digitalphotography
the complete course

New York Institute of Photography

Photoshop 13: Black-and-White Techniques

Unit Five
Lesson Twenty Seven

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Introduction.

What makes black-and-white photography such a compelling medium? In terms of pure visual enjoyment, there is the beauty of the tonal values—the shades of gray, the deep blacks and bright whites that express the play of light and shadow. The tones are versatile, and can represent a stark or subtle ambiance with equal power. [SEE FIGURES 1 & 2]

Figure 1

Figure 2 *© George Schaub*

Black-and-white photography also allows the viewer to see without the distraction of color; this means we approach the photographic design in its purest form. Despite major advances in color-reproduction technology, dedication to the black-and-white medium among fine art, fashion, journalistic, and commercial photographers continues to flourish. [SEE FIGURE 3]

Figure 3 *© Dynamic Graphics*

For the digital photographer, black and white offers a great deal of creative freedom. In fact, in the digital realm you don't even need a black-and-white original to produce a good black-and-white print. That's because a color original can be output as either a color print or a black-and-white print. In the past, if you wanted to produce the best possible black-and-white output you had to use black-and-white film. It is possible to make a black-and-white print from a color

negative, however, it requires the use of special printing paper, and the results are rarely spectacular.

With Photoshop, you can convert a color digital original to black-and-white (or "grayscale") quickly and easily, and with just as much success as its color counterpart. Let's review how this is accomplished.

Basic Black-and-White Conversion.

The basic conversion from color to black and white is deceptively simple.

Open the file named "DowntownNY.psd." It can be found in the Unit 5 Practice Image folder.

The image opens on your desktop. [SEE FIGURE 4]

Although this is a color image (in RGB mode), it has a monochromatic quality, and as such it is a good candidate for black-and-white conversion.

Figure 4 *© Jim Barthman*

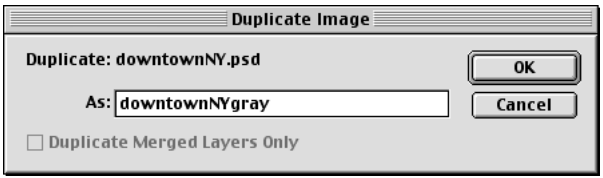


Figure 5

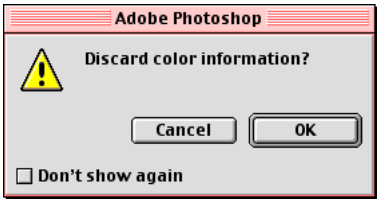


Figure 6

Duplicate the File.

First, make a duplicate of the file so that you can experiment freely.

Choose **Image>Duplicate.**

The Duplicate dialog box appears.

Name the duplicate "downtownNYgray." [SEE FIGURE 5]

Click **OK**.

A duplicate file is created.

Close the original file so that you can concentrate on the duplicate.

Choose **File>Close.**

Convert the Duplicate to Grayscale Mode.

Now we will change the image from RGB mode (color) to Grayscale mode (black and white).

Choose **Image>Mode>Grayscale.**

An Alert box appears. [SEE FIGURE 6]

Click **OK.**

The color image is automatically converted into a grayscale image.

Let's take a look at what has happened to the file.

Open the Channels palette, if it is not already open.

Choose **Window>Channels.**

Using the mode conversion method, Photoshop averages the information from the three RGB channels and combines them into one grayscale channel. [SEE FIGURE 7]

Other Black-and-White Conversion Methods.

It is important to remember that Photoshop provides you with a number of nondestructive methods of black-and-white conversion. For example, a Channel Mixer Adjustment Layer can be used to preview any color image in black and white without permanently changing a single pixel.

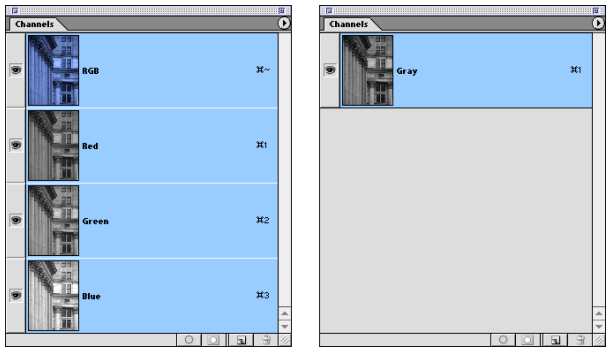
Open any color image.

Choose **Layer>New Adjustment Layer>Channel Mixer.**

The Channel Mixer dialog box appears.

Select the Monochromatic option to instantly convert your color image to black and white. [SEE FIGURE 8]

Now drag the sliders to designate what percentage of each



Channels in RGB Mode. *Channels in Grayscale Mode.*

Figure 7

Figure 8

channel's information will be used to create the image. [SEE FIGURE 9A]

When you are satisfied with your image, click **OK**.

Channel Mixer gives you ultimate control over the look of your black-and-white images. You can produce a low- or high-contrast rendition of your original and even enhance previously hidden shadows or highlight detail. Because adjustment layers can be modified or discarded at any time, this is the best way to experiment.

A Hue/Saturation Adjustment Layer is another option. [SEE FIGURE 9B] By dragging the Saturation slider all the way to the left, all color information is removed from the image, effectively producing a black-and-white image. You can then proceed to lighten or darken individual color channels by selecting them from the Edit pull-down menu at the top of the dialog box.

In Unit 3, we showed you a few different ways to convert your color images to black and white. Choose the one that suits you and your project best. This determination might require testing, so be prepared to produce a few different versions before you decide which is best. Take advantage of the creative freedom the digital darkroom affords through nondestructive trial-and-error techniques.

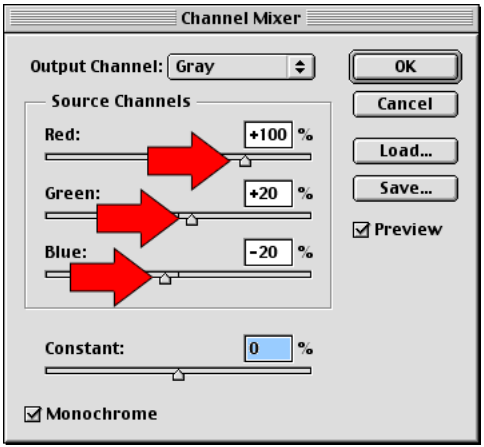


Figure 9A

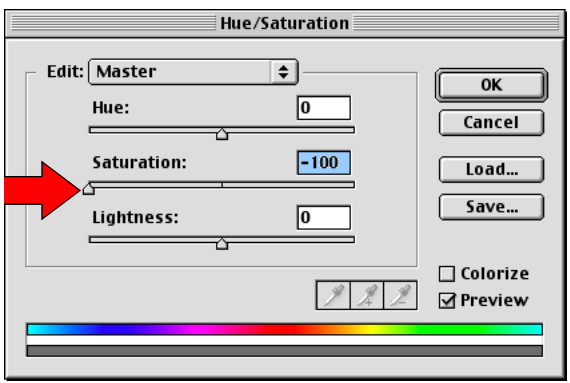


Figure 9B

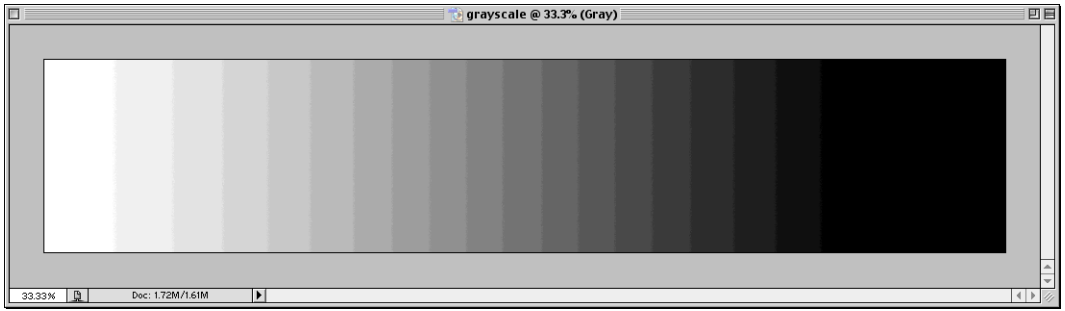


Figure 10

Black-and-White Tonal Calibration.

Although it has already been covered, it must be stressed that calibration is just as important when producing black-and-white output as it is when making color prints. Although the absence of color makes things somewhat simpler, the challenge of contrast calibration remains.

A common problem for many newcomers to black-and-white printing (film or digital) is the tendency to add too much contrast. That's because a high-contrast reproduction might appear sharper. In reality, an overabundance of contrast will yield harsh, unappealing tones. However, a good black-and-white print, generally speaking, will have detail in both the shadow and highlights areas, as well as smooth gradations of gray.

The advantage you have in the digital darkroom is that you can measure and even predict how your black-and-white prints will look before you print them.

Although Adobe Gamma does provide contrast calibration for you, we'll take it a step further by performing a few simple tests with a grayscale step wedge. A grayscale is a print from an evenly stepped scale of tonal values, from pure white to pure black. [SEE FIGURE 10]

In Unit 3, we showed you how to use a grayscale to detect and correct a colorcast in an RGB image. In the next exercise, we will use Photoshop to create a grayscale that you can use to help make your black-and-white prints look as good as they can look.

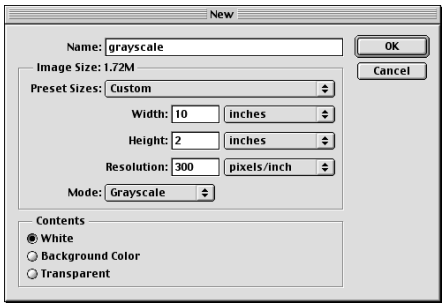


Figure 11

Create a Grayscale in Photoshop.

To make your own grayscale, start by creating a new document in Photoshop.

Choose **File>New**.

The New dialog box appears.[SEE FIGURE 11]

Configure your new document as indicated below.

Name the file "Grayscale."
Enter **10 inches** for the width.
Enter **3.5 inches** for the height.
Enter a resolution value of **300 ppi**.

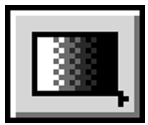


Figure 12

Select **Grayscale** as the mode.

Select **White** as the background color.

Click **OK**.

A new blank document named "Grayscale" appears.

Now we will fill the entire Canvas with a black-to-white gradient. The gradient will begin at the left side of the document and extend all the way to the right side.

Select the Gradient tool from the toolbox. [SEE FIGURE 12]

Press the D key to reset Photoshop's colors to Black foreground/White background.

Place your cursor at the left edge of the document, click and drag the cursor to the right edge of the document, and release. [SEE FIGURE 13]

Figure 13

Tip: In order to drag in a perfectly straight line, hold the Shift key down as you drag. Holding the Shift key constrains the gradient tool to a perfectly straight line.

A black-to-white gradient fills the document. [SEE FIGURE 14]

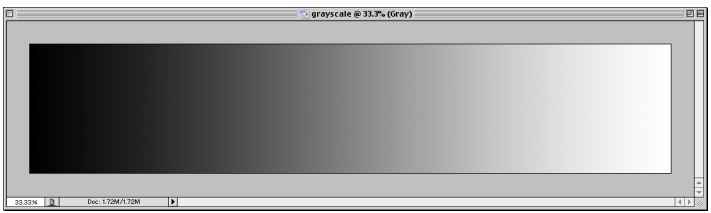


Figure 14

In order to break the continuous tone of black to white into steps of gray, we will use the Posterize command.

Choose **Image>Adjust>Posterize.**

The Posterize dialog box appears. [SEE FIGURE 15]

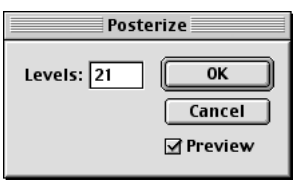


Figure 15

The Posterize command reduces the tonal range of a continuous tone image to an exact number of colors that you define. Since we want to create 21 steps of gray from our gradient, we will enter a Posterize value of 21.

Enter a value of **21**.

Click **OK**.

The continuous tone gradient has been reduced to 21 evenly-stepped levels of gray tone, from pure black to pure white. [SEE FIGURE 16]

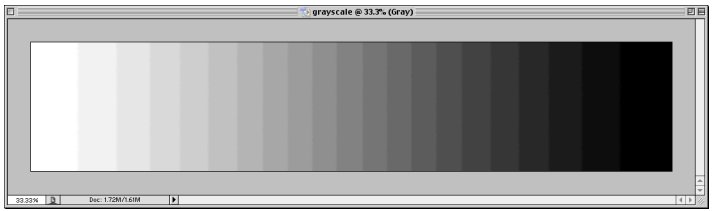


Figure 16

Analyze the Grayscale File Numerically.

To ensure that our grayscale consists of a full range of tonal values, we will evaluate it using Photoshop's Color Sampler tool and the Info dialog box.

Select the Color Sampler tool. [SEE FIGURE 17]

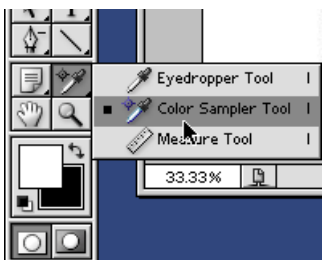


Figure 17

Set a color sample on the white patch by clicking once. [SEE FIGURE 18]

Set a second color sample on the black patch.

Open the Info dialog box. If it's not open already, choose **Window>Info.**

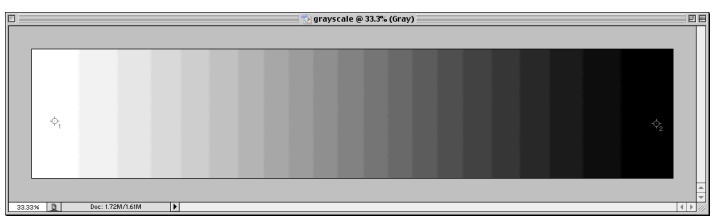


Figure 18

The Info dialog box appears.

Since our document is in Grayscale mode the Info dialog box looks a little different.

Because a Grayscale image is comprised of gray pixels only, rather than RGB values there are only black (K) values ranging from 0% to 100 %.

The value for the white sampler should be 0%, indicating a pure white.

The value for the black sampler should be 100%, indicating a pure black. [SEE FIGURE 19]

If they're not, try again. Remember to pay particular attention when you are creating the gradient. Be sure to start exactly on the left edge and finish exactly on the right edge. Accuracy is essential.

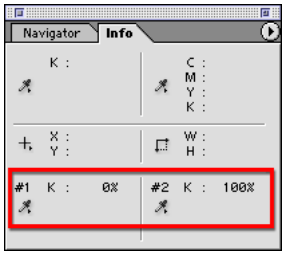


Figure 19

Print the Grayscale.

Now you're ready to print the grayscale.

Choose **File>Print**.

The Print dialog box opens.

Depending on your printer/software, you will be presented with various options. Since you are making a black-and-white print, your first instinct might be to choose the Black Ink Only option. Don't. For this exercise, use the printer's color ink settings to print the grayscale.

This may sound contradictory, but our experience has shown that black-and-white prints created with color inks are much richer than the same files printed with black ink only.

Our intention is to print the grayscale by mimicking how a black-and-white digital image with a wide tonal range will reproduce under "normal' printing circumstances.
[SEE FIGURE 20]

Click **OK** to print your grayscale.

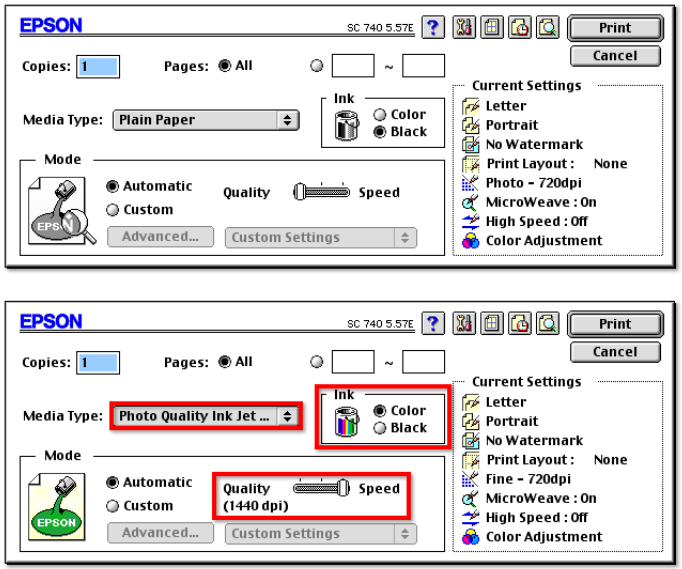


Figure 20 One example of a Print dialog box.

Analyze the Printed Grayscale Visually.

Once the printing process is complete, take a good look at your new grayscale print. You should see 21 distinct steps of white to black.

Do the black steps seem to blend together? If so, the shadows in your prints might also be "blocking up," resulting in a loss of shadow detail.

Do the white steps seem to blend together? If so, the highlights in your prints might be "blown out," resulting in a loss of highlight detail. [SEE FIGURE 21]

Remember that a good black-and-white print should have some detail in both the highlights and the shadow areas of the print.

If you have encountered either situation, or both, your prints may not be revealing all possible detail and, as such, are probably not realizing their full potential. Don't worry: we can fix this problem with a levels adjustment layer. This time we will use the Output sliders.

Choose **Layer>Adjustment Layer>Levels.**

Figure 21 Evaluate the detail in both the highlight and shadow areas of an image.

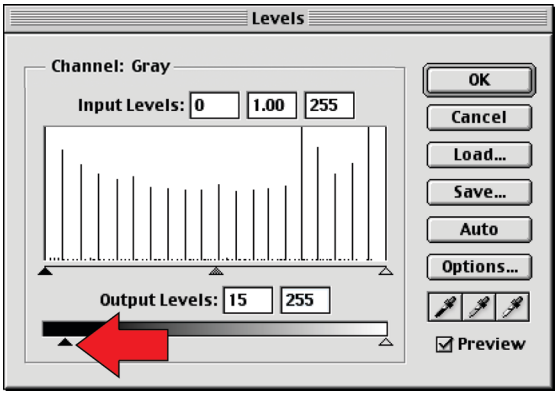


Figure 23

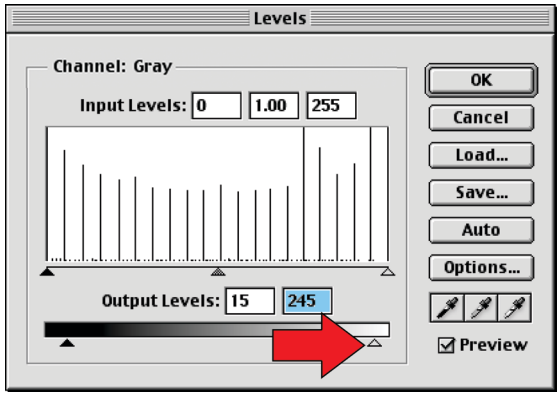


Figure 24

The Levels dialog box opens.

Located at the bottom of the Levels dialog box, the Output sliders start at 0 (pure black) and go to 255 (pure white).

By manipulating these sliders, we can reduce the contrast of the print and ensure that each one of the 21 steps is a distinct shade of gray.

If the black patches blend together, click and drag the Output slider on the left (black point) toward the center. We've moved ours to 15. [SEE FIGURE 23]

If the white patches blend together, click and drag the Output slider on the right (white point) toward the center. We've moved ours to 245. [SEE FIGURE 24]

Click **OK** and make a new print.

This might require some testing, but eventually you will get the printed grayscale looking just right. If there's still a problem, then you might consider recalibrating your monitor.

Once you are satisfied with your grayscale print, save the adjustment layer so you can reuse it whenever you make

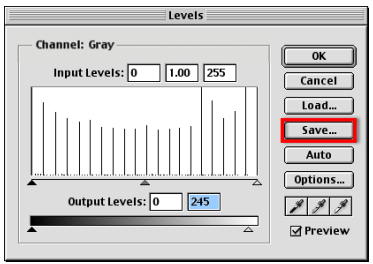


Figure 25

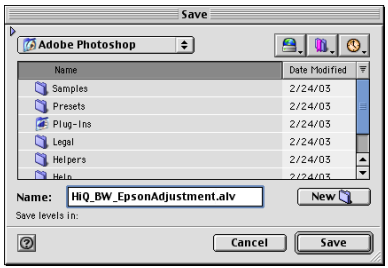


Figure 26

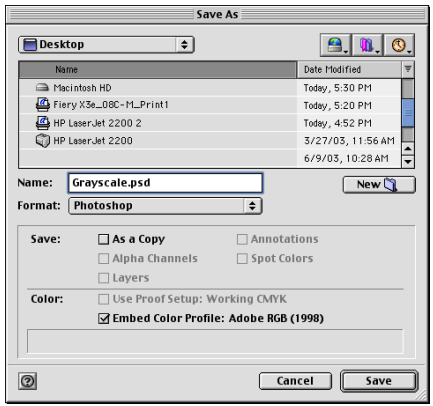


Figure 27

black-and-white prints under similar circumstances (i.e., using the same printer, paper, ink, etc.). [SEE FIGURE 25]

Click the **Save** button in the Levels dialog box.

The Save dialog box appears.

Name the adjustment layer. We named ours "HiQ_BW_EpsonAdjustment." [SEE FIGURE 26]

Click **OK**. The Output adjustment is saved and ready to use whenever you are making grayscale prints in your workflow.

Save the Grayscale File.

Choose **File>Save As.**

The Save As dialog box appears.

Name the file "Grayscale."

Save it in the Photoshop file format to maintain the output adjustment layer. [SEE FIGURE 27]

Click **OK**.

Print your grayscale on a regular basis to evaluate your system's output. You can make custom adjustments for specific papers or printers and even to attain a special look. Remember to take notes so that you can achieve repeatable results.

Color Inks versus Black Ink Only.

Now that you have established how your monitor displays grayscale images and how your printer outputs grayscale prints, it's time to make a black-and-white print of an image of your choice.

Open an image.

Convert it to Grayscale mode. Load the Levels Adjustment Layer you created earlier, if necessary.

Choose **File>Print**.

The Print dialog box appears. [SEE FIGURE 28]

Make one black-and-white print using your printer's Color settings.

Then make a second print using Black Ink Only. [SEE FIGURE 29]

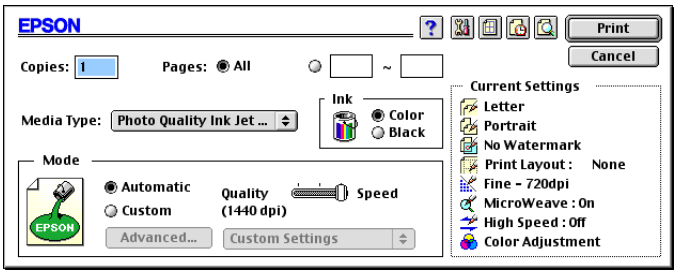


Figure 28 An example of Epson's print dialog box using Color setting.

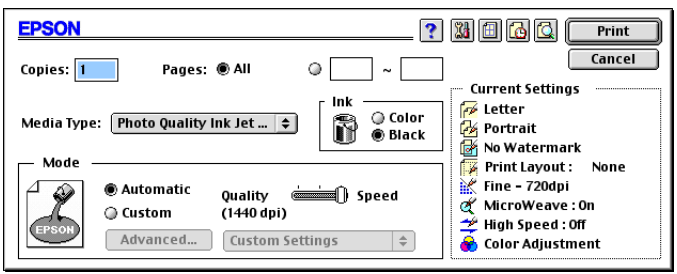


Figure 29 Epson's print dialog box using Black Ink Only setting.

Compare the two prints side by side. [SEE FIGURE 30]

Most often you will find that the print made with black ink lacks the vigor obtained by building image tonality using color inks. Of course, there are times when you should only use black ink—such as when you are making high-contrast graphic images. Some printers might even produce better black-and-white output using black ink only. Experiment and see what works best for you in your workflow.

Image printed with Color Ink setting.

Image printed with Black Ink only setting. *© Jim Barthman*

Figure 30

The Duotone Process.

One way to produce a superior black-and-white print is to use the unique duotone process. Duotones have been around for a long time. In a commercial printing environment, duotones are produced using two (duo) inks to represent the shades of gray in a black-and-white image. If done correctly, a duotone will exhibit a far greater range of tones than any single black ink can produce. Typically, a duotone is made up of black ink to represent the shadow areas and gray ink to represent the middle and highlight tones. The duotone process can also be used to create tinted black-and-white prints by replacing the gray with a color. Photoshop can convert any image in grayscale mode into a duotone. Adobe even supplies you with an entire collection of pre-set color combinations that you can apply to your images easily. They even provide a comprehensive set of monotone, tritone and quadtone color combination pre-sets that use sets of one, three and four inks respectively.

Now that you know what a duotone is, let's explore the process.

Choose **File>Open**.

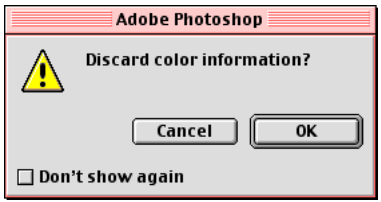


Figure 31

Locate the file named "Snow_scene.psd." You can find it in the Unit 5 Practice Images folder.

Although this appears to be a grayscale image, it's a good idea to confirm the color mode before doing any conversions. Using the menu command **Image>Mode** you can see that this image is currently in RGB mode. We'll need to convert it to Grayscale mode before we can convert it to a Duotone.

Choose **Image>Mode>Grayscale.**

The Alert box appears. [SEE FIGURE 31]

Click **OK**.

The RGB color image has been converted to Grayscale mode. Now we can proceed to convert it to Duotone mode.

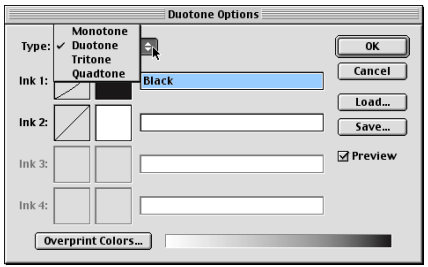


Figure 32 Duotone Type drop-down menu.

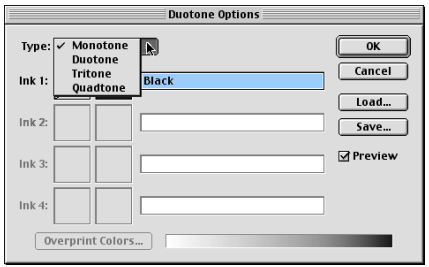


Figure 33 Choose Monotone.

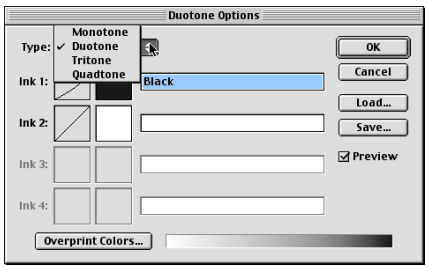


Figure 34 Choose Duotone.

Choose **Image>Mode>Duotone**.

The Duotone Options dialog box appears.

Explore the Duotone Options Dialog Box.

Click on the Duotone Type drop-down menu, located at the top of the Duotone Options dialog box. [SEE FIGURE 32]

Although a duotone, in the traditional sense, utilizes two inks, Photoshop provides even more options. Your choices are as follows, Monotone (one ink), Duotone (two inks), Tritone (three inks), or Quadtone (four inks).

Choose **Monotone**. With Monotone selected you can use one ink to represent your grayscale. [SEE FIGURE 33]

Choose **Duotone**. With Duotone selected you can use two inks to represent your grayscale. [SEE FIGURE 34]

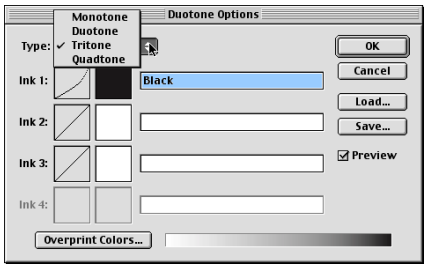


Figure 35

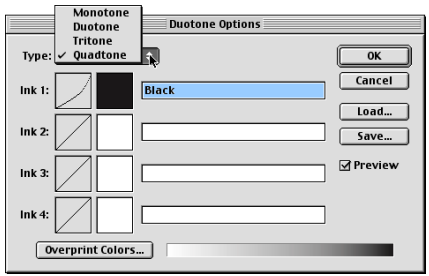


Figure 36

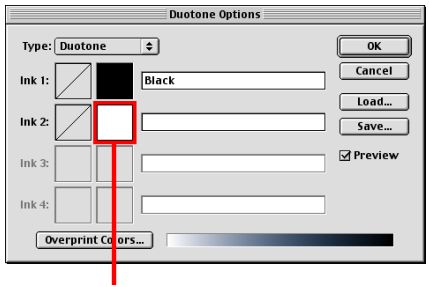


Figure 37

Choose **Tritone**. With Tritone selected you can use three inks to represent your grayscale. [SEE FIGURE 35]

Choose **Quadtone**. With Quadtone selected you can use four inks to represent your grayscale. [SEE FIGURE 36]

Now that we have explored the options, let's go ahead and make a Duotone using two inks.

Make a Duotone.

In the Duotone Options dialog box, choose Duotone from the Type drop-down menu. As we already mentioned, by default, the first ink in a Duotone is always black. However, the second ink can be a color of your choice. You could choose a warm or cool gray, or even a color like orange or blue to produce a tinted print.

To choose the second color, click on the Color swatch. [SEE FIGURE 37]

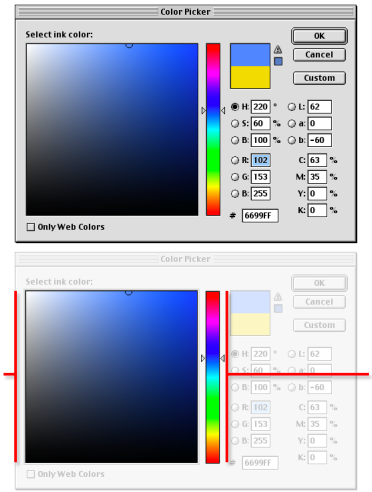


Figure 38

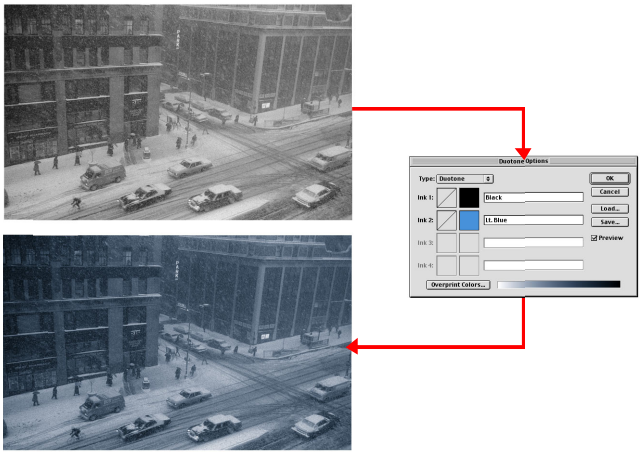


Figure 39 "snow_scene.psd" before adding blue tone and after.

The Color Picker appears. [SEE FIGURE 38]

Drag the Hue slider to select a color range. Click anywhere on the Color Picker palette to choose a color.

Notice how the original image changes onscreen to reflect your color choice. When you have selected a color combination you like, click **OK** to select the color and close the Picker.

We've chosen a medium blue. [SEE FIGURE 39]

The new color occupies the second swatch in the Duotone options dialog box and the image has a distinct blue tone added to it.

Don't click **OK**, we're not done yet.

Using the Color Picker, you have access to any one of 16.7

million colors, making this a daunting task for the beginner. So, to avoid becoming overwhelmed, we will continue by using the comprehensive set of duotone ink sets Photoshop provides. They are pre-built, ready-to-use, and help by reducing the choices to a reasonable amount.

Create a Gray/Black Duotone.

In the Duotone Options dialog box, click the Load button. [SEE FIGURE 40]

The Load dialog box appears. [SEE FIGURE 41]

Use the Load dialog box to navigate the pre-set color combinations provided to you.

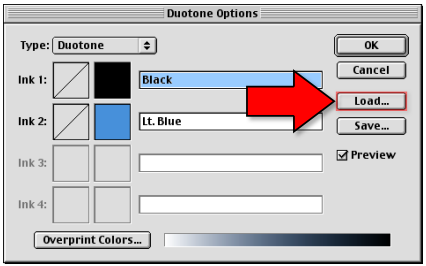


Figure 40

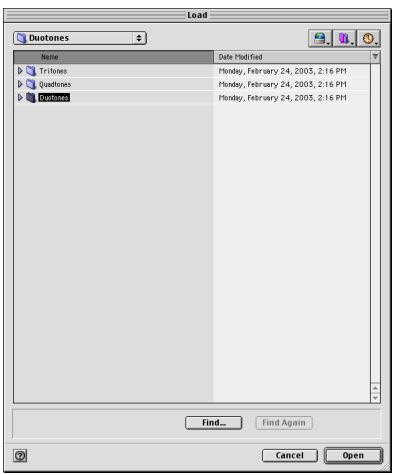


Figure 41

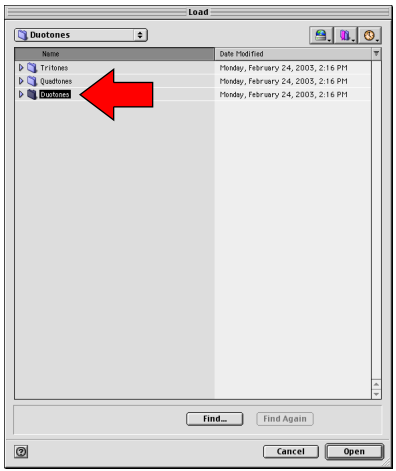


Figure 42

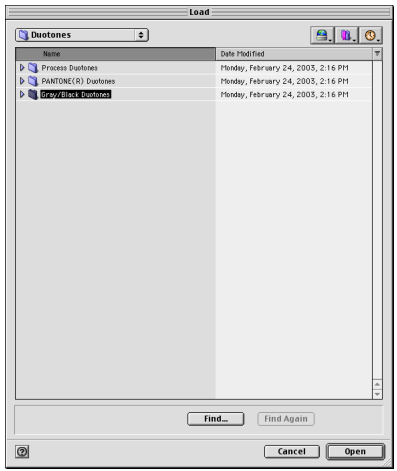


Figure 43

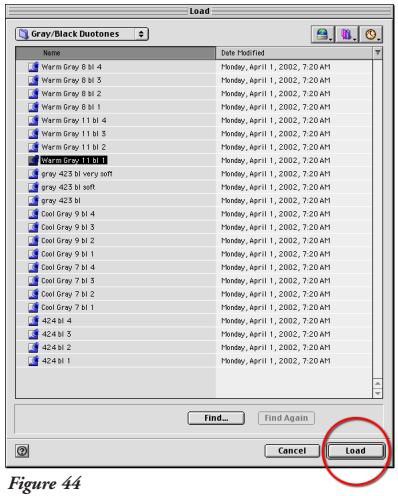


Figure 44

Double-click the Duotones folder to open it. [SEE FIGURE 42]

Double-click Gray/Black Duotones folder to open it. [SEE FIGURE 43]

Highlight the color combination named "Warm Gray 11 bl-1."

Click **Load**. [SEE FIGURE 44]

The image has a nice warm gray tone now. [SEE FIGURE 45]

Try loading one of the cool gray combinations for a different look.

Click **Load** again. This time, highlight the color combination named "Cool Gray 7 bl-4."

Click Load. The image has a slightly cool gray tone now. [SEE FIGURE 46]

Load different sets to see which one works best with your photograph.

Once you are satisfied with your image tone, you can commit your Duotone color combination by clicking **OK**.

Create a Tinted Duotone.

Adobe provides color presets so that you can create tinted duotone easily.

Let's start with a new image.

Open the image named "Clouds.psd." It can be found in the Unit 5 Practice images folder.

Figure 45 "snow_scene.psd" with warm gray tone.

Figure 46 "snow_scene.psd" with cool gray tone. *© George Schaub*

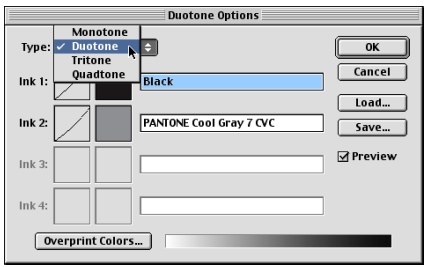


Figure 47

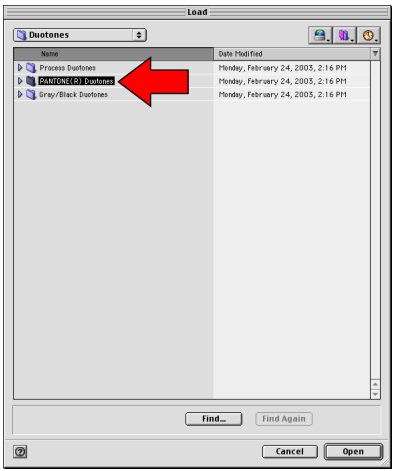


Figure 48

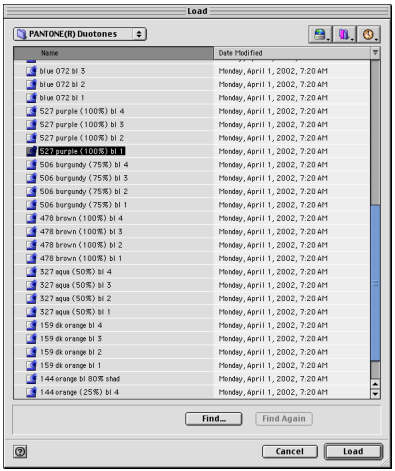


Figure 49

This image is already in Grayscale mode, so it can be converted to a Duotone right away.

Choose **Image>Mode>Duotone**.

The Duotone dialog box appears.

Select Duotone as the Type. [SEE FIGURE 47]

Click the **Load** button.

The Load dialog box appears.

Double-click the folder "Pantone ® Duotones." [SEE FIGURE 48]

The Pantone ® Duotones" folder opens. [SEE FIGURE 49]

Select a color combination. We have chosen "527 purple (100%) bl-1."

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Figure 50 "clouds.psd" with Pantone Duotone.

Click **Load**. This produces a combination of black ink and Pantone 527, or purple ink.

Your black-and-white image has a decidedly purple tone now. [SEE FIGURE 50]

Try selecting other colored ink sets to see which works best for you.

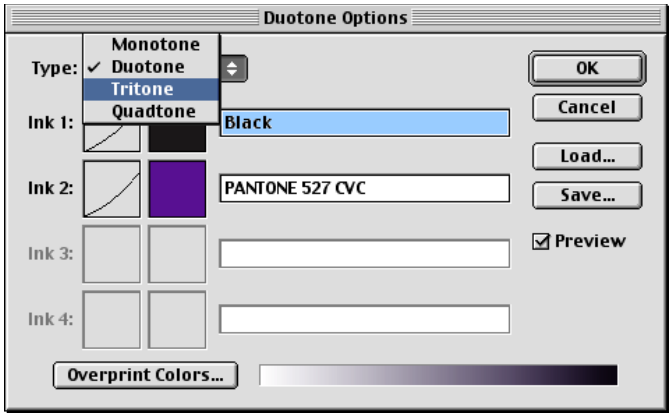

Figure 51

Create a Tritone.

You can make a tritone or quadtone using the same method described in the previous exercise. Let's go ahead and make a tritone from the same file we were just working on.

Choose **Image>Mode>Duotone**.

The Duotone dialog box appears.

This time choose Tritone from the Type drop-down menu. [SEE FIGURE 51]

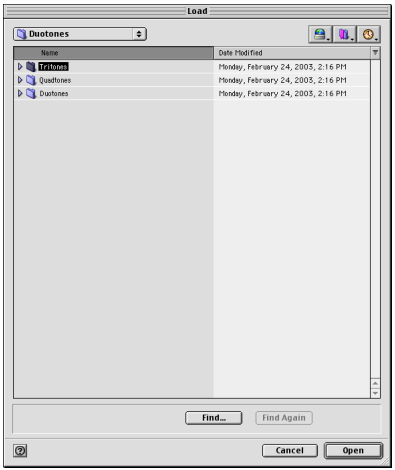

Figure 52

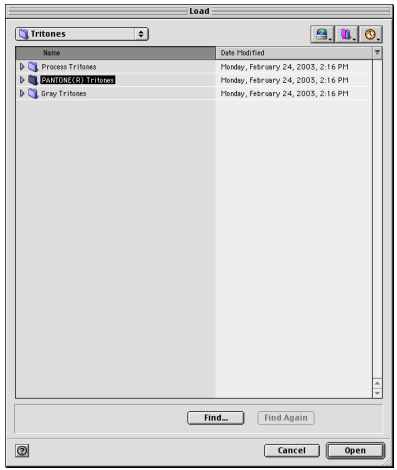

Figure 53

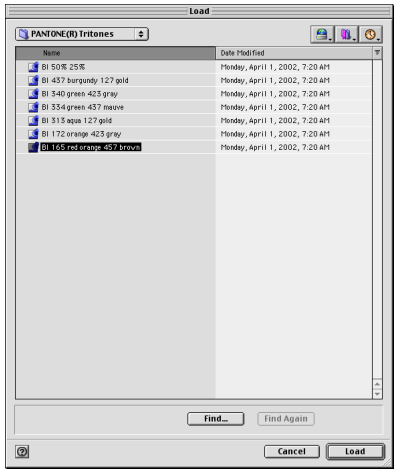

Figure 54

By choosing the Tritone option, you can now use three inks.

Click the **Load** button.

The Load dialog box appears.

Navigate to and open the directory named Tritones. [SEE FIGURE 52]

Double-click the "Pantone ® Tritones" folder to open it. [SEE FIGURE 53]

Select a color combination. We've selected "bl 165 red orange 457 brown." [SEE FIGURE 54]

Click **Load**.

Three pre-set colors are applied to the grayscale. [SEE FIGURE 55]

1. Black
2. Pantone 165, Red Orange
3. Pantone 457, Brown

Click **OK** to commit your color choices. [SEE FIGURE 56]

The combination of colors produces a beautiful rendition of this cloud shot.

Once again, it is important to experiment with different color combinations to achieve the perfect tone for your image. Using the color presets, Adobe makes it easy.

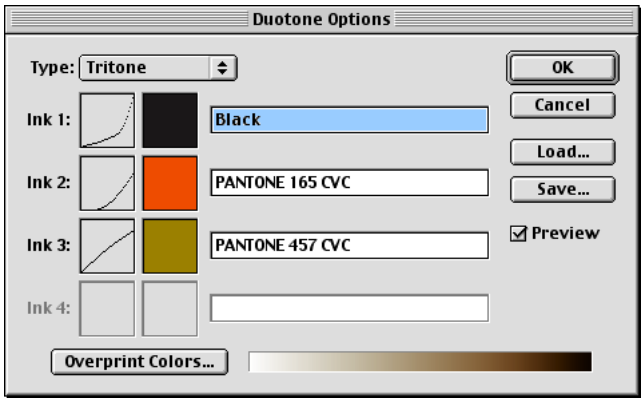

Figure 55

Figure 56 "clouds.psd" with Pantone Tritone.

Conclusion.

The digital darkroom makes black-and-white output possible without the need for special film, chemicals, or paper. Using Photoshop, black-and-white photography is brought to a whole new level, far beyond that of the traditional wet darkroom. Take the techniques we have presented here and experiment with your own images. Explore the many possibilities that this medium provides.

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