Movie 6 (Chapter 8 extract)

Black and White from Color

Color filters for monochrome work

Color filters can be used in monochrome photography to filter the colors in a scene and thereby alter the color contrast. A strong red filter will filter out the blue/cyan colors and make white clouds stand out with more contrast against a dark sky. A yellow or orange filter will produce a softer effect. A green filter can be used to make foliage appear lighter relative to everything else in the scene and so on... These principles can also be applied to the formulas used in the channel mixer to simulate the same type of filtration. A 50% Red channel and 50% Green channel mix in Monochrome mode, will simulate the effect of using a yellow filter.

Getting the mix right

When you use the Channel Mixer in Monochrome mode to make a mono conversion, the channel percentages should all add up near enough to 100%. As demonstrated in the accompanying step-by-step, the Red channel was combined at 80% with the Green channel at 20%. To create even stronger effects, you can take one or more channels above 100% and compensate by entering a negative percentage amount in the other channels.

Black and white from color

When you change a color image from RGB to Grayscale mode in Photoshop, the tonal values of the three RGB channels are averaged out, usually producing a smooth continuous tone grayscale. The formula for this conversion roughly consists of blending 60% of the green channel with 30% of the red and 10% of the blue. The rigidity of this color to mono conversion formula limits the scope for obtaining the best grayscale conversion from a scanned color original. This is what a panchromatic black and white film does or should be doing rather, because there are slight variations in the evenness of emulsion sensitivity to the visual and nonvisual color spectrum. And it is these variations in spectral sensitivity that give black and white films their own unique character. But the point is, that like a grayscale conversion in Photoshop, a black and white film interprets color using a standard formula. You may also be familiar with the concept of attaching strong colored filters over the lens to bring out improved tonal contrast in a monochrome image. The same principles can apply to converting from color to black and white in Photoshop, and of course, this allows the freedom to make this decision after the photograph has been shot. Using the Channel Mixer, you can create a custom RGB to grayscale conversion. This gives you the latitude in Photoshop of being able to make creative decisions at the editing stage that will allow you to simulate the effect of shooting using black and white film with a color filter placed over the lens at the time of shooting.

I have included an alternative technique on page 238 for producing a monochrome image from a color original, which simultaneously uses the Hue/Saturation image adjustment to modify the hue color of the underlying image and at the same time, a second Hue/Saturation layer neutralizes the color to create a neutral, monochrome image.

1 If you shoot using black and white film, the emulsion is more or less evenly sensitive to all colors of the visual spectrum. If you add a strong colored filter over the camera lens at the time of shooting, that color sensitivity is altered as certain wavelengths of color are blocked out by the filter. The following steps mimic the effect of a red lens filter being used to strengthen the cloud contrast in the sky.

2 To start with I went to the Image menu and chose Adjustments ⇨ Desaturate. This produced a flat-looking result based on a standard grayscale conversion formula where the monochrome RGB image is calculated using a mix of 30% red, 60% green and 10% blue.
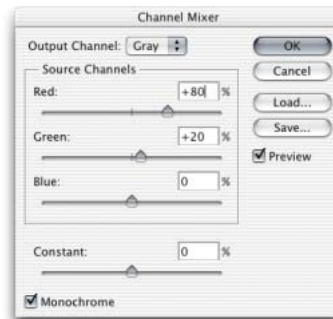

3 I chose Edit ⇨ Undo to revert to the original color version of the image and added a Channel Mixer adjustment layer using the settings shown in the dialog above. Note that when the Monochrome box is checked the Channel Mixer will produce a monochrome result based on a color channel mix of your choosing. For the very best results, try to get the percentages in each slider box to add up to 100%. This is not a hard and fast rule – variations other that 100% will just be lighter or darker. Use whichever looks best. The predominant use of the red channel created a stronger tonal contrast with the clouds in the sky.

4 Lastly, I added a Color Balance adjustment layer to create a split tone coloring effect. I changed the blending mode of this layer to Color. Doing this preserved the full luminosity information of the layers below.
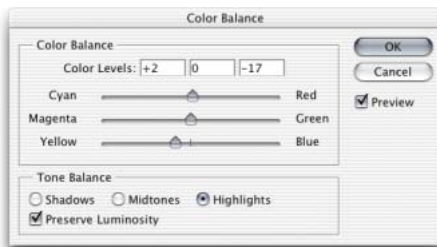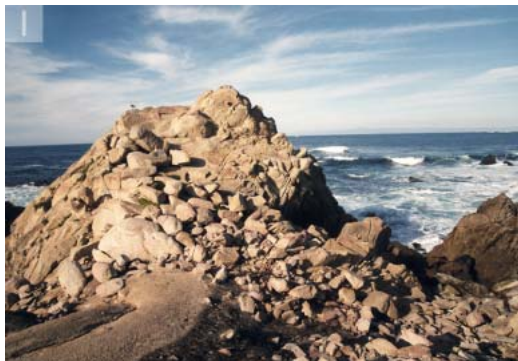
1 Russell Brown, the Senior Creative Director of the Adobe Photoshop team, was one of the first people to demonstrate the following alternative technique for creating a color to monochrome conversion in Photoshop.

2 I opened an RGB image, and went to the Layers palette and added a Hue/Saturation adjustment layer. I took the saturation all the way down to zero so that the photograph was desaturated and became a monochrome version of the color original. The result was more or less what you would expect to get if I had simply converted the image to Grayscale.


3 I activated the background layer and added a second Hue/Saturation adjustment layer. This will be between the Background layer and the earlier Hue/Saturation layer. I made no adjustments and clicked OK and set the layer blending mode to Color. When you reopen the dialog you can now adjust the Hue slider and achieve a similar result to adjusting the channel mix in the Channel Mixer as shown in the previous tutorial. When you try this out for yourself, you can also adjust the Saturation and Lightness to further tweak the monochrome conversion.

1 I used the pen tool to define the outline of this park sculpture. Note that the pen tool has to be in path mode (circled in blue in the Options bar). And because I wanted to create a path that selected everything outside the enclosed path, I checked the Subtract from path area button (circled in red) before I began drawing the path.
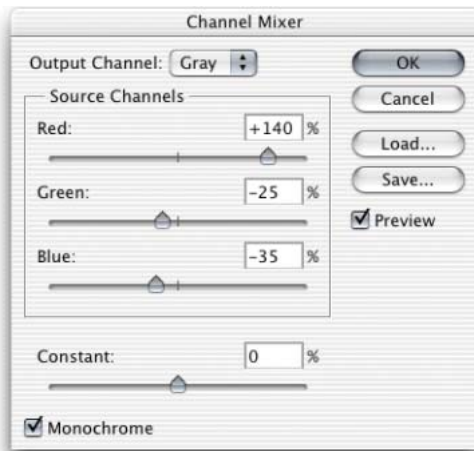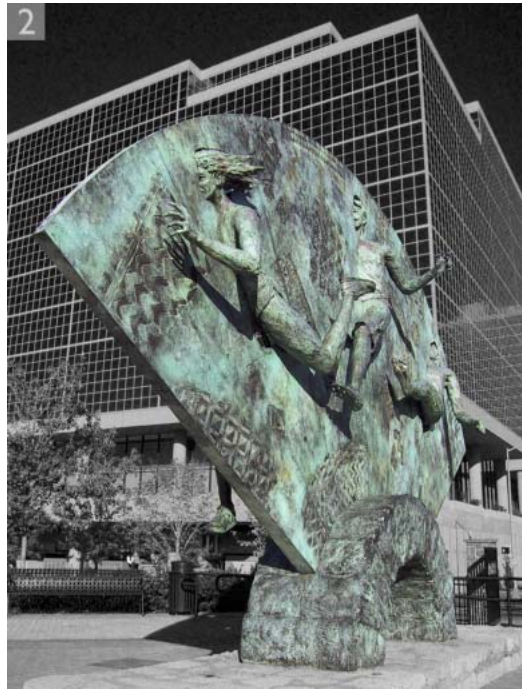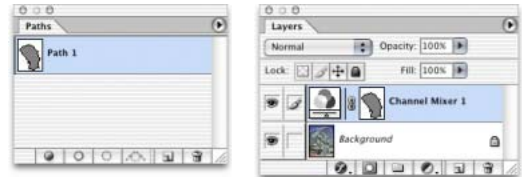
2 With the work path active, I clicked on the New adjustment layer button in the Layers palette and selected Channel Mixer. This added an adjustment layer with a linked vector mask. I used Channel Mixer to make a black and white conversion of the areas selected by the vector mask. You can use Layer ⇨ Change Layer Content to switch between different types of adjustment/fill layers. To edit a vector mask, use the direct path selection tool to manipulate the path outline.

5

Infrared film simulation

The spectral sensitivity of a photographic film emulsion will extend slightly beyond that of the human visual spectrum. This can sometimes cause problems in color photography when an object radiates light we cannot see, but the film does. This phenomenon, known as metamerism, can affect the way the colors of specific garments can appear the wrong color on the final film. There is also a special infrared sensitive film emulsion you can buy, which is acutely sensitive to infrared radiation. The black and white emulsion is quite grainy. Vegetation reflects a lot of infrared light which we human observers are not aware of. Hence, green foliage will appear very bright and almost iridescent when captured on infrared film.


1 This spring woodland scene is a prime candidate with which to demonstrate the following infrared technique. As you can see, there are a lot of fresh green leaves in the picture. What follows is an extension of the color to monochrome technique using the Channel Mixer.

2 Essentially, what I am attempting to do here is to take this Channel Mixer technique to extremes. Now if we want the green channel to appear the lightest, because that's where all the green foliage information is, then we have got to somehow boost the green channel mix. The maximum setting allowed is 200% which produces a burnt-out 'screened' result. Bearing in mind the 'keep everything adding up close to 100%' rule, I reduced the other two channel percentages, to give them minus values. There was a little cyan coloring in the green, so I reduced the red channel by only 30% and the blue channel was therefore set to minus 70%.
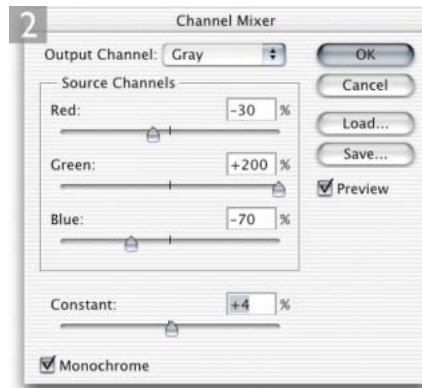
3 So far so good. Now I want to add some glow to the foliage. It is important that the underlying image has remained in RGB (because it is the adjustment layer which is making the monochrome conversion). I went to the Channels palette and highlighted the green channel and applied a Gaussian blur filtration to that channel only. The result of the full blur is shown below. This isn't the desired result, so I followed that with an Edit > Fade Filter command, reducing the blur to a 26% opacity and Screen blend mode.
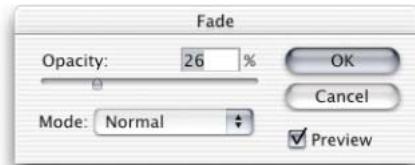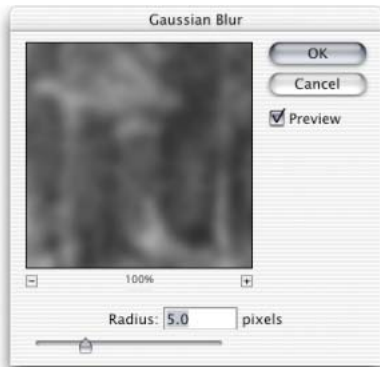
4 This is the final result after applying the Channel Mixer adjustment and green channel blur on the Background layer. To further simulate the infrared emulsion, try adding a hefty amount of Gaussian noise filtration to either all three color channels or the green channel only.