



# 4

## WORKING WITH COLOR

We are very sensitive to color, and our eyes are tremendous tools to see and compare color. The emotional and subliminal importance of color in our world cannot be denied. For retouchers, being sensitive to color values can make the difference between a so-so print and a print that looks as vibrant as the memories it represents.

The importance of color challenges us to work with our visual memory in combination with the best that Photoshop has to offer: Adjustment Layers, the Info palette, the Histogram dialog box, painting and selection tools, and Blending Modes. In this chapter, you work with color images to learn

- Additive and subtractive color correction with image variations and color balance
- Global color correction with Levels and Curves
- Selective and interchannel color correction
- Correcting color temperature problems

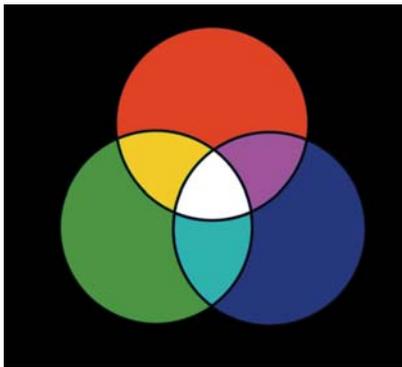
Many of the tools and techniques used to improve tone, contrast, and exposure discussed in Chapters 2, “Improving Tone and Contrast,” and 3, “Exposure Correction,” serve as the foundation for working with color. I highly recommend that you review those two chapters before diving into the wonderful world of color.



## COLOR ESSENTIALS

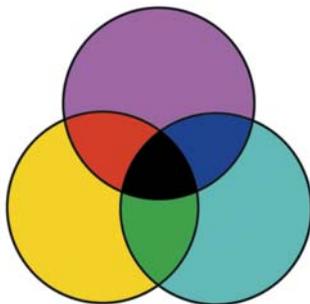
There are two types of color in the world: additive and subtractive. In the additive world, a light source is needed to create color. When the primary colors (red, green, and blue) are combined, they create white, as shown in [figure 4.1](#). Your monitor is an example of additive light.

In the subtractive world, color is determined by the absorption of light. When the secondary colors—cyan, magenta, and yellow—are combined, they create black-brown, as shown in [figure 4.2](#). Printing ink on paper is an example of subtractive color. In creating inks for print, impurities in the pigments result in a muddy black-brown when cyan, magenta, and yellow are combined. To achieve rich shadows and pure blacks, black is added to the printing process, which also cuts down on the amount of the more expensive color inks used.



**figure 4.1**

*The additive color space is formed by the red, green, and blue primary colors.*



**figure 4.2**

*The subtractive color space is formed by the cyan, yellow, and magenta primary colors.*

Combining additive primaries yields the subtractive primaries, and combining the subtractive primaries creates the additive primaries. For the retoucher, understanding this opposite relationship can be very useful when identifying and correcting color problems. For example, if an image is too blue, you have two ways to approach the problem: either increase yellow (which is the opposite of blue to neutralize blue) or decrease the blue in the image. Both yield the same result: an image with less blue.

In digital imaging, the four most prevalent color modes are RGB, CMYK, Lab, and HSB:

- RGB is the additive color space that monitors, scanners, digital cameras, and color slide film originals work or exist in. The advantages to color correcting and retouching in RGB include these: smaller file sizes; equal values of red, green, and blue will always result in a neutral color; and a larger RGB color space allows the file to be converted into multiple gamuts and repurposed for multiple final output destinations.
- CMYK (cyan, magenta, yellow, and black) is the subtractive color mode. Many people (especially people with prepress or printing experience) prefer doing color correction and retouching in CMYK because they are more comfortable with CMYK color values, and editing colors that are in the same gamut as your printer can help avoid unhappy surprises after the ink hits the paper.
- Lab is a three-channel color mode in which the black and white L (luminosity) channel information has been separated from the color information. The “a” channel carries red to green, and the “b” channel carries blue to yellow information, and it can range from +128 to -128. Lab is a device-independent color space used by color management software and by Photoshop when converting RGB files to CMYK. Color correcting in Lab is a delicate task, because the slightest move on the “a” or “b” channels can result in a very strong color shift. On the other hand, Lab is a useful color mode when you are adjusting exposure or

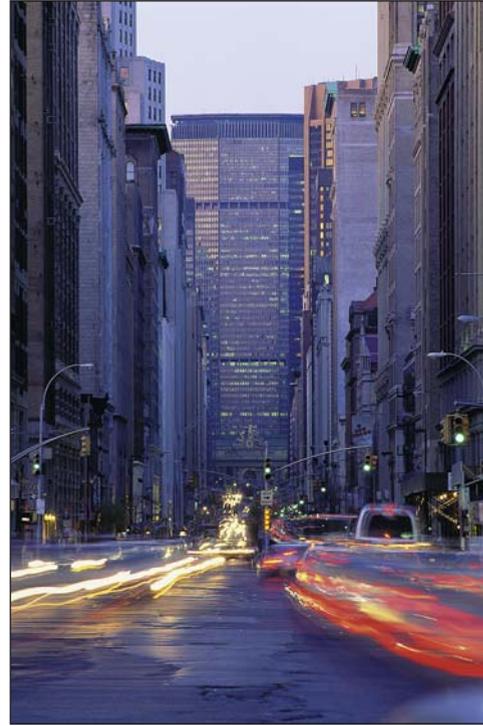
cleaning up color artifacts from digital camera files, as discussed in Chapter 5, “Dust, Mold, and Texture Removal.”

- HSB stands for hue, saturation, and brightness. Hue refers to the color, brightness refers to the amount of light in the color, and saturation determines the amount of color. You can take advantage of HSB to emphasize or de-emphasize color in portrait retouching, as shown in Chapter 10, “Glamour and Fashion Retouching.”

Each color mode has numerous pros and cons, all of which have been described in detail in *Real World Photoshop* by David Blatner and Bruce Fraser (Peachpit, 2002), *Professional Photoshop* by Dan Margulis (Wiley, 2002), and *Photoshop Color Correction* by Michael Kieran (Peachpit, 2002). Rather than reworking information that is well explained by these digital maestros, I propose we learn how to identify and correct colorcasts in antique and contemporary photographs.

### *(p)* Are All Color Casts Evil?

There are only two types of color casts in the world: those that accentuate the image and those that detract from the image. Positive color casts include the golden tones of the early morning or the cool blue cast on a late winter afternoon (see [figure 4.3](#)), the warm color created by candlelight, and the color tones created when the photographer filters the lens or light to create or accentuate the color atmosphere. Undesired color casts occur if the photographer used the wrong color film to take a picture, the picture has faded over time, light has leaked into the camera, a scanner introduces a color cast, or an undesired color is being reflected into a photograph (as the blue carpet is doing to the fur of the white cat in [figure 4.4](#)). I’m sure you’ve seen pictures taken in a stadium or in an office in which the color temperature of the light doesn’t match the color balance of the film used. The orange, red, or green color casts introduced by using the wrong color film or not compensating for the light temperature with photographic filters are both what I would categorize as undesired. Another example of an undesired color cast occurs when sunlight is filtered through green tree leaves and the people in the picture look slightly Martian-like.



© Alamy Photo

**figure 4.3**

Taken on a late winter afternoon, the blue light striking the buildings in New York adds to the mood of the image.



© Diane Tremblay

**figure 4.4**

This is an example of an undesired color cast. The blue carpet the cat is laying on is adding a blue tinge to the cat’s white fur.

## IDENTIFYING A COLOR CAST

The color correction process always starts by identifying the color cast—you have to know what the problem is before you can apply a solution. Color casts, also referred to as a *shade* or *tinge*, are easier to identify in lighter image areas, such as a white shirt or wall or in neutral areas. For example, a gray sidewalk would be a good place to look for a color cast. When evaluating an image for color, find a neutral reference, something that should be white, near white, or gray. If it looks—for discussion's sake—slightly blue, then you know that the image has a blue cast. Interestingly enough, clearing up the color cast in the lighter and neutral areas usually takes care of most of the required color correction work throughout the entire image.

The tools used to identify a color cast are your visual memory, the Info palette, the individual image channels, and practice. Color casts that are similar, such as blue and cyan or magenta and red, take a bit of practice to identify correctly. If you have a color cast in your highlights, nine times out of ten you'll have a color cast in the entire image. Just because color casts are harder to see in dark areas doesn't mean that they're not there. Once you have identified the color cast, think globally and take care of the general color cast problem first. Thankfully, correcting the big problem usually takes care of many of the smaller problems along the way.

## UNDERSTANDING COLOR CORRECTION WITH IMAGE VARIATIONS

If all this talk about identifying color casts is making your head spin, don't worry. Photoshop Variations (Image > Adjustments > Variations) is a very useful tool if you're just starting out or need a

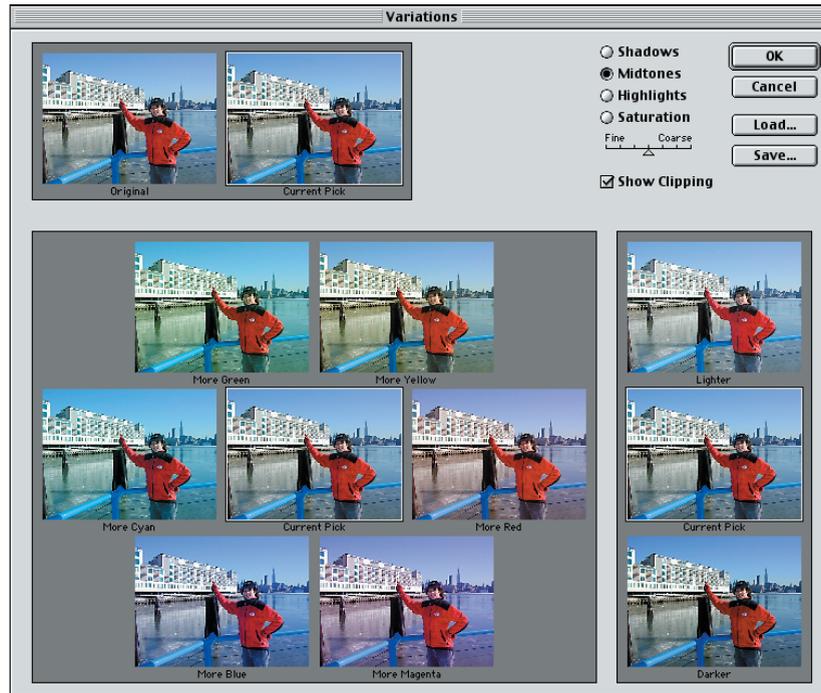
refresher on color correction. Variations is similar to the color ring-around chart that photographic printers have been using for years to see which way to move color when making a color print. The color correction part of Variations shows you six pictures, each representing one of the primary colors (red, green, blue, cyan, magenta, and yellow) opposite its counterpart (red to cyan, green to magenta, and blue to yellow), as shown in [figure 4.5](#). For example, if you have an image with a blue color cast, clicking the yellow image would add yellow and remove the blue.

Notice how easy it is to see the color change in the more neutral areas, such as the water and the building, while the saturated red of my jacket barely changes at all. This illustrates how easy it is to see color casts in neutral and light areas and how near to impossible it is to see color shifts in saturated areas.

Next to the OK and Cancel buttons are radio buttons that you click to control which image area to affect: Shadows, Midtones, Highlights, or Saturation. When using Variations to do color correction, I recommend that you start with the midtones and then refine the highlights. The only problem with Variations is that it is not an Adjustment Layer, so your color correction is applied directly to the image pixels. To ensure that you don't alter original image data, always work either on a duplicate file or duplicate the Background layer.

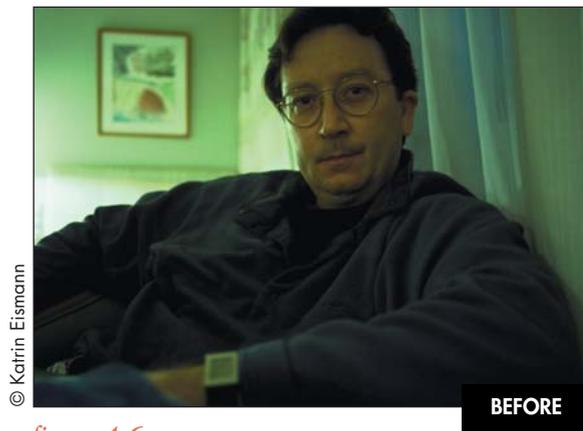
The original image shown in [figure 4.6](#) was taken indoors in fluorescent light with a digital camera that was set to daylight color balance, turning the image yellow-green. With a few clicks in Variations, the image is neutral and much more pleasing (see [figure 4.7](#)).

 [ch4\\_greenjohn.jpg](#)



*figure 4.5*

The Variations dialog box is a useful tool to identify color casts and offers you many options for color correction.

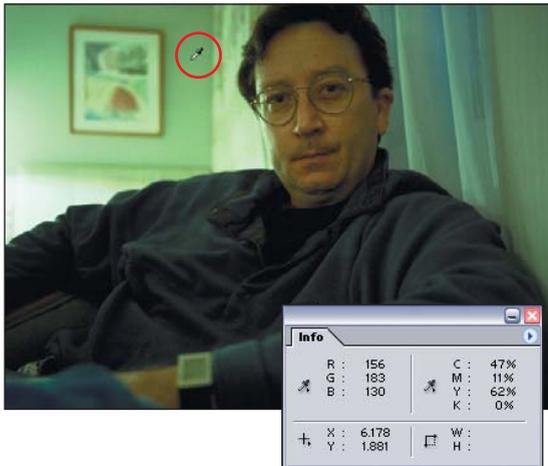


*figure 4.6*



*figure 4.7*

1. Use the Eyedropper tool and the Info palette to measure an area in the image that should be neutral. Because you haven't seen this room, how can you know what the real color is? Use your visual memory of a similar scene and you can guess that the wall in the background could be white or at least a very light neutral color. **Figure 4.8** shows the readout of 156 Red, 183 Green, 130 Blue.

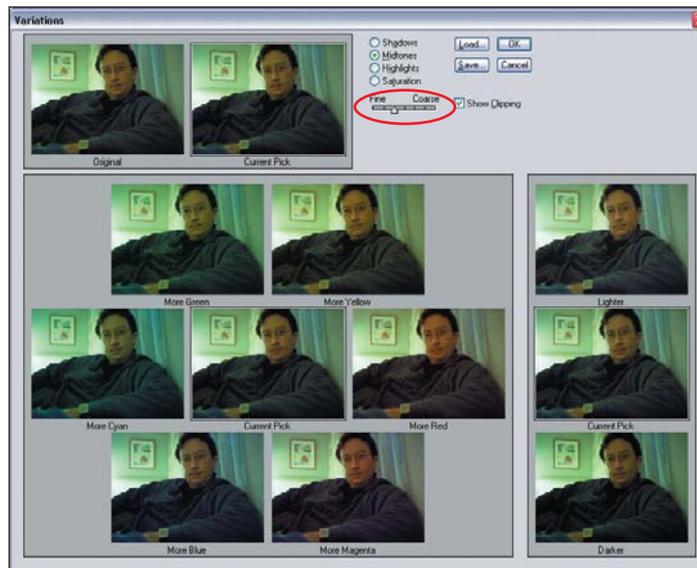


**figure 4.8**

Start by sampling an area you believe should be neutral and examining the color readout in the Info palette.

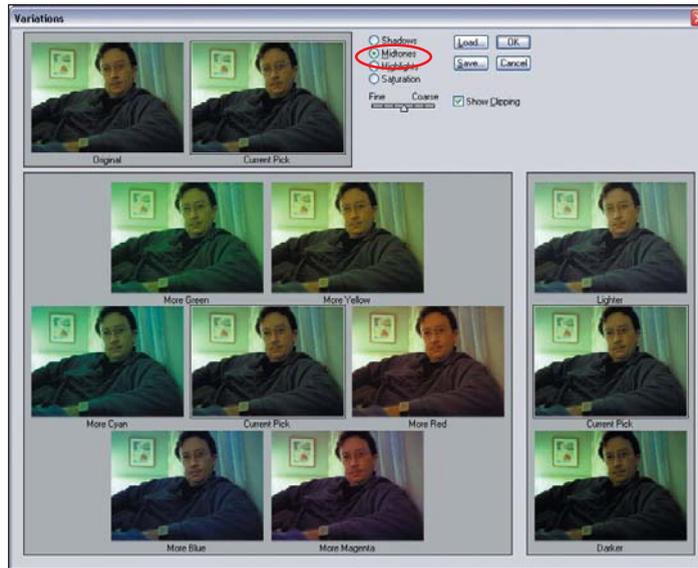
In relationship to the other colors, the much higher green readout in this example is a dead giveaway of a strong green color cast, and the low blue readout tells you that this image also has a yellow color cast. Properly adjusted, all three colors will be within one or two points of one another.

2. Duplicate the Background layer. This will protect the original pixels while you experiment with Variations to do the color correction.
3. Select Image > Adjustments > Variations and click the Midtones radio button. To see how Variations applies the opposite color principle, move the strength slider under the Saturation radio button to the right as seen in **figure 4.9**.
4. To work subtly, move the strength slider toward Fine to reduce the strength of each change, as shown in **figure 4.10**. Click More Blue to reduce the yellow, and then click More Magenta to reduce the green component. To strengthen any changes, just click the same color image again. Variations updates the center image to reflect the current change.



**figure 4.9**

Moving the slider controls the strength of the Variations change.



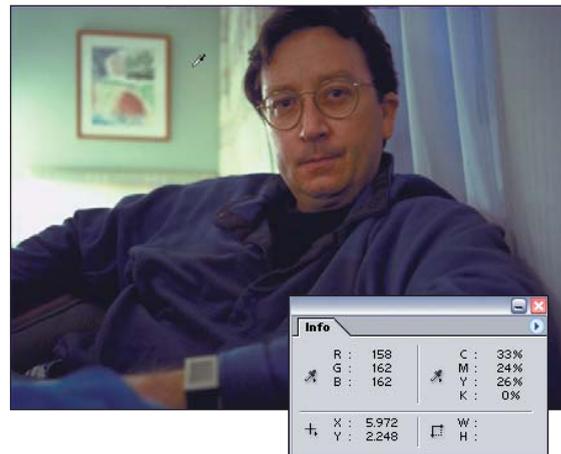
**figure 4.10**

Start your Variations color correction with the midtones.

5. Adding the blue and magenta into the midtones might make the image darker. You can offset this by clicking the Lighter image on the right side of the interface.
6. Finally, click the Highlight radio button and click More Magenta once or twice to take out the last vestige of the green color cast.
7. Click OK and compare the before and after images using (Cmd + Z) [Ctrl + Z] to undo and redo the Variations. Or toggle the visibility of the duplicated Background layer on and off to reveal the original Background layer.
8. You can also check the results with the Info palette as shown in **figure 4.11**, where the RGB readout is now 158, 162, 162, which is an acceptable neutral for a snapshot like this one.

### Tip

When using Variations, you can undo all changes by clicking in the upper-left corner of the original image.



**figure 4.11**

Check the neutral image areas with the Eyedropper and Info palette to double-check that the color cast has been removed.

Ron Hirsch, a retired engineer and reader of the first edition of this book, was kind and generous to send me an empirical analysis of Image Variations versus Photoshop Color Balance which explains how Image Variations results can be achieved with Color Balance. You can find this analysis as a PDF in the chapter 4 section of [www.digitalretouch.org](http://www.digitalretouch.org).

## MIMICKING THE COLOR DARKROOM WITH COLOR BALANCE

If you've ever done any photographic color printing, using Photoshop's Color Balance Adjustment Layers will seem familiar to you. Like Variations, it also works on the principle of increasing or decreasing opposite colors to color balance an image.

**Figure 4.12** shows a class photo that was taken in the middle of the summer on a very bright day. To soften the light, the group was positioned under a tree. The combination of shooting at high noon (when the light has a high color temperature with a high blue component) and the light coming through the leaves added a blue-green color cast to the image. This made the people's skin tones too cool. **Figure 4.13** shows the same image after I applied a Color Balance Adjustment Layer. People's skin tones are now less green and more red, and white shirts are actually white. Also notice that the grass in the picture isn't as green anymore. Because the subject of the image is the people and not the grass, it's okay to let the unimportant image areas (the grass) be less attractive. Concentrate on the essential, which, in this case, is the people's skin tone.



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**figure 4.12**



**figure 4.13**

 `ch4_group.jpg`

1. Check the image with the Eyedropper tool and the Info palette. Notice that the white shirts have a high blue value and the skin tones are also too green and blue (see **figure 4.14**). The white shirts show more blue because white with detail (white that is not overexposed) has a higher reflectance and will show the color cast much more readily.



**figure 4.14**

Checking the image with the Eyedropper and Info palette reveals the green and blue color cast.

2. Add a Color Balance Adjustment layer.
3. Always start the color-correction process with the most important image areas. In this case, the group's skin tones are more important than the shirts. Select Midtones for the Tone Balance and increase magenta (to decrease green in the image) by moving the Magenta-Green slider to the left (see [figure 4.15](#)). A green color cast can be similar to a cyan color cast, so I added 5 points of red to warm up the skin tones a touch.



**figure 4.15**

Work on the image midtones to remove the green color cast.



### Note

Red and magenta color casts can look very similar, as can blue and cyan, and green and yellow, and working on the similar color of the color cast can help clear up color problems. In this example, adding magenta reduced the green and the addition of red removed any traces of cyan.

4. Select the Highlights Tone Balance radio button, increase the red by 10 points, and decrease the blue with a 30-point move toward the yellow, as seen in [figure 4.16](#).



**figure 4.16**

Work on the image highlights to remove the blue color cast.

## GLOBAL COLOR CORRECTION

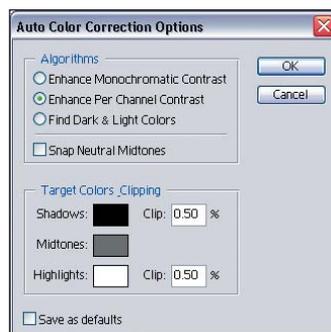
As you know by now, Photoshop often gives you three or more ways of reaching the same end result. Some people don't like this and believe that their way is the only way. Puh-leeze! Color correction is an art form that relies on your perception, experience, and interpretation of the image. With the following exercises, we'll use Levels and Curves to rescue some pretty sad photos from color cast fates worse than death.

### Using Auto Color Correction

New in Photoshop 7 is a much-improved Auto Color Correction function—one that you can control to achieve some remarkable results. I am usually the first one to shy away from anything with the word “auto” or “magic” in its name. The new Auto Color Correction offers a number of controls with which you can get into the color balance ballpark quickly and easily—especially when working with digital camera files. Once you understand how

Auto Color Correction works, it can save you a lot of time. Note that I am not referring to the Auto Levels, Auto Contrast, or Auto Color menu commands in the Image > Adjustments menu. I don't recommend those commands at all because you have no control over the values Photoshop uses to calculate the changes, and worst of all—you are not working with an Image Adjustment layer.

Both the Levels and Curves dialog boxes have an Auto button. Clicking Auto will perform the default corrections, regardless of where you access it. Because the interface is smaller with Levels, I use this one because I can see more of the image and get identical results. Clicking Options brings up the Auto Color Correction Options interface (see [figure 4.17](#)). It is here that you can cycle through the types of corrections or influence which values Auto Color references.



**figure 4.17**

The Auto Color Correction options can be set from either the Levels or the Curves dialog box.

The Auto Color Correction Options Interface has six settings that enable you to control how the color is affected:

- **Enhance Monochromatic Contrast:** Photoshop clips all color channels at once, using identical values for each, making shadows darker and light areas brighter. This is the same as Image > Adjustments > Auto Contrast, or moving the shadow and highlight slider in Levels to where image information begins on the RGB or CYMK composite histogram.
- **Enhance Per Channel Contrast:** Photoshop will adjust each channel separately. This is identical to moving the shadow and highlight sliders of the individual image channels to where the image information starts. This is how Image > Adjustments > Auto Levels works.
- **Find Dark & Light Colors:** Photoshop uses the lightest and darkest pixels in an image for the Shadow and Highlight values. This is the same as Image > Adjustments > Auto Color and may or may not introduce unwanted color casts.
- **Snap Neutral Midtones:** With this selected, Photoshop looks for a nearly neutral color in your image and then forces it to gray. Image > Adjustments > Auto Color uses this option.
- **Target Colors Clipping:** Enter values here to tell Photoshop the percentage of tones to ignore. For example, entering 0.02% for both Shadows and Highlights will skip the brightest and darkest 0.02% before starting calculations. The default 0.5% value is too high. If you want calculations to be based on non-neutral colors, clicking a color swatch will open the Color Picker, where you can choose any color as the Shadow, Midtone, or Highlight target.
- **Save as Defaults:** Clicking this tells Photoshop that these are the settings you want to use anytime you click the Auto button in Levels or Curves. Note: If you select this option, the Clipping value you enter will also be the new defaults for the Auto Levels, Auto Contrast, and Auto Color menu commands.

## The Beauty Is in the Auto Details

Now that Adobe has added the ability to control the Auto Color Correction, I find myself adding a Levels or Curves Adjustment Layer and clicking through the options to see what is going to happen. Many times the results are very good—if I pay attention to the details.

To get the best results from Auto Color, start by checking Find Dark and Light Colors and Snap Neutral Midtones and making sure that Save as

Defaults is checked. Don't worry if this ruins your image for now. By setting these as defaults, you're ensuring that Photoshop is starting with Auto Color when you click Auto in either Levels or Curves. Click OK. If making this change ruined your image, just choose Edit > Undo and the change to the image will be reversed, but the settings will be remembered.

To continue controlling how Auto Color works, reopen the interface to adjust the Target Colors Clipping values, which are both too high at .50% and will result in blocked up shadows and blown out highlights. Start by reducing the shadow value to 0 and using the up arrow on your keyboard to go up .01% at a time. Keep an eye on the image shadow and highlights; values lower than the default will create pleasant, open shadows with information and printable highlights that aren't pure paper white.

The midtone default of a perfectly neutral gray may or may not be the best choice for your images. In fact, the perfect neutral may be visually too cold. You can adjust the midtone, and best of all, as with the previous changed settings, the change is interactive.

In the image in [figure 4.18](#), the model car is a bit flat and due to the tungsten light, the overall image is yellow. Adjusting the midtone solves the problem.



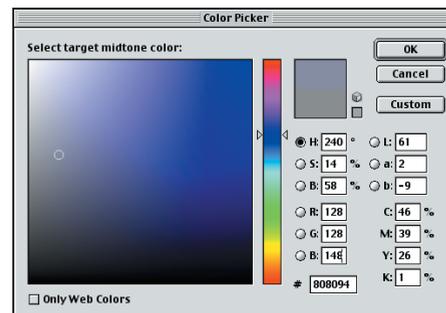
© Katrin Eismann

**figure 4.18**

*The neutral gray midtone default may not be the best choice.*

#### ch4\_bluecar.jpg

1. Add a Levels Adjustment Layer and click Options, which in this case brings up the default settings described previously.
2. To reduce the yellow cast, I clicked the midtone color swatch in the RGB values, left the red and green alone at 128, and raised the blue values by 20 points (see [figure 4.19](#)).



**figure 4.19**

*Adjusting the midtone by raising the blue value.*

3. You can achieve the same result by simply dragging the color picker circle within the color picker. Keep an eye on the image to see the effect. In this case, the yellow was minimized and as a bonus, the blue car became even bluer.

## Crop Before Clicking Auto

Consider cropping your image before using Auto Color Correction. David Bryant sent me the example in [figure 4.20](#), where he tried Auto Color Correction but was not happy with any of the results. It wasn't until he noticed and cropped out the narrow white border on the bottom and right edge of the print that the Auto Color Correction worked, as in [figure 4.21](#).

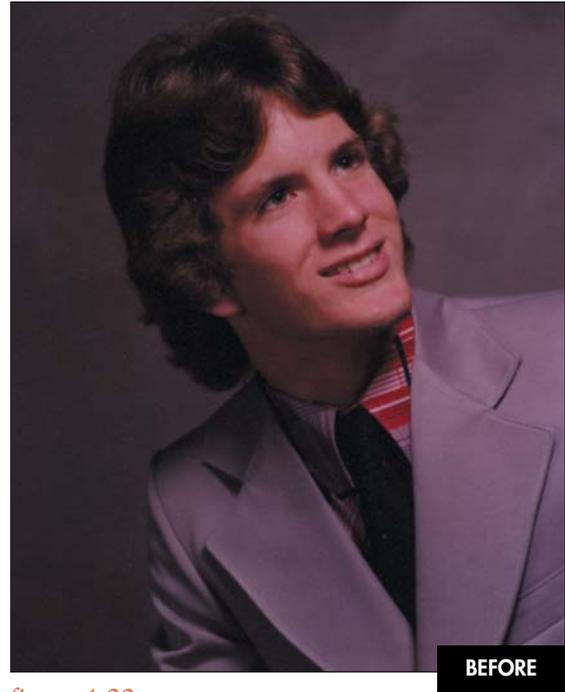


[figure 4.20](#)

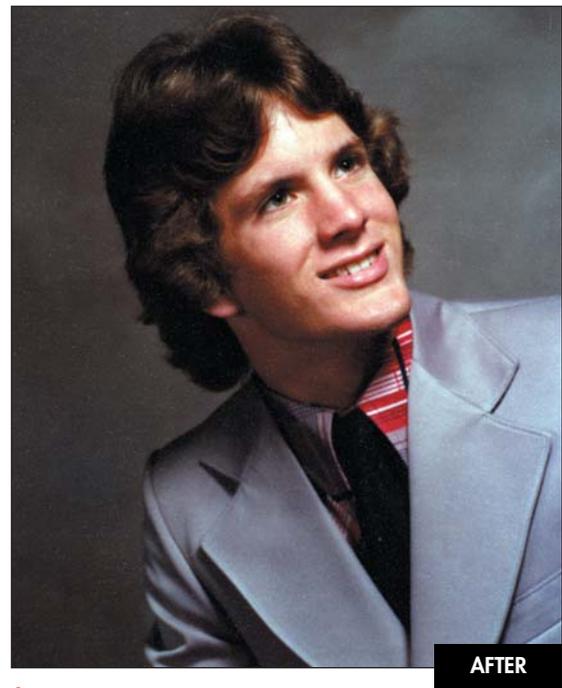


[figure 4.21](#)

The portrait in [figure 4.22](#) shows an unattractive color shift that is only too typical of color prints from the 1970s and 80s. Using our knowledge of Auto Color Correction, we can fix many of the overall color problems, as shown in [figure 4.23](#).



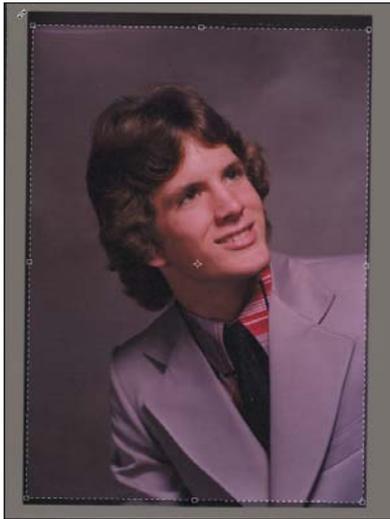
[figure 4.22](#)



[figure 4.23](#)

 ch4\_teenager.jpg

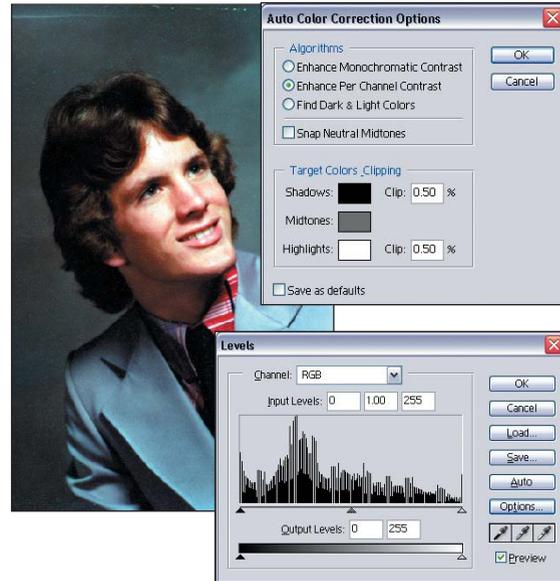
1. Crop the image to remove the white border. As [figure 4.24](#) shows, you can rotate the Crop tool to straighten out the image while cropping. To rotate your crop, move the mouse about a quarter-inch to the outside of the corner handle. The mouse will change into a curved arrow that you can use to rotate the crop bounding box.



**figure 4.24**

*Cropping and rotating the image before using Auto Color Correction.*

2. Add a Levels or Curves Adjustment Layer. In this example, I used Levels, because the dialog box is smaller and lets me see more of the image. Click Options to access the Auto Color Correction settings. You should see a change in your image as soon as Auto Color Correction Options pops up, and it's not a good change, as [figure 4.25](#) sadly illustrates. The image is now much too contrasty and coldly blue.
3. Click through the three options. With this image, Enhance Channel Contrast with Snap Neutral Midtones is the most effective. Because the default Clipping values are too high, I changed them to 0.20%, which reduced the highlights on his lapel and maintained image detail (see [figure 4.26](#)).



**figure 4.25**

*Add a Levels Adjustment Layer and Click Options.*



**figure 4.26**

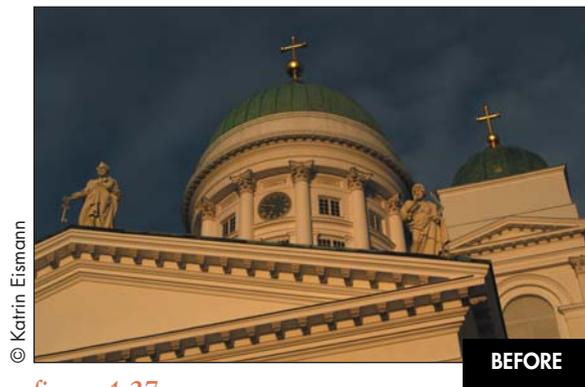
*Changing the Option settings from the defaults can make a big difference.*

4. Click OK to accept the Options settings and click OK on the Levels dialog box to commit the changes. Compare the image before and after Auto Color Correction by turning the Adjustment Layer visibility off and on.

All in all, explaining how to use Auto Color takes longer than actually making the changes to achieve good and quick results.

## Color Correction with Levels Eyedroppers

Working with the Levels or Curves eyedroppers to define the one, two, or three neutral areas of white, gray, or black will often remove a bothersome color cast. **Figure 4.27** shows a scene photographed with a Nikon D100 digital camera in the late afternoon in Helsinki, Finland. You'd never know it from the photograph, but the building exterior is actually snow white. With a few clicks in Levels, you can restore the gleaming white facade, as seen in **figure 4.28**. Please note: The color cast in this example is not typical of the Nikon cameras, rather it was my fault for taking the picture with the wrong camera settings while rushing around before sunset.



**figure 4.27**



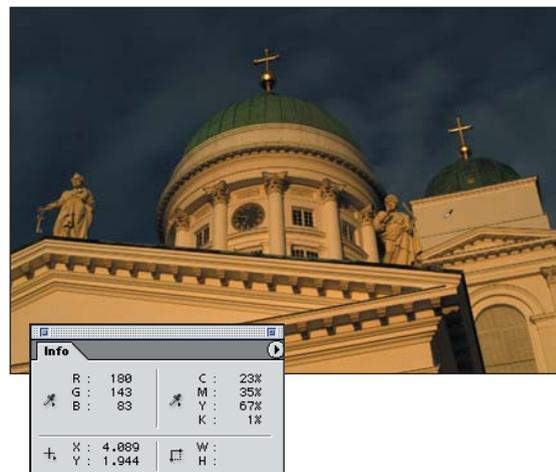
**figure 4.28**

 **ch4\_finland.jpg**

## Note

Before using the Levels or Curves eyedroppers, define the white and black target colors as described in Chapter 2 “Improving Tone and Contrast.” For printing to an inkjet printer, use the HSB scale and set the white target color to 96% brightness, or RGB 245, 245, 245, and click OK. Double-click the black eyedropper and set the shadow target color to 5% on the HSB scale, or RGB 12, 12, 12.

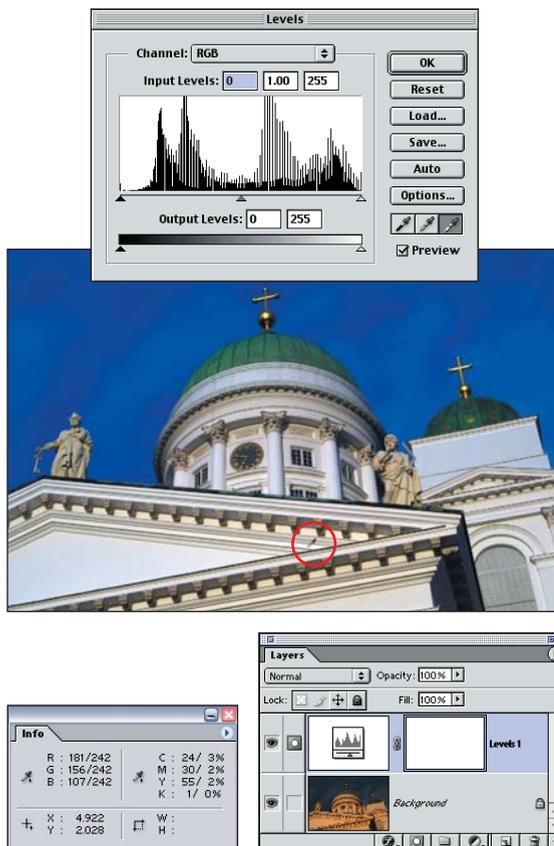
1. The first step is to identify the color cast. If you're working with a well-calibrated monitor and have a good sense for color, you'll see that the building is too yellow. If you're not sure about color or your monitor, use the Info palette. Set your Eyedropper to Sample 3 by 3 Average on the options bar, and look for something you know should or could be neutral. This image has large expanses of white, but every image will be different. When you position the Eyedropper over a neutral color, the Info palette will reveal the color cast (see **figure 4.29**). In this case, the very low blue value of 83 signifies that the image is very weak in blue, which translates to strong in yellow, so the image has a yellow color cast.



**figure 4.29**

The values in the Info palette help you identify the color cast.

- I added a Levels Adjustment Layer and selected the white eyedropper. I clicked the lightest part of the building to define a new white point. Clicking with the eyedropper not only redefines the pixels clicked to white; it also neutralizes them. In the Info palette, I noted that the values of red, green, and blue are equal, proving that I removed the color cast, as shown in [figure 4.30](#). You should experiment to find the best neutral points. Try as many areas as you like. Each click of the eyedropper will re-examine and adjust the image all over again.

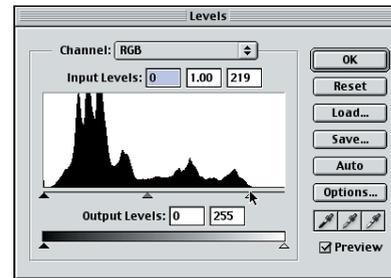


**figure 4.30**

Using the Levels white eyedropper to define a new white point improves overall color and contrast.

## Tip

(Option + drag) [Alt + drag] the Highlight slider to the left, as you see in [figure 4.31](#). Photoshop will reveal where the true highlight is. In this image, I ignored the lightest areas in the specular highlights of the golden crosses and concentrated on the building as circled. This technique works for the shadow point as well.



**figure 4.31**

Finding the highlight point of an image.

- Next select the midtone eyedropper and click the shady side of the building, as shown in [figure 4.32](#). If you think about it, a white building in the shade should be gray, so this is a good way to find a neutral midpoint.

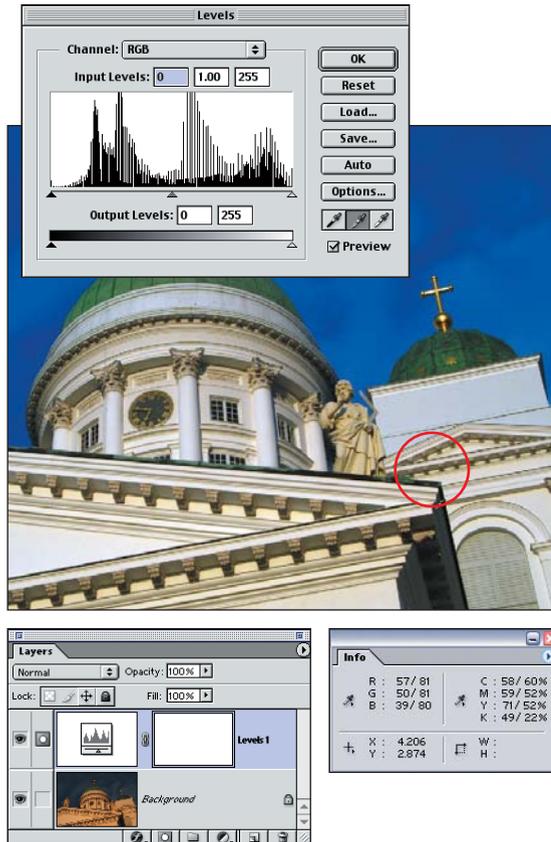


figure 4.32

Using the Levels gray eyedropper to define a neutral mid-point removes even more of the color cast.

4. On many images, correcting for the white point and midtone may be enough. However, on this image, I also selected the black eyedropper and used the darkest of the little windows to set the new black point (see figure 4.33).
5. After defining the white and black points, take a second look at the image. If the image looks too dark or too light, use the midtone slider to lighten (by moving the midtone slider to the left) or darken (by moving the slider to the right).

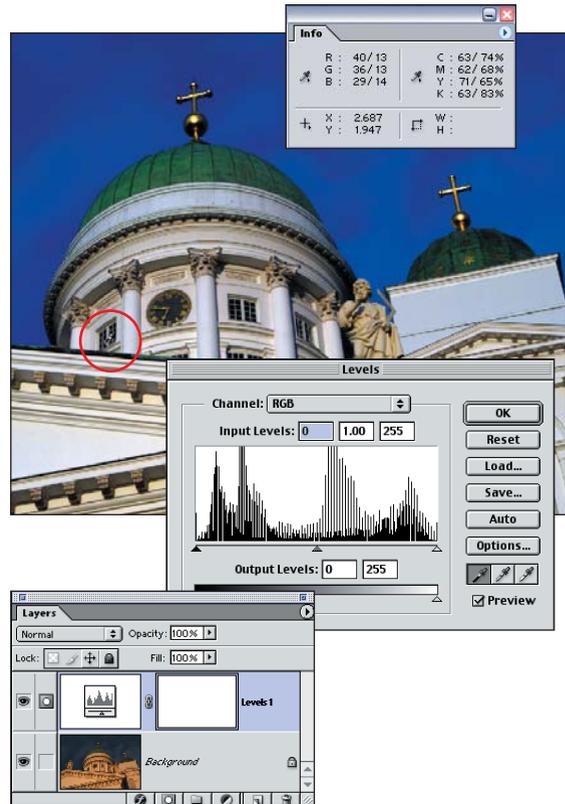


figure 4.33

Using the black eyedropper on a black point improves image density. Notice that it makes the sky come to life!

## Multiple Color Corrections with Levels

Often, pictures taken at the same time will share the same problems. Whether it was bad lighting, bad processing, bad storage, or simply bad luck, you can save time and effort by fixing one, then applying that same adjustment to the rest.

The images in figure 4.34 were all taken at the same event, and all suffer from the same unfortunate lighting. By using a Levels adjustment layer on one, then sharing that same adjustment layer with the others, I was able to fix all four, as seen in figure 4.35, without four times the work.

© Katrin Eismann



**BEFORE**

**AFTER**

figure 4.34

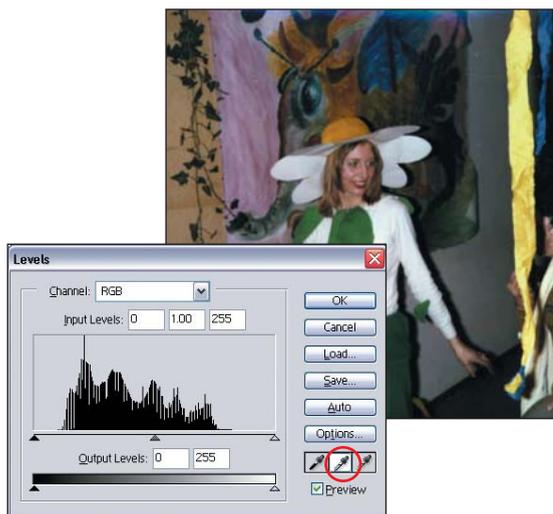
figure 4.35

1. First we need to adjust one of the images using the Auto Color Correction technique addressed previously. Add a Levels Adjustment Layer and click Auto. As [figure 4.36](#) shows, the initial Auto Color setting is rather good, but we can still improve the image with one more click.
2. We have an ideal neutral reference source to work with—the white wall in the background. Notice how the right side is still slightly green? By clicking the wall with the gray Levels eyedropper, the last hint of the color-cast is removed as seen in [figure 4.37](#).



**figure 4.36**

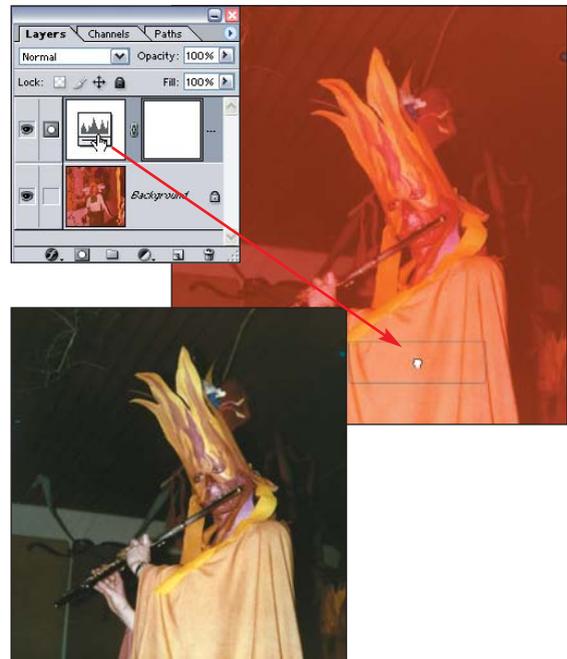
Using only Auto Color.



**figure 4.37**

Correcting the color by clicking on the white wall with the midtone eyedropper.

3. Click OK to accept the image correction.
4. Without closing your corrected image, open another of the problem images and drag the adjustment layer from the corrected image onto the second image, as in [figure 4.38](#). This applies the same correction to the new image.



**figure 4.38**

Dragging the adjustment layer to a new image.

## Subtle Color and Exposure Improvement with Curves

Not all images have overwhelming or obvious color casts. In fact, some images require a delicate touch to remove the color cast and adjust exposure. In this example, the photograph is off just a bit—meaning that it is only slightly too dark and red (see [figure 4.39](#)). In this example, I set new black, white, and gray points and improved the exposure with a Curves Adjustment Layer, and then fine-tuned the overall saturation with a Hue/Saturation Adjustment Layer. These changes, shown in [figure 4.40](#), enable you to appreciate the beauty of the young woman.



© Phil Pool

**BEFORE**

figure 4.39

**AFTER**

figure 4.40

 **ch4\_flowergirl.jpg**

1. Add a Curves Adjustment Layer. Use the white eyedropper to set the wall just above her flower to white, the black eyedropper to set the shadow beneath her chin to black, and the gray eyedropper to set the wall in the upper left as neutral gray (see figure 4.41).

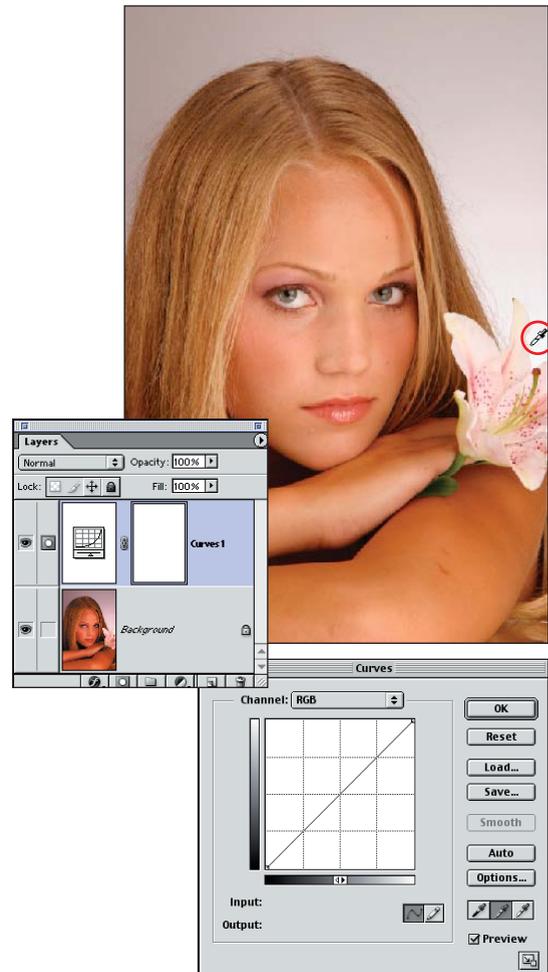
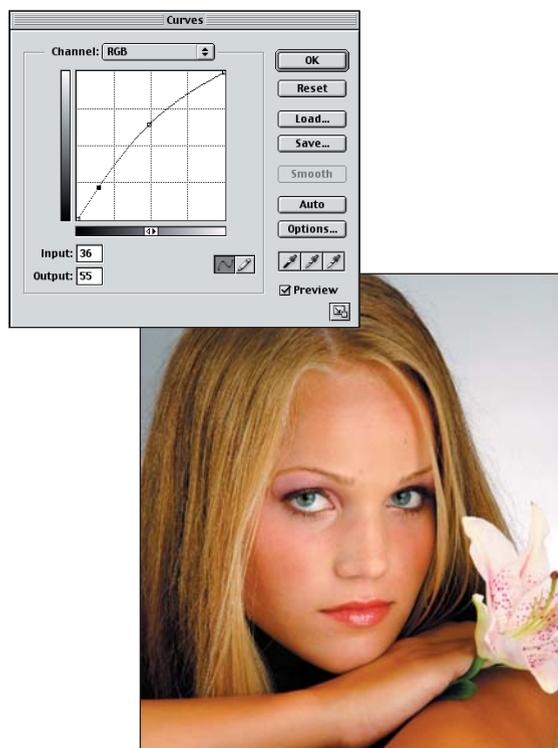


figure 4.41

Setting new white, black, and gray points using the Curves eyedropper.

- Boost the shadows and midtones by dragging the center of the curve upward to lighten the image and add the sparkle of a well-exposed photograph (see [figure 4.42](#)). Be careful to monitor the highlights on the girl's skin and flower in the Info palette so they are not forced to pure white.

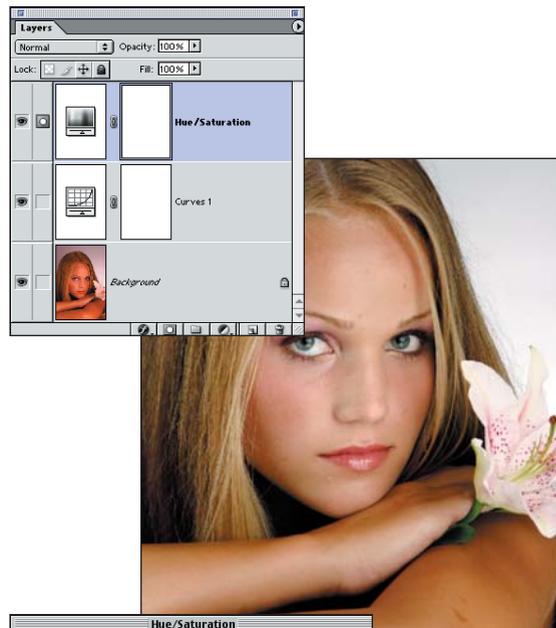


**figure 4.42**

Lighten the image with Curves.

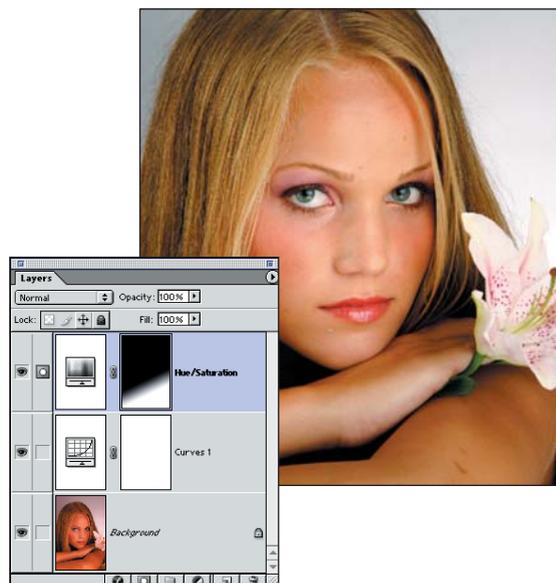
- Not all portraits require the following step, but in this instance the teenager's tanned arms are over saturated and visually distracting. To reduce the saturation, I added a Hue/Saturation Adjustment Layer and decreased the overall saturation by  $-25$ , as seen in [figure 4.43](#).

Using the gradient tool set to default black and white, I drew a gradient on the Hue/Saturation layer mask to shield the face from the desaturation, as shown in [figure 4.44](#).



**figure 4.43**

Decreasing the saturation reduces the heavy orange cast.



**figure 4.44**

Taking advantage of the layer mask to control where the change takes place.

## Using Curves with Luminosity

In most cases, using the target eyedroppers in Levels or Curves is an excellent method for removing color casts and adjust image contrast. But as with all good things, sometimes they do add unwanted density or saturation. To avoid the unwanted punch, combine the power of a Levels or Curves Adjustment Layer with the Luminosity Blending Mode, as shown in [figures 4.45](#) and [4.46](#).



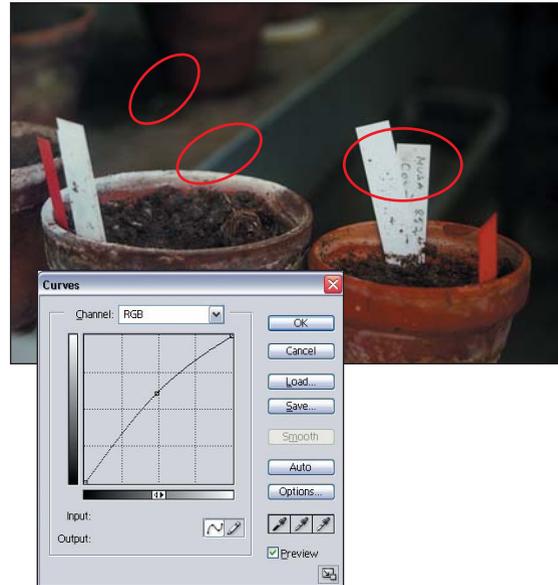
[figure 4.45](#)



[figure 4.46](#)

### ch4\_flowerpot.jpg

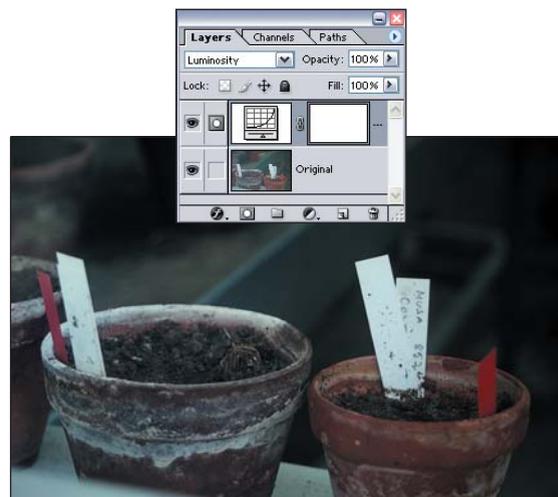
1. I used the Curves black, gray, and white eyedroppers on the areas indicated in [figure 4.47](#) and opened up the exposure with one Curves adjustment. This added too much false saturation to the clay pot.



[figure 4.47](#)

Using eyedroppers and a Curves adjustment makes the image too saturated.

2. Changing the Blending Mode of the Curves Adjustment Layer to Luminosity as seen in [figure 4.48](#) offsets the unwanted saturation while maintaining the neutral tonal values. Toggle the Blending Mode from Luminosity to Normal to appreciate the difference.



[figure 4.48](#)

Changing the Adjustment Layer Blending Mode to Luminosity lessens the false saturation.

## THE NUMBERS DON'T LIE

You're tired, had a fight with the dog, the kids played with the monitor dials, and you're just not sure what the original image really looked like. Many factors, including your mood, age, gender, and the second drink last night, can influence your color vision. So what are you supposed to do if the files are piling up and you have to get them done before going home tonight? When in doubt, do your color correction by the numbers to balance images with a mathematician's precision.

Working by the numbers entails monitoring the values in the shadows, midtones, highlights, and skin tones while you adjust individual color channels with Levels or Curves. When the highlight, midtone, and shadow RGB values are equal, your color cast problems will disappear. Working with skin tones (also called *flesh tones*) takes a bit more interpretation because people's skin varies with age, race, and sun exposure (this is addressed in a later section, titled "Balancing Skin Tones with Curves").

### Tip

Here are some specifics for color correcting by the numbers with RGB files:

- To balance highlights: Use the highest value in the Info palette as the target and match the lower values to the higher.
- To balance midtones: Use the middle value as the target (as read in the Info palette) and match the higher and lower values to the middle one.
- To balance shadows: Use the lowest value as the target (as read in the Info palette) and match the higher values to the lower.

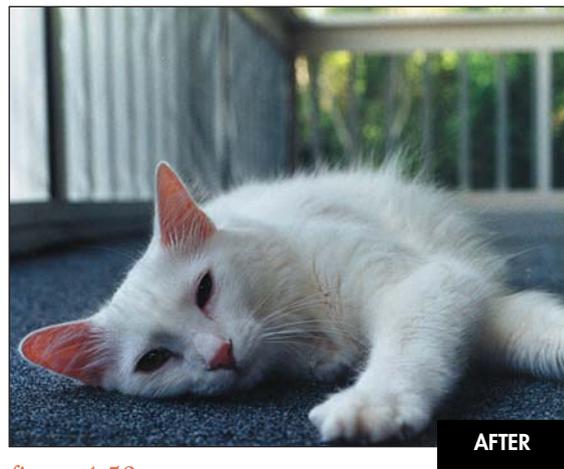
## Balancing Neutral Tones with Levels

Color correction by the numbers always begins with you identifying reference points. Look for a highlight, a neutral midtone, and a shadow point to reference. In the following example, I used the cat's forehead for the highlight reference point, a shadow on the railing as the midtone reference,

and the shadows under the railing as a dark reference point. In the example in [figure 4.49](#), the carpet is making kitty blue. After a color correction, she looks very contented, as shown in [figure 4.50](#).



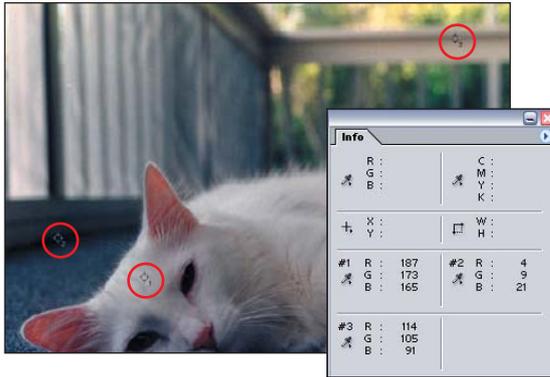
[figure 4.49](#)



[figure 4.50](#)

### ch4\_bluecat.jpg

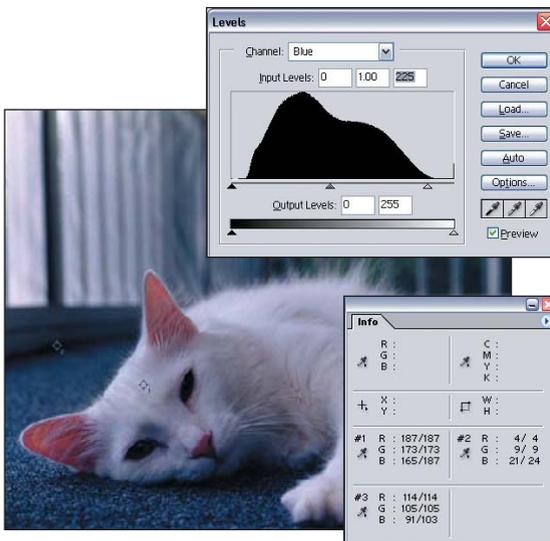
1. Add Color Samplers to the highlight (forehead), the shadow (darkest shadow under the railing) midtone (shadow on the top railing) as reference areas, as shown in [figure 4.51](#).
2. Add a Levels Adjustment Layer. To eliminate the color cast in the highlights, the three RGB values should all be made equal by matching the two lower values to the highest value. In this example, the 187 readout of the Red channel is the highest value and will be the target number to match.



**figure 4.51**

Adding the Color Sampler reference points. The readout of the #1 Color Sampler is measuring and monitoring the image highlights. The lower green and blue values reveal the color cast.

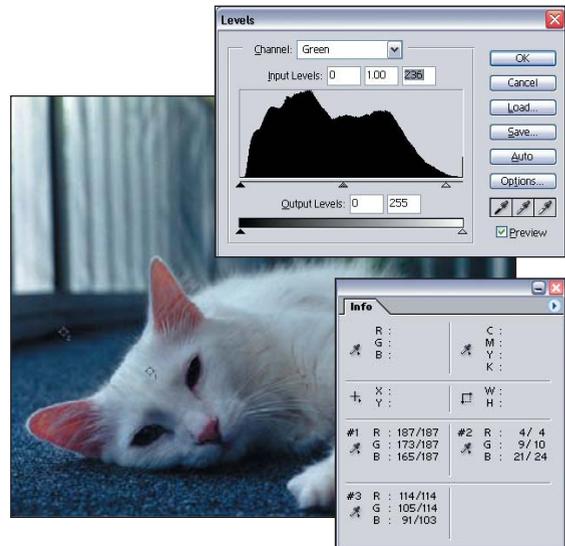
3. In the Levels dialog box, I selected the channel with the lowest highlight value, the blue channel, and lowered the highlight value (the field farthest to the right) by tapping the down-arrow key until it matched the target of 187 in the Info Palette readout (see [figure 4.52](#)). This does not change the Input level in the Levels dialog box to 187, but rather adjusts the Input Level until the number for the blue channel in the Info palette reads 187.



**figure 4.52**

Increase the blue channel highlight value to balance the highlights.

4. I then selected the green channel, placed the mouse cursor in the highlight field, and tapped the down arrow until the green value in the Info palette was 187, as shown in [figure 4.53](#). Again, be sure to look at the numbers in the Info palette and match the two lower values to the highest value.

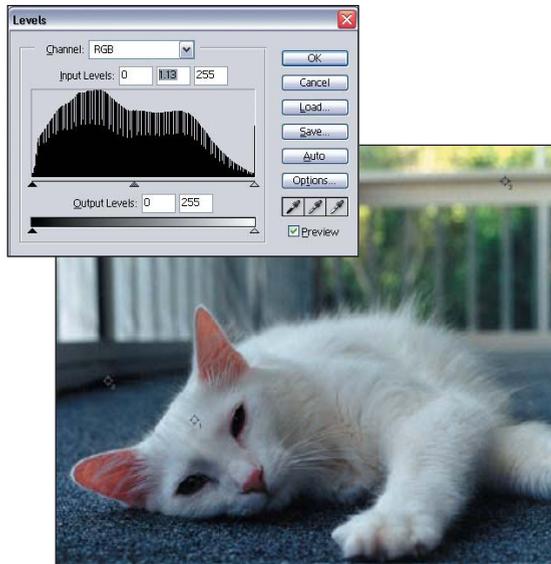


**figure 4.53**

Increase the green highlight value to balance the highlights.

5. When balancing shadows (marked by Color Sampler #2), use the lowest number as your target. In this example, the red values are the lowest, and I reduced the green and blue values a touch to match the target value of 4. Select the green channel and click in the Input Levels shadows box, and use the arrow keys to raise the green shadow to match the target of 4. Repeat on the blue channel to match the target of 4.
6. To balance the neutral areas, I worked with the midtone target values (on the top railing) by changing the midtone value (marked by Color Sampler #3) to match the median value of 114. In this example, I matched the red and blue channels to the 114 value of the green channel. Click in the Input Levels midtones box, and adjust the value by tapping the arrow keys.

- Finally, I opened up the midtones by moving the composite (RGB) midtone slider to the left just a bit, as shown in [figure 4.54](#).



[figure 4.54](#)

Open up the midtones by moving the midtone RGB slider to the left.

After adjusting the highlights and then moving on to the midtones or shadows, you may notice that the highlight values change again. This may happen because Photoshop is referencing the color settings in the Color Preferences and is adjusting the highlight to reflect your color settings. If the highlights are within 1–2 points of one another, the print will be neutral. When I use this technique, I lay more value on the highlights versus the shadows, and I keep an eye on the highlights more fastidiously.

You may be wondering why I just didn't use a Levels or Curves adjustment layer and click the cat's forehead with the white eyedropper. But doing that would have forced the cat's fur to a very light white and I would have lost a lot of the white fur detail, as you see in [figure 4.55](#).



[figure 4.55](#)

Using the Levels white target eyedropper on areas that need to maintain tonal detail may force the area to paper base white, which is undesirable.

## Balancing Skin Tones with Curves

Most of the recognized color values for reproducing skin tones are based on prepress experience and are therefore expressed in CMYK values. The schematic in [figure 4.56](#) shows that at one end of the spectrum the skin of a light baby has equal amounts of yellow and magenta without any cyan or black. Moving to the other end, as people mature, the amount of yellow increases in relationship to the magenta. The tanner or darker they are, the higher the amount of cyan ink is. The far end of the spectrum represents people of African descent with the additional black ink needed to accurately represent darker skin.

Here are some specifics for color correcting by the numbers on skin tones in CMYK files:

- In light-skinned babies and young people, yellow and magenta are equal.
- In adults, yellow is up one-fifth to one-third greater than magenta.
- Cyan is around one-fifth to one-third lower than magenta value and makes people look tanner and darker.

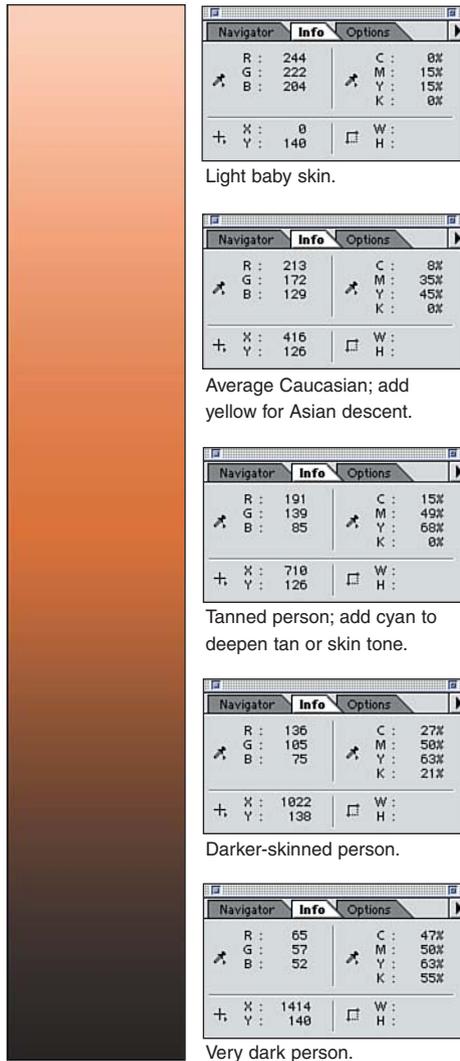


figure 4.56

CMYK representation of skin tones is shown here.

- Only people with very dark skin should have noticeable amounts of black ink in their skin tones.
- Find the cyan value; magenta should be double that of cyan, and yellow should be around one-fifth to one-third higher than magenta (20c 40m 50y).

As Dan Margulis explained in the online ColorTheory discussion group, “Persons of Hispanic or Asian ancestries tend to share approximately the same range, which is roughly the same as the dark

half of the Caucasian population. Persons in these ethnic groups always have significantly more yellow than magenta, normally 10 to 15 points. Cyan plus black tends to be one-quarter to one-third of the magenta value, occasionally higher in the case of unusually dark or very tan skin.”

“The ethnicity loosely known as black or African-American has a much wider range of possibilities than any other. Cyan is usually at least one-third of the magenta value but there is no upper limit and there may also be significant black ink. In the case of someone with light (“coffee-colored”) skin, the yellow is significantly higher than the magenta. However, unlike other ethnicities, as the skintone gets darker, the variation between magenta and yellow decreases, so that in the case of a very dark-skinned person, the values would be almost equal.”

Visit [www.retouchpro.com](http://www.retouchpro.com) to download Bruce Beard’s skin and hair color reference charts, as shown in figure 4.57.

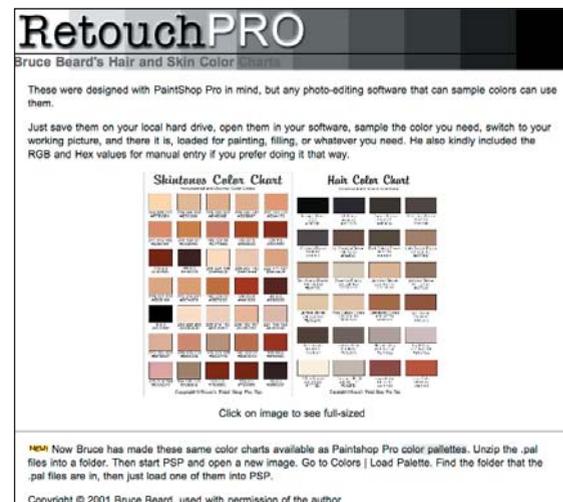


Figure 4.57

Download Bruce Beard’s skin and hair color charts.

Color correction in RGB is dependent on the Photoshop color space in which you are working. If you use the wrong working space, the numbers may look awful even though they should be correct. I personally have had fewer problems with skin tones when using ColorMatch RGB because it has a narrower color gamut and is less saturated.

When color correcting skin tones in RGB, keep the following in mind:

- Red is the opposite of cyan, and it will be the highest color component.
- Green is the opposite of magenta, and it will be one-fifth to one-quarter lower than red.
- Blue is the opposite of yellow, and it will be the lowest value—anywhere from one-third to one-half the value of the red values.
- The lighter-skinned the person is, the closer to equal these RGB values will be, with red being slightly higher.
- The darker-skinned the person is, the lower the blue values will be.

### Tip

These tips will help you when working with portrait color correction and retouching:

- When correcting in RGB, set the Info palette's second readout to CMYK and watch the relationships between the two color modes.
- To get an overall feel for the skin tones of a person, measure an average medium value on the person's face. Avoid dark shadows and extreme highlights.
- A woman's make-up can distort the readout. Try to avoid areas that have a lot of make-up, such as cheeks, lips, and eyes.
- Collect patches of various skin tones (see [figure 4.58](#)). Select a color-corrected patch of skin, run the Gaussian Blur on it to destroy any vestige of film grain, copy it, and create a file with various skin tone swatches. Refer to these skin colors when color correcting and during advanced portrait retouching sessions.

 [ch4\\_skinpatch.jpg](#)



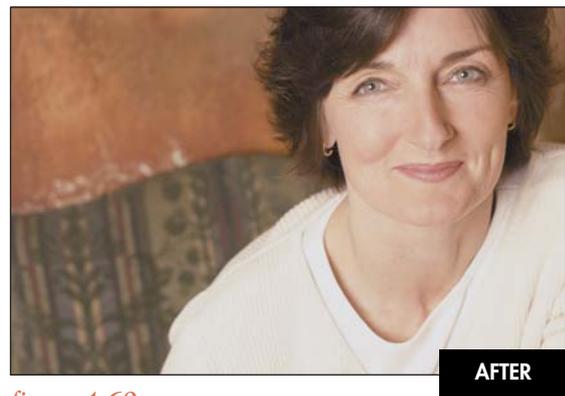
**figure 4.58**

*A collection of blurred skin samples can be used as a reference for color correction.*

In [figure 4.59](#), the original picture suffers from a color problem, but I'm not even sure what the problem is. In fact, there are many times when I can't seem to identify the problem, which is exactly when I rely on the Info palette and the color correction by the numbers technique to create a pleasing image (see [figure 4.60](#)).



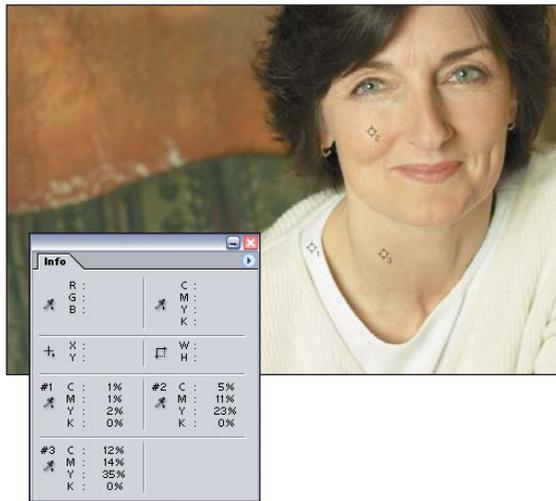
**figure 4.59**



**figure 4.60**

 [ch4\\_grnwoman.jpg](#)

1. Start by clicking the Eyedropper in the tool-bar, drag down to the Color Sampler tool, and add three Color Samplers to the image: one on the lightest part of the sweater, and two on the skin (one on the cheek and one on the neck), as shown in **figure 4.61**. The reason for the one on the neck is that there is rarely make-up there.



**figure 4.61**

Thoughtful placement of Color Samplers is an essential first step for any critical color correction.

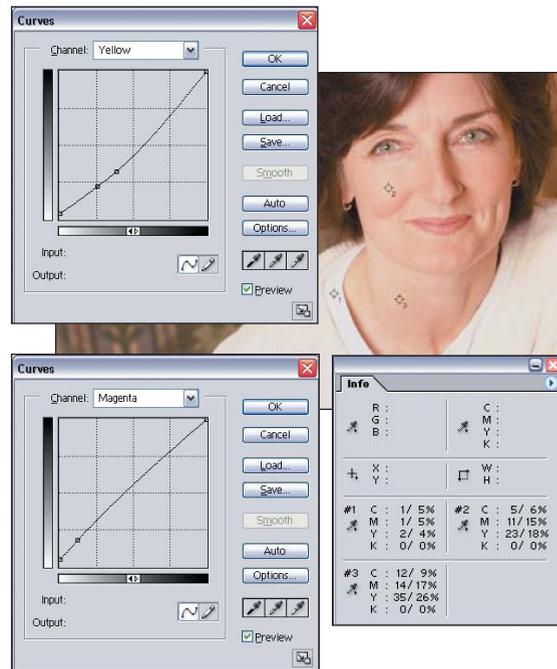
2. Next, add a Curves Adjustment Layer and click Color Sampler #1 with the white eyedropper. This defines a neutral value and sets the highlight to the correct printing density, as shown in **figure 4.62**.



**figure 4.62**

Clicking the whitest highlight that still contains detail with the white eyedropper.

3. I looked at Color Samples #2 and #3 on the Info palette and saw that there was too much yellow and not enough magenta in the skin-tones. To target the exact skin values you want to correct, activate the curve that needs adjusting. In this case, I started with the yellow curve, moved the mouse into the image, and (Cmd + clicked) [Ctrl + clicked] the area in the image to add a handle onto the curve, as shown in **figure 4.63**.



**figure 4.63**

Using the individual yellow and magenta curves to correct the skintones.

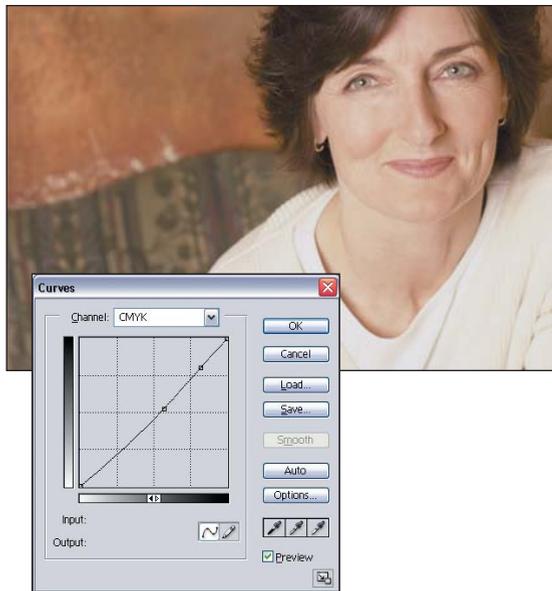
4. By pulling the yellow curve down, I reduced the yellow, and on the magenta curves, I increased magenta to remove the green color cast and make the woman look healthier.

### Tip

While in the Curves dialog box, (Cmd + click) [Ctrl + click] the area that you want to change to add a handle to the curve that you can manipulate with the mouse or the arrow keys.

Pressing Ctrl + Tab on both platforms will move from point to point on the curve.

5. Finally I lightened the overall exposure using the composite (CMYK) channel, as shown in [figure 4.64](#).

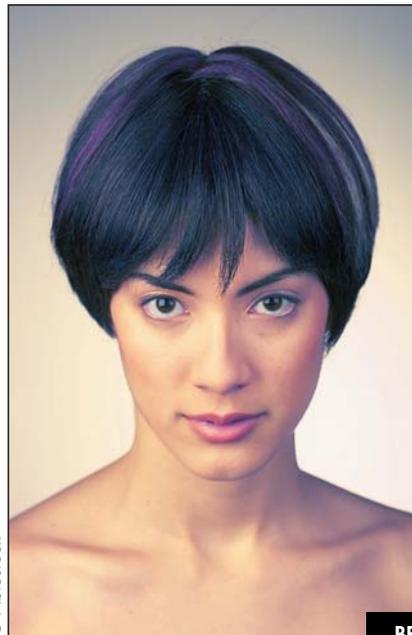


[figure 4.64](#)

*A final tweak of the exposure using the composite channel.*

## Combining CMYK and RGB

Scanners and digital cameras capture image data in RGB; therefore, many of your images will be in RGB. As mentioned, many of the known skin-color values are in CMYK. Color correction in CMYK offers you the additional control of being able to change the black plate and, in the case of skin tones, the cyan plate, which, if it is too high, can make a person look pasty. I am not recommending converting an RGB file to CMYK, making the color corrections, and then converting back to RGB. Unnecessary mode changes should be avoided to reduce rounding errors and file decimation. But there is a way to color correct a portrait in CMYK that results in an RGB file without image degradation. The portrait in [figure 4.65](#) is the original image captured with a Nikon D1x as an RGB file, and [figure 4.66](#) is an RGB file that was corrected in CMYK without converting the original file to CMYK.



**BEFORE**

[figure 4.65](#)



**AFTER**

[figure 4.66](#)

In this example, the skin tones have too much yellow, as the Info palette readout reveals in [figure 4.67](#). The yellow is 50% higher than the magenta.

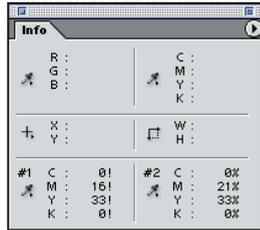


figure 4.67

The Info palette shows the skin tones are too yellow.

1. Select Image > Duplicate, and then Image > Mode > CMYK. Working on this duplicate file, I dropped down to the yellow curve and added a handle by (Cmd + clicking) [Ctrl + clicking] the woman's cheek. I moved this handle down to reduce the yellow (see figure 4.68).

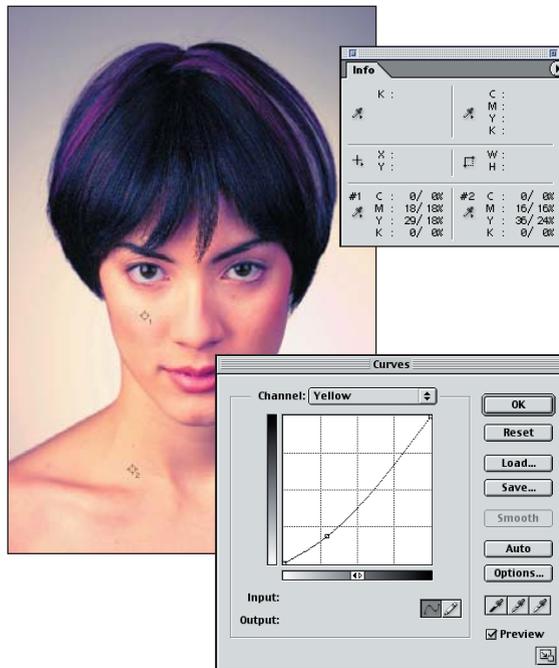


figure 4.68

Reducing yellow with Curves.

2. I returned to the composite CMYK curve to lighten the exposure slightly, as seen in figure 4.69. Because you can't drag Adjustment Layers between files that don't have the same color mode, you need to use the sneaky method of flattening the CMYK file, selecting all, and then selecting Edit > Copy.

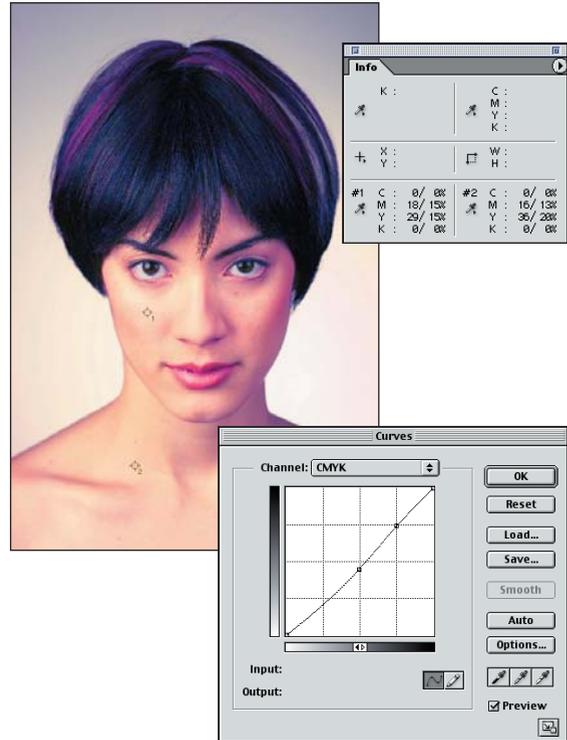


figure 4.69

Lightening the exposure with Curves.

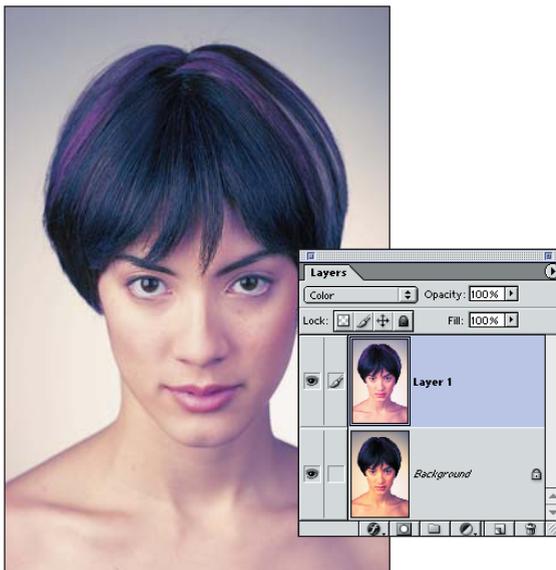
3. Activate the original RGB file and select Edit > Paste, which will paste the color-corrected file back into the RGB file and you will have two very similar files—one in RGB (on the left in figure 4.70) and one that was corrected in CMYK (on the right).



figure 4.70

Viewing RGB and CMYK versions side by side.

- To maintain the original luminosity values of the RGB file, change the pasted layer's Blending Mode to Color, as [figure 4.71](#) shows. The end result is a color-corrected file in RGB that you can continue working with.



**figure 4.71**

Changing the corrected layer's Blending Mode to Color to maintain image tonality.

## Assigning False Color Profiles

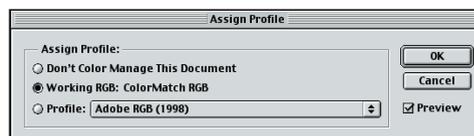
When working in RGB with printing in mind, the two most common Color working spaces are ColorMatch and Adobe RGB 1998. Adobe RGB has a larger color gamut, which I find useful for creative artwork and for producing photographic output, such as the Kodak Durst Lambda and Fujix prints. ColorMatch has a narrower gamut that better reflects offset printing, such as the book you're reading right now.

You can influence how Photoshop describes and portrays color by assigning color profiles of the Photoshop working spaces. The next time you open an image—especially a color portrait—and the person looks too saturated or red (like the one in [figure 4.72](#)), try this technique to reduce the saturation and red-to-magenta color shifts.



**figure 4.72**

A portrait in Adobe RGB 1998 working color space.



**figure 4.73**

Assigning the ColorMatch profile to reduce image saturation.

### **ch4\_profile.jpg**

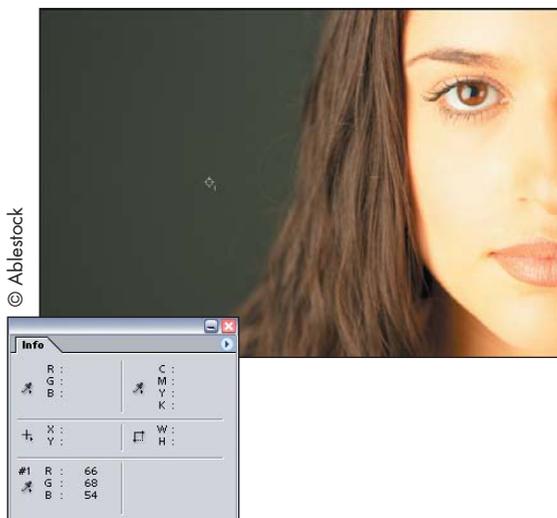
Select Image > Mode > Assign Profile, as shown in [figure 4.73](#), and select ColorMatch. The image's color gamut is quickly brought within the smaller color gamut of ColorMatch and the over saturated—almost sunburnt look—disappears.

## SELECTIVE COLOR CORRECTION

Until now, you've worked on global color correction, but images can have different problems in different areas. Sometimes one part of the image will be fine and another area is way off color. Differing color casts can occur due to poor storage conditions, mixed lighting when the photo was originally taken, or misprocessing. Always start with the global color correction, and then select the problem areas that remain and apply local color correction.

### Targeting the Problem Color

In [figure 4.74](#), the color cast is rather subtle, but the lower blue readout in the Info palette reveals that the neutral tone of the studio background does have a yellow cast. Another way to see color casts is to look at the individual grayscale channels. Because the studio background is supposed to be neutral gray, all three color channels should have the same black density. As you can see in [figure 4.75](#), the red and green channels are almost balanced with 66% and 68% density, but the blue channel is only at 54%. Wherever the channel is lighter, more light is allowed through, creating a color cast.



**figure 4.74**

The Info palette reveals a subtle yellow color cast.



Red channel, 66



Green channel, 68



Blue channel, 54

**figure 4.75**

Checking the balance of individual channels.

At first I thought this would be a simple file to color correct; just add either a Curves or Levels Adjustment Layer, use the gray balance Eyedropper tool to click the neutral background to remove the color cast, and I'd be done. But after neutralizing the backdrop, I noticed that the young woman was still much too yellow (see [figure 4.76](#)), and the challenge remained to select only the yellow to achieve a balanced image, as shown in [figure 4.77](#).



**figure 4.76**

*The skin tones are too yellow.*

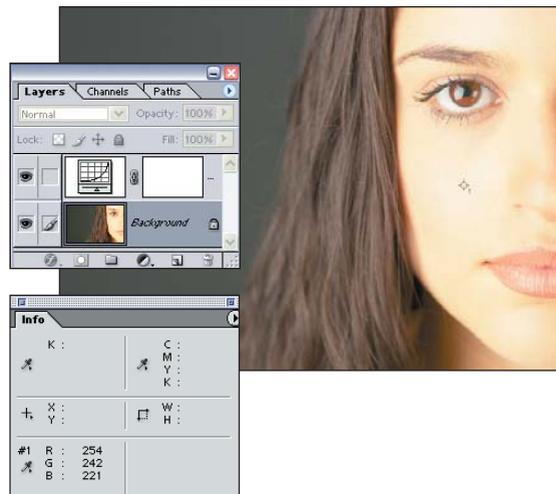


**figure 4.77**

*The final balanced image.*

#### ch4\_yellowport.jpg

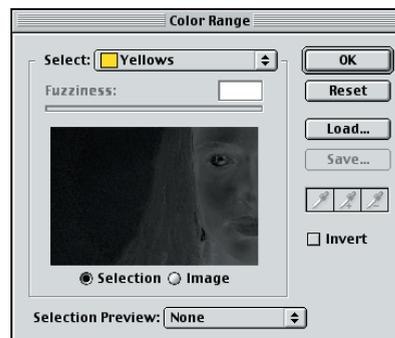
1. I added a Curves Adjustment Layer and clicked the studio backdrop with the gray eyedropper to neutralize the overall color cast. As you can see in [figure 4.78](#), the young woman's skin is still too yellow.



**figure 4.78**

*Even after neutralizing the backdrop by clicking with the gray eyedropper, her skin tones are still too yellow.*

2. The yellow problem isn't on the Adjustment Layer, but rather on the Background layer. Always work on the layer that contains the problem, which in this case is the yellow cast remaining in the Background layer. Activate the Background layer.
3. To select just the yellow components of the image, I chose **Select > Color Range** and selected **Yellows** from the drop-down menu, as shown in [figure 4.79](#). The Color Range interface shows how Photoshop is making a selection mask that we can use in combination with any type of Adjustment Layer.



**figure 4.79**

*With the Background layer active, select the yellows with Color Range.*

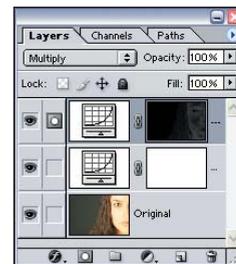
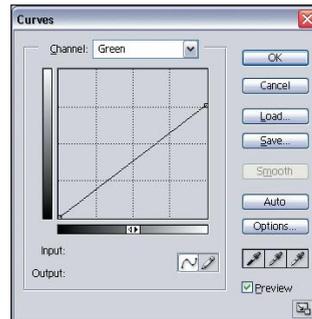
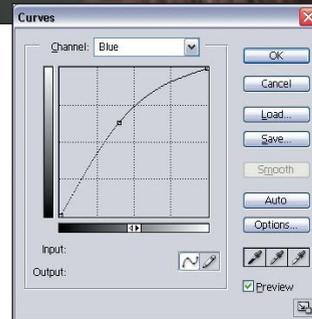
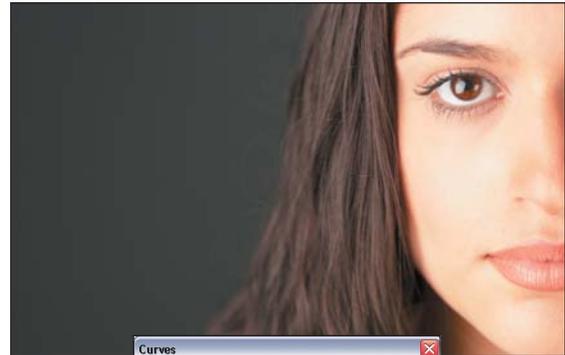
4. Photoshop may pop up a warning box that says that no pixels were selected more than 50%. You can ignore this warning, because the selection will still be active. Photoshop just won't display the dancing ants!
5. I added a Curves Adjustment Layer (see [figure 4.80](#)). In the Layers palette, a mask is automatically created from the Color Range selection. Wherever the mask is black, no color correction will take place, and wherever it is white or lighter, more color correction will occur.



**figure 4.80**

Adding a Curves Adjustment Layer automatically creates a layer mask based on the selection.

6. I switched to the blue curve (because blue is the opposite of yellow) and dragged it upward to remove the yellow color cast. Then I adjusted the green curve. Although these curve adjustments may look extreme, the mask makes the effect much more subtle, as seen in [figure 4.81](#).
7. Finally, to intensify the effect, I changed the Blending Mode to Multiply. Please note—you may not need to change the layer Blending Mode in all cases.



**figure 4.81**

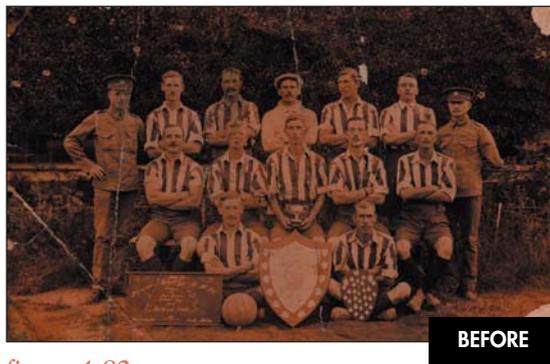
I adjusted the blue and green curves to remove yellow, and then changed the Blending Mode to Multiply.

## ALLEVIATING EXTREME COLOR PROBLEMS

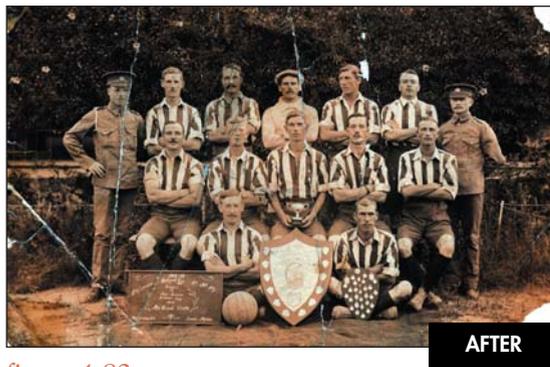
Color-correction issues can range from subtle to extreme, and sometimes correcting very bad images may seem like a daunting task. In the following section, you tackle some of the worst color problems quickly and relatively painlessly.

Sometimes an image is so dark or discolored that you're just not sure what to fix first. Should you tackle the density issue or the heavy color cast first? There is not a single solution that always applies, but in many cases images that are both very dark and color contaminated can benefit from the following treatment to remove heavy color casts caused by age, smoke damage, or underexposed images taken in mixed lighting. The photograph in **figure 4.82** was taken in 1912. The nine decades that followed made the print darken down and absorb contaminants from the cardboard it was mounted on. **Figure 4.83** shows the same image with the undesirable color cast and dark exposure removed.

© Colin Dearing



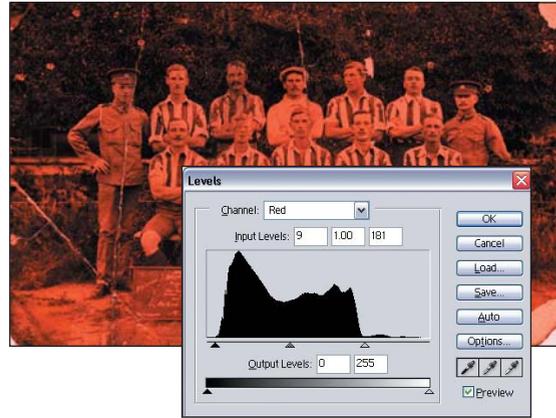
**figure 4.82**



**figure 4.83**

 ch4\_soccerteam.jpg

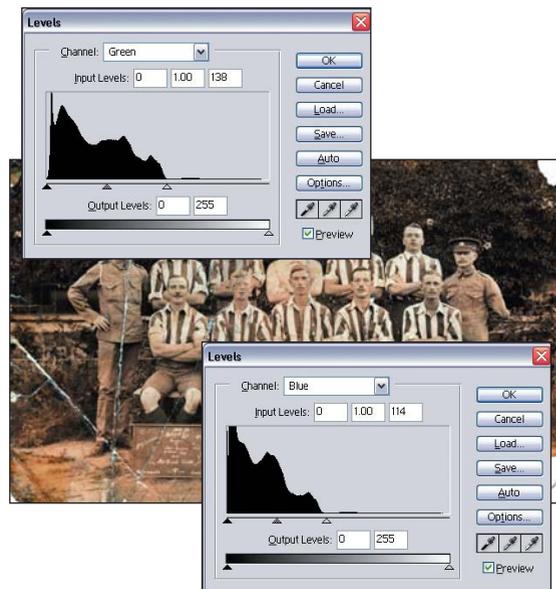
1. Open the problem image and add a Levels Adjustment Layer.
2. Activate the red channel (Cmd + 1) [Ctrl + 1] and move the shadow and highlight levels sliders to where the majority of the information begins, as shown in **figure 4.84**.



**figure 4.84**

Moving the red channel shadow and highlight sliders.

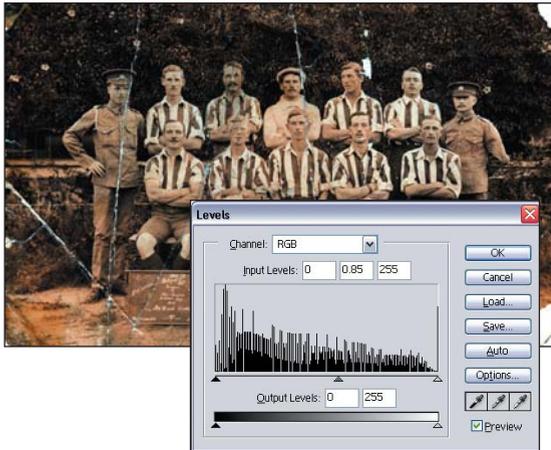
3. Select the green channel (Cmd + 2) [Ctrl + 2], and move the shadow and highlight levels sliders to where the majority of the information begins, as shown in **figure 4.85**. Repeat the process on the blue channel (Cmd + 3) [Ctrl + 3] Levels histogram.



**figure 4.85**

Adjusting the green and blue channel histograms.

- If the image requires lightening or darkening, return to the composite histogram (Cmd + ~) [Ctrl + ~] and adjust the midtone slider (to the left to lighten the image, or to the right to darken), as shown in [figure 4.86](#).



**figure 4.86**

Darkening the image by moving the midtone slider to the right.

## Extreme Color Correction with Levels

I sincerely hope you never have to work with an image that is as bad as the one in [figure 4.87](#). The original film was poorly stored and processed, resulting in a very dark image with a dominant green cast. In a case like this, the goal is to take the pathetic and create the acceptable, as shown in [figure 4.88](#).

As discussed, identifying the color cast is always the first step in the color correction process. In this case, your eyes would have to be closed not to see the green problem, but take a moment to really look at the image. What is this a picture of? It's a woman standing by a wall. Look again—read the image more closely—and look for clues that will help you make the best color decisions. The straw hat and open midriff hint that it's a picture of a woman on a summer day. With that clue, you can imagine that the dress could have been white. Keeping this scenario in mind will guide your color correction. Use your visual memory and color perception to develop a scenario to guide your color correction.



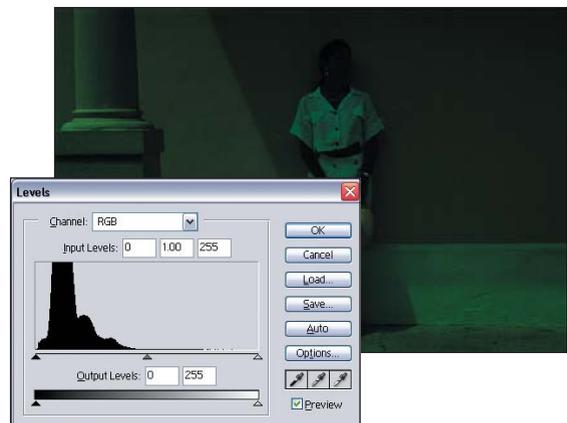
**figure 4.87**



**figure 4.88**

🌐🔗 ch4\_greenwoman.jpg

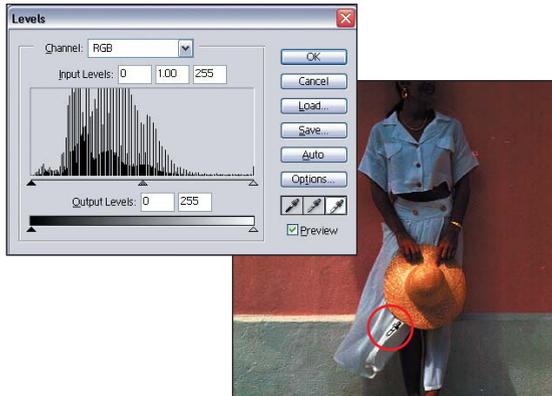
- Add a Levels Adjustment Layer. The strong color contamination and tonal problems push the histogram severely to the left (see [figure 4.89](#)).



**figure 4.89**

The Levels histogram is strongly biased to the left—a dead giveaway for a dark or underexposed image.

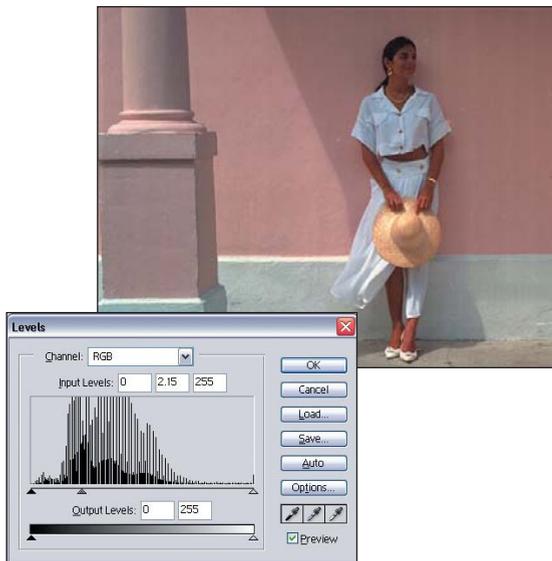
2. Look for a point in her dress that could be pure white. See how the sun is coming down from the upper left and hitting the edge of her skirt that is in the breeze? Click that with the Levels white eyedropper to remove the color cast, as shown in [figure 4.90](#).



**figure 4.90**

Clicking with the white eyedropper eliminates the color cast.

3. If need be, open up the midtones of the image by sliding the gray midtone triangle carefully to the left (see [figure 4.91](#)). In this example, don't worry that her face is still too dark; that is a selective problem and shouldn't be treated while working on the global problem.



**figure 4.91**

Moving the midtone slider to the left lightens the image.

### Tip

You can zoom and pan while the Levels and Curves windows are open by using the following command keys:

- Pan in the image: Hold down the spacebar to access the Hand tool.
- Zoom in: Press (Cmd + Space + click) [Ctrl + Space + click]. (Cmd + "+") [Ctrl "+"].
- Zoom out: Press (Cmd + Option + Space + click) [Ctrl + Alt + Space + click]. (Cmd + "-") [Ctrl "-"].

### Tip

Sometimes it's just easier to start over. When you are working with Adjustment Layers, if you don't like where the color correction is going, you can get back to the original image by pressing (Option) [Alt] to change the Cancel button to Reset. Click and the image will revert to its original settings.

## CORRECTING COLOR TEMPERATURE PROBLEMS

As I mentioned earlier, color casts can happen when you use the wrong color temperature film for the lighting situation at hand. For example, using daylight film indoors can lead to green or orange pictures. Our eyes don't see color temperature while taking the photograph, because our brain balances light to white no matter how cool or warm the light really is, but these color casts show up on film.

In the following example, I was photographing in a museum in England. I had only daylight film and the museum was illuminated with fluorescent lighting fixtures—a lethally green combination, as [figure 4.92](#) shows. With a few Photoshop steps, I was able to change the color temperature of the file from fluorescent green to neutral daylight, as you see in [figure 4.93](#). A useful correction method is to compensate for the undesired color temperature of the light by filtering the image with the opposite color.



© Katrin Eismann

BEFORE

figure 4.92



AFTER

figure 4.93

 ch4\_grnknight.jpg
**Note**

It is always better to use either the right color temperature film for the task at hand or to filter the lens or your lights to balance the color temperature. As I've said many times before, if the picture is taken correctly, there will be less work to do on the computer, and a smaller chance of unnatural results. However, this often requires professional equipment, including a color meter, color correction filters, and gels that you might not have on hand.

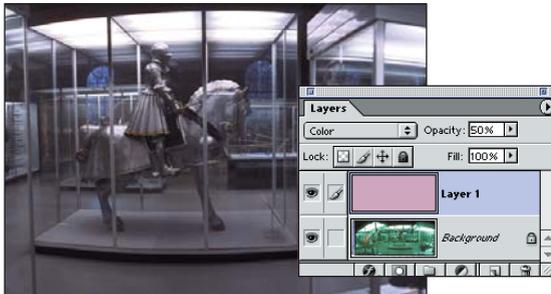
1. Use the Eyedropper tool to sample an area that is midtone to highlight and contains the offending color cast (see [figure 4.94](#)).
2. Add a new layer to the image and fill it with the sampled color using Edit > Fill > Foreground Color.
3. Change the layer's Blending Mode to Color.
4. Invert the color by selecting Image > Adjustments > Invert or (Cmd + I) [Ctrl + I] to change the selected offending color into its opposite.



**figure 4.94**

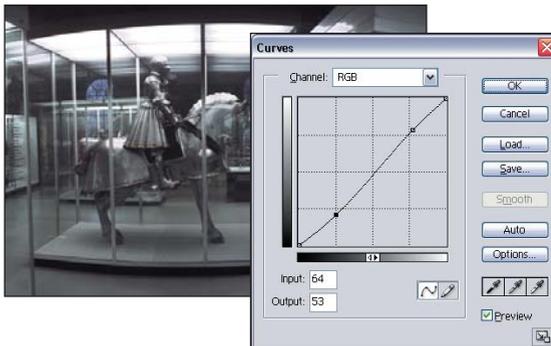
Select the offending color with the Eyedropper tool.

5. Lower the opacity of the layer. My experience has taught me that 50% is effective, as shown in **figure 4.95**.
6. In some cases, you might need to boost the contrast with Curves, as shown in **figure 4.96**.



**figure 4.95**

Lower the opacity of the fill layer.

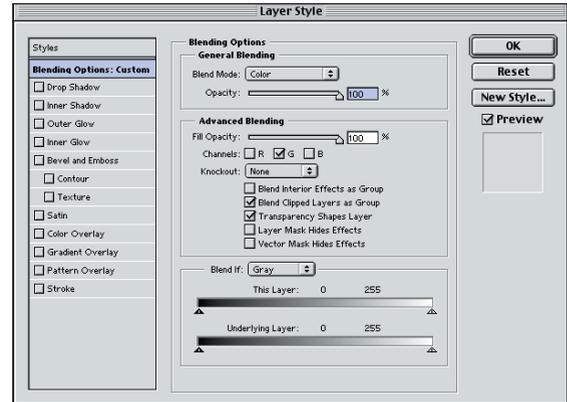


**figure 4.96**

Fine-tune the image contrast with Curves.

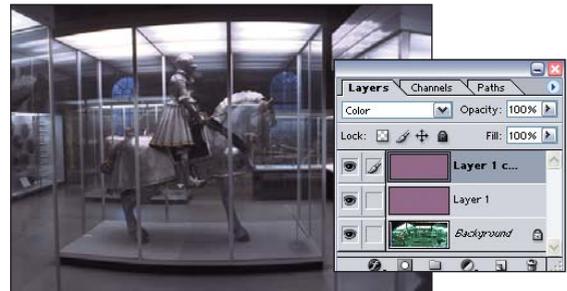
An alternative to this method builds on it while adding richness to the image. Follow steps 1 through 4 and continue by double-clicking the Color layer to access the advanced Blending

Options shown in **figure 4.97**. Uncheck red and blue, leaving only green. After clicking OK, you can duplicate this layer and adjust the opacity to intensify the correction (see **figure 4.98**).



**figure 4.97**

Uncheck red and blue in the advanced Blending Options.



**figure 4.98**

Duplicate the layer and the adjust opacity to intensify the correction.

## Correcting Mixed Color Temperature

There are many times when you have to take pictures in mixed lighting situations—such as an office with fluorescent ceiling lights while the windows are letting in daylight or, as shown in **figure 4.99**, a room where the majority of the space is lit with tungsten light but the uppermost ceiling floods are fluorescent. Photographs with mixed lighting are confusing to our eyes, as our eyes naturally neutralize color temperature without us being aware of it. To correct for the mixed lighting, Mark Beckelman worked selectively to create the image in **figure 4.100**.



© Mark Beckelman

figure 4.99



figure 4.101

Selecting the color-contaminated area.



figure 4.100

1. After scanning in the 4x5-inch color negative and doing initial global exposure correction, Mark needed to correct the blue of the faux skylights.
2. He started by sampling the blue of area with the Eyedropper tool. Then he selected the area with the Pen tool and converted the path to a selection, as shown in figure 4.101.
3. After adding a new layer, Mark filled the active selection with the blue and then inverted the color by selecting Image > Adjustments > Invert. After reducing the opacity to 50% and changing the Blending Mode to Color, he had filtered the blue color contamination out of the photograph, as shown in figure 4.102.



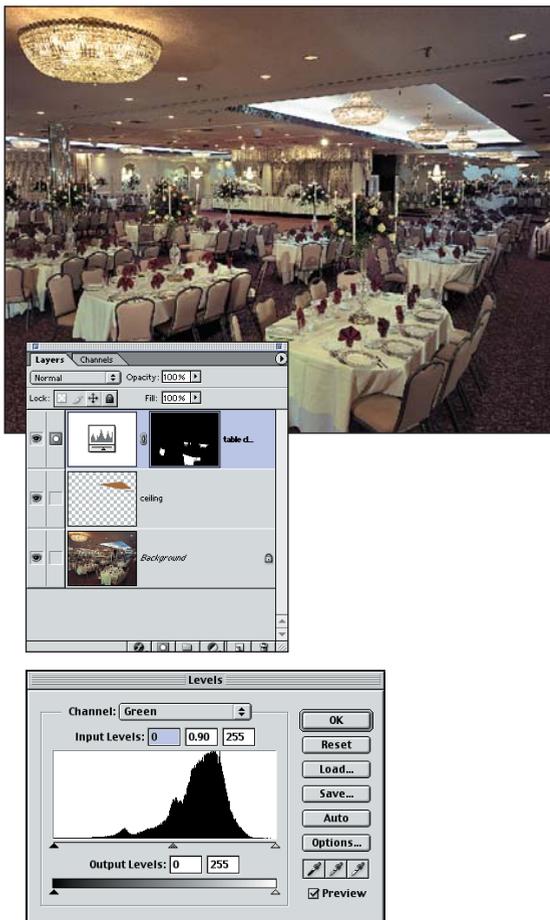
figure 4.102

Creating a color filter to offset the blue light.

4. Being the careful professional that he is, Mark opted to reduce the slight green tinge in the tablecloths by first carefully selecting them, as shown in figure 4.103. Upon adding a Levels Adjustment Layer, he reduced just the green midtones of the selected areas by modifying the green channel values in the Levels Adjustment layer (see figure 4.104).



**figure 4.103**  
Selecting just the tablecloths.



**figure 4.104**  
Fine-tuning by removing just the green midtones in the selected area.

## Thinking Ahead with a Macbeth Target

When you are photographing in mixed lighting conditions, it can be difficult to identify a neutral area in the image. But with a bit of planning ahead and the ability to drag Adjustment Layers, you can color balance even the trickiest images with astounding ease.

**Figure 4.105** shows a photo I took in a crafts boutique. The two most apparent aspects to the image are the awful orange color cast caused by the tungsten lights on the candle display and the Macbeth ColorChecker in the image. The Macbeth target is a known reference in printing and photography, and it is produced to careful specifications. You can purchase them as letter size or in a smaller 4x5-inch size in professional camera stores or at [www.calumetphoto.com](http://www.calumetphoto.com). For color balancing, the white to gray to black row of squares is of great use.



© Kathin Eismann

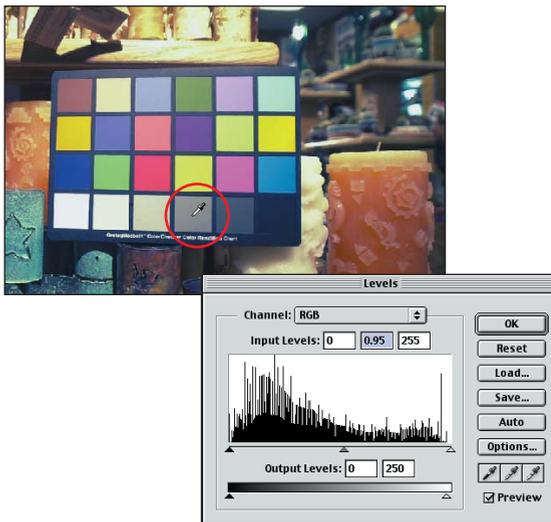


**figure 4.105**  
Photo with and without the Macbeth ColorChecker.

 ch4\_macbeth1.jpg

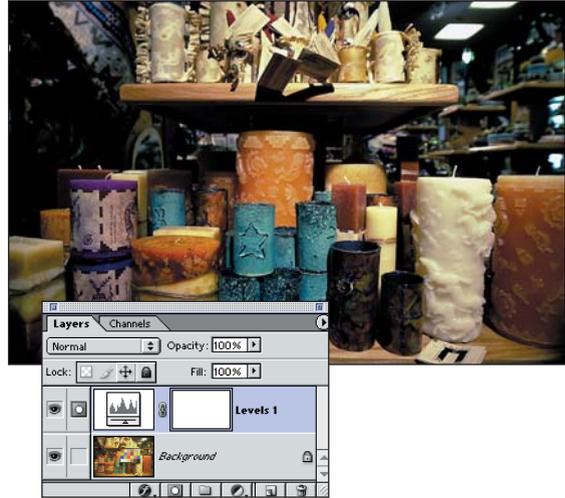
 ch4\_macbeth2.jpg

1. Compose and light the subject.
2. Place the Macbeth ColorChecker into the picture and take a picture with the same exposure you'll use for the rest of the shoot.
3. Remove the Macbeth ColorChecker from the set and shoot the photo as you normally would.
4. Bring both images into Photoshop and add a Levels or Curves Adjustment Layer to the image with the color checker. With the gray eyedropper, click the third gray square, as circled in [figure 4.106](#), and use the white eyedropper to click the white square. In some cases, I also use the black eyedropper on the black square, but it isn't always necessary.
5. With the Move tool, drag the Levels Adjustment Layer from the first image to the second image. This applies the target color-corrected adjustment to the image (see [figure 4.107](#)). Best of all, you won't need to guess at what may or may not be neutral in the image.



**figure 4.106**

Clicking the gray and white squares to neutralize the color cast caused by the mixed lighting in the store.



**figure 4.107**

Applying the neutral adjustment layer to the “real” image.

If you don't have a Macbeth ColorChecker, you can experiment with this technique with a Kodak step wedge or another known reference card that has a white, neutral gray, and black area.

## INTERCHANNEL COLOR CORRECTION

Photoshop offers many different perspectives for retouching. For example, my photographic training allows me to work out imaging solutions from a photographic and darkroom perspective, whereas people with a lot of prepress and printing experience will approach Photoshop from a different point of view. As I was working on this book, I had the pleasure of having my Photoshop eyes opened by Chris Tarantino, who comes to Photoshop with 20 years of dot-etching and high-end prepress experience.

When Chris looks at a CMYK file, the first thing he looks at is the flesh tones. As Chris explains, “When the flesh looks good, the viewer will be attracted to the product.” His color correction process always starts by evaluating the individual color channels for tone, gradation, and transitions that he can take advantage of to shape the color of an image. Rather than working with Adjustment Layers, Chris does all his color correction through the Apply Image command. The Apply Image command allows you to mix varying amounts of different channels with each other with precise control.

In the following example, Chris color corrected the photograph of the model for a very demanding high-quality import catalog. As you can see in [figure 4.108](#), the model's skin tones are too ruddy and, due to lack of tonal separation, the clothing is disappearing into the background. After applying inter-channel color correction, the model's face is clear, and the sweater has been color corrected to match the merchandise, as shown in [figure 4.109](#). Chris creates selection masks for each image element.

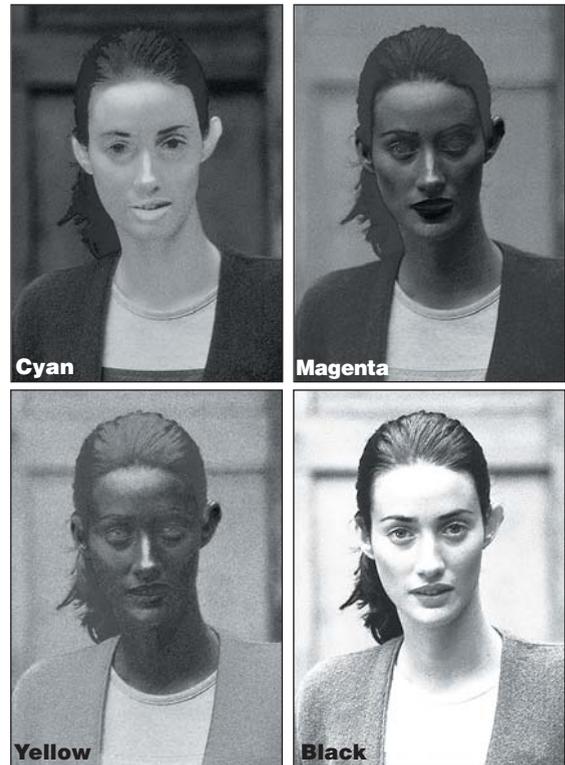


[figure 4.108](#)



[figure 4.109](#)

Chris always starts with the skin tones, and upon inspecting the four channels (shown in [figure 4.110](#)), he saw that the magenta channel was too dark, blocked up, and lacking in detail. However, the cyan channel had a full range of gray throughout that he could use to add tone and detail to the magenta plate.

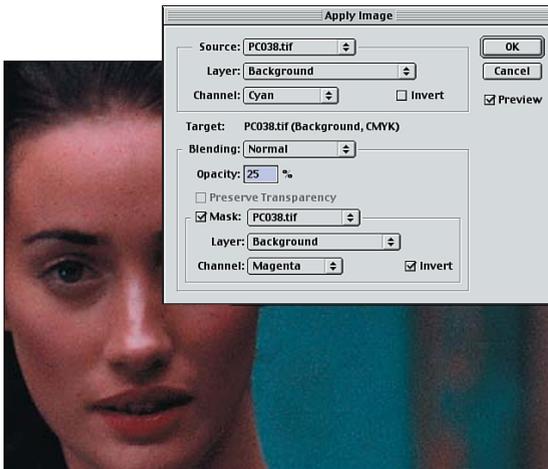


[figure 4.110](#)

*Chris starts by looking for detail, gradation, and information in each of the individual color channels.*

Chris selected Image > Apply Image and, as shown in [figure 4.111](#), he blended 25% of the cyan channel into the magenta channel. Interestingly enough, he used the magenta channel to mask itself out by checking Mask and Invert. Wherever the magenta channel had been dark, it would now be light, and the cyan grayscale information could be added to provide tonal detail for her face.

By using the better channel to replace the weaker one, Chris can simultaneously apply color correction and build up tonal and detail information, as you see in [figure 4.112](#).



**figure 4.111**

Chris uses the *Apply Image* command to add good cyan grayscale information to the weaker magenta plate.



**figure 4.112**

After improving both the magenta and yellow color plates, the model's skin is much clearer.

## CLOSING THOUGHTS

The importance of good color—pleasing color—cannot be underestimated. Trying out the techniques in this chapter on your own images will teach you more than any book. So open up some images and learn to really see color, both to remove it and to accentuate it—it's all-important.

