VOLUME ONE NUMBER ONE

PREMIERE ISSUE

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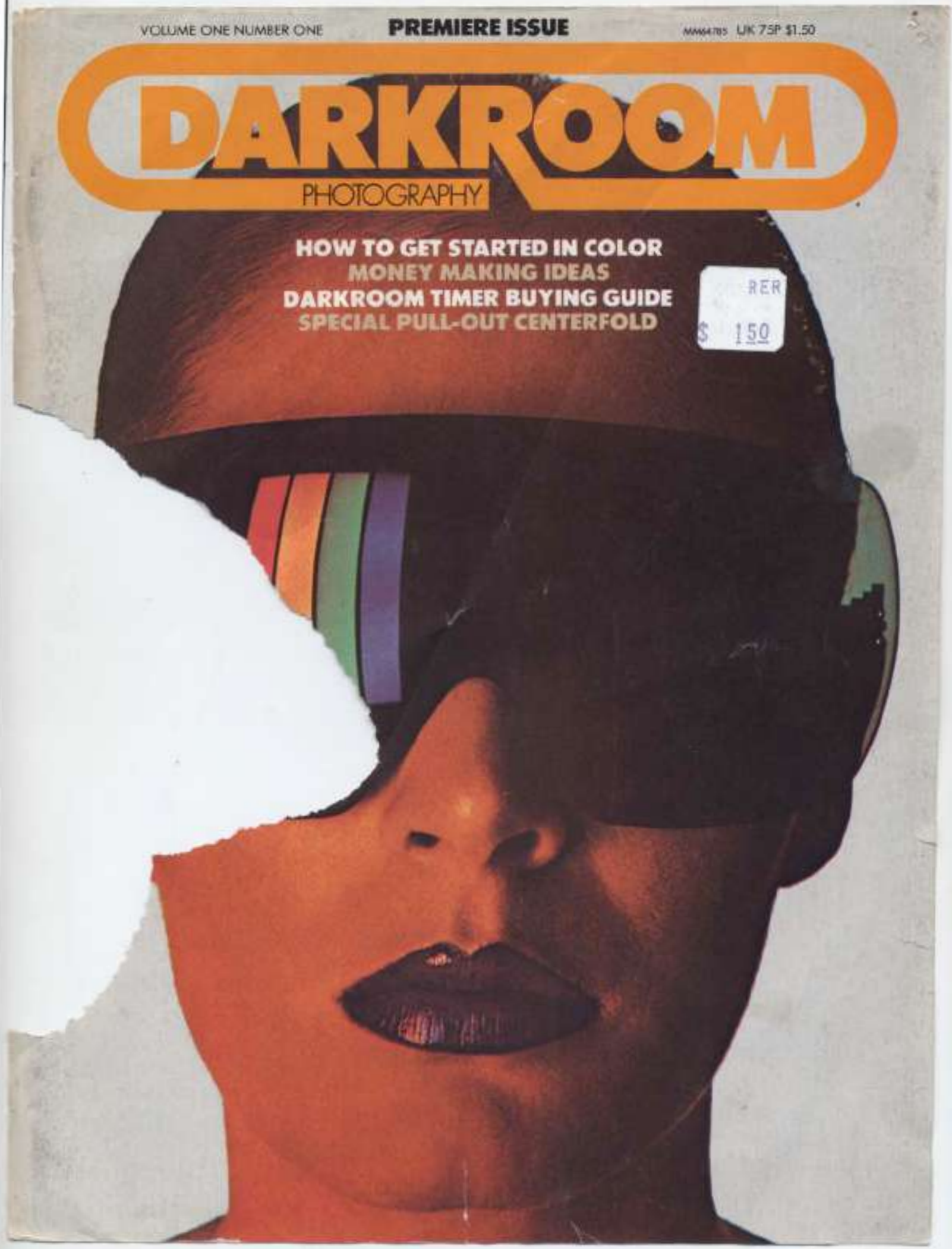


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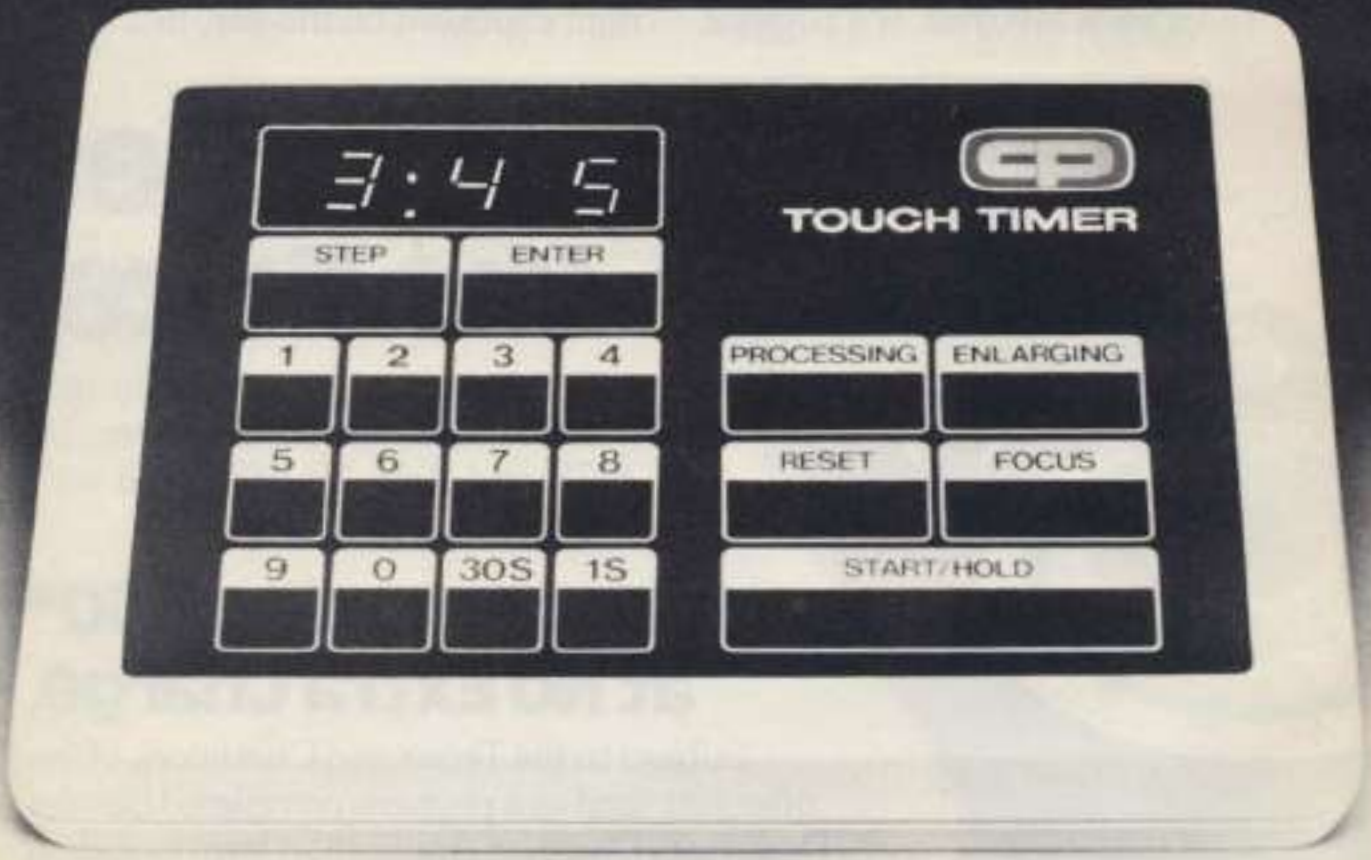

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PUBLISHER'S STATEMENT

The magazine you are holding is the result of over two years of thinking and planning. It is the result of much blood, sweat and tears of the many people who felt, since such a magazine was needed by them in their own photographic adventures, then such a magazine is needed by others . . . in fact, by you.

The need stems from the basic fact that in photography, "taking the picture" is only the beginning. It is a most critical beginning, but still it is only the first step in the chain of events leading to an enjoyable photograph. The steps after "taking the picture" are "developing" and "printing" . . . two significant areas most often neglected by current photographic publications. It is this void that DARKROOM PHOTOGRAPHY will fill.

DARKROOM PHOTOGRAPHY will concentrate on well-written and well-researched articles, but our most important credo is: "photography is fun!"

We all enjoy shooting pictures, and developing and printing them. We get excited over new techniques and ideas. We are stimulated when we hear about new processes and when we see unique portfolios. We want to share all of this enjoyment with you and hope you will respond by feeling as close to DARKROOM PHOTOGRAPHY as we do. We welcome your letters . . . your suggestions, criticisms, and hopefully, your compliments. We hope you will share DARKROOM PHOTOGRAPHY with your friends so that the magazine can grow as you grow in your photographic endeavors.

We offer a fresh outlook at an exciting pursuit, and a strong commitment to photography as fun!

Welcome and enjoy!

Paul M. Sheptow

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For years darkroom specialists have dreamed of a color enlarger that would be both fast and cool. But fast color printing requires high intensity light and that means heat—a negative's worst enemy.

Then Vivitar introduced a new enlarger. Built around a new invention—the Dioptic™ Light Source, a color head that produces high intensity light with virtually no heat. And since there's no cooling fan there's none of the vibration that so often reduces print sharpness.

The Vivitar Dioptic Light Source is fast, too. Fast because the system concentrates and transmits visible light with extremely high efficiency. Remember, the conventional color head loses as much as two-thirds of the light entering its confines. This makes printing times significantly longer and can create serious problems.

So what is it that now brings the state of the art to a new performance level?

The Light Pipe.™

Basically, the Light Pipe is a translucent rod one inch in diameter and about four inches long and made with an acrylic material containing some special properties.

When coupled with the Vivitar VI™ condenser enlarger, the output of a quartz halogen lamp is directed first through an infrared filter, eliminating damaging heat energy. The light next passes a color filtration stage where dichroic filters allow the operator to generate extremely brilliant color...0 to 200 color correction units of each secondary color or any combination. The light path is then bent 90° into the entrance of the light pipe. The acrylic air interface creates a dielectric boundary that traps the light inside the pipe where it is thoroughly homogenized. Temperature increase at the negative plane is no more than 3°F above ambient.

The Vivitar VI Enlarger with the Dioptic Light Source is a color printing system for experts...and photographers who want an enlarger that won't frustrate them as they become expert.

Remember if you buy an enlarger you might as well buy the one that will eventually give you exceptional black and white *and* color prints. And that's no "pipe dream."

Vivitar VI Enlarger & Dioptic Light Source

Pipe dream?

Vivitar.

VOLUME ONE NUMBER ONE MARCH/APRIL 1979

DARKROOM PHOTOGRAPHY

CONTENTS

GRAB SHOTS

Revelations at a Budget Price

"A stunning breakthrough in technological art," "a genuine revelation," and "we now have an Ansel Adams of inner space" were some of the comments that greeted David Scharf's book ***Magnifications*** when it was published by Schocken Books (New York City) in 1977. Scharf's amazingly beautiful photographs of insects, plants, and various other small subjects, made with a scanning electron microscope (SEM), impart a sense of profound wonder at the intricate glories of the Creation. Alas, the rather high price of the original hard-bound volume ($24.95) prevented many of us from doing more than carefully turning the pages at the local bookstore.

Now that unfortunate situation has been rectified—by a soft-bound version, priced at only $10.95 yet possessing the same high reproduction quality as the original edition. As a result, the price of taking a God's-eye look at the microworld has come down considerably.

The SEM, which deserves some—but not all—of the credit for Scharf's remarkable pictures, is a space-age "close-up" camera that uses electrons instead of light to make images. SEM photos of small subjects have greater sharpness and three-dimensional detail than can possibly be recorded using light. David Scharf is a master of the SEM; he is also a careful photographic technician who includes a section on picture-taking technique in his book which might well fuel fantasies of going out and picking up an SEM of your own to play with. (Hold on, they cost $20,000 and up.) But most important, Scharf is a serious photographic artist who has pursued Nature's beautiful mysteries—and found them close-up.

The Pursuit of Permanence

Most people like to think that something they create will live on after them. For photographers, this translates to the quest for archival permanence of negatives and prints. No one has been more closely associated with that quest than Henry Wilhelm and the **East Street Gallery** of Grinnell, IA.

From East Street Gallery have come research, publications, and products devoted to archival processing for permanence. Years back, one could get a 45-page booklet from them for 50 cents, detailing what to do to preserve your photographs for future generations.

More recently—for well over a year—we've been promised a 425-page book called *Preservation Of Contemporary Photographic Materials*, with information on color materials as well as black-and-white. The latest word from Wilhelm, via a recorded message, is that the book will be available "sometime in 1979."

One reason for the delay is that the Gallery staff is preoccupied with solving another problem. East Street Gallery has been making archival print washers (and dryers) for some time. Recently, they discontinued their original washer, and introduced a newly-designed Archival Print Washer-Type 2, with a lower price and with considerable water savings. Sounded great, but there were problems, at least with washing RC (resin-coated) papers. Given Wilhelm's concern for quality, he did the proper thing and recalled the new washers. Ever since, East Street has been hard pressed to correct the problem and catch up on back orders for the washer.

Have patience. We fully expect to see Wilhelm's promises fulfilled . . . in time. If you're interested in getting on the list for either book or washer—you get the book free when you buy the washer—contact East Street Gallery, 723 State Street, Grinnell, IA 50112.

A Better Mousetrap

If you've thought up a gadget, grand or small, to make your photographic life easier, now's your chance to share it with the world. You may even win fame and fortune in the process. Sima Products Corp. is sponsoring the **"Invent Something Contest,"** open to all photo enthusiasts, amateur or professional. First prize is $1,000, but any entry may be considered for actual development as a new product, for which the inventor will receive a royalty contract. You need only write up your idea in 50 words or less, and send it along with an official entry form (available at most photo stores) before May 31, 1979, to "Invent Something Contest," P.O. Box 6029, Kankakee, IL 60901. You could be the Rube Goldberg of the darkroom!

Put Yourself In Print

If you've ever thought your photographs were worthy of **a book,** there's a "no frills" way to do it that costs less than you might think. For the modest sum of $985, P. S. Press, 3260 Ettie St., Oakland, CA 94608 will print and bind 500 copies of a 48-page soft-cover book containing 40 pages of your black-and-white photos. That amounts to $1.97 a copy. If you don't have 500 gifts to give, you could market them yourself and recoup expenses.

We've seen P. S. Press's work, and it's good, especially when you consider the price. They specialize in art reproduction and catalogs for museums and artists. They even have a counseling service to aid photographers in ways to present and market their books. Contact Bill Plunkett at P. S. Press for further info.

A Mounting Giveaway

If you think free samples are a thing of the past, consider this. You can get, **free for the asking** (as long as the supply lasts), ten sheets of 8x10 Ademco dry mounting tissue with instructions on how to use them to mount your prints. Send your request, along with 41 cents in coins or stamps for postage to: Ademco Dry Mounting Sample, Unitron Instruments, Inc., 101 Crossways Park West, Woodbury, NY 11797.

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CS-50 shown

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Send Samples
I've worked in various darkrooms, both my own and rental, for a long time. I love trying new tricks and attempting to improve my printing. I hope you'll have lots of new possibilities for me to try. And I'd love to send you some samples of what I do. Maybe you'll like some well enough to print.

Miriam Lindgren
Le Soeur, MN

We certainly want to see our readers' photographic endeavors! Check "Darkroom Discoveries" in this issue for details of how to get your work to us.—Ed.

It's That Time
It's about time someone made a magazine especially for serious enthusiasts. My class and I look forward to reading DARKROOM PHOTOGRAPHY.

Linda Moore
New York, NY

Here and Abroad
Received information on new darkroom magazine. Hope you'll distribute in Great Britain.

Farley Cooper
London, England

Look around. They should be on your newsstand before long, ships and the post office willing.—Ed.

A New Start
Ever since I retired from the foreign service, I've been wanting to do my own darkroom work. Never had the nerve. Your new magazine may just be the thing to get me started, especially if you publish information about what equipment to get and how to use it. I'm eager for that first issue.

Clyde Johnston
Washington, D.C.

Learning the Hard Way
The magazine sounds exciting. Others in the field are weak on darkroom technique. I'd really like to see lots on color. I've been learning about it the hard way. Most of the articles I've seen on color printing have been of very little value to me in my striving for the best. Looking forward to DARKROOM PHOTOGRAPHY.

Esther Sedgwick
Raleigh, NC

Teacher's Pet
I supervise a child development center. We built the darkroom a year ago but have not had the funds for a photography instructor. I'm sure DARKROOM PHOTOGRAPHY will fill the void. Thank you.

Andy Potter
Los Angeles, CA

Good Ideas
I'm a senior high school student taking a photography class. I hope your new magazine will give me some new ideas and help me with my darkroom work. The teacher I have is very happy about a magazine on darkroom stuff.

Lisa Santini
Boston, MA

Wait and See
Just what we don't need—another photo magazine with nothing but ads. I suppose I ought to wait and see. I guess there's still a small hope that this magazine will be different—really informative?

J.T. Price
Lewiston, ME

Information Needed
Welcome to my darkroom. When will you be on sale?

Pearl Cross
Sante Fe, NM

New Arrival
I think a DARKROOM PHOTOGRAPHY magazine is a wonderful idea and I offer you my personal blessing on this venture. I am admittedly biased but I truly feel it will be successful. Keep me posted on the birth date of DARKROOM PHOTOGRAPHY.

Jerry Uelsmann
Gainesville, FL

By the Way
I heard you are starting a new mag devoted exclusively to darkroom photography, and I am delighted. That reminds me, by the way, of a slogan you might want to use: "Darkroom de-lights me." If you want, you could change it a little to "I am de-lighted in DARKROOM PHOTOGRAPHY," or even: "Picture yourself de-lighted in darkroom photography." This last one, I admit, is a little clumsy and might not fit on t-shirts. By the way, do I win anything?

Marge Bierly
Mansfield, OH

Congratulations! We are rushing you a copy of Hank Williams' darkroom classic, "I Saw De-Light."—Ed.

Homemade Blunders
I am writing in regard to last month's article on homemade chemical mixes by Arnold Trevor. There were several obvious blunders in the text of the article, not to mention the accompanying photographs. You cannot separate atomic matter with any normal stop bath and even if you could, the explosive side effects would prohibitively damage the photograph. This is just one example. Overall, the piece was quite disappointing.

Walt Zumelmo
Beloit, WI

This is our premiere issue. There was no magazine last month.—Ed.

Send letters to: Mail Box Editor, DARKROOM PHOTOGRAPHY, 3129 Fillmore St., San Francisco, CA 94123. Be sure to include your name and address. We reserve the right to edit letters for brevity and clarity.

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News about the wonderful world of lenses

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Q&A

I can't seem to tell blue from cyan or red from magenta in my color prints. Is there some way to do this more easily? I'm not really color-blind!

Marty Kabcenell, Pontiac, MI

This is a common problem so you're not alone. You need a *perfectly balanced print* to guide you, preferably one that includes skin tones. The *Kodak Color Dataguide* contains a test negative and print that will start you off. Use them to make a perfectly balanced print of your own. Another way to obtain a perfectly balanced print is to get a Macbeth ColorChecker, available from most photo stores or Macbeth, Little Britain Rd., Drawer 950, Newburgh, NY 12550. Shoot a picture of it with your favorite film, and then make a print that matches the ColorChecker. Once you have a perfectly balanced print, use your color printing filters to make a print that is filtered 30M too magenta, another that is 30R too red, another that is 30B too blue, and a final one that is 30C too cyan. Mount these together and they will serve as a guide not only to the differences between these colors, but to the degree of color shift you can expect from a 30 filtration change.

I have to take a black-and-white shot of the interior of a church that is mostly dark wood, dark carpet, dark everything! The problem is that a huge stained glass window appears in the same scene and I know I can't expose for both. Help!

Randy Shields, Pass Christian, MS

How about shooting on an overcast day or at dusk to bring the window and the interior closer to each other in brightness? If you can't do that, then you can use the water-bath development method.

Take a meter reading for the absolute darkest part of the church in which you want to retain detail. Expose according to that meter reading. (Under the circumstances, I would bracket widely and shoot several sheets of film at each exposure to allow me to vary the development if necessary.)

In the darkroom, determine the normal development time for the film you are using. Prepare a tank of developer and a tank of plain water at the same temperature. Immerse the film into the developer for 30 seconds with normal agitation. Transfer the film to the water bath and let it sit with NO AGITATION AT ALL for 30 seconds. Return the film to the developer for 30 seconds, then back to the water. Keep this up until the normal time for development has elapsed. The film will actually have been in the developer only half the normal time, the other half being spent in the water. The result will be a negative with good detail almost everywhere, including the bright stained-glass window.

What happens is that development comes to a screeching halt in the highlight areas of the negative almost immediately upon entering the water . . . the energy of the developer is used up by having to work so hard in those areas. Meanwhile, back in the shadows, the developer is free to continue working while the film sits motionless in the water. In essence, you are developing the shadow areas longer than the highlights; this compensates for the extreme brightness range of your subject.

I get gray-looking prints no matter what I do. Why?

Arlene London, Ross, CA

I assume you are not printing "gray" negatives without contrast adjustment via choice of paper grade. If your negatives are consistently gray, increase your processing time, temperature, or agitation to produce negatives with the contrast you desire. A good negative should almost print itself.

If your negatives look good, then consider this. Are you mixing fresh developer for each printing session? Remember that once stock print developer is mixed with water for use, it cannot be saved for use another time. Also check the number of prints you are putting through a tray of developer. The quality of your prints will usually begin to nose-dive after you exceed 80 or 100 8x 10's per gallon of stock developer.

More likely, though, you are not developing your prints fully. Developing times vary from paper to paper, but most fiber-based enlarging papers need from 90 seconds to 2 minutes in the developer with constant agitation. You may be overexposing your prints, developing them just until the image looks dark enough, and then yanking them out of the developer after only 30 to 40 seconds. The image can form in this time, but getting rich blacks takes more time. Develop by the clock, not by your eye. Someday you may want to adjust print developing time for creative control, but not yet.

My prints seem to have a gray fog all over them. It couldn't be my safelights because the borders of the prints are pure white. What's causing the problem?

Judy Tower, Greeneville, TN

Your problem *is* your safelight. The reason your print borders are not fogged is because of an *initial resistance* the paper has to exposure. Unless the light shining on the paper reaches a certain "threshold" value, nothing will appear on the print. The part of the paper under the edges of the easel is not pushed beyond this threshold exposure level and is not able to be fogged by the safelight as a result. The rest of the print, however, receives exposure from the enlarger and becomes sensitive to safelight fog.

Test your safelight this way. In total darkness, expose a piece of paper to a typical negative as if making a print. Then, leave this paper on your enlarger baseboard and scatter several coins on the paper. Turn on the safelight for three or four minutes and then develop the paper. If you can tell where the coins were resting, your safelight is too bright, too close, or your filter is pooped. Safelight filters do need to be replaced from time to time. Perhaps yours has reached retirement.

Some photographers—but not me—get incredibly rich black tones in their prints. How do they do it?

Harris Orkin, Austin, TX

They develop their prints fully, sometimes for as much as two or three times the manufacturer's recommended

times. They use papers that are heavy in silver, such as some of the Agfa and Ilford papers. They often give their prints a few seconds rinse in selenium toner; this doesn't change the color of the image, but deepens the black tones. Happily, it also provides a greater degree of permanence to the print.

I can't seem to estimate the color balance of a print until I have the exposure almost on the nose. But I go nuts making reams of tests to get the correct exposure and can't afford an analyzer. Is there some quick way to zero in on the right exposure?
John Alysia, Reno, NV

Kodak makes a little $4 gizmo called the Kodak Projection Print Scale, which might come to your rescue. It's a transparent 4x5-inch plastic card on which you'll find a circle divided into ten pie-shaped segments, each of which is a progressively darker shade of gray. It's usually used by black-and-white printers, but there is no reason why it can't be used for color as well.

Simply place the scale on top of a 4x5-inch sheet of paper on your easel, locating it where important subject matter is projected, and give the paper a 60-second exposure through the print scale. After processing, the paper will show the outline of the print scale "superimposed" on the image from your negative. Select the segment that looks best to you and a number in that section will tell you how many seconds to expose at the same lens opening used for the test exposure.

I have found that using a 30-second exposure for the test and then cutting the indicated time in half works quite well, especially when making smaller prints or using the new higher-speed color papers.

I really botched the exposure and development of a roll of important film. Now I have negatives which have shadow areas that look good on grade #4 photographic paper and highlights that look best on grade #1. Is there any way to salvage these negatives?
Ben Lernac, Rochester, NY

If the highlights and shadows are very close to each other, such as a model's face with back-lit hair, try this. Using your favorite variable contrast paper, for example Ilford's Ilfospeed Multigrade, make an initial exposure through a #1 variable contrast filter that

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will produce nearly normal mid-tone density in a test print. Make a similar test with a #4 filter to find the exposure needed for just the darkest tones to show black or near black. Then double expose the negative onto the paper, first through the #1 filter, then through the #4 filter. You may have to balance the two exposures a little bit, but the resulting print should show a tonal range that is missing in your negative.

If the problem areas in the negative are separated, for instance, a shot of a room interior that includes a window through which outdoor subjects can be seen, you can use a different, more easily controlled technique. First print the shadows through the #4 filter, then change to the #1 filter and print the remainder of the negative.

How can I avoid bumping into things in the dark in my lab?
Mike James, Louisville, KY

You have two choices. Either install radar or invest in a roll of glow-in-the-dark tape available from most photo stores or from Conrad-Hanovia, Inc., 100 Chestnut, Newark, NJ 07105. This stuff won't fog film unless it comes into direct contact with it and can be stuck to almost anything you need to locate in the dark, from tank tops to light switches.

Why don't they make 120-size high-contrast film?
Kenny Miller, State College, PA

They do! It's called Verichrome Pan 120 developed for 3½ minutes at 70°F in a high-contrast developer such as Kodak D-11. The ASA of VP-120 becomes 250 when it is processed this way.

Some people like to disappear into the darkroom to avoid other people, but I find that I occasionally need to communicate with someone in the outside world while I'm in the dark. This doesn't happen often enough to justify an intercom. Any suggestions?
Ellen Bennett, Seattle, WA

Cut a hole in the darkroom door about 2 inches in diameter and tape a fully exposed and developed sheet of high-contrast litho film over the hole on both sides of the door. The stiff plastic acts as a diaphragm and transmits the sound beautifully while still maintaining the integrity of your darkroom. ■

Shooting without The ColorChecker™ is like a shot in the dark.

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READERS TIPS

Make Ice Work For You

It's so hot in the summer where I live that I just had to find a way of keeping my black-and-white print processing solutions below 75°F. An air conditioner in my darkroom was the obvious answer, but was beyond my budget. Instead, I found that putting ice cubes in strong plastic Baggies and then into (oversized) processing trays enabled me to keep my chemicals cool enough. But there's more than one way I make ice work for me in the darkroom. When processing film, I take an ice bucket in with me and if I need to cool off my solutions before pouring them into the film tank, I just set a beaker full of solution into the ice bucket. Be sure to keep an eye on the thermometer though—ice will cool your chemicals fast.

Will Grant
Amarillo, TX

Plain Focus

I couldn't figure out why my prints were not quite as sharply focused as I thought they could—and should—be. My goof turned out to be not using a sheet of photo paper in the easel the same thickness as the paper I would print on, when I focused. It does make a difference!

Mick Smythe
Baltimore, MD

Keep Those Numbers

I learned the hard way that serial numbers of cameras and darkroom equipment should be recorded and stored in a safe place. I didn't have insurance when my precious equipment was ripped off. The police said they couldn't do anything to recover it without those numbers. They told me that reports of stolen items are circulated in pawn shops and camera stores, nation-wide. If you write down the number and a brief description of each piece of equipment and you're robbed, you have a fair chance of recovering your property, sometimes quite quickly. But even if you have to wait for several months, it's well worth the effort. Don't burn yourself like I did!

Peter Michel
St. Louis, MO

Dust Wipe-Out

My prints needed excessive spotting for quite a while, but where was the dust coming from? I keep my darkroom neat and clean and the enlarger head covered. Then one day I got so disgusted with the dust, I took a large damp towel to every surface in my darkroom. The shelves, paper boxes, bottles, under the paper cutter, and enlarger, the floor, everything. Any place the towel could fit in or reach. I do this every three weeks now and I never have to spot my prints any more.

Ron Bursten
Eugene, OR

Make A Paper Penlight

Sometimes I find that I need to burn-in a special detail spot or problem area in my prints. But I find it hard to aim the light precisely with a conventional burning-in tool. Recently, I hit upon the solution—a simple paper funnel. Anyone can do it. Just roll up a large piece of drawing paper in a funnel shape such as when wrapping flowers. Your funnel paper should be large enough to go almost from the enlarging lens to the enlarger baseboard. Hold the wide funnel-shaped end around the lens so that the enlarger light shines down through the funnel and out the narrowed end, onto your paper. Now move the narrow bottom end of the funnel in any direction to burn-in your problem area.

George Sloane
Cincinnati, OH

Clothespin Print Driers

I've always dried my RC (resin-coated) prints by hanging them from clothespins on a long line. Recently I moved to a small apartment where I don't have room to run such a long line. After some thought, I figured out that by drilling a hole into the two ends of a clothespin, I could hang it from the line so that the print would be perpendicular to the line, rather than parallel to it. This means I can hang four prints per foot of line rather than just one print per foot. I used an eighth-inch drill bit and drilled about ¾-inch from the top of the clothespins. I drilled three dozen clothespins in a few minutes. I use strong nylon string to thread the drilled holes. Don't try to hang more than four prints per foot of line; if you do, your prints might adhere to each other.

My customized clothespins have really helped me to dry many RC prints in a tiny place at one time.

Linda Pacino
White Plains, NY

Using Your Marbles

Every time you pour out small quantities of developer from a full bottle, the surface level of the developer inside the bottle goes down. This allows room for air to circulate and oxidize the developer, which shortens its shelf life. But if you drop marbles or clean pebbles from an aquarium store into the bottle, you will raise the surface of the developer, forcing the air out of the bottle. Add more marbles or pebbles each time you remove some developer.

Quinn Ryan
Pittsburgh, PA

A Pressing Situation

If you travel to warm, humid climates as often as I do, you may need extra protection for your film, especially after it's

Announcing a major photographic development! The Paterson Darkroom Club.™

It's the best $5 bargain in photography today...because it can improve your darkroom skills and save you an average of $18 a year.

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Get your complete membership kit and save 10% on all your Paterson darkroom purchases.

Since an average darkroom owner spends $188 a year for chemicals and papers, that means a savings of $18. (Of course, if you're just setting up your darkroom, or buying new equipment, you'll save even *more*.) But whether you've recently begun to make your own prints...or are just thinking about it...the Club offers you many *extra* bonuses.

- A wallet-sized membership card valid for one year. (Or for an extra year if you take a two-year membership.)
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- A complete set of easy-to-read blueprints showing how to set up or expand your darkroom, in either a permanent or a temporary location.
- A Paterson "how-to" book on the darkroom, giving all you need to know from A to Z. The book *alone* is a $6.95 retail value.
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exposed. Film absorbs moisture from humid air—and too much moisture can cause film damage and deterioration that can't be reversed, no matter how skillful you are in the darkroom. One way to keep your film dry is to pack it in with some freshly ironed clothes; they absorb the moisture. You could also carry a Baggie containing silica gel packets to pop exposed film into. I couldn't find any silica gel packets for sale in my neighborhood, but then I realized I already owned plenty of the stuff. I took down the boxes my camera and lenses originally came in, and sure enough, I'd saved the silica gel that was packed with the equipment.

Sandy Stein
New York, NY

Warm Up the Soup

I learned a useful trick with developer from a friend who works in a wire service darkroom. Seems they're always in a hurry for prints, and so sometimes use a short-cut to pep up the development of "blah" areas. What they do is to spot treat them with a cotton swab and warm developer, around 90°F. Dab the desired area only and then sink the print right back into the developer tray. This treatment helps to give tone to stark white areas or to bring out just a bit more detail in weak middle tones. But it's potent stuff; don't let it run over into areas you don't want to highlight. The wire service people are so fond of warm developer that they have a small hot plate permanently installed in their darkroom. I just heat up about 8 ounces of developer to 100°F at the beginning of a darkroom session; it stays warm and potent for a couple of hours.

Joan Morgan
Hendersonville, NC

Take a Dry Run

If you're printing with a photo paper for the first time, keep in mind that it will most likely look different when dry from the way it looked when it was wet. In other words, after it is dry, those sparkling clean highlights may look muted and dull, and those deep, glossy blacks may not look as rich. To "tune" my printing judgment to a new paper, so that I can take its "dry down" characteristics into account when evaluating my wet prints, I do a "test run" with each new paper I use. I make two identical prints that look good when wet. I let them both dry completely. Then I go into my darkroom, set up the same lighting I normally use for evaluating wet prints, immerse one of the prints in water, get it thoroughly wet, and then compare it to the dry one. The difference between the two gives me an idea of how much to compensate for "dry down" when I'm printing.

Brent Maxwell
Taos, NM

Hose It Down

Eurekal I've found a way to soften grain if I want to. One of my nylon stockings stretched over the enlarging lens and held in place with a rubber band does the trick. To make sure you don't lose too much contrast, make half your exposure with the stocking, half without.

Ellen Rizzoli
Eugene, OR

Bristly Brushes

I'd been finding greenish-yellow stains on my prints after toning them. It took some real detective work to find the source of the problem, much less find a solution. I discovered that the brush I used to apply the toner was at fault. The

potassium ferricyanide in the toner reacted with the metal band that holds the bristles of the brush. I solved the problem by switching to a Japanese paint brush with a bamboo handle and a plastic band holding the bristles. In case you can't find that type of brush, you can coat the metal band with clear nail polish; this will keep it from interacting with the toner.

Stanley Pratt
Des Plaines, IL

Labeling RC Prints

I'm likely to put my name and address on the reverse side of my prints, especially when I send them out to contests and magazines. However, I've had a hard time finding a pen that writes well on the back of RC (resin-coated) paper; most pens will smudge, and those that don't are usually hard to write with. So I started putting those little gummed address labels that are sold by mail order on the back of my RC prints. They stay stuck and work fine. They're real cheap too—they usually cost $1 per thousand and are available from many mail order houses.

Dorothy West
Boston, MA

Editor's note: Great idea! A thousand labels for $1 is a pretty good deal. One house we've used is George Ng's Quality Reports, P.O. Box 952, San Francisco, CA 94017.

A Simple Cropping Gadget

Sometimes I have a negative all set up in the enlarger and I'm not quite sure how to crop it. There are cropping gadgets in the photo stores, but I didn't have one so I cut out two large L-shaped pieces of cardboard. When I don't know how to crop, I just hold them above the easel to help me previsualize my photograph.

Myron Fraser
Cambridge, MA

Hair Dryer To The Rescue

I like to use plastic developing reels because I find them easy to load—when they're bone dry, that is. Recently, I took a cross-country trip and came back with 25 rolls of film. Since I've got only four processing reels, I had quite a job ahead of me, and thinking about having to wait for the reels to dry completely between uses was driving me up the wall. Just then, I heard my son using the hair dryer in the bathroom. Eureka!

As soon as he was done, I tested the hair dryer on a wet processing reel. It dried completely in just a couple of minutes. I used my new "reel dryer" to speed up processing my vacation pictures, and it worked without a hitch. And a friend who does color print processing tells me that a hair dryer is great for quickly drying color prints

Ruth Wilson
Salem, OR

Q-Tip Tip

I've found over the years that more and more of my darkroom necessities come, not from the photo store, but from the drugstore or 5 & 10. For example, I always keep a box of Q-tips cotton swabs in my darkroom. I use them for such things as applying a dab of undiluted developer or a spot of bleach to prints as I need them. I also use the little gems for gently cleaning my enlarger lens with lens cleaning fluid.

Philip Stern
Miami, FL

Flash

I got disgusted with bumping my head in the darkroom whenever I bent down to retrieve an object I'd dropped. My solution was to requisition a penlight flashlight and tape a piece of red cellophane over the beam. I keep it near the enlarger to light up the nooks and crannies under my enlarging table.

Roscoe Walters
Boise, ID

The Shake Down

I shoot a lot of 4x5 and 5x7-inch sheet film. Getting water droplets off after washing has always been a hassle. A few months ago, an old friend, a professional portrait photographer in another city, dropped by and I told him my problem. He told me his technique for removing water droplets, which I find works just great. Just leave the films in their processing hangers, lean your body over and shake the hangers downward as if you were trying to shake off a rather tenacious bug. Keep shaking till the droplets are gone. And don't use a wetting agent.

Joseph Garcia
Ford Ord, CA

We will give a free one-year subscription to readers who submit tips that we publish. Send your tips with a self-addressed, stamped envelope to **"Tips,"** DARKROOM PHOTOGRAPHY, *3129 Fillmore St., San Francisco, CA 94123.*

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Also, as you will see when you try your first box, BROVIRA-SPEED prints up pin-sharp, crisp images. There is none of the blurriness, the fogginess you might expect from a speed paper. None of the muddiness.

When to use BROVIRA-SPEED

It takes BROVIRA-SPEED less than 7 minutes to give you this AGFA-GEVAERT black & white quality. So it is ideal to use when speed in the darkroom is of the essence. As with news and magazine photographs; promotional shots for films, play reviews, college and school publications and so on.

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With the addition of BROVIRA-SPEED, you now have a bigger choice of AGFA-GEVAERT quality black & white paper. For most pictorial work, top professionals like AGFA-BROVIRA*'S neutral black and cold tones. For portraiture and salon work, many photographers prefer AGFA PORTRIGA-RAPID'S* soft, warm, brownish tones.

Agfa news flash

To conform with U.S. standards, AGFA-GEVAERT has changed the numerical grading system on all its BARYTA-BASED papers. Former numbers 2-6 now become 1-5. Letter designation such as BS, BEH, will remain the same. (An example: Grade 6 BEH is now Grade 5 BEH.) Making it easier than ever to choose the paper professionals prefer. The quality of the products, of course, remains the same.

***How to process like an Agfa professional**

The following process time will give you best results with Agfa's new BROVIRA-SPEED paper. Developing—1 min. at 68°; Stop bath—5 to 10 secs.; Fixing—60-90 secs.; Washing—4 min. That's it! (For full details, see technical data sheet.)

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NO MORE MOIRE

A new magazine is built on excitement! There are new levels of excitement as each element of a magazine falls—or is pushed—into place: finding just the right person to do a job; conceiving an idea for a feature and connecting with a writer/photographer who can turn it into a small gem; seeing fantasies fleshed out and set in type. One of the peaks of excitement has to be the moment when all those concerned recognize the single photograph that will shine forth on the newsstands, stopping viewers dead in their tracks, the photograph that says, "You can't pass me by."

At DARKROOM PHOTOGRAPHY, we knew that moment early in the game. The designer of DARKROOM PHOTOGRAPHY, Kit Hinrichs, had carried a photograph around in his memory for four years, a shot of a face: a woman's face pared down to its simplest elements—a mouth, a nose, ear lobes—and distinguished only by a huge pair of dark sunglasses with a rainbow of color bars reflected in one lens. Intriguing!

Hinrichs knew where to find the picture; the photographer was Pete Turner, well-known for his color creations. Surely a simple matter of purchasing the original transparency! But the course of true love—and the creation of a magazine—never run smooth. Turner looked—and couldn't find. Other shots from the same shoot were in the files, but not THE one. The others wouldn't do; because the woman's expression was different, the effect was different.

Give up? *Never.* What did exist was a printed page with our image on it. It had originally been shot for an educational project, a book called *The Weather Machine*, and the book still existed.

Ah, but there are changes that occur when a photograph is printed in a book or magazine: a printed image is made up of a pattern of small dots. Look closely at the photographs in this magazine, and you can see them. If you attempt to rephotograph an already printed image, you get a negative with two dot patterns instead of the desired single dot pattern. When printed, the multiple dot pattern has a tendency to create its own subtle pattern (known as a moiré) within the photograph. This moiré pulls the viewer's attention to *it*, rather than to the image itself.

But even with this almost insurmountable hurdle, we wouldn't give up. If there is a single distinguishing characteristic of photographers, as well as editors and publishers, it is the determination to get what we want in a photograph. We wanted to see that Pete Turner image on the cover of DARKROOM PHOTOGRAPHY's first issue.

We experimented. We made several high-quality, same-size 8½x11-inch color separations (each of which requires four separate negatives: a cyan,

Metacolor overlap

A posterized Turner

Metacolor variation

It's not over when you click the shutter.

Pros and serious photographers will tell you: "The secret's in the print." . . . what happens *after* you've framed and shot that can make the difference between a good photograph and a great one. Introducing DARKROOM PHOTOGRAPHY. The new magazine that takes you into the darkroom. Shows you how to get exceptional results. In every issue, you'll discover "*Basics*", a special pull-out-and-save section on the hows and whys of simple darkroom procedures. Also, Buying Guides on new enlargers, cameras, timers, gadgets. Also, features on color and B/W printing. Plus secrets of the darkroom pros. How they turn ordinary shots into award-winning and money-making finished prints. How to set up a darkroom on a budget. Where to save on film, equipment, more. DARKROOM PHOTOGRAPHY is being published by the editors of SUPER-8 FILMAKER, winner of the prestigious Maggie Award as best magazine in its field.

Whether you're an enthusiastic photographer or just starting out, student or teacher, amateur or pro, now there is a single source for everything that involves the darkroom. Eight issues a year. Columns on Q&A, special effects, color and B&W portfolios, and more. A magazine for everyone who knows: It's just beginning when you *take* the picture and it's not over until you *make* the picture. Subscribe now and save over 33%.

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(EBO11)

a magenta, a yellow, and a black). The moiré persisted.

Then we tried rephotographing the original printed image onto a 4x5-inch transparency. Luckily the dot pattern had softened enough to allow us to make another set of color separations which ultimately our printer was able to use without bringing out the uncomfortable moiré.

But that wasn't the end of our experiments. We tried a number of specialized darkroom techniques. We played. We used the Metacolor system, a special computer system designed originally for the space program and

"The course of true love—and the creation of a magazine—never run smooth."

now used to aid photographers in producing an infinite number of permutations of color, shape, and effect by projecting them onto a television screen where they can be photographed and then printed as new transparencies. You can see for yourself some of the possibilities.

With the Metacolor variations in hand, our publisher grew creative and suggested a technique from filmmaking: take two of the Metacolor transparencies, put them in two slide projectors and overlap the images, thereby creating yet another variation. If we liked the result, we could sandwich the transparencies in the darkroom. No such luck; we could not match the brightness that we liked when we used the two projectors.

Our next venture into the unknown was to see if some of our friends in the darkroom couldn't produce effects similar to those made by the computer, but without the tell-tale TV screen lines. They turned out several posterized variations, all very striking . . . but none with unanimous appeal.

It was only after we'd had all our fun that we recognized what we wanted—not the abstracted versions nor the exotic color variations, but the original unmanipulated image developed simply with the traditional Kodak process. It was a good learning experience—and exciting! It proved to us that DARKROOM PHOTOGRAPHY would not just be about "special effects," but would present good, eye-catching imagery of all types. ■

PICTURES WITH A PUNCH

Skyler Posner has to lug a box around in her darkroom; she uses it to step up to the enlarger, to the paper cutter, to the drilled clothespins that serve as print dryers. Skye is not especially small, but she is working in a darkroom designed and built for her husband of 2½ years, George Posner, a forensic photographer who just happens to be 6'4" tall. In addition to the step-up box, the darkroom is equipped with a clothes washer and dryer, a fact that would tend to put gray hairs on the heads of most darkroom enthusiasts. Nevertheless, Skye reports that she has little spotting to do. Since stirring up the lint and dust creates the problem, "when you finish developing film and hanging it to dry," she says confidently, "you close the door and go away."

There's also the little secret of George's cotton technique. George gladly demonstrated with a wad of cotton in each hand: "You wet them and squeeze out all the excess water, then rub the film down two or three times, and throw the cotton away. There's no lint." Amazingly there isn't!

Skye Posner has been a photographer for only a few years. But already there is a book of her boxing photographs, due to be published in the spring of 1979; a show at the Canon Gallery in San Francisco; and photographs published in *In/Sights: Self Portraits by Women* (David R. Godine Publishers, Boston). Her career began "in a burst of daring," when she signed up for a photography course after a lifetime of "buying every photography magazine that came out and drooling over the pictures. It never occurred to me that I could do it. When I developed my first print, that may have been the first time I had an emotional orgasm in my life. It was something I'll never forget. I felt 'now I know why I'm alive.'"

Skyler's photographs are invariably of people, and that fact governs her choice of cameras, film, and chemicals. "I'm always trying to capture a fleeting expression. It's not in my personality to want to set a camera on a tripod and stage something. I'm after the truth, so I have to use 35mm and automatic winders on two of my camera bodies. Most of my favorite pictures have been made when I've run off a dozen rolls of film trying to capture that one magic second, and out of three or four hundred pictures, I find just the one."

For the same reasons, Skyler uses only Tri-X at ASA 800 rather than the usual 400. "That suits every purpose. I can go out on a sunny day and the 800 rating will be useable, and I can go into a dimly lit boxing arena and use it too. That way all the processing is standard." The film is developed in straight D-76 for 9 minutes at 68°F. Instead of inverting the tank to agitate, Skyler rolls it up the bottom of the sink and down. That way, she says, "eliminates streaks."

Skyler has taken her first steps toward processing color; she has bought a Cibachrome Kit. She has been frustrated with sending out her color work and not getting what she wants, so "I figure if I'm going to do any work in color I have to do my own processing."

The color in Skyler's prints previously has come from her work with hand coloring, done with the pencils that were used to tint portraits in former years. She believes these give more control than do oils "and the color is more subtle." Occasionally she has used opaque water colors, working at the kitchen table where the light is best.

The images for Skyler's book on boxing stem from her interest in the sport as a manifestation of her own feelings of aggression. Over a period of two years, "I stayed in—and around—the ring," shooting 166 rolls of film. She might have shot five times as much, she believes, if there had been more boxing matches to go to.

She works just as tenaciously in the darkroom, processing film and printing as soon as possible after the taking. "I can't wait," she says. "I'll spend two or three days in the darkroom until I've printed every picture that I think has any possibility, until I'm ready to drop. I can't stop. I'm so excited and compulsive about it." Having to reprint, however, is very difficult. The publishers wanted four copies of each print for the boxing book. "All the joy had gone out of it. It was just tedious." Nevertheless, Skyler says, the time would never come when she would let anyone else do her printing "because no one could ever get it the way I want it."

Work on her photographs does not stop with the finished print. Most of her images have words which are an integral part of the statement she is making. The captions accompanying the boxing photographs, for example, are taken from the Bible.

Skyler's current work is a study of life's cycles, stimulated in part by such books as *Passages* by Gail Sheehy and Dr. Benjamin Spock's descriptions of childhood stages, but also "like a Tolstoy novel in which I'm photographing life from beginning to end."

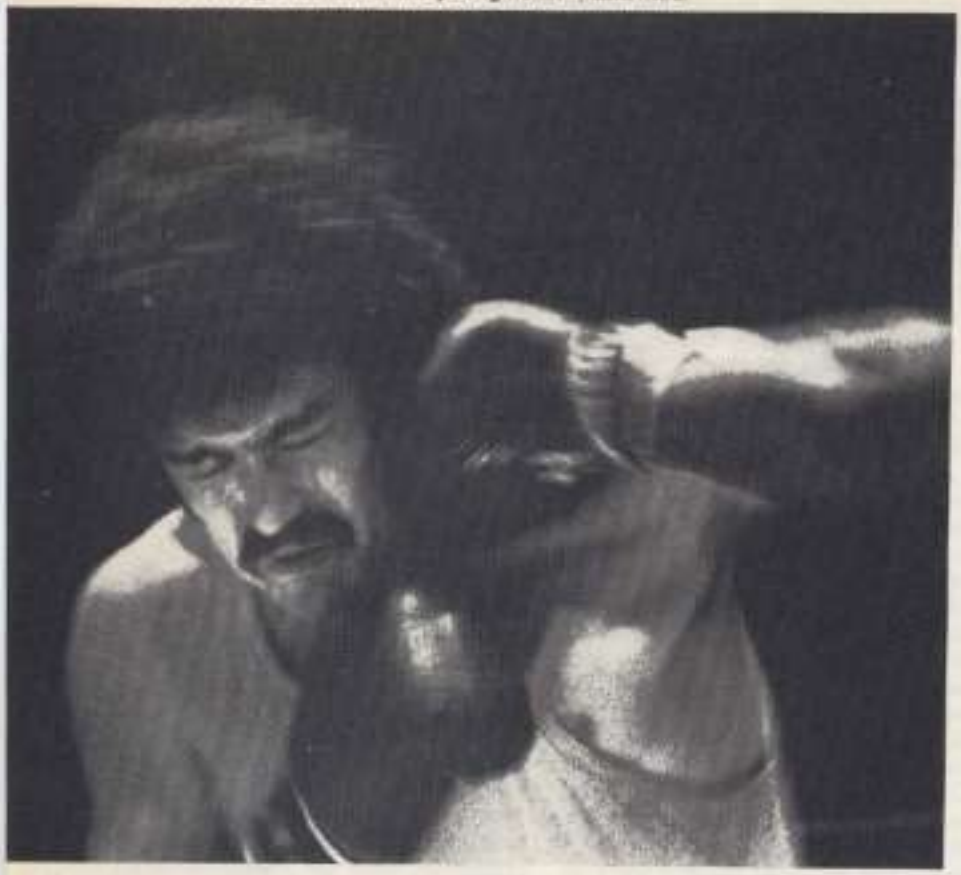
What does she want to accomplish as a photographer? "I'd like to be a little less lonely. All my life I've had a kind of unique outlook on life, a unique vision of life, a unique way of expressing myself. I'd like to meet other people who are familiar with the sound of my drummer. To have my photography acknowledged would be having myself acknowledged because my photography is me." ■

PHOTOGRAPHY BY
SKYLER RUBIN POSNER

Eleanor Pred

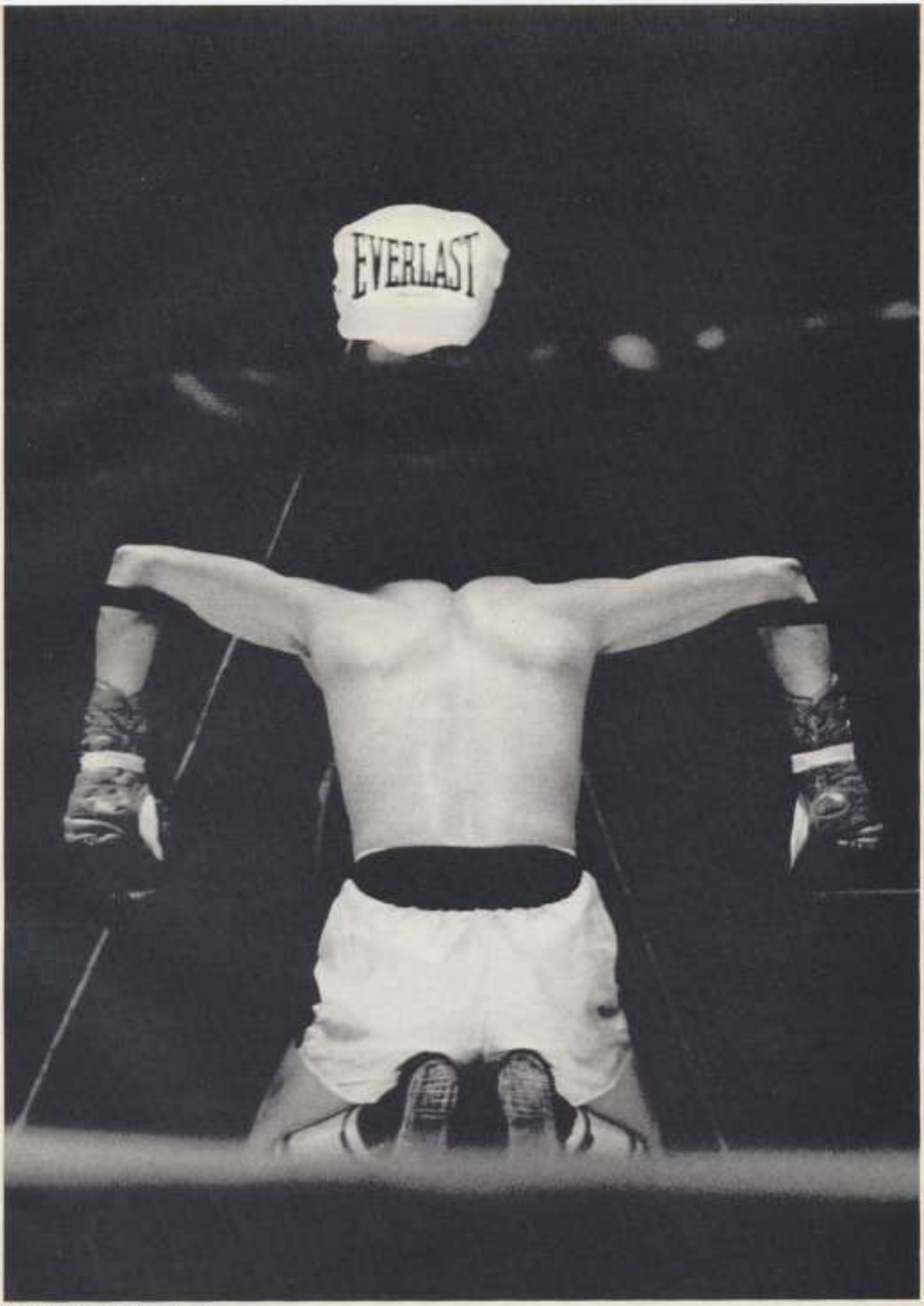
◀ ***"Look like a girl, act like a lady, think like a man, work like a dog." (Self-portrait of a woman trying to please a man)***

"Break out the great teeth of the young lions." (Psalms lviii, 6)



"Thou hast clothed me with skin and flesh, and hast fenced me with bones and sinews." (Job x, 11)

"Order ye the buckler and the shield." (Jeremiah xlvi, 3)



"Thou art the man." (Samuel xii. 7)

PRODUCT REVIEW

Neutralize Your Dust

A single blast from Quantum Instruments' **Static Neutralizer** will eliminate static electricity from your negatives, thereby "loosening" the dust that causes spots on your prints. It's simple: point the pistol-shaped Neutralizer at the object to be neutralized, squeeze the trigger, and then just blow or brush dust particles away. There are no radioactive materials in the Neutralizer and no parts to replace. Available from Quantum Instruments, 1075 Stewart Ave., Garden City, NY 11530. *List price:* $19.95.

High Speed Photo Paper

Luminos is offering a new series of RC (resin-coated) papers, imported from Germany. Called **Lumifast RD,** (that's right—RD), these papers feature rapid processing and a good tonal range. Lumifast RD is available in five surfaces: Instant Glossy F, a high-gloss paper that does not require ferrotyping; Velvet-Matte VM, for pictorial prints; Silk Y, which has a fine "weave"; Pearl P for portraits; and Hi-Lustre J, which has a "crystal grain." All surfaces are available in four contrast grades. Available from Luminos Photographic Products, 25 Wolffe St., Yonkers, NY 10705. *List prices:* $10.50 for 100 sheets of 5x7; $21.90 for 100 sheets of 8x10; $21.55 for ten sheets of 11x14.

Spot Stopper

How often have you wound up with developer stains on your white sleeves? You may be able to solve that problem with **Protective Sleeves** of lightweight cotton coated on the outside with acid- and alkali-resistant black rubber. The sleeves are elasticized top and bottom to fit snugly. Available from Porter's Camera Store, Inc., P.O. Box 628, Cedar Falls, IA 50613. *List price:* $4.50.

Home Safe

Store paper safely in Kustom Mold's economy-priced **Paper Safe**. Available in both 8x10-inch and 11x14-inch sizes, these lightweight containers are especially designed for stacking. Each holds 100 sheets and has a protective lock, so it doesn't open except when you want it to. Available from Kustom Photographic Supplies, 14924 S. Downey Ave., Paramount, CA 90723. *List prices:* $7.95 for 8x10, $9.95 for 11x14.

An Inexpensive Densitometer

For the serious photo-lab buff, R–H Products offers a simple **Transmission Densitometer** priced for the advanced amateur. An accuracy of 10 percent is claimed. The densitometer has a built-in line voltage regulator, a solid-state amplifier with CdS light cell, and a .125-inch-diameter spot light source. Available from R–H Products, 3212 Skycroft Drive, Minneapolis, MN 55418. *List price:* $185.

Personalize Your Pictures

There's a new way to make **Photo Postcards**—mount your prints on Kimac's sticky-backed postcard forms. One side is printed as a postcard, and the other has a ready-to-peel-off protective cover over an adhesive layer. Simply press on your prints. The mounts are available in two sizes from the Kimac Company, 478 Long Hill Rd., Guilford, CT 06437. *List prices:* $1.25 for ten 3½x5-inch cards or $1.90 for ten 5x7-inch cards (larger quantity prices available).

Long Life Developer

Want simpler processing of litho or high-contrast films? Then you'll be interested in **Edwal Litho-F,** a new single-solution developer for any type of line work. Litho-F does not have to be discarded after each use; it can be put back in the bottle and reused until it has developed its full capacity of film. It's usable at temperatures from 70 °F to 110 °F. Edwal offers a how-to booklet with instructions for making seven kinds of litho derivations. Write to Edwal Scientific Products, 12120 South Peoria St., Chicago, IL 60643. *List price:* $5.75 per quart.

Clean Up Your Water

Unitron's **Universal Self-Cleaning Water Filter** comes with all the fittings you need to attach it to a kitchen faucet; it can also be permanently installed in darkroom plumbing. The filter can handle up to 360 gallons an hour at temperatures up to 140°F; it can remove particles as small as 20 microns. A built-in valve allows easy cleaning. Available from the Photo Products Division of Ehrenreich Photo-Optical Industries, Inc., 101 Crossways Park West, Woodbury, NY 11797. *List price:* $17.95.

Print Retouching

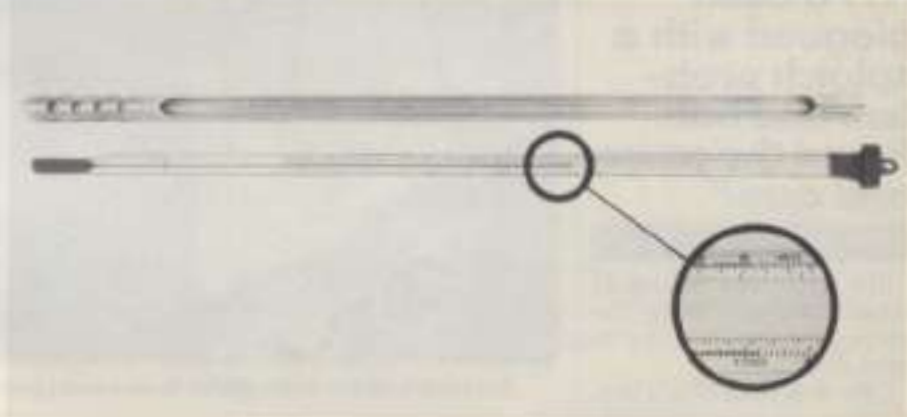
If you've had difficulty spotting or retouching black-and-white RC (resin-coated) prints, check out **Berg 'Touchrite.** This kit, comprised of three 1-ounce liquid colors and a white plastic palette, has been formulated to take care of all black-and-white papers, fiber or RC, as well as black-and-white negatives or color photographs. 'Touchrite Black and Gray are transparent colors for print spotting; 'Touchrite White is opaque and is recommended for retouching highlights. All three are blendable with each other and with water. Available from Berg Color Tone, P.O. Box 16, East Amherst, NY 14057. *List price:* $3.95 for the kit.

Rock Your Darkroom Tray

A rocker-bottomed tray for 8x10-inch paper, made by Ambico, makes agitating your prints in developer or other solutions a smooth, streak-free task. The **Wave Tray** has a unique design; it's shaped to start the solution flowing with a touch of your hand, yet still provide splash-free stability. The bottom of the tray is ribbed to keep the print from sticking. There is a special opening with a sealer cap to allow quick and easy drainage of chemicals, and a built-in holder for print tongs or a thermometer. Available from Ambico, Inc., 101 Horton Ave., Lynbrook, NY 11563. *List price:* $4.95.

Easy Reading Scale

Looking for a pro-style **Photolab Thermometer** at a modest price? Colourtronic's new TH 101 might be the answer. It's a precision-calibrated thermometer with both Fahrenheit and Centigrade scales. The Centigrade scale has gradations at 0.2° intervals; the Fahrenheit scale is marked in 0.5° divisions. The TH 101 has a clear plastic tube; a companion model, the STH 101, has a protective metal sheath around the tube. Available from Colourtronic, 9716 Cozycroft Ave., Chatsworth, CA 91311. *List price:* $19.95.



DARKROOM BASICS

ELINOR STECKER

MYSTERY OF THE YELLOW-BROWN SPLOTCHES

Sometimes it takes real detective work to solve a darkroom problem. See where the clues lead.

The phone rang one day, and a voice wailed, "I'm having a problem with my prints; can you help me?" At that time I'd been doing darkroom work for all of one year, and was regarded as an expert by the beginner on the other end of the line.

"Shoot," said I. "I mean, what's the problem?"

"Well," the despondent photographer continued, "I looked at some prints I made about a month ago, and most of them have strange yellow-brown splotches on them."

Aha! Strange yellow-brown splotches. That was something I knew about. My friend, unknowingly, had consulted an authority on this malady; an authority because I'd been plagued with a splotch problem myself and had been able to find the cause and the cure for it. "Describe the symptoms, please," said I, the yellow-splotch specialist.

"Well, as I said, they're sort of a yellow-brown color."

"Are they just stains over the picture, or is the image bleached out?" I asked.

"Oh, yes, there's no picture under the spots. And the funny thing is the spots didn't show up right away."

"Aha! Strange yellow-brown splotches. That was something I knew about ... I'd been plagued with a splotch problem and had found the cause and cure."

The scene was starting to sound familiar. "Were the prints put away in a box or were they . . . ?"

"Yes, they were all in a box. You know, the one the photo paper comes in."

"Are the stains in the same place on all the prints, or are they scattered?"

Pause. She thought a moment. "Uh, mostly they're in a corner."

"Size? Size? How large are they?" I was getting excited as the description sounded more and more like the disease I was familiar with.

"About the size of a th . . . "

"The size of a thumbprint?" I interrupted.

"Yup. Just about the size of my thumb. Some are a little larger or smaller, but most of them are the size of a thumbprint."

"Hmmm." I was acting very professional and knowledgeable now. "How do you wash your prints?"

"Just in the bathroom sink." Her voice was apologetic.

By this time I was feeling fairly confident that I had the diagnosis—it sounded just like what had happened to me. Shortly after I started making my own black-and-white prints, the same kind of disfiguring stains began appearing on prints I had stored away. I didn't know why they were occurring, although I suspected it might have something to do with improper fixing. I inquired of everyone. I consulted my bible—the *Focal Encyclopedia of Photography*—looking down the whole list of print "faults." I showed the disappearing pictures to my sympathetic consultant at my friendly neighborhood photo store. I cried on the shoulders of the experts at Kodak's Customer Service counter. Everyone was puzzled.

No one knew why I was getting these blemishes, but all agreed it could be a hypo stain. I was advised to immerse a print at least 30 seconds in the stop bath, to be sure the fixer was fresh, to agitate the prints while they were in the fixer, and to keep the white light off until at least 2 minutes after they were put into the hypo. I was an obedient (and desperate)

See what happens when splotch fever attacks your print!

student, and I followed all the suggestions to the letter.

And still the splotches kept occurring, usually in an upper corner.

Then, one day, it hit me. I realized what I was doing. Simple—obvious—*STUPID!* Simple, once I knew. So obvious that my advisors, photographers who were long removed from their beginning days in make-shift darkrooms, had never thought to mention it to me.

My darkroom was (and is) a nice large bedroom with no running water. So, after I fixed a print, I put it into a tray, carried it into the bathroom, and washed it in the bathtub, using a simple washing gizmo. Fine. No reason why it shouldn't work. But when it was time to remove the nice clean print, my hands were usually *dripping with hypo* from the next print I was doing. I liked to swish my prints in the chemicals, using my hands—a much more involved method than using tongs, and I wanted to be involved. Then, when I took the newly finished print into the bathroom, I set down the tray while I fished the clean print out of the bathtub. I actually picked up the freshly washed print by the corner with my hyper-hypoed fingers! So, when the print was dried and stored, it still had that extra dose of hypo on it, and, after awhile, that hypo bleached out a bit of the image and left its ugly stain on the area touched by my fingers.

"When it was time to remove the nice clean print, my hands were usually *dripping with hypo* from the next print."

There it was: a glaring procedural error that could easily be remedied. Now I always use tongs when I process my prints. But even though I use tongs, my hands still frequently come in contact with small amounts of fixer. So I've made one important change in my working habits: Before reaching for a clean print, I take the precaution of first washing my hands. Easy enough, even if it takes another few seconds. Only when my hands are absolutely clean do I pick up a clean print, squeegee it, and lay it down to dry. Then, the clean print safely out of the way, I take the print that is full of fixer and put it into the wash water.

No contamination. No yellow-brown splotches. Mystery solved.

So I told my telephone caller that she had luckily reached the country's yellow-stain expert, and I instructed her in the simple procedure for obtaining clean, long-lasting prints.

Next patient, please. ■

Elinor Stecker is an active filmmaker and still photographer; her articles have appeared in Super-8 Filmaker as well as the New York Times.

A HUFF AND A PUFF

Here's a simple trick for improving the longevity of your film and paper developers stored in those big brown jugs: BLOW! The CO_2 in your breath doesn't do as much damage to developers as the oxygen in the air. Just before you put the cap on the bottle, blow in the opening. Be sure to get the cap back on as quickly as possible.

SENSITIVE NOSE? LEAVE OUT THE ACID

Is your stop bath keeping you out of the darkroom? Many people are sensitive to the smell of acetic acid—even in the diluted form used for stop bath. Fact is, you don't absolutely have to use it when printing. Try instead using a large plastic tray, from an auto supply store, filled with a couple of gallons of water. Agitate your print vigorously in the water and let it drip off a bit before moving it to the fix. Be sure to change the water completely after about 15 8x10 prints, and keep your fixer fresh.

How to cut the photo paper package for easy access.

QUICK ENTRY

If you've ever had trouble extracting one sheet of photo paper from its package, here's an easy way to do it. It's especially helpful if you don't have a paper safe with separate compartments for a variety of papers (such as those made by Brumberger or Spiratone).

When you've opened the box, you will see that the end of the wrapping paper runs down the center of the package. Leave the wrapped paper in the bottom of the box, and under a safelight of course, cut at right angles with a pair of scissors, starting at the bottom of the seam line. Repeat this at the top of the paper and you will have formed a flap. Lift this flap for easy access to the paper as you need it. Unless the paper box is taken into direct sunlight, you should never have any fogging from such a doctored package.

DARKNESS AT NOON

Looking for a fast, easily removable way to block out light from the windows and doors of your darkroom space? Tape up painter's black plastic "drop cloths," available at paint supply stores in 10x25-foot rolls at a cost of around $8. The heavy plastic material is also great for covering work surfaces and protecting nearby walls from splashes.

A VERSATILE DODGER FROM THE TOY BOX

If you're ready to try some fancy dodging to lighten up shadowy areas of your prints, you can create an all-purpose dodging tool by raiding a child's toy box. Simply attach a piece of clay or some "Silly Putty" to the end of a stiff piece of wire. Your new tool can be molded to whatever shape you need whenever you need it. But be sure to keep the clay or putty covered with plastic wrap between uses to keep it from drying out.

SHELLEY FARKAS

PHOTO POPS

What do you do with your photographs?
Do you mount them on boards?
Hang them on walls? Stuff them into your portfolio?
Foist them off on friends for birthdays and Christmas?
Why not try something original and exciting?
Try photo-pops!

Photo-pops are a way of making three-dimensional sculptures from two-dimensional photographic prints, giving your viewers an opportunity to see your work from more than one direction.

Picture a jar of large lollipops in the candy store, but in place of the swirling colors you usually see are the face and form of a friend—or a bunch of friends. There you have—photo-pops!

GETTING STARTED

How do you do it? You begin by photographing your subject, a full frontal view. Be sure to pose the person in front of a blank wall or photographic backdrop paper. The idea is that the background should be free of any distracting objects.

You can choose to have the same view on both sides of the lollipop or you can have a front view on one side and a back view on the other. If you decide on front and back views, your subject must pivot for the second shot so that you can get a full back view. Be certain that the person's arms and legs are in exactly the same position as when you photographed him or her face-on. You too must be careful not to change your position, since you want both views to be the same size.

If you'd rather have the same view on both sides of the lollipop, you can simply reverse the negative in the enlarger and print the one image backwards. Choose whatever suits your imagination.

Once you have taken photographs of your subject in all the poses that might make good lollipop images, you are ready to develop the film and make prints.

Decide what size you want your lollipops to be. That is the size your image should be on the easel. If you are using only one view and intend to reverse it, all you need to do is keep your enlarger

"Picture a jar of lollipops in the candy store, but in place of the swirling colors are the face and form of a friend."

locked in the same place, take out the negative carrier, turn the film over, and put it back in the enlarger. If, however, you are using front and back views, you must note the size that you printed the front view. Do this by outlining the first image in pencil on a plain sheet of paper while the enlarger light is on. Cut out the traced image to use as a pattern for the correct size when you print the second image.

If you are working with color, you will have to make sure that your color balance is the same for both front and back images. Any type of color printing process will work. Glossy paper seems to be best for color lollipops; it gives a more playful effect, and after all, these creations are for fun.

Your final sculpture will have a uniform appearance if all the lollipops in the bunch are the same height. If your intentions are to have various sizes in order to achieve a different effect, you may want to experiment to see what sizes have the most impact.

MOUNTING THE IMAGES

After your print is dry, place it on a work table. Put a piece of cardboard under it and tape the corners of the photograph securely to the cardboard. You are now ready to begin cutting out the lollipops. You may use a pair of scissors, but an X-acto knife gives better results. Cut out your image very slowly and carefully, leaving about a ⅜-inch border around the image.

When your images have been completely cut out, you will need a solid three-dimensional surface to adhere them to. There are a variety of materials that can be used. One-inch-thick plywood is preferable, so long as you have a jig or band saw to cut out the form. Otherwise you may want to use 1-inch-thick styrofoam, which is quite easy to cut out with a knife, but has a rough surface. This surface should be covered with a layer of paper before you attach the image. Another possibility is to get a cardboard carton from the local supermarket and glue the layers together until you have a 1-inch-thick form.

In order to match the shape of your three-dimensional form with the shape of your cut-out photographic images, you need to use tracing paper to make a pattern. Place the tracing paper on top of your photo image and carefully trace the outline in pencil. Remove the tracing paper. Next, coat the surface of the form with rubber cement, and press the tracing paper onto the form. With your saw, carefully cut both the tracing paper and form along the pencil lines. After you have finished, slowly and gently peel the tracing paper from the form. When fully dry, the rubber cement will rub off when you push it with your fingers.

Next you will need to drill or cut out a hole, about ¾-inch deep, in the bottom center of your form. The diameter of this hole should be the same as that of the wooden dowel you're using. Glue the dowel into the hole with white glue. Let the glue dry for at least an hour.

Your photographic images are now ready to be attached to the lollipop form. Spray one surface of the form with photo mounting spray, available from a photo supply shop or graphic arts supply store. Carefully attach your photographic image. Press the photo-

graph down so that no air bubbles are present between the photograph and the surface of the form. Next, turn the form around and repeat the procedure on the other side. Again, be sure to remove all the air bubbles. You now have a lollipop form with a photographic image attached to the front and another one attached to the back.

FINISHING TOUCHES

The next step is to cover the 1-inch sides of your form. With a ruler, measure the form's thickness. Cut out a strip of felt that is about ⅛-inch wider than the thickness of the form and long enough to go all the way around the sides. Glue the felt along the sides, taking great care not to get any glue on the photographic images. Make sure that the felt meets carefully where the dowel attaches to the form. Allow about 1 hour for the glue to dry properly.

Now you are ready to paint the stick. You can use either poster or enamel paint. I like enamel best, because it dries with a strong glossy finish and will not rub off. If you use enamel paint, you need a can of turpentine to clean up the brush and your hands. Allow at least 2 hours for full drying if you use enamel. If you use poster paint, you probably should coat it with shellac to give it some shine and make it water-resistant. Paint the entire dowel, right to the point where it fits into the form.

In order to create the illusion of a lollipop, your photo-pop should be wrapped in cellophane, the way a real lollipop is wrapped. Cut a large sheet of cellophane from a roll and place it over the top of the lollipop. Gather the cellophane along the bottom where the dowel meets the form. Then give the cellophane a good twist and tape it closed with a transparent tape. You may want to add a bow or some colorful streamers for a playful effect.

To complete the lollipop sculpture, you will want to select a tall glass jar, one that looks like a candy store jar. Cut out some large letters from a magazine and paste them on the jar for a LOLLIPOPS label. Rubber cement works well for this. For a more professional look, purchase some press-type letters from an art supply store and burnish them to the surface of the glass. Art supply stores are great places to get all kinds of ideas for additions to projects like photo-pops. It is often those finishing touches that make your work eye-catching.

There are an infinite number of humorous variations on the photo-pop theme. For instance, if you want to make a toy, you might add wheels so that it can actually roll along the floor.

"Often it's those finishing touches that make your work eye-catching."

You can make a vase of photo-flowers and add real dried leaves. A three-dimensional portrait could include such touches as real buttons, lace, or jewelry. Even a fake wig would be interesting. Indeed, making a few photo-pops can lead you into a whole new area of creative activity—turning your photographs into "sculpture." ■

Here's all you need to construct Photo-Pops.

SUPPLY LIST

- Transparencies or negatives
- Photographic paper, color or grade #3 or #4 black-and-white
- Scissors or an X-acto knife
- Tracing paper, at least the same size as your photographic paper
- Photo mounting spray
- Rubber cement
- Scotch or masking tape
- White paint, either poster or glossy enamel
- A small paint brush
- Elmer's or a similar type white glue
- A wooden dowel, less than ½-inch in diameter
- A roll of clear cellophane
- Solid material such as 1-inch plywood, styrofoam, or several layers of cardboard
- White felt fabric

Shelley Farkas has exhibited in many galleries, art-directed films and TV programs, and taught classes and workshops. She has had work published in numerous magazines and on record album covers.

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DARK-ROOMS OF THE PAST

As we were preparing this premiere issue of DARKROOM PHOTOGRAPHY, we chanced upon a new book called The Darkroom Handbook by Dennis Curtin and Joe De Maio (Curtin & London/Van Nostrand Reinhold, 1979). We liked it because it's full of useful, carefully researched information on how to design and construct a darkroom. But we were most intrigued by a small introductory section called "Darkrooms of the 1880s," whose unusual illustrations caught our eye. As we look forward to bringing you the very latest information on darkroom equipment and techniques, we thought it most appropriate to share with you this fascinating look back at darkrooms of the past.

The 1880s was a time of transition to the modern period of photography as new, faster emulsions were introduced, simplifying the making of enlargements. Prior to this period, the slow paper emulsions required very bright light and the paper was so slow that contact printing was the only feasible way for amateurs to make prints. This meant that prints were the same size as the negative. If one wanted large prints, one needed large negatives and

Photographer of the 1860s. ***A photographer of the wet plate period loaded with camera and darkroom equipment.***

A Portable Darkroom Tent from the 1880s. ***Similar units are in use today, especially for color photography where the print is exposed, put in a light-tight drum, and then processed in daylight.***

A Portable Darkroom of the 1860s. ***The darkroom of this period had to be set up close to the camera so the plate could be coated, loaded into the camera, and returned to the darkroom for development after the exposure and before the emulsion dried.***

U.S. Photo Clip. ***Not at all unlike the venerable old clothespin still used to hang negatives and prints to dry.***

A Typical Darkroom of the 1880s. ***Papers were contact printed and produced the same size print as the negative. They were exposed in the frames mounted to the wall on either side of the door.***

Alldrige's Developing Rocker. ***Agitation during development was as important in the 1880s as it is today.***

Mobile Darkroom of the 1870s. ***A step up in class from the tent, it gave slightly more comfort to the photographer.*** [3]

Enlarger of the 1880s. ***Since electricity was not yet widely available, even the enlarger had to be operated with kerosene.***

Timing Plummet. ***It must have been difficult to swing, count, dodge, and burn at the same time.***

Chemical Storage. ***This innovative developer bottle had a tube to draw the fluid from the bottom of the bottle and a thin layer of oil on top to keep the air and developer from making contact. This enabled the developer to last longer.***

Print Dryer. ***This print dryer revolved, increasing the air flow over the print surface to speed drying.***

Safelights. ***1880s safelights came in kerosene and candle versions.***

Print Mounter. ***This is basically the same design still used today.***

"It must have been difficult to swing, count, dodge, and burn all at the same time."

a large camera to take them. The simplification of making enlargements enabled the photographer to use smaller negatives and cameras; with access to a darkroom and the new faster paper emulsions large prints could be made.

The introduction of dry plates contributed to making the photographer more mobile as well. With these technological changes photographers were free from burdensome equipment on their travels. They were now able to travel light and return periodically to a darkroom to develop negatives and make enlargements.

What was this new darkroom of the 1880s like? It was surprisingly like the darkroom of the 1980s. The photographer's needs were essentially the same as today's and Victorian ingenuity developed many gadgets to make work easier and more exact. Many of these have survived the passage of time and the fickleness of photographers to appear in only slightly revised form today. ■

1 Source: The Gernsheim Collection, University of Texas, published in Gernsheim, HISTORY OF PHOTOGRAPHY.

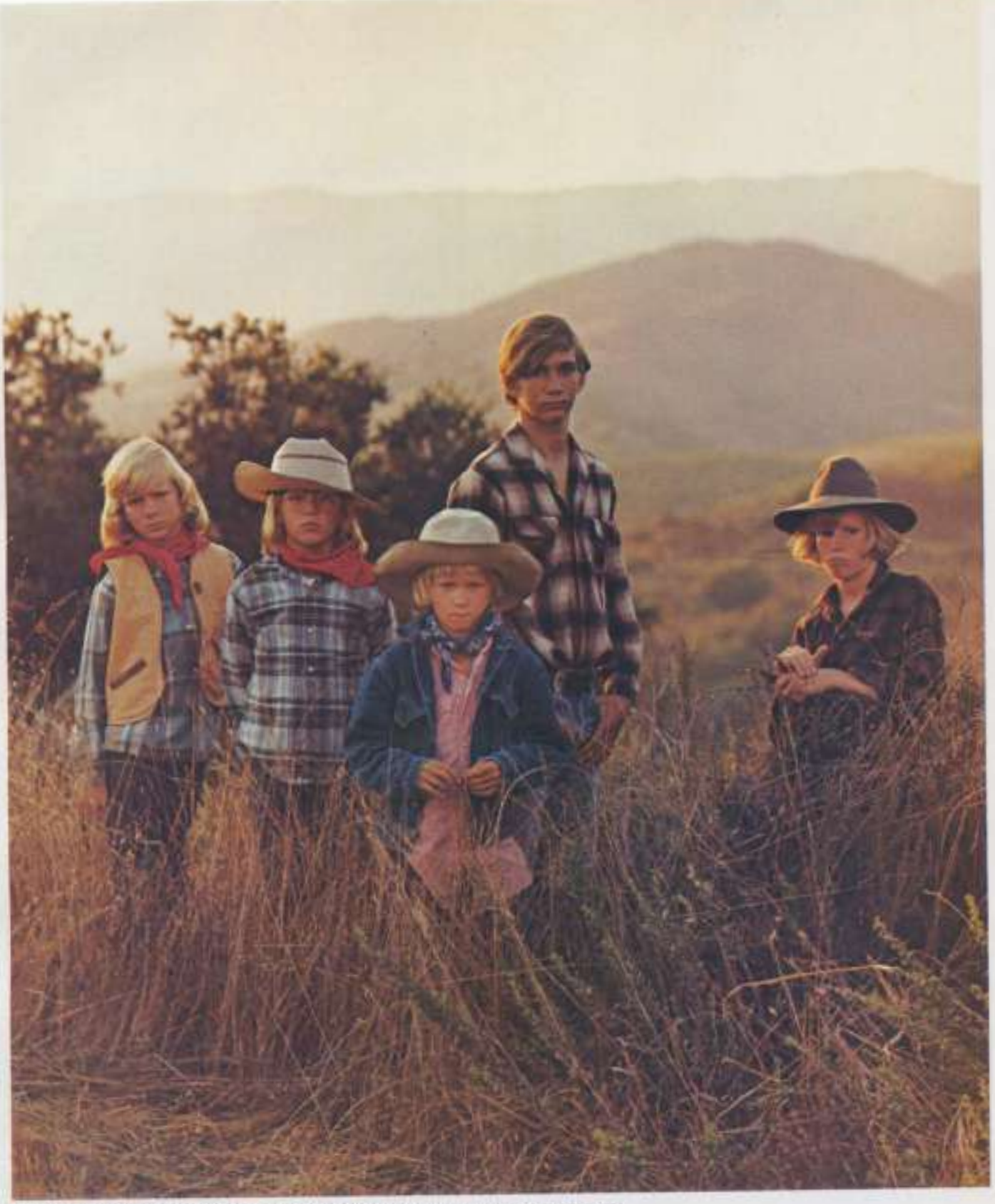
2 Source: Photo, Science Museum, London.

3 Source: From collection of the State Historical Society of Colorado.

DARKROOM DISCOVERIES

MARK SOKOL

"This composite image was created from four color transparencies printed in register, each through a high-contrast mask which blocked out everything but the image I wanted to expose. The first image, the background, is my television screen in an off-channel position; the picture is of electronic static. The next band is a photograph of my eye, transformed with the aid of the Metacolor computer. The "blue fire" inside the electronic eye is an image produced via Kirlian photography, and the central image is simply a photograph of an eclipse."



"I had set myself a project: an essay on the family, particularly brothers and sisters. One day as I rode my bicycle through town, I saw a boy—also on a bike—whom I really wanted to photograph. When he took me to meet his mother, I discovered a tribe of brothers, the first family for my essay. It took about a month to set up the shot so that the light was right. I made the photo on Ektacolor 4x5, printed it with a Beseler Dichro dg enlarger on Kodak 37 RC paper."

JOHN MARRIOTT

ELLEN GOLDSTEIN

"I made this picture from two separate transparencies, each of them quite simple in itself and both shot on the same day on a visit to a farm. I combined them in a Sickles duplicating camera (used for audio-visual graphics where I work), creating a new transparency on 35mm slide film."

WE WANT TO SHOW OFF THE BEST PHOTOGRAPHS . . . . PERHAPS YOURS!

If you would like to see your pictures in the pages of "DARKROOM DISCOVERIES," send us your finest prints or slides. We are especially interested in unique darkroom processes. Here's how to do it: **1.** Prints must be unmounted and no larger than 11x14 inches; 8x10-inch prints are preferred. Your name and address must be on the back of each picture, and they should be well-packaged with cardboard protectors. **2.** Send no more than 20 color transparencies. Your name should be on each one. **3.** A self-addressed envelope with enough postage for return mailing plus insurance must be sent with your photographs to insure return. DARKROOM PHOTOGRAPHY assumes no responsibility for return or safety of photographs although we will do all possible to protect and return them. **4.** Please do not send photographs that have been published in or are currently submitted to other national magazines. **5.** We will pay $50 for each photograph we publish.

Which counts more, in your color darkroom: quality chemistry, or total control over temperature and agitation? More important, do you have to settle for just one?

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D 4

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D 4

Maybe a quality chemistry is the most important thing in the long run. And maybe that's why Paterson Acucolor 3 print chemistry (long one of the most popular chemistries in Europe) has become increasingly popular in the United States.

You see, Acucolor 3 is a liquid concentrated chemistry. As a liquid, it's easier to measure than powdered chemistry. And easier to pour, and easier to mix thoroughly. Plus, you never get globs of undissolved powder to contend with — so you get the same quality and consistency every time.

So, while there may be a question whether quality chemistry is more important to a color photographer than absolute control, there's certainly no question that with Acucolor 3 from Paterson, quality is easy to come by.

On the other hand, even the best chemistry in the world won't give you the results you want without a color processor that lets you keep complete control over the temperature of your solution and critical agitation. For that part of the perfect color print, there's the Paterson Thermodrum.

The Thermodrum has a water bath that will keep a critical temperature steady for up to 15 minutes (about 5 times longer than you actually need to process a good color print).

For a limited time at participating dealers*, specially marked Thermodrum packages come equipped with a power agitator, a $59.95 suggested retail value, free. The agitator gives you complete mechanical control over the agitation phase which, of course, is critical to a great color print.

Clearly, control is just as important as high quality chemistry. And the surest way to get the best color print is to get the best of both.

Then how can you go wrong?

THE PATERSON Color DARKROOM

Quality control color.

*For a free Thermodrum and Acucolor 3 brochure and a list of participating Paterson dealers near you, call this toll-free number: 800-257-7888. In New Jersey call: 1-800-322-8656. (Just one free phone call between you and a great color print). Learn more about the darkroom; ask about membership in the new Paterson Darkroom Club. © 1979.


Gene Anthony

DENNIS DUGGAN

JUMP INTO COLOR

Just outside your darkroom door there's a rainbow waiting to come in. Sure, you're happy with your black-and-white set-up. You know your way around the chemistry and papers, and you've learned to express yourself in tones of gray. But imagine how much more you'll be able to say with a myriad of colors in your corner.

Due to recent technological advances in color photography, it is now possible to make quality color prints consistently and easily in your own darkroom. With some effort, the beginning darkroom enthusiast will produce acceptable prints quickly. Experienced black-and-white workers will be able to apply their acquired knowledge to the new medium and reap the benefits. One of the most exciting aspects of modern color printing is that you can turn out decent work the first evening, yet only crack the door to a world of endless colorful possibilities. Years after mastering the basics, I still find color printing satisfying, rewarding, and fun.

GET YOUR BALANCE

While most color printing steps have their black-and-white counterparts, the process of color balancing is a whole new experience. There is nothing frightening or mysterious about the color balance procedure once you understand its purpose. There are color idiocyncrasies inherent in every enlarger lamp, the orange mask of a color negative, and in the emulsion layers of film and paper. Added together, these minor irregularities almost always produce a gross error—an overall false-color tinge of "cast" in the print. By placing a group of filters (filter pack) between your light source and paper, you can neutralize this error, eliminating the color cast and producing a print with accurate, true-to-life colors. That's all there is to it.

Developing the judgment to "read" the color error accurately and select the filter pack that will best correct it is likely to be the hardest thing about color printing. But it is also the most rewarding and creative. Once you've mastered this skill, you can introduce filters that give the print color values beyond those that existed in the original negative or slide. And you don't need to spend endless frustrating hours or go broke to gain the ability to select an accurate filter pack. Both inexpensive simple aids and more costly electronic analyzers are currently available to help you come close to a perfectly balanced color print on your first or second try.

TAKE THE PLUNGE

Once you've made up your mind to try printing in color, it's time to check out your darkroom to see just what you'll need. If your darkroom has all the

With virtually any standard enlarger, you can inexpensively control the color of your printing light by using acetate filters in the filter drawer.

basics, you can make the transition from black-and-white to color with very little investment. You might on the other hand use your interest in color as the impetus to update your darkroom. No matter what its age or type, your present enlarger will suffice. If you want or need a new enlarger, the most sensible choice is one with a dichroic color head, or at least one for which an accessory dichroic head is available. With a dichroic color head, you simply dial-in the filter pack. You never need to touch or even see the filters, and extremely fine tuning is possible.

Many common enlargers designed primarily for black-and-white have a "filter drawer" above the negative. With this kind of enlarger you can put color printing (CP) filters in that drawer. CP filters are inexpensive acetates that are durable and require only reasonable care. Because of their placement above the negative, they only color the

An inexpensive color printing "calculator" which uses a matrix of color filters can help you zero in on the correct filtration.

light, without intruding on the optical system. So, less-than-perfect CP filters will not degrade the image. Though I don't advise it for beginners, some experienced color printers use everything from Roscoe theatrical gels to lollipop wrappers in their filter drawer for special effects, with no sacrifice of image quality.

In time, CP filters will fade from exposure to the enlarger lamp. Since a faded 50M (strong magenta) filter may contain less magenta color than a new 40M filter, you could have a problem getting right-on color balance. By the time that did happen, though, you'd probably be experienced enough to foresee the problem. Replacements are cheap and with care a set could last for years. (Note that color printing filters are not of sufficient optical quality to

"A basic darkroom set-up is all you need to make the transition from black-and-white to color."

use on your camera unless you're after a soft or muted effect.)

An enlarger with neither color head nor filter drawer requires the use of color correction (CC) filters. These delicate gelatin filters are placed beneath the lens with an adapter/holder. In this position, they are part of the optical system and must be kept reasonably clean and free of scratches. It is important to own a fairly complete set of CC filters so you can use as few as possible at a time—using too many of these filters will degrade the image. Being of optical quality, Kodak CC filters can also be used on a camera.

Enlarger heads designed specifically for color work use dichroic filter systems. Dichroics do not fade, so it is much easier to attain consistent results, which is even more important in color printing than in black-and-white. Working with one of today's better dichroic color head enlargers can best be described as luxurious. The only drawback to this system is its price. Dichroic color heads don't come cheap.

If you're happy with the lens you've been using in black-and-white, it will probably be good enough for color. But note that really old enlarging lenses weren't designed with color in mind, and may not be able to produce a sharp color image.

Some people make their color prints in trays since it is fast and familiar. But since color printing must be done in total darkness or with a #13 amber safelight (which leaves you just about in total darkness), trays can be hard to use, especially if you want repeatable results. Color printing drums are inexpensive and allow you to work in "total brightness."

The ambience created by printing in a lighted darkroom with a drum has made the color process a more pleasurable experience than black-and-white for many photographers. Some printing drums have interchangeable tube sections, so the same endcaps fit on tubes for 8x10 and 11x14 prints, which makes owning both sizes quite economical. And in its low-cost Discovery Kit, Cibachrome offers a 4x5 drum, perfect for tests. Being able to make four test prints from a single sheet of 8x10 paper can add up to a tremen-

dous saving, especially for the color printing novice.

Motor drive units are usually available for rotating the drums. Although you don't need one to get started, you'll probably want one eventually. Without it, you need a few feet of table space for rolling the drum back and forth to agitate the chemicals. A motor drive saves work, and can increase your printing precision because of the consistent agitation it provides.

Your present timer will fill your basic color printing needs, but now there are timers available with repeatable sequence programming options if you are ready for a sophisticated timing system. Your thermometer must of course be accurate in the temperature range used by your processing chemistry. Your present darkroom will most likely contain anything else you might need. Just make sure it is absolutely light-tight.

LOOK BEFORE YOU LEAP

With your darkroom squared away, you're ready to make some choices. The variety of papers and chemistries currently available for color printing is abundant, and familiar brands and names new to you compete for your business. They are all trying to outdo each other with easier, cheaper, and better systems. So it's simply a matter of selecting the system that suits you best.

Daylight processing tanks make color print processing a snap; and accessory motor base provides automatic, repeatable agitation.

Whether you plan to print from negatives or slides will narrow the field, because each type of original requires its own type of paper and chemistry. Printing directly from slides with the Cibachrome process is relatively easy, and the results can be magnificent. The Cibachrome Manual (available at most photo stores) is an excellent source of basic information too, and their Discovery Kit is a nice package for a beginning color printer.

Beseler makes an extremely easy-to-use and flexible chemistry that can produce a finished color print from a color negative in an incredible two minutes at 107°F on Kodak's RC Ektacolor paper. Even using the normal-room-temperature method, which I prefer, you can finish a print in 12 minutes at 68°F. A 12-minute color print would have been considered "instant" a dozen years ago. The Color-by-Beseler 2-Step chemistry and Kodak RC Ektacolor paper make a winning combination for a simple and relatively inexpensive way to turn out glorious prints from color negatives.

And don't forget Unicolor—the folks whose innovative chemistries first made home color printing easy. Now they offer a complete line of easy-to-use color products, from negative developers to sprays for changing the surface texture of the finished print.

Color printing "calculators" take much of the trial-and-error out of arriving at the proper filter pack for your negative or slide. Offered by several manufacturers, they usually consist of a card or holder with many little squares of acetate. Each square represents a different filter pack. By using a diffuser under the lens, you scramble or blend a negative's colors into a general monochromatic blur which is printed through the calculator onto the paper. After processing, only one square will be neutral gray with no color cast, indicating the proper filter pack. This technique works well for "average" scenes, i.e., those whose true colors will scramble to pure gray. But naturally a closeup of a pumpkin would throw the calculator for a loop—but it might do the same to a fancy electronic analyzer.

You should also pick up a copy of Kodak's *Color Dataguide*, available from most camera stores. It is full of important information and printing aids and even includes a gray card.

The first time you try color printing, you'll probably feel as awkward as the first time you printed in black-and-white. Your results too will probably be beneath your expectations. You might even mouth a few oaths at the jerk in DARKROOM PHOTOGRAPHY who said it was so easy. At the end of your second or third session, though, when your family and friends are oohing and aahing over your prints, it will be a different story. The awkwardness will vanish and the tricks and techniques that have become second nature from black-and-white will come to your aid. You'll be glad you let that rainbow into your darkroom, and you'll wonder why you waited so long to jump into color. ■

Kodak's Color Data Guide is chock-full of useful color printing information.

FINE PORTRAITS FROM THE KITCHEN

G. Paul Bishop is a master portrait photographer who has lived and worked at the same location in Berkeley, California for 30 years, photographing hundreds of famous and not-so-famous people. He is also a lecturer in visual design at the University of California; his classes take place at his home in his kitchen which converts into a darkroom . . . or is it a darkroom that converts into a kitchen?

DP: Since your darkroom/kitchen arrangement is so unusual, especially for a pro of long standing like yourself, let's start there. Will you describe it?

GPB: Well, (laughing) I think the best way is to say it's a system. We live here and work here and have raised three children here in the studio. Diapers—in those days they didn't have Pampers—the wash-type diapers were hung on my film drying rack. I still use the rack . . . but for film drying, not for diapers. Our system begins in the morning. My wife and I have breakfast in the kitchen, then the dishes are washed and put away, and out come the chemicals. I try to do my sittings mostly in the afternoon and my "darkrooming" in the morning. At lunchtime, my supplies are put out of the way and we have a simple lunch. The sink area is always kept clear. If I'm going to "darkroom" in the afternoon, the trays come back out again.

In the early days, I used to get so angry with my wife. She loved fresh diapers. She would snap them and all this fine lint would land all over everything. Then it was hours worth of spotting. Now, my wife does all of the spotting, although we do have pretty clean prints these days.

DP: No more diapers?

GPB: No, though our kitchen is still interesting, even tax-wise. It is over 50 percent darkroom so we treat it for tax purposes as a darkroom. We just do our cooking in the darkroom instead of doing our darkrooming in the kitchen.

DP: What about grease? Isn't that a problem?

GPB: No, I keep my equipment well covered though we do have a little grease. My old friend Sam Erlich would always say, "It's that grease that makes your prints so fine."

DP: How did you learn about darkroom work? Did you teach yourself, read books, or ask people?

GPB: My idol was Edward Weston. I spent as much time with him as I possibly could. I'd go charging down to Carmel and just get in his way, hanging around. I'm sure Weston found me very pesty.

DP: You just went down there? Were you introduced to him first?

GPB: Many people did just appear uninvited. I happened to have a mutual acquaintance whom I went with for the first time. I was so taken with Edward and his photography that I learned more than I ever expected. If you look back through my prints, you'll find that no matter what format I used, if they were 8x10, they were 8x10 full frame; if they were 35mm, they were in the proportion of one to one-and-a-half.

DP: No cropping of the negative . . . ?

GPB: Correct. I think just now I'm beginning, after all these years, to find the freedom to stray from this rule.

DP: To say, well, I really would like it better cropped this way?

GPB: Yes.

DP: I gather you learned printing by picking up Edward Weston's darkroom techniques?

GPB: Yes. My darkroom is very complicated now compared to his. He had a pull chain with a light bulb up over the table. That was how he exposed his prints, by pulling the chain. Pretty soon, if he felt the paper was exposed enough, he'd pull the chain and turn off the light. Actually, Edward apologized to me once because there was an enlarger over in the corner which belonged to his son, Brett. Edward would have nothing to do with it.

Photos by Carol Bernson

MASTERS OF THE DARKROOM

AN INTERVIEW WITH G. PAUL BISHOP

BY CAROL BERNSON

Newcomers to the darkroom were always carefully told that that was Brett's enlarger. Maybe Edward's darkroom forced me to realize that his work had to come out of him, not out of anything else. Pulling a chain on a light bulb was enough.

DP: What kind of enlarger do you use?

GPB: I'm on my second Durst enlarger. The M601. When I retire darkroom equipment, I move it up to our home in the mountains. My old Durst is up there. Both enlargers are 2¼-inch format. Here I use a color head because it's a little more diffuse for printing black-and-white. I print most of my photographs on a grade #3 paper.

DP: What enlarging lenses do you prefer?

"We just kind of do our cooking in the darkroom, instead of doing our darkroom work in the kitchen."

GPB: I use Nikkors—they're sharp. My usual lens for 2¼-square film is a 105mm. Most photographers use an 80mm lens with that format. I have to use the 50mm lens to make a bigger enlargement than I can with my 80mm.

DP: Have you any darkroom methods that you think are different than the norm?

GPB: My contact sheets and preliminary prints—I do them rapidly on Polycontrast paper. My finished prints are on Ilfobrom graded paper, almost always grade #3. I use Dektol and run the finished prints through selenium toner.

DP: Have you used any of the resin-coated papers?

GPB: I use RC paper for glossies all of the time. It's so quick.

DP: I've heard you have a personal film developer formula. How about passing it on?

GPB: Sure. I start out with 28 ounces of water at 68°F. Add one ounce of acetone at room temperature. It raises the water temperature to 70°F. Do not use paint thinner; it must be a fine-grade acetone. I use U.S.P. (pharmaceutical grade), but it doesn't have to be that good. Then I add sodium sulfite—you have to be careful, that's F-I-T-E—there's a sulfate and a sulfide. I use 30 grains of sodium sulfite. For those who don't want to bother with scales, that's a good rounded quarter-teaspoon—I still weigh mine out. Add 20 grains of Elon or Metol—they are both the same thing. I stir well and that's all. The important thing here to remember is agitation. During the first 30 seconds, agitation is continuous. Not a rapid shaking, but about two inversions every 5 seconds. Then it becomes critical to leave the tank alone, let it sit for 1 minute. Then give it 5 more seconds—about two or three inversions—each minute thereafter. I haven't put any alkali in this developer, so you don't need an acid shortstop. I use a plain water shortstop at 70°F. Then fix.

DP: What about development time?

GPB: The time is different for each type of film, and depends on how much contrast you want. For Panatomic-X, it's 12 to 13 minutes at 70°F, depending on contrast. Plus-X is 13 to 14, Tri-X is 15 to 16 minutes. The more development, the more contrast.

Vinnette Carroll

Vinnette Carroll, Dramatic actress. Taken November 14, 1955 with an 8x10 view camera; 12-inch Kodak Ektar lens on Panchro Press Type B film, developed in Pyro Acetone. Victor studio strobe: two lamps in 15-inch reflectors. Printed on Ilfobrom glossy; developed in Dektol 1:2 and selenium toned.

Imogen Cunningham, Photographer. Taken April 5, 1962 with a Mamiya C220; 135mm lens on Panatomic-X film. Victor studio strobe: 15-inch reflectors on main at f/11. Developed in Elon Acetone. Printed on Ilfobrom glossy; developed in Dektol 1:2 and selenium toned.

Andrew Lawson, Professor Emeritus, Geology and Anthropology. Taken in 1950 with a 5x7 view camera; 12-inch Kodak Ektar lens on Panchro Press Type B film. Developed in Pyro Acetone. One flash bulb in an 18-inch reflector and one reflector as fill. Printed on Ilfobrom glossy; developed in Dektol 1:2 and selenium toned.

Frank Lloyd Wright, Architect. Taken April 26, 1957 with an 8x10 view camera; 12-inch Kodak Ektar lens on Panchro Press Type B film, developed in Pyro Acetone. Victor studio strobe: two lights in 15-inch reflectors. Printed on Kodak Polycontrast F; developed in Dektol 1:2.

Andrew Lawson

Frank Lloyd Wright

Imogen Cunningham ▶

DP: Do you process all your film at 70°F?

GPB: Yes, I think 70°F is easier to maintain than 68. And 70°F works fine. My developer doesn't soften the film. If anything, it has a little tanning action, so you don't really have soft film at 70°F. I wash Panatomic-X for 6 minutes, Plus-X a little longer, and Tri-X for at least 15 minutes.

DP: How about a washing aid? Do you use hypo-clearing agent?

GPB: I do not. I was complaining bitterly about scratches on the film, and a friend of mine said, "Oh, you're using hypo eliminator, aren't you?" He was right. It softens the film just enough so that you get scratches. It isn't necessary, because thin-emulsion films will wash very rapidly. I do use Kodak's Photo-Flo, then I hang the film up to dry. There's the diaper rack right there. If I'm in a hurry for the film, I turn on a couple of burners on the stove. It isn't directly under the film, but it's close enough so that it helps. I was in the Navy, and when you're a sailor you learn to make maximum use of your space.

"Weston apologized because there was an enlarger over in the corner which belonged to his son Brett."

DP: Let's talk about your printing. You make the contact sheets and then —?

GPB: I make proof prints, all burned and dodged.

DP: What developer do you use for printing?

GPB: Dektol for everything, diluted 1:2, with an acetic acid stop bath.

DP: And fix?

GPB: I just bought some new stuff—Lauder Paper Fix. You dilute it 1:7 and fix 4 to 8 minutes. I usually use Kodak fixer, but this came at a little better price. The only thing I vary from the book is that I always use fresh hypo and I don't use two baths, just one and throw it out fast. I use Permawash, and then I wash. I have the simplest washer in the world—see!

DP: A tray with holes in it! After you wash it, then what do you do—tone it?

GPB: Right, but first I use a little solution of regular baking soda, about a teaspoon in a quart of water, just in case there's a bit of acid left in the print. If there's any acid left, you'll get yellow stains all over. I forgot to mention one thing with Ilfobrom. I don't use fixer with an acid hardener added. The difference is—if you take Ilfobrom processed in a hardened fixer out in the sunlight you'll see a definite purple glow, but if you don't put hardener in, you just get beautiful black.

DP: How do you dry your prints?

GPB: Like this (he pulls out aluminum-framed screens, stretched with cheesecloth). Air dry on muslin or cheesecloth. Then I put them in the mounting press for a few seconds and they are ready to mount.

DP: Earlier you mentioned that you were in the Navy. Were you in a war? Did anything exciting happened to you?

GPB: Well, yes. Before WWII started, I had switched from dental school into photography, and after first going bankrupt, I had succeeded in establishing a going portrait business. So I applied to be a photographic officer in the Navy, and was sent to Naval Photography School. It was the only photography school I ever went to. Mostly I did aerial photography: damage assessment and photographing beaches before invasion. But because I was once dumb enough to keep going when I should have turned back, I received a Presidential Citation, and as a result I was sent to work with Edward Steichen. Alas, I was only in Edward's group about a month before the Navy stopped his operations.

DP: What did you do while you worked with Steichen?

GPB: We were sent on special trips to make pictorial types of publicity pictures, instead of doing reconnoissance. Edward later made a book out of the pictures called *The Fighting Lady*.

DP: When the war ended, did you go back to what you had been doing before?

GPB: I didn't have a real purpose before the war. I wanted to be a photographer, to take pictures, but I didn't have a hard-core reason. I knew I wanted to work with people, and the war was a catalyst for me. I saw people killed all around me, but I gained insight into human beings' courage and basic goodness. Some other people were completely devastated by the war; they saw only the negative side. I made up my mind that human beings are the greatest things in the world. Photography became a tool for me to gain understanding and show appreciation. That's all my work is about, an affirmation that "people are wonderful." ■

Carol Benson is a California-born photojournalist whose work appears in national and international magazines as well as in corporate publications.


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TONY FREEMAN

A 6-STEP RECIPE FOR POSTERIZATION

The same eyes that are reading these words can perceive hundreds of different shades of gray. A remarkable graphic effect occurs when a photographer selects several of these gray tones and turns a normal, continuous-tone photograph into an image containing just black, white, and these particular grays.

The result is so poster-like that the process has been named photoposterization. It can be so dramatic, given the right subject, that it is high on many people's list of favorite darkroom techniques. But those who actually try to make their own posterizations often give up—after tangling with reams of high-contrast film, rebellious registration systems, and developers that never seem to do the same thing twice. The biggest headache seems to be registration: lining up the various sheets of film that contain the separate tones when it is time to reassemble them onto one sheet of paper.

Since I am basically lazy (or energy-efficient, as I prefer to put it) and easily driven to frustration, it was only natural that I should look for a simple, surefire method for making posterizations. What follows is the combination of the best points of the many routes you can follow. Use this recipe and it is unlikely that you will fail.

Here are the steps involved:

1. **Select an original negative.**
2. **Make a master positive from the original.**
3. **Make separation negatives from the master positive.**
4. **Make separation positives from the separation negatives.**
5. **Combine the separation positives into one posterized negative.**
6. **Print the posterized negative.**

HOW TO SELECT YOUR ORIGINAL

1. Tonal range. Your original is the foundation upon which your posterization will be built. You will find it difficult to select specific tones of gray (along with black and white) from a photograph for use in the posterization if they are absent in the first place. In spite of the fact that you are going to convert the photograph into, perhaps, two shades of gray, plus black and white, the original must have a broad range of tones. The quality of the finished posterization is often directly proportional to the tonal quality of the original.

2. Tonal separation. Be sure that your original features good separation of tones. That is, look for shots in which dark subject matter is placed against a light background, or vice versa. A spotted leopard against a background of foliage will turn into a spotted foliage . . . or a leopiage . . . or a foliard. You will not be able to tell where one ends and the other begins. Ma nature made spotted leopards that way on purpose. If you intend to create a posterization of one of them, you had better have a shot of it against the sky, or fully sunlit against the dark opening of a cave.

3. Chiaroscuro. Imagine an artist poised over a sheet of paper, charcoal in hand. He draws a circle. Then he begins to shade in the bottom and one side a little and the circle becomes a ball! This shadowing or modeling is what gives our eyes the information they need to make our brains say "ball" instead of "circle." This same modeling, called *chiaroscuro* by the ancients, is what we are going to divide into tones of gray in our posterization. You cannot render a solid white area in tones of gray.

4. Grain. The high-contrast film used to make posterizations will register the most incredibly fine detail. This includes specks of dust (more about this later) and, of course, grain. There will be times when this grain can be a tremendous addition to the graphic effect of the posterization. Other times it can be a real nuisance. If your subject seems to be one that will not benefit from exaggerated grain, then try to start with a fine-grained original. While the "blocking-up" technique of development I describe a little later will help overcome grain to a degree, if you don't want grain in the final print, you'd best avoid it from the start.

5. Clean lines. High-contrast film shows no mercy—the slightest spot stands out like a spotlight in a midnight sky. Everything must be clean, clean, CLEAN! And that includes the original.

6. The original image. You may use any continuous-tone original, be it a black-and-white negative, color negative, or slide, provided it has the characteristics listed above. For simplicity, in this article I will assume that you're starting with a black-and-white negative.

MAKE THE MASTER POSITIVE

Once you have selected your original negative, simply enlarge it onto a sheet of ortho litho film like Kodalith Ortho, Type 3, just as if you were making a normal black-and-white print. How do you tell which is the emulsion side of the film? Well, the emulsion side of orthotype litho film appears somewhat lighter than the back of the film under the red safelight that you use when working with this film. Treat the film just about the same as you would a sheet of RC (resin-coated) enlarging paper.

Make a test strip in the usual manner and select the exposure that will pro-

Erika Hamburg

▲ Before After ▶

1 ORIGINAL PRINT

2 MASTER POSITIVE

3 SEPARATION NEGATIVES

duce what would be a normal, full-range black-and-white print, except that it will be on a transparent sheet of film. Then make your exposure, using as big an area as you will be capable of enlarging later. Remember to leave space along the edge of the film for the registration pins. If your enlarger only takes up to 2¼-inch square film, work to that size; if you've got a 4x5 enlarger, so much the better. Some people can actually work with 35mm contact-printed masters and separations, but opaqueing and film handling are very difficult with such small film.

Develop the exposed litho film in a normal print developer such as Ethol LPD or Kodak Dektol diluted one part stock to two parts of water. A 90-second development time is fine for most originals, but remember that you can alter the dilution or the development time to change the contrast of this master positive to suit your needs.

After dipping it in the stop bath, fix the film in rapid fixer to save time. Rinse the film, treat it to a bath in hypo eliminator, and wash it in running water as you would any sheet film. The hypo eliminator allows the film to wash fully in about 10 minutes.

Before hanging the film to dry, soak it for 30 seconds in a weak solution of wetting agent such as Kodak Photo-Flo mixed with distilled or purified water.

Hang the sheet of film from one corner to allow the water to run off the lower corner. After a few minutes, you will see that the film is well on its way to drying, except for the bottom corner. Pinch this corner lightly and the remaining puddle of water will run off onto your fingers, further speeding the even drying of the film.

MAKING SEPARATION NEGATIVES—IN REGISTER

Gather your registration board (see this month's "Tools & Tricks" section for how to make one), a two-hole punch, master positive, and your other materials at your enlarger. You will be using the enlarger to make your contact exposures because you can control the brightness

4 SEPARATION POSITIVES

5 POSTERIZED NEGATIVE

6 POSTERIZED PRINT

and duration of this light easily. You will be using very small lens openings at times, and if you're not careful, this can cause dust inside your enlarger to be printed onto your contact-printed sheets of film. To prevent this, raise the enlarger all the way and extend the lens as far from the negative stage of the enlarger as you can and still get an even field of light on the baseboard.

Prepare a solution of high-contrast film developer such as Kodalith A-B or Kodak D-11 developer. The A-B developers are very effective for producing high contrast, but they require storage of two solutions and, once the two ingredients are mixed in a tray for use, they begin to kill each other off. Mix no more than you need and do not try to use the mixed A-B litho developers for more than one printing session. Developers such as D-11 may be returned to a bottle after use, but I find it inexpensive enough to use a small amount of solution at one time and dump it after a session of, say, 2 hours.

Punch a sheet of ortho-type litho film under the red safelight and position it on the registration pins, emulsion side up. Brush it to remove any dust; brush the punched master positive on both sides, and place it on top of the unexposed film. Cover it with the hinged glass sheet.

Stop your enlarger all the way down and make a five-section test strip of 5, 10, 15, 20, and 25-second exposures.

Develop this test strip for 4 minutes with constant agitation in the high-contrast developer. This is extreme over-development; it causes "blocking-up" of the tones and saves making two or even four more generations of negatives and positives.

View the test against a light box or other even light source, and determine the exposure required to produce a high-contrast negative which is about half black and half clear. Choose another that is about 80 percent black and a third exposure that leaves the film about 80 percent clear.

Punch three sheets of film, and place one of them on the registration pins with

the master positive on top. Remember to brush all surfaces clean. Make a full sheet exposure at the time required to make the light negative described above. Expose the second sheet of film at the time needed to produce the half light/half dark negative. Make the third exposure on the remaining punched sheet at the time called for to make the dark negative.

Develop all of these sheets together for 4 minutes in the high-contrast developer. Wash, use Photo-Flo, and dry these negatives as you did the master positive.

The three-negative procedure described above will yield a four-tone posterization with black, white, and two shades of gray. If you want more than two gray tones, you must make more separation negatives.

MAKING THE SEPARATION POSITIVES

While the films you just processed are drying, place a strip of litho film under your enlarger and make a test strip of the raw light from the enlarger. Start with the enlarger stopped all the way down and make an 8-section or 10-section test strip, uncovering about half-an-inch for each section. Give each section 5 seconds more than the next, producing a strip showing exposures of 5, 10, 15, 20, etc. seconds. Develop this test strip in the high-contrast developer for 4 minutes.

"A spotted leopard against a background of foliage will turn into a leopiage or a foliard."

After the film clears in the fixer, examine it to determine the minimum exposure time required to produce maximum black. Suppose the test sections are all solid black from the seventh exposure on to the end of the strip. This means that it takes a minimum of (seven times five equals) 35 seconds to produce solid black. Any longer exposure will not increase the density.

You will be using this exposure to make all of the separation positives in the next step.

Examine the separation negatives on a light box, using a magnifier. Opaque any pinholes or other boo-boos that you see in the black areas.

Next, go back to the registration board with your dried, opaqued separation negatives. Contact print each of them onto a sheet of punched litho film as before, giving each of them the same exposure, as determined in the test strip just described.

Develop these sheets for 4 minutes, all at the same time, in the high-contrast developer, stop, fix, wash, use Photo-Flo, then dry.

Opaque the separation positives where necessary as you did with the negatives.

MAKING THE POSTERIZED NEGATIVE

While the sheets of film you just made are drying, take a sheet of litho film and repeat the test-strip procedure used before printing the separation positives. Only this time develop for 90 seconds in a print developer like Dektol diluted 1:2. The resulting test strip should contain quite a few tones of gray between black and clear. The developer may be diluted even more if a wider range of grays is needed.

From this processed test strip, select the two tones of gray you want to appear in your posterized negative. The third tone will be solid black.

Punch one sheet of litho film and place it on the registration pins. Place the lightest of the separation positives on top of the unexposed film and cover it with the glass. Expose this positive for whatever time you just determined will produce the lightest tone of gray you want in the posterized negative.

Replace the lightest positive with the medium-density one. Make a second exposure through the medium positive onto the same sheet of film. Remember that the area being exposed this time has already received the exposure from the first positive, so add only enough time to this second exposure to total the time required to produce the second shade of gray you've selected.

Replace the second positive with the darkest positive. Add only sufficient exposure to the two previous exposures to total the exposure required to produce black.

Process this sheet of triple-exposed film for 90 seconds in Dektol 1:2 with constant agitation. After processing, this sheet of film will contain some totally black areas and some totally clear areas. The rest of the negative will be made up of the two tones of gray you selected.

When this film is printed as a normal negative, these areas will, of course, reverse in tone, producing a four-tone posterization having black, white, and two shades of gray.

If you have been careful about dust, there will be little or no need for opaqueing the posterized negative. If some tiny white spots show up in the

gray-tone areas, they can be retouched (very carefully) with a print-spotting fluid.

PRINTING THE POSTERIZED NEGATIVE

There is nothing special about printing this posterized negative, provided you didn't make the original master positive too big for your enlarging set-up.

There! Now that wasn't so bad, was it? Think of the satisfaction at having mastered what everyone assumes to be a very complex and difficult process. But of course when you show off your creation you can modestly say, "Oh, it was a snap." ■

EVERYTHING YOU NEED TO MAKE POSTERIZATIONS

Film: High-contrast ortho film such as Kodak Kodalith Ortho, Type 3.

Developers: High-contrast developer such as Kodak D-11 or Kodalith A-B. Print developer such as Ethol LPD (1808 North Damen Ave., Chicago, IL 60647) or Kodak Dektol.

Stop bath: Edwal's Signal Shortstop.

Fixer: Either a rapid fix or a regular fix.

Hypo eliminator: Kodak Hypo Clearing Agent or Orbit Bath (TKO Chemical Co., St. Joseph, MO 94501).

Wetting agent: Kodak Photo-Flo, used at about half the recommended strength and diluted with distilled water.

Registration board: See this issue's "Tools & Tricks" section for an easy way to make one.

Two-hole punch: Any kind available at an office supply store, but take your registration pins to be sure the holes made by the punch match the pins.

Registration pins: May be purchased at a graphics supply store—I use Bregnan's model Q3.

Opaqueing fluid: Kodak Red.

Spotting fluid: Such as Berg Touchrite (Berg Color Tone, P.O. Box 16, East Amherst, NY 14051) or Spotone (Retouch Methods, Inc., Chatham, NJ 07928).

Spotting brush: Size 00 for opaqueing and spotting.

Miscellaneous: Negative brush, red safelight, enlarger, timer, trays, and a DARKROOM!

Tony Freeman is the former national editor of The Photo Instructor. He currently teaches photography to high school students, and is on the governing board of the National Association of Photography Instructors.

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41. Saunders/Omega Easel
42. School Modern Photog.
43. Smith-Victor Lighting
44. Solar Cine Catalogue
45. Soligor Lenses
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47. Vivitar Enlarger
48. Yankee Film Dryer
49. Yankee Film Tanks

PART I: ANNUAL TIMER BUYING GUIDE

HOW TO CHOOSE A DARKROOM TIMER

Legend has it that Mannes and Godowsky, musician-inventors of the Kodachrome process, timed their intricate darkroom experiments back in the 1920's by humming sections of classical scores. Alas, for those of us not so musically inclined, whistling our favorite tune or counting "one-Mississippi, two . . ." while printing and processing is a sure recipe for darkroom disaster. Fortunately, today there is a vast array of electronic and mechanical devices that make precision darkroom timing as simple as pushing a button.

In fact, there are so many types and makes of darkroom timers on the market these days that choosing the one that best fits your particular needs can be quite a problem. What follows is intended to simplify your task and, together with the detailed tables of timer features and specs which follow, should enable you to select a darkroom timer that will give you maximum utility at minimum cost. First, some basics. There are four different kinds of darkroom timers:

1. timers that control enlarging exposures only;
2. timers that time processing steps only;
3. dual-use timers for both enlarging and processing;
4. enlarging timers which incorporate (or offer as an accessory) a light-sensitive "probe" or "cell" that can help you determine the proper printing time to enter into the timer. These are the newest type of enlarging timer; they have their own separate category because this extra feature makes them considerably more sophisticated than the average enlarging timer—and correspondingly more expensive.

The essential difference between an enlarging-only timer and the dual-use type is in the timing range. Timers intended solely for the enlarger usually don't time longer than 110 seconds, too short for most processing steps. Some dual-use timers are basically enlarger timers with an extended timing range; others incorporate sophisticated electronic "memories," useful when timing color processing steps. Many dual-use timers also incorporate a buzzer with an on/off switch so you can have an audible end-of-cycle indication when a processing step is completed, but not have to hear the buzzer when you're enlarging.

Timers meant for processing only are either of the "one-step" or "multi-step" variety. A one-step processing timer can "remember" only a single time; there is no way to program the unit to count down a sequence of processing times (for example, the steps of a color film development process). Multi-step processing timers, as their name implies, can "store" and time a number of processing steps in sequence. On less expensive multi-step timers, "storage" of your chosen times is accomplished by an interchangeable plastic "timing disk" to which you attach small "stops" at the intervals you desire. On more expensive units, solid-state "memory circuits" store the timing sequence.

"Counting 'one-Mississippi, two . . .' while printing and processing is a sure recipe for disaster."

MOTORS OR TRANSISTORS?

Contemporary timers are usually constructed either with an electric motor and appropriate cams and gears (the electromechanical type), or with electronic components, usually of the solid-state variety. The electronic type may—or may not—have a digital readout that counts down as time elapses. The electromechanical type usually has a "clock face" and rotating hands. While a high-quality solid-state unit may be somewhat more accurate and repeatable than the electromechanical type, a well-made electromechanical timer is more than accurate enough for most amateur and professional darkroom work. On the other hand, some solid-state units have special features unobtainable on electromechanical timers that can be very helpful in particular applications. So a wise timer buyer will make his or her choice on the basis of features and price, and not on the basis of clock-hands versus flashing LEDs.

Many timers feature "Auto Reset," which means that they return to the original set time after completion of a timing cycle. This is useful for fast, precise repeat operations—and also reminds you automatically of your last timing decision. Many timers, but by no means all, give you a continuous readout of "time remaining" during a timing cycle. If you like to burn and dodge, such a readout can be very useful. Serious dodgers and burners might also be interested in a timer that has, either built-in or available as an accessory, a metronome-type device which emits audible once-per-second "beeps" during the timing cycle.

Most timers meant for enlarging incorporate a socket for the safelight. If you plug your safelight in, it will turn off when the enlarger is turned on. This feature can be helpful when working with faint images on the enlarger baseboard, but it certainly isn't necessary to synchronize your safelight with your timer to get good prints—assuming your safelight is actually safe, of course. Some timers also incorporate a receptacle for an accessory footswitch; if you buy a footswitch (they usually list for under $20), you'll be able to switch the enlarger on without using your hands, thereby solving the "third-hand" problem that sometimes occurs in tricky dodge-and-burn situations.

A number of the more sophisticated solid-state timers offer a "Hold" button; others offer a "Reset" (or "Cancel") button; a couple of timers offer you both. A "Hold" button interrupts the countdown and turns the enlarger off; when the "Start" button is pressed again, the countdown resumes at the point it stopped. A "Reset" button, on the other hand, stops the countdown and returns the timer to the full time originally set.

That about wraps up our discussion of darkroom timer features. As you can see from the table which follows, manufacturers have combined these features in almost every conceivable kind of way. We are presenting this information in two parts; Part II will appear in the next issue of DARKROOM PHOTOGRAPHY. By checking the specs, you'll find the "mix" of features that most suits you.

ANNUAL TIMER BUYING GUIDE: PART 1 ENLARGING TIMERS

Cosar/Mornick 380 Timer

EPOI Printrol

Kearsarge 201

GraLab 400

Leedal ET-1

Lektra TM-762

Spiratone Lab Series Timer

Unicolor 10X

Omega 60-Second

Vivitar Digital Time Commander

Time-O-Lite GR-72

This issue's table covers timers designed specifically for enlarging. In our next issue we'll bring you specs for three other types of timers.

Note: All timers except Leedal MT-1 and Omega's 60-Second have "Auto Reset"

Name Manufacturer/ Distributor	Type of Construction
Cosar/Mornick 380 Timer Cosar Corp. 3121 Benton St. Garland, TX 75042	solid-state
EPOI Printrol EPOI, Inc. 101 Crossways Park West Woodbury, NY 11797	solid-state
GraLab 400 Dimco-Gray Co. 8200 S. Suburban Rd. Centerville, OH 45459	electromechanical/ luminous dial
Kearsarge 201 Kearsarge Industries, Inc. 1890 Michael Faraday Dr. Reston, VA 22090	solid-state with digital display
Kearsarge 301	solid-state with digital display
Leedal MT-1 Leedal, Inc. 2929 So. Halsted St. Chicago, IL 60608	electromechanical/ luminous dial
Leedal ET-1	solid-state with digital display
Lektra TM-762 Lektra Labs, Inc. 129-07 38th Ave. College Point, NY 11356	solid-state
Lektra TM-764	solid-state
Omega 60-Second Omega Div., Berkey Marketing Cos., Inc. 25-20 Brooklyn-Queens Expwy. W. Woodside, NY 11377	mechanical/ luminous dial
Spiratone Lab Series Timer Spiratone, Inc. 135-06 Northern Blvd. Flushing, NY 11354	solid-state
Time-O-Lite GR-72 Industrial Timer Corp. U.S. Hwy. 287 Parsippany, NJ 07054	electromechanical/ luminous dial
Time-O-Lite M-72-60S	electromechanical/ luminous dial
Unicolor 10X Unicolor Div., Photo Systems Inc. 7200 Huron River Dr. Dexter, MI 48130	solid-state
Unicolor SPS	solid-state
Vivitar Digital Time Commander Vivitar Corp. 1630 Stewart St. Santa Monica, CA 90406	solid-state with digital display

Timing Range (in seconds)	Smallest Marked Interval	"Time Remaining" Available During Timing Cycle?	Accepts Accessory Footswitch?	Special Features & List Price
0.1–110	0.1 sec. from 0.1–11 sec. 1 sec. from 11–110 sec.	No	Yes	Illuminated time settings; internal voltage regulation; can be operated in dark with elbow; solid-state light indicates timing cycle. **$99.95**
0.1–110	0.1 sec. from 0.1–10.1 sec. 1 sec. from 10–110 sec.	No	Yes	Two timing ranges changed by switch; internal voltage regulation; accepts accessory EPOI Audio Aid for "beeps" at one-second intervals. **$63.50**
1–60	1 sec.	Yes	No	8" diameter luminous dial. **$54.95**
0.1–99	0.1 sec. from 0.1–9.9 sec. 1 sec. from 10–99 sec.	Yes	Yes	Memory circuit allows dialing-in a second time as the first one counts down. **$119.95**
0.1–99	0.1 sec. from 0.1–9.9 sec. 1 sec. from 10–99 sec.	Yes	Yes	"Cancel" button turns enlarger off during timing cycle, resets to full set time; memory circuit allows dialing-in a second time as the first one counts down. **$159.95**
0.5–60	0.5 sec.	Yes	No	Permits manual override during timing cycle. **$30.00**
1–99	1 sec.	Yes	Yes	Digital readout can be turned off. **$80.00**
0.1–110	0.1 sec. from 0.1–10 sec. 1 sec. from 10–110 sec.	No	Yes	Both focus and expose functions can be footswitch-operated. **$69.50**
0.1–111	0.1 sec.	No	Yes	"Percentage/Reciprocity" control increases or decreases a pre-set exposure time. **$160.00**
1–60	1 sec.	Yes	No	Adjustable print-and-repeat stop. **$20.95**
0.1–99	0.1 sec. from 0.1–9.9 sec. 1 sec. from 10–99 sec.	No	Yes	"Automatic bracketing" control gives either 20% more or 20% less exposure than has been set; "Reset" button turns enlarger off during timing cycle, resets to full set time. **$34.95**
1–60	1 sec.	Yes	No	Push-button start. **$38.25**
1–60	1 sec.	Yes	No	Interval indicator points to original time selected during timing cycle; push-button start. **$56.25**
0.1–99	0.1 sec. from 0.1 sec.–9.9 sec. 1 sec. from 10 sec.–99 sec.	No	Yes	Glow-in-dark firing bar. **$55.00**
0.1–99	0.1 sec. from 0.1 sec.–9.9 sec. 1 sec. from 10 sec.–99 sec.	No	Yes	Internal voltage regulation; glow-in-dark firing bar. **$130.00**
0.5–99.5	0.5 sec.	Yes	Yes	Continuously variable brightness control of digital display and keyboard illumination. **$69.95**

H. T. KELLNER

CASHING IN ON THE MAGAZINE BOOM

Nearly everyone's favorite subject, making money with your photographs and having fun while doing it is possible—with some good, sound advice.

How many magazines and periodicals do you think are published in this country alone? 5,000? 10,000? 15,000? Actually, no one really knows. But the best "guesstimates" put the number at somewhere between 20,000 and 30,000! A look at a directory of periodicals like *Ulrich's Periodicals Directory, Ayer's Directory,* or *Gebbie's Directory* (available at your public library) reveals thousands upon thousands of periodical publications, ranging from obscure technical journals to mass-circulation magazines, newsletters, and house organs.

But that isn't all. Think of the number of newspapers, calendars, posters, greeting cards, annual reports, promotional materials, textbooks, and the like being ground out constantly on a daily, weekly, monthly, or every-so-often basis. Think of news services and church bulletins, cereal boxes and toothpaste packages. Finally, consider the number of other countries that duplicate these efforts for a media-conscious global community.

What does all of this add up to? For the reader it adds up to an almost inconceivable barrage of never-ending words. But for the photographer who is smart enough to see the potential in this limitless market, it adds up to repeated and quite often lucrative sales of stock and assignment photos.

If you're skeptical, take a look at some of the magazines and other periodicals in your local library. And note that just about every one of them uses photos—photos of babies, of children, of beautiful women, of not-so-beautiful women, of men, of seashells, of gnats and bugs, of piles of newspapers, of hang gliders, of just about everything that exists on, above, or below the earth. Moreover, editors, publishers, calendar manufacturers, advertising people, and other photo buyers pay hard cash for these images . . . and often they pay quite handsomely.

"Well," you say, "that's just fine if you live near a big publishing center. You can stop in, sell your photos, and be home in time for the evening news." But hold on a minute and consider this: there is no "publishing center" that you can't reach easily through the U. S. mail. It's true! For under $5 you can send 40 35mm slides in plastic see-through pages to a publication like *Sea* magazine in California. And the under-$5 postal fee includes the extra weight added by your cardboard photo protectors, your self-addressed stamped envelope, and $400 worth of postal insurance backed up by the postal service. If you sell just one of your slides for any of *Sea*'s four regional covers, you'll receive a check for $300. And *Sea* magazine buys 48 covers per year!

"But I don't have any photos of sea-related subjects," you protest. "My specialty is black-and-white photos of people involved in religious activities." Not to worry. For the same rate cited above you can send two dozen black-and-white prints to National Catholic News Service (NCNS), Washington, D.C. If you sell one-half of your submission, you'll earn $120. And you've got a good chance at selling them that many pictures; NCNS purchases about 1,000 images each year.

"Just about every magazine and periodical uses photos of just about everything that exists on, above, or below the earth."

And you don't have to stop there. Publishers like Standard in Cincinnati and Prentice-Hall in Englewood Cliffs buy thousands of photos each year. In fact, the magazine in your hands would be delighted to see your most exciting vertical color shots for possible covers. Send them to DARKROOM PHOTOGRAPHY, 3129 Fillmore, San Francisco, CA 94123.

Get out your calculator and you'll see that you can easily supplement your present income, possibly develop a full-time income, or simply earn some money for the rainy days to come by freelancing photos through the mail.

Does this sound good to you? If so, you're probably ready to slip some of your work into an envelope and drop it into the mail. But take my advice and hang on for a moment. If you can restrain your immediate impulses, I'll show you a strategy that can help make you a winner in the great photo marketing game.

The first thing you need to do is to take a good look at yourself to determine exactly what your motives are. If photography is an ego trip for you, i.e., your pictures are only what you like, maybe you'd better start hitting the print exhibition circuit. Photo buyers don't care about your ego; they care only about getting the pictures they need. You'll find this out when you

***Sea* magazine editor Chris Caswell selected this photo for a recent cover because it was a sharp Kodachrome with an uncluttered area for type, and it fit their vertical format.**

"You'll be amazed at how many of your own images are superior to some of the published photos you've seen."

begin to collect some of those rejection slips that are an inevitable part of the game.

And if you feel that your work is too precious to send through the mail, too much a part of yourself to part with, maybe you'd better frame all your photos and hang them in your den. Or put them into a safe deposit box. But if making money as a photo communicator is your goal, you're going to have to share your work with the world.

If you can get over the hurdles of fear of the mails and ego-tripping, you're well on your way to making money in the marketplace. Assuming that you have the skills and that you can produce quality photos in black-and-white or color, the next steps in your strategy will involve organizing and building a stock file, finding the right markets for your photos, and submitting your work through the mail. That's it! It's almost that simple: we say *almost* because there are some pitfalls you need to avoid. Future installments of this column will help you steer clear of the traps.

Here's an exercise that will help you get started. Simply flip through all of the photos you have in your files, and *throw aside* all the ones that aren't quite up to snuff, either technically or pictorially. Then make a list, by subject, of all of the remaining photos, the ones that compare favorably to others you have seen in print. You'll be amazed at how many of your own images are superior to some of the published photos you've seen. Finally, go to the magazine section of your library and see for yourself whether or not there is a market for your work. I'll bet there is! And, I'll bet I can help you find other markets for your work through this column.

Stay tuned in. Next issue I'll tell you about some tricks for submitting your photos that have paid off handsomely for other freelancers all over the world. ■

H. T. Kellner of Baldwin, NY is a teacher, photographer, writer, and editor/publisher of Moneygram, a photo-marketing newsletter. He has published a pamphlet called Money In Your Mailbox: A Guide to Freelance Photography, *available from Kellner's Photo Services, 1768 Rockville Drive, Baldwin, NY 11510 at a cost of $5.*

ROBIN PERRY

COLOR SOLARIZATIONS IN A FLASH

"You'll find that it's easier to get dramatic solarization in color than in black-and-white!"

I started out my photographic career as a "hypo splasher." I worked for a large photo-finishing outfit, and my job was to mix sodium thiosulphate (hypo) with a hardener and water to make a fixing solution for black-and-white film and papers. The chemical was purchased in 100-pound bags and the powder flew everywhere. It was the filthiest job I ever had. As they say, we've come a long way since then, especially when it comes to color-processing chemicals. Today very few color darkroom enthusiasts bother to mix dry chemicals—almost every color processing kit comes in liquid concentrates which simply have to be diluted for use.

One of the easiest all-liquid kits to use is Unicolor's K2 chemistry for processing color negatives. It requires only three short chemical steps and one water rinse. It's great for standard processing of color negative film, but I especially like to use it for making solarized color slides . . . slides with dramatic "false" colors produced by exposing the film to light while it's being developed. If you use the process I'm about to describe, you'll find that it's easier to get dramatic solarization in color than in black-and-white!

In addition to the K2 processing chemistry, all you'll need to produce exciting solarizations like the one shown here are some color slide originals, an enlarger with either a dichroic color head or a 60M (magenta) filter in the filter holder, some small processing trays, and a pack of 4x5 Kodak Vericolor II Print Film 4111 (previously known as Type SO-387). This film is relatively new and may need to be special-ordered.

SETTING UP

Pick several of your best color slides and tape them unmounted, emulsion facing you, to one side of an 8x10-inch or larger sheet of glass. This glass could be the same one you use for contact printing. Be sure that the slides cover an area no larger than 4x5 inches. Use a tape that won't leave a gummy residue, such as Scotch Magic Transparent Tape No. 810, available at most stationery stores.

Now prepare your processing chemicals. The Unicolor K2 kit contains seven bottles of concentrated solutions which, when mixed according to the enclosed instructions, produce the three necessary working solutions: developer, blix (bleach and fix), and stabilizer.

After the processing solutions are ready, do the following in total darkness. Take one sheet of 4x5-inch Vericolor II Print film out of the package, lift the glass, and lay the film on the easel or contact printer (whichever you are using) emulsion side up. Cover the film with the portion of glass that has the slides taped to it, so they are touching the film (emulsion to emulsion). You now have a sandwich: easel, film, slides, glass.

Now expose the film to the enlarger light, using 60M filtration, for 60 seconds with your enlarging lens set at f/5.6. If your final results are unsatisfactory with this exposure, vary it by adjusting the enlarging lens aperture or the height of the enlarger head; try to keep the exposure time at around 60 seconds. Slightly more or less magenta filtration could give you better results, but for your initial attempts stick to the guidelines I've suggested.

FLASHING THE FILM

Develop the film in a tray at the recommended 75°F with constant agitation for 3½ minutes in total darkness. The exact temperature is not critical, but for consistent results try to keep the temperature the same for each test. Still in total darkness, move the tray with the film in it to the enlarger. Take no more than 30 seconds, so that development time at this point is 4 minutes. Change the timer from 60 seconds to 30 seconds and re-expose ("flash") the film floating in the developer to the enlarger light, still set to 60M filtration.

Continue development for another 1½ minutes after flashing (so your total development time is 6 minutes); then place the film into the blix for 6 minutes and turn on the lights. Wash the film in running water for 3 to 4 minutes, stabilize for 1 minute and dry. That's all there is to it!

You should have some very brilliant solarized slides with reds, greens, and blues. If your colors are muddy, try less light at the first exposure. With a little practice, you'll be able to produce startling effects that will win you—if not fame and fortune—at least delight and amazement. ■

Robin Perry

Robin Perry is the author of Creative Color Photography and over 200 articles on photographic techniques. He is a photographic illustrator whose work has been honored by the Royal Photographic Society, the British Institute and over 100 photographic associations and societies.

Why can't I become a professional photographer?

"You Can!" says George Duryea
President, School of Modern Photography

Each year hundreds of men and women enroll in the School of Modern Photography. They enroll for many reasons. Many want to become professional photographers with their own part-time or full-time studios. Others are amateur photographers who simply want to improve their photographic skills as a hobby... for fun — but they want to be good.

Still others need or use photography in their work. They are not professional photographers in the true sense of the word — but they want their work to be professional in every way. These people include doctors, lawyers, scientists, interior designers, real estate appraisers, engineers, printers, reporters, fashion designers, and many more. Photography is a valuable and helpful adjunct in their work.

YOUR QUESTIONS ANSWERED

In a recent interview, Mr. Duryea answered questions that over the years many people have asked.

Question: *What does it take to be a good photographer?*
Answer: Three things: Confidence, skill, and technique.

Question: *But don't I need a certain amount of talent?*
Answer: Certainly. But what is talent? You must have certain innate interest and ability, but a talented musician becomes truly talented by first learning certain basic musical techniques and then developing his or her musical skills through study, through practice, through help and guidance from others.

The same is true of photography. You must first learn the basic principles and techniques of good photography. Then you apply these techniques by actually taking and perhaps developing pictures. Over a short time, your skill will increase rapidly. As your skills increase so will your confidence and ability. Not everyone can become a great photographer but almost everyone can become a good photographer.

Question: *I do want to develop my photographic skills. What should I do?*
Answer: As mentioned, hundreds of men and women have found that the *School of Modern Photography* offered them the ideal way to become good photographers right in their own homes, at low cost. You can do the same.

Question: *How does the method work?*
Answer: The SMP program was prepared by professional photographers. It consists of a series of fascinating and stimulating lessons covering everything from basic principles through highly advanced techniques.

When you start, you receive the first group of lessons. You read the lesson. Then, after each lesson, you have a photo assignment which you send to the school. There, a professional photographer who has been assigned to you as your personal instructor will evaluate your work. He will return your work with helpful comments and explanations. He may compliment you. He may criticize your work. But everything he says will help you increase your abilities and skills until you achieve your goal of being a truly good photographer.

Question: *What does the SMP course include?*
Answer: The course is complete. All needed theory is, of course, included. But the course is based on "learn-by-doing", by actually taking pictures and submitting them for evaluation by a professional who will then return them to you with constructive comment. All important topics are thoroughly explained including lighting, exposure, composition, developing, filters, enlarging, retouching, photo-journalism, portraits, commercial photography, and much more — everything you need to build a profitable career or to take prize-winning photos as a hobby.

Question: *I already have some photographic knowledge and want to become a professional photographer. Will the SMP program help me?*
Answer: Absolutely. Some of the material in the early lessons may be a review for you, but it will help you pull your knowledge together into an organized, meaningful form. Then you will move ahead step by step into the advanced skills and techniques you will need and use as a professional. Plus you will be given tips on setting up your own profitable photographic studio, the equipment you will need, how to get new business, and more.

Question: *I am primarily interested in photography as a hobby but are there opportunities for part-time earnings?*
Answer: Yes, there are many opportunities. Many SMP students begin earning money long before their course is completed. Through child and wedding photography, through advertising, commercial or fashion photography, and through sale of photographs to magazines and news media. The opportunities are great and your SMP course tells you how to turn your hobby into a money-making part-time business.

Question: *How can I secure more information about the School of Modern Photography program?*
Answer: Just fill out and mail the coupon below, and we will mail you a free 32-page booklet that fully explains the SMP program. Whether you wish to become a full-time professional, to make part-time earnings, to make better use of photography in your work, or to take interesting, provocative photographs as an art form or hobby, the booklet tells you how you can quickly achieve your ambitions and goals. The school is accredited by the Accrediting Commission of the National Home Study Council and the course is fully approved for veterans under the G.I. Bill. There is no obligation. No salesman will call. School of Modern Photography, 1500 Cardinal Drive, Little Falls, New Jersey 07424.

The School of Modern Photography
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JERRY BAGGER

TURNING COLOR SLIDES INTO BLACK & WHITE

You don't have to be a pro to convert your slides to black-and-white prints; with tips from a pro, do it yourself.

Custom labs are often given the job of making black-and-white enlargements from 35mm color slides. Sometimes the photographer feels the picture will work better in black-and-white and sometimes she or he has no choice. Since black-and-white is much cheaper to print than color, many pictures sold for publication must be converted to black-and-white prints.

With today's films and technology, black-and-white conversions can have very high quality. In fact, some professionals, notably travel photographers and photojournalists, shoot only color slide film and routinely make black-and-white conversions when they need black-and-white prints.

But you don't have to be a pro to want to convert some of your slides into black-and-white enlargements. And you don't have to have a professional darkroom to do it yourself, either. The basic process is simple: first you make an enlarged "internegative" of the slide on black-and-white film, and then you print this negative. About the only "nonstandard" piece of equipment you'll need is a 75mm (or longer) enlarging lens. Your enlarger must also be capable of taking at least 2¼-inch square negatives.

Diffusion enlargers will provide acceptable results, but the light from a condenser-type enlarger provides greater image sharpness. This is important when you consider that the final print is a "third-generation image"; each generation we move away from the original will show a slight loss of image quality. It is also important that your timer be consistent and capable of providing relatively short exposure times. Digital timers are ideal because they give accurate exposures to a tenth of a second, but by no means is this degree of precision necessary.

When selecting a transparency for black-and-white conversion, first check it for sharpness. Do not expect the conversion print to be any sharper than the original. Viewing it under a lupe or magnifying glass will give the best indication of how sharp the final print will be. The slide should have normal contrast, although this can be controlled to a limited extent in the processing steps. Most important, however, is the density of the transparency. It should be properly exposed. A slightly underexposed slide is workable, and sometimes preferable, depending on the tonal values of the subject matter. But an overexposed transparency cannot be salvaged by this process—if the highlights are washed out and lacking detail, they will not print. Remember, you can only reproduce what you see in the slide.

Next, check that the transparency is clean. Any scratches or dust on the original will show as black on the final print and nobody wants black spots on their prints. Usually a camel's hair brush and a can of compressed air will do the job, unless the slide has been severely mishandled. If the slide has already been photo-mechanically reproduced via four-color lithography, it may need extra attention. Experience has taught me that most color separators do not handle originals with the same care and concern as the photographer. If fingerprints are evident, a light wash with film cleaner may be the only answer. Be careful, though, as it sometimes leaves a residue and can streak the film. Go easy and be as thorough as possible.

Once the transparency has been properly prepared, place it in the enlarger as you would a negative except with the emulsion up. This will provide a right-reading negative that will be then printed in the usual manner—emulsion down. Use your 75mm-or-longer enlarging lens. This will give more even illumination across the entire image area and will necessitate a longer, more controllable exposure time. Additionally, use of a long enlarging lens is necessary with some enlargers in order to make a 2¼x1½-inch full-frame internegative from a 35mm original.

Size the color image on the easel to give the largest negative your enlarger/enlarging lens set-up can handle—remember, you've got to be able to enlarge the internegative after you've made it. Cropping at this stage, rather than when the internegative is being printed, will yield a print with finer grain. Use a grain focuser to focus the image and double-check just before exposing. Be sure to place your grain focuser on top of a spare piece of film in the easel when checking your focus.

Speaking of film, you may be wondering what type you should use to make the internegative. I recommend Kodak's Super-XX Pan sheet film, which is available in sizes 3¼x4¼ inches and larger. It's got fine grain, a long tonal range, and relatively low contrast—all important characteristics for an internegative film. Because it's a panchromatic film, it must be handled in total darkness.

Since Super-XX is a rather fast film (its ASA rating is 200), you'll have to cut your enlarger's light output. A good way to do this is to place an .90 Kodak Wratten neutral density filter in your filter drawer or below your enlarging lens. Do not use a variable contrast filter for this purpose. It will change the tonality of your print in the same way as using that filter over your camera lens when shooting black-and-white film. Stop the enlarging lens down to f/16 or f/22 and set your exposure for 3 seconds. Here's where the accuracy and repeatability of your timer become important; the goal here is to standardize the process for use in the future.

Original Kodachrome transparency: Guadalajara, Mexico

The greatest challenge in the slide-to-black-and-white process is to reduce

slide contrast to a range that is acceptable for black-and-white enlarging paper. A properly exposed slide of a full-tonal-range subject has a much greater brightness range than any black-and-white paper can handle. So, a severe reduction in the contrast is necessary to maintain all the detail that is seen in the slide. The critical variables in controlling contrast are the same as if you were using the film in a camera. The film must be overexposed and underdeveloped to provide a suitable reduction in contrast. Additionally, because of the relatively long exposures used in the internegative process, reciprocity must be taken into consideration and accounted for in your exposures. This may take a couple of tries in the darkroom, so be patient. It's trial-and-error until you finalize the exact exposure and processing times.

Make your final focus of the image with the grain focuser and place the film in the easel, emulsion up. Handle the film only by the edges and be sure your hands are clean and dry. Expose and process the film, using trays (unless you happen to have a deep tank and holders). Begin with Kodak's developer HC-110, dilution B, for 4 minutes at 68°F. Examine the over-all negative density. It should look pretty much like a good normal negative. If it is severely over- or under-exposed, go back and correct your exposure accordingly. Look at the shadows in the negative. You must aim for the minimum exposure necessary to render adequate shadow detail.

Once you have a normal-density negative, look at the contrast. It is best to use a densitometer for this, but if one is not available use your best visual judgment. The shadows should show adequate density to provide detail, and the highlights should have good separation. If the highlights are extremely dense while the shadows look good, reduce development time. Be careful here, because short development times can easily produce uneven development. If this occurs, try a greater developer dilution. This will "weaken" the developer and give a longer processing time. Reduced development times and increased developer dilutions will lower the contrast by reducing highlight density without appreciably affecting shadow density. If the highlights look acceptable but the shadows appear thin, increase your exposure and reduce the development slightly. The rules are the same as when exposing film in the camera: *exposure determines shadow density while development controls highlight density.*

When you're happy with your internegative, give it the final test—make your black-and-white enlargement. This print should closely duplicate the values in the original transparency. If the reproduction is not faithful to the original, decide what the problem is and make the necessary changes in the procedure. Retrace the steps to see where you can solve the problem. In attempting to trouble-shoot this kind of problem, be sure to keep as many variables constant as possible. In this way you can more easily spot sources of trouble, and will also be able to fine-tune the process to meet your own specific needs.

Once you've got the basics of this process down, and your results are consistent, you can experiment further. For example, burning and dodging when making the internegative can boost image quality. Just remember the effect is the opposite of working on prints: dodge a sky to make it darker, or burn a shadow to bring out detail. Explore any technique that comes to mind; in your own darkroom you are the innovator and problem-solver. Break some rules—in addition to solving your problem, you might make a fantastic discovery. ■

Print made from internegative: foreground dodged during printing to compensate for great contrast range in original

Jerry Bagger is owner of Gamma Photographic Lab in San Francisco. He is a self-taught commercial photographer.

RUDY BENDER

AGITATION: THE MACHINE ROLLS ON

I hate to agitate; I'll bet you do, too. If you're like me, you think agitating when processing films is boring, time-consuming, and tricky to do consistently. Wouldn't it be nice if you could pour the developer into your tank, stick the tank into a machine, and come back when it was time to fix the film?

My father thought so. Back in the forties and fifties, he bought and tried every mechanical film tank agitating device that came on the market. I remember one in particular that, if left unattended, would walk the tank right over the edge of the counter top.

My father's disappointing experiences with automatic film tank agitators bred in me a strong distrust for such devices. However, after agitating my films by hand for over 20 years, I am now using a new method for agitating my black-and-white roll films. And, the method uses an agitating machine!

I used to develop my roll films by hand in a stainless steel inversion tank with the agitation method used by most photographers today and almost universally recommended for roll films by developer manufacturers. I would gently turn the filled tank upside-down and then back upright, two or three times over a 5-second interval every 30 seconds, or once each minute, depending on the film/developer combination I was processing.

Even with this method of agitation, I still occasionally got some uneven development. Usually it would appear as extra density along the edges of the negative caused by the developing solution eddying around the spiral reel flanges. These eddy currents bring more fresh developer to the side edges of the film than to the center, causing the edges to develop faster.

Another problem with hand agitation is what I call the "twitch factor." Nobody can agitate his or her film tank identically from day to day. On one day you might be very excited over how well a shooting session went and want to see your results as soon as possible. You will probably tend to invert your film tank more vigorously and your film will develop faster—and contrastier. On those days when you really don't feel like developing anyway, you will probably turn the tank over a little more slowly than usual. These negatives will be thinner and flatter than normal. So film development contrast varies with your mood.

AUTOMATIC AGITATION

Recently, I had coffee with a photographer friend who was experimenting with automatically agitating his black-and-white roll film development with color print drum motor-base agitators. He felt that the Unicolor Film Drum used on Unicolor's Uniroller motor base was the most promising combination that he had tried. However, his results were not too encouraging. Still, I was intrigued, and because I've always hated the chore of mechanical agitation, I decided to try some experiments myself.

I borrowed his Uniroller and bought my own Unicolor Film Drum II on the way home. The Uniroller was designed to automatically agitate the color print processing drums that revolutionized color print-making. It has a special two-way agitation cycle that rotates a print drum one-and-a-half turns in one direction, then reverses itself, and rolls the drum back one-and-a-half turns every 4 seconds. This two-way action prevents a type of uneven development called longitudinal streaking, which can occur when color prints are spun in only one direction during processing.

The Unicolor Film Drum II is a most unusual film processing tank that was designed for semi-automatic processing of color roll films when mounted on the Uniroller. My color processing friends speak well of the unit when used for this purpose. It can also be used as an inversion tank with hand agitation. It accepts both the special film processing reels that Unicolor designed for it as well as the stainless steel reels you may already own.

THE SET-UP

I set the Uniroller and film drum up in my darkroom. Then, I exposed several test rolls, taken of a special film test target that I use, on Tri-X, Plus-X, and Panatomic-X 35mm and 120 roll film emulsions. I developed several of these rolls in the film drum with both Acufine and Edwal FG-7 film developers while following the Uniroller's black-and-white processing instructions to the letter. Each time, I loaded the drum and filled it half full of developer. Then I laid it over on its side on the Uniroller and let the roller rotate the film back and forth through the developer for the 15 percent-shorter-than-normal developing time that the Uniroller's instructions call for.

Some of the films processed this way were evenly developed, but the highlights seemed unusually contrasty. When the developing time was further shortened to hold the highlights back, the shadow detail grew weaker and printed as though underexposed.

Next I tried an idea of my own. I filled the drum completely with developer and turned the Uniroller on for 6 seconds only, every 30 seconds. This idea did not work at all. Every film and developer combination I tried was badly streaked with very heavy edge densities. Then suddenly, I had a flash. If I couldn't get the machine to do all the work, maybe I could get it to share the load. I put film reels loaded with Tri-X test rolls into the film drum along with

Unicolor Film Drum II on Uniroller Motor Base Agitator.

two empty reels. I positioned the loaded reels in the drum so that they would be in the bottom of the drum when it was standing on end.

After turning the Uniroller on and leaving it to run, I poured in the amount of Acufine developer that Unicolor's instructions suggested with four reels in the film drum. This filled the tank half full of developer—the tank lay on its side on the Uniroller. It was also just enough developer to fully submerge the two loaded reels of film when the drum was standing on end.

As soon as the developer was in the drum, I laid it over on its side on the running Uniroller. Thirty seconds later I plucked the drum off the roller and stood it on end. Sixty seconds later, I laid the film drum back onto the rolling Uniroller for just 6 seconds. Since the Uniroller reverses every 4 seconds the film received some agitation in each direction. At the end of the 6-second period, I lifted the drum off the roller again and stood it upright. I continued to give the film 6 seconds of motorized agitation each minute until the developing time was up. When those negatives came out of the fixer, they looked like the most evenly developed negatives I had ever seen.

"I remember an agitating device that, left unattended, would walk the tank right over the edge of the counter top."

I took density readings from the center of each negative as well as both edges. The maximum difference between the edge and center readings for each negative was a very low .02 density unit. For comparison, I also read the edges and centers of earlier Tri-X/Acufine test negatives that had been taken of the same test target and processed by hand with inversion agitation. The best hand-agitated test rolls showed edge-to-center differences of .05-.06 density units.

ABOUT THE "TWITCH FACTOR"...

The method of intermittent motorized agitation had produced the most uniformly agitated roll film negatives that I had ever seen.

Would it work with other film/developer combinations as well? I ran test rolls of both 35mm and 120 Panatomic-X and Plus-X in FG-7 diluted

1:15 with water and used as a one-shot developer. The resulting negatives were as uniform as the Tri-X/Acufine negatives.

Did the method give repeatable development contrast over successive developing runs? To find out, I developed six rolls of identically exposed Plus-X in FG-7 one after the other. Then I took density readings from each negative on each roll and compared them. The maximum variations in density between the successively developed rolls never exceeded .04 density unit.

Is there a way of using the inversion tanks you already own with a Uniroller processor? Yes, you can, but you will need to make a simple adapter; the diameter of a regular stainless steel roll film tank is too small to ride on the motor drive cams of the Uniroller. My friend Paul Glines, a professional photojournalist, made such an adapter when he tried some similar experiments with the Uniroller motor base. It is very simply an 8½-inch long piece of 4½-inch diameter PVC drain pipe. He puts the tube on the Uniroller with his Nikor tank nested inside the tube.

I don't claim that my new agitation method will work with all possible film-and-developer combinations. But it has worked with every one that I have tried. I do know that I have not had to waste a single sheet of paper or any time burning down the edges of negatives developed by this method. With the rising cost of photo papers, saving a sheet here and another there, by any method, can really add up to a lot of money. Now, if they would only make a machine that would roll a tank back and forth and then stand it on end. . . . I still hate to agitate. ■

Rudy Bender, former owner of a black-and-white lab for professional photographers, currently teaches photography at a community college. He also conducts intensive workshops in black-and-white every summer for professionals.

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TOOLS & TRICKS

TONY FREEMAN

BUILD A $10 REGISTRATION BOARD

Why does a photographer need a registration board? Simply because many darkroom special effects like posterization require you to make a contact image using two or more precisely lined-up sheets of film.

A two-hole punch used in conjunction with a registration board is a simple and very effective way of getting the various sheets of film to "register" precisely each time. But commercial registration boards are designed for professional graphic arts applications, and are usually quite expensive. Fortunately, you can make a simple but highly accurate one at home for well under $10. Here's how:

1. Obtain the materials shown on the supply list and place them all in front of you.

2. With the two-hole punch in hand, notice that there is an edge guide on the far inside of the punch to provide exact placement for the film and to enable the same positioning of the holes in each sheet (even when you are in the dark). Using the two-hole punch, make a pair of holes in a scrap piece of film or in an index card the same size as the film (photo A). Put the film against the edge guide in the same place every time you use the punch to assure that the holes will be located at the same distance from the top and bottom of the film each time a new sheet is punched.

3. Registration pins are small metal plates bearing a ¼-inch pin onto which the film is placed (photo B). Insert the pins through the holes in the scrap film from the underside (photo C) and place the film and pins on the lower half of the sheet of Masonite. Now tape the pins securely to the board (photo D). Use duct tape or cloth mending tape to secure the tabs of the pins in place.

4. Place the cover glass over the film with one edge of the glass just touching the sides of both registration pins (photo E). Make a hinge by taping the glass to the board at the furthest end from the registration pins. And there's your registration board for only $10!! ■

Photo A: A standard two-hole punch is the key to easy registration.

Photo B: Registration pins are small metal plates with a 1/4-inch nub.

Photo E: Completed registration board with glass pressure plate taped all around for safety.

SUPPLY LIST

Pressed wood sheet: approximately 12 inches square.

Glass sheet: at least 6 inches square with beveled or taped edge for safety.

Two registration pins: I use Bregnan's model Q-3, available from most graphic arts supply stores.

Two-hole punch: costs about $2 at an office supply store. Bring your registration pins to be sure the diameter of the holes made from the punch matches the size of your pins.

Tape: duct, cloth, mending or masking tapes all work well.

Photo C: Holes made by the two-hole punch fit over nub on registration pin exactly, ensuring precise film positioning.

Photo D: To assemble the registration board, tape flat end of pin to board while scrap film is still in place.

JOHN SEXTON

STEPPING UP FROM 35MM

Have you ever found yourself wishing that your prints had a little less grain, or were a little sharper? Have you ever wanted more subtle tonalities in your pictures? Or have you ever wanted to make really *big* blow-ups in your darkroom and still get crisp images? If you've answered "yes" to any of these questions, then maybe you should consider working with a film format larger than 35mm.

There's an old photographic saying that you simply can't beat square inches when it comes to negative (or transparency) size. It's true—the size of your negative has an important bearing on the quality of the prints that come out of your darkroom. For one thing, larger negatives need less enlargement during printing to reach a given print size. Less enlargement means less grain and less magnification of any unsharpness in the negative.

Some of you are probably saying, "Yeah, but I get darn good results with my 35mm camera." You're right—I've seen numerous exquisite images made on 35mm film, and for many people it's the ideal format for their work. But if you're a 35mm photographer who's always looking for a new ultra-fine-grain film or developer, a larger negative format may be just what you need.

ROLL OR SHEET?

The "larger formats" this column is devoted to range in size from the newly introduced 6x4.5cm (2½x1¾-inch) size negative used, for example, in Mamiya's M645 camera, all the way up to 8x10-inch film, which is usually used only by professionals. Using a negative format larger than 6x9cm (2¼x3¼ inches) requires that you use film that comes in individual *sheets;* the smaller formats allow you to use 120 or 220 roll film, which is considerably more convenient to handle. And roll film cameras, due to their smaller format, are considerably lighter and faster to use than their sheet-film-using cousins. But sheet-film cameras, typically 4x5, usually have special features, like lens "swings" and "tilts," which can give you a remarkable degree of control over how the final image will come out. So choose a sheet-film camera when you desire the utmost in negative quality and pictorial control, and are willing to accept limited portability and slowness of operation in exchange for it.

"SYSTEM" 120-FILM SLRs

Many modern 120/220 roll film single lens reflex (SLR) cameras, like Bronica's ETR, Hasselblad's 500C/M and 2000FC, Mamiya's RB67, the Rolleiflex SLX, and the Pentax 6x7, feature a systems design similar to that used by sophisticated 35mm SLRs. A vast range of accessories, including lenses, metering

viewfinders, and motor drives, allows you to customize your rig for the kinds of shooting you like to do. A number of these cameras handle so well that they can be used as "oversize 35s." Most offer interchangeable film magazines; if you own two magazines, you can switch films mid-roll. The only disadvantage of this type of camera is that,

"There's an old photographic saying that you can't beat square inches when it comes to negative size."

what with all those appealing accessories, the total tab for your dream outfit may be a little high. Remember, the modern roll film SLR is designed for the photographer who wants ultimate quality in a portable camera, and prices reflect the stringent manufacturing tolerances this requires.

A BUDGET ALTERNATIVE

If you want the advantages 120 film can provide, but are on a limited budget, you might want to check out a twin-lens reflex (TLR) like the Mamiya C330 or the Yashica Mat 124G. These cameras differ from SLRs in that they use separate (but matched) lenses for viewing and taking.They're less versatile than most SLRs, but they may well be versatile enough to fit your needs. For example, the Mamiya C330 can accept a wide range of interchangeable lenses.

Sheet-film cameras are more specialized tools than 120 roll film cameras, being useful only when the photographer can spend a good deal of time setting up his or her shot. But what sheet-film cameras can do, they can do very well. A closer look at their advantages (and disadvantages) requires its own separate column. In future issues, you can also look forward to discussions of special darkroom problems faced by larger-format users, evaluations of new darkroom equipment aimed specifically at the larger-than-35mm photographer, and special exposure and processing techniques that can help you get the very highest quality out of whatever format you've chosen. ■

John Sexton is a professional photographer and an instructor for the Owens Valley Photography Workshops.

BEA NETTLES

KWIK-PRINT: A NEW COLOR PROCESS

Kwik-Print is one of the most exciting and versatile processes that I have ever found, and I am convinced that when enough people learn about it, a color "revolution" will occur. Perhaps this sounds like an exaggeration, but read on and I'll tell you why.

THE KWIK-PRINT SYSTEM

Kwik-Print is a graphic arts printing system originally designed to make color proof prints prior to offset printing. The system uses premixed, light-sensitive colors that are wiped onto white Kwik-Print base sheets. The colors can also be used to print photographic images on suitably "sized" and coated artist's paper, and on fabric as well. The colors are solutions of synthetic gum arabic (to make them stick), bichromate (to make the gum light-sensitive), and permanent color pigments. They come in plastic squeeze bottles (which have a two-year shelf life) in many colors which can be intermixed. "Clear" Kwik-Print is available, and can be added to reduce color intensity.

PREPARING THE SHEET

Kwik-Print base sheets come in many sizes, even very large sheets for making murals. Each sheet is slightly larger than standard photographic dimensions, so a registration system (see "Build a $10 Registration Board" in this issue) may be used on the edge of the sheet and trimmed off later.

There are three types of Kwik-Print base sheets available, Wide Tone P, Wide Tone V, and Hi Con V. I recommend starting with the Hi Con V sheets. They are the simplest to use because they have the least absorbent surfaces so it's easier to maintain clear highlights.

The Hi Con V sheet is white and looks like matte RC (resin-coated) paper. The sheet is not light-sensitive, and has an invisible coating on the front side that makes the colors adhere. Each sheet is notched, and when held in your right hand with the notches in the upper right top corner, the proper side of the sheet will face you.

I work on a smooth, hard counter in normal room light. I sprinkle the counter with a few drops of water and lay the sheet face up, smoothing it out with my hand so that it sticks tightly. This eliminates the need to tape the sheet down and lets me coat a little color over the edges. It is important to wipe off any excess water from the coating area with a paper towel, as water will cause streaks in the color. *Make sure that no water seeps out from under the edge of the sheet.*

SELECT THE FIRST COLOR

Kwik-Print color can be used straight out of the bottle or mixed. A 35mm plastic film cannister makes a perfect container for mixing. You can mix a small quantity and the lid will give light-and air-tight storage. Your mixtures will last for several hours unsealed in room light. If stored in containers, the colors can be used until they dry out. If you have red, blue, yellow, black and clear, you can mix any color.

CHOOSE THE NEGATIVE

Any *contact size* negative can be used. The Kwik-Print system can make continuous-tone, high-contrast, or halftone images, and it can be used to make photograms from such materials as lace, leaves, or cut paper.

COAT THE SHEET

Usually on the first exposure you will want to coat the entire sheet. Coating is done with cotton pads, provided with the kit. Tear a pad into strips and fold one into a square. Pour a small puddle of color onto the sheet. To coat a 16x20-inch sheet, a pool the size of a 50-cent piece should be enough.

First, wipe the color back and forth over the sheet. Next, use a clean cotton pad wrapped around the applicator (also included with the kit) to buff the color dry. Work as quickly as possible, with steady side-to-side and up-and-down motions. You don't have to press hard; a light touch is best.

Your coated sheet is now light-sensitive, so it is best to expose it right away (if necessary, it can be kept in normal room light for up to 30 minutes).

Very simple equipment will give you fine results when exposing your base sheets. Your light source can be sunlight, photofloods, or quartz lights—all give equally good results. The sun is nice, if you have it and want to be outdoors, but it is the least consistent and reliable. A 500-watt photoflood hanging 30 inches from the counter surface is an inexpensive alternative.

The simplest way to make your exposure is to place a foam rubber pad on a board, and lay the coated base sheet on top of it. Then place the negative in position on the sheet. Last, place a piece of glass on top of it all.

"Sound Kwik? It is. This procedure takes about 10 minutes per color."

Exposure times vary with different negatives and different colors. With Hi Con V sheets, you can usually get an acceptable exposure in 5 to 8 minutes with a 500-watt photoflood at 30 inches with a "normal" negative. If, when the sheet is developed, most of the color washes away, increase the exposure time. If the sheet is very hard to develop, decrease the time. Note that after several layers of color have been exposed on your sheet, the exposure times must be gradually increased.

DEVELOPING KWIK-PRINT

Place the base sheet in a sink and hose

Coating Kwik-Print base sheet with color emulsions.

Sometimes I add a color layer on just part of the image.

Interior Moonlight by Bea Nettles (original is 20x26 inches)

it with tap water. If you don't have a sink, a bucket of water and a sponge will work. The unexposed color and its bichromate sensitizer will begin to wash off. This may happen immediately or slowly, depending on the color used and the length of exposure. You may speed up development by rubbing the image with a wet sponge. If you have difficulty in getting the color to wash off, spray the surface with a weak solution of ammoniated water, which you can keep handy in a plastic spray bottle. If this is still not enough, you can use the brightener (included with the kit) which is very strong and will make the image temporarily quite delicate—so use it as a last resort and with caution.

During development you can achieve special effects by deliberately removing parts of the image with a sponge and scouring powder or drawing into the image with a typing eraser. Done carefully this will not damage the base sheet or its coating in any way—and new colors can be exposed over these parts of the sheet in the future.

When the image is developed completely (no more color washes off), your sheet may be hung to dry or immediately dried with a towel. The color is permanent and rubbing with a towel will not hurt it.

ADDING COLOR LAYERS

To add a second color, repeat the process just described. You may add as many color layers as you wish. Because the base sheet is plastic, it will not shrink or curl up, so you can get perfect registration. I use "sight registration"; I lay a negative on the sheet and move it around until I can see by looking through it that it is in the right position. You may prefer to use a standard hole-punch and registration-pin system on the outer borders of the sheet.

When adding color layers, I often add color only in specific areas. It is also possible to carefully wipe off color in certain areas with a damp piece of cotton before exposure.

Real richness is achieved by consecutively exposing multiple layers of color. It may be necessary to expose the same negative with the same color twice to get a really dark color. Colors are translucent, and this must be taken into account when adding color layers. A yellow coating over blue areas will result in green, for example.

My images are often built up with 20 or 30 different exposures from several composite negatives, positives, and photogram material. Sometimes I expose color in an area of a print without using a negative at all.

The possibilities and variations are endless . . . I'm sure you'll discover new ones.

A Kwik-Print Starter Kit is $20 and includes two 5½x9-inch sheets of each type (six sheets total), three colors: lemon yellow, blue, and magenta, and all of the other supplies I have mentioned. The kits are available by mail exclusively from Light Impressions Corp., Box 3012, Rochester, NY 14614. ■

Bea Nettles teaches at the Rochester Institute of Technology. Her book BREAKING THE RULES: A Photo Media Cookbook *is distributed by Light Impressions.*

DENNIS DUGGAN

THE AUTOMATIC PRINT MACHINE

Omega has a new approach to the darkroom. They call it Concept Six. Of the several medium-priced enlargers that make up this group, we've picked the top of the "Concept" line, the CS-50 Automatic Print Machine, to evaluate.

First, note that our purpose in what follows is not to impress or intimidate you with a lot of technical numerical calculations of equipment performance. Instead, we will bring you honest reports of how products function in normal use. With this in mind, let's see if the Omega Concept Six CS-50 Automatic Print Machine is the kind of companion you could be happy with alone in the dark, night after night.

INSTANT ATTRACTION

The CS-50 is an attractive lightweight unit that is easy to break down entirely and reassemble—a nice feature if your darkroom has to serve as a kitchen or bathroom part of the time. Its squared column is slanted forward in typical Omega fashion so you can center the enlarged image on the baseboard even at higher magnifications. The column is also calibrated so you can easily duplicate past efforts. Two paper guides on the baseboard make borderless prints up to 11x14 inches possible without having to use a separate easel.

AUTOMATIC EXPOSURE CONTROL

Built into the enlarger's base is the CS-50 automatic exposure control system, the most unusual feature of this enlarger. In its manual mode, it is an enlarging timer for exposures from 1 to 180 seconds. In its automatic mode, you can program it to accurately expose paper to negatives of various densities and contrast, achieving consistent and well exposed results with push-button ease. A manual override allows adjustment of the standard exposure to suit your taste without loss of the automatic function. The exposure control works by spot reading the enlarged image with a silicon blue cell probe with LED indicators. As well as automatically setting the optimum exposure, the probe can also give a readout of the optimum contrast grade of black-and-white paper.

THE NEGATIVE CARRIER

The CS-50 negative carrier is a study in simplicity and beauty of function and design. Four large silver-colored pins on the bottom gently hold the negative in alignment at the frame window. Its downward curved shape also makes the carrier self-standing and greatly reduces the possibility of a rough edge coming into contact with your precious negatives. The white top and black base of the metal carrier make it easy to see which end is up even in extremely low light.

The condenser housing allows cleaning of the two condenser lens elements with relative ease after removal of a few screws, and a simple plastic filter drawer accepts economical 3x3-inch color-printing (CP) and variable contrast filters. A wheel raises and lowers the bellows, which is of standard design, and the Leica-type threading of the lensmount makes the choice of a great number of fine lenses possible.

PERIOD OF ADJUSTMENT

My first working session with the CS-50 Print Machine was fraught with all the insecurities that plague any new relationship. Being used to a much heavier machine with a faster lens than the f/4 Rodenstock Trinar supplied with the CS-50, the Concept Six seemed somehow insubstantial, and even the automatic exposure system foiled my favorite game of trying out my educated exposure guesses. On the other hand, the built-in paper positioners and smooth negative carrier won my immediate approval. And I found that the extremely well designed lamphouse/condenser system casts bright and even illumination without excessive heat.

After determining that a 10 percent exposure increase over my test would produce the perfect print, I followed Omega's detailed instructions (complete with photographic illustrations) to use that information to program the enlarger's auto-exposure system. Once this is done, you can change magnification, lens aperture, or filtration without any variation in the print density. Reprogramming only becomes necessary with changes of paper type. The only tricky part of the procedure is that when you switch to another negative, you must "place the probe's cell under a reference spot similar to the one originally programmed." If you originally used a skin tone to set your program, then switch to a landscape shot, finding a similar reference spot may not be so easy, particularly if you're working in color.

Generally, the automatic exposure system allowed me plenty of room to exercise my own judgment of the "perfect print," yet prevented any really gross errors, saving a lot of time and paper in the process. The ability to override the auto-exposure allowed successful burning-in after the initial exposure too.

EXPLORING THE POSSIBILITIES

Although color printing can be done with the basic condenser version of the Concept Six enlarger, Omega offers the Chromega B Dichroic Lamphouse [list

price, $165) for the more serious color printer. This color head provides a diffused light source and cyan, magenta, and yellow filtration in values from 0 to 170. This system allows color printing from negatives or slides with a minimum of hassle. The dichroic filters don't fade or come in contact with your fingers or dust, so their effects on color balance are consistent. To set a filter pack, you need only dial in any two of the three dichroics.

The Chromega B can also print black-and-white. Its diffused light source will greatly improve the appearance of prints from scratchy negatives, and the dichroic filters can substitute for variable contrast filters. With the Omega B copy camera attachment (list price $9.95), the enlarger also becomes a copy stand.

Along with the standard power supply unit for the Chromega B, an optional voltage-stabilizing version is available. If you're serious enough about color printing to invest in a color head, it would be foolish to settle for

"Is the Concept Six the kind of companion you could be happy with alone in the dark, night after night?"

the standard power unit. Voltage fluctuations are the prime culprit in producing color shifts and erratic, inconsistent results in the color darkroom.

AFTER THE HONEYMOON

After testing all its features, I just let the CS-50 be my enlarger for a while. During this period I used my El Nikkor f/2.8 lens, which is sharper and faster than the f/4 Rodenstock Trinar that was supplied with the enlarger. The only problem I encountered during this phase was occasional vibration when a heavy truck or bus went by outside. This could easily be remedied in a permanent installation by securing the enlarger's base to a rigid table and securing the top of the column to a wall stud. Other than this, I found the Concept Six idea very easy to live with, and one I'd recommend to anyone looking for an enlarger in this price range. The list price of the CS-50 with condenser head is $359.95. ■

Dennis Duggan is a professional still photographer and filmmaker. He is technical consultant and contributing editor for Super-8 Filmaker magazine.

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CALENDAR

MARCH

Friends of Photography. Exhibition: Robert Cumming photographs, to March 25. Group shows, March 30 to April 29. Sunset Center, San Carlos at 9th, Carmel, CA.

66th Pittsburgh International Salon of Photographic Art. Contest sponsored by the Academy of Science and Art of Pittsburgh. Closing dates: March 6 for slides, March 20 for prints. Entry fees $2.75 to $3.50. Contact: Mrs. C.L. Hissem, 1046 East End Ave., Pittsburgh, PA 15221.

Exposure 79. Conference for photographic education presented by National Photography Instructors Association. Principal speakers Douglas Kirkland and Ansel Adams (if health permits). Open to all. March 8–11. Sheraton Hotel, Anaheim, CA. Contact: Tony Freeman, 823 South Hilda St., Anaheim, CA 92806.

Photoshow International. Los Angeles Memorial Sports Arena, March 15–18; San Francisco, The Showplace, April 5–8.

Fantastic Photo Flea Market. Sponsored by the Cincinnati Friends of Photography for the benefit of the Great Oaks Vocational School. March 24-25 on the school grounds in Sharonville, OH. Contact: Patrick Brown, 228 Heaton St., Hamilton, OH 45011.

Art Institute of Chicago. Exhibition: Hugh Edwards, "Discovering America," and a celebration of the Institute's centennial, "Photographic History of the Art Institute of Chicago," March and April. Michigan Ave. at Adams St., Chicago, IL.

Nikon School visits 12 cities in March, lots more in succeeding months. Find out when they will be visiting your city; contact Myron Charness, Nikon School of Photography, 623 Stewart Ave., Garden City, NY 11530.

APRIL

International Center of Photography. Exhibition: Bruce Davidson retrospective. March 16 to April 22. 1130 Fifth Ave., New York, NY.

Center for Creative Photography. Exhibition: New acquisitions, including the work of Manuel Alvarez Bravo, Ralph Gibson, Arnold Newman, Stephen Shore and Todd Walker. March 25 to May 4. 843 East University Blvd., Tucson, AZ.

Atlanta Gallery of Photography. Exhibition: Harry Callahan photographs, March 27 to May 5; Brett Weston photographs, May 8 to June 16. 3077 East Shadowlawn Ave., N.E., Atlanta, GA.

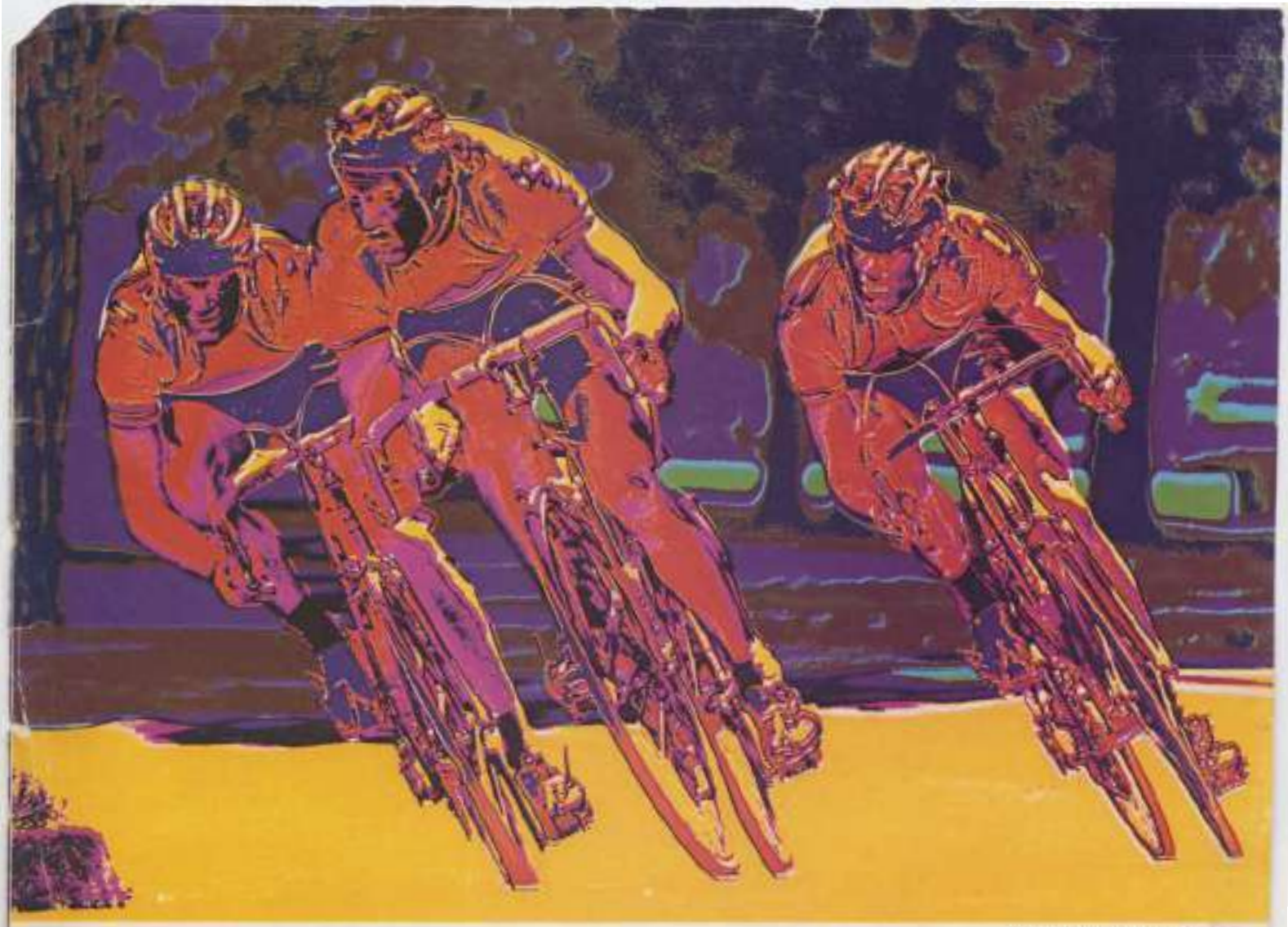
Porter's First Annual Calendar Contest. Entry deadline May 1, 1979. Restricted to calendars made from Porter's calendar materials; may use black-and-white or color prints. Awards: $50 first prize; each entrant gets gift. Contact: Mary Sale, Porter's Camera Store, Calendar Contest, Box 628, Cedar Falls, IA 50613.

Fourth Annual Home Color Processing School. Sponsored by Unicolor. In April, 18 cities are on the schedule.Contact: Bob Chapman, Unicolor, 7200 West Huron River Drive, Dexter, MI 48130.

MAY

Focus Gallery. Photographs by Andree Ferris (1921–1978), memorial exhibition, and Thomas Johnson, May 1–26; Egypt: contemporary photographs by Eliot Porter and 19th century photographs from the Leonard Peil collection, May 29 to June 23. 2146 Union Street, San Francisco, CA.

Photique 79 Photographic Seminar. May 20–23, Sherbrooke University, Montreal, Canada. Contact: Andre Germain, Photique 79, C.P. 457, Station N, Montreal, P.Q. H2X 3T3.



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