

# **A NON-SILVER MANUAL**

Cyanotype, Vandyke Brown, Palladium & Gum Bichromate  
with instructions for making light-resists including pinhole photography

by

**Sarah Van Keuren**

with

**GUM PRINTING ON ALTERNATIVE SURFACES** by Dana Leight

New in this edition:

**DESKTOP NEGATIVES** by Sandra C. Davis

**INSTRUCTIONS FOR VERTICAL COPY CAMERAS**  
by Sandra C. Davis, Stuart Goldstein, and SVK

**ONE INTERPRETATION OF GUM PRINTING** by Melissa Good

**CASEIN PRINTING** by Rosae Reeder

# CONTENTS

PREFACE

LIGHT-RESISTS WITHOUT CAMERA OR COMPUTER

CYANOTYPE

PINHOLE PHOTOGRAPHY

ENLARGED NEGATIVES

Desktop Negatives by Sandra C. Davis

Instructions for Vertical Copy Cameras  
Sandra C. Davis, Stuart Goldstein, Sarah Van Keuren

VANDYKE BROWN

PALLADIUM

GUM BICHROMATE

GUM PRINTING ON ALTERNATIVE SURFACES by Dana Leight

One Interpretation of Gum Printing by Melissa Good

CASEIN PRINTING by Rosae Reeder

RESOURCES

The pagination of individual handouts has been retained. The formatting and fonts of the different contributors have also been retained.

## PREFACE

This manual is intended to reinforce and supplement classroom instruction but may also assist artists outside the classroom who are already committed to working in non-silver processes. It originates from a collection of handouts that I wrote for non-silver students at The University of the Arts (formerly the Philadelphia College of Art) in the 1980s and early 90s. My explicit descriptions of processes are not put forth as *the* way but rather as *a* way that has worked for students and myself. It is one of the pleasures and rewards of teaching to see students finding their own ways — and to learn from them!

### A Body of Knowledge

You might expect that non-silver processes from the 19<sup>th</sup> century would comprise a static body of knowledge but I have not found that to be the case. In 1977 when *Breaking the Rules: A Photo Media Cookbook* by Bea Nettles was published, her slender volume was the definitive printed word on the topic of non-silver. When *The Keepers of Light* by William Crawford was published two years later it seemed positively encyclopedic. Little did I imagine that cyanotype, which occupied a bit more than one page in Nettles' book and 6 pages in Crawford's book, would by 1999 be the subject of a fascinating 178 page book titled *Cyanotype: The History, Science and Art of Photographic Printing in Prussian Blue* by Dr. Mike Ware. Recently we had the luxury of a periodical devoted to all aspects of non-silver, namely *Post-Factory Photography* published by Judy Seigel.

My introduction to pinhole photography was Jim Schull's little book of humorous drawings, *The Hole Thing*, published in 1974. *Pinhole Journal*, edited and published by Eric Renner and Nancy Spencer delighted and educated for over two decades, and Eric's in-depth *Pinhole Photography: Rediscovering a Historic Technique* is a major reference. Within the past few years, two new comprehensive, handsomely illustrated volumes, *The Book of Alternative Photographic Processes* by Christopher James and *Photography's Antiquarian Avant-Garde: The New Wave in Old Processes* by Lyle Rexer have contributed to our understanding and appreciation of non-silver.

And what, you may ask, would be the place of my small, un-illustrated, self-published manual within this wealth of new literature on non-silver? I don't know the history of non-silver processes as well as Christopher James does nor do I know about as many processes as he does. And I don't have the perspective on the contemporary art scene that Lyle Rexer demonstrates. Certainly I don't know chemistry or the history of science the way Mike Ware does. Judy Seigel's deep knowledge of the field of alternative processes cannot be matched.

What this manual does offer is a body of practical knowledge gained from my experience as artist and teacher as well as the practical knowledge of those who generously contributed to this new edition. I have covered what I have been able to do within the constraints of a modest lifestyle with modest facilities. And I have been able to teach the contents of this manual to others within the limits of weekly 6-hour studio classes over the course of two semesters. The un-ambitious scope of this manual may be its strength.

### **What's New in the Third Edition?**

The text of this manual has undergone many revisions during the 29 years that I have been teaching non-silver processes in the Printmaking studios at UArts. For this Third Edition I went over the entire text, modifying and expanding it in accordance with what I learned in the past several years. As continuous-tone sheet films are phased out and we move into the digital age in earnest, I have tried to find digital ways to produce the full scale matrices required for printing in non-silver. For the 8<sup>th</sup> Revision I updated all of the chapters that I wrote. This 9<sup>th</sup> Revision simply updates the *Resources* chapter.

A chapter by Rosae Reeder on casein printing, a collaborative piece on using an old-fashioned copy camera by Sandra Davis, Stuart Goldstein, and myself, a page by Sandra Davis on digital negatives, and a page by Melissa Good on her way of printing in gum bichromate from digital negatives are new in this 3<sup>rd</sup> edition but have not been changed in this revision.

### **Acknowledgements**

For their help with this manual in its earlier stages I want to thank Dana Leight, who, as a graduate student and teaching assistant, encouraged me to self-publish. Her page on surfaces to print on besides paper has stood up over time. Thanks also to the late book artist Enid Mark who critiqued my initial text and part of this one. Going back in time, thanks to Lois Johnson, Patricia Dreher and the late Jerome Kaplan, for introducing me to non-silver processes in the mid-1970s and to Phil Simkin for getting me started with pinhole photography and later my first computer. Thanks to the University of the Arts for awarding me four Venture Fund grants that helped support research in preparation for the writing of this manual and for providing workshops and classes to bring the faculty up to speed with computers. Most sincere thanks to Harris Fogel, in Media Arts/Photography at UArts for his generous support in my quest to make digital negatives to print in non-silver and for his help in the production of this edition. Thanks to Sandra Davis, Stuart Goldstein, Melissa Good, and Rosae Reeder for their contributions to this third edition. I am especially indebted to Stuart Goldstein for his help in editing the new and expanded text of this edition. And thanks to my partner Harry Kalish for his continuous support.

Finally, thanks to the non-silver students, undergraduate and graduate, matriculated and non-matriculated, who have used these antique 19<sup>th</sup> century processes to convey their late 20<sup>th</sup>/early 21<sup>st</sup> century visions. They have given me an expanded understanding of the range of expression inherent in the processes described in this manual.

### **Warning**

There is an environmental price to pay for the alchemy that takes place in the production of non-silver images. Less toxic means of expression should be exhausted first (especially by people whose homes have septic tanks).

Some of the metallic compounds and certain other chemicals used in these processes are potentially hazardous to the printer. As a general rule, children should not be taught non-silver processes because of the risk of skin contact and inadvertent ingestion of the chemicals. Even adult classes should be small and closely supervised to ensure safe practices. A student should not be required to take a non-silver class if he or she has no

interest in the processes. Students in my classes sign a contract in which they agree to adhere to explicit safety guidelines.

### **Feedback**

Corrections or suggestions for improving the text are welcomed and may be incorporated into future revisions with appropriate acknowledgement. Such material (including questions about or orders for the manual) can be sent directly by U.S. mail to:

Sarah Van Keuren, 6 Herford Place, Lansdowne, PA 19050-2408  
or by email to: [svankeuren@comcast.net](mailto:svankeuren@comcast.net)

*Copyright 2009 by Sarah Van Keuren and Individual Contributors*  
All Rights Reserved

# LIGHT-RESISTS WITHOUT CAMERA OR COMPUTER

## Basic Principle

The non-silver processes covered in this manual rely primarily on the energy of light rather than the energy of chemicals to produce a print. This light, referred to as *actinic* light, is rich in ultraviolet and blue rays. In the 19<sup>th</sup> century the only source of actinic light was the sun. Where actinic light strikes paper coated with one of the non-silver solutions or emulsions for a sufficiently long time, a chemical reaction occurs and the coated paper darkens or takes on a different color. Where actinic light is prevented from reaching sensitized paper, the chemicals wash out leaving plain paper. Where light is partially prevented from striking, a tone is produced that is somewhere between the completely darkened paper and the original color of the paper.

The ways of making light-resists discussed below produce white shapes or marks on a dark ground — with the exception of ‘Opening Up Lines’.

## Possibilities

**3-D Photograms:** The most direct way to produce an image is to lay objects upon the sensitized paper. This is a variety of photogram. A point light source, such as the sun in a clear sky or an old-fashioned sunlamp, casts shadows from standing objects that print clearly. A diffuse light source, such as an overcast sky or an array of black light tubes, eliminates delineating shadows revealing only the ‘footprint’ of the object on the paper.

Partially translucent objects allow varying amounts of light to penetrate to the sensitized paper and produce intermediate tones. Such tones can be produced also by moving opaque objects during the exposure.

**Flat Photograms:** Materials that can be pressed tight by plate glass against sensitized paper — such as botanical specimens, tissue, wisps of cotton, locks of hair, lace, onion skin, cheesecloth, and translucent printed matter — produce light shapes in various tones

on a dark ground. If you want to prevent chemical reactions or staining, insert a layer of clear acetate between the coated paper and damp photogram materials such as leaves or flowers. You could tape or glue photogram materials to the acetate to permit multiple printings of a particular arrangement of photogram materials. You could also compose a number of related photograms on acetate to print in successive layers of gum bichromate colors or layers of other non-silver processes.

**Markers, Washes & Colored Pencils:** The same clear acetate may be drawn on with rubylith or amberlith AD markers. Red and orange dyes in these markers block actinic rays. The inks in other markers, such as black, brown or red Sharpies, are not designed to hold back light very effectively. Blue and green markers definitely allow actinic light to penetrate and are the least effective light resists.

In 2001, Faber-Castell introduced Pitt Artists' Pens in black, sepia and sanguine — all permanent, acid-free India inks that do block light effectively. Each of the three colors comes with 4 different nibs including a versatile brush nib. Artist Mary Laniel Nakigan used the 3 colors to draw registered acetate separations to print in 3 gum colors with great success. Since about 2005, Pitt Pens have been available in a wide range of colors which could be used to block varying amounts of light.

Photo opaque, acrylic paint, and various inks and watercolors can be strong light-resists when used full-strength but washes of these materials diluted with water bead up on the slippery surface of regular clear acetate. Rosae Reeder recently told me that you can add a drop of a surfactant such as Photo-Flo or even liquid detergent to reduce surface tension and allow such materials to adhere. There are also certain more expensive clear acetates that are treated to accept washes. Frosted acetate, frosted mylar, and tracing paper will accept washes in photo opaque, Plaka, Pro-Color, and acrylic paint. Inks and watercolors can be tried on frosted acetate or mylar, perhaps with a drop of a surfactant, but with no guarantees. Tracing papers, especially sturdy vellums, tend to take washes easily but their density prolongs exposure time onto papers sensitized with non-silver processes, especially when printing in relatively slow cyanotype. Graphite, crayons, and

colored pencils in the black-sepia-sanguine-orange range can be used on the frosted materials and on tracing paper or vellum for light-resists.

If dark figures on a white ground are desired, a contact negative must be made (unless you have been clever enough to draw a negative). A contact negative can be made in a darkroom by placing the photogram object(s) or drawing in contact with sheet film or photographic paper, exposing and developing it appropriately, and then using the resultant 'negative' to produce a *positive* non-silver image.

**Opening Up Lines:** Sheets of rubylith or amberlith masking film can be used to create high-contrast light-resists. Film-cutting tools provide an easy way to open up lines on masking films that will then print dark on a white ground.

If you should accidentally fog a sheet of black-and-white film, don't throw it away. Instead, expose it completely to daylight or artificial white light, develop, stop, and then wash it—no fixing should be necessary because there is no unexposed silver salt to dissolve out. The resultant black sheet can be scratched on the duller emulsion side with a sharp tool such as an etching needle. Dampening the emulsion side of the film with a sponge or paper towel allows smoother removal of the metallic silver by scratching and even permits a degree of tonal gradation with a tool as primitive as your fingernail. You may want to try this on actual negatives too. Scratching on the film can be a bold way of saving an overexposed or fogged pinhole negative or copy camera negative.

Cliché-verre is a late 19th century ancestor of the scratched films described above. A group of French artists, referred to as the Barbizon School, that included Corot and Millet, worked directly from nature and made drawings with etching needles on opaqued glass that they printed in gum bichromate and other processes. The resultant images, resembling etchings, were called *cliché-verres* (repeatable glass prints). Traditionally, glass was opaqued by holding it over a lantern and allowing soot to darken it, or by brushing brown hard-ground (used on etching plates) onto the glass. Today some printmakers still use hard-ground but various modern water-soluble materials seem to work even better because they don't offset on the printing paper, melt under hot lights, or involve the use of solvents. It is not necessary to opaque an entire sheet of glass; it can be

coated partially or in painterly brush strokes. Some of my students have included photographic negatives upon the glass, opening opaqued areas with a single-edge razor and attaching the film to the coated side with a few drops of gum arabic that can be washed off the film later. To obtain a sharp image a cliché-verre must be printed with the drawn side in contact with the sensitized paper. (This means that your image and text will be laterally reversed.) Otherwise, light will spread as it passes through the thickness of the glass and the image will be blurred. Of course a softened image is preferable sometimes. One could draw with a focal plane in mind on one side of the glass and then draw on the other side in lines and shapes that will print out of focus. As is the case with etchings, cliché-verre plates can be reworked, filling in some areas and opening up others to produce different 'states' of the image. These states can be printed in different layers of non-silver processes if desired.

©Sarah Van Keuren 2008