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Tuesday, 19 November 2019

Dye Transfer and Me, Part IV: Where Most of the Work Is

Fig. 1

Words and photos by **Ctein**

Dye Transfer and Me: A Meandering Half-Century Journey: *As a prelude to the big Black Friday Dye Transfer Sale I'm writing a series of columns talking about dye transfer—how it worked, what it meant to me and other photographers and printers, and our perpetual jousting with Eastman Kodak. (Important note: You cannot put in print orders or requests before the sale. Please don't email me your preferences in advance.)*

Part 4 of an Uncertain Number...

In Which There is More Hacking of Process

My first meeting with Frank McLaughlin in 1978 was a high point in my life. Frank was warm and welcoming and knew everybody in the dye transfer world. Frank introduced me to Phil Condax, Louis's son and a curator at the Eastman House—we also became lifelong friends—and Tom Rankin and the other folks at Frog Prince, a commercial dye transfer lab in San Francisco. Frank knew there was strength in networking and he made certain we networked.

Frank brought in Bob Speck, who developed the dye transfer process for Kodak under the direction of its inventor, Louis Condax. Pretty exciting! Bob and Frank pored over my prints and gushed fulsome praise, to a degree that anyone with a smaller artistic ego than mine would have found embarrassing (I coped). They declared they had never seen better dye transfer prints. I expect my feet didn't leave any footprints as I was departing Kodak.

Frank's favors didn't stop with introductions. He put in a word about my work with Kodak's public relations department which, a few years later, produced its own substantial rewards, and he introduced me to my biggest and best clients. But I'm getting ahead of myself.

Fig. 2.

Dye transfer changed what I photographed. This print medium could handle anything I could record on film, and that was a lot. Color negative films had an exceptionally long exposure range, well over 10 stops of straight-line curve. I could photograph in the middle of the desert, at noon, and make prints that held detail in the highlights and the shadows (figure 2).

Night photography was—and still is—one of my passions, though not the way it was usually done back in the era of available darkness, pushing films to their max. In college, I'd begun to wonder what kind of photographs I'd get if I went all the way to the other extreme—slow films, processed for minimum grain and maximum tonal quality. The first time I saw what urban landscapes at midnight looked like on Panatomic X, I was hooked.

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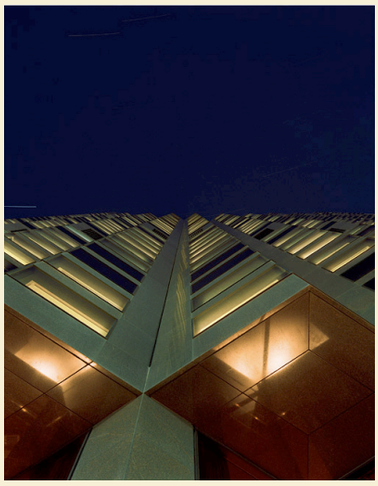

Fig. 3.

When I moved to color and medium format, it was the same. It demanded patience, a flashlight, and a good book. Occasionally the exposures were only a few minutes; figure 3 ran 45 minutes. I discussed reciprocity failure last column—contrast went up, and the scenes were contrasty to begin with. Well, that's what contrast-control masking and dye transfer were for. I dealt with previously impossible-to-print-well negatives like figure 1. That vein of work continued throughout my film and darkroom career, culminating in the Christmas in California series.

Dye transfer was a "hi-fi" printing process that exposed problems the same way a really good sound system reveals a poor recording. I loved telephoto lenses (still do), and long lenses are prone to lateral chromatic aberration—the color fringing that occurs towards the edges of the frame because the lens produces red, green, and blue images of slightly different magnifications. Before digital image processing, which made the fix simple, it was something you lived with. I could ignore it in smaller prints, but I was printing large in dye transfer. Worse, the high color purity of the dye transfer process made those fringes more obvious. Worst, color fringes in a dye transfer print look like bad technique! It takes a technical eye to distinguish lens aberrations from mis-registered color separations. This would not do.

I measured the exact amount of the color fringing and calculated how much I'd have to raise or lower the enlarger head to compensate. It was a millimeter or so over a throw distance of about a meter. When I printed a negative made with my 300mm lens I carefully adjusted the enlarger head between the matrices to compensate for the aberration. Mostly, it worked. I rarely got perfect results—enlargers really aren't designed to be manipulated that way with any degree of precision alignment—but there was much less color fringing than there would have been if I done nothing.

Other complications—I've mentioned that one of my misconceptions was that dye transfer prints would be technically the equal or superior to chromogenic prints in all respects. Among other delusions, I expected dye transfer prints to be as clean and flawless as a well-executed Ektacolor print.

Oh my, but that is to laugh! We're talking about a process that involves multiple generations, large trays of liquid dyes, rinses and washes and multiple hand transfers. Why in the world I ever imagined that would produce spotless and flaw-free results, I have no idea.

Any bits of dust on my negative or contrast masks produced a white spot in the matrices that would have to be retouched out of every print I made. You can bet I went to great lengths to be as clean as possible, and sometimes I achieve perfection...but more often, not. Further, any bits of dust or air bubbles that got trapped between the matrix and the receiving paper would keep the dye from transferring to the paper, leaving a little bright red (minus cyan), green (minus magenta) or blue (minus yellow) spot that also needed to be retouched.

If a bit of grit got embedded in a matrix or it got scratched, then there'd be a little bright spot or streak to spot out of every print thereafter. Manipulating large sheets of soft, wet emulsion for print after print, stuff would happen. Even careful craftspeople aren't perfect, as much as we'd like to be.

Little particles of dye precipitated out of the liquid baths. If they settled on a matrix and weren't entirely removed in the rinse step, those dye specks would transfer themselves to the receiving paper to create a minuscule pinpoint spot of pure cyan, magenta, or yellow. Fortunately, the yellow specks were invisible to the human eye, but the cyan and the magenta? Not so much. They had to be bleached out, and the cleared spot retouched in with dye.

Sometimes there were only a few. Sometimes there were hundreds. Very rarely were there none. Dye specks like that are so common in dye transfer prints that it's one of the more reliable diagnostics for telling if what you're looking at is a dye transfer print. Peer really closely and the odds are good you'll see a primary-color speck somewhere in the light areas.

So, spotting had to be done. A lot of spotting, and I wanted it to be *perfect*, because I didn't know any better. Nobody knowledgeable was trying to turn out perfect dye transfer prints. (Okay, almost nobody—Frank Tartaro's lab in New York was as obsessive about this as I was.)

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It helps that the dyes used to make a dye transfer print are the same ones you use for spotting and retouching. Any finishing work you do can be flawless and invisible, if you're good enough. And your brushes are good enough. I'd buy six or eight 000 brushes to find one that produced the perfect pinpoint spot of dye. I coddled those perfect spotting brushes, but over the course of my career I wore out several generations. Lots of print spotting!

Potassium permanganate selectively removes cyan dye. Happily, that was the most common dye speck. I tried the finest spotting brushes I had, but they made far too big a blotch. I can't recall what inspired me, but I discovered that toothpicks, whittled down to a needle point, proved ideal. I could take out a spot a tenth of a millimeter across and leave the surrounding area almost untouched.

It also helped that I'm phenomenally nearsighted. In my youth, without my glasses my "infinity" working distance was only four inches from my nose!

Permanganate left a brown stain that I removed with sodium bisulfite applied, again, with a sharpened toothpick. Then I had to quickly wipe off the bisulfite with 1% acetic acid, because bisulfite itself would start to bleach dye if left on the print.

Unfortunately there wasn't a strong selective bleach for magenta. There was a general-purpose bleach that would attack all three dyes—it was Kodak's R-18 B&W film reducer formula. R-18 is a mixture of potassium permanganate and sulfuric acid. It bleached great, but it turned out to have problems that I discovered only when I went after the other "dirty" part of dye transfer—stained borders.

In theory, the totally clear parts of the matrix film, where there is no gelatin emulsion to carry the dye (see process description) should print as pure white. Well, they don't. Usually they'd carry a few CC of dye density over to the print paper. Even though I'd figured out how to get sharp borders on my prints' image areas, the surrounding borders would usually have a faint dye stain. Some people considered it a mark of the process. I considered it unattractive.

After I made a print, I'd bleach the area around the image with R-18 bleach, removing most or all of the dye from an inch or three around the image to provide clean white border suitable for framing. Then I'd wipe that whole area down with sodium bisulfite, rinse it off with 1% acetic acid, and dry the print. Nice.

What I didn't realize was that the sulfuric acid in the reducer was creating residual sulfur compounds in the paper. I was turning archival paper into non-archival paper! The paper started to turn brown and get brittle where I'd applied the bleach. Fortunately for me, the the consequences of that became apparent in less than a year and I hadn't sold any prints yet. I needed a better solution—pun intended.

I dug into the chemistry and decided that it wasn't sulfuric acid in particular that was important, it was that it acidified the potassium permanganate. Perhaps glacial acetic acid would do—it wasn't anywhere as strong an acid as sulfuric but if it drove the pH low enough....

It did. R-18C (for Ctein flavor) worked just as well as the Kodak formula and it meant I didn't have to contaminate my prints with sulfuric acid. Not so incidentally, it also worked just as well as R-18 as a film reducer. I passed that information on to Kodak, although I don't think it ever made it into the literature. Now you know.

Why have I spent so much time talking about print spotting and finishing? Because that's where most of the work is! After the first print, I spend far more time on that than on transferring prints. That's the reason I've had to put something like a thousand hours into preparing prints for the upcoming sale.

Ctein

(To see all the comments, click on the "Comments" link below.)

Featured Comments from:

Posted on Tuesday, 19 November 2019 at 12:23 PM in Ctein, Film and Darkroom | Permalink

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Comments

@Ctein -I'm enjoying this series a lot.

Posted by: Fernando | Wednesday, 20 November 2019 at 09:30 AM

Your efforts at fixing fringing reminded me of my own struggle making dye prints from 5x7" glass plates shot on a one-shot color camera. If you've never seen one, Google it and you'll see something that looks like a cubist's interpretation of a camera.

This oddity from the very early days of color, used mirrors and prisms to direct the image from a single lens to three different pan B+W glass photo plates. The three plates had a red, green or blue separation filter in the path from the lens in order to create color separations.

The red and green were developed more or less the same and the blue was developed longer. Post-masking was usually done to adjust contrast and compensate for the red reflection of the Kodak cyan, which made skin colors look unnatural.

The hard part came when you realized that the image rendered on the three plates was not the same size. The solution was the same as yours - bump the enlarger up or down. I was printing 30x40" dye transfers, so I may have been covering a range of half an inch or more in moving the enlarger head.

I made these prints in the 80's for a client who did corporate portraits. At first it seemed like an interesting approach, but soon I wondered why anyone would use this Rube Goldberg camera when they could buy modern color film.

Posted by: Paul Judice | Wednesday, 20 November 2019 at 12:23 PM

I had a go at this back in the 70's, and since my then (and still!) heroes Jay Maisel, Ernst Haas, and Pete Turner all shot Kodachrome, I learned to make separation negatives from transparencies. I found that the "big boys" were all making ENLARGED (not contact) separations, and since I had access to a friend's 4 X 5 enlarger, unlike the pro labs use of 8 X 10, I ordered a registration punch and corresponding glass plate with pins from now out-of-business Condit Mfg. of Sandy Hook, Ct. I got a negative carrier for the Omega enlarger that took slides, a Kodak step wedge, and a Kodak "visual" densitometer, which I always thought of as the "eye strain special"(!), and a piece of glass to put on TOP of the film being exposed, supplied by my best friend's Uncle who was in the auto glass business. I then set to work making trial exposures on 4 X 5 separation film, adjusting, trying again, adjusting, etc. until I could make matching H & D curves plotted on graph paper. Masks were another story - when I visited local dye labs I found, before I got the "Go away, kid - I got work to do" spiel, that NONE of them were doing the way the Kodak manual said - they were ALL making THREE (R, G & B) highlight masks, rather than ONE "white light." I visited the now defunct Brooks Institute School of Photography in Santa Barbara to ask the teacher who did the dye transfer instruction part of their color course why, and he said "They make three highlight masks? Really? I wonder why they would DO that?" I realized I was wasting my time there! If I remember correctly, when I did it this way, with density "aim points" supplied by L.A. area pro practitioners like the late Bob Pace, there was not just highlight information recorded on them but curve SHOULDER info, as well. I worked in a camera store for a year and talked up dye transfer to anyone who would listen, which resulted in a guy coming in who worked at Mattel Toy Co. who was dabbling, too. This guy had experience making and rolling matrices, so we took a couple of sets of my masked separations and made small prints that looked very good, so I knew I was on the right track - I figured that when I retired someday I would rent a garage somewhere and "go all out," which of course never happened what with the phase-out of material availability and the rise of inkjet printing.
I did visit New York City in the 70s and had two very nice dyes made from Kodachromes at K&L Color Lab and took slides of their facility which I still have - the big room with the "mat rolling tables," the point-light-source(!) enlargers used to make separations on 8 X 10 film, even the bottles of "immersion oil" use to mount the transparencies in their pin register carriers (and the ultrasonic cleaners used to subsequently GET THAT OIL OFF the transparencies!)
So far I've seen Ctein refer only to prints made from color NEGATIVES using panchromatic matrix film, so ... what happened when clients like Jim Marshall brought in their TRANSPARENCIES for printing - did Ctein make or have made INTERNEGATIVES, or what?

Posted by: Bob Casner | Wednesday, 20 November 2019 at 01:46 PM

Most processes in photography and this is true of processes in general are someplace on a line of continuity between extremely controllable and flexible at one end and extremely reliable and repeatable at the other. Extremely controllable and flexible is the nice way of saying “kind of unstable yet predictable ”. My extremely limited experience with dye transfers is mostly from working in a studio that would occasionally have dye transfer prints made in order to do rather radical color changes. Changing a band’s purple leather outfits to yellow for example. The lab we used charged at least $5000 a print back in 1979 and flat out refused to make a pair of identical prints, end the borders were a mess. Printing dye transfers in editions the way you describe just blows my mind. It reminds me of some “obviously it’s possible, how hard can it be?” projects of my own where the only reason I was successful was I was to ignorant to know how hard it was.

Posted by: hugh crawford | Wednesday, 20 November 2019 at 02:53 PM

Ctein,

I love these stories. I grew up at Kodak; my father was a photographic chemist in research (late 50's through early 00's). I don't know the players, but there were a lot of great people I met at Kodak through my dad, as well as when I was working there in the 80's (in college, and then again in pharma research).

At a previous TOP print sale I bought dad your Hawaiian dye transfer print (ferns on black lava). It was a really nice gift for him for a couple reasons: he loved the dye transfer print process (and thought you had done a beautiful job with this print), and he had visited Hawaii in the late 80's to accept the Photographer's Society of America Progress Award (with Bob Booms) for the invention of the T-grain.

Looking forward to next Friday! When will lines be open?

Posted by: Jim K | Thursday, 21 November 2019 at 08:57 AM

Ctein,

When I'm reading all this, I can now fully understand your need to go all-in on digital. Everything you are describing is something for which digital is way better in every way. Maybe up to the point of the print, but then your the expert there.

I'm sure going to order at least one print through your generous layaway payment scheme.

Posted by: Lars Jansen | Friday, 22 November 2019 at 05:01 AM

Dear Paul,

Oh yeah, one-shot cameras! Although the name always struck me as funny, since it makes three photographs at the same time. (Yeah, I get why... it still hits my funnybone.)

Lou Charno had (has?) one of those. She ran a major portrait studio and dye transfer printing lab in Kansas City up until the mid-1980s. I did some printing for her when she was overcommitted. A Kodak manufacturing screw-up kinda drove her out of business (details in an upcoming column) and one of the ways Kodak mollified her was by giving her a case or three of glass plates cut for her camera.

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Posted by: Ctein | Friday, 22 November 2019 at 07:29 PM

Dear Bob,

Highlight masking was always a weird thing and a controversial subject. Ditto color-correction masking, although more or less necessary when printing from slides. Emphasis on the more or less. Frank McLaughlin was the opinion that if you had a really clean, flare-free setup, you didn't need a highlight bump mask. I don't know if he was right in general about that, but I found that when I was printing transparencies most of the time I didn't.

Color-correction masking should have been always necessary, for technical reasons I won't get into here. But for some reason I don't understand, I could get excellent and accurate color from slides without them. I have no idea why, except maybe it was because I was using unusually narrow-cutting separation filters. Maybe that was all it took. I never looked the gift horse in the mouth and investigated deeply.

I've been talking only about making prints from color negatives because, for myself, that was the only printing I ever did. 99% of my color work was with negatives. The very few transparency photographs worth adding to my portfolio, I never got around to printing as dye transfers. Happily digital printing made that irrelevant.

The vast majority of my clients were providing me negatives, because I was one of the very few printers who knew how to make good prints from them. Almost everybody in the dye transfer business specialized in transparencies, because most of the printing was for the advertising market and that's what product and advertising photographs were made on.

But, yes, when I printed for Jim Marshall (and a few others) I worked from his original transparencies.

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Posted by: Ctein | Friday, 22 November 2019 at 07:33 PM

Dear Hugh,

Well, yes, that was one of my misconceptions — that dye transfer was 100% perfectly reproducible, because chromogenic printing was and dye transfer was, of course, better.

Such charming naïveté.

Not to put a fine point on it, I simply developed the chops so that my printing WAS reproducible. You wanted 10 or 20 dye transfer prints that matched to within 1 CC of color? I was the person to do it for you. Of course, most printing didn't require that level of reproducibility, not even for my own portfolio. But when it did, I could.

The kind of color-swapping work you're talking about, though, that's really hard and requires a lot of hand fussiness. Indeed, exactly duplicating it from print to print is pretty much impossible.

If I may ask, which lab did you work for? $5,000 a print back in 1979 was at the absolute top of the scale. I'm sure the results were worth every penny.

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Dear Jim,

I never met your father but I sure knew who he was — I kept up on all that kind of technical stuff. And I'm sure we had friends in common at Kodak, like Dick Dickerson and Sylvia Zawadski (the inventors of the fabulous Xtol developer).

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Posted by: Ctein | Friday, 22 November 2019 at 07:42 PM

Hi Ctein,

I certainly knew Dick, but never met Sylvia... God, I really miss the 'good ole' days' of Kodak. It's a shame that mismanagement messed that company up so much, because they had a tremendous amount of smart, clever scientists at that company!

Posted by: Jim K | Monday, 25 November 2019 at 08:50 AM

The comments to this entry are closed.
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