Poitevin, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say:—

I print photographically with ink of a greasy nature on paper, lithographic stone, metal, glass, wood, or other suitable material, in the following manner:—  
I apply upon the surface which is to receive the design one or more layers or films of a mixture, of equal parts of a concentrated solution of albumen, fibrine, gum arabic, gelatine, or similar organic substance, and a concentrated solution of a chromate or bichromate of potash, or of any base which does not precipitate the organic matter of the first solution. This single or compound layer or film is then dried if the photographic impression is to be produced by contact; or it may be used in a moist state when the photographic impression is to be produced in the camera obscura. In producing the impression by contact, the surface is covered with a photographic negative picture, or an engraving, or other transparent or partially transparent object, or screen, and then exposed to light, as in the ordinary photographic process. After a sufficient exposure, if the surface has become dry or has been used in a dry state, it is moistened with water by means of a sponge, and, while moist, the greasy ink or matter is applied to the surface by a ball or dabber, or by a roller or press, or otherwise, and it will be found to adhere to those parts only which have been affected by the light. Thus, if the screen employed be a negative, having the lights and darks reversed, the print will be a positive, with the lights and darks correct; and, if the screen be a positive, the print will be a negative. The print may be retained on the surface on which it is first produced, or it may be transferred or printed upon paper or other suitable material, and the operation repeated. I thus obtain a design upon lithographic stone, or other suitable material, from which I am enabled to multiply impressions by the method of lithographic printing by inking the moistened surface with a greasy ink.

I apply various liquid and solid colours upon paper, cloth, glass, and other

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### Poitevin's Improved Photographic Printing.

then exposed to light, as in the ordinary photographic process. After a sufficient exposure, the greasy ink or matter is applied to the surface by a ball or dabber, or by a roller or press, or otherwise, and it will be found to adhere to those parts only which have been affected by the light. Thus, if the screen employed be a negative, having the lights and darks reversed, the print will be a positive, with the lights and darks correct; and, if the screen be a positive, the print will be a negative. The print may be retained on the surface on which it is first produced, or it may be transferred or printed upon paper, or other suitable material, and the operation repeated. I apply various liquid and solid colours upon paper, cloth, glass, and other surfaces by mixing such colours with the aforesaid mixture of a chromate or bichromate with organic matter, and applying this new mixture or combination to the paper, or other fabric, or surface. The photographic impression is produced upon this prepared surface or material by the action of light, as before, and it is then washed with a sponge and a large quantity of water. The albumen or other organic matter is rendered insoluble at the parts where it has been acted upon by the light, and the design is thus produced in the colour which has been employed. Mixtures containing different colours may be applied to different parts of the surface, corresponding to different parts of the negative or screen employed to produce the photographic impression. A design in several colours may thus be produced. The proportions of the materials may be varied.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Alphonse Louis Poitevin in the Great Seal Patent Office on the 7th June 1856.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, ALPHONSE LOUIS POITEVIN, Civil Engineer, of Paris, in the French Empire, send greeting.  
WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Thirteenth day of December, in the year of our Lord One thousand eight hundred and fifty-five, in the nineteenth year, of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Alphonse Louis Poitevin, Her special licence that I, the said Alphonse Louis Poitevin, my executors, administrators, and assigns, or such others as I, the said Alphonse Louis Poitevin, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term, therein expressed, should 35

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### Poitevin's Improved Photographic Printing.

surfaces, by mixing such colours with the aforesaid mixture of a chromate or bichromate with organic matter, and applying this new mixture or combination to the paper or other fabric or surface.

The photographic impression is produced upon this prepared surface by the action of light passing through a negative photographic picture, or an engraving, or other suitable object, or screen, or in the camera obscura, and it is then washed with a sponge and a large quantity of water. The albumen or other organic matter is rendered insoluble at the parts where it has been acted upon by the light, and the design is thus produced in the colour which has been employed. Mixtures containing different colours may be applied to different parts of the surface, corresponding to different parts of the negative or screen employed to produce the photographic impression. A design in several colours may thus be produced. The proportions of the materials may be varied.

Having now described the nature of my said Invention, and in what manner the same is to be performed, I wish it to be understood that what I claim is,—

First, the mode of printing in the manner of lithography, by moistening and inking with a greasy ink a lithographic stone, or other suitable surface, prepared with chromatized albumen, fibrine, gum, gelatine, or similar organic substance, and on which a photographic impression or effect has been produced in manner herein before described.

Second, the mode of printing upon paper, cloth, glass, or other suitable surfaces, by applying to them a mixture of liquid or solid colours with the aforesaid chromatized albumen or other organic matter, and exposing to light, as herein before mentioned, and afterwards washing away those portions of the mixture which have not been acted upon by the light, as herein before described.

In witness whereof, I, the said Alphonse Louis Poitevin, have hereunto set my hand and seal, this Second day of June, in the year of our Lord One thousand eight hundred and fifty-six.

Witness,

A. L. POITEVIN. (L.S.)

CH. ARMENGAUD, Ing<sup>r</sup> Civil,  
6, Rue Filles du Calvaire, à Paris.

LONDON:  
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,  
Printers to the Queen's most Excellent Majesty. 1856.



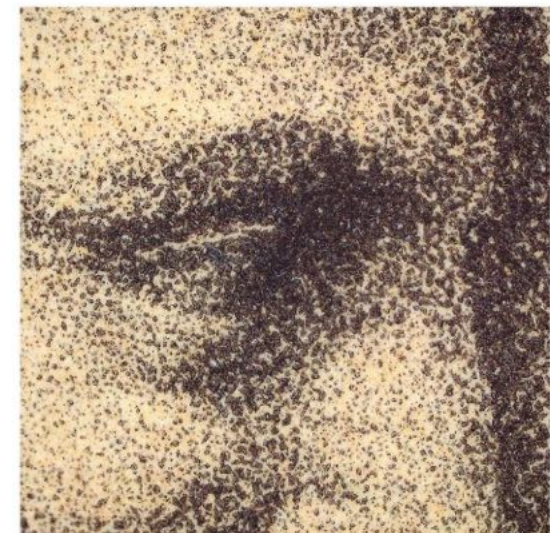
Choix de Terres Cuites Antiques du Cabinet de M. Le Vicomte Hte de Janzé

Mark Katzman





Labarte, *Histoire des Arts Industriels au Moyen Age*

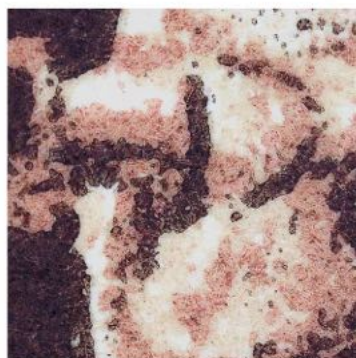


15X



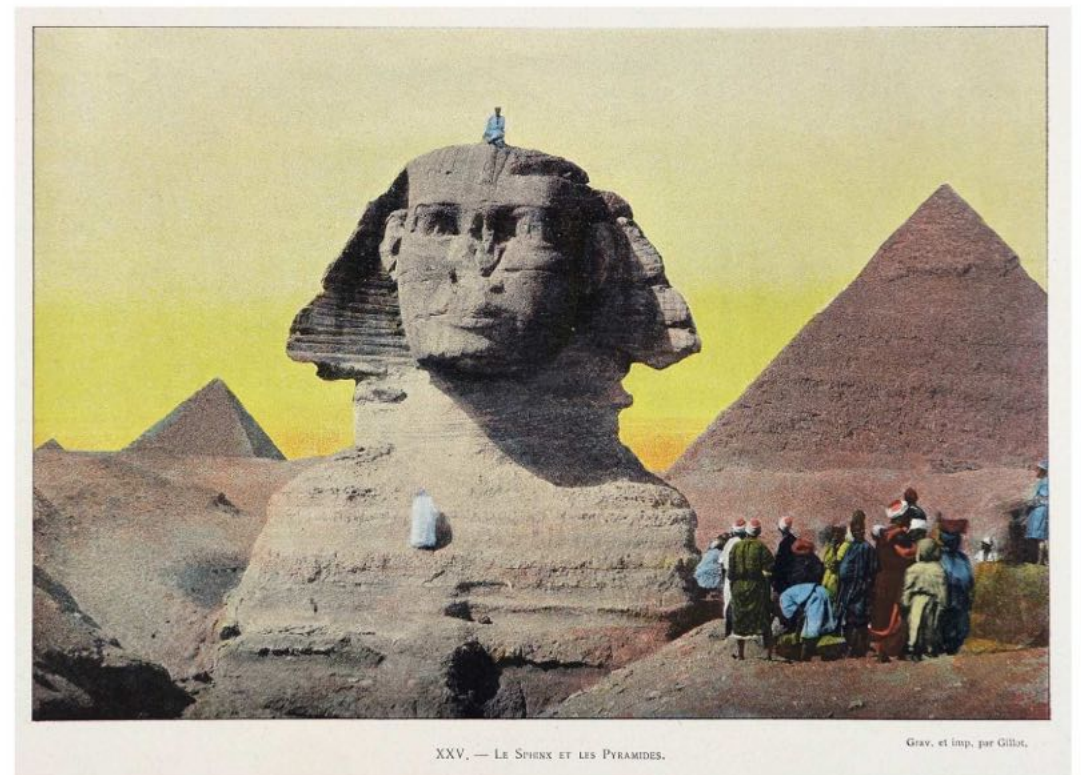


"On a new craniophore for use in making composite photographs of skulls", *Memoirs of the National Academy of Sciences*, vol. III part 2, 1886



15X

This is the final picture page. This long list of examples covers the most common methods of photomechanical reproduction, however there is a whole world of alterations, combinations, adulterations, designed to catch the viewer's eye and to make the image more imaginative. Here are two such examples: The first by Julius Bien – a photolithograph with multiple tints and heavily retouched. Examples like this were used extensively in government publications in the US. The second by Gillot is a halftone with fanciful tints from a publication that ran to hundreds of photographs from around the world. I didn't think that there was a place for these except as a tantalizing sample.



*Autour du Monde*, fascicule IV, "Égypte Paysages et Monuments"



15X



## ACKNOWLEDGEMENTS

Without the interest, encouragement and help of Susan Roeper at the Sterling and Francine Clark Art Institute, who was the person that saw a small glimmer of value in my obsession, I would not have pursued this project. Steven F. Joseph has been the person who corrected all of my flaws, did translations, gave images from his collection and has been completely encouraging. Mark Katzman has given freely from his extensive collection. Leonard Seastone and Paul Taylor have both donated their expertise in printing from old process plates. The photography dealers Hans P. Kraus Jr. and Charles Wood donated works and encouragement. Museums supplied examples including The National Library of Sweden, Stockholm; The Albertina Museum, Vienna; The J. Paul Getty Museum, Los Angeles; The George Eastman Museum, Rochester; The Société Française de Photographie, Paris; The Victoria and Albert Museum, London; The Graphic Arts Collection, National Museum of American History, Smithsonian Institution, Washington. I would also like to thank Helena Wright, curator of the Graphic Arts Collection who has for many years been helpful and encouraging, and Fred Pajerski who found a home for my accumulation. Finally I would especially like to thank Howard Daitz who with his extraordinary knowledge helped me enormously starting in about 1977.

All illustrations in this project, other than those identified with the example are in the collection of the Sterling and Francine Clark Art Institute.



## **Production**

Without the advent of print on demand technology this project would never have been possible for me to do by myself. Also, until very recently the cost of so many color images would have been prohibitively expensive. It wasn't that long ago that each image was billed separately – this project has over 670 images.

I am very indebted to the Sterling and Francine Clark Art Institute for allowing me to come and photograph from their collection. I spent three very long days there using both a digital camera in a simple copy stand and a digital microscope attached to a laptop computer. My system was quite rudimentary by professional standards, a Sony RX100 camera, LED strip lights, and a Celestron 5mg. microscope. Also at home I used an inexpensive Epson scanner. All of the images were corrected and adjusted in Photoshop CS6. I used the simple layout program furnished by the printing company Blurb. Those images furnished by others, including institutions were done on probably much better equipment.

Over the two years that I focused exclusively on this project I spent a great deal of time using the Internet. A great many publications have been digitized and are accessible. Without web sales sites I would not have many of the examples that I was able to track down through them.

DAH

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December - 2017







