Allowing the Color Problem To Fade Away

Topics: Curves in Luminosity mode

Column first appeared: June 2000, *Electronic Publishing* magazine.

Source of this file: The author's draft as submitted to the magazine.

Author's comment: Along with my 1998 series on channel blending, this column laid the foundation for the Picture Postcard Workflow (PPW) I introduced in 2007. Its basics are still sound; only two parts are dated. First, in the age of turtle computing, Fade could operate considerably faster than the more flexible approach of using a duplicate layer set to Luminosity mode. Second, although the column is correct that curves work better in CMYK than RGB, channel blending is the opposite. In today's PPW, the luminosity step therefore takes place in RGB.

This archive, to be released over several years, collects the columns that Dan Margulis wrote under the *Makeready* title between 1993 and 2006. In some cases the columns appear as written; in others the archive contains revised versions that appeared in later books.

Makeready in principle could cover anything related to graphic arts production, but it is best known for its contributions to Photoshop technique, particularly in the field of color correction. In its final years, the column was appearing in six different magazines worldwide (two in the United States).

Dan Margulis teaches small-group master classes in color correction. Information is available at http://www.ledet.com/margulis, which also has a selection of other articles and chapters from Dan's books, and more than a hundred edited threads from Dan's Applied Color Theory list.

Allowing the color problem to fade away

It's easy to add contrast to an image, if you don't mind butchering its color.
A little-known, less-documented Photoshop feature can put your mind at ease.
Forget the color! It's easy to get it back, if you know the secret.

The millennium just ended saw a fair amount of analysis of what constitutes pleasing color.

It's tough to say that people like da Vinci and Ansel Adams and William Morris and Walter Sargent and Darwin were hacks, but of all the savants who have written about the issue, the most perceptive, in my view, was a 19th-century American physics professor named Ogden Rood. Have a sample.

"We forgive, then, a partial denial of the truths of colour more easily than those of light and shade, which probably is a result of the nature of the optical education of the race. For the human race, thus far, light and shade has been the all-important element in the recognition of external objects; colour has played only a subordinate part, and has been rather a source of pleasure than of positive utility."

Allow me to translate this into 21st-century English. Today, whether our work appears on press, on some kind of digital printer, or on the Web, our object is creating something that our client will like. Predicting what clients will like is a chancy exercise, but Rood offers good advice. He says, the client will cut us some slack on color fidelity, provided we hold contrast in the important areas of the image.

Range equals contrast

Show the pictures of the green pitcher below to a hundred random clients and (speaking as someone who has actually done this) almost all will say that the version at left is the worst and the one at right the best. The way of getting to the one at right is simple enough for a novice to grasp yet deep enough to confound experts, and attractive enough that everyone should know it, particularly the professional photographer.

Last time, we discussed one of the crudest, yet most effective, of Photoshop's tools: the Auto command, which produced the version at center below. Now, it's time to hit a more sophisticated variant, one that is as important to those who deal with excellent originals as the rest of us grunts who have to try to resurrect garbage.

Auto extends the range of the image, and range equals contrast and contrast equals detail, etc., etc. The problem, as we discovered last time, is that Auto can also introduce some highly undesirable color shifts.

That isn't occurring below, because the background behind the pitcher is a nearly perfect gray. I know this, because the photographer provided, although it is cropped out here, a grayscale that was essentially the same color as the background.

This file is for the moment in RGB, and all three channels are lightest on the left side of the pitcher just above the base. The Auto command maxes all three out there. This would be a very bad approach if the point in question really wasn't supposed to be white but had some kind of color associated

Definition and detail depend on a long range between the lightest and darkest parts of an object. The middle version, produced by Photoshop's Auto command, is better than the original at left, because it has lightened the background. But this benefits the entire image, not just the object of interest. Bottom right, a version done with curves followed by a reversion to luminosity (above right).
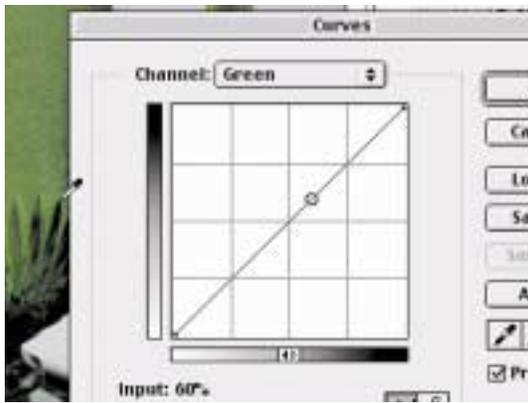
Finding an object's original range is easy: hold down the mouse button while the curve dialog is open. A circle appears (left) showing the value that's now underneath the cursor. Once the object's range is known, it is forced into a steep area of the curve in each channel. The curves at left (the pitcher's original range is shown in orange) produce the overly blue image at right. Fade to luminosity then completes the correction.
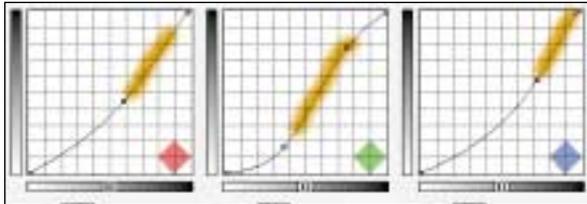
with it. Here, however, the background's neutrality makes life easy for the Auto command. The middle version is a lot better than the one at left.

It falls short of the one at right, however, and you need know nothing about color correction to understand why. Auto works because it extends range to the maximum. One can refine that approach. We should definitely extend range—but be more selective about what we make the beneficiary of all that added contrast.

Once the overall range is as wide as possible, any further gain in contrast comes with a price tag. You want to gain snap somewhere, you have to pay for it somewhere else. Fortunately, the choice here is a no-brainer. This photograph is of a pitcher, not a background. The center version's background is too contrasty, in my opinion. Even if I didn't think so, I would gladly make the trade exemplified by the right-hand version, where the background has less contrast, and the pitcher more, than in the center version.

To do this requires a basic idea of how curves work but extensive knowledge of how the color channels interrelate—unless you make it easy for yourself with the following method.

To find and to steepen
This method works in both CMYK and RGB. All it takes is a decision as to what parts of the image are important and which aren't. Assuming you're in accord that here the pitcher, not the background, is what's important, we can proceed to step two.

In the Curves dialog box, expose, with a Command-1, the first channel's curve, in this case the red. Hold down the mouse button, and drag the cursor across the pitcher. A small circle appears and moves about the curve. Note approximately where. Place points at both ends of the range that the pitcher seems to fall in. And twist.

The curve, now steeper in its range, forces extra contrast into the pitcher. The Auto command does somewhat of the same thing, but this is no scatter-shot method: it puts the contrast right where we want it, instead of spreading it over the entire image.

The red's range is basically the upper half of the curve. By putting a point near the center and dropping it, we can arrange for this half to become steeper. The blue is similar, but the range is less: it's confined to the top third of the curve, which we can make steeper than the red was.

In the green, which is the lightest of the three channels, the range is so much lower that an S-shaped curve can isolate its range. (All the curves in this column place whiteness at the origin and darkness at the top and right; if you prefer it the other way around the same methods will still work but the curves will be flopped.)

This powerful contrast-enhancing method works well—in black and white. Throwing three different curves at three different channels in a color file, however, is a good way to get something that looks weird, such as the version at the top of the page. Parts of the background have gone purple,

parts are blue, and the pitcher is generally the wrong shade.

That's the bad news. The good news is, it doesn't matter.

Tradeoffs and free lunches
One need not get caught in the cross-fire of the eternal war between color and contrast. The great reconciler is the realization that they can be treated as separate items. Many times the original contrast is rather lame, but the color is approximately correct. One can then attack the contrast *without* "correcting" the color.

There are at least four ways of doing this in Photoshop, the simplest being with the aid of a little-used and less-documented command, illustrated right next to the title of this column.

Directly after applying the curves choose Filter: Fade>100%>Luminosity. That last word, *Luminosity,* is Ogden Rood's big-ticket item. Choosing it means, restore the original colors, but retain the additional contrast. The image above is before that final command. The one at bottom right of the first page comes directly afterward.

If you are out for better contrast in the important parts of your image, and who isn't, this becomes one of your most important maneuvers. The reason people are deterred from using curves more often is a fear of throwing colors off. The luminosity move at the end prevents this.

Now, granted, this image is an absolute setup for the technique. There's only one object of importance and the background is utterly irrelevant. Usu-

ally we aren't so lucky, but in those cases the luminosity trick becomes even more crucial.

The second exercise features a church from the time of William Shakespeare. The basic approach is as with the pitcher, but here there's a complication. The sky and the buildings at rear aren't as important as the church but they aren't to be sneezed at, either. Trading some of their contrast for more in the church makes sense. Trading all of it in doesn't.

If it did, we'd use curves similar to the one in the green channel of the pitcher for every channel here. The church is more neutral than the

pitcher was, meaning that the range it occupies will be more uniform across channels. The pitcher was much darker in the blue and the red than in the green. The church is only slightly darker in the blue and green than in the red.

The sky, however, is not a neutral color. It's darkest in the red channel,
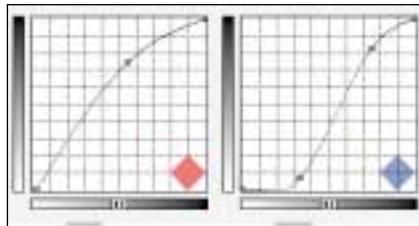
Now comes the horsetrading part. In principle, we need an S-shaped in every channel. The more extreme the S, the more contrast the church picks up. Annoyingly, the more extreme the S, the more the sky loses out, *except in the blue channel.*

The clouds are light in all three channels, but the sky around them is dark only in red and green. In the blue, the sky is about the same darkness as the clouds. In other words, we can hammer the blue channel pretty hard

Different channels have detail in different places. In the original (A) the clouds are well defined in the red channel (B) but not in the blue (C). In the blue we can therefore lighten the lightest point of the church without damaging the background. That wouldn't work in the red, as the clouds would be suppressed. Instead, (see cuives above) we steepen the range that starts with the clouds and ends with the darkest part of the church.

Monkeying with these two channels produces crazy color (D) but after fading to luminosity the result is (E). Contrast will generally be a bit better if the move is done in CMYK (F), rather than RGB, but either E or F is better than using the Auto command only (G).
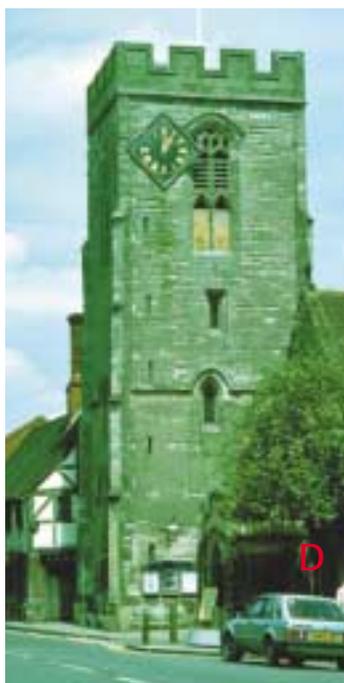
This type of curve/fade to luminosity maneuver works better in CMYK than in RGB. Here, the black channel is easy to exploit because there is no detail in the sky that could be damaged.

because there isn't any contrast in the sky for us to damage. The blue channel represents a free lunch.

The red channel also can be a free lunch, but not if we use an S curve. The church is slightly lighter than in the other two channels, and the sky slightly darker. Forgetting about the S shape, and instead simply raising the curve at the darkest point of the church, makes the curve steeper for both church and sky and improves both simultaneously.

Only in the green is there a clear tradeoff to be made. If you're willing to lose some contrast in the sky to make more in the church, use an S curve. If not, forget the green, as I did.

But if you work only on the other two, you'll get a blue church and a cyan sky, and you'll need the Fade to luminosity command afterwards.

The photographer's best friend

This method of improving an image comes with a significant limitation. The overall color has to be approximately right before trotting it out.

For run-of-the-mill images, this means you have to be capable of getting the color somewhere within reason. Using the white and black point eyedroppers, as discussed last time, is a tentative step in the right direction. Even more so is using the gray-color eyedropper to neutralize an area of the image that shouldn't have color associated with it, such as the center of the clouds in the church picture.

Powerful as the luminosity trick is

for everyday work, its greatest strength is for images that are on the fringes—very good ones, and very bad ones.

The very bad ones are more and more common these days. In such cases, we normally have to apply major curves just to get some semblance of contrast. In doing so, the color may change from merely awful to blood-curdlingly bad. Naturally, the luminosity scam is invaluable here—as we'll see next time.

But the biggest beneficiary of all is the professional photographer, especially one who works in studio conditions. Taking a good photo and repurposing it for print or for the Web is something that sounds like it should be a lot easier than it turns out to be.

It isn't considered mandatory for every photo to have maximum range. That is, the photographer rarely makes much of an effort to get extremely white whites and black blacks.

In print and web work, however, full range *is* necessary on every image, although many photographers have trouble grasping the point. If not, the picture, any picture, will look too flat in comparison to others nearby.

In short, that correction is needed before printing or posting on the web is in no way a reflection on the photographer or the photograph. It should, however, be a tonal, a contrast correction. If *color* correction is also needed, that *does* reflect on the photographer. As a matter of fact, if a photographer in studio conditions can't produce accurate color, this is a problem well beyond the scope of this column, as in, maybe the guy needs to find a new line of work.

A method that treats color as a problem already solved is ideal for someone who can pretty much guarantee good color. This describes most professional photographers.

The end of the beginning

Note that in this column, as in the last one, we've been working entirely in RGB. That didn't matter last time. This time it does. The method works in RGB. It works better in CMYK.

The idea is to exploit channels where one object can be attacked without nailing another. This happens more frequently in CMYK, which has four rather than three channels.

Example: in our image of the church, what to do in the red and green channels was up for discussion. In the blue, however, one would have to be a wacko not to want to increase contrast in the church, since in this channel the sky couldn't be hurt.

In CMYK, it's debatable what to do with the cyan and magenta channels, which correspond to the red and green, respectively, of RGB. The yellow could use the same treatment accorded to the blue, but the real gain is in the black. The black has no detail in the sky, either, so it can be targeted.

Furthermore, if you're so concerned about a certain object that you're willing to play the luminosity game, you should look into applying serious sharpening to the black channel. This is likely to be the best way to sharpen the image overall, and it isn't possible in RGB.

Whatever colorspace you work in, separating color from contrast is an idea whose time has come. This is the theory behind making corrections in the LAB colorspace, which many imaging professionals do regularly.

If you like this method, you will be pleased to know that Fade to luminosity works after most commands, including most Filters (especially Unsharp Masking!) One can use most painting tools in Luminosity mode. Layers and Adjustment Layers have the mode available as well.

Realize the power of the luminosity maneuver, and the truth of what Ogden Rood said about contrast and color, and the end of this column will actually be the beginning.