David Kachel's

Practical Applications for

S.L.I.M.T.

Selective Latent Image Manipulation Techniques

v1.01 12-08-18

The topic of this monograph is the practical application of what I invented years ago and called…

***Selective Latent Image Manipulation Techniques* (SLIMTs).**

Their coverage in this document is limited to their practical use in everyday photography, without the complex history, chemistry and background coverage that will accompany a larger version of this document, when it is finally completed. This particular version is intended to accompany the pre-made bleach[1] that will be marketed by the Freestyle[2] company, as a convenience to their customers and my readers. It should be noted that I have no fiduciary relationship with Freestyle whatsoever, save that they occasionally accept some of my money in exchange for film, chemistry, etc. Freestyle is also not going to get rich selling the chemicals for SLIMTs, so they are really doing us all a big favor by making the chemicals easily available to those who wish to use SLIMTs but are not comfortable with weighing out chemicals in bulk. With Freestyle's prepackaging of these chemicals, simply dissolve, dilute and use, like any other prepackaged dry photographic chemicals. SLIMT techniques are extremely, ridiculously, paper-hat-job simple. If you can use a dry powder developer like D-76, you can use any SLIMT technique. They are indeed, *that* easy.

During the 1980's I spent a lot of time and effort researching various new techniques for contrast and tone control in B&W analog photography. That effort resulted in even more discoveries than I had anticipated, including SLIMT controls for color photography, in addition to black and white. I was more surprised by this than anyone. The results of my research were first published in several issues of *Darkroom & Creative Camera Techniques* magazine, during the early 1990s, and have since been published in many magazines and numerous languages on four continents and adopted by photographers around the world. They have been added to University photography programs and I understand that one Master's thesis by a student at Georgia Tech was based on SLIMT techniques. I have even had the honor of seeing my work published under the names of those who thought my techniques so valuable as to be worth stealing. (Plagiarist approved!) For those who may be unfamiliar with SLIMTs, I can assure you they have more than a quarter century of heavy testing and use, and are.. bulletproof.

Instead of altering an analog photographic image in the traditional manner by changing development, SLIMTs alter the latent image itself, after exposure and, BEFORE development. That's correct. You are not hallucinating. With latent image manipulation techniques, we alter the latent image and turn it into a different latent image, then develop it! The development that follows is *normal*. You apply the same developer, same dilution, same development time, same agitation, everything the same as normal development for a normal negative, because normal development is precisely what needs to be applied after altering a latent image. In fact, SLIMT altered negatives are developed right along with normal negatives that have received no such alteration to the latent image.

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[1] Chemicals that dissolve the silver in photographic materials are commonly called *bleaches*. They are not bleaches in the same sense as household or other bleaches.

[2] https://www.freestylephoto.biz

Applying normal development to a SLIMT treated negative means there is no chance of uneven or blotchy development such as occurs with other, traditional techniques for contrast reduction. And, the SLIMT bleach is applied in place of a presoak and therefore doesn't even require an extra step in processing, unless you don't normally use a presoak. (Then it requires a single extra step.)

For all practical purposes, you create a new latent image that is more in line with what you intended for your image and then develop the film or paper normally, just as if you had done nothing and didn't want to change the image. How can this be done?

Latent image is manipulated by chemically destroying some of that image before development. Photo scientists used to study the latent image formed on film and paper by bleaching some of it away, then measuring what was left. Different bleaches were used for this purpose, but for SLIMT use, the type of bleach with which we are primarily concerned is called a *contrastwise*[3] bleach. This is a class of bleach that has strong preferential action on more heavily exposed areas. And the best of the contrastwise bleaches for our purposes is *potassium ferricyanide*[4], the most commonly used bleach in all of photography. A contrastwise bleach has very little effect on shadows, the least heavily exposed parts of a negative and the greatest effect on highlights, the most heavily exposed parts of a negative. It reduces contrast with precisely the

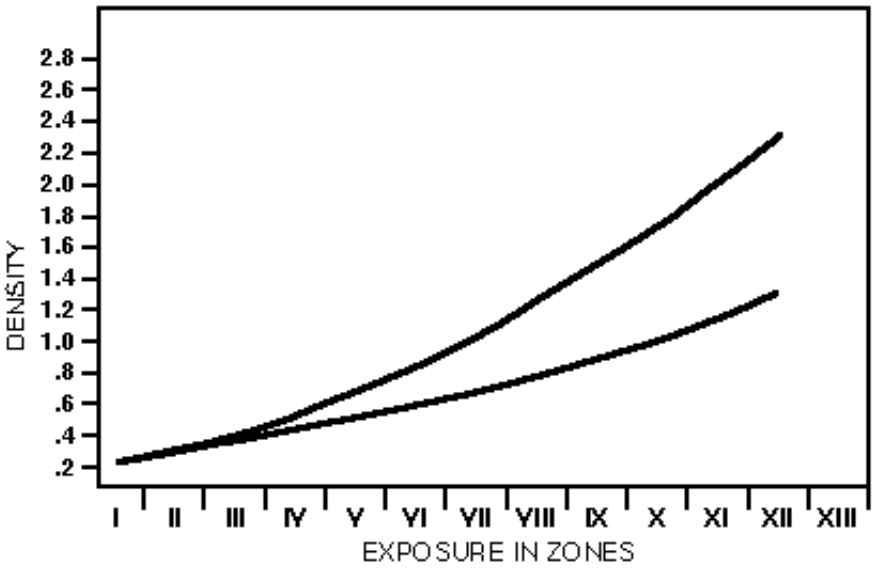

Figure 1. ***Illustration of contrastwise bleaching.*** Curve **A** represents a normally exposed and processed negative of a subject with a long reflectance range. Curve **B** is what that same negative might look like if a contrastwise bleach were applied prior to (identical) development.

[3] More commonly used by photo scientists was a class of bleach called *speedwise* bleaches. They reduce all exposure evenly, leaving contrast largely untouched. The only practical use for a speedwise bleach is *pulling* overexposed film. In more than a quarter century, no one has ever asked me for a formula for pulling film.

[4] Potassium ferricyanide behaves quite differently when applied to latent image than it does when applied to an existing silver image. Bleaching a negative in Farmer's Reducer (a potassium ferricyanide bleach) for example, acts nothing like a contrastwise bleach.

kind of bias we would want for reducing the contrast and preserving the shadows of a negative. A contrastwise bleach reduces image contrast while mostly leaving film speed alone and preventing all of the pitfalls associated with conventional contrast reduction development because after bleaching, the film requires normal development. It is a perfect solution.

SLIMT works on the following analog photographic materials:

- all B&W negative films (including specialty films such as high-contrast and X-ray films)
- all B&W silver-based papers (both variable contrast and standard, graded papers)
- all C-41 process color films, including B&W C-41 films such as Ilford XP2
- all EP-2 color papers
- all RA-4 color papers

SLIMT does not work on:

- color slide film
- color reversal paper such as Cibachrome, etc.
- B&W reversal film? (this has never been tested, it might work, but there is no real need)

All the photographic materials listed above with which SLIMTs are effective require the exact same one or two chemicals: *potassium ferricyanide* (always) and *potassium bromide*. Some materials require only the potassium ferricyanide. When potassium bromide is required, it is always used in the same volume as the potassium ferricyanide. You always add equal liquid amounts of both.

WARNING: Potassium ferricyanide is relatively harmless, but can be dangerous if handled foolishly. Photographers have been using it for well over a century and there are no dead, yet. But if you swallow it, or add a strong acid to it, the cyanide could conceivably be released. If you actually need a warning label on chemicals telling you not to eat them or randomly add corrosives to them, photography may not be a wise choice for you.

The two chemicals are kept in separate *permanent stock* solutions that are used to make further dilutions, as needed. Dry or dissolved, they both keep indefinitely. Potassium ferricyanide is stored in a 10% *permanent stock* solution, potassium bromide in a 3.3% *permanent stock* solution. If you don't know what a percent solution is or how to make one, Freestyle has solved that problem for you. The two packets provided make exactly those solutions by simply dissolving them in the indicated amount of water. The orange colored chemical is the potassium ferricyanide.

From those two *permanent stock* solutions you will make weaker, *working stock* solutions, as needed. That is, you will never work directly from the two *permanent stock* solutions but make small quantities of even higher dilutions from which you will make greater dilutions still, the ones actually used to treat film or paper. That makes a total of three different dilutions, actually applying only the third one, to film or paper.

- **Permanent stock** - 2 containers, one each of potassium ferricyanide 10% and potassium bromide 3.3%
- **Working stock A** - 1 container with 450ml of water and 50ml permanent stock potassium ferricyanide solution
- **Working stock B** - 1 container with 400ml of water, plus 50ml permanent stock potassium ferricyanide solution, plus 50ml permanent stock potassium bromide solution
- **Working dilutions** applied to film or paper, begin with 10ml of EITHER working stock A, OR working stock B, added to enough water to total 1 liter

By the time you get to adding 10ml of working stock A or workings stock B to a liter of water for actual use as a SLIMT bath, most of what is in that liter of solution is plain water, containing very little bleach. This is because the amount of latent image in an exposed sheet or roll of film is extremely tiny, requiring an equally tiny amount of bleach. And, because the amount of bleach is so small, film or paper can be transferred directly from bleach bath to developer, without fear of contaminating the developer. The tiny amount of bleach not already used up by the act of bleaching the latent image is instantly overpowered by the much higher concentration of chemicals in the developer.

When applying any SLIMT bleach, make sure the temperature of the bleach is as close to the working temperature of your developer as possible. Agitate your film or paper in the bleach bath exactly the same way as for the developer you will be using. When bleach time is finished, pour the bleach off and directly down the drain (flush drain with tap water), as it is always a one-shot solution. Then place the film or paper directly into the developer. No rinse or other step is required. Develop exactly as you would process the same film without special development requirements. Normal, time, temperature, agitation, etc., etc. SLIMTs are designed to require normal development after treatment. After developing, stop, fix and wash as usual.

SLIMT treated materials can be developed along with any other materials destined for the same, normal processing. Throw them all in together. The tiny amount of bleach carried into the developer along with SLIMT treated film/paper cannot in any way effect other materials processed at the same time. Regardless of the degree of contrast reduction, film and paper treated in mild to extreme SLIMT baths all get the same, normal development. (In Zone System parlance, N-1 and N-12 negatives get processed together, along with N negatives, all in the same normal developing bath.)

Every photographic material is different and the amount of contrast reduction you require will also vary greatly. Using 10ml of working stock in a liter of water is simply a starting point for testing. Be sure to test materials with SLIMT baths before entrusting important images to them. You must experiment to determine what amount of working stock and what treatment time (begin with 5 minutes) best suits what you wish to accomplish. It is impossible for me to test or predict every potential combination, especially in light of the fact that the potential contrast reduction with SLIMT baths and the materials on which they work, is extreme. SLIMTs can provide everything from very slight contrast reductions to unbelievable reductions not available by any other method, along with

every subtlety in-between. SLIMTs are superior to and supersede every contrast reduction technique ever invented including, a couple of my own.

The best way to begin is by exposing two identical negatives. Throw one in a pre-soak and the other in that liter of water containing 10ml of working stock. When the five minutes are up, toss them both into the developer together and develop both exactly the same way: NORMALLY!

Now you can see what effect the first trial had. If the test negative is way off, don't adjust the next bath by a little. Take big steps. Double or halve the amount of working stock used. Only after you are in the ball park of achieving what you sought, do you need to think about making smaller changes. Write down the results of every test. You may be looking for a lot of contrast reduction and get only a little with the first test, or vice versa. But you will need that information for the next image that requires the amount of contrast reduction obtained with that first test; and every test thereafter. It won't take long at all before you can begin to intuit a likely dilution and treatment time for a new material.

Exposure Compensation

At the time I invented SLIMTs I was using a film speed determination method advocated by Ansel Adams. Film speed was based on a Zone I negative density of .10 over B+F. Using that, SLIMTs caused virtually no loss of film speed, at least for moderate contrast reduction needs. In the intervening years I have come to realize that was probably not the best way to view film speed. Today I determine film speed based on higher levels of the characteristic curve and on some other considerations that are pointless to discuss in detail here, but this leads me to newer recommendations with regard to film speed and SLIMTs. Increase exposure when using SLIMTs. For moderate reductions in contrast, increase exposure by one-half to one stop. Give progressively more exposure as the need for contrast reduction increases. You are unlikely to do any damage with additional exposure. Remember, *contrastwise* bleaching effects higher levels of exposure more strongly. The more exposure you give, the more highlights are reduced by the bleach. Overexposure remains possible, but increasingly unlikely.

Development Problems

Some films and other materials are prone to difficulties; splotchiness, uneven development, etc., etc. SLIMTs do not cause these problems, but they also do not repair them. If a film is inclined to having problems, that film will likely still have problems when using SLIMTs. Some high contrast films adapted for pictorial use tend to develop unevenly when used for purposes other than what was originally intended. If using a film that is prone to problems, try adding a plain water pre-soak, prior to the SLIMT bath. Customarily, the SLIMT bath replaces a presoak. On occasion, the only way to get some materials to behave is to break the surface tension of the material with plain water and only then, introduce the first active chemical bath. These problems are not associated with SLIMTs, they simply continue to occur with materials that are already problematic.

Exotic Developers

DO NOT use exotic developers for SLIMT treated materials. Remember, SLIMTs require normal development. Exotic developers do not provide *normal* development. They provide exotic development: usually things like contrast reduction or staining. To use them with SLIMT treated materials is to apply two different contrast reduction techniques to the same piece of film. A very bad idea, and an unpredictable one. If you are one of those who insist on using *Uncle Abe's Miracle Orange Juice & Toe Jam Developer* on your film, don't do it with SLIMTs. Neither is agitation optional. Agitate normally.

HC-110, D-76, any of the standard pre-packaged developers from reputable manufacturers are what is required. Likewise, use the standard temperature, agitation scheme, etc., etc., described by the film manufacturer. Normal development means what Kodak, Ilford, etc., etc., tell you is *normal*. Not what some *expert* on the internet told you was normal. The internet is now awash in crackpot *experts.*

Notes for All Materials

Whether you use working stock A or working stock B, depends on the nature of the material you wish to process. Working stock B is required only for those materials that will fog without the presence of potassium bromide. This is not a failure of SLIMT techniques or of the materials processed in them. It is simply a difference in chemical requirements. Under each material heading below, you will be told which working stock applies.

All SLIMT dilutions applied to film or paper are one-shot solutions. Never re-use one.

I prefer to use one-shot developers, too, but they are not required for SLIMT processes. In theory, you might eventually contaminate a replenishment developer with SLIMT bleach, but it is unlikely.

Word to the wise… you are probably going to be tempted to skip over the section about using SLIMTs with high contrast films. Don't do it. Multiple surprises are hiding there! The same is true for paper.

SLIMTs for All Pictorial B&W Films

(All require potassium bromide: working stock B)

This really means EVERYTHING. If you can buy it, a SLIMT will work on it. Tri-X, HP-5, Pan-F, T-Max films, the FOMA films, EVERYTHING. There is no known B&W negative film on planet Earth on which SLIMTs are not supremely effective. (High contrast films, X-ray films and Chromogenic B&W films will be covered under other headings, despite the fact they are all essentially the same with regard to applying SLIMTs.)

These B&W films all require that potassium bromide be included in the formula, and always in the same liquid amount as the potassium ferricyanide. Should you ever get bizarre results you can't explain, try a SLIMT bath without the potassium bromide. This is a scenario that has never been reported to me and is highly unlikely, but perhaps worth considering under unusual circumstances.

Remember, same temperature, same agitation, same everything.

I invented two other techniques for contrast reduction in the same time period as SLIMTs. Both were designed for extreme contrast reduction. The extremes of contrast reduction of which SLIMTs are capable are so extensive, the other two techniques are really not needed. (One still works, the other is obsolete.) If you can imagine needing it with B&W film, a SLIMT can do it.

SLIMTs for Chromogenic B&W Films

(All require potassium bromide: working stock B)

These are listed separately, simply because they are so different. But from the standpoint of SLIMTs, follow the same instructions as for ordinary B&W films. Remember to raise the temperature of the SLIMT bath to the same as that of the C-41 developer. And because of the higher temperature SLIMT bath, expect that you may need a slightly weaker SLIMT bath and perhaps a shorter SLIMT treatment time.

SLIMTs for All B&W Printing Papers

(None require potassium bromide: working stock A)

B&W photographic papers are by nature, higher contrast than ordinary B&W films. So, they are likely to require more bleaching. Start with a slightly higher concentration of bleach and treat for the same amount of time as your standard paper development time, not the 5 minutes previously suggested for B&W film. If you process paper in the developer for 3 minutes, apply bleach for the same 3 minutes, before development.

DO NOT use potassium bromide with B&W papers. It is not necessary and will in fact cause problems. Of course, YOU will be the first person ever to encounter the one paper that does require it.

25+ years ago, SLIMTs for B&W printing papers were an afterthought; something I didn't even seriously test beyond mere proof of concept until more than a year after announcing SLIMTs in general. My surprise was substantial.

SLIMTs turn every B&W paper, graded or variable contrast, into a new kind of variable contrast paper. With SLIMTs, you get a whole new class of paper out of every single sheet you use. SLIMTs result in a print with highlights that retain the inherent contrast of the paper you are using, while reducing contrast in the shadows to whatever lower level you desire, across all grades. Should you use a grade 5 paper for example, you can bleach the shadows back to as little as grade 000, while retaining much of the highlight contrast of grade 5; and any subtle variation in between the two extremes is available. SLIMTs give you options when printing in B&W that never existed before and while these options can be as subtle as you wish, they can also be quite strong. This is nothing like printing with two different variable contrast filters. Try it and you will see what extraordinary possibilities exist with SLIMTs and B&W printing papers.

SLIMTs for All High Contrast B&W Films

(All require potassium bromide: working stock B)

This section may seem out of order. It should have preceded the section on SLIMTs with B&W papers. But you needed to read that section on papers before you would be able to understand the last bit of this section. Feel free to skip ahead if you are curious.

Everything in the section on ordinary pictorial B&W films applies to the films in this section, too. The only reason this is a separate section is because of the extraordinary possibilities available when using SLIMTs in combination with high contrast films.

In the 1980s and 1990s, Kodak promoted their film Technical Pan for conventional pictorial images, despite it being a very high contrast film not designed for such use. People developed it in specialty developers intended to produce lower contrast and it was quite popular until it was discontinued. I was one of those who didn't think much of this idea, but it had strong devotees. High contrast films are simply not well suited to pictorial use, not only because they have a high propensity for uneven development when one attempts to get normal contrast out of them, but also because they are usually not panchromatic but instead, either blue sensitive only, or orthochromatic. There are few if any panchromatic, high contrast films. Strong contrast reduction techniques of the past are prone to uneven development. These high contrast films are themselves, by nature, prone to uneven development. Combining a film and development scheme that are BOTH prone to uneven development, is a bad idea. But if you remove one of the two contributors to uneven development, odds improve considerably. Remember that SLIMTs require normal development after bleaching, thereby removing one of the two sources of potential uneven development.

There are actually two different classes of high contrast film, loosely defined as moderately high contrast film and very high contrast film (I don't think there are any official definitions). X-ray films tend to be moderately high contrast film. Ortho films and line films tend to be of the higher contrast variety. But then, ortho means orthochromatic (blue and green, but not red, sensitive) and is not an indication of contrast, despite it being widely used to at least suggest contrast.

The goal of Technical Pan was to offer a high contrast film with developers that turned it into a low contrast pictorial film. Not such a hot idea in my opinion, but what such a film does lend itself to quite well is use as an *expansion* film.

In 1989 I published an article entitled *Zone System Expansion Film*. This article concerned the use of a moderately high contrast Kodak film called *Professional Copy Film Type 4125*. I proposed that readers use this film as an in-camera film for subjects needing increased contrast beyond the capabilities of standard films. That film no longer exists so details are unimportant, but for those who want higher contrast than is available from regular B&W films, the use of an existing higher contrast film and SLIMT contrast reduction allows the photographer to employ a film that can render contrast anywhere from extreme, down to as low as his everyday film. The best films for this are the class of moderately high contrast films, as opposed to the very high contrast films. Most of these moderately high contrast films are also orthochromatic, and therefore have that tone rendering advantage over the

very high contrast films which are only blue light sensitive. For those photographers unfamiliar with orthochromatic B&W film, they were at one time very popular, giving quite pleasing gray scale rendering under a lot of different conditions. Many photographers preferred them to panchromatic films that existed at largely the same time.

I am currently using a Kodak X-ray film for such purposes. Most X-ray films have emulsion coated on both sides and no anti-halation layer, deal killers as far as I am concerned. But one X-ray film I know of is a Kodak product marketed as: Carestream EB/RA. This film is orthochromatic, coated on one side only and has an anti-halation layer. In 8x10 it is about $1 per sheet, perhaps the last real photographer's bargain on the planet. ISO in daylight is about 25. I find this to be an excellent pictorial film that responds very well to SLIMT bleaching. I can reduce the contrast to any degree I like from as low as any ordinary pictorial film (and probably lower, though I see no point in trying) to as high as the natural contrast built into the film, which is considerable.

I have never used it, but Ilford's Ortho Copy Plus sheet film would almost certainly be an excellent candidate for higher contrast variation with SLIMTs.

SLIMTs should work with any and every high contrast film you care to employ, giving you a range of possibilities never before available.

Remember to add a plain water pre-soak prior to the SLIMT bath if you should have problems with any of these films, especially the higher contrast films.

The Last Bit

There is still more to the use of high contrast B&W films with SLIMTs. Remember the section on B&W papers? Remember how you can print on a higher grade of paper and using a SLIMT bath, get high contrast highlights and lower contrast shadows? Sort of a new kind of variable contrast B&W paper? Well, you can do the same thing with B&W high contrast films.

If you use a SLIMT bath to reduce the contrast of a high contrast film all the way down to the contrast levels of normal everyday film, you get shadow tones with notably higher contrast and highlights with significantly reduced contrast. In other words, you get the same range of densities as normal film, but with a very different distribution of gray tones, just like using SLIMTs with B&W printing paper. *Variable contrast film!* Using SLIMTs with high contrast films provides a treasure trove of possibilities.

SLIMTs for C-41 Process Color Films

(All require potassium bromide: working stock B)

This technique potentially provides just as much contrast control with color films as with B&W, but you can probably expect potential color crossovers with extreme contrast reductions. I may have invented it, but I never worked with SLIMTs for color film or paper beyond *proof of concept* and I even enlisted the help of a colleague for that. I don't make color images and have no interest in them. Despite that, this definitely works and works well. Many have used it.

Apply SLIMTs to color negative films exactly as for B&W pictorial negative films, but bring the SLIMT bath to the same temperature as the color negative developer. Move film directly from SLIMT to color developer without rinse, just like other films. Process normally. It just works.

SLIMTs for EP-2 and RA-4 Color Papers

(None require potassium bromide: working stock A)

Potassium bromide is not only not needed, it will send your paper developer south if you try it. Just use the potassium ferricyanide W*orking Stock A*. This technique potentially provides just as much contrast control with color papers as with B&W, but you can probably expect potential color crossovers with extreme contrast reductions, limiting somewhat, the potential extremes of usefulness. I don't know for sure. As with SLIMTs for color negative film, I may have invented it, but I don't use it. Like SLIMTs for color negative film, this definitely works and works well. Many have used it.

Advanced SLIMTs

This is for later… MUCH LATER!
SLIMTs are even more versatile than I have let on up to now. Much, MUCH more versatile. But, there are so many possibilities, a newcomer may feel overwhelmed. That is why this is for, later, until you have some experience with SLIMTs under your belt. I have never before published the information that follows and have only revealed it in confidence, to two or three other photographers over the years. It is made public here for the first time in this paper, intended to accompany the pre-packaged SLIMT bleach kit from Freestyle.

When you are comfortable with SLIMTs for whatever usage you prefer, it may be time to experiment.

Throughout this paper I have emphasized *normal* development after treatment in a SLIMT bleach bath. And users of course would not want to develop a SLIMT treated material for less than the normal development time. That would cause contrast reduction and potentially lead to uneven development. The purpose of using SLIMTs is to achieve contrast reduction without the risks of uneven development. But there is nothing that prevents the user from adding *more* development time.

SLIMTs don't destroy all latent image. They don't even destroy most latent image. They destroy some latent image, with preference for areas of higher exposure as you already know, but also with a strong preference for latent image on the *surface* of the silver halide crystal. Internal latent image is largely untouched. Yes, *surface latent image* and *internal latent image* are real terms. That's what those scientists were studying when they were using these bleaches: external vs internal latent image.

If you prolong development beyond normal after having applied a SLIMT bleach, you will *buy back* some of your image. In fact, you can buy back a LOT of your image. But it won't be exactly the same image. The shape of the characteristic curve that results will be altered from normal, even if you *buy back* the complete density range you would have had, prior to the SLIMT treatment.

To fully understand the possibilities here, you have to seem them, rather than just have me describe them. Start by making two identically exposed negatives on your ordinary B&W film, exposures of a long brightness range subject, such that the negatives will require contrast reduction to a moderately strong degree. You might even want to make a third negative at the same exposure, to be used for an interesting additional comparison.

Process one of the negatives as you routinely would for such a situation, normal development time included. Whatever the SLIMT bleach dilution was for the first negative, process the second negative in the same dilution bleach, but for twice as long. Then process the second negative in the same type developer as for the first, but for twice your normal development time. You should end up with two roughly similar negatives. But the midtones and highlights of the second negative will be differently distributed, favoring greater separation in midtones. (I would be inclined to say, *enhanced,* but that conclusion is up to you.) You now have the first inkling of what can be done by altering bleach concentration and time, along with development time. The variations are limitless.

As for the third negative, if you made one, process that for double the bleach time, too. But develop for your normal time. This will allow you to see how much more latent image silver was bleached away, compared to the first negative. This third negative will probably appear almost blank. The one bleached for twice the time and developed for twice the time, clearly demonstrates just how much latent image was hiding in the woodwork, when compared to the third negative.

How does this all work? Well, remember that a contrastwise bleach works preferentially on areas of greatest exposure. When you doubled the bleach time, you removed proportionally more surface latent image from the highlights than you did from midtones. When you then extend development time, there is simply more proportional latent image remaining in midtone areas, to be developed.

The extreme possibilities available with alterations to bleach time coupled with development times extended beyond normal have yet to be fully explored. And this does not take into account the possible variations of bleach concentration, too. One could for example, use a SLIMT bleach that is twice as strong, instead of doubling the SLIMT treatment time. This would favor removal of highlight latent image even more strongly than just doubling the bleach treatment time. There is much room for exploration and experimentation.

Total Variable Contrast Control for Color Film & Paper

The more astute reader might have noticed that SLIMTs for color C-41 film and RA-4 color paper, together amount to a variable contrast control system for those materials, something that never existed before. Well, they amount to *half* of a variable contrast system, because such a system would also require a way to increase contrast of those materials in addition to a means of decreasing it.

It just so happens that another researcher published an article in a previous issue of the same magazine as the one in which I announced SLIMTs, announcing his discovery of the other half of that system: a means of increasing the contrast of both color film and color paper. Neither of us knew anything about the work of the other, prior reading each other's articles. (Our editor was an excellent

secret keeper.) Together, we invented complete variable contrast control for color photography with virtually unlimited controls.

His name is Robert Anderson and his new technique was both brilliant and, like SLIMTs, severely simple. In fact, even simpler than SLIMTs, if that is possible. Here are the steps to flawless contrast increases with both color film and paper[5]…

- Develop film/paper as always
- Fix film/paper with ordinary B&W fixer (not the standard color bleach/fix solution)
- Thoroughly wash film/paper
- Bleach film/paper with potassium ferricyanide (experiment, to find the proper amount)
- Thoroughly wash film/paper
- Develop film/paper AGAIN, as if for the first time

If the resulting contrast increase is enough, use color Bleach/Fix and finish normal color processing

If contrast increase is not enough…

- Thoroughly wash film/paper
- Bleach film/paper with potassium ferricyanide (experiment, to find the proper amount)
- Thoroughly wash film/paper
- Develop film/paper AGAIN, as if for the first time
- repeat as necessary

When repeating the process to get more contrast, you do not need to use a B&W fixer again. Additional fixing is not required until you decide to do the final bleach/fix.

You can bleach and redevelop both film and paper numerous times for ever-increasing contrast. The limit is determined only by the amount of color couplers remaining in the materials. They do not wash out so there is plenty to work with. With increases of contrast in both film and paper, levels of contrast can be achieved that are almost certain to be higher than anyone could possibly need.

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David Kachel

[5] I am relating Mr. Anderson's technique from memory as I cannot locate my copy of his original article. If you have difficulties, it is safe to blame me as his original technique is well proven.