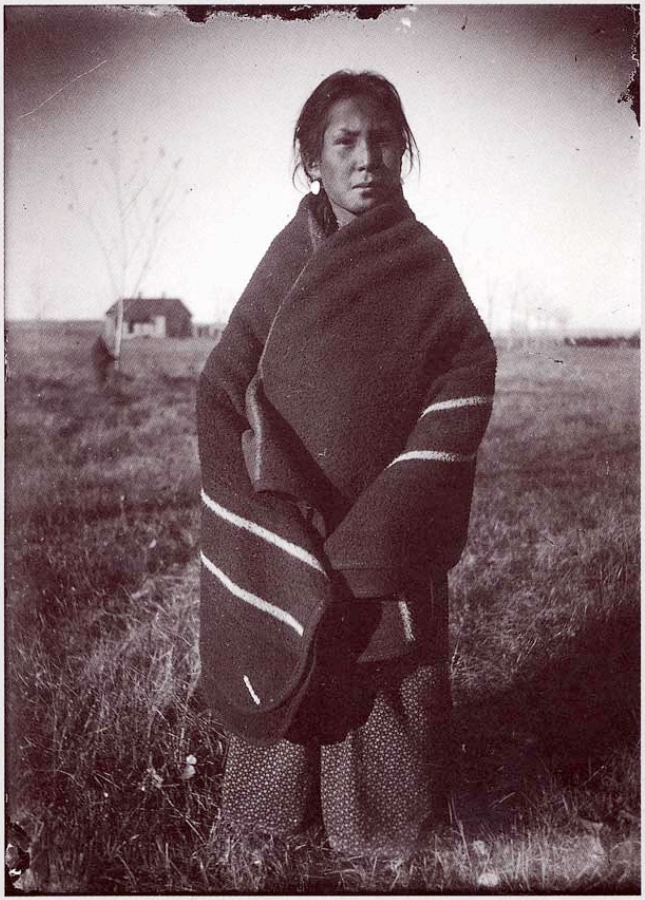
Gelatine Chloride Printing-Out Paper: Some Historical and Contemporary Notes

The first production, over a century ago, of gelatine chloride printing-out paper marked the introduction of one of the most long-lived printing products in the history of photography. From its earliest European manufacture (in Munich by Obernetter, 1884, and in Dusseldorf by Liesegang, 1886) and its earliest American manufacture soon thereafter (by both Bradfisch & Hopkins of Brooklyn, and the New York Aristotype Company of New York City), gelatine chloride printing-out paper has been on the market nearly continuously for over one hundred years.



Fred E. Miller
Crow girl, ca. 1910
Goldtoned POP print from dry gelatine glassnegative
Collection Nancy Fields - O'Connor, USA
Printed by Doug Munson, Chicago Albumen Works

However, there is an historical irony to the introduction of this product. Gelatine chloride printing-out paper was not marketed and used because it was a progressive and 'modern' product. It was developed in response to the conservatism of the professional photographic community of the late 1880's and early 1890's. While its popularity was augmented by its wholesale adoption by the then new and emerging cadre of amateur photographers, P.O.P.'s longevity derives from its continued utility to professional photographers, its direct lineage as an historical printing media, and its unique and beautiful printing characteristics.

Until the 1880's, photographic printing was done almost exclusively on albumen paper. While the paper was albumenized (coated with a salted egg white solution) in large factory productions and sold through various jobbers and supply houses, each individual photographer or studio still had to sensitize the paper on a daily basis for their own use. Albumen paper was relatively insensitive to light, and it required direct exposure, by contact to a full-size negative, to sunlight or open sky. The image emerged completely during the exposure, and the processing merely called for the paper to be rinsed in water, toned in an alkaline solution of gold chloride, fixed in plain photographic hypo, and washed.

In the early 1880's, attempts were made to introduce silver bromide developing papers, utilizing the same chemistries which had been recently developed for the marketing of the new gelatine dry plates. The studios would have none of it, however. While the new silver bromide papers could produce images which would not fade and whose whites would not yellow (both were problems of albumen prints), and while the new papers were fast enough that enlargements could be made, these features could not overcome the traditions of the previous thirty years of albumen printing. These papers had a lifeless neutral black tone, rather than the rich chestnut hue of the albumen print, and the ability to produce enlargements was largely irrelevant because professional studios were not yet using small cameras. But most importantly, the studios were not set up to print in true darkrooms. The old albumen paper was so slow that it could be processed and handled in dim natural light. Whether for contact printing or for enlarging, the new bromide papers required printing and processing rooms too radically different to be readily accepted, and the new papers were far too sensitive to survive the working habits of a generation of albumen printers without being fogged.

Gelatine dry plate negatives could be processed in the same darkrooms as could the older collodion wet plates. Indeed, shifting to the new dry plate technology did not require great changes in working routines, and many studios used both processes concurrently for years. For non-critical work, they used the new dry plate process. Being pre-sensitized these plates were easier to use, but they possessed uncertain speed, contrast, and aging characteristics. For critical work and work away from the studio which could not be repeated, photographers used the older wet plate process. As wet plate negatives had to be processed immediately, an imperfect plate could be remade on the spot.

The studios were ready to accept a pre-sensitized, factory-produced printing paper, so long as it behaved like the old albumen paper to which they were accustomed. Their willingness was rewarded by two such papers. Nearly concurrently, in the mid- to late- 1880's, both collodion chloride printing-out papers and gelatine chloride printing-out papers were introduced to the market.

Similar to each other in chemistry and working methods, one paper adopted the collodion of the wet-plate process as its vehicle, and the other gelatine of the dry-plate process. They were each coated on a lightweight, baryta surfaced paper stock (to keep in line with the light weight and surface gloss of albumen paper), and each contained as essential chemicals, silver chloride, silver nitrate, silver citrate or tartrate, and citric or tartaric acid. They were each true emulsions. Made with an excess of silver nitrate, the fact that they were 'unwashed' emulsions caused them to behave astonishingly like albumen paper. They had about the same printing speed as albumen paper, they printed-out during exposure to the same intensity, and they had nearly the same contrast (their slightly higher contrast was actually useful in printing the new gelatine dry-plates). Their processing sequence was the same, and, most importantly to the studios, the papers could be processed in existing processing areas with virtually the same chemistry. Equally as important as these utilitarian factors, the two new papers looked very much like albumen paper in image color and surface texture, and what is more, they would not yellow or fade as easily.

While initially the term 'aristotype' was used by some manufacturers to refer to both collodion and gelatine printing-out papers, it soon came to refer exclusively to the collodion papers.

Gelatine chloride printing-out papers were distinguished by the acronym 'P.O.P.'. The term was introduced by Ilford Ltd., in 1891, as a trade name, but it soon achieved the status of a generic label.

By the mid-1890's there were at least six American firms producing collodion papers and no fewer than eight companies making P.O.P. papers. By contrast, there were only two companies making gelatine emulsion developing papers, and each had a very small market share. Aristotype and P.O.P. papers were available in either matte or glossy surface, and, in addition, P.O.P. could be had with a white, pink, or mauve tinted paper base.

For twenty years, collodion and gelatine printing-out papers were the standard of the industry. Catalogues from the early twentieth century devote twice as many pages to the availability of aristotype and P.O.P. papers, as they do to the availability of gaslight and bromide developing papers combined. (Gas light papers were special

Pieter Oosterhuis
The Harbour of Rotterdam, 1865/1870
Goldtoned POP print from wet collodion stereoglassnegative
Collection W.L. Oosterhuis
Printed by Jan van der Kooi, commissioned by the Municipal Archives of Amsterdam

silver chloride developing papers slow enough not to require a true darkroom, but fast enough to be exposed by artificial light.) Sales records of American paper manufacturers show printing-out papers consisting of 60% of the market in l899. Interestingly enough, these same records indicate that in America, collodion artistotype papers outsold P.O.P. by over 50%, while in Europe the situation was reversed, with gelatine P.O.P. being by far the more popular paper.

The Eastman Company introduced its first P.O.P.,which was trade named 'Solio', in l892, and nearly every maker of photographic printing papers, in both Europe and North America, produced P.O.P. as well. One by one, as the profession shifted from contact printing to enlarging papers, the P.O.P. papers were withdrawn from the market. Finally, in 1987, the Eastman Kodak Company ceased manufacture of the last P.O.P. ('Studio Proof' paper).

But the history of P.O.P. did not end there. Within a year, the French firm of R. Guilleminot, Boespflug & Cie resurrected a P.O.P. formula, and the Chicago Albumen Works of Housatonic, Massachusetts, arranged to distribute the paper in North America and Europe, through the Dutch conservation laboratory, the Nationaal FotoRestoratie Atelier. Upon the demise of Guilleminot in 1995, Kentmere Photographic Ltd. UK, began production of Centennial™ POP for exclusive distribution by the Chicago Albumen Works.

WHY, AFTER AN ENTIRE CENTURY, IS THERE STILL DEMAND FOR THIS PRODUCT?

The answer to this question is partly technical, partly historical, partly aesthetic, and partly utilitarian.

The printing characteristics of P.O.P. cannot be found in any other contemporary printing paper. It has an exceptionally long tonal scale, requiring negatives of a corresponding density range. Its image color can range from a ruddy brown through a rich chestnut to a violet-black according to the processing given each sheet. While these attributes are a matter of taste to contemporary working photographers, they are a matter of necessity when printing pre-turn-of-the-century negatives, which more than likely were made to be printed on a printing-out paper. Trying to print long-scale nineteenth century glass plates and early sheet film negatives on today's developing papers is a procedure doomed to inadequacy. The density and exposure scales do not fit, the mid-tones do not fall properly, and there is no proper color. (Toning a developing paper can only mimic the hues of a true P.O.P. print.)

As institutions and the viewing public become more sophisticated in the history of photography, it becomes imperative that historical negatives be printed in a manner true to their original presentation. Only when we can see prints which are historically and aesthetically

correct, will we be able to fully feel the true impact they had on their original audiences.

In addition to its unique printing characteristics, P.O.P. paper is a very convenient proofing system which requires no darkroom. Many portrait studios today still offer fully printed, but un-fixed (thus, unstable) P.O.P.'s to their clients as proofs, which cannot be copied. However, perfectly stable proofs may also be made by merely fixing the printed-out image, and many photographers use P.O.P. to make proofs because the printing can be done at leisure, without the necessity of setting up a full darkroom.

It would be misleading to concentrate on the use of P.O.P. as a proofing paper. Many contemporary photographers are desirous of printing on a commercially prepared paper which can exhibit more warmth and a different character than currently available black and white papers. The tonal scale and color of P.O.P. offers photographers a unique option for photographic printing.

The processing of P.O.P. paper differs from that of customary developing papers. Nevertheless, it is quite straightforward and easily learned, and while it is not the intent of this article to present detailed processing instructions, below is a brief outline of the sequence employed in the printing and processing of gelatine chloride printing-out paper.

Two of the most salient features of P.O.P. have already been mentioned: its extreme slowness and the fact that the image appears spontaneously during the exposure. As a consequence, P.O.P. can be used as a contact printing material only. Exposures are made by sunlight or other strong ultraviolet source, and the degree of printing is periodically checked by looking at the printed-out image in dim light. This can be accomplished without losing registration between the negative and the print by using a split-back printing frame which is designed to allow one side to be opened while the other continues to hold the negative and print firmly in register. As the subsequent processing steps will cause the print to lighten somewhat, printing is extended so that the image looks darker than it should for final viewing. When it is judged that the print is sufficiently exposed, it can be removed from the printing frame and held for processing.

To process, the print is first given a short rinse in slowly running water. It is then toned in a gold chloride toner. The effect of the toning is two-fold. First, it establishes the unique hues characteristic of P.O.P. papers, and second, it lessens the bleaching action of the hypo, so the prints do not have to be over-printed as much.

After the desired degree of toning has been reached, the print is immersed directly into a 15% plain hypo solution and fixed for ten minutes. A two-bath hypo system, with five minutes in each bath, is recommended. Once the fixing is complete, the print is washed as one would wash any fine print.

P.O.P. prints must be dried face up on blotters or screens, but once dry they may be flattened in a warm dry mounting press.

During the processing of P.O.P. prints, vast color and density changes occur from step to step. The changes which go on during the pre-rinse, the fixing, and the drying cannot be altered, but the color of the final print can be controlled during the toning, and that is the challenge in P.O.P. printing. The printer must learn to observe how much change has occurred during toning and correlate that by memory to the appearance of the final print.

Printing-out paper is an important part of our printmaking vocabulary. It serves to broaden our contemporary means of visual expression as well as to provide access to a greater understanding of historical photography. Far from being an historical relic, it is a vital medium with qualities unmatched by other printing papers.

Doug Munson

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Information, datasheets and order forms may be obtained by writing or faxing:

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