A Forgotten (?) Use for Sepia Toning

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It happens to the best of us. We are in a mode of haste and excitement as we develop that newly exposed roll of film. The freshly developed film is removed from the reel after that photoflo dip. Uh, oh, the negatives are underdeveloped! The developer was too cold...I used the wrong dilution/ the developer was old and stale. Whatever the reason, I have thin negatives from underdevelopment.

Oh, well, no problem, I'll use a higher grade of paper, or a higher numbered VC filter and add some contrast. I make the print. Darn, no soap! The shadows are weak and muddy and the overall print still has that classic "dead" look. It looks like I need to get out the chromium intensifier and beef up these negatives. But, wait, not so fast...

When it comes to negative intensification, perhaps the most commonly used methods are the various formulas using potassium dichromate, simply known as a chromium intensifier. This treatment used to be available in packaged form from Eastman Kodak. The company discontinued the product about ten years ago, no doubt due in large part, to the environmentally unfriendly nature of chromium salts. It is still possible to mix chromium intensifier from scratch using individual chemical components, but the ingredients that are called for (hydrochloric acid and potassium dichromate) are toxic substances and need to be handled with care. It is possible to eliminate the hydrochloric acid and use sodium bisulfate to acidify the bath, but you still need to handle the potassium dichromate. This stuff will cause intense itching if it gets onto your skin (I believe it was sold as itching powder in novelty stores in the days when we were more cavalier about such things) and I do not want to think about what would happen if you inhaled the stuff.

"So what?" you may think, "I use gloves and a respirator when I mix up chemistry anyway, so what is the big deal?" Well, when you put it that way, not much. Except when you use chromium intensifier, you still need to redevelop the bleached film to restore the image. My experience in using a chromium intensifier indicated that to have a meaningful effect, I had to repeat the process several times. Each time you retreat the negative, you increase the chance of physical damage to your precious negative. It also was stated that chromium intensification could cause reticulation in some film emulsions. With today's tougher, pre-hardened emulsions, I do not know if that is still true, but it is something to keep in mind. The ironic thing in this discussion, is that chromium intensifier was considered one of the safest ways to increase the contrast of a weak negative. When you consider that mercury bichloride, potassium cyanide, and uranium nitrate are materials used in other intensifier formulas, I guess I can see their point!

Ansel Adams, John Sexton, and a few other notables made known the use of selenium toner to increase negative densities. The toner is mixed at a strong dilution (1+4) or less, and can be used to intensify the entire negative, or used with a brush to selectively intensify portions of a negative that printed up a bit weak. However, the intensification obtained by this method is fairly subtle. It will give you approximately 1/2 of a grade of additional contrast. The method is very convenient, since it is an easy-to-use liquid concentrate for your intensifier. It also has the advantage of making the negative more stable, giving it additional protection from airborne environmental attack.

However, we can take this idea one step further. Consider using a sepia toner to help your weak
negatives. "A sepia toner?" you ask. "Why in the world would I want to tone my negatives a brown, sepia color?" There are two reasons:

1. sepia toning negatives is as effective as an intensifier, as several times through a chromium intensifier.

2. it will impart the maximum protection available for your negatives against deterioration from environmental pollution.

The explanation of how this works is fairly simple. In the case of reason #1, what happens is this. The negative acquires extra density in the highlights and midtone regions of the image, and little extra density in the shadow region. If you attempted to make a print with the original thin negative, you might have gotten decent highlights and fair midtones, but weak smoky shadows. After the negative is sepia toned, the paper sees this as extra density. To match the highlights in the first attempt at printing the untoned negative, you will have to add more exposure time with the sepia toned negative to compensate for the density difference. The shadow areas are now printed down, and will appear less smoky, or even good to excellent. It is akin to the stain formed using a pyro developer, but different. The sepia tone is not formed in situ with reduced silver as in the case of pyro development, it is rather a general stain. So, it is not a replacement for pyro development, but the increased contrast seen when printing on graded paper is similar to comparing a non stained negative vs. a pyro stained negative on graded paper. As with any intensification process, sepia toning works best with negatives that are thin from underdevelopment, rather than underexposure, since no intensifier can replace shadow density that was not there in the first place. With underexposed negatives, it will help if the highlights are printing grayish on a high contrast paper, which may be worth doing, even if it will not help with the lack of shadow detail.

Reason #2 stems from the fact that converting an image from silver metal to silver sulfide makes the image very stable. Normally, an untoned print or negative, even if properly washed free of fixer, will eventually begin to acquire a yellowish fading effect, sometimes with a silvery sheen on the surface of the print. Sulfur in the air from pollution, or leached away from old newspapers and other paper products will interact with the silver that makes up the photographic image, forming silver sulfide in a haphazard manner that eventually destroys the print. However, if the silver image is uniformly converted to silver sulfide as with a sepia toning process, the image will have very little interaction with environmental sources of sulfur. Thus, the compound that wreaks havoc when left to its own devices becomes friendly when it is formed uniformly. Sepia toned negatives will be well protected from fading due to pollution. If you don't mind the contrast increase that occurs when you apply the process to a negative, it might be worth considering for use with negatives that you print often, and wish to insure are in good shape when you print that last retrospective show in your mid 90's. However, a properly fixed, well washed negative that is kept in dark storage and not subjected to humidity extremes is permanent enough for most applications.

You can accomplish this process in two ways, by the use of a direct sepia toner, or by use of a bleach and redevelop sepia toner. I lean toward the bleach and redevelop sepia toner because sometimes with a direct sepia toner, the excess potassium polysulfide that is not used to convert the silver leaves a sediment on the surface of the film. The film becomes very soft when a sepia toner is used, wiping off this sediment before the final wash could cause some problems with possible scratches being formed. The bleach and redevelop toner seems to work cleaner, not leaving the sediment behind as often, or in the same quantity as the direct sepia toner. This is easily obtainable in camera stores as Kodak Sepia Toner, or you could
use any of the bleach and redevelop sepia toners that are listed in places like The Photo Lab Index or Anchell's The Darkroom Cookbook.

Most of the references concerning after-treatments of negatives advise you to use a prehardener before using any intensifier or reducer on a negative to help prevent physical damage to the film. This contains Formaldehyde, which must be shipped as a hazardous chemical, and is not such a great thing to have in a darkroom anyway. I would suggest that you make use of tanks and reels for sepia toning negatives as a way of minimizing the physical handling problem, rather than resort to a pre-hardener.

**Suggested Method**

1. mix up the bleach and redevelop sepia toner A and B baths in separate 1 liter beakers. The B bath puts out a "nice" rotten egg odor, so you will want to use it in a well ventilated area, or even outside. Do not use it in close proximity to sensitized materials (unexposed paper and film). All wet operations should happen at a reasonable room temperature (65-72°F).
2. place the negatives intended for sepia toning back on a reel so the process can be done in a tank.
3. briefly refix the negative you intend to sepia tone in fresh 1+3 diluted rapid type fixer without hardener (one minute should be sufficient).
4. wash the negative with 6 changes of water at 30 seconds per change.
5. pour in the A bath, agitate the film for 5 minutes or so, to make sure the bleach has a chance to really work.
6. wash the negatives with another 6 changes of water, or until you no longer see the yellow color of the bleach come out from the tank.
7. Pour in the B bath-the negatives should be fully toned in a minute or two.
8. give the negatives a rinse of water.
9. pour in some fresh wash aid for 2 minutes.
10 give the negatives a final wash of 6 changes of water.
11. give the negatives a final photoflo rinse in distilled water, and hang to dry.

Unlike chromium intensifier, the sepia toning process goes to completion the first time you do it. Repeating the process will not add additional intensification. If it does not help your negative print better on either the grade of paper you attempted, or a lower grade of paper, then you are pretty much finished. The negative is thin beyond hope. But of course, NONE of you have EVER made a negative that bad, now, have you?

Sepia toning is rather taken for granted as many people do not care for the look of prints toned in it due to its strong coloration. When we do it to a negative, we are turning a possible vice into a virtue. You may now have a reason to buy some when you thought it was only used to color prints.

I hope this provides you with one additional trick that can either be used to help a negative that is weak, or to preserve a negative that is a special favorite of yours.

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