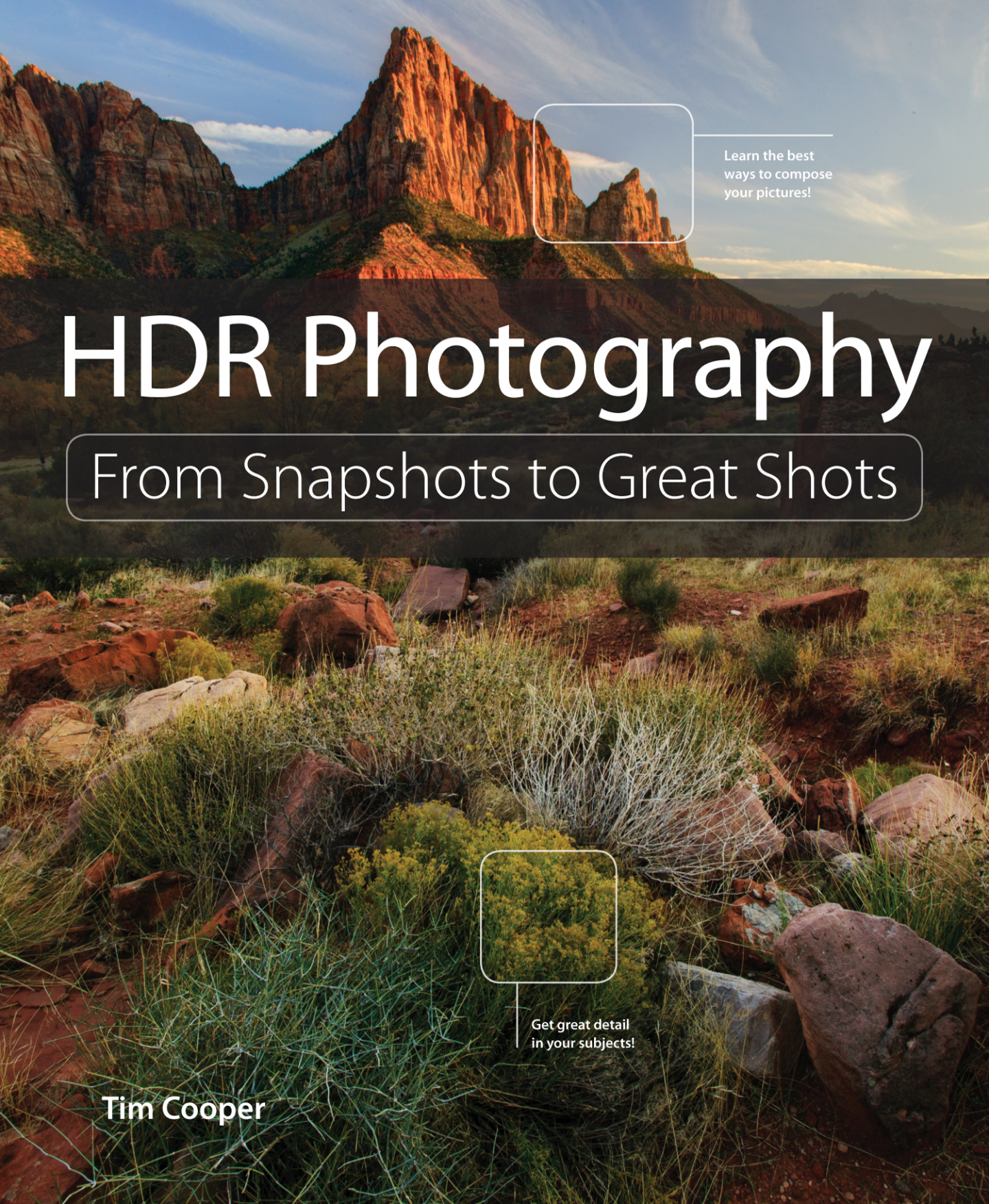




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ways to compose
your pictures!

HDR Photography

From Snapshots to Great Shots

Get great detail
in your subjects!

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HDR Photography: From Snapshots to Great Shots

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HDR Photography: From Snapshots to Great Shots

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Introduction

Like most photographers, I began carrying a point-and-shoot camera to capture memories of friends and family at weekend events and vacations. Curiosity, though, eventually led to my exploration of the camera's "advanced" features. Slow shutter? Fill flash? Wow, that was cool. Thus began my 24-year obsession with photography.

It wasn't long after I bought my first 35mm camera that I became familiar with the work of Ansel Adams. I remember marveling at his sensitivity to subject matter and at the beauty he created with his prints. Growing up in New Jersey, I was of course drawn to the magnificent and wild views of the West, but there was something else that drew me into Ansel's work: dichotomy. He was as much an artist as he was a craftsman. It wasn't enough for him to be technically proficient with his camera and chemicals—he also needed spirit, creativity, and vision to create his masterpieces.

As I grew as a photographer, I began to achieve a deeper understanding of Ansel's work. The artist/craftsman relationship was not his only dichotomy. He also straddled the line between realism and surrealism. Creating black skies and intense contrast was not an effort to conform to reality but rather an attempt to amplify its beauty. His technique rarely overwhelmed the essence of the scene.

As computers replace darkrooms, our ability to manipulate the photographic image has become limitless. With the never-ending options available in post-processing, it's more important than ever to understand the essence of our work. It's far too easy to let the manipulations overpower the spirit of the image. My goal, then, is to show you how to straddle the line between reality and possibility. Using the latest technologies, and the wisdom of a century of photography, you'll learn how to translate those difficult-to-capture scenes into believable imagery.

Beginning with an explanation of the HDR process, you'll learn the strengths and weaknesses of the camera as well as of our vision and our perception of the world. You'll discover which meters to use and how to properly expose a scene that requires multiple exposures to blend to HDR. There's an emphasis on Adobe Photoshop Lightroom and how and why to use it to download and prepare your images. I also cover Photomatix Pro and Lightroom's new Photo Merge > HDR function. The book ends with tips and tricks for three popular forms of photography that require the use of HDR: nature and landscapes, architecture and interiors, and low-light and night photography.



ISO 100 • 1/2 sec., 1/4 sec., 1/8 sec. •
f/16 • 17mm lens

1

What Is HDR and Why Use It?

The Problems That HDR Solves

Although HDR programs are a relatively new phenomenon, the problems they solve are as old as photography itself. Photographers have long struggled with the inability of the camera to render the scene as the eye perceives it. Our eyes are fantastic instruments that allow us to perceive detail over a very wide range of brightness. Cameras, however, have always failed to produce a photograph that matches what our eyes can see.

From the earliest days of the medium, photographers have been developing methods to remedy this disparity. Contrast-reduction methods could be as simple as waving cutout pieces of card stock over an image during printing, or as complex as calculating new developing times with altered solutions of film developer. The modern HDR programs are a cleaner, more elegant, and easier solution to the problem of high-contrast scenes.

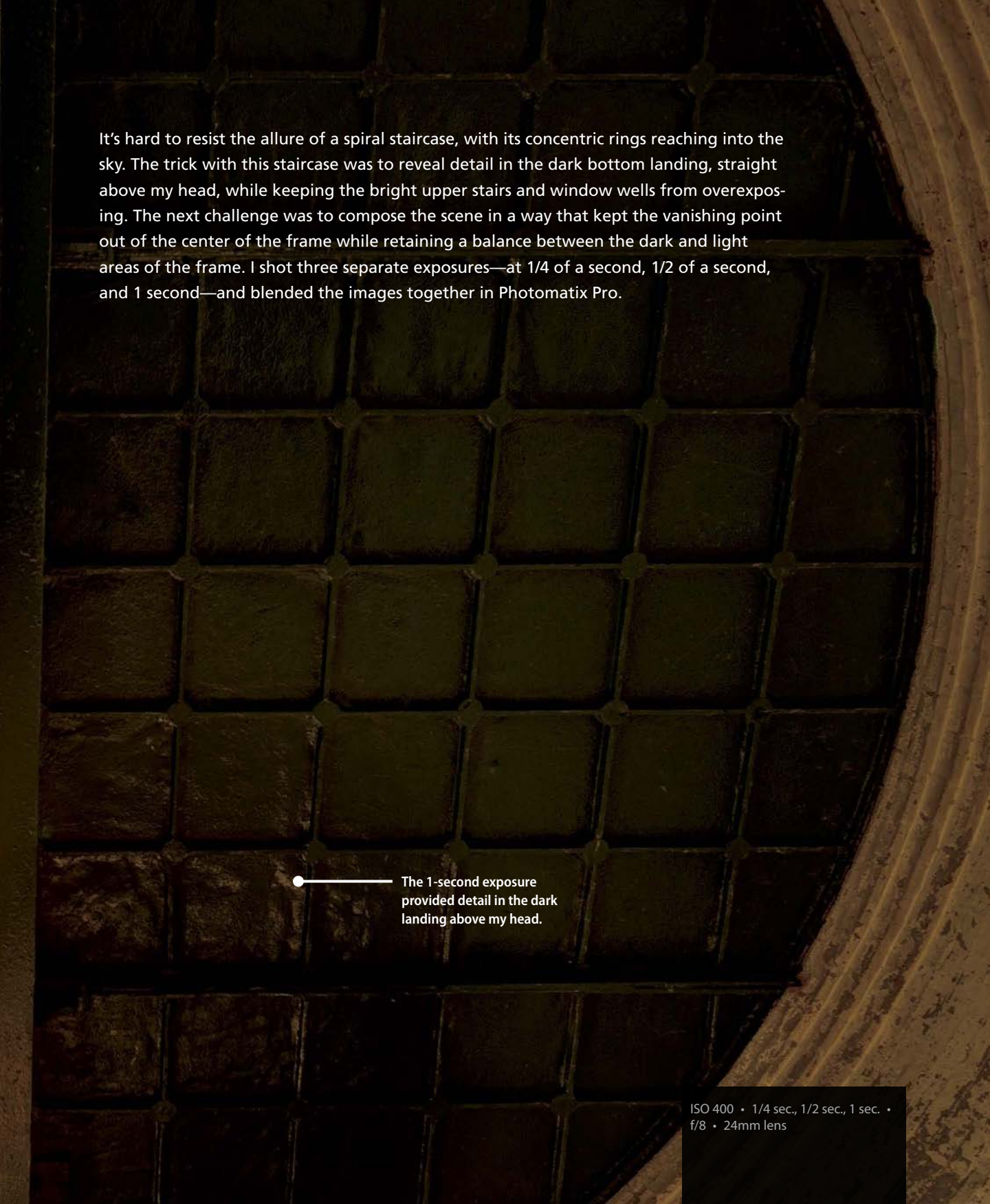
Poring Over the Picture



The 1/4-second exposure kept the highlights from overexposing.

The vanishing point was placed off-center to break up the natural symmetry of the lighthouse.

Looking straight up required the careful use of a tripod to manage the precise composition.



It's hard to resist the allure of a spiral staircase, with its concentric rings reaching into the sky. The trick with this staircase was to reveal detail in the dark bottom landing, straight above my head, while keeping the bright upper stairs and window wells from overexposing. The next challenge was to compose the scene in a way that kept the vanishing point out of the center of the frame while retaining a balance between the dark and light areas of the frame. I shot three separate exposures—at 1/4 of a second, 1/2 of a second, and 1 second—and blended the images together in Photomatrix Pro.

— The 1-second exposure provided detail in the dark landing above my head.

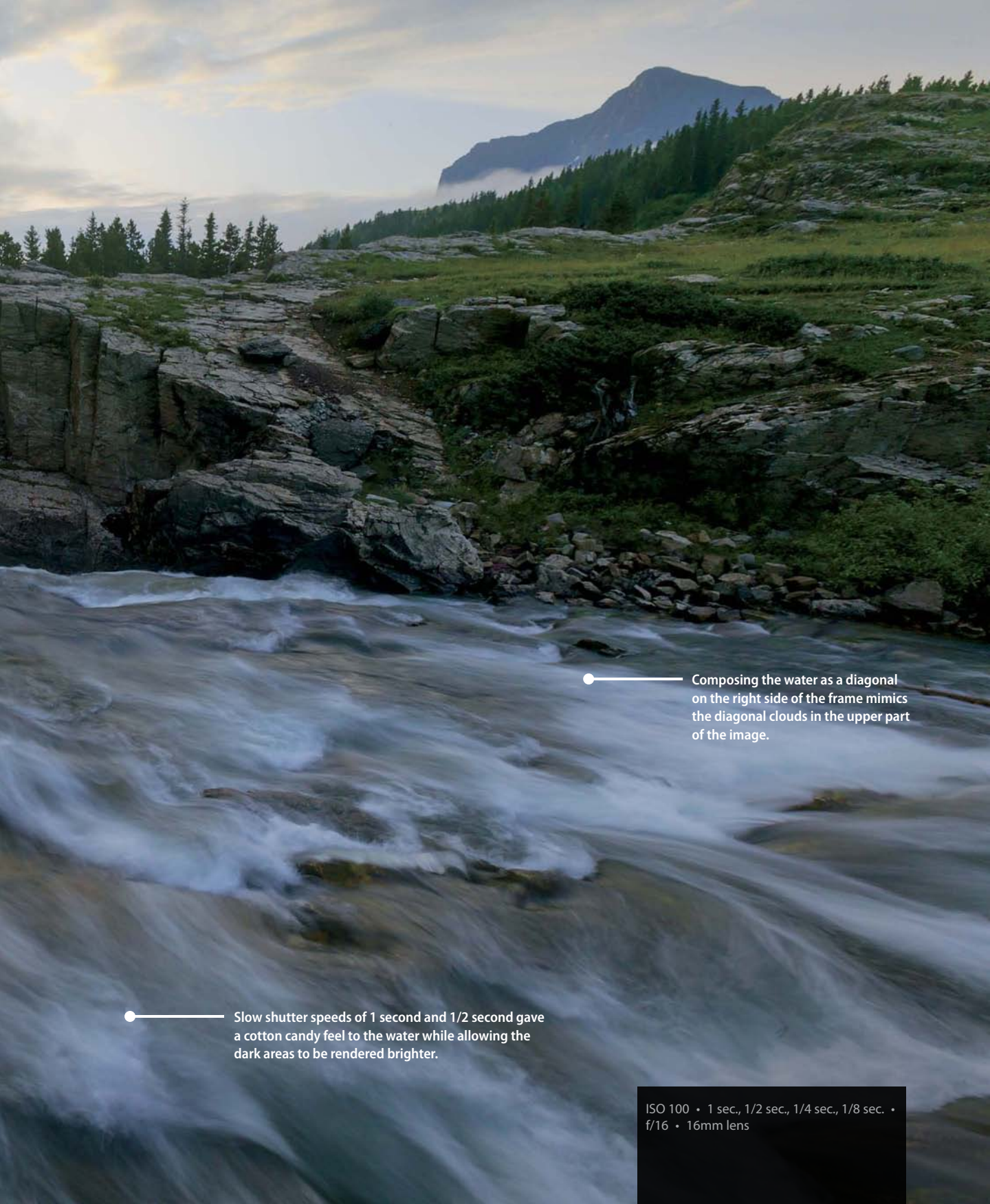
ISO 400 • 1/4 sec., 1/2 sec., 1 sec. •
f/8 • 24mm lens

Poring Over the Picture

The exposure of 1/8 of a second kept the bright, sunlit clouds from overexposing.

A waterfall downstream created a cloud of mist that blended with the distant clouds.

This image was created at a favorite photography workshop location overlooking the Swiftcurrent River in Glacier National Park. Sunrise at this location is simply magical. As the sun began its ascent into the morning sky, it illuminated the mist created by the waterfalls downstream. Distant fog and low clouds softened the harsh sunrise and made the powerful scene somewhat more ethereal.



Composing the water as a diagonal on the right side of the frame mimics the diagonal clouds in the upper part of the image.

Slow shutter speeds of 1 second and 1/2 second gave a cotton candy feel to the water while allowing the dark areas to be rendered brighter.

ISO 100 • 1 sec., 1/2 sec., 1/4 sec., 1/8 sec. •
f/16 • 16mm lens

A Program, an Image, or a Technique?

The initialism HDR stands for high dynamic range. It can refer to a computer program, a photograph that has been processed by an HDR program, or the technique of taking multiple photographs with the intention of blending them in an HDR program.

Let's begin with the phrase "dynamic range." Dynamic range refers to the brightness difference between the darkest and brightest parts of a scene. A scene low in dynamic range would have a limited range of brightness tones, as seen in **Figure 1.1**. Here you see tones that are almost all the same brightness; the entire scene is made up of midtones. A scene high in dynamic range would have a large range of brightness values, as seen in **Figure 1.2**. Here the image consists of midtones, shadows, and highlights. By including the sky and background, the difference between the highlight values and the shadow values greatly increases. This huge difference between values is what makes this scene high in dynamic range. "High-contrast" is commonly used to describe scenes with high dynamic range.

Figure 1.1

A scene with low dynamic range.



Figure 1.2

A scene with high dynamic range.



The problem with film and digital sensors is that neither is capable of providing a realistic image in these high-contrast situations. If you expose correctly for the shadow area of the scene, the bright highlight areas become overexposed (featureless white), as seen in **Figure 1.3**.

If you expose properly for the highlight area, the shadows become underexposed (featureless black), as seen in **Figure 1.4**. In cases where the contrast is really extreme, it is possible to lose detail in both the shadow areas and the highlight areas.

Both photos appear unrealistic because as we encounter these situations in real life, we see detail in the very dark and very bright parts of high-contrast scenes. We see something more like the image in **Figure 1.5**.



Figure 1.3 A good exposure for the shadows results in overexposed highlights.



Figure 1.4 A good exposure for the highlights results in underexposed shadows.



Figure 1.5
An image created by blending the two previous photos in the HDR program Photomatix.

The HDR *technique*, then, is to take multiple photographs at different exposures. Each of these photos will capture a different range of detail. Once the photos are captured, you can then import them into an HDR program. HDR programs blend all the exposures into one photograph that contains full shadow, midtone, and highlight detail. The resulting image is often referred to as an HDR image or HDR photograph.

Purchasing HDR Programs

Adobe Photoshop and Adobe Lightroom have the ability to blend images together using HDR algorithms. The industry standard HDR program is called Photomatix, which can be purchased at hdrsoft.com. I recommend purchasing the Photomatix Pro version. You can receive a 15% discount on Photomatix by typing my name, TimCooper (capital T, capital C, all one word), into the coupon code upon checkout.

Why Use HDR

The primary reason for wanting to shoot multiple exposures and blend them in an HDR program is to capture full detail in a scene that contains very bright areas and very dark areas. These high-contrast scenes can be found everywhere, from landscape and nature scenes to interior architecture and real estate situations. A classic example would be a landscape photograph taken just before sunrise: the sky is being illuminated by the sun, which is not yet high enough to illuminate the land. The result is a very high-contrast scene. If you make a good exposure for the sky, the foreground becomes black. Make a good exposure for the foreground, and the sky turns white. Neither of these situations is how we perceive the scene as we are standing there.

Controlling high contrast

In addition to their ability to provide detail in the shadows and highlights of high-contrast scenes, HDR programs come with the capability to control contrast throughout the entire image. This ability has led to the use of these programs for generating a unique, somewhat grungy look (**Figure 1.6**).



Figure 1.6 A contemporary use of HDR programs is to create a grungy look.

This type of imagery is relatively easy to create and will not be the focus of this book. In the upcoming chapters, I show you how to create photographs that better represent reality and that have subtlety, depth, and staying power.

Camera Capabilities

As we have seen, there is a great disparity between what our eyes perceive and what the camera's sensor captures. This difference can be measured in *stops*, which are units used by photographers to quantify light. Simply put, moving your aperture from f/8 to f/11 decreases the amount of light hitting the sensor by one stop.

Sensor capabilities

Moving your aperture from f/8 to f/5.6 increases the light by one stop. The term *stop* also applies to shutter speeds. Opening up your shutter from 1/250 to 1/125 increases the light by one stop, whereas closing it down from 1/250 to 1/500 decreases the light by one stop.

Our eyes perceive detail in scenes that contain up to 11 stops of difference in light, whereas the camera can capture only five to seven stops of light. At first this may not seem like a huge difference, but when you realize that each stop lets in twice as much light as the previous stop, you can understand that the difference is significant.

It is important for photographers to recognize when parts of their scene will be rendered as featureless black areas or as blown-out, featureless white areas. This information can lead us to use different exposures, change compositions, or even return under different lighting conditions. Your camera can display a tool called a histogram, which provides this information. Most cameras can display the histogram after each shot, but typically this is not the default behavior. Check your camera manual for directions on how to display this essential tool. Many cameras will also allow you to choose between two types of histograms: the luminosity histogram, shown in **Figure 1.7**, and the RGB histogram, shown in **Figure 1.8**. The RGB histogram shows the red, green, and blue channels of the image.

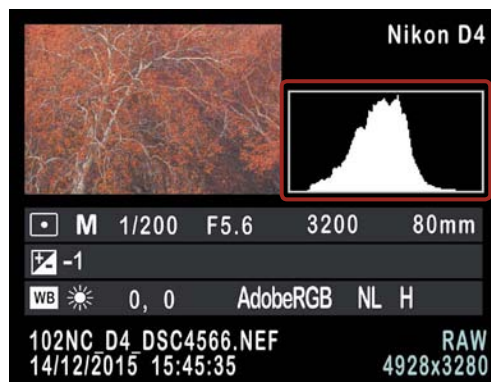


Figure 1.7 A luminosity histogram as it appears on the back of a Nikon camera.

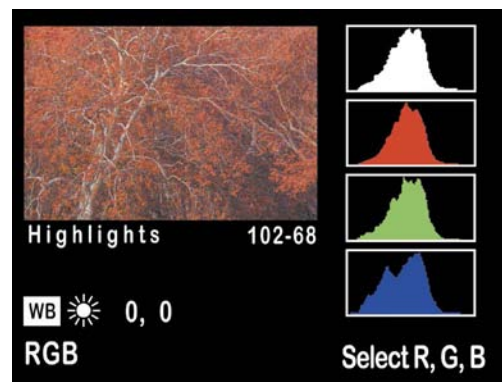


Figure 1.8 An RGB histogram.

The luminosity histogram is sometimes called a composite histogram because it is made up of a combination of the red, green, and blue channels. Both histograms perform the same function, and either can be used. Most image-editing programs, such as Adobe Lightroom, also provide a histogram (Figure 1.9).

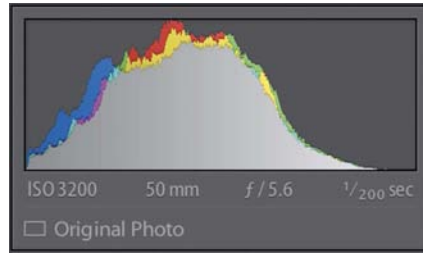


Figure 1.9 The same histogram as it appears in Adobe Lightroom.

Histograms and Pixel Information

The histogram is a graphic representation of the tonal values in the scene. It tells you how much of the scene is composed of darks, lights, and midtone values. It also tells you when you are losing detail in the shadows and highlights.

In **Figure 1.10**, you see an image that contains a full range of tonal value and detail; **Figure 1.11** shows the histogram that represents it. In this photo you can see detail in both the shadows and the highlights.



Figure 1.10
An image that contains full tonal detail.

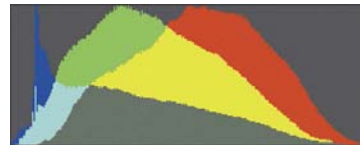


Figure 1.11 The histogram representing that image.

Figure 1.12 shows the areas represented by the histogram. If the spike of the graph is high in a region, it means there is a lot of that value in the scene. It's not a problem if the spikes reach or touch the top of the box (as the red and green channels do in Figure 1.12). This just tells you that there's an abundance of that value (brightness) in the scene. This histogram tells us there are plenty of midtone values in the scene. It contains fewer darks and lights and very few blacks and whites. Take a couple of minutes and examine the photo in Figure 1.10 and its histogram together. Note the small amounts of blacks and whites in the image and how that corresponds with the histogram.

When the graph comes down into the corners, as seen in **Figure 1.13**, it means you will see full detail in your blacks and whites. Examine Figure 1.10 again and you will notice that you can readily see detail in the brightest area of the photo as well as in the darkest areas.

Figure 1.12 A histogram represents different tonal values of a photograph.

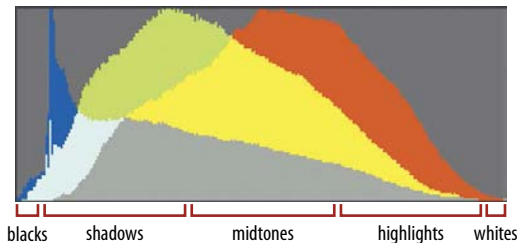
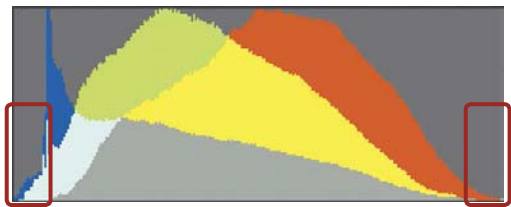


Figure 1.13 Histogram showing good highlight and shadow detail.



If the graph touches the left or right sides of the box, it means you will see some under- or overexposure in your final photograph. **Figure 1.14** shows a dark photo of a stairwell and its histogram. You can see how the graph is pushed up against the left wall of the histogram box. In this image there is plenty of highlight detail, demonstrated by the graph on the right side coming down into the corner. **Figure 1.15** shows a lighter photo of the same stairwell, and its histogram. Here you can see plenty of detail in the shadows but not in the highlights, which are overexposed.

Tip [NEED SIDEBAR HEAD OTHER THAN "TIP"]

Many terms in photography are left over from film days and don't always match with current circumstances or technology. For example, we would say our highlights were "blown out" when they were overexposed; overexposed highlights are pure white with no visible detail. We would also say our shadows were "blocked up" when they were underexposed; underexposed shadows are pure black with no visible detail.

Figure 1.14 On the left side of the histogram, you can see the graph touching the edge of the box; this shows you that the shadows are blocked up, resulting in a loss of detail in the black areas. The information on the right side doesn't touch the edge, meaning the highlights have good detail.

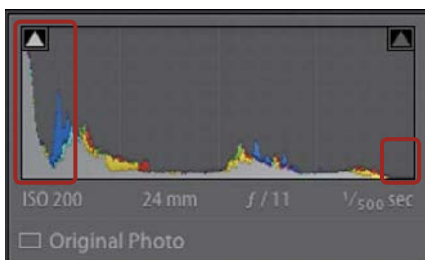
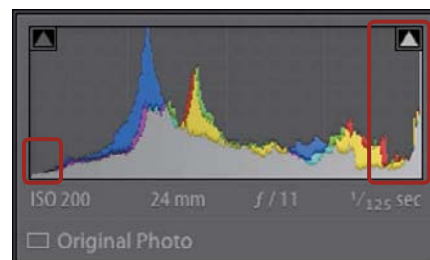


Figure 1.15 On the right side of the histogram, you can see the graph touching the edge of the box; this shows you that the highlights are blown out, resulting in a loss of detail in the white areas. The information on the left side of the histogram comes right down into the corner, indicating that the shadows have good detail.



When the graph touches the edge of the box, it is really finishing outside the box, which is out of our view. **Figure 1.16** is a histogram showing good detail in both the blacks and whites. The graph is contained inside the box. **Figure 1.17** is an example of the same scene but with overexposed highlights. You can see the graph actually finishing outside the box. This is sometimes referred to as “clipping the highlights.” **Figure 1.18** is an example of the same scene except with underexposed blacks. Again, the graph finishes outside the box. Another term for this is “clipping the shadows.”

As you can see, the histogram is an invaluable tool for judging exposure. It should be referenced after every shot to ensure that you are capturing detail when necessary. Remember that there is no perfect shape for a histogram. The shape of the graph is simply determined by the scene it represents. The histogram in **Figure 1.19**, representing the photo of the snow-covered tree, is clearly unorthodox, but the scene it represents is properly exposed. Because most of the scene is highlights and whites, the graph should be over to the right. There are no real shadows in the scene, and the histogram represents that. The same could be said for **Figure 1.20**. Here, the graph is stacked to the left, as is proper for a scene with an abundance of blacks.



Figure 1.16 Histogram representing an image with good highlight and shadow detail.



Figure 1.17 Histogram showing overexposed highlights.



Figure 1.18 Histogram showing underexposed shadows.