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- Waiting for the Moment

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- Altered Luminescence and Focus for Drama

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- Sometimes Your Best Shot is Behind You

SEXTON—

- Contact Sheets: Seeing the Print Potential

ENFIELD—

- Hand Painting on a Liquid Emulsion

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EDITOR'S NOTE



BY PAUL R. SCHRANZ

In Spite of Everything... YES

The world is retrenching and downsizing. We are doing the opposite. We are excited to announce the rebirth and expansion of *PHOTO Techniques*. What you are about to see is huge!

The first change may seem slight, changing the title to *Photo Technique*, but the corresponding philosophical mindset is significant in the new name. Our subtitle, *Variations on the Photographic Arts*, reflects our commitment to all elements of photography, their aesthetics and methodologies, in creating the professional photograph.

Starting with the January/February 2010 issue, you will be seeing some exciting and significant improvements in *Photo Technique* in both physical appearance and content. The magazine will become part of a network that will also comprise the new interactive online Photo Tech Forum and the Mesilla Digital Imaging Workshops.

While the magazine page size will be larger and print quality enhanced, don't expect merely a cosmetic change! You'll find a refreshingly enriched editorial content, layout design, Web presence, and an interactive forum, brought to you by newly energized writing and production staffs.

The real force driving the redesign, both visually and editorially, is a renewed dedication of this publication since its early inception as *Darkroom Techniques*: to focus on methodology as it serves to create better execution of the photographic image.

Starting in 2010, you will see more visually intriguing and intellectually stimulating portfolios by leading photographers in every aspect of the medium, followed by articles and interviews about the techniques and technology used in the creation of the work. You'll find that we are committed to all aspects of the photographic medium, not only silver-based and digital, but architecture, documentary, fine art, industrial, portraiture, fashion, illustration, and experimental—we won't set limits. Both experienced practitioners and exceptional emerging photographers from around the world will write articles about works presented in the magazine.

We will continue philosophical essays by photography's best visionaries, as well as scientifically based articles. You'll also find a special Off Beat tech section that will feature current information that is critical to many photographic projects, but not found in mainstream media.

Our News section will include a Call for Artists announcing juried exhibitions, information about significant gallery shows, noteworthy photographic publications, and general human interest stories from the field of photography.

What else is new? The Photo Tech Forum will be what we think is a long-awaited Web site of interactive and intellectual discussion about the field of photography—both conceptual and technical.

The *Photo Technique* magazine Web site will be completely rebuilt. It will continue to offer information about our current issue, feature an image of the month from one of our subscribers, but also offer a valuable Q/A section using our LinkedIn connection. We plan to electronically provide access to a research library of process articles from the *Darkroom Techniques/PHOTO Techniques* archives not previously available online. There are more surprises to come.

The legendary photographer Ralph Steiner wrote, "In spite of everything, YES." That about sums it up.

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PHOTO NEWS



BY JERRY O'NEILL

\$20 wireless remote control for Nikon and Canon DSLRs

Yes, it really costs only \$20 (\$19.95, to be exact) but of course there's a catch—that's the price of the software only; you also must have an iPhone or iPod touch to run it on, as well as one of the supported DSLR models. Oh, and a computer, too. With a wireless network.

Sure, there are other wireless remote controls, but not for \$20, and not with the wealth of other capabilities that the iPhone and iPod Touch provide. DSLR Camera Remote looks so useful you might want to consider buying one of the "i" gadgets just for this specific application.

Here's what onOne Software says the program lets you do: Look through your DSLR's viewfinder remotely (and even zoom to 1:1 to check focus and important details);

remotely control camera settings such as shutter speed, aperture, white-balance and more; and remotely fire the camera, and view images saved on the camera, all from your iPhone or iPod Touch. The folks at onOne suggest the setup is "great for remote-firing at weddings, sporting events, for kids, and for self-portraits." As examples, an iPhone can remotely control a DSLR mounted on a basketball backboard, providing that "basket eye view" of the game . . . or can be placed in a church balcony to get an eagle's eye view of a wedding.

In addition, you can control the camera with the software's advanced intervalometer, or timer. The intervalometer can automatically take a series of images at a pre-set time interval, anywhere from one second to



The display on the iPhone or iPod touch when using DSLR Camera Remote from onOne Software.

one day apart, up to a total of 1,000 frames. This lets you do time-lapse photography or stop-action animation. And the intervalometer can also be used as a customized self-timer.

For a mere \$1.95 you can buy DSLR Camera Remote Lite, but naturally it doesn't support all of the Professional version's features. The exact capabilities the system provides depend on which DSLR model you use it with. For compatibility charts and all the details, visit www.ononesoftware.com. ■

Photography can't get any more automatic than this

Over the past few decades, cameras became more and more automatic—first auto-exposure, then autofocus, and, lately, automatic face-detection, smile-detection, and so on.

Now Sony is taking automation to the extreme with its new Sony Party-shot IPT-DS1 for use with its new TX1 and WX1 digital cameras—a new type of "camera dock"



Sony's idea of how the Party-shot might be used.

that Sony says "pans 360° and tilts 24°, automatically detects faces, adjusts composition, and takes photos for you" using Sony's Smile Shutter function to choose a good moment. (The Party-shot works together with the camera's BIONZ image processor to do all this.) You can simply set the Party-shot on a table or whatever, or mount it somewhere higher using a clamp and the tripod mount on its base. (Of course you'll want to choose a location where the camera won't get knocked over—and what about theft?)

The idea is that this gizmo makes it possible for the photographer to finally enjoy the party, too—you just set it up and then go socialize, instead of missing out on the fun because you're trying to get good pictures of everybody. Sony says the \$150 Party-shot runs for 11 hours on a pair of AA batteries, and an AC adapter will be available. ■

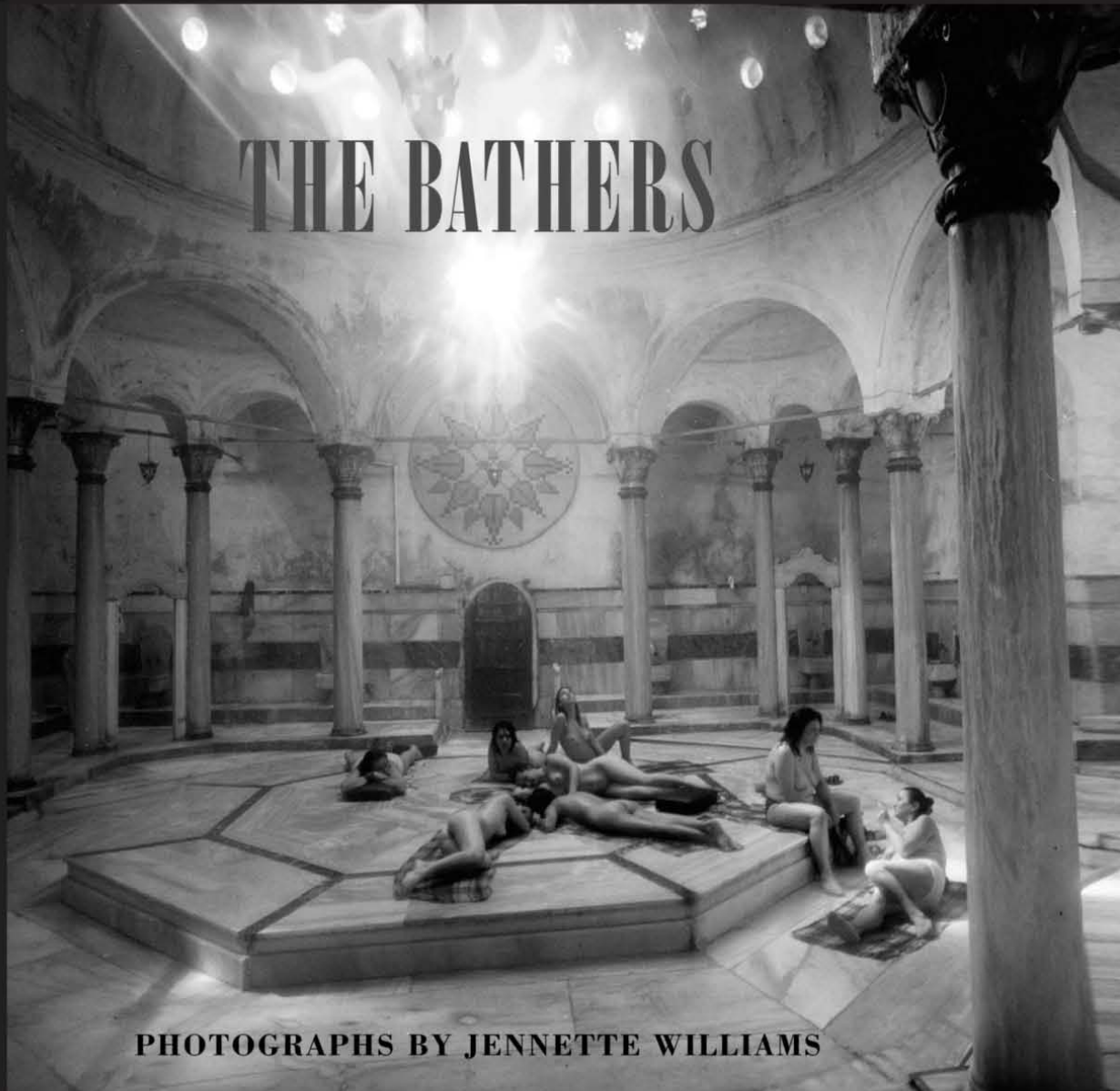


The Sony Party-shot IPT-DS1 with a Sony Cyber-shot TX1 digital camera mounted on it.



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PHOTO NEWS

Goodbye, lightbulbs . . . hello, (what?)

One of the many, many differences between film photography and digital photography is Automatic White Balance. Most of the time, Automatic White Balance does a pretty good job and the photos have pleasing colors.

With film photography, life was harder. Indoor shots might come out terribly yellow or orange-red, and outdoor photos could have an overall bluish cast, sort of like they'd been shot underwater. Not to mention home and office fluorescent lighting, which produced photos with sickly green or yellow-green skin tones, making everyone look ill or embalmed. (And which generated sales for a lot of 30 Magenta and FL-D correction filters.)

(Photo-historical trivia: In olden times, color slide films such as Kodachrome came variously in Daylight Type; in Tungsten Type or Type B, designed for 3200°K lightbulbs—and Tungsten Type generally did a good job with ordinary indoor lighting, too; in Type A, matched to 3400°K lighting such as the floodlights used with home movie cameras; and also Type F (F for Flash) matched to 3800°K clear flashbulbs—non-blue-coated. The fact that I know this stuff marks me as an Old Photographer, if my gray hair didn't already give that away!)

But soon, automatic white-balance may have a new challenge. Because of the low efficiency of traditional incandescent bulbs, they may not be around for many more years. (Incandescent bulbs actually produce more heat than light, with their maximum output in the infrared.)

A ban on traditional incandescent bulbs has already gone into effect in the European Union (EU), in an effort to save energy and thus combat global warming. According to the *New York Times*, "Under the European Union rules, shops will no longer be allowed to buy or import most incandescent frosted glass bulbs starting Tuesday. Retailers can continue selling off their stock until they run out." In the U.S., incandescent bulbs are scheduled to be phased out starting in 2012.

Instead of incandescents, we'll see compact fluorescent (CF) lightbulbs, those looped or spiral tubes that produce the same amount of light using roughly only 20% as much electricity. But CF bulbs, like old-fashioned fluorescent tubes, give off light with a discontinuous spectrum. There might be a lot of one shade of green but nothing in the other shades . . . and the same with the shades of blue . . . and yellow is especially tricky. Looking at the spectra of three

different brands of CF bulbs, #1 produces a lot of yellow, #2 produces less, and #3 gives off hardly any yellow at all. This would mean yellow objects will look much darker than they should to the eye, and presumably also will be much darker than they should be in digital photos, with similar effects for other colors, depending on the color spectrum of the specific light bulb.

In addition to CF bulbs, we'll probably see LED lighting, and who knows what else. LEDs have a much better color spectrum than CF bulbs and they last a LONG time, but they're expensive. (If zillions of them are sold, presumably they'll get a lot cheaper.)

The European Union's ban on incandescent bulbs has its critics who don't like the light from CF bulbs. And the CF bulbs cost a lot more than incandescents—I've seen U.S. prices of about \$3 to \$6 each for common household sizes, compared with perhaps 50 to 70 cents for incandescents.

Another criticism is that CF bulbs contain mercury, a poisonous chemical that should be kept out of landfills. So instead of just tossing burned-out bulbs into the trash, CFs need special treatment.

Yet another complaint about banning incandescent bulbs in the EU is that the ban will deprive children (not to mention photographers) of traditional fairground lights(!). ■

Paint your living room to match that great enlargement over the couch



I'm not sure how many photographers have ever thought, "Gee, if I could only match my living room walls to that color in the photo." But if that's what you want, Color Explorer (colorexplorer.com) has a free online tool that analyzes the predominant colors in photos. Upload your favorite picture of Red Rock Canyon, out near Las Vegas, and Color Explorer will show you the 10 predominant colors, ranging from sky blue through shades of orange and brown rocks, to the black of the shadow areas. (Or instead

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PHOTO NEWS

of 10 you can choose to see only the three most predominant colors, or 50.)

Or use your favorite photo of your toddler in the bathtub and you'll get an assortment of five varied skin tones, plus near-whites from the tub itself. A photo of a younger toddler, asleep and sucking her thumb, with a red-checked dress and a pink pillowcase, produces key colors of white, pink, skin tones, and brown (from Emily's hair). And an autumn landscape of colorful reeds is rich in subdued yellows, greens, and browns.

Once you've selected the colors you like, write down the color code numbers displayed next to the color patches, either the three RGB numbers or the six-digit HTML number, for instance CFAEBD for the pink in "Emily Sleeping." Then go to Easy RGB (easyrgb.com), to their "RGB to commercial tints" Web page, and enter your color number(s). Select a color palette such as "Benjamin Moore Color Collection" and the program shows you near matches to your selected color. For the pink in Emily Sleeping, the best paint color match was Damask Rose, with Pink Pansy, Purple Easter Egg, and Lavender Lipstick also in the running. Then you just go to the paint store . . . ■



SHORT TAKES

Free access to journal of the history of photography and motion pictures— Since 1952, the George Eastman House International Museum of Photography and Film has been publishing *Image* magazine, which helped establish "the history of photography as a legitimate field of scholarship," according to Anthony Bannon, the Eastman House director. Copies of the magazine have been difficult to obtain and complete collections are rare, but now 46 years of *Image* magazine, from 1952–1997, have been digitized for open online distribution. You can download the PDF files by going to eastmanhouse.org and clicking on the *Image* Magazine Online button, and can search the issues by year, author, and article title.

Bored with photo mugs and photo mousepads?—Now PhotoShower Curtain.com will make a custom color fabric shower curtain from your favorite photo, using a sublimation process the company says fuses the

image into the fabric to make a permanent, extremely durable, high-detail image that will not fade, crack, or peel. The curtains take two to four weeks to make and cost \$149 to \$199, depending on size.

Music-copyright violators get fined; why not photo copyright violators?— Many professional photographers have seen their copyrighted photos used on Web sites that never paid them a dime, and suing the violators and collecting any money is usually a struggle. But the music industry is better organized and has more lawyers, so Boston University student Joel Tenenbaum was recently ordered by a federal court to pay \$675,000 to four record companies for illegally downloading and sharing music. He admitted he downloaded and distributed 30 songs, and copyright law says the fine can be as much as \$150,000 per track if a jury finds the infringements were willful. The Tenenbaum case is only the nation's second music downloading

case against an individual to go to trial.

We love our technology gadgets... for a few years—A global survey conducted for Lexmark has revealed that 78% of people surveyed do not expect their technology devices (cellphones, laptop computers, digital cameras, computer printers) to last more than five years, based on 10,000 respondents in 21 countries. When asked, "Which element is most likely to reassure you about the durability of the device," nearly 40% worldwide said they would be most reassured by a long warranty. Interestingly, Lexmark has begun offering a five-year warranty on most of its Professional Series inkjet printers and all-in-one printers. ■

Jerry O'Neill has been photographing, writing, and lecturing about photography for many years. His photo credits include grip-and-grin shots for the U.S. Army, photo finishes for thoroughbred race tracks, hospital operating room photographs, and snapshots of his wife and two children.

VESTAL AT LARGE



by S. Tinsley Preston

BY DAVID VESTAL

Two-Filter Printing on Variable-Contrast Papers

In the January/February 2009 issue of *PHOTO Techniques*, Dick Dickerson and Silvia Zawadzky correctly said and showed that printing with two contrast filters—a low-contrast one such as Ilford's #00 and a high-contrast one such as Ilford's #5—will not give us “richer” black-and-white prints than printing with any one of the contrast filters provided by Ilford, Kodak, and other manufacturers, or with no filter.

They then concluded, not altogether correctly, that split-filter printing “does not afford access to a print appearance (contrast, curve shape) unattainable with single filters; it just takes longer to get there.”

Intermediate grades

In saying this, they overlooked one limitation of the manufacturers' filter sets. The filters are designed to produce 12 distinct degrees of contrast, spaced half a contrast grade apart, from softest (lowest contrast) to hardest (highest contrast). The results per filter vary somewhat when we use different papers and/or different paper developers, but with any such combination we are locked into those 12 degrees of contrast when we use those filter sets, or the grade numbers furnished by enlargers with built-in filtration, one filter or setting at a time.

Incidentally, I have tested contrast filter sets sensitometrically, and have never found one that gave consistent or accurate half-grade differences from one filter to the next. The Kodak and Ilford sets that I've used are definitely quite uneven. Don't

worry about this; there's nothing we can do about it. Also, gelatin contrast filters, which I use above the lens in my old but good Omega D2V enlarger, fade over time, as I learned one day when I saw that my #3½ filter was giving me higher contrast than my #4½, which had faded more. It was time to get a new set.

IT'S USEFUL TO KNOW
THAT THE HUMAN EYE
SEES DIFFERENCES IN
LIGHT TONES MUCH MORE
DISTINCTLY THAN IT SEES
EQUAL DIFFERENCES IN
DARK TONES.

Once in a while, we want to make a straight, unmanipulated print with contrast that falls between that furnished by either of two adjacent single filters. For instance, if we want a print that is softer than #3 but more contrasty than #2½, we can get to about grade 2¾ by giving half the print's exposure with the #2½ filter and half with the #3. It doesn't matter which filter comes first. Yes, this takes longer than single-filter printing, but it does give us a print that we can't get with any single filter. What makes Dick and Silvia almost absolutely right is that such fine contrast-distinctions in prints are barely perceptible to the eye. In general we don't readily see contrast differences of less than ¼ grade in picture prints.

I do not mean to scold Dick and Silvia: I believe they give the most

accurate information on black-and-white technical matters available in any magazine. In most such matters I trust them more than I trust myself, because they know more than I do, and because they are honest.

Masks and filters

With some problem photos in which the light and dark shapes are so intertwined that dodging and burning-in aren't practical, I know of two ways to get to a good print. One is to make a mask and print through a negative-and-mask sandwich. Al Weber knows exactly how to do this, but I have never learned it, so I use a two-filter method, which I find easier, although I think it must be a little less effective than masking. Still, it helps.

This consists of printing with only the softest and the hardest filters. The method goes like this. Make test strips or prints to find the minimum print exposure with the soft filter that gives you distinct tones in the picture's “whites” (light grays that say “white” but show detail). Then make more tests that combine that soft-filter exposure with different amounts of hard-filter exposure to find the hard-filter exposure that, when added to the soft exposure, pumps up the picture's darkest grays to give good “blacks” (dark grays that say “black” but show detail). This gave me a decent print of a produce market in Salvador-Bahia, Brazil, shot from some distance, that shows black people in white clothes in both sun and shade, and gleaming metal oil tanks in bright sunlight on a hill above the market. The first print

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was too dark to suit me, but the proportion of soft exposure to hard exposure gave just the contrast I wanted. I then used a pocket calculator to find $\frac{1}{10}$ of the soft exposure time and $\frac{1}{10}$ of the hard one, and giving those $\frac{1}{10}$ exposures did the job. A different percentage change in each would have given me a lighter or darker print of the same contrast, but that wasn't necessary this time.

The point is that, although one filter that gave the exact degree of contrast that this photo needed would have done the job as well and more easily, I didn't know what degree of contrast that might be. I tried two or three single filters, none of which was right. Fiddling with #00 and #5 took some more time but delivered the degree of contrast that worked for me in prints.

Fortunately, this is seldom needed. I'm almost sure that masking can solve contrast problems better than two-filter printing can, but they both work. And just imagine what you could do by using both. It would take time, but we all have 24 hours every day, and it would be interesting.

Fixing white skies

There is another use for two-filter printing. A common case is the landscape with dark ground and a bright sky. When the dark ground is printed through a filter that gives it lively contrast among its dark tones, the sky prints far too light. It stays blank white. (Some students call that "blown out.") It's a useful common practice to burn-in the sky through a soft filter, before or after the main exposure for the ground, until we get a print that shows our white clouds and open sky in full detail. In prints, because of the paper's curve, all very light tones are inevitably low in contrast, so the softest filter can't degrade them much and offers more latitude than contrastier filters. A double-zero-filter burn also doesn't show so much when our sky-burn overlaps the area of darker ground, so

there is no unwanted black edge at the top of the ground.

It's useful to know that the human eye sees differences in light tones much more distinctly than it sees equal differences in dark tones. To see this, just examine a Kodak gray-scale strip; its 21 steps range from white to black in evenly differentiated tones, the measured densities of which plot in a straight line on graph paper.

Or if the sky is bigger in the picture than the ground, it makes sense to expose the print to show sky tones as well as possible, while dodging to keep the ground from printing too dark. If dodging the ground is no good because its tones are too low in contrast, you can dodge the ground with a contrasty gelatin filter instead of using cardboard. This both lightens the ground and gives it higher contrast. It took me only 40 years of printing to think of this simple thing.

Ilford or Kodak 6x6-inch filters make this easy. Those two filter sets look different, but they behave very much alike. In 1985, when I visited an Ilford factory in England, I was told that Ilford was then making Polycontrast filters for Kodak as well as their own Ilford filters.

To sum this up, printing with two contrast filters can be useful in several ways, although using only one filter, or none, is just as good, or better, for most black-and-white photos.

I like to do things as simply as I can and still get good results. This is a matter of temperament. Some good photographers choose to work in difficult and complicated ways. One whom I knew, Leo Stashin, felt sure that he had to use all 12 contrast filters in making every print. He told me his mystical reasons why he needed each filter for a certain elusive and necessary quality that it alone could give. He always needed them all. And his prints were excellent.

So cheer up and work the right way, which means, just as you please. ■

PHOTOGRAPHY MYTHS

BY DICK DICKERSON & SILVIA ZAWADZKI

Can a Photograph Change History?

HOW TO DEVELOP A ROLL OF FILM THAT SPENT DECADES ON A MOUNTAINTOP

Mt. Everest, June 8, 1924, 12:50 pm: George Mallory (“because it is there”) and Andrew Irvine are spotted 800 vertical feet below the peak and “going strong for the top.” Neither climber was ever seen again. Did they perish as they continued their ascent or after having reached the summit, 29 years before the successful climb of Sir Edmund Hillary and Tenzing Norgay? An answer—a photograph from the top—may exist in one of the Kodak Vest Pocket Model B cameras the two carried, a “miniature” (for the day) camera that had become very popular with soldiers during World War I. In 1986 Tom Holzel, fascinated by the possibility, organized an expedition led by Andrew Harvard with the express intent of recovering those cameras. The team was eventually defeated by 10 days of continuous blizzards with temperatures of -30°F , 100 mph winds, and an avalanche that cost the life of sherpa Dawa Nuru. Mallory’s body, but not Irvine’s, was subsequently recovered by the Simonson Expedition of 1999, but no cameras were found.

Our role during the ascent in 1986 was to identify a best technique for developing the Kodak NC (Non-Curling) Film, had a camera been recovered—film that would have had 62 years of exposure to extreme cold, severe dehydration, and intense radiation. We were fortunate to obtain for experimentation a roll of identical film, expiration dated March 1, 1926, from Kodak’s Patent Museum. The tin wrapping and wood and metal spool were forwarded to Holzel to better tune his metal detectors. Analysis of the film coupled with a review of archived Kodak literature furnished us with information about the product’s halide content, grain size, silver coverage, and chemical and optical sensitization. ISO speed was estimated from the camera’s construction and exposure recommendations included in its operating instructions. Using a radioactive cobalt source, we had a portion of the film exposed to an amount of radiation deemed equivalent to six decades atop Everest, roughly the same as a roll stored in Rochester would have received had it arrived on the Mayflower. There was, of course, no way to mimic the actual latent image age and cold storage. Snippets of the film were imaged and subjected to a variety of development protocols.

Our best results derived from development by inspection with a Kodak No. 1 safelight in Kodak Developer D-76 containing 5 mg/l of 5-methylbenzotriazole. Printing the images on a grade 5 paper afforded a density range of 0.3 units, very weak but clearly discernible. Remarkably, the irradiated and unirradiated samples showed little difference in density scale, though the former had a significantly higher fog level. Among other developer additives explored were various traditional antifoggants and chemicals capable of enhancing

grain-internal latent image (surface latent image could contain appreciably more fog) such as sodium thiocyanate, potassium chloroaurate, mercaptopropionic acid, and others, but none yielded better image discrimination.

As word of our efforts spread, several other rolls of film were donated that had been found, exposed but unprocessed, in old cameras. These ranged from one found some 30 years earlier in a Rochester bedroom to one exposed some 70 years earlier and stored in a presumably very hot attic in Paris. By processing snippets from the edges that extended perhaps a quarter inch into the image area, we were able to explore many more developer variations. Long story short, we did not find any panacea procedure that worked with all old films, but we did make some interesting discoveries along the way.

One or the other of two distinctly different protocols usually yielded the best results. The gentler of the two was to presoak the film for two minutes in a 0.1% solution of potassium iodide followed by development in Kodak Developer D-76. This failed totally with the oldest films that had suffered the worst storage conditions, but the presoak and seven minutes in D-76 gave remarkable results with newer films, one of which yielded images that looked like they had been exposed earlier in the day on freshly manufactured film. The newest telltale we found on this roll was a 1956 Chevy, putting the latent image age at about 30 years.

The second and much more aggressive technique was to use the same potassium iodide prebath followed by development (often for only two or three minutes) in Kodak Rapid X-Ray Developer (KRX) containing an additional 0.5 g/l of potassium iodide. This severely fogged the newer rolls but worked rather well, considering, with the oldest. The frame in the image plane, if any, was consistently the weakest and discrimination always improved from the outside to the inside of the rewind core. One roll in particular, estimated to have been exposed about 1916, displayed images from an ancient amusement park. Although prints on grade 5 paper were still exceedingly flat, faces were clearly recognizable.

But the film of Mallory and Irvine? The world may never know. Readers who would like to learn more about their attempt and subsequent searches for those pioneers and their cameras may enjoy reading *The Mystery of Mallory & Irvine*, by Tom Holzel and Audrey Salkeld, Mountaineers Books, 2000 (ISBN 0-89886-726-6).

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TRADITIONAL
Master Print Class
SPECIAL EXPANDED SECTION

BY BRUCE BARNBAUM

Wait For It

Patience is one of a photographer's most important assets

In last issue's Master Printing Class, I wrote about my impressions of Machu Picchu in Peru, and the photography I did there both prior to and during a workshop I instructed in April 2009 (specifically the first photograph I made there). This article deals with the final photograph I made at Machu Picchu, as the workshop drew to a close. I'm already looking forward to adding to the Machu Picchu portfolio when I travel down there again next year for another workshop.



Straight Print. *The straight print shows that everything seems to be there (actually the clouds are virtually featureless, being so dense on the negative—above Zone 10), but a glance at the negative reveals separations in the dense zones. There is also ample density in the shadow zones.*

Machu Picchu lies at the head of the Amazon rainforest. It sits atop a knife-edge ridge 1,400 feet above the Vilcanota River, with the river turning a 180° curve in its gorge below, creating nearly vertical cliffs down to the river on both sides. Those cliffs rise up to peaks towering thousands of feet above Machu Picchu, all covered by dense jungle growth. A few, topping out at 19,000 and 20,000 feet, are draped with thick glaciers. It's a stunning location, with the ruins and the landscape vying with one another for attention.

I photographed there for two days prior to the workshop earlier this year, and another two days during the workshop. Next year, we'll expand that

to three days during the workshops. My hope is that we'll be given the same variable weather conditions that we had this year, where we alternately experienced rain, fog, and sun, but very little wind—conditions that couldn't be beat.

Of course, I didn't just photograph as if there were no students there. I also worked with them throughout our time together. And they worked with me, taking interest in what I was doing when I set up my camera.

One final picture

On the final morning of the workshop, we had several hours to photograph within the ruins. It was another perfect morning, with variable

conditions continuing. So we all did a lot of shooting. But we had an absolute deadline of 9:30 a.m. to pack up and run out to catch the bus down the cliffs in time to catch the train.

Right before 9:00, I climbed to one of the highest points within the ruins just as a brief episode of sunlight shined through a set of openings—windows, as it were—in one of the massive Inca walls facing toward the east. Clouds quickly covered the sun, but during the several seconds of sunlight that I observed, I realized that a potentially wonderful photograph could be made as soon as the clouds lifted once again. Actually, I didn't even need the sunlight (though I recognized that some



Final Print, Windows to the Land, Machu Picchu. *The lower half is printed at 30 units of magenta dialed into the enlarger, and the upper half at 130 units of yellow, with an extra burn at the upper sky, especially the upper left corner. A small amount of bleaching is also done on the shadowed wall, imparting a bit more light and life to it.*

sunlight could be a special benefit); I simply needed a few openings in the clouds below the ruins to see the canyon walls and also some cloud openings above to see a bit of the mountains in the distance rising up above the wall.

So I set up my camera with none of the distant landscape visible. But, not to worry, I thought. With conditions changing as swiftly and regularly as they were, I realized that shortly after I set up, I'd get the atmospheric conditions—and the photograph—I wanted.

Unfortunately, it didn't work out exactly like that. My camera was focused, the aperture was set, and the film holder was in place, with my very last sheet of film ready for exposure. I then waited for the openings in the clouds. Five minutes went by. Then 10 minutes. (I had only 20 more minutes before I had to hightail it out of there.) Another couple of minutes went by and a student wandered over, asking what I was doing. I told him I was waiting for a break in the clouds, and he said he would wait there with me. Another few minutes went by...by now, 15 minutes in all. It was really socked in. My companion suggested that things weren't looking good. Twenty minutes went by. He suggested I give up and pack it in. I stood my ground. Finally, I had just five minutes left.

Suddenly clouds started swirling around rather wildly. The canyon wall became visible and within seconds a few of the mountain peaks and ridges started showing up. (Not even the parting of the Red Sea could have been better.) I waited a bit longer. They both became more visible. Finally I snapped the shutter. I had no more than two minutes remaining before I had to run. But I got it! It was a joyous, celebratory moment.

Printing the negative

The straight print shows that all of the lower half, except the several areas

Suddenly clouds started swirling around rather wildly. The canyon wall became visible and within seconds a few of the mountain peaks and ridges started showing up. (Not even the parting of the Red Sea could have been better.) I waited a bit longer. They both became more visible. Finally I snapped the shutter.

receiving direct sunlight, is quite dark compared to the upper half, specifically the clouds across the top of the image. But film can easily encompass the extreme range of brightness that was inherent in the scene. So it was of no real concern to me. I simply made certain to have ample exposure in the shadows below, so as to later develop the film at slightly less than normal contrast, which I felt would produce a wonderful negative with printable densities.

Not surprisingly, printing the negative requires some serious effort. But I expect that to be the case in at least 50% of the negatives I produce. There's no free ride here.

I print the negative as if it's two separate negatives. First I expose the lower half, right up to the top of the wall (and even a bit above the wall) at a moderate contrast level: 30 units of magenta filtration. Then I dial out the magenta and dial in 130 units of yellow filtration, exposing the upper part of the image, down to the top of the wall, and even a bit into the wall, to get detail into the sky, and to make the contrast transition invisible at the top of the wall and lower sky. But I then also have to burn the upper part of the sky, especially the upper left corner considerably, or it ends up being almost blank white. The burn is substantial, but it can be done...and was.

Still, just like the image from last issue, the wall serves as a frame—or series of frames—for the landscape beyond. The landscape is really the prime subject, seen through each of the three windows, and above the

massive lintels topping the windows. The wall itself is of exceptional interest, even though it serves as second fiddle (though not by much). The original 16×20 print-inch of this negative shows tremendous spatial depth between the nearby wall and the distant cliffs and mountains. It's just what I was hoping for.

My basic thought about the image is that I'm glad I had the perseverance to wait out the clouds, right up to the very end. My patience was rewarded. ■

*Bruce Barnbaum teaches photography workshops throughout the year focusing on the art of seeing and the art of conveying your impressions of your photographed world, real or imagined. Please see his 2009 workshop schedule on his Web site at www.barnbaum.com. Bruce has two black-and-white fine-art photography books in print, *Tone Poems—Book 1* (with 90 superbly reproduced black-and-white photographs), published in 2002, and *Tone Poems—Book 2* (with 91 reproductions), published in 2005. Both are collaborative efforts, featuring a CD of classical piano music by pianist Judith Cohen. Bruce's textbook, *The Art of Photography...an Approach to Personal Expression*, is available in a fully revised fourth edition. It is considered to be the finest exposition of the technical, artistic, and expressive aspects of photography available. For complete information on Bruce's books, images or his 2009 workshop visit his Web site www.barnbaum.com, or contact him at P.O. Box 1791, Granite Falls, WA 98252, or at barnbaum@aol.com.*

TRADITIONAL
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BY JILL ENFIELD

Liquid Emulsion on Tile with Hand Painting



Friends Seminary Tile

Every year my children's school has an auction to raise money and I always donate one of my images. A few years ago I decided to do something especially for the school. I had been working with photographic emulsion on tiles on and off for a few years, but had never hand-painted on top of the emulsion. Doing this kind of project, where I have a deadline, helps push me to try new things. I planned to donate the tiles to the school where they would be

embedded in a wall, but before doing that, I scanned the tiles and made prints that could be sold at auction. It worked out for everyone.

Images can be put onto tiles in several ways. Decals are the easiest and can be fired so that they are permanent, but I have never been happy with the way decals look. They usually look too perfect, which doesn't really appeal to me. Liquid emulsion can go on any surface and shows the brush strokes (a look I am very fond

of), but I needed to come up with a way to make the image and treatments permanent. If the emulsion is on an unprotected tile, the image rubs right off if anything hot touches it or easily scratches if someone rubs against it.

I seem to like doing difficult things. I made a lot of extra tiles so that I could test them—and I needed them all! I found that I could use chalks directly on the emulsion and that was fine. But when it came to

putting layers of varnish to protect both the color and emulsion, that was a different story. After much trial and error, my final method was to spray several coats of fixative to protect the chalk from the varnish, then coat the tiles with several layers of varnish for final protection. The tiles are now up at the school and several prints were bought as well. Best of all, I now know how to do this again.

If you are interested in trying a project like this, two companies still are making photographic emulsions: Rockland Colloid Liquid Light and Rollei Black Magic Photo Gelatine. There is also a new product (that I have not used yet) called PYROFOTO that is produced by Rockland. The kit consists of permanent majolica glazes, and can be used indoors and outdoors in wet and dry conditions without fading, as well as for food service. You also can make your own emulsion at home in a blender or use decals to transfer images. There are so many possibilities that you just need to try things out and

see what is best for you.

Liquid emulsion products are complete in one bottle and are silver-based sensitizers for applying to any surface, exposing by enlarger, and processing with conventional darkroom print chemistry. However, you will need to pre-coat your tile with either polyurethane (non-yellowing) or a gelatin/hardener mixture. A one-pint bottle of emulsion covers approximately 16 square feet. The finished print can be hand-colored or toned like any photographic print on commercial paper.

Preparing your tiles

There are several ways to prepare tiles. You need to experiment and see which works best for you.

1. Polyurethane should be sprayed at least twice onto the tile, letting it dry between each coating. Let the tile dry over night before coating with emulsion. Make sure to get a non-yellowing product (likely at an art supply store).

2. Buying gelatin flakes from one of the sources listed at the end of this article. Mix as follows:

Hot distilled water:	750ml
Gelatin:	5 grams
2% chrome alum solution:	20ml*
Distilled water to make:	1 liter

Follow the same directions as above (three coats with drying between, and then a 24-hour dry time before coating with emulsion).

3. Knox Unflavored Gelatin** can be bought in the grocery store. Dissolve one packet (three or four packets to a box) in one cup of boiling water. Cool the solution until lukewarm and then pour or brush onto your tile. Dry with a cool hairdryer and put on another coat. Repeat for a total of three coats. Then let dry overnight before coating with emulsion.

Preparing your emulsion:

At room temperature, "liquid" emulsion is, in fact, a solid gel. It needs to be warmed up before it can be used or it is difficult to spread the emulsion and it will flake off in the developer. While there are a number a ways to liquefy emulsion, a few general rules apply to all of these methods.

1. First, use containers and tools made only of plastic, rubber, or glass. Metals, such as steel or brass, may contaminate the emulsion.
2. Second, ensure that both the temperature and the humidity in your darkroom are moderate to minimize drying time.
3. Liquid emulsion is just as sensitive to light as fiber-based photographic papers. However, the emulsion tends to be out longer than papers

* Chrome alum is a hardener that not everyone uses. I find it makes a better solution, but that is debatable. In any event, to make a 2% solution: mix 5 grams of chrome alum to 250ml of distilled water. If have something that will measure less, use it. You only need 20ml of this solution and you cannot save it once it is mixed.

** Knox is food-grade gelatin, not photo-grade, and may have some impurities. It is always better to buy the photo-grade gelatin, but in a pinch, Knox will work.

Trouble-shooting

Emulsion turns gray during or after coating: Too much developer added as a sensitizer when using Liquid Light; coating paper too close to a safelight caused fogging; opening the bottle in daylight caused fogging.

Emulsion bubbles or peels during processing or washing: Poor adhesion caused by incorrect surface preparation (use shortstop or water wash before hardening fixer); lack of hardener in the fixer or inadequate fixing time.

Emulsion melts during processing or washing: If solutions are too warm, the surface of the emulsion can be smudged with a fingertip.

No image or weak image: Insufficient exposure; emulsion not sensitized with working developer.

Blacks not deep enough or streaked: Emulsion coated too thinly, or too fresh for maximum blacks. Sensitize with developer as described on previous pages.

Spots or blotches of brown, yellow, or purple: Used liquid fixer instead of powdered fixer; insufficient fixing time; not sufficient quantity of fixer to wash away unwanted salts in the emulsion; insufficient agitation; weak or stale fixer.

Image fades over time: insufficient washing.

Equipment sources:

Freestyle Photographic Supplies: <http://www.freestylephoto.biz>

Rockland Colloid Corporation: <http://www.rockaloid.com/products.html>

because of the coating and drying time as well as the developing time. Do not open the emulsion bottle until the safelights have been lowered.

4. Emulsion melts at 110°F and it takes approximately 45 minutes to liquefy a full bottle. If you overheat it, the emulsion burns and looks fogged. You can use smaller bottles to heat the emulsion instead of heating the large bottle.
5. I use a double-boiler method for heating so that I don't burn the bottom of the bottle. I have a pot of water on a hot plate with a Pyrex measuring cup filled with water and the liquid emulsion bottle inside the pot of water. This makes the bottle float up and not touch the bottom of the pot.

Coating the tiles

Some people like to pour on the emulsion; I use a bristle brush because I like the brush marks. I prefer two

light coats to one heavy one, drying in between. Again, this is a personal choice; there is no rule here. You can let your tiles air dry or use a cool hair dryer, but either way, keep the safelights low, or if air drying, do it in complete darkness.

Exposing and developing

I expose the tiles the same way I expose fiber paper, using a negative and enlarger. To run them through the chemicals, you need to be careful.

1. Make sure your chemicals are cool (70°F or cooler).
2. Do not put tiles on top of each other; they will scratch the emulsion off the one underneath. The emulsion is very soft at this point.
3. Follow the developing instructions of the emulsion that you buy.

Once the tiles are exposed, let them dry completely. If you want to stack

them when you are done, put something between them.

Hand painting

Before you start painting the tiles, I suggest using workable fixative; you can buy it at any art supply store. I spray the tile with two coats of fixative and use soft pastel chalks. I can work them with my fingers, remove them, or re-apply them to make the colors brighter.

When you are done, you need to fix the chalks or they come off. The emulsion is also soft and subject to spills (in other words, not permanent). Spray the tiles with workable fixative, let that dry, and then spray or paint over them with polyurethane—non-yellowing—either matte or glossy. You're done! ■

Jill Enfield is the author of Photo Imaging: A Visual Guide to Alternative Processes and Techniques.

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BY JOHN SEXTON

Patience, Practice, and Printing

All played a role in creating Lower Calf Creek Falls Detail, Utah

I made the image *Lower Calf Creek Falls Detail* in Utah's Grand Staircase Escalante National Monument on a blistering hot day. From delicate and subtle landscapes to jarring topography, Southern Utah is an always changing and wondrous portion of the planet. The three-mile round trip walk was indeed a warm one. My wife Anne and I walked at an accelerated pace from the most intense exposure to the sun to the mild relief found in the shade. Upon turning the last bend in the trail, we entered a cool and verdant paradise. The lush canyon was filled with the delicate whisper of the falls ahead, and we were immersed in a cooling mist. With gently shifting winds, the autumn flow of the fall was never the same for more than a few seconds.

We spent a rejuvenating few hours photographing the falls, as veils of water constantly changed in the shifting breeze. We would wait for just the right instant to release

the shutter—often being a second too early, or a few seconds too late. Each of the twelve 4x5 negatives I exposed that day was unique. The negative I finally printed was the only negative where the water pattern formed a design that was exactly what I had hoped for. It was one of the few days where we used all of the film that we had with us in our camera packs.

You can see a reproduction of that 4x5 inch Kodak T-Max 400 negative (Figure 1) as it would appear on a light box. It was processed in Kodak Xtol developer, and given N+1 development to increase the contrast. After processing a negative, I always make a low-contrast contact sheet, as shown (Figure 2). I gleaned this approach from studying, and later working, with Ansel Adams. He liked to make low-contrast contact sheets so that he could reveal all of the tones in the negative that could be rendered on the paper. In the contact sheet, the dark areas are often a little smoky, and



Figure 1. The original 4 x 5 negative.



Figure 2. A low-contrast contact print, which reveals all of the information in the negative.

the highlights may be a bit dingy, but with practice one can visualize the possibilities of the final print.

After carefully studying the contact sheet, I generally know with some degree of certainty whether or not the image has potential for further exploration in the darkroom. Often, an image is technically adequate, but lacks some element of magic. There are times when I wish I had used a “magic filter” on my camera lens, but, alas, no such filter exists! Once I decide I want to print a negative, I use the contact sheet—along with a careful examination of the negative on a light box—to determine the lowest contrast that might produce a successful result, and use that as my starting point. I find working up in contrast (i.e., starting with a soft print) to be far more productive than backpedaling from a higher contrast print.

In Figure 3, you can see a straight print of the negative with no manipulation, and in Figure 4 my finished print, both of which were made on Kodak Polymax Fine Art paper with grade 3 filtration. The basic exposure on both prints is identical. The difference between the straight print and my finished print is the result of dodging to lighten certain areas of the rock and flowing water, combined with a number of burns to darken and balance the tones in the wet rock wall. When printing, I always try and remember that a photograph is an illusion. The only

way to make the light tones in a print lighter is to decrease the exposure in those areas, but on many occasions that also can reduce the amount of detail and local contrast. What I really wanted in this image was to create the illusion of brighter water. I attempted to achieve this goal by darkening the surrounding wet sandstone cliff. This also enhanced the feeling of wetness. Finally, I locally applied some potassium ferricyanide bleach in surprisingly small amounts in various areas to balance, brighten, and increase the local contrast in those areas.

One of the magical aspects of the medium of photography is the ability to transport the viewer back in time, not just to what the photographer saw, but also to what the photographer felt. As I look at this photograph of Lower Calf Creek Falls, it amazes me how it brings back vivid memories: the blistering heat of the hike; the cool breezes bathing us in a light mist below the fall; the shroud of solitude created by the constant reverberation of falling water—broken occasionally by my favorite sound in the Southwest, the call of the Canyon Wren. ■

*John Sexton is known worldwide as a photographer, master print maker, workshop instructor, and lecturer. He is the author of four award-winning monographs, the most recent of which is *Recollections: Three Decades of Photographs*. For more information on John's books, photographs, and workshops visit www.johnsexton.com*



Figure 3. *Straight print of the negative with no manipulation.*



Figure 4. *The final print of Lower Calf Creek Falls Detail, Utah.*

DIGITAL

Master Print Class

SPECIAL EXPANDED SECTION

Corner Sharpening

BY UWE STEINMUELLER

Lenses are not ideal. Most of us have ended up with images in which the corners of the frame look too soft. This is not important for all pictures, but matters when the main subject covers the full frame and focus falloff is obvious. In such cases, post-capture fixes present an opportunity to save the picture. Of course using more appropriate lenses in the first place is the best solution, but it's too late once you have taken the photo and cannot go back.

I'll show my technique for improving a photo with lens falloff in the context of a full workflow. I will be using my own commercial detail-extraction and sharpening tools (available at Digital Outback Photo) but the technique is very general and you can easily use your tools of choice, such as plug-ins already found in Photoshop. The initial capture was converted to a TIFF using Iridient Digital's RAW Developer (www.iridentdigital.com/products/rawdeveloper.html), which I use because it produces excellent detail.

Step 1: Improve overall contrast

As you can see, the image I'm using to illustrate my technique (Figure 1) covers the entire frame, and suffers from an obvious falloff of detail in the corners. To fix it, first slightly brighten and add some more midtone contrast using Curves or your contrast software of choice (Figure 2).

Step 2: Improve Detail

Improve detail using detail-extraction tools (like my DOP EasyD Plus) or some sharpening with another tool such as the Unsharp Mask filter. The

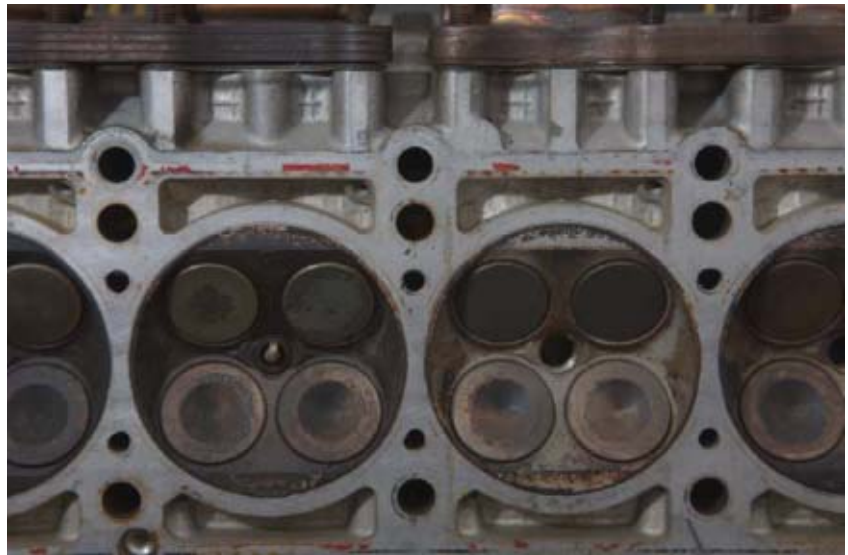


Figure 1. *The original capture, taken with a Canon 1Ds Mark III, 24-105mm at f/4 @ 81mm, using dual flash.*

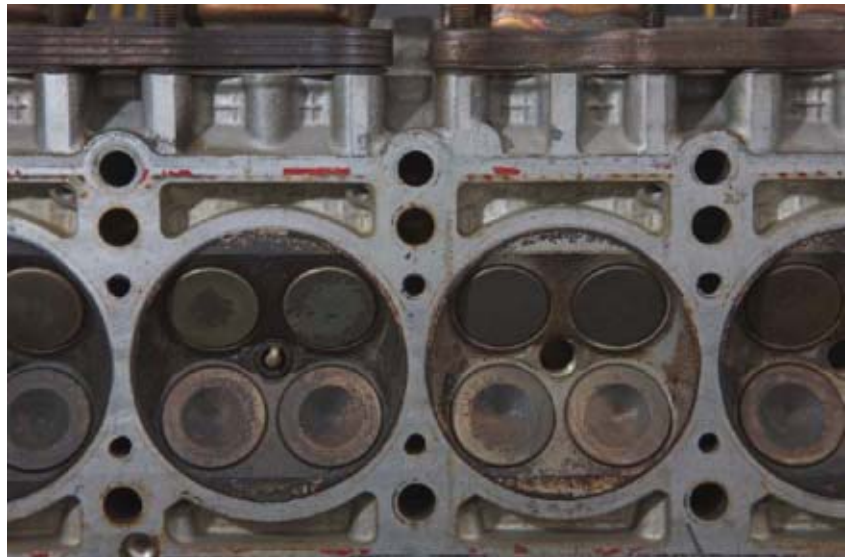


Figure 2. *The image with improved contrast.*

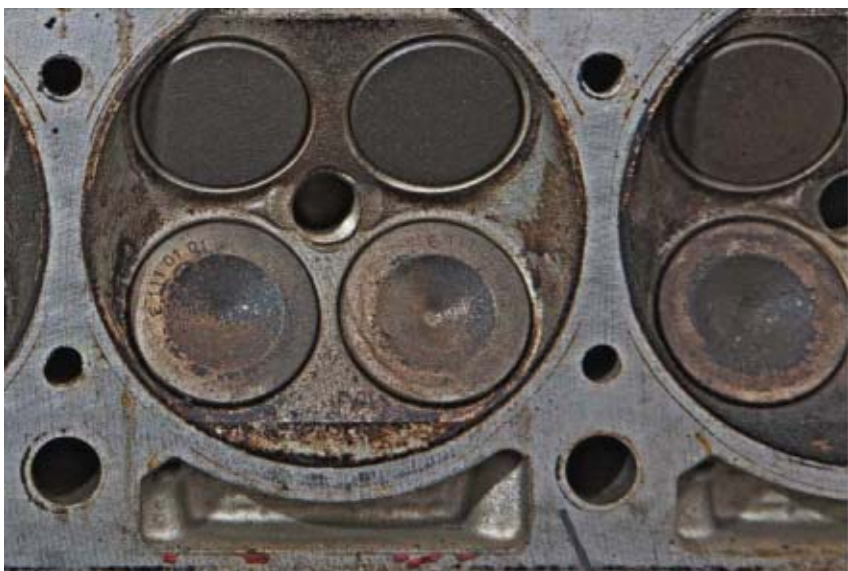


Figure 3. *Medium-strong detail extraction for the full image.*



Figure 4. Using an elliptical Marquee to select the areas that don't need sharpening.



Figure 5. Adjusting the feathering using the Refine Edges dialog.

middle section of the image shows good detail but the corners are too soft due to the lens being soft in the corners (Figure 3).

Step 3: Strong detail extraction and masking for the corners

I now create a copy of the image on a new layer and perform a much stronger detail extraction on the full



Figure 6. The image after applying sharpening to the corners.

image. The corners are improved but the center is now over-processed (although this kind of subject often needs a lot of detail extraction). The goal is to restrict this second pass of detail increase only to the corners. So I need to create a Layer Mask that limits the stronger detail extraction to the corners.

To do this, create an Elliptical Marquee around the portions of the image that *don't* have falloff (Figure 4), and use a strong feather at the edges using Redefine Edges (Figure 5). Now invert this selection and apply it as a Layer Mask (Figure 6). The corners now look nearly as sharp as the center. If it looks too sharp, you

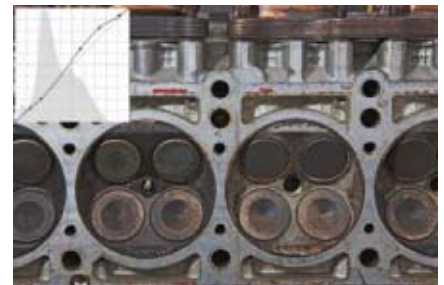


Figure 7. The final image after some Curves tweaking.

can lower the opacity of this layer so that it blends in a way you find more pleasing or natural.

Final tuning

After some final tuning of the exposure using Curves (Figure 7), we get the final result in Figure 8.

Of course, this technique cannot truly recover lost sharpness from the lens, but it can help make the image quite acceptable. The same technique also works very well for other types of selective sharpening where one can paint a Layer Mask as needed to limit the sharpening to specific areas of an image.

Uwe Steinmueller is a fine-art photographer and the publisher/editor of Digital Outback Photo (www.outbackphoto.com), an online photography magazine. He has written numerous books on and offers workshops and Photoshop scripts digital workflow for fine-art photographers.



Figure 8. The final image.

DIGITAL

Master Print Class

SPECIAL EXPANDED SECTION

BY PAUL SCHRANZ

I just took my first trip to Point Lobos on California's west coast since I transitioned to digital several years ago. Before that I had always shot with a medium- or large-format camera. With digital tools at my disposal, I decided to produce a photograph using the extended depth-of-field capability of Photoshop CS4.

I selected a relatively small image, with sufficient distance between the rocks in the foreground and the wet glossy plateau on the rock at the back of the image. I made three exposures, each focused differently, and imported the resulting images into Lightroom, which I use as my initial software for all non-montage work (Figure 1).

In Lightroom, I selected the three images, did global corrections on the first one, then synched it with the other two. From Lightroom I went to Edit > Open as Layers in Photoshop. Selecting all three layers, I ran Auto Align then Auto Blend on the three focus layers (Figure 2). I then flattened the layers and saved the file; it was automatically moved into Lightroom. I now had my base image with extended depth of field.

The wet rocks had a luminescence that permeated to the outside rather than to the inside, and I wanted to reverse this. Selecting Lightroom's Adjustment Brush tool, I drew a mask around the perimeter of my image and then lowered the brightness in that area (Figure 3).

I next created another mask for the low center rock and again decreased the brightness. I added an additional mask to the bottom rocks to darken

Changing Focus and Luminescence Post-Capture



Figure 1. Opening the three images used for the final image in Lightroom.

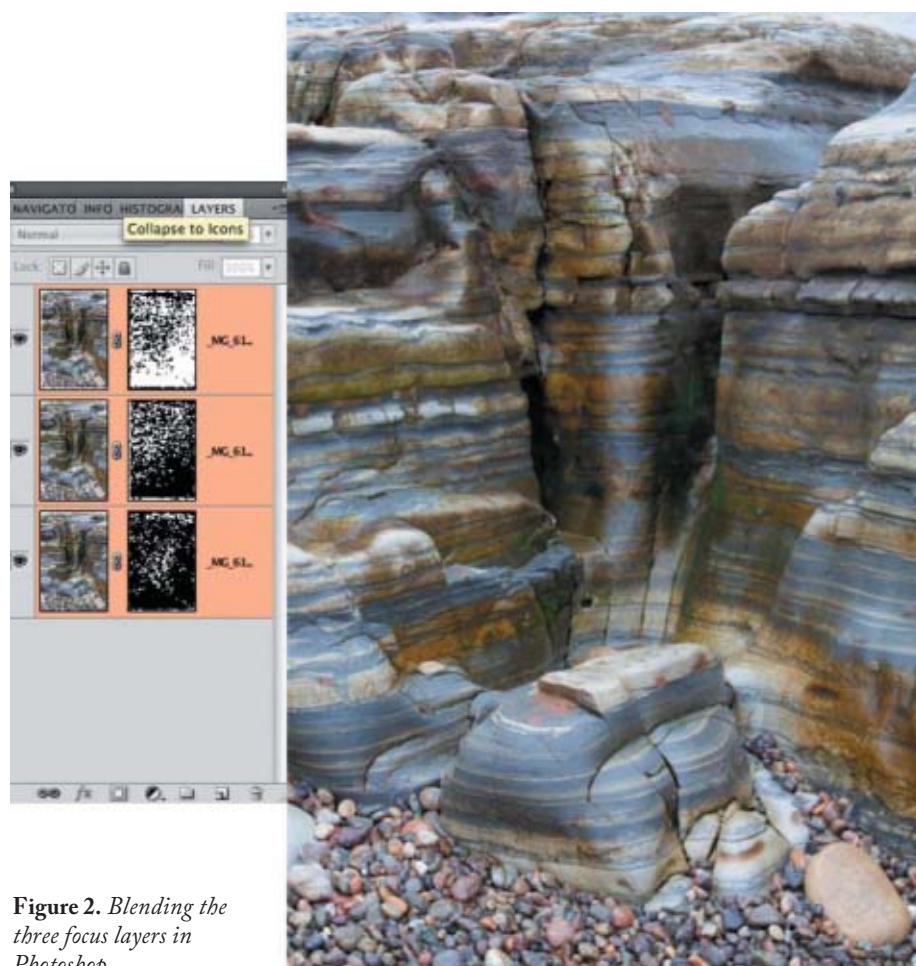


Figure 2. Blending the three focus layers in Photoshop.

them further. I added a final Adjustment Brush mask to the center, and then set it to lighten the middle of the image. At this point, I decided that most of my general corrections were complete.

I exported the file as a 16-bit Adobe RGB file into Photoshop for further tweaking (Figure 4). Once in Photoshop, I cropped the image a little tighter on the top and bottom to help define the lower right rock and give a smooth edge to the top.

I created a new blank layer and set the Blending mode to Soft Light. This isn't so much image correction as it is finessing an image's interpretation. I used a white brush of 15% opacity and lightened the wet areas of the rock to emphasize the luminance values. I changed the brush to black at 15% and darkened the light flat rock on top of the foreground boulder that I felt was competing with the luminance areas. I then lightened the wet areas of the rock and darkened the flat light portion of the bottom rock.

While I could have sharpened in Lightroom, my habit is to sharpen at the very end of the process. I used Smart Sharpen in Photoshop (See final image). I use a formula for determining optimum radius and sharpening. I take the ppi value of the output file and divide it by 200; thus, the optimum radius of this image is 1.5. I then adjust the sharpening amount as needed.

The final result had the aesthetic weight in the section of the image where I wanted it, and the eye easily moves through the image the way I wanted it to. ■

Paul Schranz, a PT contributing editor, is a professor emeritus at Governors State University in Illinois. He lives in New Mexico, where he is director of the Preston Contemporary Art Center and runs the Mesilla Digital Imaging Workshops.



Figure 3. *Changing brightness using Lightroom's Adjustment Brush tool.*

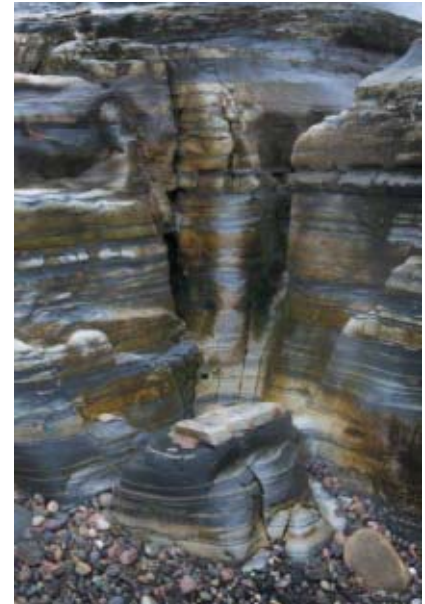


Figure 4. *Exporting the file as a 16-bit Adobe RGB file into Photoshop.*



Figure 5. *The final image, with sharpening applied.*

DIGITAL

Master Print Class

SPECIAL EXPANDED SECTION

BY DAN BURKHOLDER

Always Watch Your Back

Getting the shot behind you—and then knowing what to do with it

I'm not sure who said it first, but the advice, "When you think you've found the best shot, turn around and look behind you" was the wise counsel that left me with a keeper during an early morning shoot in the Catskills.

I'd stopped to photograph a waterfall from a stone bridge when a cloud blew in silently but with amazing swiftness. Suddenly, the friendly upstate New York mountains felt more like a spooky English moor. The mist was so thick that the waterfall below the bridge utterly disappeared in the haze. Thinking that the best shooting for this location was at an end, I meandered back to the car to pack up and travel to another scene. Approaching the car, I turned around to look back at the bridge. Leaping lizards! The scene was completely transformed by the cloud; the atmosphere was filled with depth and intrigue, whereas moments before it had been as routine as cornflakes and nonfat milk. The camera went back on the tripod with a 24–105mm lens providing perfect fine-tuning for the composition.

Back at the studio it was time to build the image step by step, taking whatever liberties were required to add soul and interest to the Raw capture. I never even bothered with the earlier images shot from the bridge.

Working smart

The experts tell us to make as many image adjustments as possible in Adobe CameraRaw (ACR) or Lightroom, and that's just what I did, tweaking the shadows, highlights, and color as best I could with the controls in ACR. All my friends know I have a terrible fear of commitment (except in



Figure 1. The original capture.

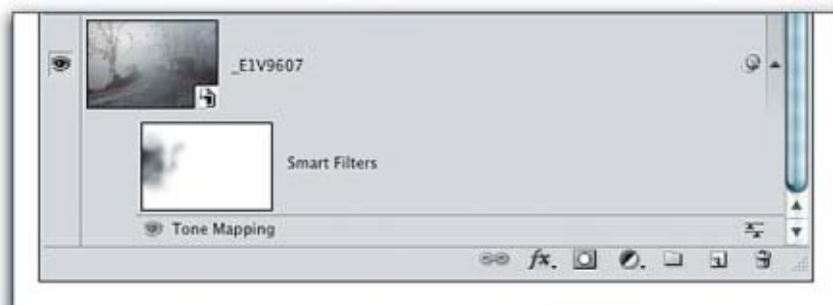


Figure 2. The Raw file opened as a Smart Object.



Figure 3. Setting ACR workflow options to create Smart Objects.

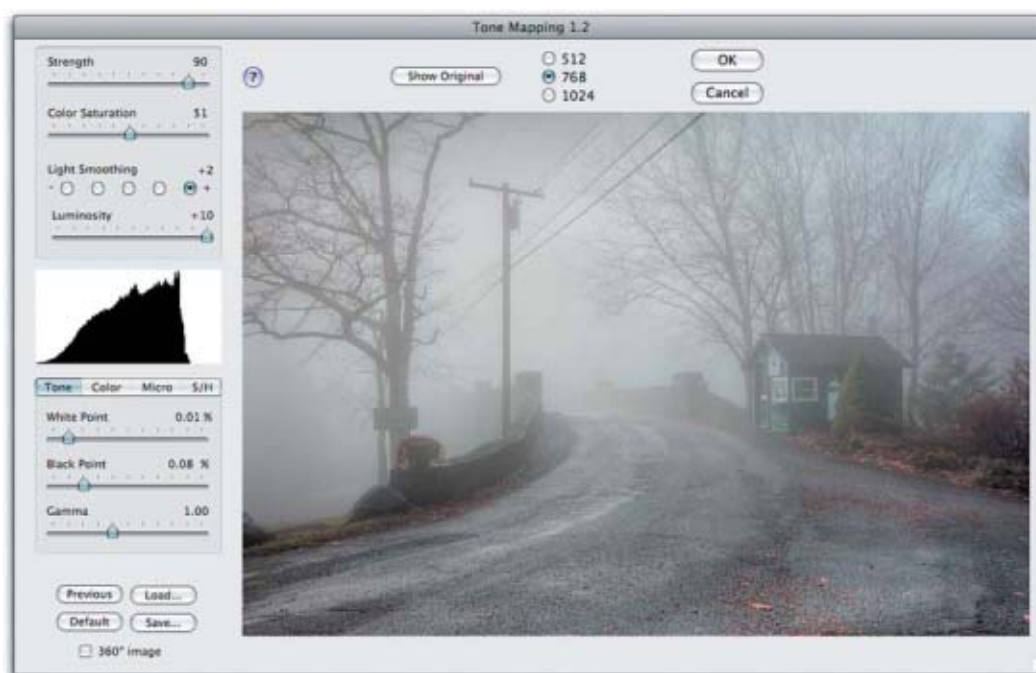


Figure 4. *Tone Mapping a single exposure.*

the all-important arena of marital bliss) and that fear is nowhere more apparent than in my digital workflow.

Fortunately for those of us working in CS3 or CS4 (or Lightroom 2), we can honor that trepidation by opening our images as Smart Objects, friendly items in our layers panel that let us change our minds—going back to ACR—with nary more than a double-click.

In Figure 2 you can see the bottom layer of my Layers panel (in CS4 the term “palette” has been banished by Adobe). That dog-eared icon in the lower right of the image thumbnail indicates that this layer is a Smart Object.

Creating a Smart Object is quite

easy. Figure 3 shows the bottom section of the ACR window. If you want your images to open in Photoshop as Smart Objects (as opposed to old-fashioned pixel layers), click on the Workflow Options button that looks suspiciously like a link in a Web browser (the circled text in Figure 3). It opens the ACR Workflow Options dialog box. Check the Open in Photoshop as Smart Object option as shown in Figure 3.

The neat thing about Smart Objects is that they give you one more way to not commit to your image-editing decisions. Say it again: “a fear of commitment is a good thing.” Should you decide the

ACR processing is not satisfactory, all you do is double-click that Smart Object layer and the Raw image opens again in ACR, where you can make different edits or even crops.

(Note: if you use Lightroom 2 to Open in Photoshop as Smart Object, the behavior might be a little different than expected. The smart objects that originate in Lightroom 2 respond to double-clicks, not by opening the image back in Lightroom 2 but by opening the Raw file in ACR. This behavior will probably change in the future but, if nothing else, it demonstrates the parity between image processing in ACR and Lightroom 2.)

This process is actually easier to do than it is to describe. The important thing to remember about Smart Objects is that you are never more than a double-click away from non-destructively changing your mind.

I did not bracket this scene for high-dynamic-range processing. If anything, this foggy scene was a low-dynamic-range image that was lush in both highlight and shadow detail. Yet if you look closely, you’ll notice in Figure 2 that not only is the base

Other Changes to Consider for your ACR Workflow Options

Sadly, the default bit depth in ACR is 8-bits. In Figure 3 you’ll notice that I’ve changed my setting to 16-bit so my pixel images—or Smart Objects—open as wonderfully malleable 16-bit files rather than thin, fragile 8-bit images. Also notice that I’ve changed the color space from the default Adobe RGB (1998) to ProPhoto RGB. This last modification is of less importance than the change to 16-bit, though increasingly, professionals and serious amateurs are adopting ProPhoto RGB as their standard.

layer a Smart Object, but there is a mask labeled “Smart Filter” and below that is a Smart Filter (that’s what we call filters that can be applied to Smart Objects).

Because I applied the Tone Mapping plug-in (www.hdrsoft.com) to this Smart Object, double-clicking the filter opens the Tone Mapping dialog, so it’s easy to choose different settings. Think of Smart Filters as filter-adjustment layers that can be

changed easily and that are non-destructive. Double-clicking that Tone Mapping filter results in what you see in Figure 4.

One of the things the Tone Mapping filter can do is judiciously amplify subtle tonal differences. And where might you find a plethora of such subtle differences? In fog shots. Yes, I’ve used this trick more than once to accentuate the planes of subject matter as they recede into the misty

distance. You really should give it a try (a free, trial version of the plug-in is fully operational though it places a watermark on your image until you register it).

The image was starting to come to life but there were a few intrusive things lurking in the fog that just had to be dealt with. An ugly No Trespassing sign on the foreground tree, a goiter-like electrical transformer on the telephone pole, and one too many power lines disrupted the flow of subject matter. They had to go.

I tackled each of these problems on different layers. Figure 5 shows the three retouching layers and what they contributed.

Adding warmth

I should have known better than to share a JPEG with a talented colleague. Just when I thought I was finished with the image, friend and fellow photographer David Jeffery saw the JPEG and asked, “How would it look if you warmed it up a bit?” Dammit, he was right! It was morning light after all.

Fortunately, the days of trial-and-error are over with digital helpers such as Nik’s Color Efex Pro 3.0 in our holsters. This fun filter pack provides terrific control over color effects for your images. Nik has included lots of pre-configured filters, but you are also free to explore to find your personal best color changes. And once you find a color combination you love, you can save it as a preset so it’s easy to reapply to other images. Of course I’d be remiss were I not to mention Nik’s neat U-point technology that lets you control where and how much the effect is applied. In Figure 6, I have limited the golden morning glow to just the foggy area over the bridge itself. Masking in Photoshop would have taken many more steps to get the same effect.

My one and only gripe with Color Efex Pro is that you can’t apply the

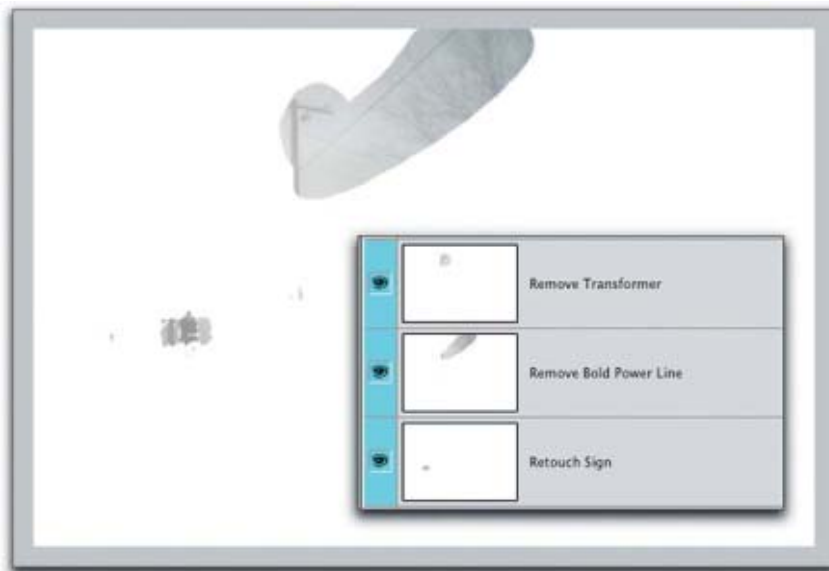


Figure 5. Retouching the “uglies” out of the picture.

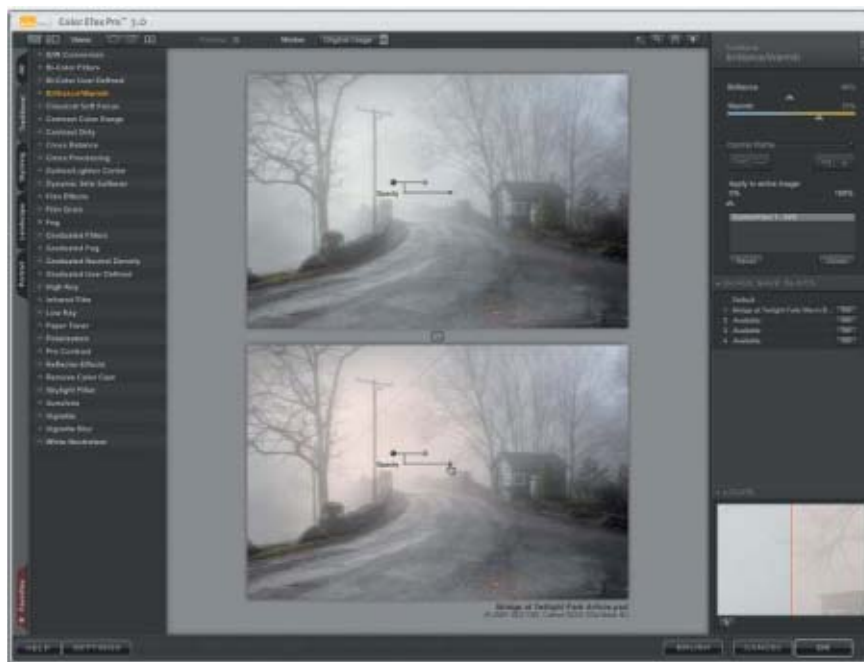


Figure 6. Tweaking the morning light in Nik Color Efex Pro 3.0.



Figure 7. *Final print of Bridge at Twilight Park.*

filter to Smart Objects. Since you can't bask in the have-no-fear world of modifiable filter effects, you must apply this filter to a layer of—shudder—pixels.

It was a good time to regroup, so I combined all of the “thus-far” visible layers into a new layer that could be filtered. In case you don't remember from previous articles, the keyboard command (because there isn't a direct menu item) is Command-Option-Shift-E (PC: Control-Alt-Shift-E).

For the actual print, I use papers from both Museo and Inkpress. Another fine filter from Nik, Sharpener Pro 3.0, has last-step duty for tightening detail with perfect control and precision. As one who loves Epson hardware but loathes their software, Imageprint removes much of the uncertainty from the printing steps, removing frustrating choices such as “Rendering Intent,” and “Black Point Compensation.”

Different workflows

In the world of commercial

photography, you won't pay your bills unless your expose-to-sell ratio is pretty close to 1:1. There just isn't much money to be made by futzing around in Photoshop for hours (sure, there are exceptions). But in the fine-art world of image creation, the original capture is often only the first building block as the image is crafted to its final printable form. I like to think of it as sculpting with tonality, adding depth and dimension to the image that, let's face it, is going to be displayed as a two-dimensional object on a wall.

A wise critic once observed that whereas painting is an additive process—starting with a blank canvas and adding compositional elements one by one—photography is subtractive. By choosing camera position, focal length, cropping, and retouching, our decisions try to tame the confusion around us, distilling the image into a message that moves from the print to the viewer.

Photographers have been called hunter-gatherers because of the way

we stalk and capture images. But that passion of the hunt can mask awareness of our surroundings. On that chilly morning out in the field, in the midst of your pursuit, one of the most important decisions you can make is to turn around and look right behind you. ■

Dan Burkholder has been teaching digital imaging workshops for 15 years at venues including the School of the Art Institute of Chicago; the Royal Photographic Society, Madrid, Spain; The International Center of Photography, New York; and many others. Dan's new book, The Color of Loss (University of Texas Press, 2008), documents the flooded interiors of post-Katrina New Orleans and is the first coffee table book done entirely using HDR methods. His award-winning book, Making Digital Negatives for Contact Printing, has become a standard resource in the fine-art photography community. You can see more of Dan's work at www.DanBurkholder.com.

Portfolio:

Kenvin Pinardy: The Personal and the Professional

Text by Scott Lewis



Little Girl #2

Kenvin Pinaryd is a professional Indonesian photographer living in the capital of Jakarta. He primarily makes his living doing weddings and fashion shoots for domestic and foreign magazines, though his interests as a photographer range well beyond that.

His professional work centers on wedding and pre-wedding photography, businesses that are "aggressively growing in Indonesia," Pinaryd says. But his hobby is his more photojournalistic work. "Whether it is for a magazine or for my personal collection, I can spend

my whole day doing it with full enjoyment and without any complaint."

Examples of his personal work include *Little Girl #2*, shot at morning prayers during the Moslem holiday, *Eid ul-Fitr*, which marks the end of Ramadan. During the holiday, he says, "people are gathering for morning prayer, after which they gather their whole families and relatives together and forgive each other" for any transgressions of the past year.

As with most photo-journalistic work, Pinaryd's usually requires

patience and a sense of the crucial moment, as when he caught the two girls facing each other in mirrored poses that break the regularity of the other people present at the ceremony. Another example is *Going to the Top*, an image of a man leading a horse up a mountain at Mount Bromo, East Java. "From a long distance," he explains, "I saw a group of tourists were riding horses toward the top of the mountain. I waited a long time to shoot that perfect moment."

In addition to his more journalistic images, Pinaryd has been working on



Going to the Top

Portfolio: CONTINUED



a series of underwater images that require his spending time in the depths of a swimming pool wearing diving gear and oxygen tanks while an assistant feeds oxygen to his models between shots. The images were influenced by photographer Zena Holloway, but have required a lot of experimentation and work on Pinardy's part. When he began the series, he didn't really know how to

photograph underwater and began with inexpensive cameras in cheap underwater housings. "The results disappointed," he says. So he moved on to Sea and Sea casings on a Canon 5D. He generally covers the tiles of a pool with cloth and keeps the lighting simple—normally using nothing but the noon sun.

"For me, the most difficult challenge in underwater photography is how to get beautiful expressions on the models and a

◀ *Catching the Sun*
Dragon Lady ▼





Dancing Underwater #3



Dancing Underwater #10

beautiful pose," he explains. I still do them in swimming pools, but I am pretty sure someday I will shoot in the sea."

Pinaryd first became interested in photography in the mid-1990s while a college student. But that initial enthusiasm was put on the back burner as he finished a degree in accounting and went to work for a chemical company. His interest in photography returned in 2004, and he quickly became interested in portraiture. "Initially, I preferred a more classic style of photography,"

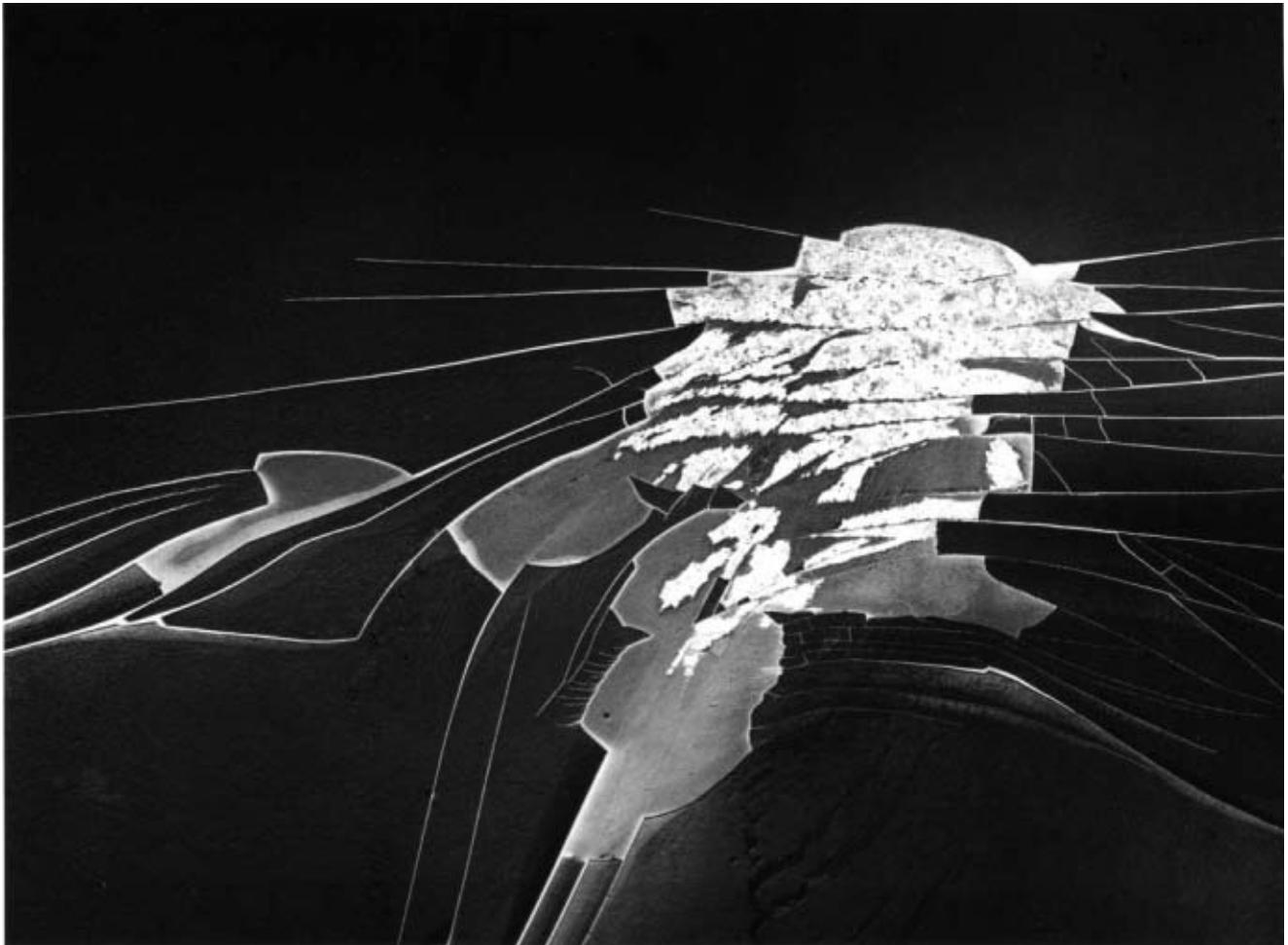
he explains. "I don't find what I would describe as 'classic style' images to be boring, but I am bored by 'straight' portrait images. I started working to create my own style that was classically based, but dreamy and dark. I always try to give my photos that feeling, and to create photos with my own unique style, rather than following the style of others. Digital photography has really helped me to create photos that align with my imagination."

He adds that while it may seem like he does a lot of post-processing

in his photographs, "I very seldom change the actual situation, I just make it more dramatic. I use Photoshop, I never use any plug-in to make the photos more dramatic. I often use a pattern for the background like wood, an old wall, sand, old paper etc. Usually I set the background darker than the subject to make the subject appear more exposed. After that I fine-tune with the color balance, channel mixer, or filter settings."

You can see more of his work at www.Pinaryd.com ■

Photography and Music: **My Movement towards Abstraction**



T.A.C. 8

BY HOWARD BOND

Having had careers in both fields, I have often thought about a parallel between photography and music regarding the way words affect the perception of the listener or viewer.

I started doing darkroom work 65 years ago and began photographing weddings while still in high school. After workshops with Ansel Adams beginning in 1967, I turned from photographing people to photography as art. This increased to full time by 1979. My music background included playing in bands and orchestras, two degrees, and five years of conducting and arranging, followed by 30 years of singing choral works with symphony orchestras. (I now listen to music instead of participating.)

A photographer or composer (or other artist) can exercise very much or very little control over how a given work will be perceived, depending on the presence or absence of words, and how this works in music is particularly instructive. I will call the sort of music that exerts maximum influence on the thoughts of the listener "Type 1." Songs with words in a language understood by the listener do this.

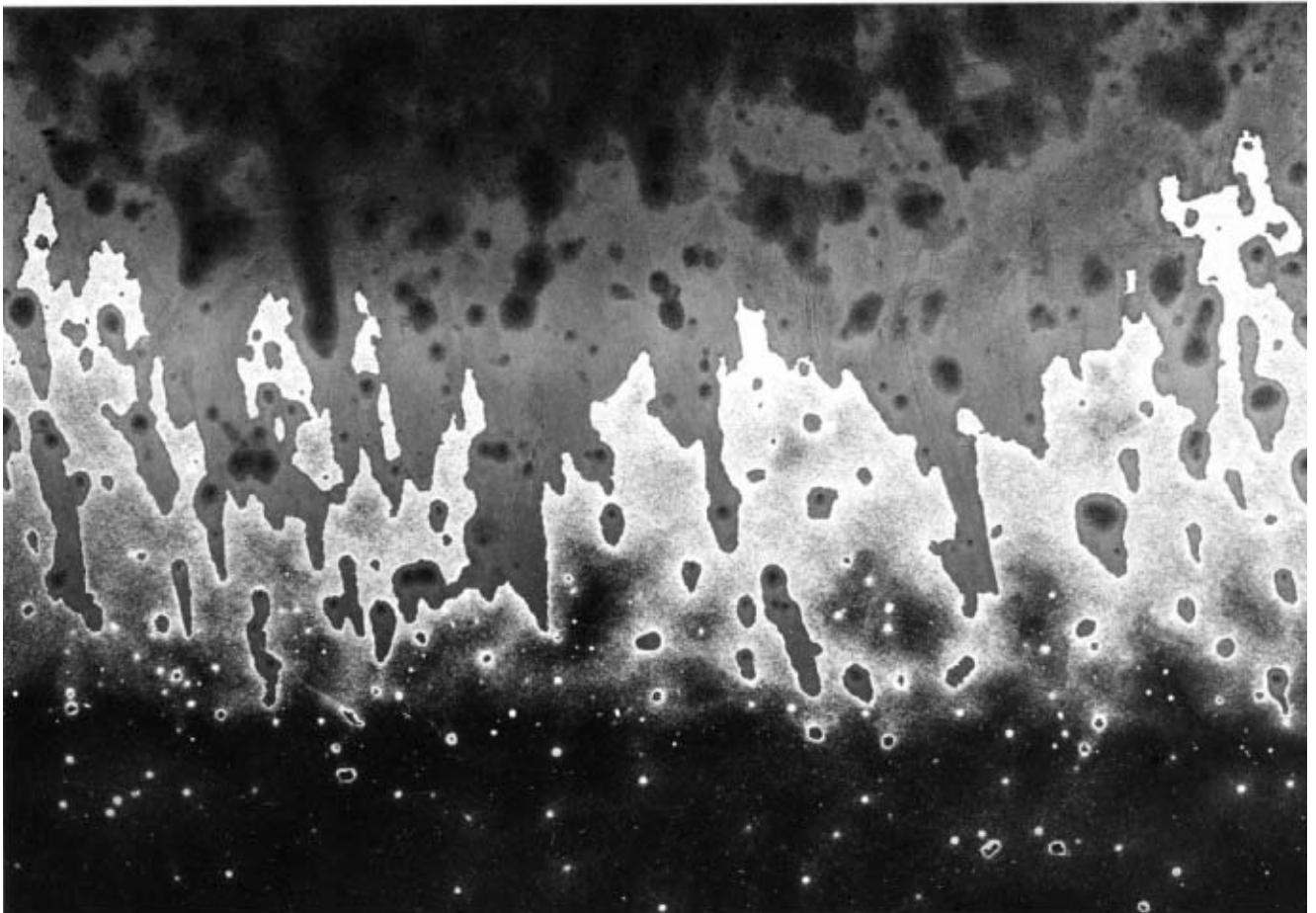
Music that involves less specific direction (Type 2) includes that which is meant to describe a story or give an impression purely through sounds, such as Mussorgsky's *Pictures at an Exhibition* or Debussy's *La Mer*. The technical term for these is program music, and the printed program usually tells the audience what the composer had in mind. Other Type 2 examples are instrumental pieces with descriptive titles, and vocal works with words in a language you don't know, such as the Verdi *Requiem*.



T.A.C. 16



E.M.I. 7



T.A.C. 21



E.M.I. 2



M.A.S. 1

Music with no extra-musical references (Type 3) is called *absolute music*. Typically, this would be a symphony, concerto, or other instrumental composition identified by number or by the letter of the key in which it was written, instead of by a title consisting of words.

I will use Type 1 to designate photographs (or art in general) that depict familiar people, places, or objects. In Type 2, the kind of subject being shown is apparent, but the viewer doesn't know which specific one is depicted; there may be a title that influences the viewer's thoughts. Type 3 photographs are completely abstract; the viewer can't tell what was in front of the camera. Pleasure comes entirely from shapes, tones, textures, or colors with no words present.

The absence of verbal cues in Type 3 art and music not only gives more freedom to the listener/viewer, but also asks more of him or her. Although anyone can appreciate a beautiful landscape or a song with interesting words, full enjoyment of Type 3 art or music is more likely for those with considerable previous viewing/listening experience.

During most of my photographic career, I made only a few truly abstract images, but some of my most satisfying photographs, made from whitewashed-building details on the Greek islands, approached abstraction. Last year, following a decision to seek more opportunities to make

“PHOTOGRAPHY IS A VISUAL
MEDIUM AND THE LESS SAID,
THE BETTER.”

—Brett Weston

Type 3 photographs, I obtained permission to photograph details of wrecked cars in four junkyards. The first few photographs from this project accompany this article.

Titles are a problem, since it isn't very useful to have 25 abstract photographs labeled *Untitled, 2009*. Accordingly, I have used the initials of the junkyard and chronological numbering of the negatives made there. Thus, both image and title are abstract for anyone who doesn't know the naming scheme.

I hope you looked at the accompanying photographs before reading this text and were unable to tell what the subjects were. They are meant to be seen with no words from me influencing your thoughts. As Brett Weston said, “Photography is a visual medium and the less said, the better.” ■

Contributing editor Howard Bond is a fine art photographer who lives at 1095 Harold Circle, Ann Arbor, MI 48103.

COLLECTOR PRINT:

DARKROOM PRINTS:

English Cathedrals

by **Howard Bond**

Howard Bond has contributed more than 100 articles to *PHOTO Techniques* since 1985, taught workshops from 1975 to 2008, and has made 22 limited edition portfolios of prints. His photographs are in the collections of more than 30 museums in the United States and Europe. Photographs for this cathedral set were made in 2003 and 2008 on T-Max film with a 5×7 Deardorff camera and are printed on Ilford MGFB Warmtone, fully toned in selenium, signed and mounted on archival board. The image title, date, and a stamp of authenticity appear on the back of the print.

Bond's standard price for 10×13 prints on 16×20 mounts is \$375 each, but these are being offered to *PHOTO Techniques* readers for \$200 each, four prints for \$600, or all 10 for \$995. Shipping in the U.S.: add \$15 per order. Inquire for shipping outside the U.S.

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A. *Pillar, Worcester*



B. *Piers, Gloucester*



C. *Chapter House Pillar, Lincoln*



D. *Pillar & Ceiling, York*



E. *Choir Screen, Ely*



F. *Chapel Ceiling, Ely*

Great Scans

DISCOVER WHAT HELPS AND WHAT DOESN'T

BY CTEIN

Scanning is serious business. Think of your scanner as a combination enlarger and enlarging lens, the intermediary between your original film (or photographic print) and your finished photographs. For many photographers, a good enlarger and lens were the single most expensive and important purchases they made in their career, and they would pore over the details and published tests to determine which ones would really serve their needs.

Learning how to make high-quality enlargements was not an overnight task. Cleanliness, sharpness, freedom from stray light and contrast-robbing flare, all were concerns of the darkroom printer. Just as with darkroom work, making good scans is a matter of both equipment and methods.

Flatbed or film scanner

For scanning prints, you'll use a flatbed scanner. Print scanning is relatively undemanding. The density range and image detail of a print rarely exceed the density range a moderately priced scanner can capture.

Scanning film is dicier. A dedicated film scanner almost always captures a much better density range and more detail than a flatbed scanner. Yes, a good medium-format film scanner will set you back around \$2,000, but how much did that really good enlarger and enlarging lens cost you (in current dollars)? You will get many years of use out of a good film scanner; it's a long-term purchase that pays for itself with better prints and faster printing.

Large-format film scanners can handle 4x5-inch and even 8x10 formats. They produce superior results, but can you afford one? They're outside my budget. For large-format film, I'm forced to rely on a flatbed scanner; \$1,000 or less buys a pretty good one.

Is it sharp?

Flatbed scanner manufacturers' resolution figures never tell you how much detail the scanner captures. Strangely, few reviews even test this.

The optical or physical resolution of a scanner is a measure of how many pixels the scanner captures per inch.

For instance, my last-generation Epson 4990 scanner is spec'd at 4800x9600 ppi. That means it captures 4800 pixels per inch across the width of the platen and 9600 pixels per inch in the direction of travel with the scanner head. The way it achieves twice the pitch lengthwise is by microstepping the scan head in half-pixel increments. That's a real and legitimate technique for obtaining higher resolutions and is often used in advanced scientific equipment. Ignore the software-interpolated numbers; there is no additional detail captured, only a lot more pixels generated.

The true resolution of flatbed scanners is usually much less than the maximum pixel count. Obtaining real resolutions of 2400 or 4800 ppi requires extremely tight focus tolerances. A fraction of a millimeter error in the position of the film plane is all it takes to blur fine detail. Unlike film scanners, flatbed scanners rarely have focusing optics. With no way to adjust focus, you're dependent upon the flatbed scanner being manufactured to near-perfect mechanical tolerances. What do you think the chances are of that?

I compared the Epson scanner to my Minolta Dimage Multi Pro film scanner. Both claim a top resolution of 4800 ppi, ignoring microstepping. That corresponds to approximately 95 line pairs per millimeter (lp/mm). Fortunately, I have targets that well exceed that.

I scanned the reflection target on the Epson scanner at various pitches all the way up to 4800 ppi. The best widthwise resolution I got was just barely 40 lp/mm at extremely low contrast, although it sharpened up well. The best lengthwise resolution was 32 lp/mm with low contrast. There was nothing gained from scanning at higher than 2400 ppi.

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Transmission scanning was a little sharper. The maximum widthwise resolution was 50 lp/mm with good contrast, which would justify going to 3200 ppi. Lengthwise resolution was still down at 32 lp/mm with low contrast (Figure 1).

The Minolta scanner was almost twice as sharp as the Epson, even though both claimed the same pixel pitch. At 4800 ppi, its widthwise resolution was 90-plus lp/mm with low-to-fair contrast in the center and 80 lp/mm at the edges with a little smearing. The lengthwise resolution was 65–80 lp/mm with good contrast.

I've not tested most of the film or flatbed scanners on the market; you no doubt will find some that perform better or worse than this pair. But in general, a film scanner is much better than a flatbed for scanning film, and you should never, ever trust the manufacturer's quoted figures for how much detail a scanner will give you.

Unfortunately, I don't know of any source for inexpensive high-resolution targets for running your own tests. If any readers know of targets that hit 100 lp/mm or better (and don't cost hundreds of dollars), please drop me an e-mail.

When you're scanning film, always scan the film at the highest resolution your scanner meaningfully supports (e.g., 3200 ppi on my Epson). Film grain can never appear smaller than one pixel in size. Because film grain acts a lot like random noise, it doesn't blur out very quickly when resolution drops. Consequently, a low-resolution scan isn't grainless; instead it has large, mushy, soft grain, looking a lot like an out-of-focus print (Figure 2). Of course, once you have the photograph in your computer, you can use noise-reduction tools (reviewed last issue), but the less you have to use them, the better quality and the more fine detail and tonality you'll retain in your photograph.

Cleanliness is next to...

All flatbed scanners eventually collect a

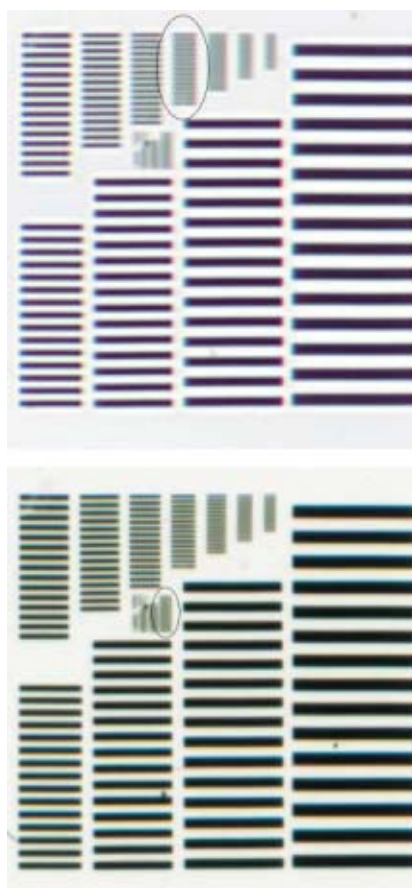


Figure 1. Two 4800 ppi scans of a high-resolution glass target on the Epson 4990 (top) flatbed scanner and the Minolta Dimage Scan Multi Pro film scanner (bottom). The largest set of bars corresponds to 10 lp/mm. The bar sets at the absolute resolution limits are circled.

haze on the underside of the glass platen. This is a big problem when making reflection scans (it has much less effect on transmission-film scans). Just like the scum that forms on the inside of your automobile windshield, the haze on the platen reduces contrast and degrades shadow detail. Pay attention to how the glass looks when the lamp inside the scanner is on—a scummy haze will be obvious. If you get the feeling that you're losing maximum density range in your scans, take a close look at that glass; odds are that it's collected a film that you didn't notice.

External glass surfaces, of course, should be cleaned at every opportunity. If you can see any dust or smudges on your scanner glass, on the platen, or on the underside of the film-illuminating



Figure 2. I scanned a TMax 100 negative at 4800, 2400, and 1200 ppi (top to bottom). Observe how much the fine detail blurs with each drop in scanning resolution. The degradation in detail is much worse than the reduction in grain; even at 1200 ppi the grain is still visible as low-contrast blotchiness, but a huge amount of detail has been lost. For the finest grain, scan at the resolution that produces the finest detail your scanner can provide.

lid, you're seeing too much. Believe me; your scanner is more sensitive to these things than your eyes.

Some scanners are easier to disassemble than others. Fortunately, these days there are lots of online instructions for how to take apart your scanner. If that's something you're comfortable with, you can keep the glass crystal clear at no expense beyond your periodic maintenance time. Film scanners, on the other hand are pretty much sealed black boxes. Fortunately, I've never seen evidence that my Minolta scanner needs cleaning. When it does, I'll just have to find a competent repair shop.

There's only so much I can do myself to maintain a complicated piece of equipment.

Many quality scanners come with something called Digital ICE. It does a good job of eliminating dust and scratches when it's built into the hardware. Some flatbed scanners include a software-only version of Digital ICE and it doesn't work very well. Hardware-based Digital ICE performs an infrared scan of film. Color film dyes (except Kodachrome's) don't absorb much infrared; dust and scratches do. That gives the software the information needed to subtract dust and scratches from the scan, and it's why Digital ICE doesn't work with Kodachrome or with black-and-white films.

Some flatbed scanners have real infrared Digital ICE; most don't. How do you find out what a flatbed scanner really has? Download the full manual for the scanner from the manufacturer's Web site. If the instructions for Digital ICE warn that the software won't work with black-and-white or Kodachrome film, you've got the real deal.



Figure 3. The slide scan on the top was done in Adobe RGB color space and the one on the bottom in Wide Gamut color space. The differences looked subtle in the original scans, but there was serious clipping in the Adobe RGB scan. Expanding the shadow detail, shown here, makes the clipping problem more evident. The Adobe RGB scan is missing a lot of tone and color gradation in the reds and magentas, the reds look pink, and the blues and cyan purple. The Wide Gamut RGB scan on the bottom shows much more natural and accurate color and tone.

What does a good scan look like?

In my article on scanning back in the September/October 2007 issue of this magazine, I spent a lot of time discussing what constitutes a good scan. Here I'll keep it short and simple: a good scan is one that uses 16-bit channel depth (that's 16 bits per pixel in grayscale, 48 bits in color) and that uses most of the range in the histogram. Don't try to get 100% coverage; if you do, you'll likely find that you have some small areas that are going to pure black or white in the finished scan and that means you're throwing away a bit of highlight or shadow detail. If the histogram looks like it's about 90% full, with minimum values around 15 and maximum values around 240, you're right where you should be.

Almost all color photographs have density ranges that span the full range of values from near black to near white in all three channels. If you use the levels control built into the scanner software to individually adjust the color channels until they all span a similar 90% range, you'll be surprised to find how often you are close to a correct color balance for the photograph.

Until pretty recently, I didn't know that it can make a big difference what color space you make your scans in. I owe Mikkel Aaland, author of the *Lightroom Adventure* books, for that tip. Film, especially slide film, contains a very, very wide range of colors (negative films don't have this problem as much because, effectively, their data is compressed). Most photographers these days work in the Adobe RGB color space because it's a pretty good match to

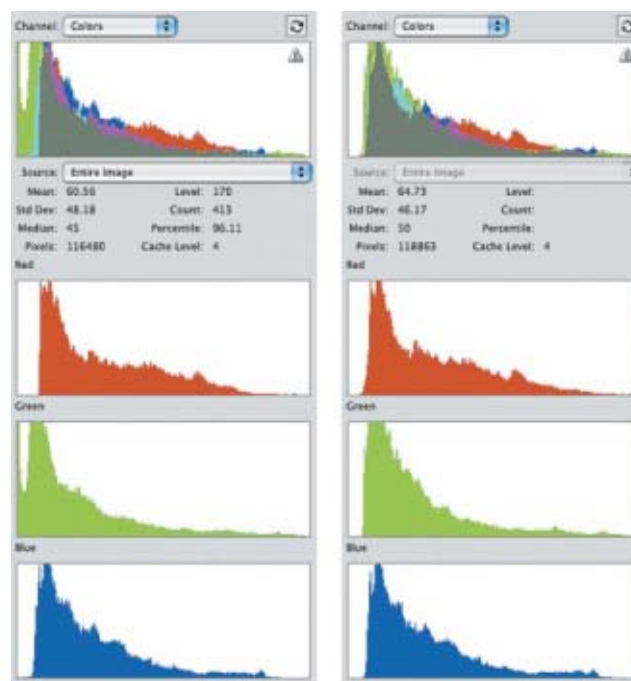


Figure 4. The histograms for the previous two scans tell the tale. The Adobe RGB scan shows serious clipping in the shadows in the green channel and a little bit in the blue channel. The scan into Wide Gamut RGB space has a very nice histogram, with no clipping.

the display capabilities of a high-quality monitor and the color range of a good printer.

The thing is, slide films routinely include colors that fall well outside of Adobe RGB. If you scan such a slide into Adobe RGB color space, you get clipping: one or more of the color channels will have areas that go to pure black or pure white, with values of zero or 255. The original slide will have tone and color gradation in those areas that won't make it into the scan. This loss of quality can become very evident when you start to make any adjustments to tone or color.

Good scanner software has an option for choosing the output color space. If it doesn't, it's time to go buy some better scanner software. Look for ProPhoto RGB, a very large color space. Use a 16-bit workflow with this space or you'll have problems with contouring and banding. When you open the scan up in Photoshop you'll get a warning box asking you which color space you want the photo opened up in (unless ProPhoto RGB is your default working space). Be sure to tell Photoshop to open it in ProPhoto RGB.

As a demonstration of the difference color space makes, I scanned a brightly colored Kodachrome slide into Adobe RGB and Wide Gamut RGB color spaces. My scanner software is too old to know about ProPhoto RGB; Wide Gamut is a good fallback.

As a demonstration of the effect this has on color and tone values, I lightened the shadows in both scans to bring out the details (Figure 3). Notice that there is tone and color gradation in the red and magenta areas in the ProPhoto RGB scan, and the cyans and blues are clean and pure in color. In the Adobe RGB scan, reds come out pink, most of the variations in tone and color in the deep

magentas and reds are gone, and the color in the blues and cyans is distinctly off.

The histograms of the original scans (Figure 4) show the problem with Adobe RGB; large portions of the slide have a solid zero for the green value (maximum magenta). There are also some areas where the blue (maximum yellow) also clips. Grayscale images of the green channels in both slides show how unnatural this is (Figure 5); the solid magenta (black) areas in the Adobe RGB scan are very obviously not normal.

Expanding the shadow range in the Adobe RGB scan didn't lift the clipped values in the green channel because zero times anything is still zero. In the ProPhoto RGB scan, the deep magenta values increased proportionately along with the other color channel values.

Evil, evil flare

Figure 3 shows another scanning problem: stray scattered light. That can cause trouble even with black-and-white negatives, but it isn't as big a problem with color negatives because their density ranges are lower. When making the scans for this article, I intentionally misaligned the slide so some clear sprocket hole would show through. You can see bands of light pouring into the image area as strong white light degrades nearby shadow detail.

Easy to fix! Make sure you mask off the areas outside of the film image where white light can get through. It doesn't matter what you use to do this; black construction paper or strips of black plastic work fine. Just so it blocks the light.

It's better when wet

Several years ago (November/December 2007), I wrote about the joys of oil-immersion scanning. OK, truth—



Figure 5. Here are grayscale images of the green channels for both scans. The green channel in the Adobe RGB (left) scan looks extremely unnatural, because large portions of it are solid black. The Wide Gamut RGB scan (center) looks normal. The figure on the right shows the pixels in the Adobe RGB scan that are being clipped to zero (i.e., pure magenta).

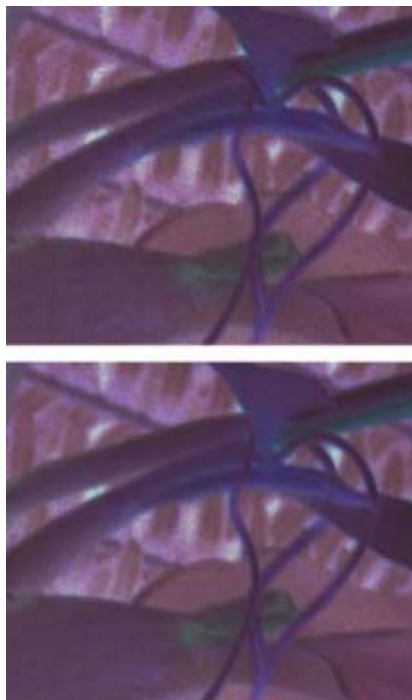


Figure 6. *The top scan is a normal 4800 ppi scan of a color negative, the bottom scan was made using the ScanScience kit. Same settings, big improvement.*



Figure 7. *Here is the equipment you need to do wet scanning. ScanScience makes flexible plastic overlay sheets and glass mounting plates for a variety of scanners and will custom manufacture to fit yours if it isn't in their catalog.*

it wasn't at all enjoyable. The astonishingly improved scan quality made it worth the trouble, but it was a huge amount of trouble. As that article was going to press, I discovered ScanScience (www.scanscience.com) and included a sidebar about their products. Since then, I've converted entirely to the ScanScience way and abandoned my makeshift oil methods.



Figure 8. *Spray the glass plate and one side of the film with Lumina fluid after you've thoroughly cleaned and dusted.*

The most amazing thing about fluid-immersion (a.k.a., wet) scanning is that grain actually gets finer and the scans are cleaner (Figure 6). That has to do with surface characteristics of film that I won't get into here, but the difference between ordinary dry scanning and wet scanning is like going from 35mm to medium-format film or going from ISO 100 film to ISO 400.

Good film scanners include very effective grain-reduction software, Digital GEM, but it robs a little bit of sharpness and fine detail. My ScanScience scans have less grain than I got before and they are more detailed and flaw-free.

ScanScience kits fit most scanners or they can make them to order for your film or flatbed scanner. The price depends on the scanner, the format, and what's included in the kit; they run from under \$50 (Canadian) to \$280. Check their catalog for details.

It's simple to do. You'll need the equipment shown in Figure 7 (ScanScience also sells kits that include gloves, hanging clips, and a squeegee). The canned air, PEC Pads, and PEC-12 are for cleaning off the film and equipment before and after scanning. At the top is a bottle of the Lumina immersion fluid. At the bottom, on the right, is a thin, optically flat glass plate and next to it a similarly sized sheet of transparent flexible plastic.

After you've cleaned everything thoroughly and blown off any residual dust, spray one side of the film and glass plate with a light coating of Lumina (Figure 8). Bend the film into a U-shape (Figure 9) and touch



Figure 9. *Lower the sprayed film onto the glass plate by curling the film into a U-shape so that it touches the plate in a thin line to start with. That helps prevent trapped air bubbles.*

the center of it to the glass plate to make a bead of liquid. Slowly lower the ends of the film and you should get a bubble-free layer of fluid between the film and the glass plate. If not, try it again or use a squeegee to squeeze out the bubbles.

Next, spray the exposed surface of film and one side of the plastic overlay sheet with Lumina. Lower the overlay sheet onto the film the same way you lowered the film onto the glass plate. Pick up the whole "film sandwich" and put it in your film carrier or on your flatbed platen with the plastic overlay facing the scan head. Scan away.

I never make a dry-film scan anymore. It throws away too much quality. Everyone out there who is serious about getting the best possible scans needs to be doing wet scanning, and ScanScience makes it affordable on almost any scanner.

I threw a lot at you in this article. I'm confident, though, that if you follow my suggestions, you will be pleased and amazed by how good your scans look. Even if you can't afford the best scanning equipment, improving your technique will do a lot to improve your scans. ■

Ctein has been a writer and fine printmaker for 30 years, and is one of the few remaining expert dye-transfer printers. His books DIGITAL RESTORATION and POST EXPOSURE—Advanced Techniques for the Photographic Printer, are available from Focal Press. Autographed copies may be purchased and his photographic work can be seen online at ctein.com.

Focus and Practical Depth of Field

Especially with high-resolution digital cameras, full-image sharpness is limited to a narrow zone even when stopped well down, demanding careful attention to detail for best results.

BY LLOYD L. CHAMBERS

My recent *PHOTO Techniques* articles have explored how diffraction, focus shift, and field curvature all can lead to blur. The focus shift and field curvature issues can be mitigated by increasing the depth of field, so long as diffraction is held at bay by not stopping down too far.

Depth of field means “the zone of reasonably sharp focus,” with the term “sharp” being both arbitrary and ambiguous. The word “zone” is truer to reality, as “depth” implies a fixed-thickness layer of sharpness at a fixed distance, which is generally *not* the case once field curvature and other aberrations are taken into account. Furthermore, lenses are complex physical objects that have build variances from design specifications that can at best only approach the theoretically best performance. Lenses also vary in rendition, so that two lenses at the same aperture can show strikingly different real-world sharpness.

Circle of confusion

The circle of confusion refers to the blur produced by an out-of-focus point of light. Wide open, there is lens-barrel vignetting causing a partial eclipse of the blur circle (the “cat’s eye” effect). It’s one reason why off-center detail can be sharper than expected—the blur “circle” is smaller than it is at the center.

Stopping down one stop changes the diameter of the lens diaphragm by a factor of 1.4, which means that out-of-focus blur circles are reduced by a factor of 1.4 linearly, improving resolved detail by a factor of 1.4.

But for detail to double in linear resolution, then *two* stops are required. For example, $f/5.6$ is two stops more than $f/2.8$, yielding a 2× improvement in resolving power. Aperture $f/11$ is again two stops more than $f/5.6$, or 4× the linear resolving power over $f/2.8$. It should be clear that even a quadrupling of resolution doesn’t amount to much when detail is strongly out of focus to begin with.

Figure 1 shows actual-pixels crops of a single star, taken with the Zeiss ZF 85mm $f/1.4$ Planar at $f/1.4$, using the Nikon D3. The series was progressively defocused to show just how the blur circles look in reality (and near optical center). We can see various optical aberrations at play, probably axial chromatic aberration as well as spherical

aberration and spherochromaticism. It should be obvious that there is more going on than just a simple blur circle.

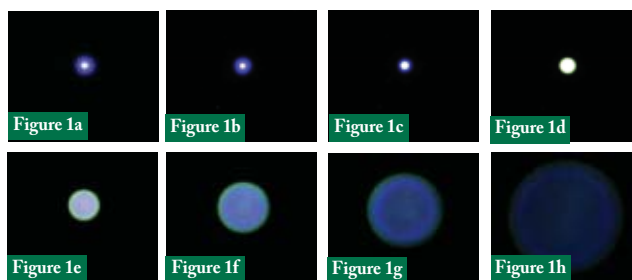
The goal in stopping down is to reduce the size of the circle of confusion. Not only does stopping down help eliminate some optical aberrations (e.g., the ring of purple haze), it reduces the size of the blur circle. A lens diaphragm whose diameter is reduced by half (two stops) cuts the blur diameter in half also, yielding a blurred dot (circle of confusion) of half the diameter and a quarter of the area.

Smaller blur circles look sharper than larger ones. Eventually, the circles are small enough that we perceive the detail as “reasonably sharp” and therefore within the depth of field. But until the circle of confusion approaches and exceeds the sensor resolution, the image fails to utilize the full sensor resolution. That is why the term “sharp focus” in the context of depth of field is oxymoronic—only a narrow zone of focus actually resolves to sensor resolution. This is especially noticeable at closer ranges, where depth of field is shallow.

Depth of field and depth of focus

Depth of *field* and depth of *focus* have an inverse relationship. Depth of field refers to the subject matter (real objects), and depth of focus refers to its inverse: the area of sharp focus at the sensor. The two ideas are really the same concept, except that one is an object space, and one is related to the image being projected onto the sensor.

We can get depth of field just as we want it, but it’s depth of *focus* that determines whether the image is *faithfully recorded*. Assuming perfect alignment of components (unlikely), a digital sensor will faithfully record the image. Not so with film, which not only has substantial



Figures 1a–h. Progressive defocusing of Zeiss ZF 85/1.4 Planar @ $f/1.4$.



Figure 2. Shallow depth of field is just right for some images @ $f/8$.

thickness, but can warp as much as 200 microns.

With film, one layer/area might have perfect focus, and thus resolve detail at critical sharpness, but other layers or areas might be substantially blurred because the film does not lie flat. For example, medium-format 220-roll film is generally considered sharper than 120-roll film, for film-flatness reasons. (See *Zeiss Camera Lens News* #10). Film flatness also changes over time, as the film starts to curl slightly. Sharpness can be subtly or greatly degraded because the film is warped out of the zone of sharp focus ("depth of focus").

Digital sensors are perfectly flat, but alignment of the sensor to the lens mount is critical. The chances of a DSLR having perfect lens-mount-to-sensor alignment are slim, and this shows up with asymmetric sharpness with ultra-wide lenses (especially 24mm and wider). *Focus accuracy* is difficult even with Live View, which is generally accurate to no more than 40 microns; a 60 micron difference at the sensor is equivalent to 10 feet versus 12.5 feet on a 21mm lens. As a practical matter with wide-angle lenses, *significant depth of field is required for any hope of consistently sharp imaging across the frame*.

What is acceptably sharp?

The term "sharp" by itself is fairly meaningless; it's an arbitrary judgment based on print size or viewing distance. View a magnified image, and



Figure 3a



Figure 3b



Figure 3c

Figure 3. a) Left foreground, DX @ $f/5.6$; b) Right background, FX @ $f/5.6$; c) FX @ $f/9$. The FX frame at $f/9$ matches the DX frame at $f/5.6$.



Figure 4a



Figure 4b



Figure 4c

Figure 4. a) DX @ $f/5.6$; b) FX @ $f/5.6$; c) FX @ $f/9$. The FX frame at $f/9$ matches the DX frame at $f/5.6$.

what appeared sharp at a smaller size might be blurry. But reproduced on a postage stamp, the image might contain more than adequate detail.

A rational way of judging acceptably sharp (e.g., adequate depth of field) has been to reference a print size and a viewing distance, taking into account the acuity of the human eye.

But that approach has its own issues with human perception. Why not make the sharpest possible image so that its future potential is not limited to any particular print size?

Lens depth-of-field markings assume a circle of confusion of 30 microns, which is about 30 times larger (in area) than the photosites on

today's high-resolution DSLRs. Thus, detail in a 24-megapixel camera is allegedly sharp when equivalent to 0.8 megapixels. Consider such things when upgrading to a higher-resolution camera.

As a practical matter, consider a 24-megapixel versus 12-megapixel camera, both with the same size sensor. A primary reason to move from 12 to 24 megapixels is to increase the maximum size of sharp prints. Yet at the same aperture, the amount of blur hasn't changed, but it is now *simply spread over more pixels*. Nothing has been gained except in a narrow zone of focus where resolved detail approaches the sensor resolution. Stopping down one more stop will improve detail rendition overall, so long as diffraction doesn't reduce the resolution in the critically focused areas. The appropriate approach to depth of field is: *how can sensor resolution be fully utilized?* The answer to that involves depth of field and also diffraction; there is no free lunch.

More depth of field is often the goal, but photographers sometimes spend considerable sums to get *less* of it (e.g., a Canon 85mm $f/1.2L$). Higher shutter speeds might be the goal, but it's often also about *minimizing* depth of field. But consider that the poppy image in Figure 2 was taken at $f/8$. Less depth of field can make an image appear *sharper* because the subject matter in critical focus will be clearly separated from the background and comparatively sharp.

Focal length, sensor size, and depth of field

For the same angle of view, smaller-sensor cameras require shorter focal-length lenses. Shorter focal lengths offer more depth of field at any f -stop. One of the major drawbacks of small-sensor cameras is the effective impossibility of smoothly blurred backgrounds; no point-and-shoot camera offers an $f/1.0$ or even $f/1.4$ lens.

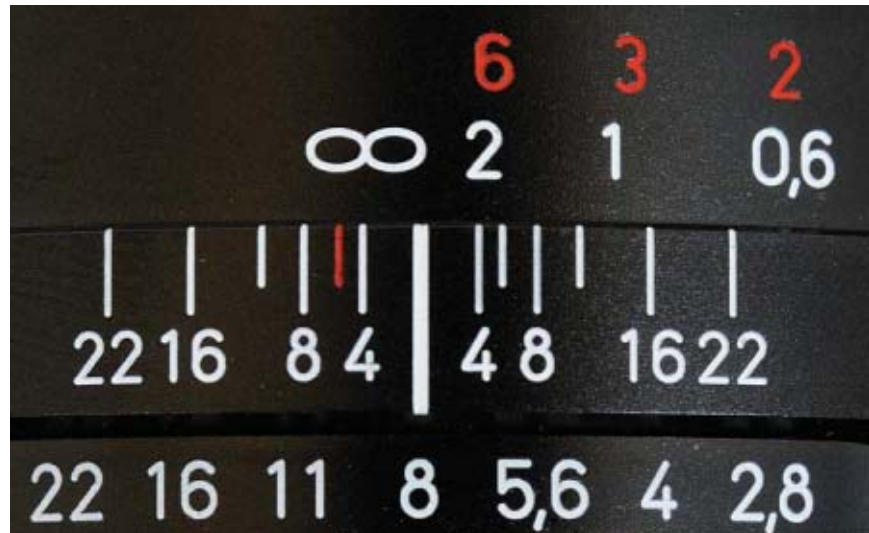


Figure 5. Use the $f/4$ markings when shooting at $f/8$ to ensure reasonable sharpness. Focus is also slightly biased to infinity in this example. (Zeiss ZF 21/2.8 Distagon)

Figures 3 and 4 compare details of an image shot with a full-frame Nikon D3x; the camera also offers a “DX crop” mode used for some detail. The 24–70 zoom was set at 70mm for the full-frame shot and approximately 46mm in “DX mode” (cropped sensor). At $f/5.6$, the DX-crop frame shows notably better front-to-back sharpness than the FX frame. The equivalent full-frame f -stop for equivalent depth of field should be $f/5.6 \times 1.5 = f/8.5$. Aperture $f/8.5$ cannot be set on the camera, but it falls between $f/8$ and $f/9$, and $f/9$ is only $1/3$ stop more than $f/8$, so the test is within roughly $1/6$ stop. Aperture $f/9$ is used here in the crop for comparison purposes.

Examination of the image front-to-back reveals that 70mm FX-frame sharpness somewhere between $f/8$ and $f/9$ is indeed a match for the $f/5.6$ image on the 46mm DX crop, with the $f/9$ crop indeed a smidgen sharper. There is a small margin of error, of course (exact focal length and lens performance and exact focus matching), but the comparison proves out the theory: on the DX frame at ~46mm, depth of field at $f/5.6$ matches that of the FX frame at 70mm at $f/9$.

Practical tips for field work

Focus carefully, always!

For large prints, critically accurate

focus is essential. Stopping down helps, but overcomes only a modest amount of error; $f/2.8$ versus $f/11$ is only a factor of four in resolved (linear) detail, hardly enough to compensate for a focus error of even a few feet at 10 feet with a 21mm lens. Try it yourself on an outdoor subject and critically assess your images; it's demanding work to nail it. This problem will only worsen with future DSLRs in the 30–40 megapixel range.

While variations in the zone of sharpness can be acceptable with three-dimensional subject matter, focusing at 3 meters instead of 5 meters will visibly degrade the sharpness at infinity, even with an ultra-wide 21mm lens.

Bias focus to the most important subject matter, or infinity

Focus on the most important area of the subject, or at least bias the focus toward it as a means of ensuring crisp rendition. If distant subject matter is important, bias strongly toward infinity; the image will generally fail to appear sharp otherwise, even at the hyperfocal distance (the old “ $1/3$ in” rule, roughly speaking). You are not wasting depth of field by doing so.

Depth-of-field markings

Depth-of-field markings on the lens can be helpful, though with



Figure 6. *The test scene using the Nikon PC-E Micro-Nikkor 45mm f/2.8D ED.*



Figure 7a. *f/8 without tilt: background is blurred.*



Figure 7b. *Using tilt: background is crisp.*



Figure 7c. *f/8 foreground without tilt: foreground is blurred.*



Figure 7d. *f/8 foreground using tilt: foreground is crisp.*



Figure 8a



Figure 8b

Figure 8a. a) $f/5.6$ single-frame image; b) $f/5.6$ nine-frame focus-stacked image; c) crop from single frame; d) crop from focus-stacked image—crisp and detailed; e) crop from single frame; f) crop from focus-stacked image. Note edge artifacts (blur).



Figure 8c



Figure 8d



Figure 8e



Figure 8f

experience they're simply not needed. Add *two stops* to obtain acceptable sharpness. For example, if the depth of field indicated for $f/4$ is desired, use the $f/4$ markings as a guide, but expose at $f/8$ (see Figure 5). Avoid $f/22$ —it's a losing proposition due to diffraction.

Hyperfocal mediocrity

To ensure mediocre sharpness, use the hyperfocal distance, the old “ $\frac{1}{3}$ into the scene” rule. You'll get good *average* sharpness, but sharpness at infinity and close-up distances will suffer. That might be fine for some subjects, but

for important subject matter at infinity, the image will disappoint.

Using the so-called hyperfocal distance *can* work reasonably well, simply because most photographers using this rule stop down to $f/16$, or even $f/22$. But this sacrifices contrast and detail, especially with 20+ megapixel DSLRs. Especially for scenes where detail at infinity is important, bias toward infinity.

Tilt lenses to the rescue

A “tilt” lens allows adjustment of the focal plane relative to the film or sensor; the plane of sharp focus is

skewed for better alignment to the sensor (it can also be deliberately *misaligned* to throw things out of focus). Tilt has long been used in large-format view cameras, where the front and/or rear standards can be “swung” or “tilted.”

The tilt effect is so powerful that at $f/2.8$, a lens tilted appropriately can easily be sharper from foreground to infinity than at $f/16$ without the tilt. With cooperative subject matter, $f/5.6$ or $f/8$ can yield not only superb lens performance, but also ample depth of field. The subject matter must be

Continued on page 51

Promoting Your Work Online

WEB SITE OPTIONS FOR PHOTOGRAPHERS—YOUR NEEDS AND WHAT MIGHT MEET THEM

BY STEVEN H. BEGLEITER

Most photographers know they should be promoting their work online, but sorting through the vast number of options to find the right one is daunting. The idea for writing an article on this came out of my own need to find a good, editable Web site (where you can change photos and content anytime and from any computer). For me that meant finding a Web site vendor that would allow me to showcase the retail side of my wedding and portrait business.

I soon realized I needed to be more specific about my objectives and narrowed my list to five objectives. I also asked advice from my peers on the social network **LinkedIn** in its groups Photography Industry Professional and Professional Photography. Some photographers hired Web designers, some designed and wrote their codes, but the majority purchased an editable Web package. This article will address the last option.

My five objectives for finding the right Web site were:

1. Price
2. Navigation
3. Shopping cart
4. Print fulfillment
5. A way to monitor traffic.

These objectives were specific to my needs and might not be what you need. You may just want to share your images with family and friends and give them a way to purchase prints. Therefore I will begin by discussing the basic sites you can subscribe to, then progress to the more extensive and expensive editable Web sites. The primary question you want to ask yourself is: "What I am going to use the Web site for?"

- To show and share my images.
- To show, organize, share, and print my images.
- To show, organize, share, print, and promote my images.
- To show, organize, share, print, promote, and sell my images.

Notice that as the list grows, another requirement was added: the "promote" and "sell" requirements transform your consumer Web site into a retail/commercial Web site. By promoting your Web site you are looking to a target audience, whether it is brides or art directors. You want a



Figure 1. This is the page on the Blu domain site where you can explore their templates and view the functionality of their packages.

Web interface that caters to that audience through the use of design, keywords, and the ability to fluidly showcase your work. The ability to sell or license your work with your Web site involves an interface that can perform e-commerce. Whether it is through a shopping cart or the use of drop-down lists of pricing for the rights and usage of the purchase or licensing of your images, this adds a layer of complexity to your Web needs.

Free sites

Social networking

The easiest and cheapest way (free, in fact) to promote your photos and business is through social networking. By signing up for **Facebook** (www.facebook.com, which has more than 150 million subscribers), **MySpace** (www.myspace.com), or **LinkedIn** (www.linkedin.com) you can reach a large audience (as well as reconnect with high school buddies). I have found Facebook is only effective as a business tool if you deliberately target your audience with updates of work or advertise on the site. Using MySpace is a good strategy if you are trying to target your work to a younger crowd for senior portraits or high school sports.

LinkedIn is a more professional site and is targeted to professionals, such as art buyers and designers. These social networking sites allow you to connect with other friends and professionals and share photos and ideas. It does not replace a marketing plan, but does expediently put your name and photos out onto the Internet.

Blogging

Blogging is another indirect and initially free way to get your work out there and make contacts. There are paid blog sites you can subscribe to such as **interactivewoo** (interactivewoo.com). Blogging has become such an effective tool for photographers that they are embedding blogs in their Web sites, social sites, and e-mails, and buying into paid blogging sites such as **Siteground** (www.siteground.com/blog-hosting.htm).

The key to successful blogging is to write often and with content that triggers search engines to find your business. A free and easy way to start is to sign up with **Google's blog site** (www.blogger.com) or **WordPress** (wordpress.org).

Having your own blog with your business name (tip: using "Joe Photography" rather than "Joe Photographer" will attract more attention) is a more direct way to attract potential clients to your work. If you keep your blog (which stands for Web log) constantly maintained (at least one new entry a week), you are feeding keywords into the tentacles of the search engines. These keywords—and more importantly, phrases—act like metal fragments attracted to a big magnet called a search engine. The more relevant the keyword phrases, the better your chances are for your business to be placed at the top of the search list.

For instance, if a potential client is looking for a wedding photographer in Akron, Ohio, they might search for "wedding photographer + Akron, Ohio." Being a good blogger for the last year and writing about all your wonderful weddings you photographed in Akron, Ohio using the phrase "wedding, Akron, Ohio, Joe Photographer" a hundred times, the search engines light up and your business name comes up on the first page (most people do not look past the first page on a Google search). As a result, the potential client clicks on your blog link and reads about your weddings, looks at some of the photos you posted, and hits the hyperlink to your contact info.

That is a very simplistic view of how this all works, but nonetheless describes one of the cornerstones of grabbing the attention of potential clients. Keywording is crucial to grabbing attention on search engines. Using specific phrases and words geared to your business gathers more attention. Keywording is a science—and is an article unto itself—but in the meantime, you can go to www.controlledvocabulary.com/metalogging/keywording.html to get a better idea of how to effectively keyword your blog or Web site.

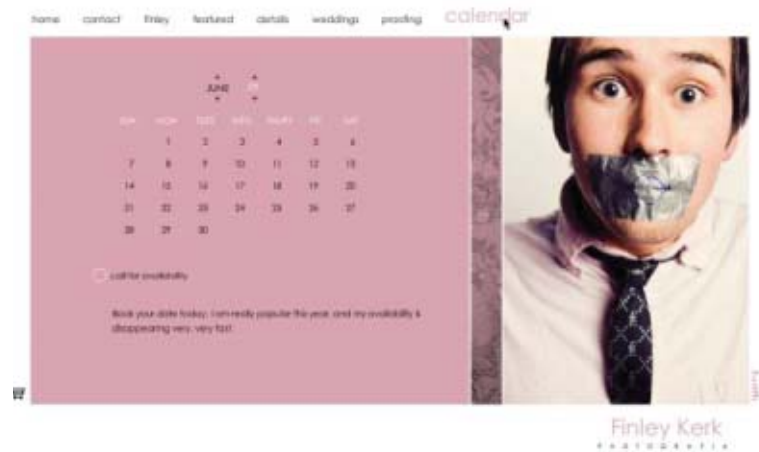


Figure 2. Several retail Web sites offer "availability calendars," which allow clients to see when you are available for a shoot.



Figure 3. A contact page is essential on all Web sites and the ones I looked at all have them. Ideally you want the potential client to click on a link that will allow them to e-mail you directly.

Organizing, sharing, and purchasing

The following sites are recommend to photographers if your objective is to organize, share, and purchase photos and photo products such as photos on mugs and T-shirts:

Shutterfly (www.shutterfly.com) is a consumer-friendly site where you can place your images and create products. Established in 1999, Shutterfly's strategy is to provide free digital storage, file sharing, basic photo software, and back-of-the-print messaging (a service that customizes your prints by printing a message on the back such as "Happy Birthday, Joe") for photographers. In exchange for these free services, photographers order all their prints and products through Shutterfly.

The interface for uploading and organizing images is very simple. It allows you to crop, remove red eye, and use various borders. This is more of a consumer print and product-fulfillment site; it is not a site to promote and sell your images. If your objective is to organize your images, share images, make prints, and create products with your photographs, this is a good site—after all, it's free.

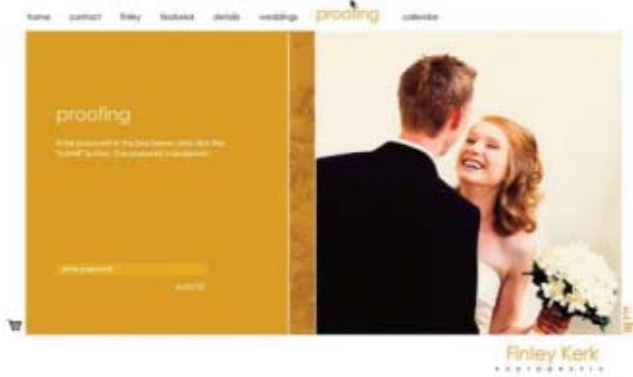


Figure 4. It is essential for a retail Web site to have a proofing system that allows clients to view and order prints. Some come with the Web site package; for others you have to go through another vendor.

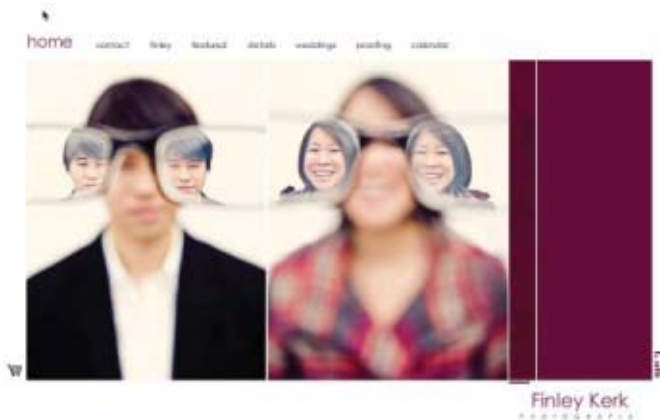


Figure 5. This is an example of what a Blu domain home page can look like. Notice the headers and how they address each element essential to a good retail Web site.

Flickr (www.flickr.com) is probably one of the most popular and easy ways to organize and share your photos and videos. It is part of Yahoo, so you need a Yahoo account to join. A basic Flickr account is free, and the interface is very user-friendly. You upload your images via Aperture, iPhoto, or Windows XP to the Flickr Web site, where you can apply simple edits, such as cropping and red-eye removal. If you don't want to bother, you have the option to go to a third-party (www.pickpic.com) to do all your editing. Once you have uploaded and edited your images/videos, you can organize them into Flickr Sets (a group of images from a shoot), Collections (bigger themes such as people and dates), finally the Oranizr, where you can combine your sets and collections and batch-file them for tagging, change-permissions, and edit timestamps.

Now that your images are ready to be seen, it's time to share them with the world. You can specifically group your photos—for example, by placing your images in a group such as Dogs, other people can look at your images of dogs and comment. You also have the option to make them private and only have a select group see them.

At this point, you can add a map of where the photos

were taken, have friends and strangers use your images for various purposes, and use your images as social-networking tools. As a professional photographer, I am concerned about the part where other people can use your images to print from. They do need your permission to use the image, but my concern is more about the amateur photographer who gets a call from Capitol One credit card, which wants to use one of his images for an advertising campaign—and will pay \$100 for the use.

There are many services that offer services similar to the two above, such as: **Snapfish** (www.snapfish.com); **Bubbleshare** (www.bubbleshare.com); **Kodakgallery** (www.kodakgallery.com); **Picasa** (picasa.google.com), **SmugMug** (smugmug.com), and even a service that helps you organize and share your images through **Twitter** called **Twitpic** (twitpic.com). (This last service was used a lot to transmit images out of Iran following their recent election. All the above companies essentially do the same thing; which service is best for you really comes down to your personal preferences.

I have found that more and more printing houses are setting up partnerships with Web designers and developers to broaden and secure their client base. While it's technically not free, **Zenfolio** (www.zenfolio.com) charges as little as \$25 a year for hosting, with options to present, protect your digital art, and sell your work using **Mpix** (www.mpix.com), and **fotoflot** (www.fotoflot.com). The amount of space you need for uploading determines the yearly cost, which ranges up to \$100.

A step more expensive, **White House Custom Color**, (www.whcc.com), has partnered with **PicPick** (www.pickpic.com) via LicketyPixel to build a dedicated client base for users. PicPick charges a one-time fee of \$1,250 to set everything up. This may initially induce sticker shock, but if you think about it, you get great customer support, a custom site with some bells and whistles, and you don't have to worry about monthly/yearly fees and extra charges such as transaction fees and upgrades.

Commercial/retail sites

If your objective is to create a Web site to promote and sell your work, you need to go to the next level—what I call the “pay to play” sites. They come in all types of flavors and price ranges offering various options. I will first start with the Web sites used by retail photographers; not that the others are exclusive, but the following are designed to get the portrait/wedding and photographer off and running.

If you decide you want to purchase a commercial/retail site, consider the following questions you will want to ask the Web vendor:

1. **Storage space:** How much storage space do you get to upload images onto their server? The amount of space is usually determined by the package you purchase. In

other words, the more you spend, the more storage space you'll have access to. Once you purchase the package there are no additional charges for uploading images. (It is a good idea to also ask them what sort of backup systems they have if their primary server goes down.)

2. **Functionality of the interface:** How easy is it to upload images to their server and place your images on your Web site? This is the key function of an editable Web site, and the reason you would pay a premium to have one. You want to be able to upload images to your site with ease, anytime and from any remote computer. (It is up to you to prepare your files appropriately to be viewed for your Web site. You need to upload the correct file format and approximate resolution size of your images so they can be viewed on your Flash or HTML site.) I know that **liveBooks**, **Pictage**, and **PhotoShelter** have plug-ins for Apple Aperture and Adobe Lightroom that allow you to upload batches of edited images directly to the site. In addition, liveBooks has a function that you check off when uploading that will resize images to correct proportions for the Web.
3. **Shopping cart:** Does the site come with a way to sell images, e.g., e-commerce? If you are a stock, wedding, or portrait photographer, you need a way to sell your images online, rights-managed and royalty-free. Most of the retail sites offer an e-commerce component, which clients can securely access to view images for their event (via a password), and purchase prints and products. There is usually a transaction fee that you pay and sometimes a monthly or yearly fee for the service.
4. **Video:** Video is an important marketing tool for photographers, whether it is to promote you at work or promote your videography skills. To maximize your Web presentation, it is important to have the option of placing video clips on your Web site. Many digital cameras now also shoot video that you could use to create a promotional piece.
5. **Tracking results:** Unless you can track your Web traffic, it's difficult to gauge the effectiveness of your site. Ask your potential Web companies if they have a way for you to access your stats—most do. Some of the sites I researched use **Google Analytics**, which you can embed into the site. I have found it to be a great tool to monitor who is looking at my site, how long they stay on my site, and what outside links led them to my site. This is a very important tool to have when you are trying to decide where to spend advertising dollars.
6. **Other considerations I came across:** Do they charge a one-time fee or monthly fee? Do they offer royalty-free music for use on the site (mainly for the wedding and portrait photographer)? What is their service like? Is there someone you can talk with to help you get started and troubleshoot? (In my opinion this is a big one and is often overlooked.)



Figure 6. If your Web site does not have an e-commerce capability, Pictage has a great interface for a client to proof and purchase prints and products.

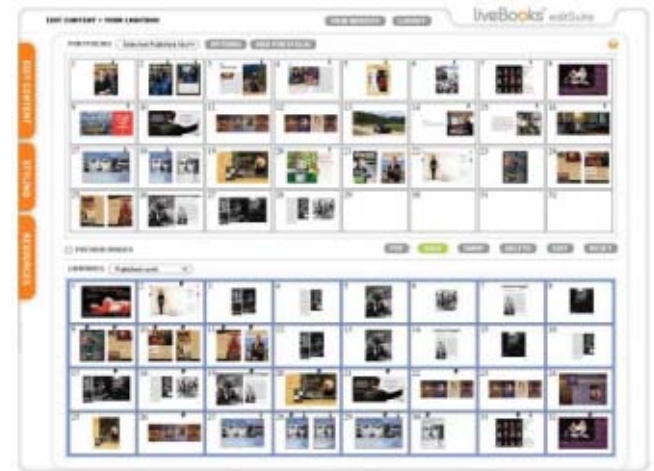


Figure 7. The above is an example of the liveBooks library. The interface is very easy to use: you upload your images into your portfolio folder, save them, then drag them into your gallery in the order you want.

7. **A last bit of advice:** As in any big purchase, contact other photographers who use a service and ask them about their experiences. Most Web site vendors are happy to put you in contact with their customers.

Some good examples

I have tested the following Web sites, and feel they represent a good overview of what you would look for in choosing a Web site vendor. Each site developed a good business model that is representative of similar services and applications found in most other sites within their genre. Each site description will help you become more familiar with the options you have when selecting the best site for you.

The first editable photo Web site is **Blu Domain** (www.bludomain.com), a hosting site that offers a variety of

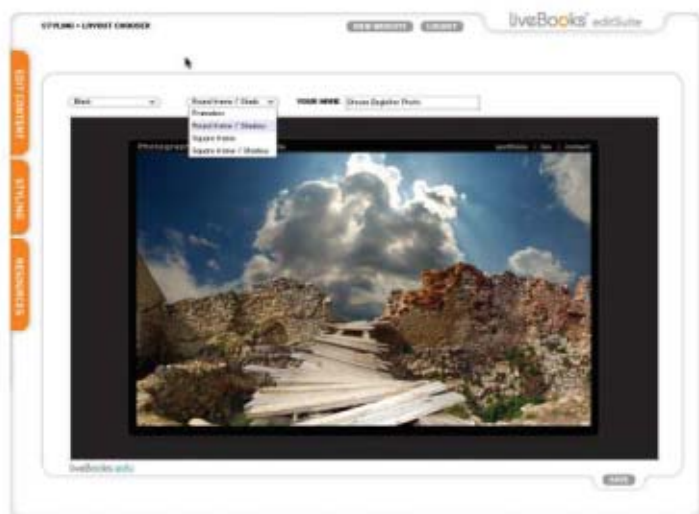


Figure 8. This is the liveBooks page on which you can choose different templates and styles for your site. The package you purchase determines how many templates you can choose from or even customize.

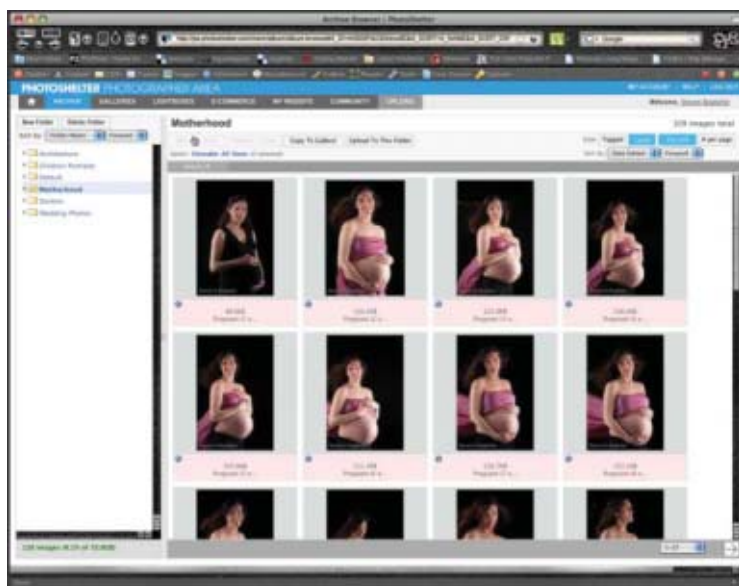


Figure 9. This is an example of uploaded images to the PhotoShelter archive page for public or private viewing.

bought the first for \$400). These are Flash sites, (not HTML sites) which, for now, means search engines will not be able to read the metadata or keywords that help your site turn up in searches. They do offer Flash indexing to improve search-engine friendliness. Blu Domain does not offer a shopping cart but does offer a proofing area where your clients can go to select the images.

In my research about this site, the biggest complaint I heard from photographers was the lack of technical support on setting up their sites. Those who did set up their sites through Blu Domain seemed pretty happy.

Another site I found that was similar to Blu Domain is **big folio** (bigfolio.com). It is also template-based, and charges a one-time setup fee of \$450 and monthly hosting of \$20. Like Blu Domain, it offers multiple e-mail accounts, storage space, and monthly traffic space. In addition, big folio partners with **Next Proof** (www.nextproof.com) to help sell your images online via your own shopping cart. You'll pay a transaction fee, plus a monthly fee determined by how much storage you need. The monthly fees are as low as \$9 for 3 gigs, and up to \$99 for 250 gigs (or about 60,000 high-res images). The transaction fees average 7%. Transaction fees are a common practice with stand-alone print-fulfillment houses, so be sure to ask what about the transaction fee. **Pictage** (tiny.cc/pictage), a pretty well-known online proofing site for wedding photographers, charges monthly fees and a transaction charge for all prints and products sold. As a user of Pictage for my wedding clients, I have to admit they have a slick ordering interface and a customer-friendly shopping cart—but I do cringe when I receive my monthly royalty check and realize how much was taken out in transaction fees.

The last site I want to discuss in this genre is **PhotoShelter** (pa.photoshelter.com). PhotoShelter is a photography-driven Web site; unlike the above-mentioned sites where you can be pretty passive about your site, PhotoShelter pushes you to be more proactive with plenty of advice along the way.

PhotoShelter is primarily HTML-based and prides itself on search-engine optimization and protecting your images from copyright infringement through watermarks and warnings. They have templates to choose from to create your own Web site, and if you have some knowledge of Web design and coding, you can customize your site. They also have great customer service; I got a person every time I called, and they offer a lot of tutorials and webinars to help you maximize your site. PhotoShelter is a great site for photojournalists, stock photographers, and those who want to sell prints online. I felt it was a little too technical for beginners and that its design wasn't slick enough for retail photographers; unless you are sufficiently versed in Web design to customize your site.

PhotoShelter uses PayPal (www.paypal.com) for

Web templates. Templates start at \$100 and go to \$400 (depending on what options you want), which is very reasonable if you consider that it costs from \$3,000 to \$10,000 to build a custom site with a Web designer. There are too many options to list, but here are few: up to 10 galleries; a calendar that shows clients when you are available; a shopping cart; drop-down text to tell your clients about yourself; a proofing section for your clients to view their images for purchase; and a limited selection of royalty-free music.

In addition to the initial cost of the template, you can have Blu Domain host your site for \$100, add video for \$150, and buy a second template for \$200 (providing you

e-commerce (or your own merchant account) and charges 10% across the board for transaction fees. The amount of storage space you want determines your monthly fee—100 GB is \$50 a month, for example. (disclaimer: PhotoShelter gave me three months to try out their service).

Moving up the ladder in Web sites and prices, I found **liveBooks** (www.livebooks.com) to be a good balance; some photographers call it the “Holy Grail” of customizable, editable Web sites. For a one-time fee of \$3,200 before any discounts (it runs discounts throughout the year, and, as of this writing, it was \$600 off) and a hosting fee of \$90 a year, you can have all the bells and whistles and a presence in the world of search engine optimization. There are less expensive packages to choose from. You can work one-on-one with a Web designer to create your customized Web site, where images are shown at 920×562-pixel resolution, unlimited portfolios, unlimited information pages, external links, and FTP options. While the service does not include a way to sell your images online, liveBooks is very effective in their use of keywording and driving traffic to your site. Even though they are a Flash-based system, they have indexed their coding to read as if it were HTML, resulting in better search engine optimization.

If you are a photo student or photo instructor at an educational institution, take advantage of liveBooks educational discount. It is an inexpensive (\$95 a year) way to get started. I have used the educational version of liveBooks, and found it very fluid and intuitive. In addition, I have heard from my peers that, outside of the steep price, they have been very happy with the pro service.

There are a lot of resources to promote and sell your work online. It all depends on the type of photography you practice and your objectives. Most importantly, once you decide on a service, don't forget to promote your URL through a post-card campaign, advertising, or simply in the Yellow Pages. It's great to have a slick-looking Web site—but worthless if nobody knows it is there.

In addition to the sites listed above, I have researched others sites that are worth looking into. Take a look at them, and good luck with your decision-making process. ■

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Depth of Field

Continued from page 45

shaped more or less in a planar fashion; a tall tree sticking too far out of that plane would be blurred due to the tilt. The distant trees in Figure 6 are close to the tilted plane of focus, which extends from the foreground to Yosemite's Lempert Dome in the distance. They remain sharp, and the whole image is sharp at $f/2.8$. That's the power of tilt. Figure 5 shows the test scene at $f/8$; stopping down would never match the results with tilt.

Focus stacking for impossible depth of field

Focus stacking employs computing power to merge multiple images taken at different focus distances into one composite image.

Focus stacking extends depth of field from the close focus limit of the lens to infinity! However, the process is rarely perfect; there are often merging artifacts that require

retouching, especially along edges or areas of movement. Photoshop CS4's focus-stacking feature is fun to try, but turn your attention to Helicon Focus software, which offers fewer artifacts (www.heliconsoft.com).

Practical in-the-field focus stacking might mean stacking only two or three images; after all, the wind blows and the sun and clouds move; it will depend on the subject matter and conditions. In the studio, many more stacked images are practical. Since focus stacking requires careful incremental focus adjustments, a top-quality manual-focus lens is your best choice, so choose the very best optics available, ignoring the automation issues.

Figure 8 shows an image made with a 280mm lens at $f/5.6$; there is simply no hope of getting the wagon in sharp focus throughout, not even at $f/22$. Focus was carefully bracketed in nine frames from the leading edge of the wagon to the rear. The stacked image is sharp across the entire wagon left-to-right and front-to-back. But there's a catch—odd-looking blur

along the board-edges of the wagon. Helicon Focus offers a retouching mode where such artifacts can be cloned out, but it's tedious to fix a large area. Cleaning up the rightmost wheel, with its dangling chain, was really easy and quick. Other areas looked great.

Conclusions

Depth of field is exceedingly shallow in terms of resolving to sensor resolution. Zero in on the most important subject matter to distract the viewer into believing that everything is sharp. When feasible, use a tilt/shift lens to move the plane of sharp focus as needed, and consider focus stacking for situations where time and lighting allow it. ■

Lloyd L. Chambers enjoys all-digital photography after shooting film for years in 35mm, 4×5, 6×7, and 617 formats. His Web site diglloyd.com offers a wealth of material on advanced photographic techniques, and his Zeiss ZF Lenses review is a reference work on those fine lenses.

Backup

for Photographers

Your precious image captures are only as safe as the data that describes them. Here's how to come up with a plan for ensuring their longevity

BY MARC ROCHKIND AND UWE STEINMUELLER

There is an irony about digital photos: they can last forever without degrading (even get better through improved imaging software) and yet they are very volatile, many bits on storage media that can easily get lost or damaged.

A backup is a copy of data that is sufficiently independent of the original so that destructive events can't affect both at the same time. A backup doesn't prevent destruction of data; it only allows you to recover the data once the destruction has occurred.

A simple example of backup is copying files from a laptop to a CD (the act of copying), and putting the CD in your desk at home (independence of location). If the laptop is stolen (the destructive event), you still have the data that was copied to it.

To design and implement a backup plan, one has to consider the possible threats to data (e.g., theft, electrical surge, fire); the various ways to copy data (e.g., using the Mac Finder or Windows Explorer, using a backup utility, using CD/DVD-burning software); and ways of achieving independence (e.g., online storage or placing media in a safe-deposit box).

Unfortunately, most articles about backup focus on the copying and ignore data threats and independence. But without evaluating all the threats, there's no way to be sure that the backup will allow you to recover from them, and insufficient independence means that both the data and the backup can be destroyed by the same event. An obvious example is a fire that destroys everything in an office.

Additionally, if backup isn't convenient—automatic, ideally—it may not get done often enough to be effective. (It's common after a data loss for someone to regret that their most recent backup is months old.) The restore has to



Figure 1. One's backup method is always under construction.

be convenient, too, or else the damage will be compounded—an electrical surge is bad enough, but if your data is unavailable for a week while you restore it from an online service, you still lose a week of productivity.

Since backup is potentially expensive and time-consuming, you also have to consider the importance of your data. Backing up irreplaceable photographs is more important than backing up application preferences.

Threats to data

For photographers, the three places where your data (images, mostly) is threatened are: in the camera; in the field, during or just after a shoot; or back in the office. In all three places, only six types of threats can destroy data:

- **User error.** A user mistake that accidentally deletes or overwrites one or more files. Examples are reformatting a card by mistake, losing a card, and accidentally deleting a folder of images on your computer.
- **Equipment failure.** This includes any failure of hardware or software that results in data loss. We put the two together because it's often difficult to tell whether the problem was caused by software or hardware, and because the effect on the data is usually the same. The most talked-about failure, a disk crash, is in this category, but so is an operating-system upgrade that causes a file system to be corrupted, or an application install that deletes data files. (Apple once accidentally released a version of iTunes that could delete all files on a hard drive.) Camera and card failures go in this category as well.
- **Electrical surge.** This is in its own category because it can affect every plugged-in device in a home or office, so it makes independence especially difficult. Copying data to an external drive won't protect you from a surge if the drive is plugged in—but if it's not plugged in you can't access it. A good surge protector can prevent damage from some surges, but there's no device that's guaranteed to prevent them all.

- **Disappearance.** This includes theft and accidental loss (leaving a laptop in a taxi, for example). The good thing about theft and loss is that even the slightest amount of independence is effective: Thieves might take the computer on the desk but probably won't notice the hard drive on a shelf under the desk, and someone who snatches your camera probably won't take the card in your pocket.
- **Office destruction.** This includes anything that destroys the location containing the computers and includes fire, explosion, structural collapse, collision, water damage, and vandalism. Everything in the office might be destroyed, including external drives and CDs/DVDs.
- **Regional disaster.** Anything that damages an entire neighborhood or city, such as radiation, flood, earthquake, tornado, and various acts of war or terrorism. Here even a copy in a bank safe-deposit box may not be safe.

Of course, not all threats affect all locations equally. In the field, a surge is seldom a problem because you're not normally plugged in. In the camera, card failure is a serious threat because most cameras only record one copy of the image; once you're back in the office and have made a couple of backups, the card doesn't even matter anymore.

The perfect backup

The almost-perfect solution in the office is to back up your computer every hour to an ultra-reliable, redundant, online storage service such as Amazon's S3. We say "almost" because the backup software you use might have defects. To make it perfect, you need two or more completely independent copying utilities and services.

Unfortunately, for many photographers there's too much data for this to be practical. If a photographer comes back from a shoot with 20GB of photos (not unusual) and has a T1 line (1.544 megabits per second) operating at 100% efficiency (extremely unusual), it would take 29 hours to copy the photos to an online service. Every 1GB of image data modified (50 photos at 20MB each) would take an additional 1.5 hours or so to upload. That's assuming that there is a T1 line, that it operates at 100% efficiency, that the line isn't being used for anything else, and that the online services can receive and store the data that fast. At a more realistic upload speed, say 500 kilobits per second, it would take more than three days to upload the 20GB, by which time the photographer might have shot another 60GB. The backup would never finish!

Oh, we forgot . . . the photographer needs two T1 lines, because we were going to use two independent services. Worse, when you're in the field, there's usually no Internet access and, even if there were, it would be much slower than T1.

So the minor problem with our perfect backup scheme is that it won't work. We need to back up to hard drives and/or optical disks, which gets very complicated.

A backup plan therefore consists of a collection of

overlapping imperfect solutions, as we will explain. And because digital photography technology evolves and your use of it changes, backup is a construction project.

We listed the six categories of threats that can destroy your data: user error, equipment failure, surge, disappearance, office destruction, and regional disaster. Before acquiring and installing hardware and software for backup, you'll want to develop a plan for backup and restoring so you can ensure that you're covered against all six.

Convenience vs. independence

A backup only works if it's independent of the original data, and multiple backups are effective only if they're independent of each other. Generally, the more convenient a backup method is, the less independence you get. So, you'll need a combination of methods: One or two that are convenient but provide just enough independence to protect against the most common threats, and one or two that are inconvenient but provide complete independence.

For example, using a background backup utility such as Apple's Time Machine is convenient, but since the backup drive has to be within WiFi range and plugged in to power, it doesn't provide enough independence to protect against surge, office destruction, or regional disaster. Those threats are much less common than user error, equipment failure, and disappearance, so running Time Machine is a great idea. It's just not the only idea.

For protection against surge, all you need to do is back up to an external disk (probably not with Time Machine) that you can unplug and, for good measure, put into a fireproof media safe. Store that drive in a neighbor's house and you'll protect against office destruction as well. Take it to your mother's house 25 miles away and you're protected against most regional disasters. Copy your irreplaceable files to online storage such as Amazon's S3 and you're even more completely protected.

In the field during a shoot, you have more important things to do (photography!) than to deal with backup, so it has to be even more convenient than it would be in the office. You have fewer choices in equipment, too. The last thing you want is for your concern about the six threats to interfere with your workflow. If it compromises your photography, it isn't. Of course, you have more options when you're shooting landscapes or interiors than you do when you're shooting weddings, sports, or breaking news.

Backup plan

The way we arrived at the combination of methods in the previous section was to list the six types of threats, list the available backup methods, and then pair them up to ensure that we were covered. The more backup methods available and the more you know about them, the more effectively

you can come up with something you can live with. If your plan is too inconvenient, you'll find you're not using it, and then you won't be protected.

Hardly any operating system comes with sufficient backup software, so you'll need to buy a third-party utility.

You'll have to spend some money, mostly for software and external drives. The software should cost less than \$100; a couple of 500GB drives for your most important data will cost less than \$150 each. Amazon's S3 service is really cheap, only a few dollars a month. So, for about \$500, a little planning on your part, and a slight change to your work habits, you can get almost 100% protection from all six threats.

The worst mistake is to assume that some exotic piece of equipment is a complete solution. Recently, someone on a digital photography forum said that he had lost a day's shoot because his portable external backup disk failed, so he solved the problem by replacing the drive with a portable drive-mirroring device. In fact, the drive that failed wasn't a backup (independent copy) at all—as soon as he erased the card, it became the un-backed-up primary copy. His new portable mirror is a slight improvement that probably protects against an actual drive failure, but it doesn't protect against failure of the drive controller or power supply, against physical damage or loss, against surge when it's plugged in, or against user error. Had he followed our approach, he would have added a true backup instead of trying to make the single drive more reliable. Also, at today's prices, it's usually unnecessary to erase a card during a single-day's shooting.

Uwe's strategy in the field is to assume he'll be in a hotel at night on most trips. He carries enough memory cards to get through a day (at present, 40–50GB). In the evening, he copies the images to his travel Mac and then also backs up to two USB-powered disks. These two disks stay in his camera bags and are not left in the hotel.

Restore plan

It's a safe bet that very few people who do a backup have ever tried a restore to see if the backup worked. It's not hard to see why: Restoring a complete system is pretty disruptive, and if it doesn't work, you've just wiped a perfectly good system. To test a restore, you have to put another hard drive in the system so you can safely overwrite it (or wait until you have a new computer). Marc has a Windows desktop with six drive bays with handy slide-out trays, so it's very easy for him to pop in a new drive to test a restore while the primary drive is safely out of the computer. (This is not a common set up, however.)

Even without actually doing a complete restore, you should spot-check your backup to ensure that your files are really there. Backup software that won't let you do this, such as Vista's Complete PC Backup, should be avoided.

Your restore plan also should include a way to replace

damaged hardware. If you live near computer stores and they're open when you need them, you might be able to simply buy what you need when you need it. But if not, and time-to-restore is important, you need replacement equipment on hand and ready to go—if your replacement hard drive already has data on it, you won't be able to use it without destroying that information.

After a restore, make sure you don't start running without a backup. For example, suppose you keep a complete, bootable copy of your primary drive on an external drive. If the primary drive fails, you can boot from the external drive, which gets you up and running immediately, losing only a few hours of work. But if you run that way, you no longer have your backup, since the backup drive has become the primary and the old primary is dead. Instead, you should immediately clone the backup to a replacement primary drive or, if that's not feasible, clone the backup to a second external drive.

Backup hardware

You'll usually back up to external hard drives, optical disks, or online storage. The first two are discussed in this article.

The main external-drive choices are a single drive, a network-attached drive, or a RAID drive-set (which could also be network-attached). Internal drives aren't good choices because they're not sufficiently independent of the computer being backed up. They're gone if the computer is stolen, and they share the same drive controller, so a controller failure could destroy the data on all the internal drives.

External drives are available in sizes from about 100GB to 2TB, and some of them are entirely powered from the USB or FireWire cable, which makes connecting them and transporting them especially convenient. (Laptop and some desktop USB ports often don't put out enough power for an external drive, but some drives come with a split cable that allows you to draw power from two USB ports.)

Nearly all computers have USB 2; those that have FireWire (IEEE 1394) usually have FireWire 400, although FireWire 800 is available on newer models. For external drives, FireWire 400 is noticeably faster than USB 2, and FireWire 800 is much faster than FireWire 400.

You'll know if you have a computer or drive with FireWire 800, as opposed to FireWire 400, because the connectors are different (USB 1 and USB2 use the same connector). You can connect FireWire 800 disks to FireWire 400 ports on the computer (of course you then only get FireWire 400 speed).

Several times faster than FireWire 800, eSATA (external Serial Advanced Technology Attachment), is just becoming available. It takes the bus commonly used inside the computer (SATA) and extends it with an external cable. Since most external drives are SATA, this bypasses the conversion to USB or FireWire and then back to SATA.

(Currently, eSATA cables don't supply power.) With a \$40 eSATA PC-Card, adding eSATA to a laptop is even easier than it is on a desktop or server.

Remember, though, that for backup, the most important property of an external drive is that you can easily separate it from the computer, not the speed of its connection.

If the drive is going to be running all the time, put it out of sight, such as on a shelf under your desk, or on a bookshelf with some books or a family photo in front of it. Figure that a thief won't know your drive is even there and, even if he does, few will steal a \$200 drive when there are computers, CDs, and jewelry to take instead, all much easier to fence.

RAID stands for Redundant Array of Inexpensive Disks. The advantage of RAID is that it's more reliable than a single disk of the same size. The disadvantages are that it costs extra for the same amount of storage (at least one extra disk and some fancy electronics), and that the disks aren't nearly independent enough because they share the same power source, controller, driver, and connecting cable.

There are various RAID arrangements, the two most popular of which are RAID-1 (mirroring) and RAID-5 (striping with parity). The idea is that when a disk fails it can be removed from the running system and replaced without the system going down or any data being lost. When you replace the defective disk, the RAID system automatically restores the data that was on it. Unfortunately, the restore often takes hours, during which time you are vulnerable to a total data loss if there's a second failure.

So-called RAID-0, also called striping, isn't really RAID at all because there's no redundancy. The loss of either disk destroys all the data on both disks. RAID-0 is for performance, not for reliability, which is actually reduced.

To see why RAID doesn't diminish the need for backup, we can do a quick threat analysis:

1. **User error:** No help; with RAID there's still just one logical copy of the data.
2. **Computer failure:** RAID protects only against disk failure. That's probably the most common hardware failure, but as RAID doesn't protect against other hardware failures (such as the RAID controller itself and the rest of the computer, nor against software failures), the need for backup hasn't changed.
3. **Surge:** No help, as all RAID hardware has to be plugged in.
4. **Disappearance:** No different than a single disk. An external RAID cabinet can be hidden below the desk, but so can a single-disk cabinet.
5. **Office destruction:** No help.
6. **Regional disaster:** No help.

Anyone who thinks RAID provides sufficient protection is focused too narrowly on a single kind of failure, the disk



Figure 2.
A bus-powered drive.

itself, and is ignoring the other threats. Still, if you have the money, a RAID device is more reliable than a single disk. (Not RAID-0, however, which is less reliable.)

Optical disks are in theory more stable than hard drives, even unconnected ones, because they don't rely on magnetic recording and have no moving parts. Disks you write on a computer use dyes, however, so they're not indestructible.

However well you care for optical disks, they won't last forever. You should plan to recopy them every few years, and then verify that the images on the copy are still good with a tool like Marc's ImageVerifier (imageingester.com/ivinfo.php).

Backup software requirements

The following requirements must be met by any backup system:

1. There must be a way to determine what will be backed up. Systems that tell you they're backing up "other files" without naming them are unacceptable. Systems with so many options that you can't easily determine for sure what your settings are going to do are also problematic unless you're willing to spend time studying the documentation (if any), run experiments, and verify (see #3, below) that you're backing up what you think you are.
2. There must be a way to tell if a specific file was backed up, so you can spot-check the backup. Systems that keep the backup in a mysterious form (e.g., a giant, compressed file) don't meet this requirement unless they also have a user-interface for showing you a list of files. Vista's Complete PC Backup fails in this regard (more later).
3. There must be a way of verifying the integrity of the backup, short of doing a restore and running the system for a week or two to see if any hidden problems show up. A system that uses the ordinary file system meets this requirement because you can run a utility or script to compare the two folder hierarchies—file-by-file if you want. Systems that use their own format have to provide a separate verification option.
4. For a complete backup, there must be a way to restore individual files. (This may not be a requirement for some, but it is for us.)

Continued on page 58 following Marketplace

Review:

Exclusive for *PHOTO Techniques* Digital Readers

Canon's New Quality Desktop Printer

The PIXMA Pro9500 Mark II produces excellent prints—but is it “professional”?

BY PAUL SCHRANZ

If you are looking for an inexpensive and fast photo printer, this isn't it. If you are seeking exceptional quality, the new Canon PIXMA Pro9500 Mark II (Canon gives their products the longest names in the industry), is worth serious consideration. It doesn't have a roll feeder; however, it does produce seriously fine photographs.

When a company has the word “Pro” in the product's name, my expectation is that it will easily adapt to a superior quality workflow; the PIXMA Pro9500 Mark II satisfies only part of that criteria.

The machine has some awesome



Images with subtle grays benefit from the Canon PIXMA Pro9500 Mark II's tonal rendering abilities.

weapons. First, it uses the latest generation of Canon's LUCIA pigment inks, using 10 total. I've found in working with the larger Canon printers that having full additive colors conserves ink cost and produces more saturated colors. It has feed systems for Photo Black or Matte Black, eliminating the need to drain a system when exchanging black inks. In addition to Cyan, Magenta, and Yellow, the PIXMA Pro9500 Mark II has Photo Magenta, Photo Cyan, Gray, Green, and Red. The price of each

replacement ink is approximately \$16.

The printer has a fairly small footprint for a 13×19-inch printer. It has two loading systems, a top rear-loading one for regular photo-quality papers, and a front-end load for thicker fine-art papers and canvas. The rear-load mechanism is a fairly normal gravity-load system. The front-load requires moving the front paper shelf up a notch for direct feed. There is also a back door/shelf that must be open for front feed, which increases the size of the operation footprint for the printer. The size of the printer when fully opened is 26×14×7.6-inches.

Loading from the front requires an



The Canon PIXMA Pro9500 Mark II

additional 16-inch clearance behind the printer. Paper is dragged to the back and projected forward during printing. The head is a user-installed 4800×2400 dpi system with dots as small as two picoliters.

The printer has a PictBridge cable for feeding directly from the camera, and runs off a fast USB 2 cable (a concept that confuses professionals). It also has the capacity to print directly from the camera of a cellular phone.

The Pro9500 Mark II has ambient-light correction built into the software. This assumes two things—that light is consistent and that the print's display location won't ever change. I can't see this as a pro advantage.

The printer's Easy-PhotoPrint Pro plug-in software is used directly from recent versions of Photoshop or Photoshop Elements. It allows you to make multiple layout packages and to set individual numbers for multiple prints when using rear-tray loading. It also allows borderless printing.

The unit is exceptionally quiet when printing, but it's no speedster. It takes four minutes to print an 8×10 print at the highest quality.

The printer works well out of the box if you are using either a Canon paper with a defined profile or a generic profile. I got outstanding results with the profiles for the four papers that come with the printer: Photo Paper Plus Glossy II, Pro Platinum, Photo Plus Semi-gloss, and Fine Art Photo. My test prints were clean, sharp, and show excellent saturation and depth. The grayscale prints on fiber paper look amazingly silver-like.

Profile problems

However, there are two issues when using non-Canon papers. While third-party paper manufacturers do supply profiles, most of them are for Canon's preceding model, the Pro9500. I feel that a "pro" printer



Figure 1. A test chart for measuring a printer's ability to separate tones.



should be easily configured to any paper I want to use.

Canon supplies its Color Management Tool Pro software, but it comes with a pretty expensive hitch. The output sample for profiling can only be made with an X-Rite Eye-One Photo spectrophotometer—and no other. While the Color Management system works extremely well and creates an exceptional sampling chart (it requires two sheets of letter-size paper), I'm not one to favor a collusion of two companies to create a proprietary system. To my knowledge, this is a first for Canon. If you don't have the X-Rite Eye-One (or can't borrow one), you are up a creek. A "pro" level machine should offer professional choices.

Once calibrated and profiled to my non-Canon papers, the printer performed well. Colors were deep with no shift. Black-and-white images on the fiber paper were extraordinary, with deep blacks, subtle tonalities in the darkest grays, and an angel's breath light gray.

I tested both the printer and the calibration system on two non-Canon papers, Moab's Colorado Satine and Harman's Matt FB, to get an idea of the printer's densest black (Dmax),

tonal separation, and accuracy of the profile created with the Color Management Pro Tool.

Dmax on the Harman Matt FB paper was 1.36, while it reached 2.12 on Moab's Colorado Satine. On Moab Colorado Satine using the test chart (Figure 1), there was separation from black as low as 20, 20, 20, and a light-gray separation from white at 251, 251, 251.

The Pro9500 Mark II sells at \$785, significantly higher than others in its class. While it produces superior images with generic profiling, custom profiling without the X-Rite Eye-One system makes Canon's larger printers a better investment with support of more non-Canon papers. Though the Pro9500 Mark II supports thick paper and canvas, the printer is limited by not having roll-paper support. I don't see this as mandatory in a 13×19 printer, but it is another factor to consider. ■

Paul Schranz, a PT contributing editor, is a professor emeritus at Governors State University in Illinois. He lives in New Mexico, where he is director of the Preston Contemporary Art Center and runs the Mesilla Digital Imaging Workshops.

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Backup for Photographers *Continued from page 55*

A much better choice is Super Duper. We used Super Duper to make both bootable disk images and partial backups for carrying offsite, with consistently excellent results. We run Super Duper every night to alternate external drives, so that if there's a failure during one of the backups, we still have the backup from the previous night.

Marc also tried Retrospect for OS X, which interested him because it's one of the few backup programs that can write CDs/DVDs, but it repeatedly hung trying to write a DVD.

If Uwe is not making 1:1 disk copies, he exclusively uses folder-tree mirroring software for backup. He's used ChronoSync on the Mac for about two years because it's easy to use, can be scheduled, allows containers that bundle multiple synch jobs, and is a great value. It also has exceptional and flexible handling for deleting files in the target folder (e.g., even keeping previous versions of a file—we use this for business data).

Note on Synchronizing: We always synchronize in one direction. Doing otherwise can be a risky business—if a folder on the backup is empty, the software will empty that folder on your primary drives as well. Always think which folder tree is the master folder and synchronize from this folder to other target folders. Also remember that only one backup copy is not enough.

If you do that and follow the other steps in this article, you should come as close as realistically possibly to 100% protection. ■

Uwe Steinmueller is a fine-art photographer and the publisher/editor of Digital Outback Photo (www.outbackphoto.com), an online photography magazine. He has written numerous books on printing, Raw processing, and digital workflow for fine-art photographers.

Marc Rochkind began developing software before the first moon landing and taking photographs before that. He is the developer of ImageIngester and a few other digital-photography apps. His best-known book is Advanced UNIX Programming.

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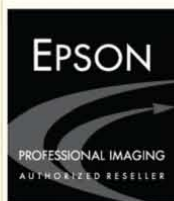
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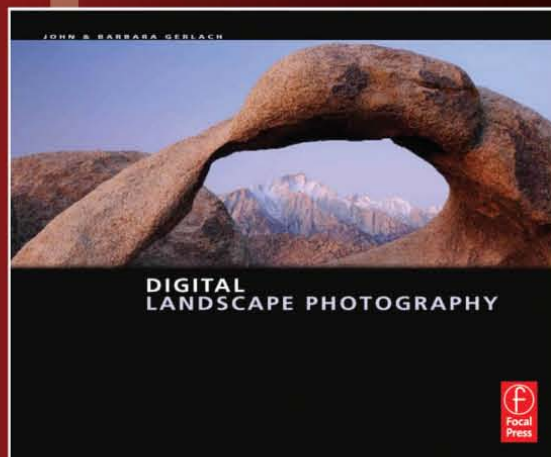
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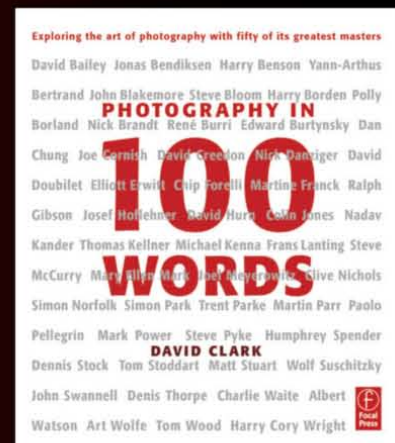
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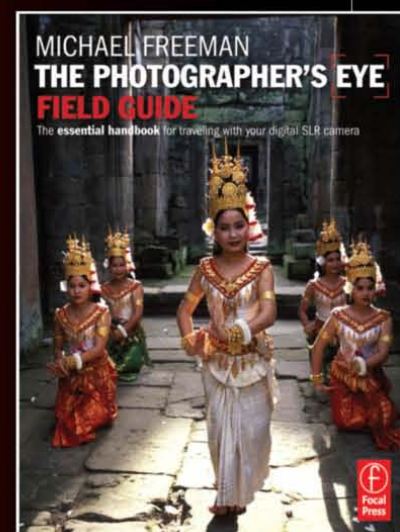


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