DIGITAL PHOTOGRAPHY SCHOOL

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PHOTOGRAPHY FOR THE WEB

BY **PAUL DUNCANSON**

DISCOVER HOW EASY IT IS TO CREATE STUNNING PHOTOGRAPHS

Summary of Contents

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BY **PAUL DUNCANSON**

Photography for the Web

by Paul Duncanson

Expert Reviewer: Simon Pollock
Technical Editor: Raena Jackson Armitage
Technical Editor: Andrew Tetlaw
Chief Technical Officer: Kevin Yank
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48 Cambridge Street Collingwood
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Web: www.sitepoint.com
Email: business@sitepoint.com

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About the Author

Paul Duncanson has been playing around with cameras for far more years than he cares to remember. When digital cameras became as good as film (but without the waiting and the messy chemicals) he started taking it seriously. He began taking photos professionally before finishing his studies at Melbourne's Photography Studies College (http://psc.edu.au) and now works as a freelancer, covering advertising and other commercial photography, along with the occasional wedding.

About the Expert Reviewer

Simon Pollock is the community manager for the Digital Photography School (http://digital-photography-school.com/) and a live music photographer based in London, England. Starting out as a musician who enjoyed taking pictures, Simon has switched it around and now photographs musical artists ranging from Paolo Nutini to Counting Crows to Metallica—though he still enjoys playing his guitar from time to time. Simon writes about his music photography experiences and other camera-related ramblings on his blog at http://www.gtvone.com, and can be found on Twitter most hours of the day at http://twitter.com/gtvone/.

About the Technical Editors

Raena Jackson Armitage is an Australian web developer with a background in content management, speaking, and training. When she's not thinking about the Web, she loves knitting, gaming, all-day breakfasts, and cycling. Raena's personal website is at http://raena.net.

Andrew Tetlaw has been tinkering with websites as a web developer since 1997. At SitePoint he is dedicated to making the world a better place through the technical editing of SitePoint books, kits, articles, and newsletters. He is also a busy father of five, enjoys beer, and often neglects his blog at http://tetlaw.id.au/.

About the Chief Technical Officer

As Chief Technical Officer for SitePoint, Kevin Yank keeps abreast of all that is new and exciting in web technology. Best known for his book, *Build Your Own Database Driven Web Site Using PHP & MySQL*, he also co-authored *Simply JavaScript* with Cameron Adams and *Everything You Know About CSS Is Wrong!* with Rachel Andrew. In addition, Kevin hosts the *SitePoint Podcast* and co-writes the *SitePoint Tech Times*, a free email newsletter that goes out to over 240,000 subscribers worldwide.

Kevin lives in Melbourne, Australia and enjoys speaking at conferences, as well as visiting friends and family in Canada. He's also passionate about performing improvised comedy theater with Impro Melbourne (http://www.impromelbourne.com.au/) and flying light aircraft. Kevin's personal blog is *Yes, I'm Canadian* (http://yesimcanadian.com/).

About SitePoint

SitePoint specializes in publishing fun, practical, and easy-to-understand content for web professionals. Visit http://www.sitepoint.com/ to access our blogs, books, newsletters, articles, and community forums.

For Raena, this book's other biological parent,
with thanks.

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Preface

It is the best of times, it is the worst of times.

With apologies to Charles Dickens, digital imaging technology is now common enough and cheap enough for almost anyone to take up photography. Chances are good that you have a digital camera included in a phone, PDA, or even a music player as an extra feature. The superseding of film and its processing in favor of the pixel has removed the biggest ongoing cost to practicing photography. The Web has given us a wall as big as the world on which to hang our pictures. Alas, most of the content is substandard.

It seems that for many people, the primary use of their digital camera revolves around taking happy snaps of themselves and their friends for their Facebook page. Preserving the memory of the moment is enough. Most camera owners skip reading their manuals beyond the instruction that tells them how to turn it on and how to take a picture. If that's all you want, that's fine—you have no need for this book. But if you want to make pictures that people will want to look at and enjoy … well, that's a different scenario altogether.

Your camera's manual will tell you how its functions work, but it won't explain why you might use them, or why you might even want to turn off some of them. A camera left on automatic may produce a fairly ordinary image, but switching it to manual without knowing how best to capture the scene can lead to ruining the shot entirely. Given the choice between achieving a photo that's merely okay and the risk of no photo at all, it's unsurprising a lot of people let their cameras do the thinking.

You won't learn everything you need to know about making your own photos from this or *any* book. There is a lot to learn, but most of it, once you've mastered a few basic concepts, can only come from practice—and lots of it. This book aims to teach you those basic concepts about how cameras function, how light works, and how we see and respond to what we observe. No replacement for practice can be found in a text, but this book will help you practice smartly, and assist you to understand and learn from practicing. It will help you overcome that first big bump on the road to becoming a more confident and skilled photographer.

And if we're really lucky, we might start to see some more interesting pictures on our blogs, websites, and photo gallery pages.

Who Should Read This Book

If you've bought yourself a quality camera but keep it set to the automatic modes, if you enjoy taking photos but wonder why they never look as good as you expect, or if you have experienced the joy of the worldwide amateur photography movement and just want to join in … this book is for you. *Photography for the Web* provides a firm grounding in the mechanics of cameras and the fundamental

techniques of photography. Your camera will change from a point-and-click device to a tool that you can understand and control in order to create the photos you desire. Creating a beautiful photograph does not stop at the camera, though, and you'll also learn the simple tricks that will transform your photos from average to stunning.

What's in This Book

This book comprises the following seven chapters.

Chapter 1: *About Your Camera*

We start off with an overview of digital cameras, and look at some of the differences between two popular forms: compact and SLRs. We then examine the main features of a camera—the sensor, lens, aperture and shutter, viewfinder, in-built flash—and their functions. We'll also cover some of the preset scene options available, in order to understand how we can make the most of our camera's ability to do the work for us.

Chapter 2: *Photo Basics*

This is where we learn to seize control of our cameras and go beyond the limitations of automatic modes. We'll progress from taking good if unremarkable photos that use preset modes, to mastering a variety of conditions to produce outstanding images. Along the way, we'll learn how to master exposure, depth of field, and shutter speed, and discover the meaning of terms like white balance, metering, f-stop, and ISO. Finally, we'll address the secrets of composition, and look at the role that space, patterns, placement, lines, angles, and balance have to play.

Chapter 3: *Advanced Techniques*

As you'd expect by the title, we explore more advanced methods and accessories to better prepare you when capturing the scene, rather than just dealing with what the elements throw at you. There's be a strong focus on gaining the maximum benefits of working with light, both natural (direction, quality, amount) and flash (in-built, external, diffusers, reflectors). Other topics include shooting objects in motion, using tripods, and the beautiful effects you can capture utilizing long exposures.

Chapter 4: *Storing and Managing Your Images*

I wanted to call this chapter "The Importance of Backups" but they wouldn't let me! Still, backing up your images is paramount in the digital age, as well as preserving your originals, should you make an error or want to start over. We also look at the electronic benefits of metadata and tags for sorting and rating your images, and cover some of the image organizing software options to manage your output.

Chapter 5: *Editing Your Images*

Here we look at making your pictures the very best they can be through digital editing. We cover some of the image editing options that are available, especially more affordable choices for the amateur photographer. We consider the concepts of non-destructive editing through the

use of layers, and tonal and color correction with histograms. Then we reveal further tricks of the trade to improve the quality of your output, such as cropping, rotation, distortion, and the removal of flaws.

Chapter 6: *Sharing Your Images*

Now it's time to show off your babies. Even if you're feeling a little vulnerable at the prospect of a wider audience, this is really the best way to discover what's working for you and what needs fine-tuning. We'll look at the various ways people distribute images electronically, from email and blogging, to image hosting services like Flickr. There's even the possibility of creating your own photo website, as well as more old-fashioned methods such as printing on paper.

Chapter 7: *Further Steps*

To wrap up, I suggest more possibilities for exhibiting your work and how to meet like-minded shutterbugs. Online forums, social groups, and photography schools provide ideal outlets to engage with fellow photographers, while competitions and microstock websites offer an excellent opportunity to make a financial return on your hobby.

Where to Find Help

SitePoint has a thriving community of web designers and developers ready and waiting to help you out if you run into trouble. We also maintain a list of known errata for this book, which you can consult for the latest updates; the details follow.

The SitePoint Forums

The SitePoint Forums[1] are discussion forums where you can ask questions about anything related to web development. You may, of course, answer questions, too. That's how a discussion forum site works—some people ask, some people answer and most people do a bit of both. Sharing your knowledge benefits others and strengthens the community. A lot of fun and experienced web developers and designers hang out there. It's a good way to learn new stuff, have questions answered in a hurry, and just have fun.

The Digital Photography School Forums

The Digital Photography School Forums[2] are home to thousands of photographers, ranging from absolute beginners to seasoned professionals. Forum discussions give you the opportunity to ask questions, show your work, and look at the work of others for inspiration. The pool of talent at DPS is vast; ask how to shoot a particular type of scene and you'll receive several answers, all of them different and none of them wrong.

[1] http://www.sitepoint.com/forums/

[2] http://digital-photography-school.com/forum/

The Book's Website

The website that supports this book is located at http://www.sitepoint.com/books/photography1/. No book is perfect, and we expect that watchful readers will be able to spot at least one or two mistakes before the end of this one. The Errata page on the book's website will always have the latest information about known typographical and content errors.

The SitePoint Newsletters

In addition to books like this one, SitePoint publishes free email newsletters, such as the *SitePoint Tech Times*, *SitePoint Tribune*, and *SitePoint Design View*, to name a few. In them, you'll read about the latest news, product releases, trends, tips, and techniques for all aspects of web development. Sign up to one or more SitePoint newsletters at http://www.sitepoint.com/newsletter/.

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Your Feedback

If you're unable to find an answer through the forums, or if you wish to contact us for any other reason, the best place to write is `books@sitepoint.com`. We have a well-staffed email support system set up to track your inquiries, and if our support team members are unable to answer your question, they'll send it straight to us. Suggestions for improvements, as well as notices of any mistakes you may find, are especially welcome.

Tips, Notes, and Warnings

You'll notice that we've used certain typographic and layout styles throughout this book to signify different types of information. Look out for the following items:

Hey, You!

Tips will give you helpful little pointers.

Ahem, Excuse Me ...

Notes are useful asides that are related—but not critical—to the topic at hand. Think of them as extra tidbits of information.

Make Sure You Always ...

... pay attention to these important points.

Watch Out!

Warnings will highlight any gotchas that are likely to trip you up along the way.

Acknowledgments

Several people whose names don't appear in this book must be thanked for their contributions behind the scenes.

First and foremost, Raena Jackson Armitage, who first thought of pitching a photography book to SitePoint, and asked for some help with an outline.

Kate Fisher and Hayu Abdi for their patience and assistance with shooting example photos. The tutors of the Photography Studies College[3] in Melbourne, who are worth their volume in ink-jet pigment. And finally, Cate Billing who, once upon a time, gave me a digital camera for Christmas and started everything.

Without them these pages would be a lot emptier.

[3] http://psc.edu.au/

Chapter 1

About Your Camera

At the most basic level, the camera is one of the simplest machines you can own. The lever, the wheel, and the toaster are slightly simpler, but only just. At its core a camera is nothing more than a box with a hole at one end and a light-sensitive element at the other. Everything beyond that is bells and whistles, but it's the bells and whistles that do all the cool stuff—providing the means to turn a small shaft of light streaming through a hole in the side of a box into art.

There are a multitude of manufacturers and models out there, too many for me to tell you how to use the specific camera you own, so don't throw away your manual just yet. The manufacturer's manual is the best way to learn *what* each control does, but it rarely, if ever, tells you *why* you might want to do it. That's what I aim to cover with this book.

However, before we become too deeply immersed in the art and science of photography, let's take a look at the general features of a camera and make sure we understand their functions.

Types of Digital Camera

When we discuss digital cameras, there's very little agreement on what labels to apply to different physical designs. For instance, how small does a camera have to be before it can be called *compact*? Or, what price point separates cameras for the professional from those for the enthusiast? Then, to confound the situation, manufacturers have taken each of the various options that feature in most cameras and branded them; for example, Vibration Reduction, MEGA Optical Image Stabilizer, Anti-Shake, Super Steady Shot, and Vibration Compensation are all labels for exactly the same

feature found in most cameras. Sometimes it's hard to be certain what a photographer with a different camera from yours is talking about.

So while there are no official definitions, in general usage it works like this: a **compact** camera is one that is noticeably smaller than a full-sized model. It might fit in a large coat pocket. Cameras referred to as subcompact (like the Nikon Coolpix S220 depicted in Figure 1.1) or ultracompact are smaller again, fitting in your pocket and still allowing room for other items. It's about as convenient to carry around as a mobile phone. Many camera companies design their subcompacts to have a front surface area that has similar dimensions to a credit card.

Figure 1.1. Nikon's Coolpix S220: at 90x56x18mm (with the lens retracted), the very definition of subcompact

The More Compact, the Less Features

Most of the significantly compact cameras lack the full range of manual controls you'll need to follow along with the examples in the next few chapters. Their preset scene modes, however, often come close to what's needed.

The one camera format that does have an agreed upon definition is the **SLR**, which stands for **Single Lens Reflex**. The SLR camera is named for the way its viewfinder works. In an SLR camera, a mirror directs light from the main lens into the viewfinder. When you look through the SLR's viewfinder, you see the same light the sensor sees when the shutter opens. Some compact cameras have viewfinders that look like SLR viewfinders but are in fact small, enclosed LCD displays that show a live view from the sensor. An SLR viewfinder gives you a clearer view than any LCD. We'll talk more about this shortly.

The images below show the path taken by light through an SLR camera. Figure 1.2 indicates the shutter closed; the prism's role is to turn the image the right way up (after the mirror inverts it). Figure 1.3 shows the light path with the shutter open.

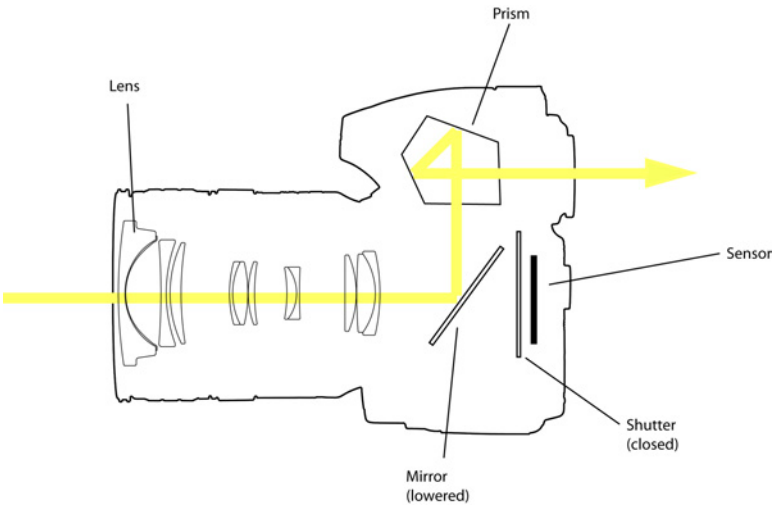

Figure 1.2. The light path through an SLR camera with the shutter closed ...

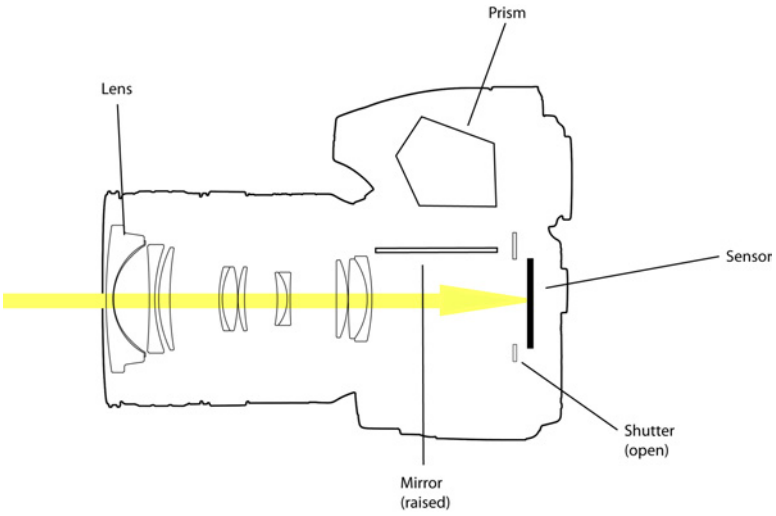

Figure 1.3. ... And open—in this instance you're unable to see through the viewfinder

The extra optics needed to bounce the light around like that take space. SLR cameras are larger than most other digital cameras on the market. They also give the most control over the image-making process. The accuracy of sighting and degree of control are two of the main reasons SLR cameras are favored by professional photographers.

Because they're the choice of professional photographers, camera manufacturers tend to lavish more attention developing the features and accessories of their SLR cameras. The largest, highest resolution sensors are found in SLR cameras. A single SLR model will often have a wider range of accessories than the manufacturer's whole compact camera range. Then there are the lenses.

Lenses on SLR cameras are interchangeable. Compact cameras are stuck with one fixed lens that's okay at everything but great at nothing. SLR cameras have a range of lenses that are each superb for

a small range of purposes. You buy the lenses you need for the kinds of photos you shoot, and swap them as needed.

The main disadvantage of the SLR format is the very reason why we have compact cameras. The extra mirrors, prisms, and lenses that an SLR needs for its viewfinder contribute to the size of the camera, as Figure 1.4 shows. Even the smallest SLR is unable to fit in a pocket. (Maybe in very large pockets, but it would be uncomfortable.) On top of that, most SLRs come without a live preview on their LCD displays, although in the last few years some models have gained the feature that allows you to set up a shot via the display.

Figure 1.4. The Nikon D90

At the more expensive end of the non-SLR section of the camera market, you'll find "SLR-like" cameras—cameras that look like an SLR but lack interchangeable lenses and the unique viewfinder arrangement of an actual SLR. Some will be advertised as "super-zoom" or similar if they have a lens with a maximum zoom in double figures. The Nikon Coolpix P90 depicted in Figure 1.5 is one of these types.

Figure 1.5. Nikon Coolpix P90

There's another class of camera that caters for large-format photography and involves sensors significantly larger than the standard 35mm film frame. Because the sensors are so large their price puts them out of reach of the amateur photographer. They're large, expensive, and way beyond the scope of this book.

Another term you'll encounter in the photography world quite a lot is "point and shoot." Some people use it to describe a camera that does all the work for you, without providing many options to take control. In other contexts it can mean letting the camera do all the work even if it does have manual controls. Since the most expensive digital SLRs can be set to shoot fully automatically, "point and shoot" is a fairly useless term for distinguishing types of cameras, so we'll avoid using it here.

What do all these bells and whistles do?

Now that we're using the same labels to describe our cameras, let's take a look at the parts of a camera, what their functions are, and how they will affect your picture taking.

The Sensor

At the back of the lightproof box that's the core of your camera lies the **sensor**, a chip covered with millions of light-sensitive sites in a space no bigger than a postage stamp. Light through the lens forms an image of what the camera is pointing at on the surface of the sensor. The sensor converts the light's brightness at each of those millions of sites into an electrical signal that's then sent to the camera's processor. Figure 1.6 shows the 12.3 megapixel sensor of the Nikon D5000 SLR. The sensor's sensitive area is 23.6x15.8mm, making this considerably larger than the sensors of most compact cameras.

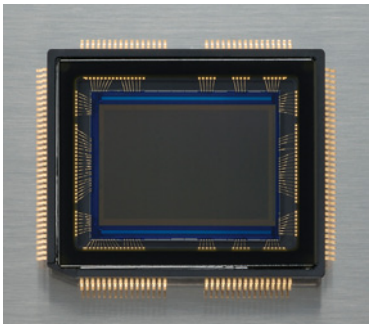

Figure 1.6. The 12.3 megapixel sensor of the Nikon D5000 SLR

Each of those light-sensitive sites on the surface of the sensor makes up one pixel of the finished image. The more pixels an image has, the finer the detail and hence, the larger it can be displayed before it becomes evident that it's all just a bunch of tiny dots; thus, the pixel count of a sensor can be important if you want to produce large images. A few years ago camera marketing was entirely megapixel-based, almost as if the megapixels were the product and the cameras just a container to hold them. Megapixel hysteria has calmed down a bit in recent years as camera manufacturers, their marketing departments, and their customers have realized two things:

1. Not everyone wants to create billboards.
2. Bigger isn't always better.

The decline in megapixels being the number one selling feature has partly been replaced by the marketing of "mega-zoom lenses" (or the equivalent company-branded feature), yet there's still a tendency for people to think of megapixels as the primary measure of a camera's quality. And that's misguided.

Let's consider the size of the images you'll be making with your camera. Canon's PowerShot SX1 is a standard 10 megapixel camera. It produces, at maximum resolution, an image file that's 3648 by 2736 pixels. If you just want to display it on your computer's monitor, it's likely to be around four times the number of pixels your monitor can show (perhaps much more). Put it on a web page and, allowing for the browser window surrounding it and any other design elements that might be on the page, you need even fewer pixels. To produce a high-quality print of the image you'll want to put those pixels on paper at 240 pixels or more per inch, giving you a print size of around 15 by 11 inches—far bigger than most home photo printers. You can see how 10 megapixels is far more than most people will ever need.

Sites, Not Websites

Just to be clear, I use the term "sites" in this section to refer to the light-sensitive dots that make up a camera's sensor. I wouldn't want you to think I'm alluding to the location for an event or building, nor am I referring to websites in this instance, though I will be in chapters to come. I'm unsure how many websites you can cram into a camera's sensor, nor will I answer the question in this book.

Cramming more megapixels onto a sensor is a bad idea for image quality too. Sensor chips come in a range of standard sizes, and camera designers build their products to make images on surfaces of those sizes. Adding more light-sensitive sites to a chip of a fixed size means decreasing the size of each site. Smaller sites are less sensitive and so they capture less light. A lack of sensitivity can be overcome by amplifying the signal produced by each light detector, but this can add visible noise. Images produced with very small, high-resolution sensors show much more graininess than those made with chips comprising larger individual light detectors, especially when the light levels are low. Compare the quality of an image taken with a mobile phone camera to one from any larger camera taken under ordinary indoor lighting.

Figure 1.7 shows some typical camera sensor sizes. It's entirely possible to pack a dozen megapixels on the smallest, as well as the largest, of these, but the picture quality difference is often visible.

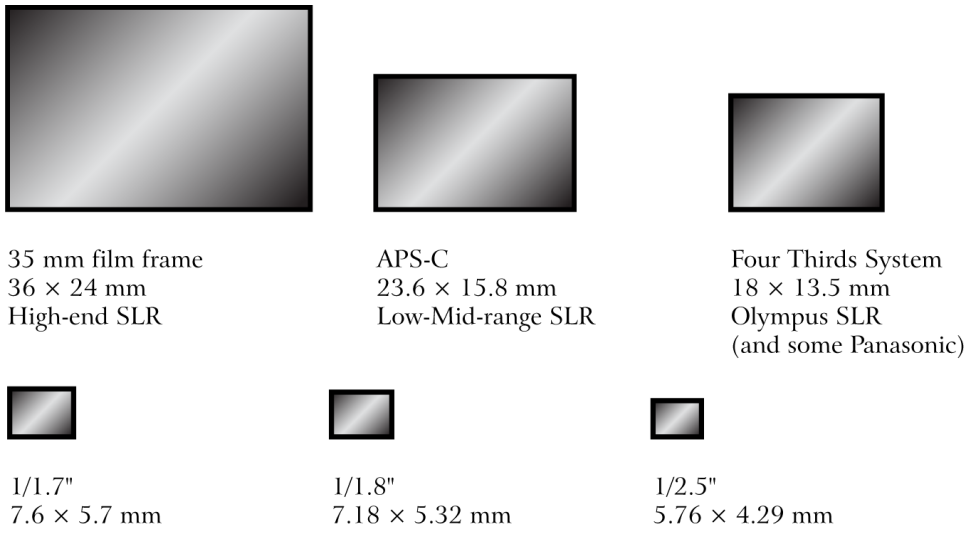

Figure 1.7. Various camera sensor sizes

Clearly there's no need to worry about the megapixel count of your camera. You almost certainly have enough. Instead, concern yourself more with the quality of the pixels you have. Take test shots well before you shoot anything important and look at them in full size on your computer. Remember that the LCD display of the camera has a much lower resolution than the sensor. For every LCD pixel there are tens of sensor pixels. Noise that appears as a variation in brightness between single pixels might be invisible on the live LCD display. You might well find that you have an unusable photo when it's too late to reshoot.

Figure 1.8 shows the night sky shot at maximum sensor sensitivity. The sky has been rendered spotty by the amplification of the sensor data. This was shot with a Canon EOS 30D SLR, which has a relatively large sensor. If your camera's small enough to fit inside your pocket, it will produce more noise than this under similar conditions.

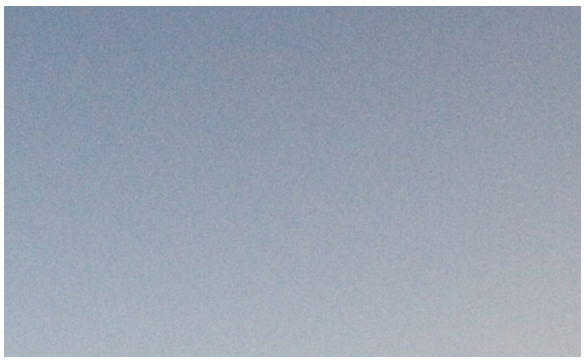

Figure 1.8. The night sky shot at maximum sensor sensitivity

The Lens

The first thing a person sees when you point a camera at them is the lens. It's more complex than it appears. The piece of glass at the front of the camera is only the first of a series spread along the length of the lens tube. There may be more than a dozen finely shaped pieces of glass in a camera lens, all moving back and forth with incredible precision every time you shift focus or zoom.

Once upon a time the owner of a compact digital camera would have been proud to have five times the zoom factor. Nowadays cameras with built-in lenses can have a zoom range of 20 times or more. A high magnification factor is handy if you need to photograph a subject that's a long way away, but there are drawbacks.

Due to their increased mechanical complexity and the more pieces of glass needed, lenses with a high zoom factor rarely produce images as sharp as those with limited (or no) zoom. For really defined images, SLR camera owners often use a **prime lens**, one with a fixed focal length and no ability to change magnification at all. In order to "zoom in" with a prime lens the photographer moves closer to the subject. Low tech for sure, but the difference in sharpness can be quite remarkable. The superiority of a camera's lens has greater influence on the quality of the final image than the megapixel count of the sensor, or any other factor of the camera hardware. The best sensor ever built can only capture what light the lens delivers to it, and a cheap lens can blur and distort your image in ways that Photoshop can never fix.

The camera's lens is often a bigger factor in the price of the camera than the sensor. Long zooms are expensive to make (as are wide apertures, but we'll get to that in the next section). At the professional end of the camera market, it's very common for a single SLR lens to cost more than the camera to which it's attached. Figure 1.9 shows where all the professional photographers' money goes.

Figure 1.9. A lens for every purpose: one of each model in Canon's EF lens range for SLR cameras

Focal Length versus Zoom Factor

Despite the zoom factor being marked in big shiny letters on the box, the capabilities of a compact camera's lens can seem a bit unclear. Manufacturers often fail to explain *what* exactly is being

multiplied by 10, 15, or 24. It may indicate the maximum magnification (that is, 10, 15, 24) times the minimum, but what is the minimum and what does that mean?

Let's look at real-world examples: the Canon PowerShot SX200IS and the Sony Cyber-shot DSC-H20, two compact cameras released early in 2009. The Canon boasts a 12x zoom, while the Sony only zooms by a factor of 10. If you go by just those numbers it looks like the Canon is the better choice for shooting distant objects. Alas, it isn't that simple.

To meaningfully compare the performance of lenses, we need to know more than just the ratio of the maximum to the minimum magnification. Lenses for SLR cameras are sold by their focal length. The **focal length** of a lens is the distance from the optical center to the place where the light is focused—where the camera's sensor is placed. How to calculate or use that distance is less important than knowing how the focal length affects the view though the lens: a long focal length gives you a narrow field of view (also called **angle of view**), while a short focal length gives you a wide field of vision. The narrower the angle of view, the greater the magnification.

In our example, the Sony has a base focal length of 38mm, while the Canon's is 28mm. At their maximum zoom, the Canon has a focal length of 336mm while the Sony goes to 380mm. There's 13% greater magnification with the Sony.

Whenever you see a camera with a big "X times" zoom factor advertised, look carefully at the documentation; you'll usually find, in finer print, the focal length of the lens. Sometimes you might have to look elsewhere, like the manufacturer's website, or even a reputable camera review site (Digital Photography Review[1] maintains an extensive database of technical information on digital cameras of all kinds as far back as the mid-1990s).

Lenses are broadly grouped into three categories based on their focal length. Standard lenses show you a view similar to what you'd see with your own eye without the camera. They have a focal length around 50mm. Wide-angle lenses, typically with focal lengths less than 35mm, show you a wider view, while telephoto lenses (focal lengths of 80mm or more) show a narrower field of view. Zoom lenses have movable parts that allow them to cover a range of focal lengths.

The angle of view is also affected by the size of the sensor. A smaller sensor captures a smaller view, so it can achieve a longer zoom from a shorter focal length.

Old Standards in the Digital Age

When we refer to a focal length in this book we'll always use its 35mm equivalent. The 35mm film standard has been around long enough that is has become the universal language for translating camera specifications. Since most digital SLR camera designs are based on the 35mm format, it's likely to stay that way for a while.

[1] http://dpreview.com/

Lost in Translation?

Most manufacturers translate the angle of view into the equivalent focal length for a 35mm camera, but that isn't always what's printed on the camera. If the minimum focal length printed on the lens of a compact camera is less than 10mm it hasn't been translated to a 35mm equivalent. If it's nowhere to be found in your camera's manual either, you can usually find that information on the manufacturer's website, or definitely in Digital Photography Review's database.

In the example we looked at above, the Canon camera has a focal length range from 28mm to 336mm, while the Sony ranges from 38mm to 380mm. If you want to shoot broad landscapes instead of distant objects, the Canon would be the best choice for its wide-angle view. This isn't easily worked out from reading the camera's magnification range alone, but it's a very useful point to know.

It's a little tricky to understand what a lens of a specific focal length will capture just by reading the numbers, so here's what some common focal lengths will show you if you point them at a cityscape.

Figure 1.10 shows the view through a 16mm lens. 16mm is a rather wide angle, perhaps too wide for some views. Diagonally it covers just over 108 degrees.

Figure 1.10. City view through a 16mm lens may be too wide

A 38mm lens is at the shorter end of standard lenses. Figure 1.11 shows the view of the city through a 38mm lens, which is as wide as some cameras go at the bottom end of the scale.

Figure 1.11. Falling within the standard range is the 38mm lens

A good all-purpose focal length is 50mm, demonstrated in Figure 1.12. It's very similar to what you'd see looking at the same scene through one eye without a camera.

Figure 1.12. 50mm: a good all-purpose focal length

Now zooming in to the lower end of telephoto lenses, Figure 1.13 depicts the view at 100mm.

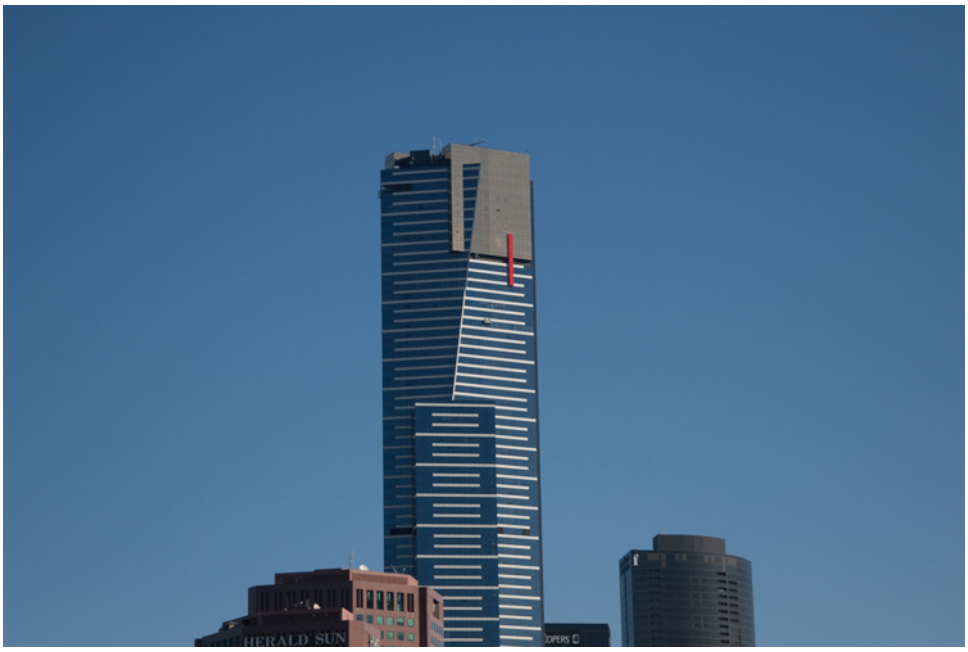

Figure 1.13. View from a 100mm lens: an example of what shorter telephoto lenses can achieve

Figure 1.14 shows the view with a 200mm lens, a very popular telephoto length.

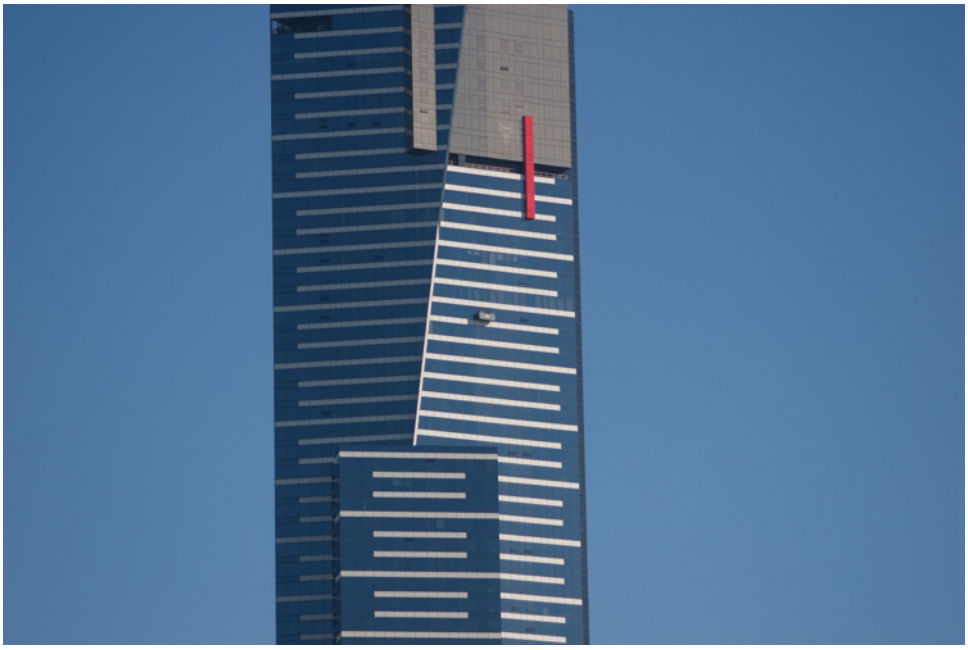

Figure 1.14. The 200mm lens is very popular among the telephoto range

And again, the same view in Figure 1.15 using a 480mm lens. The current range of 35mm SLR lenses available extends to 1,200mm (which can be increased to 2,400mm with an add-on extender), but I think we've made our point.

Figure 1.15. Ready for my close-up, Mr DeMille

Focal length affects more than just how large an object appears in your image; it also affects the perspective of your image. Table 1.1 compares the angles of view of different size lenses.

Table 1.1. Angles of view comparison

16mm	38mm	50mm
		
100mm	200mm	480mm
		

When using very short focal lengths, there can be quite a dramatic effect on perspective. An ultra wide-angle lens exaggerates the apparent distance between objects in the foreground and background. To fill the frame of a wide-angle shot you need to be much closer to your subject, and this can cause considerable distortion. If you use a 10mm lens to shoot a close-up of a person, it's entirely possible for the tip of the nose to be twice as close to the camera as the person's ears. The sides of the head recede into the distance, while the nose looms larger in the foreground.

Figure 1.16. Why portraiture with a wide-angle lens is a bad idea

Figure 1.16 shows a close-up shot using a 16mm lens. Notice how the left side of the face is smaller than the right, the nose is enormous, the top of the head seems to curve away from us, and the glasses lenses appear to be asymmetrical. The lesson, I hope, is clear. Avoid using a wide-angle lens to take portraits.

The Aperture and Shutter

The **aperture** is the hole in a camera lens that allows light to enter the camera. In among the many pieces of glass in your lens is the iris, which controls the lens's aperture. Logically, opening the iris and increasing the aperture lets more light into the camera, while closing it reduces the amount of incoming light. Photographers use a wider aperture when wanting to reduce the **depth of field**—the level of distance between the closest objects and farthest objects that remain in sharp focus. For instance, a picture taken with a shallow depth of field would have only the main object in focus, with any other elements appearing blurry.

In most of the camera's automatic modes of shooting you have no direct control over the aperture. When shooting in manual or semiautomatic modes (which we'll cover in Chapter 2), you'll find that mastering the use of the aperture control is a very important part of photography.

While the aperture controls the amount of light entering the camera, the **shutter** is the device that controls the amount of time the camera's sensor is exposed to the light entering the camera. When the shutter is closed, no light can reach the sensor. **Shutter speed** is the measure of time the shutter is open. A slow shutter speed means the shutter stays open for a long period of time, and, unsurprisingly, a fast shutter speed means the shutter is open for a short amount of time.

Aperture and shutter speed are combined to control the overall amount of light that reaches the sensor when taking a photo, as we'll see in Chapter 2.

The Viewfinder

There are several distinct types of viewfinder. Each has its advantages and disadvantages, and all will affect the way you take photos.

On most cameras the LCD display gives a live feed of whatever the sensor is capturing. On smaller cameras it's often the only option for setting up your shot. In the most compact cameras there's no space for a separate viewfinder. A large display is terrific for visualizing the composition of an image, and is large enough to allow you to shoot under conditions where you might have to hold the camera some distance from your eye, such as shooting over the heads in a crowd.

Large LCD screens can sometimes perform poorly as viewfinders in very bright light. Their own brightness can be overwhelmed by direct sunlight, making it hard to see the details of what it is you're aiming at. Lower-resolution LCD displays may also be unable to display the kind of fine detail needed for accurate manual focusing. When shooting with a camera that only has an LCD display, autofocusing is essential. Many compact cameras have the ability to detect faces within a scene and focus on them, and that's a great way to overcome the problem when shooting portraits. Otherwise, you can often increase the display's magnification to better see where the image is focused.

The problem of viewing an external LCD display in bright light is completely overcome by viewfinders with an eyepiece. Not all of them give you a direct view of the subject, though. Many compact digital cameras have an electronic viewfinder, which consists of a very small LCD display mounted internally in front of the viewfinder eyepiece, like the Nikon model shown in Figure 1.17. This eliminates the problem of bright light contrast, but does not fix the fine detail dilemma.

Figure 1.17. The back of the Nikon Coolpix P90 showing both LCD display and electronic viewfinder

The issue of fine detail goes away with optical viewfinders. On a compact camera this is a hole that passes right through the camera body, containing its own separate set of lenses that create as close a match as possible for what the sensor sees through the main lens. Because they're a bit out of line

with the main lens, they don't quite line up with the view; any markings that overlay the view are usually placed a little off center to compensate for the difference in alignment.

The Single Lens Reflex (SLR) camera is a special case of optical viewfinding. Looking through the viewfinder shows you exactly what the sensor will see when you open the shutter, because you're seeing it through exactly the same pieces of glass. The viewfinder of an SLR overlays lots of useful information on the scene—grids to help keep the image straight, a selection of points on which to focus, and a display of all the current camera settings, as demonstrated in Figure 1.18.

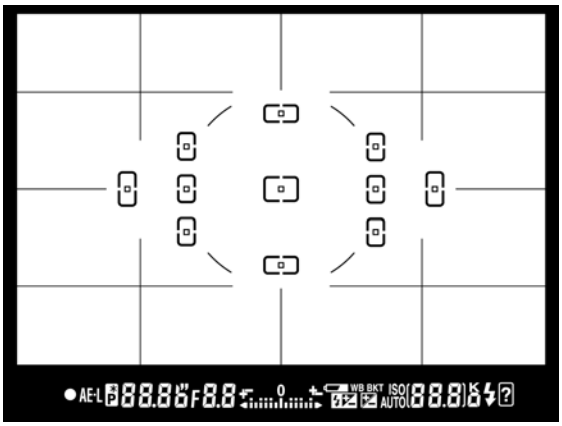

Figure 1.18. The viewfinder overlay of a typical SLR camera

Onboard Flash

It might seem odd, but it's only the most expensive cameras aimed at professional photographers that lack a built-in flash. Everyone else gets one of these horrible little items, whether they want it or not.

You might assume from that last sentence that built-in flashes are to be avoided at all costs (or at least that this author detests them). That's not entirely true. If you have absolutely no other light sources and no way to keep your camera or subject still for a really long exposure, it's probably better to use the built-in flash than miss the shot.

Built-in flashes do have problems: they cause red eyes in your subjects, cast very harsh shadows, and are unable to be pointed from anywhere other than where the camera is. In Chapter 2, you'll learn ways to do without your camera's flash to light your scene. In Chapter 3 you'll learn how to better work with flashes—built-in and external.

For now, we'll just deal with the worst problem of built-in flashes: most of them turn on automatically. Many compact cameras, when faced with a slightly dim scene, go flash-happy, whether they need to or not. Nobody likes having a flash go off in their eyes, either, so it's probably a good idea to check your manual and learn how to turn the flash off. It will save your batteries, too.

Preset Scene Options

As you progress through this book you'll learn how to take control of your camera and to tell it what to do. You'll make choices that will create great photos but, while you're learning, you should take advantage of your camera's ability to do some of the work for you.

Manufacturers' claims aside, your camera is not a very smart piece of hardware. It's unable to know a good photograph from a bad one. It has no comprehension of what it's being pointed at. However, it can measure how bright a scene is, and recognize when the point at which it's aimed is out of focus and adjust itself. Some autofocus programs can recognize when an object is face-shaped and focus on it. That's about all it can do without your input, but the average camera user barely knows how to manually set the camera to capture the image they want. Many camera designers program their products with a range of preset scene options. They can be used for a number of standard types of scene, and the camera will adjust its settings to best suit that type of shot under the current lighting conditions.

These pre-programmed options vary from camera to camera; Figure 1.19 shows the selection available on a Nikon D5000. On larger cameras they're often set via a dial on top of the camera. Smaller cameras with less room for knobs and dials will put them on menus accessible via the LCD display. High-end cameras aimed purely at the professional photographer may have no preset modes at all.

Figure 1.19. The Mode Dial of a Nikon D5000 and icons representing the presets from which you can choose

Automatic Mode

Automatic mode tells your camera to use its best judgement to select shutter speed, aperture, focus, flash, and a range of other settings, to take the best shot that it can. With some cameras, auto mode lets you override flash or change it to red-eye reduction, but beyond that everything else is left up to the camera. If you're shooting in standard conditions you'll probably record a decent shot using automatic mode; however, you need to keep in mind that your camera knows nothing about the type of scene you're looking at or the style of shot you're taking.

There will almost certainly be more modes to choose from, designed to make the best guesses about how to shoot specific types of scenes. Following are some of the more common scene modes.

Portrait Mode

When you switch to portrait mode your camera will automatically select a wide aperture, which helps to keep your background out of focus. This ensures that only the subject of the portrait is in focus and does not get lost in a busy background. After all, the person you're shooting should be the center of attention. Portrait mode works best when you're photographing a single subject, as in Figure 1.20.

Figure 1.20. A portrait shot should focus on the subject

Landscape Mode

Landscape mode is almost the exact opposite of portrait mode in that it sets the camera up with a narrow aperture to ensure as much of the scene as possible is in focus. It's therefore ideal for capturing shots of wide scenes, particularly those which have points of interest at different distances from the camera, as in Figure 1.21. At times your camera could also select a slower shutter speed in this mode, so you might want to consider a tripod or other method to ensure your camera is still.

Figure 1.21. Focusing far and wide in a landscape shot

Macro Mode

Macro mode—also called close-up—lets you position your camera very close to your subject. It's great for shooting flowers, like the one in Figure 1.22, insects, or other small objects. Different digital cameras will have macro modes with distinct capabilities, including various focusing distances. Check your camera's manual to find its minimum focusing distance. When you use macro mode you'll notice that focusing is less forgiving at short distances.

Figure 1.22. Macro mode sets the camera to focus as close as possible to let you see things larger than life

Night Mode

Night mode is for shooting nearby subjects in low-light situations. It combines the flash, to illuminate the subject, with a slower shutter speed, to let in some light from the background. It can be a good idea to use a tripod in this mode to avoid your background being blurred, but it can also be fun to take handheld shots to purposely blur your background—especially with lights behind your subject (great for parties with colored lights). Figure 1.23 shows the difference between automatic mode at night (on the left) and night mode (on the right). At night in automatic mode the camera fires the flash only, while in night mode the shutter remains open after the flash has fired to let more light in.

Figure 1.23. Automatic mode at night compared to night mode

Sports Mode

Sports mode (also called action mode in some cameras) is designed for shooting moving objects. It isn't limited to photographing people playing sports. If the subject you want to photograph is moving, this is the best mode to use. Sports mode attempts to freeze the action by increasing the shutter speed. The less time the shutter is open, the less distance the subject can move while it's open, and the less blurred it will be.

Other Modes

Beyond those common modes, here are some others you might find lurking in the depths of your camera's menus.

Panoramic/Stitch Mode

This mode is for taking sequence shots of a panoramic scene, to be joined together later as one larger image. Your camera, if it has this mode, will show you the edge of the first picture on its LCD so you can line up the next shot with a bit of overlap. The software that joins the images looks for common objects in the overlap to align the images. (Sometimes the camera can do this itself; other times the assembly needs to be done on your computer).

Snow/Beach Mode

Snow and beach scenes can be tricky. Most scenes in everyday life are less bright than one featuring the pure white of snow or even a sandy beach under a blazing summer sun. Shooting people in such scenes on automatic usually ends up with the camera dimming the shot to properly expose the very bright snow or sand, leaving people in the dark—literally. This mode tells the camera to select the exposure based on the brightness of the subject only, instead of the background, regardless of how much the background takes up in the shot.

Fireworks Mode

Unsurprisingly, this mode is for shooting fireworks displays. This combines a slow shutter speed with a medium-to-small aperture and a focus at infinity to capture the exploding fireworks

as trails of light. The problem, of course, is that as well as recording the movement of the explosions in the sky, it will equally capture any movement of the camera. For shooting fireworks, a tripod or some other way of securing the camera to avoid vibration is essential.

Kids and Pets Mode

This mode is a bit like sports mode, in that it tries to maximize the shutter speed to record the shot of a subject that could move away at any time.

There are other scene modes. Most are variations on these themes with distinct settings for color saturation, white balance, and sensor sensitivity to compensate for the difficulties inherent in different kinds of scenes. They're all useful in direct proportion to the frequency with which you encounter these specific types of scenes. You can use them to do the work for you, but they'll never be a substitute for understanding the principles of exposure and lighting. Learning how to set the camera according to the image you want to capture is what's coming up in Chapter 2.

What happens when you push the button?

Everyone knows what happens when you push the shutter button on a camera: it goes *click* and a picture appears on the LCD screen. It seems very simple, but it isn't.

The shutter button usually has two pressed positions: a half-press and a full-press. There's a bit more resistance halfway down to let you know where the half-press ends. What happens after that is complicated.

Half-press

When you half-press the shutter button your camera wakes up. Compared to its standby state before that half-press, your camera is now wide awake and watching.

One of the biggest complaints about smaller digital cameras is **shutter lag**—the delay between pressing the button and the picture being taken. Most of the time lost to shutter lag has nothing to do with the shutter. Before a camera using any kind of automatic exposure can take a photo, it has to evaluate the scene in front of it to decide how to apply those settings. It looks at the brightness of the scene and the color of the light, and chooses the appropriate shutter speed, aperture, and white balance settings. It also needs to focus on whatever object at which it seems to be pointed. This can be tricky. Autofocus depends on being able to detect edges or lines that should be sharp, and on shifting the focus back and forth until the selected point is sharp (or looks like an unblurred face if you're using a face-detecting camera). That's the bit that takes the most time. A fuzzy subject or a broad flat one with little detail, hazy conditions, shaky hands, a fast-moving object, or a number of objects at different distances can all cause autofocusing to take a lot longer than desired.

Half-pressing the shutter acts like a poke to the camera, as a reminder to begin preparing your shot. Once the focus locks, it will stay locked as long as you hold that half-press. Smarter cameras may

even adjust the focus to keep a moving object in focus, but at the very least your focus will be locked at the distance of the object when the focus was first locked to it. When your focus is locked the light metering will also be done and the camera will be ready to take the shot almost immediately.

Focusing lag is unavoidable unless you can turn autofocusing off, but by learning to anticipate your shots and being ready before the decisive moment, you should be rewarded with the shot you seek.

Full-press

When you fully press the button the lens aperture closes down to the set amount, the shutter opens, light falls on the sensor, and the shutter closes again. You've just taken a photo. Behind the scenes there's a bit more to do. The processor takes the data from the sensor and applies whatever adjustments are needed according to the scene mode, white balance, or other settings. The data is then compressed and shifted to the memory card for storage.

If you have an SLR you'll notice that the viewfinder goes black for a moment when you press the button. That's because the mirror that normally reflects the view from the lens into the viewfinder has to move aside to expose the sensor.

Afterwards, there are often further operations for your camera to complete. If your flash fired when taking the shot, it might need a few seconds to recharge. If you've taken several shots in quick succession, it might take a few moments to save them all to your memory card and free up the camera's internal memory for more photos. These factors might slow you down a bit but, while your camera is working, it's your opportunity to find your next shot.

Take Control

Now that you've examined your camera and understand more about the main features and functions, you should have a better understanding of its capabilities and limitations. You're ready to learn more about how to use what you have to make better images. Prepare to take control of your camera—the next chapter is just a page away.

Chapter 2

Photo Basics

A digital camera's built-in presets and automatic shooting modes are enough to achieve a decent shot of most subjects. Automatic functions are great helpers but they're limited. The camera only sees light and dark and color, while a person sees a world full of *things*—people, trees, clouds, buildings; whole scenes with subjects, meaning, and stories. Therefore, the results will be better if the person behind the camera tells the camera what to do, rather than the camera doing the job itself.

The next few chapters are full of practical examples of how to take photos without letting the camera take choices away from you. Understanding your camera and its limitations will help you take great shots in a variety of conditions, even less-than-ideal ones. But, in the end, no amount of theory is any kind of substitute for practice; the best way to learn how to take a professional-quality photograph is to take a few thousand really bad ones.

Exposure

As photographers we're limited by what light can do and what light we have. When taking a photo, we set out to capture the right amount of light to portray our subject the way we want it to be seen.

The amount of light captured by your camera is called the **exposure**. The concept is simple, but in practice it can seem complicated. There are three settings on your camera that affect the amount of light it will capture, and each will affect the look of your photo in a different way. The camera can choose those things for you, but it cannot know what the scene it is pointed at should look like. When you understand those controls you can look at a scene, decide how the photo should look, and set your camera accordingly.

The three factors that control the amount of light your camera captures are:

- shutter speed—how long the camera's sensor is exposed to light, measured from fractions of a second to multiple seconds.
- aperture—the size of the hole that lets the light in
- **sensitivity** (usually referred to as **ISO**)[1]—how sensitive the sensor is to light

The three elements are inextricably linked, as indicated in Figure 2.1. Change one without balancing it with the others and the exposure will be affected.

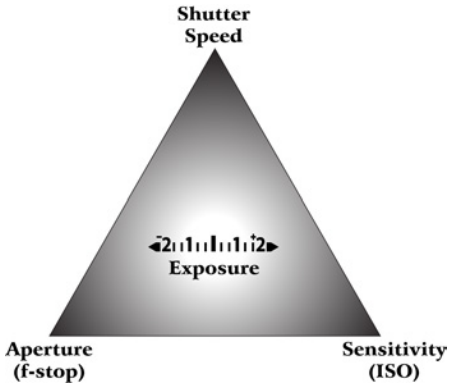

Figure 2.1. The exposure triangle

Changing any of those settings changes the amount of light your camera captures. The trick to achieving the right exposure is to balance all three. If you choose to increase one of the settings, one or both of the others will have to decrease to compensate.

It sounds easy—lower one setting and raise one or both of the others to counteract the shift; raise one and lower another. There's a light meter built into your camera that will show you when they're in balance. So it's quite simple, as long as you consider the secondary effects of the settings. *Secondary* effects, you say? That's right. They all have secondary effects and they need to be taken into consideration when you plan your shot.

Metering

Before we look closely at the three factors that control exposure and their secondary effects, let's consider how we measure exposure and how we choose which exposure is right.

[1] Named for the International Organization for Standardization (ISO) that defines measurement standards and who set the scale by which film and sensor sensitivity is measured.

Your eyes automatically adjust to variations in lighting. An indoor light that appeared too dim to see by when you first entered from outside on a sunny day is bright enough to read by a few minutes later. There's no change to the lighting; your eyes have adjusted to the new light level.

The sensor in your camera merely records the light that falls on it. It's unable to become accustomed to brightness or more sensitive to darkness unless you tell it to. But if your eyes are constantly adjusting to the light around them, how can you know how bright (or dark) it really is?

Well, help is at hand in the form of your camera. As well as recording the light, it can measure it. In each camera there's a light meter. If you have an SLR camera you should see the meter in your viewfinder, while compact cameras usually display their meter on the LCD display. Most cameras will only show the exposure meter when set to a mode that allows the manual adjustment of exposure, so if you don't see a meter, make sure you're out of the automatic or preset modes (consult your manual if you need to find out how to turn on the display of the exposure meter).

The exact look of the meter display varies from camera to camera, but the basic idea is represented in Figure 2.2. The indicator below the scale moves according to the current exposure settings and the amount of light falling on the sensor.

Figure 2.2. A typical in-camera exposure meter

The meter measures the light reflected into the camera, compares it with the amount of light the camera's exposure settings capture, and indicates if the scene is too bright or too dark. The central point on the meter represents the amount of light that will give your image a tone midway between dark and bright.

The numbers on the scale of your camera's exposure meter do not represent a linear scale of brightness. The +1 point represents twice the amount of light. The +2 mark is double that—four times as much light as the midpoint. In the other direction, -1 and -2 represent a half and a quarter (respectively) the quantity of light.

There are several ways for a camera to measure the light in a scene and these are called **metering modes**. Put simply, your camera can average out the amount of light in a scene, or be more focused—taking a reading from only one spot in a scene. Of course, it's slightly more complex than that and more advanced cameras have a range of metering modes. A detailed explanation of all the possible modes your camera may have is beyond the scope of this book, and your camera's manual should provide all the details you need. Much more detail on metering can be found in the tutorials at Digital Photography School.[2]

[2] http://digital-photography-school.com/

Most scenes have a range of shades in them and aiming for a mid-tonal point tends to produce a well-exposed image for a lot of situations, but not all. And some scenes don't need to be of average brightness. If you point your camera at a well-lit, pure white wall and adjust your exposure so that the meter is centered, the wall will look off-white in the photo. It has a similar effect when shooting black, too; blacks will tend to become grays.

It's dangerous to rely on the meter alone for your shots to look right. You need to look at the scene and judge for yourself if you want it darker or lighter, then adjust your exposure accordingly. Judging the best metering mode for a scene, so that you achieve the desired result, is a skill that takes practice.

Stops

When we talk about the amount of light we let into our cameras, we measure it relative to the midpoint on our camera's light meter, and we refer to it in stops.

A **stop** is a change in camera setting that shifts the exposure by a factor of two: it either doubles or halves the amount of light captured. Switching your shutter speed from 1/100 of a second to 1/200 halves the amount of time light enters the camera, so halves the amount of light that's captured. It reduces the exposure by one stop.

When we take a shot using settings that center the meter, we say we're taking a photo "**metered as read**." If we set the camera to shoot with the meter showing a higher or lower value, we say we're overexposing or underexposing by however many stops the meter reads away from the center. This becomes especially important when shooting in some of the semiautomatic modes that we'll look at later. These modes let you dictate one or two of the control settings while the camera calculates the other setting (referring back to our exposure triangle) to balance. When you shoot with fully manual controls, the meter is more of an advisor, telling you how bright your image will be. To tell the camera to calculate a brighter or darker exposure in the semiautomatic modes, you can dial the meter indicator up or down. This is called **exposure compensation**.

Many cameras also allow **exposure bracketing**. With this option the camera takes several shots in succession with different exposure settings for each. If you're unsure how best to shoot a scene, bracketing exposures—so that you take one metered as read, and one each at plus and minus one stop—gives you a good chance to achieve the shot you want. You'll have to refer to your camera's manual to see if this is an available feature and how to enable it.

Using and Understanding Available Light

When you have no control over the placement or brightness of the light in your scene, you can only control how it falls on your subject by moving the subject. If you want a person's face to be lit, you're best to avoid shooting them with their back to the sun. Turn your subject so that the person faces the light source.

On cloudless sunny days you might find the light is too harsh. Parts of your subject will be brightly lit while other parts will be covered with deep shadows. If you can move the subject into the shadows or use an object to cast a shadow of your own, it can soften harsh lighting.

If a fixed artificial light source is not bright enough for your camera to achieve good exposure and you'd rather skip using the flash, try moving your subject closer to the light. If possible, turn on any other lights available.

In Chapter 3 we'll learn about modifying light to suit our needs. Until then, practice finding the light that works best.

White Balance

After having not enough light, the biggest problem with light in photography is when it's the wrong color. Sometimes it's obvious that your light is colored and you might even want it that way. The problems arise when the coloring is more subtle and unwanted, and this is known as a **color cast**.

You've probably taken photos under ordinary incandescent lights that have a strong yellow-orange cast to them. When you took the photos the scene didn't look yellow to the naked eye, but your camera showed you a yellow image. Is the camera to blame? No. The camera faithfully recorded what it was pointed at. Incandescent light really is that color.

When you're surrounded by slightly off-color light, your brain is smart enough to compensate for the cast. You know what white is supposed to be and that is how you see the light. Your camera is less smart. It records what it's told to record, so you have to tell it to record the scene a little differently.

Your camera will have a control or menu option called **white balance**. As well as an automatic setting, you should find settings for **tungsten**,[3] fluorescent, sunlight, flash, cloudy, and shady conditions. When you're surrounded by those lights, they might all look the same to your eyes, but there are some fairly major differences in color, as Figure 2.3 illustrates.

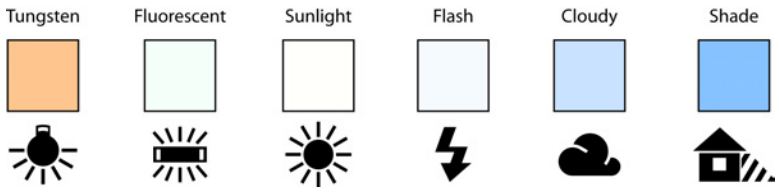

Figure 2.3. The most common preset white balance options offset the most common sources of color casts

Set your white balance to whichever setting most closely describes your light source before you start shooting. You can correct a color cast on your computer later, but it's usually best if your

[3] Ordinary incandescent lightbulbs use filaments made from the metal tungsten. This has become the common term in the photographic business for any kind of light produced by a bulb containing a hot glowing wire.

camera does it while you shoot. If you're unsure which setting is best for your lighting, try shooting test shots of an object you know is supposed to be white. Check the results on your LCD and pick the one in which the object is closest to white. You could set your white balance to automatic, but then you trust the camera to guess it right. If it guesses wrong, the color cast will be worse. Figure 2.4 illustrates the problem. The photo on the left is taken in daylight with the balance set to tungsten and the result is too blue; the photo on the right shows the exact opposite—shot under a tungsten bulb with the white balance set to sunlight—so the result is too yellow.

Figure 2.4. Having the wrong white balance will create color problems

Aperture and Depth of Field

As we covered in Chapter 1, your camera's lens covers the aperture: a hole that lets light into the camera. The aperture's width is controlled by an adjustable diaphragm. Widening the aperture lets in more light; narrowing it lets in less. On cheaper compact cameras you might not have direct control over the aperture, though its settings may be affected by your choice of shooting mode. Even if you're unable to control it directly, its effect on your image is important.

Aperture measurements may seem a little odd the first time you see them. They're expressed in **f-stops** (as opposed to the plain old stops we've already covered), usually written either as f and a number (for example f16), sometimes with a slash (/) character between them. The number is not

an absolute measure of the aperture's size, but is the related focal length of the lens; therefore, an aperture of any given f-stop will let in the same amount of light regardless of what lens you use.

The first slightly tricky point to remember about apertures is that the smaller the f-stop, the larger the aperture, and the more light that enters the camera. To increase exposure, set your aperture to a smaller number. To decrease exposure, make the f-stop larger. It might help to think of the number as a measure of how much the hole is closed.

Another aspect of aperture that takes a bit of getting used to is the numbering. Standard lens apertures are usually a subset of the sequence f/1.4, f/2, f/2.8, f/4, f/5.6, f/8, f/11, f/16, f/22, and so on. Each number is roughly 1.4 times the previous one. This is no huge joke played by math nerds on those of us who are more numerically challenged: 1.4 is the square root of 2, rounded off to fit on a camera's display. If you multiply the width of the circular aperture by 1.4, you double the aperture's area and let in twice as much light. You can see this demonstrated in Figure 2.5.

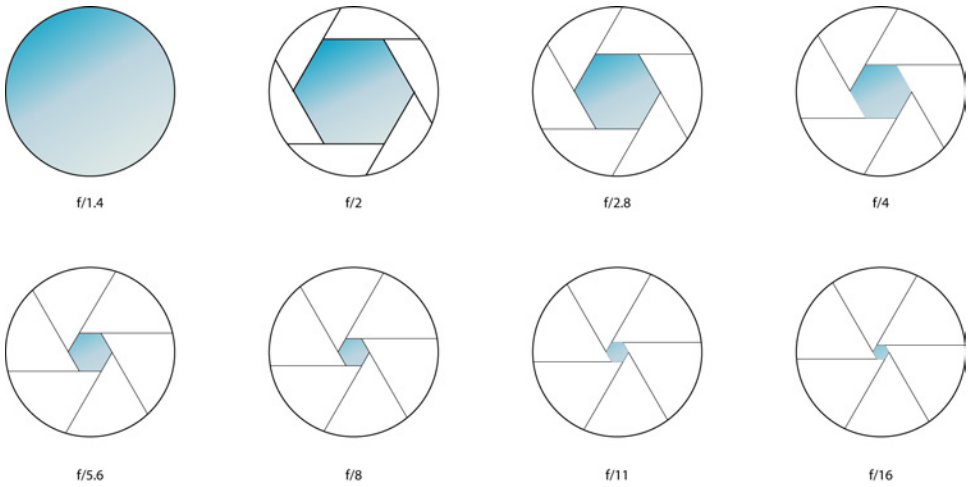

Figure 2.5. Each f-stop is half the area of the previous one

When you change the aperture from f/1.4 to f/2, you halve the amount of light the camera lets in. Go from f/8 to f/5.6 and you double it. You don't need to understand the math, but it's a very good idea to learn the sequence of f-stop numbers. It might seem counterintuitive that f/8 means half as much light as f/5.6, but knowing it well enough so that it's second nature to you might one day save you missing a shot. Most cameras allow you to adjust apertures in half-stop steps; some allow steps of a third of a stop, but you'll find some part of that sequence of f-stop numbers in your camera's settings if you have manual control over the aperture.

The aperture's primary effect is to control how much light passing through the lens reaches the sensor. As a secondary effect, the aperture controls depth of field.

As we saw in Chapter 1, depth of field is the amount of scene that's in focus in front of and behind the point you've focused on. A small depth of field means that only a part of your image will be in

focus and the rest will be blurred, as illustrated by Figure 2.6. A large depth of field gives you a greater distance in front of and behind your subject in focus. A wide aperture gives you a shallow depth of field; a narrow aperture gives you a deep one.

Figure 2.6. The size of the depth of field

A bit of blur can be a good thing. If you want to shoot one flower in a garden full of flowers, or a portrait in front of a busy background, limiting your depth of field so that only your subject is in focus will separate the subject from the background. Background details, which would be distracting if in focus, are blurred, leaving your subject standing against a more abstract background. In the following flower pictures, at f/22 (Figure 2.9) the trees in the background clash with the flower stems in the foreground, while at f/1.8 (Figure 2.7) it's hard to tell that there are any trees. An aperture in between (Figure 2.8) shows all the flowers on the one plant yet still blurs the background. (Automatic portrait modes use depth of field in this way to isolate a subject.)

When shooting a landscape or a large group of people, you might wish to keep a number of objects in focus that are all at different distances from the camera. You'll need a narrower aperture to do this, so if it's necessary to increase the exposure, you'll have to add more light (difficult for a landscape photograph) or adjust one of the other corners of the exposure triangle.

There are other factors involved in depth of field besides aperture. For example, the closer you are to the subject, the shallower the field at any given aperture. The previous flower examples were all shot from within a meter of the plant. Had the focus been on the trees in the background instead, the depth of field would likely have extended to infinity at f/22.

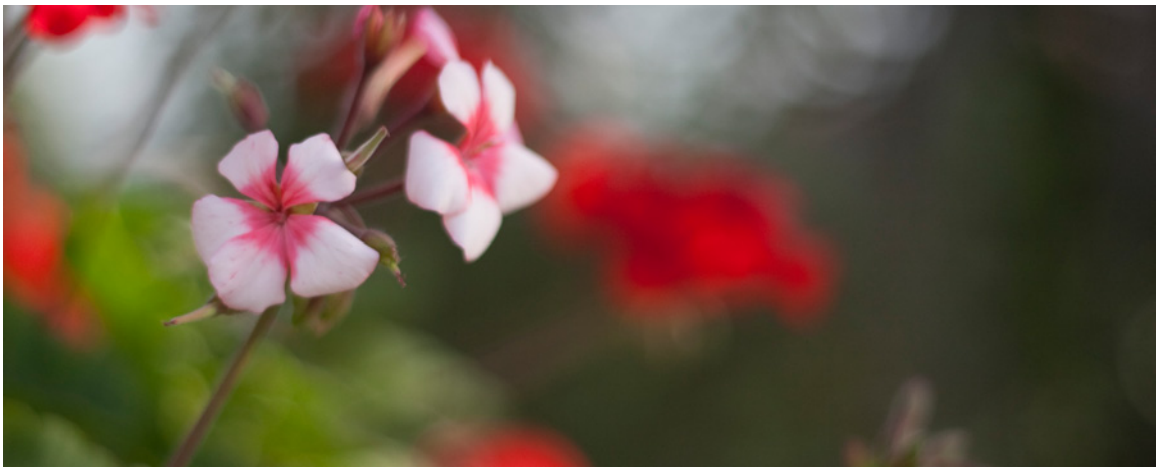

Figure 2.7. Flowers on a bush at f/1.8

Figure 2.8. The same flowers at f/8

Figure 2.9. And again at f/22

Aperture Priority

If you decide that the depth of field of your image is important—whether it's to be deep or shallow—you might want to shoot in **aperture priority** mode. It is often abbreviated to **Av**, **Ap**, or just **A** on mode selection dials, or it might be abbreviated or spelled in full in a menu. Aperture priority mode is one of several shooting modes that are halfway between the fully automatic mode and manual control.

Compact Cameras Might Lack an Aperture Priority Mode

Some compact cameras might not have an aperture priority mode as such, but they will have preset modes that prioritize wide or narrow apertures according to the type of scene you're shooting. For a wide aperture, select a portrait mode; for a narrower aperture, try landscape.

Aperture priority tells the camera to adjust the shutter speed in order to balance it with your aperture setting. If the exposure cannot be balanced with shutter speed alone, the ISO setting might also be adjusted.

If a shallow depth of field is required, set a wide aperture and the camera should increase the shutter speed so that there's no overexposure.

You can dial in a narrow aperture in aperture priority mode if focus over a long distance is required, and the camera will automatically calculate the shutter speed needed to balance it. Be careful doing this, though: always check the speed the camera chooses. If the shutter speed is too slow your image might be blurry. We'll look at shutter speed and blur very soon.

Practice

I could give you tables of numbers to look up focal lengths, subject distances, and apertures, in order to find out exactly how much depth of field you achieve with every possible combination of settings and conditions. I could, but I won't. For one, those kinds of tables are really boring. And in any given instance, by the time you've looked it all up the conditions will have changed and the settings no longer apply, or your subject has become bored and gone home. So instead, I recommend you go out and practice.

Take charge of your camera's aperture. If you can set your camera on manual, do so, then shoot a series of shots in different kinds of light with the same shutter speed at various apertures. See how much difference a stop of exposure makes in-camera compared to what your eyes think they're seeing when they adjust.

Go up really close to a small item and shoot at various apertures to see how depth of field changes the look of scenes. Try shooting for a day using only aperture settings to control exposure to find out the limits of your camera. Learn under what conditions you can shoot using indoor lighting with wide apertures. See for yourself how you can affect depth of field by changing your aperture

and the distance from your subject. The more you experiment while practicing, the less you'll need to pause and think before setting up a shot later.

Shutter Speed and Motion Blur

Shutter speed controls exposure by limiting the amount of time light has to shine on the sensor. That's the primary effect of the shutter speed control. A fast shutter speed can freeze a bird in flight, as shown in Figure 2.10. Its secondary effect that needs to be considered is motion blur. The longer the shutter is open, the more likely an object can move in that time. At slower shutter speeds, fast-moving objects are blurred while slow-moving objects remain sharp, as Figure 2.11 shows. For most shots you'll be working with shutter speeds measured in fractions of seconds.

Figure 2.10. A fast shutter speed can freeze a bird in flight

Figure 2.11. At slower shutter speeds, fast-moving objects are blurred, while slow-moving objects remain sharp

The more the subject or the camera moves, the more the image is blurred across pixels in the frame. If you're holding the camera in your hands when you take pictures, it shakes; there really is no way to avoid it. So if you shoot at too slow a shutter speed, you run the risk of even the steadiest subject being blurred by the shaking of the camera. The movements are tiny—most of the time you never notice them. They will rarely move your camera more than a fraction of a degree between the opening and the closing of its shutter. The problem arises with zoom. When your angle of view is only a couple of degrees, a small shake makes a considerable difference. The longer the focal length of your lens, the more susceptible it is to the effects of shaking.

There are a number of ways to combat this, the best being to place the camera on a sturdy object that won't move. A tripod is ideal, but putting it down on any solid surface is more stable than holding it in your hands. (We'll look at tripods and the fun things you can do with them in Chapter 3).

Tips for Reducing Shakes When Shooting Handheld

Another way you can reduce the effect of shaking is by increasing the shutter speed. The less time the shutter is open, the less time the camera has to move before it closes. The usual guideline for handheld shooting is to avoid shooting at less than 1 divided by the focal length. For example, if you're shooting handheld at 300mm, try to keep your shutter speeds faster than 1/300th of a second;

at 30mm you can shoot at 1/30th of a second. Obviously this will vary with the environmental and personal conditions. If you are very tired or standing on an unstable surface, you'll probably be less steady with the camera than you would be if you're well-rested and on solid ground.

Use the eyepiece viewfinder if your camera has one. When you use the LCD panel to frame your image, you need to hold the camera a lot further away from your body than when looking through a viewfinder. The further your arms are extended, the more they shake.

Hold your camera close. Grip it with both hands and tuck your elbows into your sides. Brace the camera against your body. The closer you hold the camera, the less it can move around. You can improve the stability even further by bracing yourself. Rest your elbows on a solid object if you can; perhaps lean against a wall.

Your camera might have an **image stabilizer**. This is hardware that moves the sensor or lens elements to help cancel out vibration. If your camera has image stabilizing, turn it on when zooming in. (It's inadvisable to leave it on all the time as it will drain your batteries.)

Shutter Priority

For occasions when shutter speed is an important consideration and you know how long you want your shutter open, you might have at your disposal **shutter priority** mode. Sometimes it hides in your controls. Some camera companies abbreviate it on control dials with an **S**, some with a **T** (for time), or **Tv**. Check your camera's manual for details of your model's controls.

When you set shutter priority you tell the camera how long the shutter should stay open, and the camera calculates the aperture that will give the desired exposure (and sometimes the ISO if aperture alone won't balance the exposure).

You may recall the preset scene modes mentioned in the section called "Preset Scene Options" in Chapter 1. If you have a compact camera without a shutter priority setting, you'll most likely find a sports mode or action mode. This will speed up the shutter to freeze moving objects. Sometimes there's also a mode called "kids and pets," which combines fast shutter speed with flash. You can use this to freeze a fast-moving subject.

You might also have a night scene mode to give you a slow shutter speed, or a night portrait mode that combines slow shutter with flash. If you want blur, either of these should achieve it, but it's wise to experiment a bit to work out how they'll perform in bright light.

Practice

The best way to gain a feel for how shutter speed affects your photos is to shoot a lot of moving subjects. Try shooting sporting events, fast-flowing traffic, or children at play. See how fast a shutter speed is necessary to freeze the action in each case. The faster the subject moves, the higher the

shutter speed you need; for example, a shutter speed fast enough to freeze a running child can still blur a speeding car.

See how slow you can set your shutter speed before hand shakes blur the image. Start with the recommended 1/focal length setting. If you can shoot it without any noticeable blurring, reduce the shutter speed by a stop and try again. Keep reducing the speed and note when camera shake makes the photos too blurry. Discovering the limits of what you can shoot handheld is important, and it's best done before you need to decide whether to pack a tripod.

ISO and Noise

Sometimes the light is too poor for any combination of aperture and shutter speed. Scenes in very low light—where you need either a wide aperture or a fast shutter speed (or both), and you're unable to use a flash—require a high ISO setting. For instance, you might want to use a fairly fast shutter speed to capture the blowing out of candles on the cake at a birthday party. Unfortunately, even the widest available apertures will prohibit you from shooting very fast by candlelight. A flash will wash out the scene and kill the golden glow.

When you need more light and are unable to change aperture or shutter speed, the last option left is to change the sensitivity of the sensor. The camera's light sensitivity, referred to as ISO, is controlled by a less accessible means than the shutter and aperture, but you should be able to find it among your camera's settings menu. This is partly a holdover from the old days when *all* photos were made with film (which wasn't too long ago, mind.) The sensitivity of a film camera is a matter of the formulation of the light-sensitive chemicals on the film. To change the sensitivity you change the film; the decision is unable to be made on the spur of the moment. Now we can change the camera's light sensitivity electronically by amplifying the sensor data.

The other reason some cameras' ISO setting is buried away in a menu is that most photographers would prefer to avoid changing sensitivity if they can. As well as increasing the brightness of photos, increasing the sensitivity has the secondary effect of introducing and increasing **noise**—the visible graininess in shots. By amplifying the signal from the sensor, we also amplify the differences between pixel values. Increase the differences enough and they become visible. Transitions between colors and tones look rougher. At low ISO settings it might be unnoticeable, but as the ISO gets higher images take on a grainy appearance that's *generally* considered unappealing. Detail is lost to noise, along with the smoothness of color and tone transitions.

We say generally, because ISO noise is not necessarily all bad. Sometimes you might want a rougher, noisier look to your images. We've all grown up seeing grainy news photos and film, usually of breaking stories shot as events unfold. Sometimes it's a result of cheap cameras in the hands of eyewitnesses, sometimes it's from seasoned photojournalists using very high ISO film because they're in situations where speed is important. At the same time, most advertising and entertainment photographs are clean and noise-free. We've come to think of grainy images as being more real, while slick and polished images can seem fake.

That does not mean that you should crank the ISO up to 6400 every time you want an image to look spontaneous. Noise that looks just like high ISO can be very easily added in Photoshop, but real noise is difficult to remove. If you think you want grain in an image, you should seriously consider the option of adding it later.

While shutter and aperture priority modes are very common on digital cameras, ISO priority is not at the time of this writing. A couple of camera manufacturers have introduced ISO priority modes, but given the preference of most photographers to shoot at the lowest ISO setting available, it's unlikely to become very popular.

The Sunny 16 Rule

Now that we've covered shutter speed, aperture, and ISO, let me introduce a useful technique. It's unlikely that you'll find yourself in a situation where you have no meter at all, but it's always a good idea to be prepared to shoot quickly. If you preset your camera according to the following rule, chances are good that if you need to shoot quickly you'll already be set for the shot.

A good guideline for estimating exposure without using a meter is the **Sunny 16** rule. On a sunny day with your camera's aperture set at f/16, setting your shutter speed to the same value as your ISO setting should give you a decent exposure. At ISO 100, shoot at 1/100th of a second. From that, you can adjust for different conditions. It's best to keep your ISO as low as it can go, so all you need to do is balance any increase in shutter speed with a similar decrease in aperture. Double the shutter speed, halve the aperture, and so on.

Judging how bright is bright enough for the rule to apply is easy. Away from shade, cloud cover is about the only element that will diffuse the sunlight. Look at your shadow. Is it distinct and hard-edged? Can you see a shadow at all? Try the settings in Table 2.1 for a start; look at your preview, then adjust if necessary.

Table 2.1. Aperture guide

Weather	Shadows	Aperture
Bright and sunny	Hard-edged	f/16
Slightly overcast	Soft-edged but distinct	f/11
Moderately overcast	Barely visible	f/8
Heavy cloud	Not visible	f/5.6

Composition

Composition is the art of placing elements in a scene to make it more aesthetically pleasing. It's a subject on which many books have been written. Here I'll give you an overview of some of the basic principles of composition. Rather than tell you to take pictures in a certain way, we will show you some well-established techniques that engage the viewer's interest, encouraging them to explore the picture rather than just stare at its surface.

Good composition derives from a number of different design principles, which are in turn based in the psychology and neurology of our responses to visual cues. It's unnecessary to know the underlying reasons why these principles work in order to use them; the artists who first noted them thousands of years ago simply observed how people reacted to scenes, images, and objects, and deduced principles they could apply to creating new works.

Effective composition can happen by accident. Sometimes everything just lines up perfectly: you see a scene and it's exactly the way you want it to appear as soon as you look through the viewfinder. More often, it doesn't. The best compositions usually require some effort from the photographer. Sometimes it's the careful arranging of objects in the scene, sometimes it's just finding the right point of view from which to shoot. Top advertising photographers can spend weeks of planning, days of setting up, and hours of fine-tuning for a single image. Landscape photographers are unable to arrange their subjects so easily, but they can spend weeks scouting a location for the best possible angle, then wait weeks more for the light and weather to be right.

Nobody expects you to go to quite those lengths to take a photo, but you might be surprised how much improvement there'll be in your images if you just take a few moments to construct your shot before you click.

In the following pages we'll discover some of the elements of composition you might use in creating your images. These are not strict rules that you must follow if your images are going to work (even though at least one of them is called a rule). Professional photographers sometimes ignore them on purpose to great effect. However, they're useful to keep in mind while you're practicing and increasing your skill level.

Focal Point

Framing your image with one prominent object or area that stands out from other elements gives the viewer an easy way into the image, a place from which they can explore other elements and return to before they look away. Before you shoot, it's a good idea to consider just what your photo is about, so that you can base it around that object or theme.

When you frame your shot, place the subject so that it's unobscured, so that nothing else in the frame distracts the viewer from the subject. Focus on a prominent feature if the subject is taking up a significant amount of the frame. (If it's a person, focus on their eyes. In-focus eyes create a much

stronger connection between viewer and portrait.) If you're unable to avoid a busy surrounding scene, use a shallow depth of field to blur the background so that it doesn't draw attention away from the subject (as we did with the flowers in the section called "Aperture and Depth of Field"). Make it clear to the viewer why you took the shot by showing the subject in question clearly.

If your scene contains many elements, remember which object first grabbed your attention. It's a good chance that it is a point that's significantly brighter than its surroundings (unless it's a bright scene, in which case it might be significantly darker than the nearby areas). Our attention is naturally attracted to areas of high local contrast—places in an image where there's a small area with a heightened difference in brightness. The highest contrast point tends to be where we look first, and if that's your subject, people will look at it. When composing your scene, try to frame your subject so that it is at or near the brightest point.

Figure 2.12. The bright lights of the carousel

In Figure 2.12, the bright lights of the carousel in the foreground provide a focal point from which your attention can wander around the other sights of the cityscape. Your attention was most likely attracted to those bright lights first. From there you can wander through the image to the skyline still glowing from the setting sun, to the lights on the taller buildings that intrude into the darkening sky, to the lights reflected on the surface of the river, and back to the carousel. There's one major focal point, but not just one thing to look at, and that's worth aiming for when framing a landscape

style of photo: a focal point to encourage the viewers to look, other areas of interest to keep them looking.

If you're shooting a wide open landscape without a lot of prominent features, pick one to focus on and place it prominently in the frame, even if there's nothing else in it. Sometimes, the best way to convey a sense of emptiness is to find (or place) one object in the frame that, by its presence, emphasizes the barrenness of the rest of the image. An empty table could mean the beginning or end of an event, or neither. Add an abandoned snack, as in Figure 2.13, and it's clear that the party's over.

Figure 2.13. The party is over

When you next take photos of a location or a landscape, practice finding one object within the scene to be your focal point, rather than just pointing indiscriminately.

Telling a Story

When a photo's points of interest are arranged so that the viewer's attention wanders around them, they begin to tell a story. We make assumptions about what's happening based on where objects and people are placed relative to each other, where people are looking, and where they appear to be going. A still photo cannot move or change, but movement and change can be suggested, and a narrative can be read into that. When people start reading stories into your photos, you really have their attention.

Viewpoint and Angle

The angle from which you look at a subject conveys a lot about that subject and about what you have to say about it. A large subject shot from above at a steep angle appears small to the viewer, because they seem to be towering over it as they look at the image. Likewise, a small object shot from below seems to loom over the viewer, making it seem larger even if we know it is small. A person can appear as tall as the tallest building, as illustrated by Figure 2.14, if the shot is taken from the right angle.

Besides impressions of size, the point of view from which we take a photo can say much about the subject that we may or may not mean. "Looking down on" things which we hold in contempt is not just a metaphor. We routinely place more important or valuable items physically higher than objects we hold to be of lesser significance. Take the presentation of medals at the Olympic Games, for example. The winner stands higher than the second-place getter, who's placed higher than the person who came third. "Top-shelf" products are the more expensive ones, and are often kept on higher shelves than cheaper items. If you want to show an individual as important or powerful, shooting them from above will give the opposite effect. Shooting children from their level (or a bit lower) can show a person who is growing rather than one who is small.

Figure 2.14. A person can appear as tall as the tallest building

Distance also makes the subject seem smaller. A person surrounded by lots and lots of open space might seem small or lost or unimportant. If the person is important, even if only to you, zoom in. If you're unable to zoom in, move closer to the subject.

When you're shooting a familiar subject, especially one that has been photographed a lot, your photos will be more interesting if you find a different perspective. Sometimes you're unable to change the lighting or the placement of an object, but you can change where you shoot from. Choosing an alternative vantage point or a unusual angle of view can make all the difference between a boring shot and an image at which people will want to look. Unless it's a fast-moving object and you have to shoot quickly or miss it, take the time to explore various angles and points of view. Use your viewfinder to ensure everything is in frame and to see how the subject fills the frame.

These two photos of the spire of the Melbourne Arts Centre were taken only seven minutes apart with exactly the same camera settings. In Figure 2.15 the photo on the left is rather dull, while the one on the right is much more interesting. The point of view and angle are the only aspects changed between shots, yet they make the difference between a boring photograph and one that's far more compelling.

Figure 2.15. When the difference between dull and interesting is an angle, a point of view, and seven minutes

Experiment with viewpoints that are uneven or angular. You can see by tilting the frame of the second spire photo, we've achieved a much more dynamic image. The strong diagonals and greater convergence of lines suggests movement, even though there is none. The standard, level view of the first shot just sits there, while the tilted view appears to be going somewhere.

Lines and Angles

Lines, particularly converging lines, lead to places. If we look at a set of lines that converge across an image, we instinctively assume it's the effect of perspective, and that the narrower end is further away; even if we can plainly see that this is not the case, we still have that feeling. The lines give the image depth, and the viewer's gaze follows them from foreground to background into the image. The viewer's attention is drawn by more than just the one point and so they're inclined to look longer.

A path snaking off into the distance, starting in the foreground then heading deep into the image, is the sort of feature a viewer's gaze will naturally follow. Putting your subject somewhere along a path, as in Figure 2.16, is an easy way to imply a story—a person is walking towards or away from you. With the viewer led into the image and prompted to read a story into it, they are far more engaged than they'd be if the subject was standing on a blank studio set.

Figure 2.16. Leading you up the garden path

The lines need not even be complete and continuous. When enough points in a shot are lined up, they'll be read as a line leading to a point, as seen in Figure 2.17. Here, a row of lights in the darkness form a line drawing our gaze to the man in the shadows.

Figure 2.17. Lights mark the path leading to our man in the shadows

Even if there's no real path or sense of movement in your scene, a photo can often be improved by suggesting a sense of direction and depth. Simply tilting your viewpoint can have a dramatic effect. Even without any convergence, diagonal lines make us think of movement. They suggest perspective, unlike straight verticals and horizontals.

The next time you take a photo, look for lines in your scene and note from where they lead. Try to find an angle to shoot from, using them to lead your view into the image.

Pattern and Symmetry

We look for patterns in everything, unconsciously, all the time. We do it so much that we find them even when they're not really there. Our minds create patterns in the random scattering of stars and of grains of sand, and everything in between. Patterns in your photography are a great way to hold the interest of a viewer.

There are many ways to work with patterns but most of them are variations on two ideas: you can emphasize the pattern, or you can break it.

If you fill your frame with anything that forms a pattern, the viewer may imagine that the pattern continues way beyond the limits of the image. It's a common technique in filmmaking. If a director needs to depict a huge crowd but can only afford a few extras, by bunching the people together they completely fill the frame a few people deep. It doesn't matter that there's no one else outside the frame; the viewer will imagine that there is. The pattern leads them to extrapolate beyond the bounds of the frame.

To add more interest to a patterned image, you can break the pattern. What happens then is that the viewer, happily extrapolating the pattern and enjoying its rhythms, suddenly has to rethink it and see it afresh. Changing the color of one element in the pattern (like the photo in Figure 2.18), leaving a gap, or replacing an object with a different item are all great ways of making a viewer pay more attention, both to the pattern and the element that breaks the pattern.

Figure 2.18. An object that breaks a pattern stands out more in the frame than it would by itself

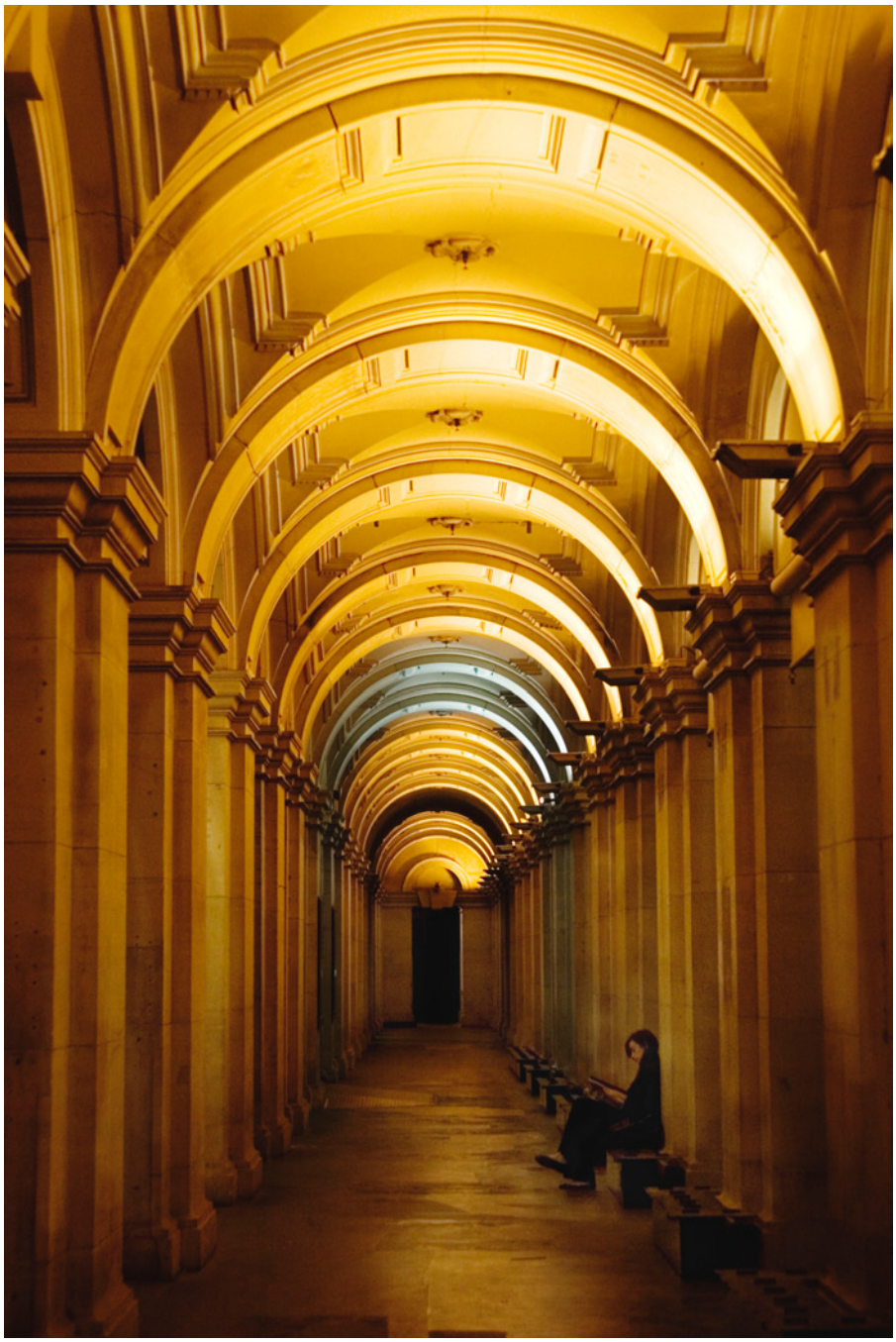

Figure 2.19. An unbalanced, off-center element upsets the symmetry

Much the same principles apply for symmetry in images. Symmetry is pleasing to the eye and gives a sense of balance to an image, but unless it has a very strong point of interest, it can be a bit boring. An image that is too balanced can lack any sense of direction and feel static. Break the symmetry just a little bit, as shown in Figure 2.19, and you can achieve the pleasing effect of the symmetry

with the tension of an unbalanced image. The viewer will be drawn back to the source of the asymmetry, and will find the image more interesting.

Look for patterns and the symmetrical arrangement of objects when you're next taking photos. Try rearranging objects into symmetrical and asymmetrical groups to see how the balance and imbalance can be used to highlight objects within the group. Experiment with deliberately framing your subject off-center.

Placement

Breaking patterns, unbalancing symmetries, and skewing the alignment of elements can make them appear more interesting in a photo. The trick is knowing how best to position the misplaced elements to achieve the desired effect.

The Rule of Thirds

When it comes to choosing where in your image to place significant objects and lines, no principle is more written about, used, or highly recommended than the **Rule of Thirds**. This is one of the oldest rules in the book on composition. It's strongly in evidence in the proportions of ancient Greek architecture, through Renaissance painting, and right up into modern filmmaking. It's also very simple.

Imagine your frame split into thirds horizontally and vertically, as in Figure 2.20.

Figure 2.20. A grid of thirds

Several camera makers helpfully overlay a grid like this on their viewfinder displays. Those that lack such a grid usually have at least some of their autofocus points at the intersections. Placing important elements of your image along the lines or at the intersections of the grid will create more visual interest in the scene than centering them in the frame. The placement doesn't have to be exact, but if it's somewhere close to those points and lines, the imbalance in the off-center placement draws our attention to the subject.

The statue in Figure 2.21 isn't quite on the grid line, but the shot has been lined up so that the angel's hand is on one of the grid intersections. In the meantime, on the other side of the frame, most of the cloud is confined within the left and bottom thirds of the image. It's a much more memorable composition than placing the angel statue in the center of the frame. Our attention can wander back and forth between the statue and the clouds catching the first golden tinge of sunset.

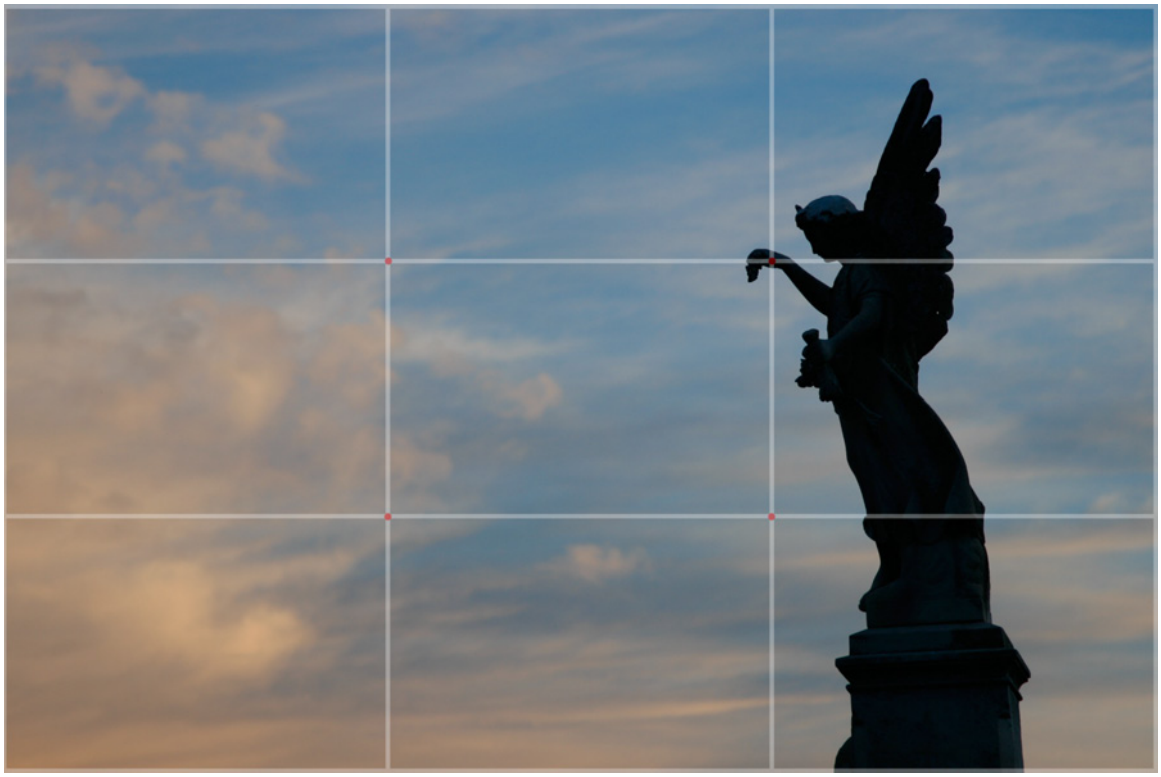

Figure 2.21. The Rule of Thirds in action

One of the reasons the angled perspective of the spire image we looked at earlier works is that it was carefully composed to use the rule of thirds, as Figure 2.22 shows. The base of the spire runs along the lower third line, the brightest point is just above the lower right intersection, and the rising spire leads from the base through two of the intersection points.

When shooting a portrait, particularly close up, aligning an eye on one of the intersections of the rule of thirds grid helps make a connection between the subject and viewer, as Figure 2.23 demonstrates.

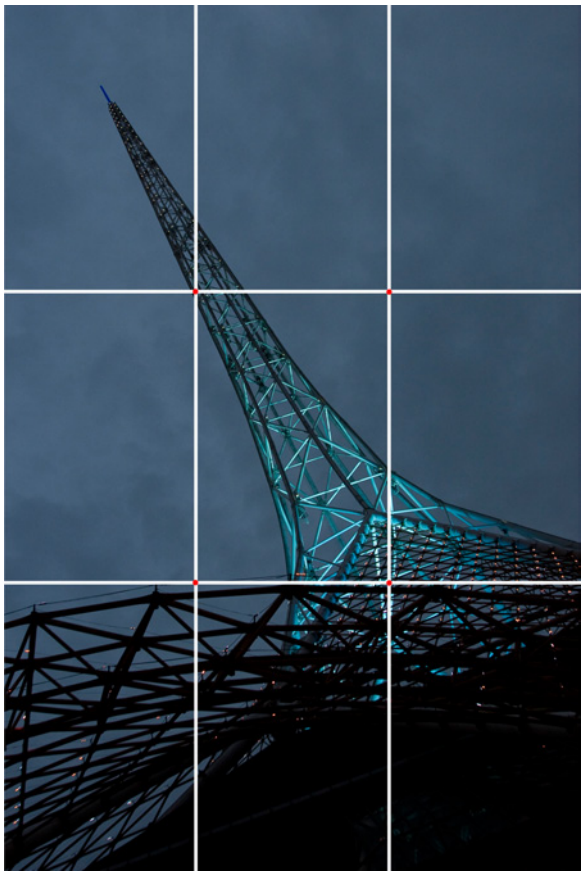

Figure 2.22. Applying the rule to inspire

Figure 2.23. For portraiture, it's all about the eyes

Landscapes tend to work best if the horizon is placed along one of the horizontal lines of the grid. Which one depends on where you want the emphasis. Placing the horizon along the bottom third of the grid leaves the sky to fill two-thirds of the frame. This is great for giving a sense of open space. Alternatively, filling the bottom two-thirds of the image with landscape gives you the opportunity to show more foreground detail, or have large objects in the background—mountains or city skylines, for example—dominate the land around them and thus appear large despite their distance.

And if the landscape fills only the top one- or two-thirds of the frame, you're probably holding your photo upside down!

Space

The space around the subject of an image can sometimes say as much about the scene as the subject itself. We talked briefly about how placing an object in the distance surrounded by empty space can make the object seem small and insignificant. When judging where and at what apparent scale to place your subject, you should also consider how it fits into the space around it, and what the contents of that space say about the subject and the scene.

Figure 2.24. Portrait orientation ...

Your first thought on composing a photo of a person or a tall building might be to use a portrait orientation and fill the frame as much as possible with the subject. However, if we use a landscape orientation for an image of a tall object, we have the opportunity to show more of its surroundings. We can give the viewer a better sense of where the subject is and under what circumstances the photo was taken.

As you can see when comparing Figure 2.24 and Figure 2.25, placing the subject to the side of the frame leaves room to show the surroundings, and even enable an interaction between the two.

Figure 2.25. ... And landscape orientation to take advantage of space in portraiture

When you leave space around a subject, you have choices as to how the subject relates to that space. If it's a shot of a person, are they facing into the space or away from it? The latter option may be used to give the impression of the person leaving the scene, or of the subject thinking of somewhere else; it may result in images that are a little unsettling, though that is not necessarily undesirable. The former choice, with the person facing into the open space, draws the viewer across the image as they follow the direction of the subject's gaze.

Balance

While unbalancing an image can make it appear more dynamic and be used to draw a viewer's attention *through* the scene, it's unable to solely guarantee a good image. Often some other ingredient is needed to make it work. The off-center focal point can be balanced by a secondary object of interest at the opposite side of the frame. The dark angel statue in the section called "The Rule of Thirds" is balanced by the bright clouds opposite it. An object moving through a frame can be balanced by lines along its path showing where it has been or where it's going, as Figure 2.26 illustrates.

Figure 2.26. Using movement to convey balance

Whether or not an image will benefit more from balance or imbalance depends a lot on the subject, the subject's actions, and the surrounding environment. Some images work better with some balance—the angel, for example. Other images work precisely because they are imbalanced, such as the cyclist. The cyclist's long shadow draws our attention along his future path and helps offset the emptiness of the frame. It gives us a sense that he's going somewhere.

There is no fixed rule about how to make an image work, only what looks good and what does not, and that is for you as a photographer to decide. If an image looks wrong, try reframing it either in camera or, if it's too late, in Photoshop or another image editing application. It's very easy to crop an image to reframe the subject; it's less easy but still quite possible to add and remove objects, to adjust contrast and color, and even to move objects within an image to improve the composition.

If you're only shooting photos for your own enjoyment you might feel it's unnecessary to spend that much effort on an image. Just preserving the memory of a moment might be enough. If you're producing images for others, however, taking the time to find the best way to compose the shot might mean the difference between just another snapshot and an item for which they'll want to pay.

The Next Time You Pick Up Your Camera

There's a lot more to the art of composition than we can cover here. Fortunately, there are many books devoted to the art of composition. The principles of composition are firmly rooted in the way you perceive an image. You can learn a lot about good composition by looking at well-composed images. Anytime an image really grabs your attention, stop and take a closer look at it. See if you can figure out what it is about the image that first stood out for you. Was it a bright area? The arrangement of the lines? The contrast between different colors? When you start to notice what grabs your attention, you can look for those elements in scenes and try to incorporate them into your photos.

The next time you pick up your camera, rather than just pointing it at your subject, focusing, and shooting, pause a moment. Look at what your viewfinder is showing you. Look at where your subject is in relation to everything else in the scene. Move the camera around a bit and consider how changing the placement of your subject in the frame makes the image look to you. See if you can create a more remarkable perspective than just the same old shot of a single subject stuck in the center of the frame. When you do settle on an arrangement that works, shoot it, and then try another different take before moving on.

Practice, Practice, Practice

Now that you have a much better idea of how your camera works, and you know about the three settings that control exposure, it's time to experiment. Play with the manual and semiautomatic controls, and learn what their settings mean and what affect they have on the photos you take.

Consider how images work when you look at them and find new ideas about how to compose an image to make it more arresting. You need to go out and combine your newfound technical knowledge with what you've learned about composing an image; you need to practice, practice, practice!

Chapter 3

Advanced Techniques

In Chapter 2 we looked at how the features of your camera work and how to use them to deal with everyday shooting situations, as well as what to look for when taking a photo of a scene. Now we'll tackle some more advanced features, concepts, and accessories that will better equip you to take control of the light and the scene, rather than just dealing with what nature throws at you.

Working with Light

We need light to make photos, but we need not be at its mercy. Once you understand the basics of exposure you can work with the light you have and, with practice, achieve the best shots possible with what's available. Last chapter we looked at how to use camera controls to balance the brightness of a scene with the exposure we want. Now we'll take a look at what we can do to modify light in a scene to better suit our needs.

Eventually we all come up against circumstances in which the available light is too limited to shoot what we want. There's a strong tendency to flip on the built-in flash and blast more light at the subject. This can sometimes be the right way to go, but there are more clever and subtle tricks you can do with light.

When you're considering the light in your scene, especially when you're adding or modifying light, there are three aspects of light to consider: direction, quality, and amount.

Direction

The direction the light comes from has a significant effect on how we see the objects it illuminates. Lighting front on gives a much different look from light coming from the side or from behind. There are good reasons for wanting to shine a light from any of these directions.

Light from directly in front of a subject is excellent for capturing its color and shape. The light falls on the subject and bounces straight back to the camera, so any shadows it casts will be cast behind the subject. This is why a lot of photos taken with an on-camera flash look a bit flat, as seen in the cup on the left in Figure 3.1. Shadows are necessary to define the surface shape of an object. We can see the cup's outline just fine, but without the cues given by where the shadows fall, we have no way to judge the height and depth of surface details. This may be the effect desired by the photographer, though. A lot of glamor photography is shot with lights designed to eliminate all shadows in order to hide imperfections in the skin. Makeup is used instead of shadows to define shapes and contours.

Light from the side highlights texture and form, as the cup on the right attests. When lit from the side, every bump and wrinkle casts a shadow, and stands out against the rest of the surface of the object. Side lighting is the ageing model's worst enemy, but can produce some wonderful effects in images of people.

Figure 3.1. Front lighting on the left, side lighting on the right

Light that comes predominantly from behind the subject helps to separate it from the background, thus providing depth to an image, as indicated in Figure 3.2. Rather than illuminating what the camera sees, this type of lighting leaves bright edges to backlit items. This rim-lighting effect can be really useful when you have a dark subject against a dark background. If you want to see more detail in the front of the subject, you'll probably need to use a second source of light or a reflector to fill it out.

Figure 3.2. A light from behind helps separate a dark subject from a dark background

Quality

The quality of the light refers to the hardness of the shadows it casts. We call a sharp-edged shadow "hard" and a diffuse one "soft." The hardness of the light is directly related to the size of the light source. A small light casts a hard shadow, while a large light casts a soft shadow.

The hardness of a shadow is determined by how completely the object casting the shadow blocks the light. As evident in Figure 3.3, a small light source is more easily blocked by an object. With a very large light source, as in Figure 3.4, much more light shows around the edges of the object. There might be some areas untouched by light and in total shadow, but the edge of that total shadow will be partly illuminated by light emanating from around the object's edges.

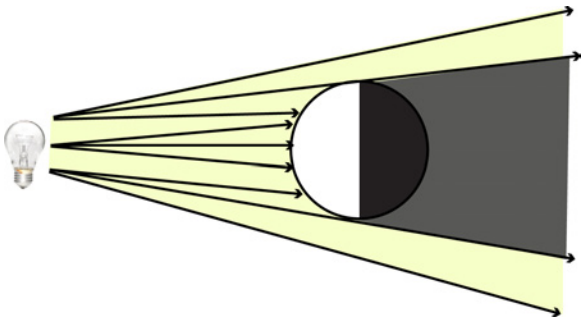

Figure 3.3. A small light casts a hard shadow

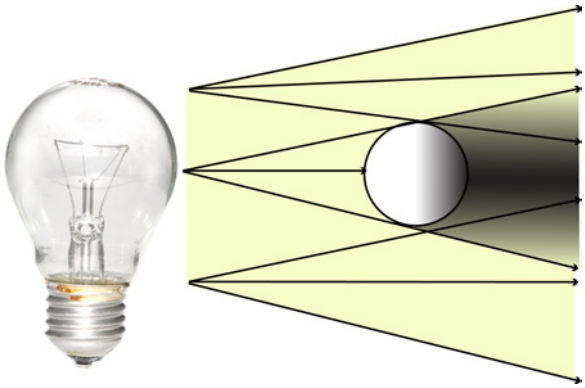

Figure 3.4. A large light casts a soft shadow

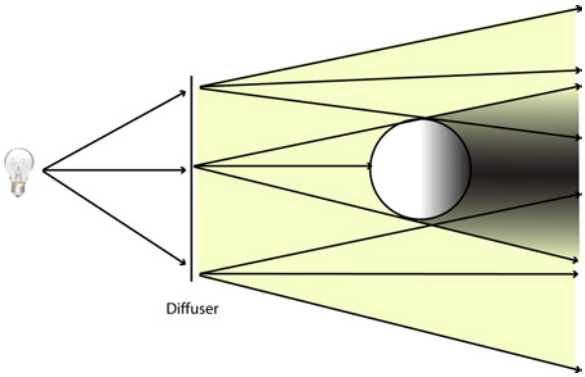

Figure 3.5. Using translucent surfaces ...

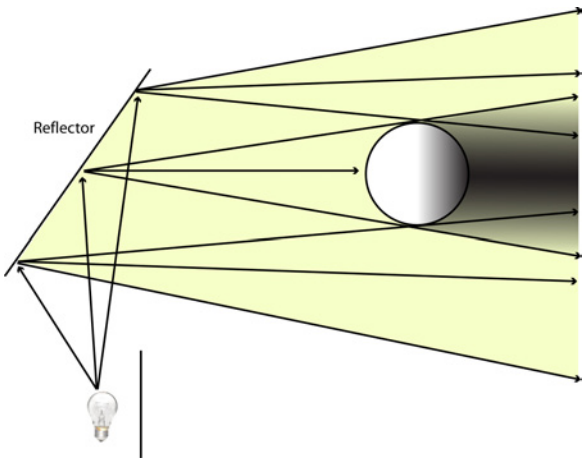

Figure 3.6. ... Or reflective surfaces softens light by spreading it out

Most lights that you'll use in photography are quite small—lightbulb-sized, funnily enough. When we need a softer light in a studio, or anywhere, for that matter, we don't go out and buy larger bulbs. Instead, we spread out the light by either shining it through a translucent object (a diffuser), demonstrated in Figure 3.5, or bouncing it off an object (a reflector), like in Figure 3.6; this way, the diffused or reflected light is used to illuminate our subject.

The same effect happens with the sun on an overcast day. The sun lights up the whole cloud layer from above and the light goes from being a single half-degree wide spot (the sun itself) to the whole sky. The clouds act like any other diffuser and spread the light out so that the light source appears bigger and the shadows cast are softer.

Hard light can be difficult to work with. Sharp shadows mean very high contrast. Without the gradation of shades across the picture, you may have to choose between losing all the detail in your shadows or your highlights if you want to keep any area of the image properly exposed. Very soft light can also present problems. We need some shadows to bring out texture in a subject. If the light is too soft and even, the picture can turn out flat and lifeless. To combat these problems we need to work with the amount of light our sources are producing, and maybe bring in more light.

Amount

In Chapter 2 we learned how the overall amount of light in a scene affects exposure. There's another aspect to the amount of light that can complicate your photo: how the amount of light varies within an unevenly lit scene.

In a very brightly lit scene with hard shadows, you might find that you're unable to see much detail in the darker areas when you set up to correctly expose the unshadowed areas. In this case you'll need to give some extra thought to selecting your exposures. If you have a scene that's so contrasty that you can really only capture the detail of the shadows or of the highlights but not both, as in Figure 3.7, you might like to consider what part of the scene is most important to you. If the detail you want is in the shadows, you might have to accept blown-out highlights; similarly, if the required detail is in the highlights, you might have to settle for totally black shadows.

Figure 3.7. One side of our model is correctly exposed, but there's very little detail in the shadows

The situation described above is common on sunny days in places where there is shade. If you're unable to decide, take a couple of shots, bracketing the exposures so that you have shots in which both ends of the brightness scale are covered (and perhaps a third shot halfway between them). If you use a tripod, you might be able to combine the unbracketed shots in Photoshop to produce a single shot that captures the detail over the full range. At worst, you'll be able to choose which exposure you like best at a later time.

If you're unhappy with the amount of light nature has given you, you can add light to the scene to fill in shadows.

In a studio, you can solve any lighting problem with more lights. Outdoors, it's not so easy. While it's impossible to control the sun or the weather, you can bring extra light with you. It might seem strange, but sometimes the brightest days are when you most need to use your flash. If the sun is casting hard shadows in your scene, try using your flash to brighten the dark areas a bit. This is especially useful if the sun is behind your subject, as in Figure 3.8. The solution is evident in Figure 3.9.

Figure 3.8. Shooting a portrait against a sunset leaves the subject in shadow

Figure 3.9. A flash reveals the missing detail

A white reflector can be used to fix light that's either too hard or too soft. Place it on the shaded side of your subject to reflect light into the shadows that are too dark if your light is hard, demonstrated in Figure 3.10. If your light is too soft and there are no shadows at all, placing the reflector very close to the subject might allow you to brighten one side enough so that there'll be noticeable

contrast across it. Foldable reflectors are available in multiple colors from most good camera stores, but can be a bit expensive. You can practice cheaply with a large sheet of white card, as demonstrated in Figure 3.10. Folding car sunscreens (without colored designs) are an easy, cheap substitute for their expensive photographic cousins. Those made with foil are excellent reflectors, while the mesh type make fine diffusers.

Figure 3.10. A simple piece of white card reflects light into the shadows

Alternatively, you can soften the light of the sun by holding a translucent object between it and your subject. You might need to call a friend or use a stand to support the diffuser while you handle the camera. This is a little more difficult than bouncing light into shadows, as whatever you use for a diffuser needs to be large enough to alter the light falling on the subject. Translucent car sunscreens and white sheets can be very effective. On a smaller scale, tracing paper or baking parchment are excellent diffusers.

Reflectors and diffusers are great for modifying the available light. But when there isn't enough light on offer, you might have to provide your own.

Flashes

Flashlights, table lamps, candles, even your computer's monitor can light up a scene well for a photograph of a lengthy enough exposure time. As you'll remember from the last chapter, though, longer exposure times can introduce blur—from the movement of your camera or the subject. If capturing a scene quickly is important and you lack enough light, you'll have to use a flash.

Chances are there's a flash of some kind attached to your camera. In this section we'll learn how to get more out of your flash than the usual harsh front-on light.

Built-in Flash

Think of your camera's built-in flash as a life preserver. It can save you in an emergency, but you wouldn't want to wear it every day.

Wherever you go that people have cameras, you'll see flashes going off—even when it couldn't possibly help. No compact camera exists with a built-in flash that will light anything up at over 100 metres, yet stadium events are full of flashing compact cameras, all lighting the backs of people in the row in front and draining batteries. Now that you've read this far, you know that there are alternatives that will achieve a better-looking photo without annoying everyone else in the room, but they're not always the solution. If you want to freeze motion indoors, you need enough light to use a fast shutter speed. You'll have to use a flash and for most people, that means the one built into the camera.

If you have to use a built-in flash, some of the problems you can expect are:

- being unable to vary the light's direction, as it's immovably positioned in front of your subject
- hard shadows, due to the flash being very small and close to your subject
- the light being a different color to any other lights in the scene

It might seem that these problems are insurmountable. None of them are. With a bit of ingenuity, you can get around them all to some extent. All the solutions to any of these problems will reduce the amount of flash light that falls on your subject, but should be made up by the improved quality.

In most situations, the harsh light of a bare flash is worth avoiding, especially when lighting portraits, as Figure 3.11 proves. To improve the look we modify the light. We bounce it, we diffuse it, and we color it to suit the look we're after. With big studio lights and a decent budget, all that's easy. If we want the softness of, say, a meter-square light, we use a diffuser or reflector that size. It's a bit more difficult, but you can do much the same (though on a smaller scale) with your camera's built-in flash.

Figure 3.11. An on-camera flash fired straight into the subject's face is quite unflattering

The problem with a built-in flash is that it's impossible to turn it any way other than the direction in which your camera is pointing. So instead of moving the flash you have to redirect the light, and to do that you need a reflector. A pocket-size mirror is ideal, otherwise you can improvise using plain everyday tinfoil. As a last resort, a white piece of card (the glossier the better) will do. Place the reflector so that it blocks the flash from shining directly on your subject. Tilt the top of it forward and the flash light will hit it and bounce up to the ceiling. A ceiling is a very large diffuse reflector, and unless it's painted a strong color, it should give a nice, soft illumination to your scene. If you tilt the card to the side instead, you can bounce light off a wall for a bit of soft side lighting, such as in Figure 3.12.

A mirror bouncing light onto a ceiling will be less bright than the direct flash, so you'll need to keep an eye on your exposure. Tinfoil will lose a bit more light and white card even more. The reduced brightness will also reduce the effective range of the light, but the improvement in the quality of your light will most likely be worth the trade-off, as you can see in Figure 3.13.

Figure 3.12. A piece of foil stuck in front of a built-in flash to bounce light to the side

Figure 3.13. The built-in flash light is softened and redirected using the wall to the right of the frame

If you want the softened light to hit your subject front on, you'll need to place a diffuser in front of your flash. There are a lot of materials you can use: tracing paper is good, and plastic bags are fairly easy to find. For a more durable material that can survive in a camera bag until needed, a piece cut from a translucent plastic bottle is ideal, shown in Figure 3.14.

Figure 3.14. A piece of translucent plastic cut from a milk bottle makes a fine diffuser

The trick to using a makeshift diffuser is to position it so that all the light from the flash passes through it, but to keep it far enough in front of the flash so that the light illuminates the whole of its surface—much like a diffuse lampshade. The flash turns the entire diffuser surface into a larger light source. How you do it will depend on the size of your camera and where the flash is on the camera body. You could cut a strip of the diffuser material and tape each end to the camera body so that the material curves in front of the flash. Or you might take a rectangular piece of a more rigid material, cut a hole in it to one side to poke your lens through, and angle the sheet so that it covers the flash (this works particularly well with very small cameras). If you can shoot one-handed (and be careful of shaking), you can just hold it in your other hand. The important point is to ensure that no part of your diffuser obstructs the lens.

The color problem is a little trickier. Most indoor lighting is yellow tinted, but we don't usually notice it because our eyes adjust to the color. Our cameras, however, don't. Light from a flash tends to be much more neutral in color. When we have a built-in flash turned on, our cameras generally switch their white balance automatically to compensate for the color of the flash. If we're using the flash as a fill light rather than as the main light source, or if we're shooting with a slow shutter speed to allow ambient light in (like the night portrait mode of some cameras), it can lead to mismatches in lighting color. We achieve a look where the subject is bathed in neutral-colored light,

but tinged with overly yellow-lit surroundings (if the scene is artificially lit). If we're filling shadows on a bright sunny day, the rest of the world can end up way too blue.

If you want to throw some money at the problem, professional camera stores will sell you colored gels (colored plastic sheets) calibrated to offset any number of different lighting mismatches. Place the colored gel over the flash so that it matches the selected light source. If you're on a budget, colored cellophane can sometimes do the trick, but the stuff they sell to wrap gifts is sometimes too strong a color. You only need a little bit of yellow to match a camera flash to the light of an ordinary incandescent lightbulb.

In addition to all the external modifications you can make to the light of your flash, you should also be able to vary the brightness of the flash itself via a control called **flash exposure compensation**.

Flash exposure compensation works a little like regular exposure compensation, but only adjusts the amount of light put out by the flash. Left to its own devices, your flash will attempt to light at least the foreground to the same 18% gray mid-tone for which your exposure meter aims. If the flash light is overexposing your highlights, you might want to turn this option down a stop or two. If it's underexposing (a real risk when bouncing your flash), you might attain better results by turning it up.

Knowing how and when to use flash exposure compensation adjustments can be a little tricky and takes practice. Experiment with your flash to see how it behaves when bouncing and diffusing its light, and check your shot with the LCD preview to see if adjustments are needed. Check the highlights. If there is a section that's supposed to be white and it appears gray, you might want to dial the exposure compensation up; likewise if there's no detail visible in the darker areas. If your highlights are blown out and lack detail, dialing down the exposure compensation will shoot less light at your subject.

External Flashes

If your camera's built-in flash lacks the power you need or if you want more flexibility in bouncing light onto your subject, the next step is an add-on flash unit. Some—but not all—compact camera makers produce special add-on units for their cameras. Some compact cameras cannot take an add-on flash at all, while others have standard connectors that can accept full-size flash units designed for use with SLR cameras. What you can do with an add-on flash will depend on the model. At the very least you can add a lot more light to a scene. External flashes use their own batteries, so they can put out a lot more light without being a drain on your camera.

The big external flash units designed for SLRs, sometimes called "speedlights," attach to your camera via a **hotshoe**. This is a bracket that holds the flash, and contains a set of electrical connectors that allow the flash and camera to communicate. A flash with a swivelling head allows you to bounce your light off walls and ceilings with ease, even walls behind you. Some top-of-the-range flashes have built-in wireless communications that allow you to place multiple lights a long way

from the camera that fire when you release the shutter. There are also cable options that allow a hotshoe connection to be extended so that the flash and the camera can be separated.

Some external flashes also have the option to manually set the brightness of the flash. This can be very useful if you only want to add a small amount of light to a scene. Exposure compensation usually only allows a couple of stops adjustment, while the manual controls of a Speedlight brand flash (a high-end brand), for example, might give you five or six stops.

A flash is handy if you want to use a fast shutter speed in low light. Used well, a flash can eliminate blurring from shaky hands and moving subjects. But there are times when you might want some blur in your image …

Working with Objects in Motion

While we mainly aim for images with sharp, in-focus subjects, the careful use of motion blur can produce some interesting effects. Sometimes you want to give the impression of motion, and nothing says "movement" quite like a bit of blur.

There are several ways to handle blur to give a sense of motion. You can aim to blur the subject and keep the background sharp, or vice versa. Which one you choose will depend on the scene and how you want it to look.

Figure 3.15. This image with a moving ferris wheel was shot with a shutter speed of 6/10ths of a second

Keeping the camera steady while letting the subject move is recommended if you want to keep the background sharp, as in Figure 3.15. It's advisable to use a tripod or stable resting place for the camera for this kind of shot.

This is where shutter priority mode can come in handy. When shooting moving objects, the shutter speed is directly related to the amount of blur. Shutter priority mode was used to shoot the ferris wheel image above. The wheel was timed and the shutter speed set so that the wheel would move half the distance between spokes while the shutter was open; exposure compensation was dialed down to keep the sky dark as a backdrop to the lights of the wheel and the city. In general, shutter priority is rarely used, but when you have a subject with consistent movement it can be very useful.

Figure 3.16. The wheel appears motionless

It's more likely that you'd prefer your moving subject to have no blur. Shooting at very high shutter speeds will achieve this, but will remove any impression of movement from the image, as evident in Figure 3.16. This image was shot at 1/1000th of a second early in the day when there was enough light to shoot this fast. The wheel appears motionless, though it was moving at the same speed as in the blurred shot in Figure 3.15.

Movement can be conveyed just as effectively by blurring the background while the subject remains sharp. You do this by turning the camera to track the subject as it goes past. This is called **panning**. Panning the camera to follow a moving object is a skill that takes some practice to perfect. Getting the shutter speed right is easy when the object is turning at a regular speed like the ferris wheel. It has a repeating pattern that can be timed. An object moving past you lacks that type of advantage. You'll have to experiment to obtain the perfect timing.

To take a panning shot of a moving object, start by selecting a slower shutter speed than you normally would. Exactly how slow will depend on the light and the speed of the subject. If you're shooting in daylight, try starting at 1/30th second and experiment with faster and slower speeds until you find what works. You'll need a subject that's moving past you, rather than towards or away from you. It helps if its path is fairly straight.

Some cameras have an automatic focus tracking option that attempts to hold focus on a moving object. If you have one, now is the time to turn it on. If not, or if your camera's autofocus is a bit slow, pick the spot where you want the subject to be in the finished image, turn off autofocusing, and manually focus on that spot.

As the subject approaches, track it with your camera. Try to keep the view centered on the same part of the subject as it moves and as you turn (a tripod with a swivelling head will help enormously). Just as it reaches the spot where you want it to appear, release the shutter but keep tracking. A smooth follow-through will keep the camera movement consistent so that the resulting blur is continuous across the whole image.

It's quite likely that parts of your subject will be less sharp than others. With practice, it'll become easier to shoot moving subjects that retain a sharper look than their surroundings, as indicated in Figure 3.17.

Figure 3.17. Minimal blur on the subject, maximal blur on the background, and we have one fast tram

Working with Tripods

If you're gaining the impression that photography is a series of challenges to be overcome, and that dealing with them can mean compromising your vision, you are mostly right. It's a balancing act. Timing, lighting, and movement all conspire to make your photography difficult. We've looked at how we can solve some of these problems with lighting. The tripod is the solution to several more.

Consisting of three legs and a head on top to which you mount your camera by a screw or clip, the tripod is a very simple device that enables you to perform feats you could never do while holding the camera by hand. Its most important function is providing stability. Barring accidental bumping or earthquakes, when your camera is mounted firmly on a tripod it should keep pointing the same way until you're ready to move it. Hand shake is eliminated; long exposures become as rock-steady as short exposures.

A tripod can be used for more than just eliminating shaking from shots. Many tripod heads can be made to rotate around an axis. When you're shooting panning shots of objects in motion or sequences of photos to be assembled into panoramic images, a tripod head rotating only around its vertical axis will keep the image lined up evenly along the horizontal path.

Regardless of how you use it, a tripod is a good tool to have when going into an unfamiliar shooting situation. There'll always be instances when you lack enough light or will be unable to control the light you have. A tripod provides another option for achieving the exposure you need, by allowing longer exposures than you'll ever manage handheld.

Long Exposures

In really low light you need very long exposure times in order to capture enough light to make an image. We've seen how that can cause problems with motion blur, and if you want a sharp image of your subject, motion blur is the enemy. Alternatively, you can work with blur to produce images that look like nothing you can see with the naked eye. Long exposures combined with moving subjects can create fascinating images. Using a tripod is highly recommended, though you may be able to achieve the same effects by placing your camera on a stable, solid surface. (A table is nowhere near as portable or posable as a tripod, though.)

In a very long exposure with a steady camera, moving objects can be blurred into invisibility, while stationary objects remain sharp. Dim lights that are too dark to see in a normal exposure become bright highlights.

You need to shoot in very dim light for effective results with a slow shutter speed. Closing down your aperture will buy you even more time. Experiment with settings. Set your camera for its slowest shutter speed, put your camera on a tripod, point it at a scene, and check the result. If it's all washed out, close up the aperture more or try a slightly slower speed. Soon enough you'll capture a compelling image.

Long Exposure Effects Worth Trying

Traffic flowing past a long-open shutter turns into a river of light. Figure 3.18 shows how fast-moving cars at nighttime reflect too little light themselves to appear in a 30-second exposure; their headlights, however, produce bright-enough lights that streak across the frame.

Figure 3.18. Seemingly invisible cars rush through a darkened tunnel leaving a trail of light

When photographing moving water with a long exposure, all the signs of movement—ripples, waves, and ducks—seen in Figure 3.20 are blurred and smoothed out in Figure 3.19. Ripples take on a smooth, silky sheen while still water appears flatter. Ducks blend into invisibility.

Figure 3.19. A two-minute exposure blurs rippled water into silky smoothness and creatures into invisibility

Figure 3.20. The same shot with exposure that's one-tenth of a second

Figure 3.21, a 15-second exposure, allows the city lights time to register and levels out the waves in a fairly calm bay, creating smooth bands of reflected light across the water.

Figure 3.21. Long exposure produces beautiful bands of light in this city bay

Painting with Light

When a scene is devoid of light, you might like to try this artistic effect. Low-powered lights produce minimal illumination, so they can be used for very localized effects.

Fix your camera onto your tripod, grab a flashlight, and draw or write on the air as shown in Figure 3.22. Point the flashlight at the camera and move it to create light trails through the scene.

Figure 3.22. Drawing with light makes people smile

Alternatively, you can use a portable flash (or the flash of another camera) to selectively light up parts of a large scene. The effect achieved in Figure 3.23 was the result of the subject positioning herself at three different points, with the photographer holding the flash up to illuminate each position.

Figure 3.23. One shot, three flashes, with a bit of movement in between

Capturing Lightning

Capturing the brief flash of a lightning bolt can only occur with a slow shutter. The trick is to make the most of a dark and stormy night, close down your aperture, point your camera in the direction of the storm, and open your shutter for as long as you can.

Bulb mode is an option on some cameras. It holds the shutter open for as long as you hold the button down. Combine bulb mode with a **cable shutter release**—a device with a metal cable that's attached to the camera's shutter button— that can be latched open, and you can take extremely long exposures, hours even. You can try to do it without the latched switch but manually holding down the button becomes dull after the first minute. If your camera lacks bulb mode, you'll just have to set your camera for the longest exposure setting and hope for the best. If you do have bulb mode, open your shutter, sit back and wait for the lightning, then close the shutter once the flash has occurred. If you use the smallest aperture setting, you should be able to keep the shutter open for many minutes without exposing much of the scene before the lightning.

Macro Photography

Macro photography is the art of capturing the very small and making it look big. It can produce some of the most fascinating shots imaginable, showing you everyday objects in ways you've never seen them before. It can also create headaches you'll never feel producing any other kind of photography—and it's absolutely worth it.

When you read about macro photography and macro lenses, you'll see a lot of references to magnification factors. A lens will be rated with a magnification of 1:2 or 1:1, or even 5:1. Sometimes the label will just say "life-size." In most cases there'll be a noticeable lack of detail as to what this means for your final image. It does not refer to the size it appears as on your computer monitor (naturally), nor to the printed image. Rather, the life-size image is the one that's projected on the sensor by the lens.

The terms for magnification are simply the ratio of the size of the image on the sensor to the size of the object; so, 1:1 is life-size, 1:2 is half life-size, and 2:1 is twice life-size. Lenses with a magnification of 1:1 are readily available for most SLR brands and some compact cameras. Lenses capable of magnifying larger than life are uncommon. Canon's MP-E 65, a macro lens capable of magnifications up to 5:1, is a significant exception; it's a lens with a limited range of uses due to its maximum focusing range of around ten centimetres, but it still has an enthusiastic following among macro photographers.

The grains of rice in Figure 3.24 are a bit over half a centimeter long, while the image of each grain covers about a third of the sensor's width. At whatever size you display this image, the grains will be about a third of the width of the whole image, so, unless you want to print postage-stamp size or smaller, "life-size" means very, very large.

Figure 3.24. Grains of brown rice, "life size" but larger than life

Many compact cameras have macro modes that allow focusing on very close objects. How close varies from camera to camera. Few, if any, can manage life-size magnifications but many do quite well. At the SLR-end of the scale, life-size-capable macro lenses are available for most models but they tend to be expensive. There are, however, a few ways by which you can try SLR macro photography without using an expensive macro lens.

The magnifications of ordinary non-macro lenses can be increased by the addition of extra lens elements on the front. SLR lenses can have separate lenses added onto their screw-on filter attachments. These lenses, sometimes called close-up filters, do degrade the quality of the image a little, but are significantly cheaper than a macro lens; thus, they're helpful in giving you an idea of whether you want to pursue macro photography further before you pay the big bucks.

Macro performance can be improved more dramatically and with less loss of image quality by adding **extension tubes** between the lens and the camera body (obviously this is an SLR-only option). Extension tubes are merely hollow tubes with connectors to fit them to your camera and lens. Cheap ones may lack the electronic connections that allow your camera to control the lens, forcing you to focus manually and possibly relinquish control over the aperture. More expensive extension tubes include the electrical contacts that develop the connection between camera body and lens, and are well worth the price difference.

A small number of compact cameras have optional add-on lenses or adapters for attaching third-party lenses (even reversed SLR lenses) but they are not common to all brands or models. If you want to try macro photography with a compact camera, choosing a camera with a low minimum focusing distance is a good start. There are compact cameras available that will allow you to focus right up to the point where the subject is touching the lens (though actually doing this is a bad idea). This is usually only possible at the shortest focal lengths, so if your camera is able to focus at such a short distance, no matter how close you are to your subject you'll still produce a wide-angle view of it. If a fly or bee lands on your lens, you'll be unable to fill the frame with just its head, as Figure 3.25 shows.

Figure 3.25. A bee at half life-size

Being up close to your subject entails a certain amount of risk to your lens. Even if the subject is soft and harmless, a slight tremor or a misjudged movement may have your expensive piece of glass bumping into an object that will require cleaning off. The same small movement, such as the mild shake when you press the shutter button, can move your carefully composed shot out of alignment.

With very close focus (at ranges of under ten centimeters) comes very shallow depth of field—millimeters at best, even with the tiniest of apertures. Hand shaking becomes a problem in macro shots. Move forward a millimeter and your subject goes out of focus. If the front of your lens moves in and out when focusing, you may find that the very act of trying to focus moves your subject out of the depth of field.

For many of the problems caused by small working distances and shallow depths of field, the solution can be achieved with a tripod. It will eliminate the shaking problem and allow you to shoot at slower shutter speeds, so you can get away with smaller apertures to marginally increase your depth of field. However, tripods can make it more difficult to frame your shot and focus on your subject due to their size and immobility.

If your macro subject is able to be moved, you can bypass the focusing problems by placing it on a movable surface and then adjusting its position until it's in the spot the camera is focused on. Our grains of rice example, shown earlier, was produced this way: placing the rice on a piece of black cartridge paper and moving it across the table towards the camera until it was in focus.

Macro photography also causes problems with lighting: when your subject is only a couple of centimeters in front of your lens, how do you light the front of it? The lens itself can cast shadows into the shot. This is especially true if you use a flash mounted on the camera. Dedicated macro flashes that attach to the front of the lens, as shown in Figure 3.26, eliminate this problem.

Figure 3.26. Flashes attached to the front of the lens to illuminate very close subjects

Shooting outdoors on a sunny day is ideal for photographing insects (if you can get them to sit still), or you can use an external flash on a cable if your camera supports it.

Now that you know about controlling light, working with moving subjects, and shooting up-close subjects, it's time to tackle the toughest of photographic projects.

Photographing People

People are the most common photo subjects but they can also be the most difficult to deal with. For every person who insists on snapping photos of the family each time more than a couple of members are gathered in the one place, there's usually a majority of family members who'd prefer not to be photographed.[1] While candid snapshots, say at a party or family gathering, are fairly straightforward, posed portraits can be nerve-racking for both subject and photographer.

Helping your subject to relax in front of the camera is the key to taking a good portrait. Until then, no amount of lighting or cajoling will prepare a subject to be photographed. Once relaxed, a subject is more likely to be comfortable posing or tolerate lights shining in their eyes.

Candid Photography or Stalking?

Using a really long lens and photographing people from a distance without their knowledge is best avoided. It can work, but it tends to come off as creepy and stalker-like if they notice.

Instructions for how best to photograph people are difficult to specify. Everyone is different; you need to work with each subject as an individual if you want to capture what makes them special. The best we can do is explore some general tips. Like the composition rules in Chapter 2, these are guidelines and can be used or altered as you see fit. If what you see through the viewfinder works, go with it.

Tips for Photographing People

The best way to relax your subject is to be relaxed yourself, and you'll be more composed if you're confident in what you're doing. Part of that confidence will come with practice. Knowing your camera, your lighting, and what you want to achieve when you start shooting are traits that you'll develop over time if you keep practicing and working to improve your skills. When you show confidence in your own abilities, the subject will notice and respond to it.

As a beginner, this will not come easily but you can make up for some lack of experience with preparation. Plan your portrait session. Know what you want and work out in advance how to accomplish it. Make sure you have everything you need at hand before the subject arrives. If you can set up and be ready to shoot without hesitation, directing the subject when needed, you'll be less likely to make mistakes that could unsettle you or your subject. If your technical skills still need practice, don't worry, keep shooting. Digital images cost nothing to shoot and even the worst mistake can teach you a lesson for next time. There's no need to show your subject every frame you shoot, just the good ones.

[1] Some of them go on to become photographers because they figure that if they're always behind the camera, they're never in front of it.

Keep your subject engaged. Talk to them while you're setting up and while you're shooting. Discuss what you and they hope to gain from the photo shoot, certainly, but go beyond that. Find out a bit about them, what they like to do, what makes them tick. The enthusiasm they have for pastimes they enjoy talking about will be apparent in the photos, and it will help distract them from the photography going on around them.

Once they start to relax, people are much easier to pose. Start with fairly simple poses first and see what works for the subject. If they're uncomfortable they'll look uncomfortable, which will ruin all that work you did settling them while setting up. If your subject is nervous or fidgety in front of the camera, ask them to sit down. It limits how much they can move about and relaxes them at the same time.

Keep an eye on the subject's hands. Nervousness can show itself in hands even when a person is forcing a smile, as can a lack of enthusiasm, evident in Figure 3.27. If the subject's hands are going to be in frame and they seem tense, have them hold an object or perform an action, such as in Figure 3.28. Otherwise, try a tighter framing that crops the hands out.

Figure 3.27. If the subject lacks enthusiasm the viewer will too (watch hands and eyes for signs of discomfort)

Figure 3.28. A prop helps to distract a nervous subject, as well as provide a secondary point of interest

Young children in particular can be fidgety subjects that need extra attention. Props might be necessary to occupy the child. If you're unable to coax the child into posing for the camera, try letting them play with a toy while you find an angle that works for the position they're in (be ready to shoot fast—they'll move when you least want them to).

If a child is too young to be directed to pose for the camera, you might be able to have them look where you want with a favorite toy that makes a noise. When you're ready to shoot, hold the toy where you want them to look and make the noise. If all goes according to plan, you'll have them looking the right way and responding.

Shoot people from their eye level, even children. Keeping the camera at eye level removes the impression of being looked down on, or vice versa.

When your subject is not looking directly at the camera, try composing the shot so that they're a bit to the side of the frame relative to where they're looking. When we look at a picture of a person we tend to follow their gaze. Enabling them some space to look into also gives the viewer somewhere to look to, and can grant a sense of direction and flow to an image, as seen in Figure 3.29. You might also consider including another object in the frame to act as a secondary point of interest they can look toward.

Figure 3.29. A sense of direction

If the subject's head and body are both turned the same way they can look a little stiff. Try angling their body a bit to one side while their face is pointed directly at the camera; then have them looking off to the side while their body faces the camera, as shown in Figure 3.30.

Remember that the photo is about the person. We tend to connect with images of people when we see their eyes. No matter where they're looking in the frame, make sure their eyes are in focus, as in Figure 3.31. If you're using an autofocus without automatic face recognition, put the active focus point on one of the eyes. If you can position an eye on one of the intersections of your rule of thirds grid, even better.

Figure 3.30. Alignment of body to the camera and the face to one side

Figure 3.31. Ensure the eye is focused and positioned well within the frame

Rather than moving a subject yourself when posing them, tell them carefully what you'd like them to do. Direct them with words and gestures. People are not action figures, and you can ruin the mood of a shoot very quickly if you treat them that way. If you want them to look in a specific direction, place an object where you want them to look. If it's close to the camera position, just holding out your hand and asking them to follow it—either with their eyes or their whole head—works very well.

Saving for the Future

By default, most cameras save your images to the memory card in the JPEG file format. JPEG files compress the data so that it takes up less space and you can store more photos on your memory card, but there's a catch: the smaller you make the file size, the lower the quality of the image. JPEG compression is **lossy**—some data is tossed away to make the file smaller. Rather than being random or arbitrary, the tossing away is based on the human eye's limits for distinguishing color. Pixels that are next to each other and very similar in color are converted to the same color, so as you increase the compression, your smoothly shaded tones become blocky. At low compression levels it's usually unnoticeable, but it can become more pronounced at higher compression rates. Worse, each time you resave a JPEG image after editing, it has to be compressed again; hence, the more you work on them, the more their quality will degrade, as the result in Figure 3.32 shows. The banding in the sky and blotchy colors are the result of saving the image just twice, with a bit too much JPEG compression.

JPEG images also have issues with color range. A JPEG image can only have 24 bits per pixel and so can contain no more than 16,777,216 different colors.

That's a lot of colors. It's more than a human eye can distinguish, so if your image is nicely balanced tonally it should be more than enough. However, in a very bright image a lot of the colors are going to be bunched together at the bright end of the scale. There might be no blacks or dark shades of any colors. Of the 16 million colors available, a very bright or dark photo might use only a few thousand shades at the extreme of the scale. Subtle differences in tone will be lost in the black or white sections, and nothing you can do will separate two objects whose colors are similar enough to group them as the same shade. We'll look at this problem in more detail in Chapter 5.

If your camera supports it, saving your images in its **camera raw** image file format can help. Most camera sensors record more data than a JPEG file can store—at least 36 bits per pixel (68,719,476,736 colors). A camera raw image file stores all this data without processing or lossy compression. The files are bigger so they'll fill up your memory cards faster, but will also give you better quality images.

Figure 3.32. The result of a bit too much JPEG compression

If you're saving JPEGs, changes are made to the image colors before it's saved. White balance and other color adjustments are applied to the image before it's compressed. When shooting in your camera's raw image format, no changes are made to the data in the image at all. The camera will record what the white balance control is set to and use that adjustment in generating previews, but the sensor data is left alone. This allows you to take control of the white balance in software later. If the color of the light you're shooting under isn't an exact match for any of the presets on your camera, you can manually adjust it to whatever color you need. You can do this after shooting with a JPEG file, but remember that the JPEG has lost some data in compression and storage. Any changes you make may degrade the quality of your image.

Every camera maker has a different way of storing and interpreting the data from the camera's sensors. Often there are variations even between raw formats from different model cameras from the same maker as sensor specifications develop over time. Shooting raw gives you much more flexibility in post-production on your images, but there's no guarantee that any third-party application will be able to read your camera's raw image files. Your camera should have had a raw file conversion application bundled with it so you can make basic adjustments and then resave it in a more widely accepted format. Adobe is usually quick to add new camera models to Lightroom and the Adobe Camera Raw plugin for Photoshop. Apple tries to incorporate support for new raw files in its Macintosh OS X operating system, allowing them to be viewed, if not edited, on an up-to-date

Mac without any other applications. However, if you're an early adopter, some applications might lag a bit in being able to read your raw files.

There's also some question about the long-term usefulness of raw files. Once a camera model has been discontinued for a few years, will software that's able to read its files still be available? Adobe has put forward the **Digital Negative** (DNG) file format as a standardized format for storing camera sensor data, and promised to always support the reading of DNG files in its applications. What happens if Adobe collapses in some future economic disaster or is taken over by a less conscientious business is unknown. For now, DNG seems like a good idea, but keeping files in other non-lossy formats after editing is complete (such as TIFF or PSD) might be best.

In general, unless you're desperately short of space on your memory cards, and have a lot of shots left to take before you can transfer them, you should set your camera to shoot raw whenever possible.

Treat Practice as Play

Is your mind spinning with all the photographic possibilities that emerge when you take control of the scene and the light?

You should no longer fear moving subjects or dark scenes, because you now know what to do. All you need now is practice—lots of practice. Go out there and take some photos.

Try bouncing and diffusing your flash. Have a friend sit for a portrait and see for yourself what your flash can do with different reflectors and diffusers. Note how much you need to increase your exposure to compensate for the light lost in bouncing and diffusing. When you find the material that works best as a diffuser for you, put a few sheets of it in your camera bag so that you'll always have some handy.

Try some panning shots of fast-moving objects. Practice the technique and see how fast a subject you can track. Try it on slower subjects too: cyclists, dogs running, or people playing sports, perhaps.

Play with dim light sources after dark. See what you can illuminate with only a flashlight and slow shutter. See if you can write your name legibly with light in a 30-second exposure. Find out for how long you need to open the shutter to shoot by streetlight.

Establish your camera's minimum focusing distance. (It's sometimes printed on the lens, otherwise check the manual.) Practice focusing on small objects at that range. See how much magnification you can achieve. The smallest object with which you can fill the frame will give you a good guide to what size subjects will make successful macro shots. (Coins make good test subjects and provide an easy-to-remember guide to sizes.)

Have fun while you're practicing. There's no need to follow these suggestions to the letter. Pick subjects that interest you. Treat practice as play rather than homework. When you return I'll be here with Chapter 4, where we'll discuss how best to handle the thousands of shots you just took.

Chapter 4

Storing and Managing Your Images

A modest-size memory card in a modest digital camera—say a four gigabyte card in an eight megapixel camera—can hold over 400 photos if you're shooting raw and hundreds more if you only save as JPEG. Yet, this could be less room than needed for one afternoon's work if you're a wedding photographer. If you're new to photography and you remember what we said earlier about the best way to learn to take one good photo,[1] it could be too little for you too. You probably won't want to keep every single image—even the best event photographers toss out more shots than they keep—but at some point storing, sorting, evaluating, and filing those images will be necessary. And it's a very good idea to plan for that before you fill your first gigabyte.

The Importance of Backups

Before we dive into the exciting world of filing and sorting images, it would be good to review the single most common piece of advice (and single most ignored) ever given to people who work with computers:

Always make backups!

When you return home after a long day's photography and copy all your shiny new images from your memory cards onto your computer, that's a good start. There are now two copies of each image. Sooner or later you'll need to erase the memory card to shoot more photos, so you're back to one copy of each image. If your computer fails, if you accidentally delete or overwrite a file, if anything

[1] That is, take a few thousand really bad ones.

bad happens to your home or your computer … the photo is gone. A good insurance policy will cover you for missing hardware and any applications installed on that hardware. But it cannot replace a lost photo.

Avoid trusting your photos to any one device. Most people seem to think that it won't happen to them right up until the moment that it happens. Computer hardware failures do happen, and they can happen very suddenly and surprisingly. During the writing of this book, my computer, camera, and memory cards performed flawlessly but my external backup disk failed without warning, wiping out a whole terabyte of data. The drive went from okay to inaccessible between hourly backups in the middle of a very large job. Nothing was lost because I'm rather paranoid about losing photos and book manuscripts. My backup plan works like this:

Work in progress lives on my main desktop computer's hard drive (an iMac). An external 1.5 terabyte drive (three times the size of the iMac's drive) backs everything up automatically every hour via Apple's nifty Time Machine application. As well as the current version, Time Machine backs up all the earlier data for as far back as your drive capacity allows (which is why a drive three times the size of the one it's backing up is useful).

My whole image library and all my active projects are also backed up on a 250GB portable USB hard disk, which lives in my everyday carry bag. When I'm out shooting photos, the bag holds my main camera; when I'm writing, it holds my laptop. No matter what I'm doing, it holds that portable drive. Files are updated on the portable drive when major changes are made or at the end of a day of shooting.

My main active project (the manuscript for this book at this time) also lives on an 8GB USB flash drive that hangs from my keychain and in an online dropbox at dropbox.com. The online copies are more for exchanging files with editors, but they'll do as a backup if everything else is lost. The flash drive can be taken out and plugged into any nearby computer for an impromptu writing session.

Finally, I keep a number of extra memory cards for my camera and don't erase them until its contents are copied to at least two of the above drives.

It might seem excessive, but it makes my projects hard to kill. Losing any one drive costs me nothing but the replacement of the hardware. Losing my main backup drive was annoying, but all that was permanently destroyed were some early drafts of old, completed projects. It was still frustrating, but less so than permanently losing everything. You should hope that you never need backups, but always keep several.

Never Work on Your Originals

There's another reason why you should always keep backups of your work: to have an original copy of your work. That way, if you do any work on your images, you always have the option of starting again from scratch. If the finished edit fails to look as good as you hoped, or the client wants the image done differently, or even if you just want to show off your Photoshop skills, having the untouched original means you can always go back to the start.

Make a habit of backing your work up often. A lot of external hard disks ship with automatic backup applications that can be scheduled to update their backups regularly. As I've mentioned, Apple's Time Machine application, included in the Macintosh operating system since version 10.5, automatically makes hourly backups of any changed files. There really is no excuse for being without backups of any of your important files.

Metadata and Tags

When you take a photo, your camera records more than just the image that's in front of it. Embedded in the file is a large amount of extra data: the make and model of the camera, the exposure settings, whether the flash fired, the time and date the shot was taken, and much, much more. Once the photo has been copied to your computer, this **metadata** can be used to sort, file, and search through your images. Figure 4.1 shows the metadata retrieved from a photo by the Adobe Bridge application.

The usefulness of metadata goes beyond this, though. Further information can be added in whichever application you use to catalog your images: names of people in the photo, the event or occasion, ratings, the name of the location and its GPS coordinates, the project for which it was shot, the name and contact details of the photographer, the copyright details, and as many different relevant keywords you can think of—all can be filed with the image.

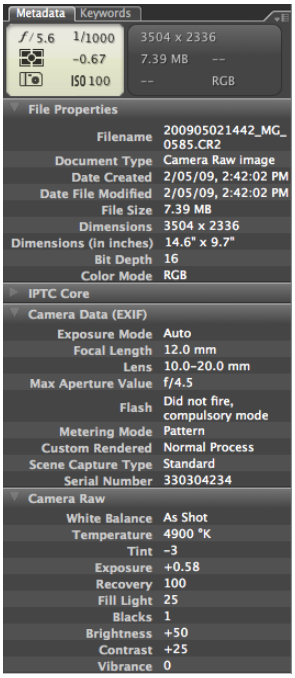

Figure 4.1. A part of the metadata panel in Adobe Bridge

Metadata is not always stored in the image file itself. The details of your camera and its settings at the time of shooting are added to the file by the camera, but titles, notes, and records of adjustments—the details added after you transfer the image to your computer—might be kept separate from the image file. Your image management application might store extra information in either a library file that holds the data for all your images (Apple's iPhoto does this) or a sidecar file—a separate file containing the additional

metadata—for each individual image (Adobe's products tend to use this method). A sidecar file should always be in the Adobe-developed XMP format and be readable by most other applications. Storing the metadata in an application-specific library file might mean that the data can only be read by the one application that you created it in.

Metadata can store a whole lot more information about a file than the filename can, so using it to sort and index your images will give you a much more flexible and searchable catalogue.

Naming, Sorting, and Rating

On a small scale you can keep track of your photos by sorting and storing them in folders or naming them by subject or theme. When you have a thousand images to file, however, naming each of them individually is tedious—not to mention a little difficult. If you lack some sort of a plan, finding one specific image can be like trying to find a particular needle in a needle stack. Sorting them into directories based on subject can only really work if you have only one subject per photo or if you store multiple copies of each photo. Even broader categorization—folders for locations, people, events, photo types, and so on—fall apart when people stage an event in a specific location. On a small scale, say the work done from one day's shooting, you can accomplish this because there's fewer photos to sort and they all at least have the date in common. When you have thousands taken over a long time, you need another system.

The key to keeping track of thousands of images lies not in filing but in indexing, labeling, and tagging. The idea of spending any significant amount of time in organizing and filing is probably filling you with a desire to flip to another chapter. If so, you're in good company! When you first start cataloging images there will likely be a lot of them to work through. Even if you're very new to photography, you'll have the couple of hundred shots you took while practicing the lessons in the last few chapters.[2] You can be forgiven for wanting to put off naming and labeling and tagging and cataloging your images, but the sooner you start, the easier it will be. With a good image management application, the process becomes easier the more you do.

A lot of stress can be avoided if you let your computer do as much of the work as possible. It is, after all, what computers are for. They think about the tedious stuff to save you the effort. The applications we'll be looking at in this chapter spend most of their time creating and maintaining indexes of image files. Rather than grouping the actual files into relevant categories, an image-organizing application keeps track of where your image files are and allows you to create indexes, collections, and sets of images by manipulating the indexes. It looks like you're seeing your image files rearranged and reordered on screen, but actually you're just seeing previews displayed according to the index you and the application create. The original files remain where they were put.

[2] You *have* been practicing, haven't you?

Adobe Bridge

If you have Photoshop (CS or Elements) you'll also have an application called Adobe Bridge. Bridge is unlike the image organizers and editors we'll be looking at in this chapter. Rather than build indexes and base collections on them, Bridge browses and manipulates the image files in their actual location and performs most editing functions by opening the image with Photoshop. It was designed by Adobe to browse and work with files from all the Creative Suite applications. It's very good for browsing images—especially if you already have them sorted and filed in an organized way—but doing the initial organizing is a little tedious.

Your camera should have shipped with an application to handle importing and organizing the photos from it. There are other applications available from alternate sources which often do a better job (and support a wider range of cameras; for instance, the software provided with your camera might be unable to read the raw images from other brands or even later models of your brand). We'll look at some of the application choices a bit later.

The first step in becoming organized is to import your images into the application. You might be given the option to have the application scan your entire hard drive and look for images to catalog. This can be time consuming and may result in a large number of images found that you've no wish to catalog. It can also help you find that image you misplaced several projects ago. It's your choice. If your hard disks are a disorganized mess of folders without any real plan, a full scan might be a good idea. You can always delete the unwanted images from the application later. Adobe Lightroom's (http://www.adobe.com/downloads/) import dialog, shown in Figure 4.2, lets you choose images, rename them, and attach metadata while it imports.

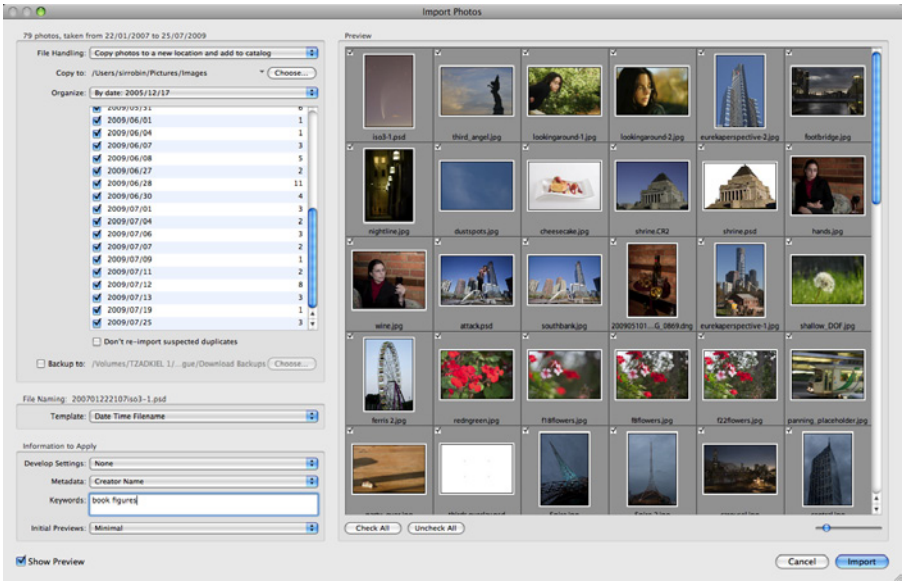

Figure 4.2. Adobe Lightroom's import dialog

If you're given the option of moving all the files to be cataloged to the one folder, you should consider taking it. Image files can be backed up easily, as you know from your habit of making backups. Keeping your image files in the one place—Windows and Mac OS X both provide a unique folder for storing pictures—makes backing them up easier. Dragging just one folder to another drive is simpler than finding and dragging many. In the event that you need to restore your files from a backup, having them all together will speed up the moving, and also make the rebuilding of indexes and previews easier and quicker.

How the files are sorted within the folder is a little less important. Once you have them stored you'll almost always be using your new image organizer to find and work with them. Most applications default to storing them in subfolders by date, and this is also a good idea.

Once everything is imported into the application, it is time to go to work tagging and rating images. The images should all have the dates and times they were taken attached to them and they'll probably be sorted chronologically. The photos of any events should all be grouped together that way, so that's a good place to start adding keywords. Birthdays, Christmases, holidays, and so on should all be labeled as such. Locations should be named if they're important. Even if you have GPS coordinates attached to your images, 37°45'52"S 144°58'13"E hardly says "home." If your application can detect faces, tell it to do so and name the faces it finds. Each time you add a keyword or name to a photo, that word will be available in a list, a menu, or some other control, so subsequent images can be labeled with just a mouse-click or two. Multiple images can be selected and have the same keywords applied to all of them. You can never have too many keywords. iPhoto's location tag works with Google Maps to show you the geographical location from within iPhoto, as illustrated by Figure 4.3.

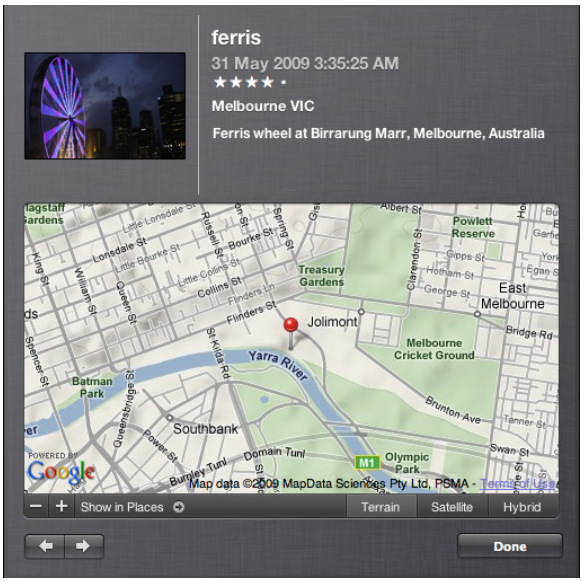

Figure 4.3. iPhoto's location tag working with Google Maps

While you're adding names and places and other keywords, you should find the option to rate images. Most applications support ratings from 1 to 5, except Picasa (http://picasa.google.com/), which only lets you add a single star, disappointingly. You can use the ratings in many ways. Five-star images can be picked out for easy showing off or uploading of your best stuff. One-star images can easily be gathered together for trashing, and ratings in between can indicate the degree of work they might need to make them work. (Check your keyboard shortcuts. Number ratings are often given an easy shortcut—usually **ctrl+1** to **5** in Windows or **⌘+1** to **5** on a Mac. It's the quickest way to mark the images to which you want to return.)

The point of all this tagging and rating is that the organizing application can find and sort your photos using the tags and metadata included at the time of shooting. If, for example, you filter your whole photo collection by date, focal length, keyword, and subject name, and only show five-star-rated photos, finding your favorite photo of your child on her birthday, shot with your best lens, will be much easier.

For further organizing, you can create collections or albums. The names vary according to the applications but the concept is the same. A collection is a list of photos, much like a playlist in a media player application. The filtering and sorting functions can make groups of images related by common data. Collections allow you to build groups based purely on how you want to group them together. Most applications also have the option to create **smart albums**. You define a set of rules that tell the application what you want to collect—say, images with a rating of four or higher taken between the start and end dates of your last holiday—and it will gather images that match the criteria into a collection.

While writing this book, I've spent a lot of time playing with many applications on different platforms to see what they're capable of and what they do well. Adobe's Lightroom best suits my style of working. I import images from my camera directly into Lightroom, which adds my name and copyright details at that point, plus any keywords that I want to add to the whole batch. The newest batch of images in Lightroom are cataloged under **Previous Import** until the next time you import images, which is worth taking advantage of. Before importing the next memory card of images, I drop any existing images for specific projects into the collections I created for those projects when they began. I also add obvious keywords—location, the names of significant people in them—and give a star to any that appear worthy of (or needing) extra attention at first.

That's all I do at the time of importing. Later, when all the day's memory cards are imported and backed up, I go through each collection's new images and add stars to the ones that are probable keepers, flags to the ones that need work, and consign the ones that are unusable to the trash. If I come across a photo I don't like, or where the subject has a silly expression, it may still qualify as usable; they could very well form the basis for a composite image that's better than any unedited image from the shoot. The only photos that are trashed at this point are ones where a flash failed to fire or the whole scene is blurred due to focus or movement issues.

Next, I use Lightroom's Develop module to make easy fixes to the images I flagged as being worthy of attention: crooked images are straightened; brightness, contrast, and color balance are fixed; and cropping is done. Anything more complex is done in Photoshop later.

Outside of Lightroom, I keep all the camera raw files in my Mac's Pictures directory in subfolders for years, months, and dates. This makes it a bit easier to share large amounts of raw files with a collaborator: I just copy the appropriate day's folder for them.

Files to be worked on in Photoshop are exported to a new folder for each major project, and these copies are worked on until finished. Many projects require another application in addition to Pho-

toshop for further work—usually Illustrator or InDesign for layout—and since I mostly work with Adobe applications, I use Bridge to browse and manage the work. When I'm done working on them, I import the finished files back into Lightroom and file them in the same catalog as the original images. This keeps everything for each project in the same place and makes managing a final product easy. From Lightroom I can take a bunch of raw images, some lightly retouched and several heavily Photoshopped pictures, and export them all to the one email message, all in the same format at the same size for the client to look over.

Image Organizing Applications

Your camera, no doubt, came with an image management and editing application included. Depending on the camera manufacturer and your taste in software, the bundled application could be everything you need or it could be the worst software idea since Microsoft Clippy. Even if it does make you think of the Microsoft Office assistant, put down the hammer. There are a lot of applications on the market. One of them will almost certainly suit your style and needs, but nearly all of them allow free trials. It would be silly not to test a few of them. And until you've found the one that's right for you, it would be wise to hang onto the manufacturer's offering. It's the one you can be absolutely sure is compatible with the files your camera produces when you shoot raw.

The Cheaper Options

If you're on a limited budget, spending a few hundred dollars on Aperture (http://www.apple.com/aperture/trial/) or Lightroom could well be beyond your means. If that's the case, there are some free options that are nearly as good as the expensive ones—perhaps better, depending on your taste. Some of them include features that the expensive packages lack. Designed with the consumer-level novice user in mind, some functions are simplified or more heavily automated compared with applications aimed at the professional. Some of the extra automatic functions come at the cost of some loss of flexibility, but the value for money is hard to beat.

Somewhere in the box your camera came in was probably a disk full of software that you barely noticed at the time. On that disk there was almost certainly an application that imports and organizes images from your camera. Most of these applications made by camera companies are just fine for small-scale photo collections and if you're already satisfied with the way yours performs, by all means continue using it.

If you're after a bit more power or flexibility than what's bundled with your camera, you might already have what you need. If you have an Apple Mac, it should have come with the iLife suite of applications, which includes iPhoto as seen in Figure 4.4. Windows Vista includes Windows Photo Gallery and an upgraded version—Windows Live Photo Gallery shown in Figure 4.5—is only a small download away for Windows 7, Vista and XP.[3] Both iPhoto and Photo Gallery are excellent applications. They have their drawbacks—support for camera raw files may require additional codec

[3] http://download.live.com/photogallery

plugins for Photo Gallery, and new versions of iLife beyond what was bundled with your Mac are not free—but most users are likely to be happy with what's included.

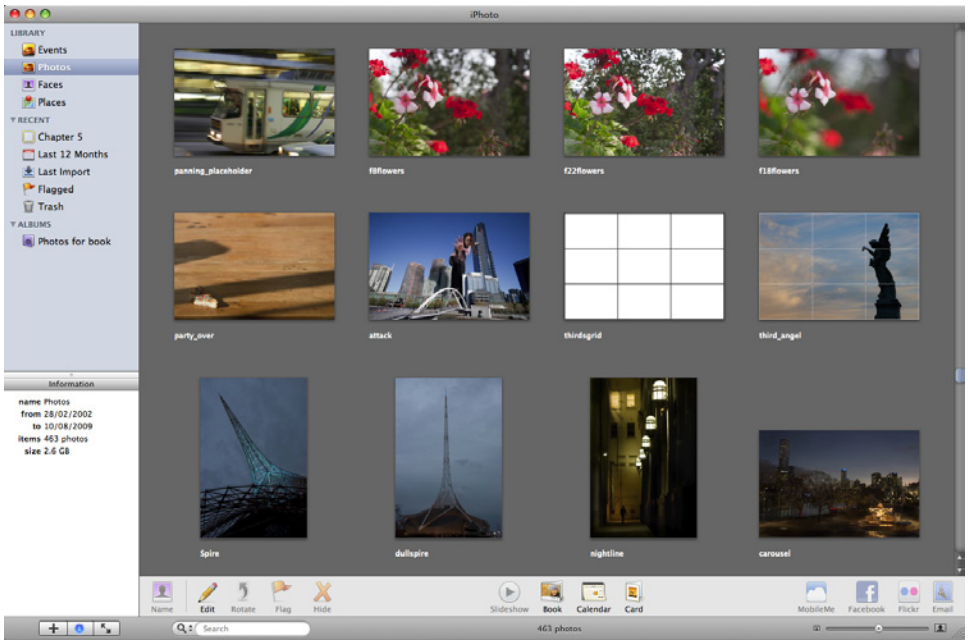

Figure 4.4. Apple iPhoto

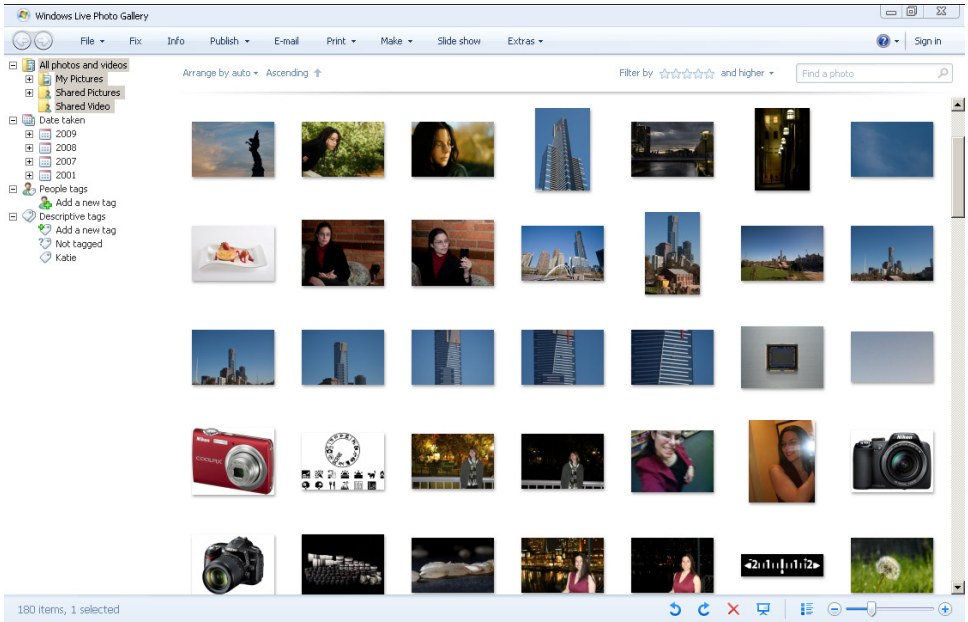

Figure 4.5. Windows Live Photo Gallery

A further option is available from Google. Picasa (Figure 4.6) is an image organizing and editing application that's free and is available for Mac, Windows, and Linux. It's designed for working with

the Picasa Web online photo-sharing application but works perfectly well as a stand-alone organizing and editing application.

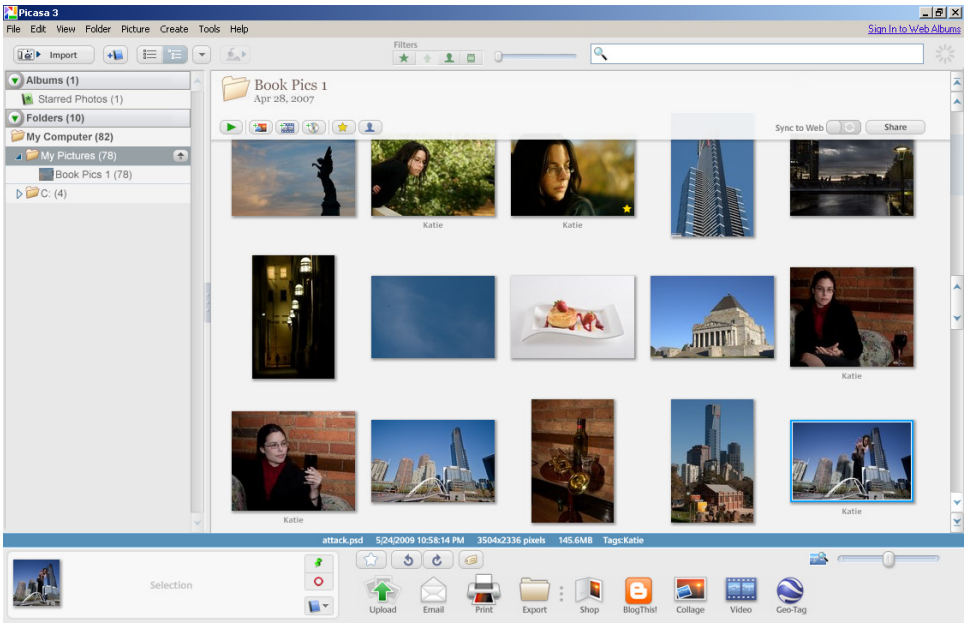

Figure 4.6. Picasa

The feature sets for all three are very similar. All can search your computer to find images wherever they might be hiding and, if you choose, relocate them to a more central place. All of them support adding tags, labels, and ratings by which they can search and sort. All can build collections of images, upload to online photo-sharing sites, and manage printing, emailing, and backing up of images.

In addition, they all can associate names with individual faces in your images. When a name is associated with a face in iPhoto, the application can search your other photos for a similar-looking face and present you with the option to confirm the identity of the person. While falling short of being 100% accurate, it can greatly speed up the tagging of a large catalog (demonstrated in Figure 4.7) and is a nice flashy gimmick to show off to your friends. The Picasa application is unable to recognize faces itself but the Picasa website, in Figure 4.8, can. Images need to be uploaded to your online albums before people in them can be identified. It's quite likely that programmers at Microsoft are being worked extra hard until they too can include this feature. At this time, neither Aperture nor Lightroom can detect faces.

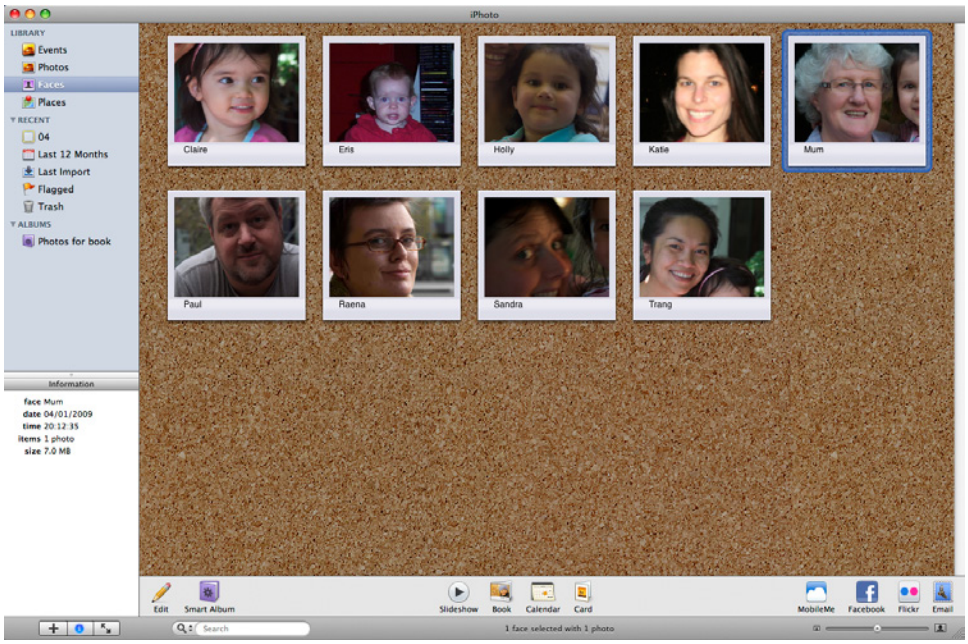

Figure 4.7. You can sort and search photos by name once you've tagged the images

Figure 4.8. Putting names to faces online in Picasa

Windows Live Photo Gallery and Picasa are closely tied to their respective online services, and iPhoto has built-in uploading to several sites. These applications can only upload to their respective services, and some of the more advanced functions of Picasa and Photo Gallery are only available through those online services. Yet all are very capable editors and all can save and export images in suitable formats for uploading and sharing, even if you have to use another application or an online upload form to do the uploading to your site of choice.

The Pro Options: Aperture and Lightroom

At the other end of the price range are those applications designed for the professional user. Aperture was developed by Apple as an advanced option for users who demanded more from a photo organizer than iPhoto had to offer. Lightroom was developed by Adobe for photographers who found Photoshop and its attendant applications to be a far more powerful and expensive photo editor than they would ever need. By beefing up iPhoto on one hand and toning down Photoshop on the other, both Apple and Adobe have arrived at very similar applications.

Both Aperture and Lightroom are designed for the photographer who has thousands of photos to organize and edit and needs the workflow to be as streamlined as possible. Which of the two is best for you depends a lot on your taste, your approach to working on your photos, and whether or not you have a Mac. For the moment at least, Aperture is not available for any non-Apple platform. The professional photo industry is very Macintosh oriented but it is also very Adobe oriented. There are a few more applications at the professional end of the market, but none have as significant a share of that market as Lightroom and Aperture.

Apart from cosmetic differences, Lightroom and Aperture are very similar. The biggest difference is in their attitude to workflow and how they try to balance creative freedom with efficient work. Lightroom is designed to promote processing images in an orderly sequence. It's divided into five modules: Library, Develop, Slideshow, Print, and Web. As evident in Figure 4.9, photos are imported into the Library where they can be viewed, tagged, rated, and made into collections. They can be processed, edited, and retouched in the Develop module (Figure 4.10), displayed via the Slideshow module, and output through Print and Web. In each module, commands, controls, and functions are laid out down sidebars in the best sequence for performing those tasks on an image: big changes at the top, smaller tweaks toward the bottom. You can hop back and forth between modules as much as you like to tweak edits or add new images to a presentation but, in general, the processing of images works best if you follow the path Library/Develop/Output and work through each module's controls from top to bottom. This orderly progression makes Lightroom a good choice for beginners and educators; it can help establish good working habits and it's easy to choose where to go next as you work through your images.

Figure 4.9. Lightroom's Library module

Figure 4.10. Lightroom's Develop module

Aperture is a bit more flexible in its approach to workflow. The display, seen in Figure 4.11, is divided into three panes: a file browser, which displays thumbnails of images in the library; the file viewer, which shows the currently selected images; and the file information inspector pane, a tabbed set of controls for navigating projects, viewing and editing metadata, and making adjustments. In Aperture, everything is done in the one view rather than switching between modules as in Lightroom. If you want to arrange images into albums, click on the Projects tab in the inspector panel and off you go. The Adjustments tab contains all the editing controls. The main view stays the same, though each of the three components can be switched on and off to allow more screen space for the others. While Lightroom has modules that handle printing, slideshows, and web pages, Aperture produces these as specialized types of projects, created via the Projects tab (in Figure 4.12) in the Inspector pane.

Figure 4.11. Aperture's default layout shows the browser at the bottom, the viewer above it, and the inspector pane that features the **Projects**, **Metadata**, and **Adjustment** tabs at the left

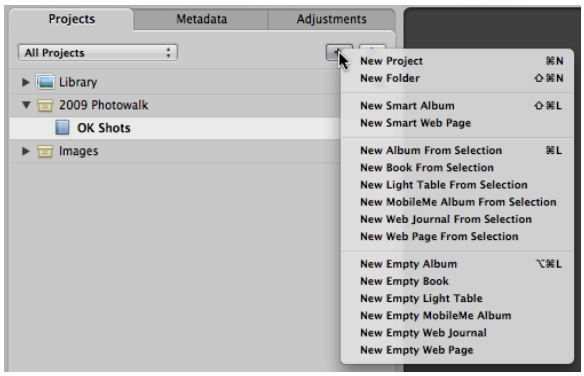

Figure 4.12. Creating a new project in Aperture gives you a lot of options

Both applications can be extended and enhanced with plugins, both from their manufacturers as well as from independent developers. Plugins are available to automate exporting directly to most popular online photo-sharing sites and add new functions to the applications, and are a source of preset styles for developing images. Aperture plugins can be downloaded from Apple at http://www.apple.com/aperture/resources/. Lightroom plugins can be found via Adobe at http://www.adobe.com/cfusion/exchange/. If you work with Lightroom to process images for online use, Jeffrey Friedl is the source of a lot of very useful plugins. An independent camera geek and programmer, he develops them as a hobby and releases them via his blog at http://regex.info/blog/lightroom-goodies.

Storage

An individual JPEG image takes up little storage space. You can fit a ten-megapixel photo in less than a megabyte without losing much in quality. A camera raw image is a little larger. Depending on your sensor, it might be ten megabytes, maybe a little more. None of them are particularly large compared to the size of even a basic hard drive. Storage shouldn't be a problem, right?

If you only take a couple of images a year, this probably *is* right. Shoot photos regularly, though, and the space requirements can build up. A hundred raw files might fill up a gigabyte. That might take months to shoot; it might only take a few minutes.[4] If you shoot that many photos often (and you do need to practice the skills you're learning here), the gigabytes will accumulate quickly. Start working on the images in Photoshop and the files eat up even more space. Photoshop files of a few hundred megabytes are easy to create if you're combining multiple images.

A CD or DVD might do the job for storing the images from a single photo shoot. That's great if you need to send the photos to a person. It's less than ideal if you're taking photos every day. Taking photography seriously means lots of images, which means lots of storage space. That means hard drives—the bigger the better.

[4] The last wedding I shot resulted in 658 raw files in one afternoon and early evening.

Fortunately, large hard drives are becoming cheaper all the time. Terabyte drives are now common and affordable now. It's probably a good idea to buy a decent large drive and use it just for your photography, Photoshop work files, and related files your image managing software requires or generates. And while you're doing that, grab another that's easily portable for your backups. A small, portable USB hard disk makes it easy to keep a backup of your most important files with you.

Make Your Life Easier

You now have a lot of work ahead of you, but once it's done your life will be a whole lot easier. We've discussed the basic principles of organizing your photos using image organizing applications, but the practical details are up to you. With the exception of iPhoto, all of the applications we discussed here have free trial versions available for download (and any Mac should have shipped with a version of iPhoto), so you can try them all before you commit to one.

Chapter 5

Editing Your Images

Now that you've spent several chapters learning how your camera works, practiced taking photos, and sorted and indexed them in the photo management application of your choice, it's time to make them look as good as they possibly can.

There are a lot of people who frown at the idea of digitally altering photos. Photography forums all over the Internet regularly erupt in flame wars, with one side proclaiming that an altered image isn't a true photograph, while the other argues that the final image is more important than the means by which it was created. I really want to avoid encouraging that argument here. Both sides have some valid points: it's better to get as much right in camera as possible, but if an imperfect image can be made good with a little post-production work, it should not be discarded out of some fanatical devotion to image "purity." The greatest photographers in the history of the art have all made adjustments to their images in the darkroom or in software. It's important to be happy with your photos, and even with the most expensive set of photographic equipment money can buy, there's still no guarantee you'll be able to capture the exact image you want in camera.

The range of image editing software available has been growing quite dramatically over the last few years, but the market is still dominated by Adobe's Photoshop.[1] Photoshop does everything a photographer could want to do to a digital image, and does it well. It's well-supported by Adobe and is the standard image editing application in the photographic profession. It's also very expensive.

The high cost of Photoshop has driven the development of alternative applications. None of them do everything as well as Photoshop, but very few people actually need everything in Photoshop's

[1] http://www.adobe.com/products/photoshop/

toolbox. Adobe themselves recognize this and produce two simpler applications aimed at different niches in the market. Photoshop Elements is a cut-down version of Photoshop with a simplified interface (and price tag) aimed at the amateur photographer. Lightroom combines a very good image organizer with a good set of image correction and editing tools. Lightroom is aimed more at the professional or advanced amateur photographer who has many thousands of photos to work on.

It's possible that you already have everything you need for basic photo editing. As I've already mentioned, most cameras ship with a simple editing and organizing application included. Canon gives you Digital Photo Professional, while Nikon has View NX. Olympus Master, Pentax Photo Laboratory, and others all provide basic photo editing functions. The better image organizing applications also include fairly sophisticated suites of editing tools. Many photographers do everything they need to do in Lightroom or Aperture, from downloading images from the camera to making their final prints.

If you're on a budget or are a devotee of free, open source software you might like to try GIMP—the GNU Image Manipulation Program.[2] It's a wholly free application that aims to be a complete substitute for Photoshop. It lacks a few features that serious Photoshop users will miss and can be difficult to master, but for simple editing and correction it's hard to beat the price.

Also spectacular value for money is Aviary. Aviary is a full-featured suite of image editing applications (and others) in a website.[3] Wherever you have internet access, you can edit your images. It's less powerful than Photoshop, but it's growing and has a thriving community of image makers. An Aviary account is totally free.

Which of the applications available work best for you will be a matter of budget, personal taste, and computer platform, but most provide a free trial version so you can try before you buy. Regardless of what you choose to use, the basic functions are the same. The dominance of Photoshop over the market has led many developers to adopt new features introduced by Adobe and to style aspects of their interfaces a little like Adobe's, so that, once you've learned one application, moving on to another is relatively painless. It also makes it easier for writers of books like these to teach general principles with a degree of confidence, knowing that our examples will be understandable regardless of the application from which we take them.

[2] http://www.gimp.org/
[3] http://aviary.com/

Non-destructive Editing

You might have heard mention of the importance of keeping backups. As we covered in Chapter 4, backups not only help you when your computer crashes, is stolen, or eats your files, they're also handy when you're partway through a project and you change your mind about how it should go. With a backup, you can always start over.

Even better than backups (though not a replacement for them—there's never a replacement for backups) is **non-destructive editing**. With a non-destructive approach to editing, no files are harmed in the making of your image. Changes are only made to the image in ways that retain the original data.

In Photoshop and many Photoshop-like applications, this is done by making all our edits on **layers**. If we were producing a painting rather than a photo, working with layers would be like placing a sheet of glass over the picture before adding any new paint. That way, if you're unhappy with the result, the glass can be tossed aside or cleaned off and the original picture is unchanged. Photoshop's layers are a bit more complicated than that, but the principle is the same. Most of the editing functions we'll be looking at here are **adjustments**—changes to brightness, contrast, color, and so on—rather than the addition or subtraction of pixels. Photoshop includes **adjustment layers**, which let you apply adjustments non-destructively, unlike many other applications. If there's no adjustment layer, the changes are made directly to the image. In these cases it's a good idea to save a copy of the work in progress using the **Save as…** command before making any major changes. That way, if you're unhappy with the result, you can reload the saved copy and pick up from there.

A small number of applications never touch the original files. Adobe's Lightroom and Apple's Aperture are completely non-destructive editors. They never change the original image. These applications record the instructions you give them and only apply them to the display while you edit. When you save the work, the editing instructions are saved alongside the original file so that the edited image can be reconstructed. When you're done you can export a new image that incorporates the changes in it for sharing, showing, or printing. The original image is always there, untouched, and you can go back to it and re-edit it, as many times as you like.

If you can afford it, a non-destructive editing application is a good idea. Otherwise, take care not to overwrite your originals. Use the **Save As** command at least once while working to make a fresh copy, and create new backups before making any major changes that you might want to undo later.

Tonal and Color Correction

The best place to start when editing your images is to balance the colors and tones. Depending on your file format and which application you're using, you might have the controls for doing so presented to you as soon as you open the application. Adobe Photoshop and Photoshop Elements open raw files via a plugin called Adobe Camera Raw (ACR), which allows you to make some fairly complex adjustments before the image is even available in the application.

Histograms

It's easy to look at an image and see that it's too bright or too dark or lacking in contrast. It's a little trickier to look at it and say by exactly how much. Fortunately, help is at hand. Every image editing application worth having (and indeed, most digital cameras) include a handy tool for seeing at a glance where the brightness and contrast of your image needs work.

The key to understanding the color, brightness, and contrast of your images—in fact, probably the single most important piece of information you'll find in an image editing application—is the histogram. Some applications, such as Photoshop, put it right at the top of the tool panel where it's unmissable. Others bury it away where it remains dormant until you choose a tool that uses it. But it is there, and learning how to read it is one of the most important steps you can take towards freeing yourself from the automatic correction tools and taking charge of your own images.

The **histogram** is a graph, as revealed in Figure 5.1. In its simplest form it shows the brightness of pixels along the horizontal axis and the number of pixels along the vertical. It's a measure of the brightness of an image laid out in such a way that you can see contrast, brightness, and, when split into color components, color casts and how to fix them.

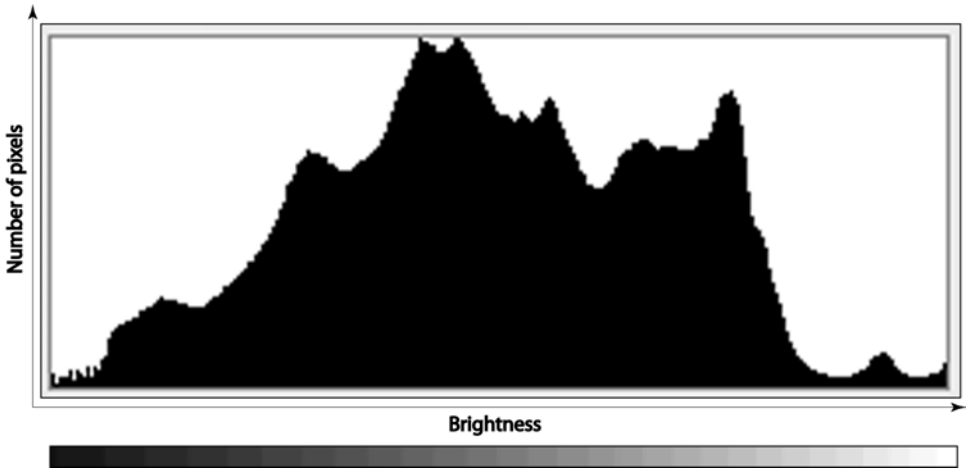

Figure 5.1. Histograms depict pixel brightness by numbers

The best way to gain an idea of how histograms work is to look at them in action.

Figure 5.2. Southbank by day

This scene in Figure 5.2 has a good exposure range. It has some bright highlights, some deep shadows, and a full range of tones in between. The graph in Figure 5.3 shows that we have some pixels at every point along the brightness scale.

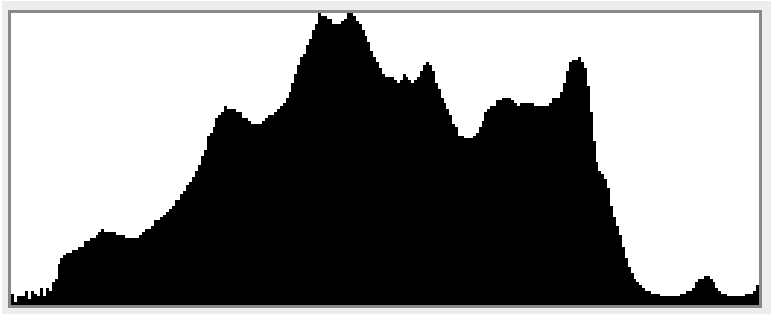

Figure 5.3. A full range of tones

Figure 5.4. A very bright, or high key, image ...

Figure 5.4 contains mostly very light tones. There's a bit of shadow beneath the plate and a few dark patches in the sauce and strawberries, but overall the image is very bright. This is also known as a **high key** image. Figure 5.5 upholds this theory in the large peaks at the bright end of the scale.

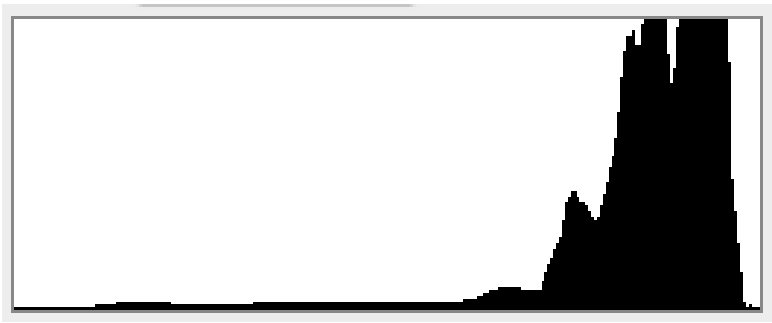

Figure 5.5. ... And its resulting histogram

Figure 5.6. A much darker scene ...

Here in Figure 5.6 we have an image with a lot of darkness and very little light, also known as a **low key** image. The large peaks at the dark end of the graph in Figure 5.7 confirms that there are a lot of pixels that are very dark. Notice the minuscule peak at the bright end. This represents the very small number of pixels that make up the brightest lights in the image.

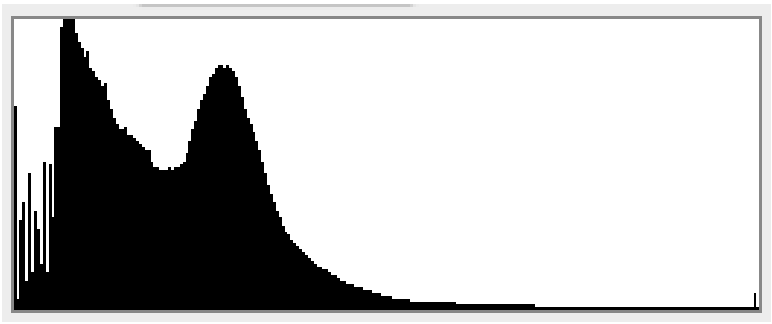

Figure 5.7. ... And its histogram

Tonal Range

Whether a picture is bright or dark can be judged with your eyes. What a histogram is good for is judging the range of brightness in an image. The range of brightness, ignoring color, is called the **tonal range** of the image. All three example images above have pixels at every point along the

brightness range. Even though they're radically different in overall brightness, they each have a full tonal range.

Generally it's good for a photo to contain the full range of tones from black to white, as it has the greatest possible contrast. However, there are entirely good and valid reasons for not wanting to cover the full tonal range in an image; pictures of polar bears in snowstorms come to mind. More often though, there's an improvement in the picture when the full range is covered, even if, like the dark and light images above, some parts of the image lack much coverage. Back in Chapter 2 we noted that our attention is drawn to the points of highest contrast. In a dark image, those will be the bright highlights. Ensuring that the tonal range extends across the full histogram maximizes the amount of contrast you can give to your points of interest. In a brighter image, ensuring some depth in the shadows improves the definition of shape and texture.

This image in Figure 5.8 lacks bright highlights and dark shadows. It looks flat, as indicated by its histogram inset.

Figure 5.8. Grays converge in this image of skyscraper against sky

When the tonal range stretches across the full width of the histogram (inset), the improvement is apparent: shadows are darker, highlights are brighter, and the whole image has more depth and detail.

Figure 5.9. Watch that color pop!

In some histograms you'll see a cluster of pixels pressed right up against the extreme light or dark end of the scale. There's an example of this in Figure 5.10, which represents the dark image of the footbridge shown earlier in Figure 5.6.

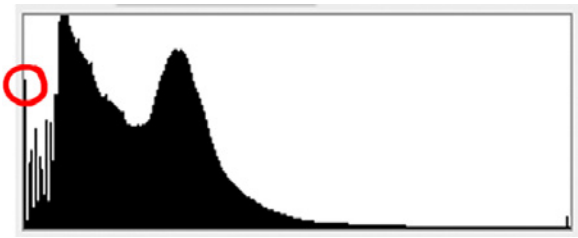

Figure 5.10. A spike at the black end of the scale

Pixels that appear right at the end of a graph are either totally black or, at the other end, totally white. If there are a lot of those pixels, you might have areas within your photo that are devoid of detail. We say that those shadows and highlights are **clipped**. The image in Figure 5.6 was taken at dusk, so a few completely black areas are inevitable and not undesirable. In other cases, though, clipped shadows and highlights can mean the loss of detail that you do want. If your image is saved as a JPEG, there's nothing you can do. If you saved it as a camera raw or DNG file, some detail might be recoverable.

Some applications provide the option to view clipped highlights and shadows. In Adobe's Lightroom you can choose to have clipped areas colored, so that you can see where your image needs work. Figure 5.11 features a Lightroom color histogram with handy arrows at either end that you can click to reveal the clipping in your image.

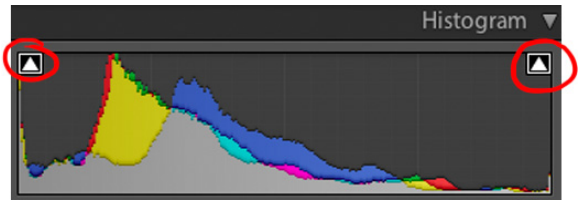

Figure 5.11. Clicking the triangular buttons at the top of the graph show you clipping in the image

The image in Figure 5.2 that we used to demonstrate medium exposure above was shot on a very bright clear day. The hard, direct sunlight created notably bright highlights and cast very dark shadows, resulting in quite a bit of clipping in both. What it looked like originally with the clipped areas highlighted—blue (for shadows) and red (for highlights)—can be seen in Figure 5.12.

Figure 5.12. Lightroom includes the option to highlight clipping so that you can see where work is needed

The red patches show where the image is too bright to retain any detail; the blue areas (apart from the sky) are too dark.

These clipped areas can still be saved, though. The detail is clipped because it's beyond the ability of your display to show it and beyond the range of a JPEG to save it; the details remains in the original file. As we learned in Chapter 3, the average camera sensor can collect a lot more information than can be stored in a JPEG file or displayed by a standard computer display. If you shot and saved your image as a camera raw image file, it might be possible to pull that detail out by darkening the highlights and lightening the shadows.

If you're in a hurry or a bit wary of the more complicated manual controls we'll be looking at soon, most applications offer a quick fix-up option, like the ones shown in Figure 5.13.

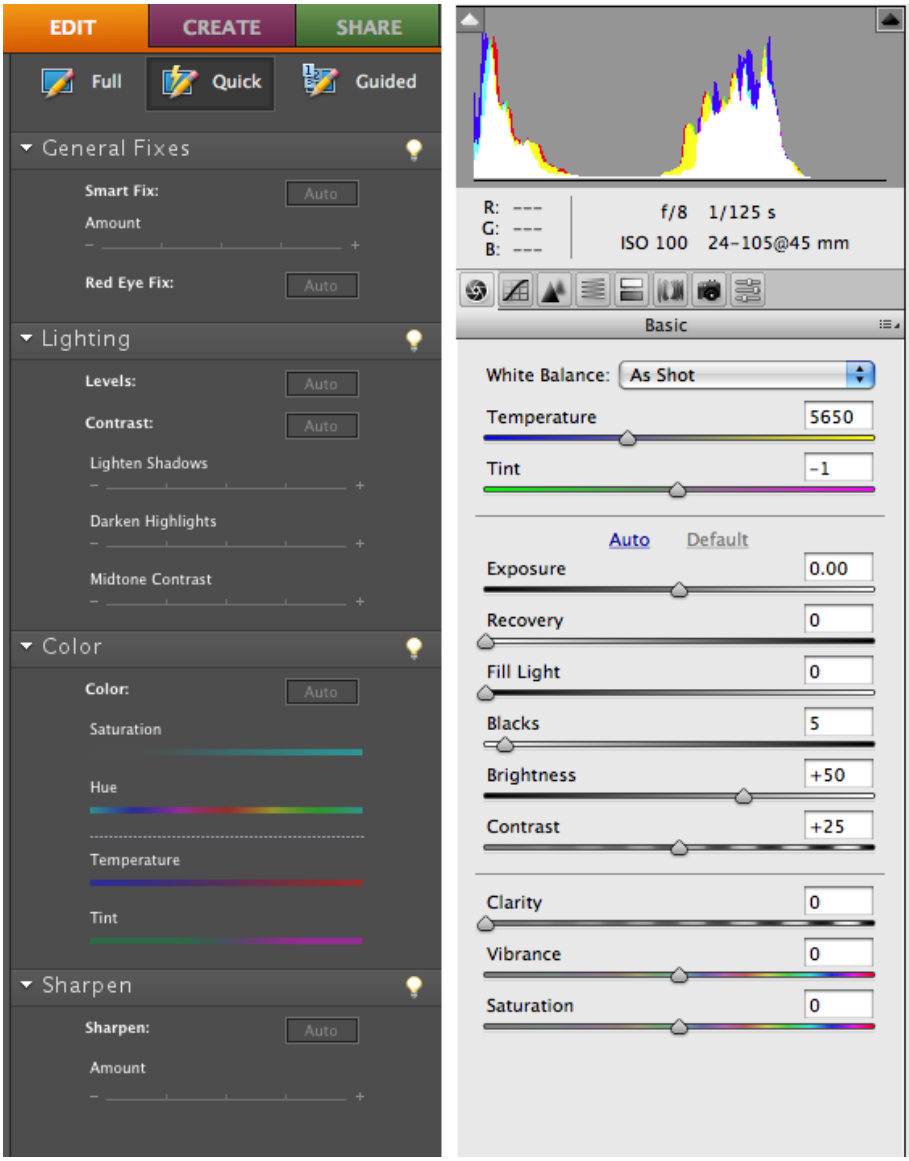

Figure 5.13. The quick edit panel of Photoshop Elements (left) and Adobe Camera Raw (right)

With their quick edit options, most applications allow you to brighten, darken, and adjust the color of an image, but not much more. If your image is clipped only at one end of the histogram, adjusting the exposure or brightness up or down for shadows *or* highlights should fix the problem. If it's clipped at both ends, like the image above, recovering detail at one end of the histogram will only worsen the problem at the other end.

Most applications that can handle raw image files include a **Recovery** or **Darken Highlights** control (to darken only the brightest portion of the histogram) and a **Lighten Shadows** or **Blacks** control (to lighten only the darkest parts). **Auto** buttons and other automatic controls tell the application to make its best guess as to what the image should look like, but they're often no match for being able to watch and see what works as you gradually adjust a control manually.

Brightness and Contrast

Learning to read a histogram and its attendant functions is the first step towards correcting the tonal and color problems in your image. The next step is adjusting the image. The simplest way to adjust the brightness and contrast is via the **Brightness** and **Contrast** controls—most applications have a set of slider controls called just that, as shown in Figure 5.14.

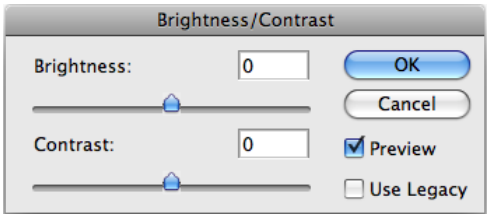

Figure 5.14. Brightness and Contrast sliders in action

They're simple and every image editing application has them, but they can work differently between applications. In many applications, the brightness control will affect the mid-tones more than the shadows and highlights; the brightest and darkest points will be unchanged. In applications that behave this way, there's no need to worry about your adjustment causing any areas to be clipped. In other applications, the brightness control brightens or darkens everything equally. To check which way your application behaves, watch the histogram as you brighten an image. If some of the graph remains at the shadow end while the rest moves toward the light, you have the former kind; if the whole graph shifts leaving the dark end empty, you have the latter.

Contrast, in contrast, is simpler. Increasing contrast darkens parts of the image that are darker than the midpoint of the histogram, and lightens areas that are lighter.

Brightness Control in Photoshop

For Photoshop users, brightness grows more confusing with time. Before version CS3, Photoshop's brightness control brightened everything. From CS3 onwards, the brightness control just shifted the mid-tones, and a new control—exposure—was added that adjusts the whole histogram. Just to make things a little bit more confusing, Adobe added the **Use Legacy** checkbox that you see in Figure 5.14. When **Use Legacy** is checked, Photoshop CS3 reverts to the behavior of previous versions, brightening everything.

Levels and Curves

Once you've played with brightness and contrast, you'll find it's quick and easy to use, but there are more powerful options. If your image editing application of choice has a command called **Levels**, select it and you should see another histogram. This histogram is more than just a source of information; it has controls attached.

The exact form the controls take will vary a bit between applications, but the concept is similar everywhere: independent controls for setting the black, white, and midpoint of the image's histogram. The version of the control in Figure 5.15, from Photoshop Elements 6, is a good example; to access it select **Enhance** > **Adjust Lighting** > **Levels**.

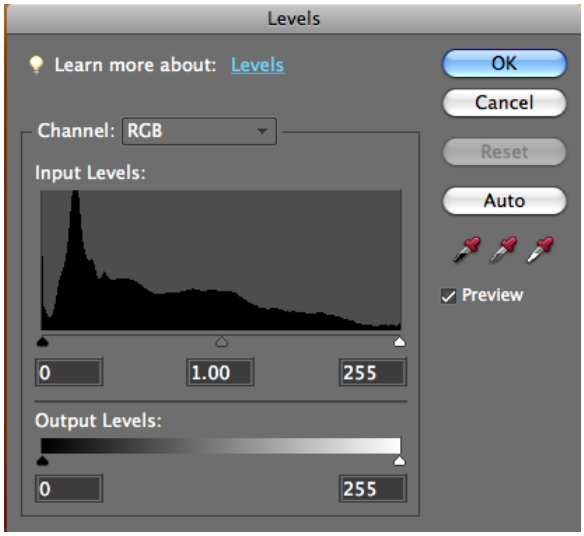

Figure 5.15. The Levels adjustment panel from Photoshop Elements 6

The **Auto** button does what you would expect; it guesses what the image should look like and then makes the appropriate adjustments. Usually this means spreading the tonal range across the whole width of the histogram. Immediately below the **Auto** button are three eyedroppers.

Select the gray eyedropper and click on an object in your photo that's supposed to be of a neutral color; the color balance will be adjusted to compensate for any imbalance at that point. The black

and white eyedroppers are tools for indicating brightness and darkness. Click on any part of the image with the black dropper and whatever brightness value that point has will be darkened to black. Anything that was already darker than that point will also become black (and clipped), and the rest of the histogram will be stretched so that the brightest point remains where it was previously. Likewise, the white dropper brightens the point it was clicked (and any others similar or brighter) to white and stretches the graph to meet this change.

In some applications, the three eyedroppers are separate from the levels adjustment interface. Nikon's Capture NX, shown in Figure 5.16, puts them in a palette of their own.

Figure 5.16. A palette of eyedroppers

Immediately below the histogram in Figure 5.15 are three triangular sliders with numbers below them. They're the controls for setting the shadows, midpoint, and highlights (from left to right). Each can be dragged across the bottom of the graph to set the points that you want to be the brightest and darkest, and how much of the photo's tonal levels falls on each side of the midpoint. The left triangle is the **black-point control**. Wherever you move it, its place on the graph becomes black. Any pixels further left will become clipped shadow. The right-hand triangle is the **white-point control**. Its position becomes white and any pixels to its right will become clipped highlight. The middle triangle sets the midpoint between highlight and shadow. Its position represents the brightness of mid-gray (but not the color—this has no effect on your white balance). Slide it left or right to darken or lighten the image within the black to white range set by the other two. If you move it right of center, there will be more of the graph on the dark side of mid-gray and the image will become darker; move it left and more of the graph will be on the light side. The first few times you play with this might seem odd, as you're moving the slider toward the light side to darken the image and vice versa, but you quickly become used to it.

To fix the tonal range of an image so that it covers the whole width of the histogram, look at where the ends of the data are in the graph. Drag the black triangle slider to the left end of your histogram and the white slider to the right end and click **OK**.

The triangle slider controls have one really big advantage over the black and white eyedroppers: you can make your adjustments in small increments and watch the effect on the image as you work, tweaking the adjustments until you have it looking just right. If you're unsatisfied with the result of an eyedropper, all you can do is click undo and try again.

A more complex version of the **Levels** interface can be found under **Curves** in some applications. In Photoshop this lives in the **Image** > **Adjustments** submenu. Several applications combine the levels and curves features into one control panel, such as the one in Figure 5.17 from Canon's Digital Photo Professional.

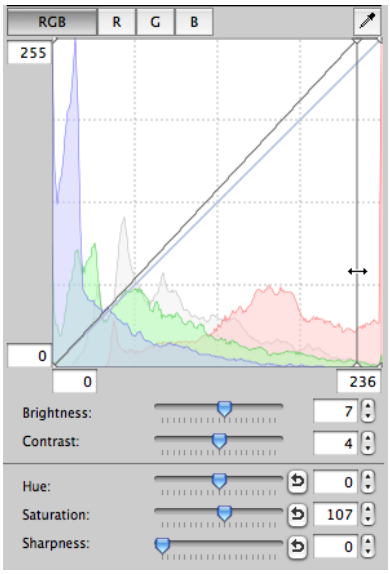

Figure 5.17. levels, curves, histograms, and color balancing

Curves adjustment is very similar to levels adjustment. You have a shadow point and a highlight point that perform a similar role to the black-point and white-point level controls above, enabling you to adjust the overall tonal range of the image. However, you also have multiple points in between that can be adjusted. In Figure 5.17, the diagonal line that runs across the histogram begins with the shadow point at the bottom left and ends with the highlight point at the top right. The ends can be dragged left and right, to give the exact same effect as adjusting the levels by dragging the black and white sliders in Figure 5.15.

The Curves display is also a graph but the axes differ from the histogram. The horizontal axis is the brightness range of the original image, while the vertical axis represents the brightness range of the adjusted image that you'll create. At its default 45-degree angle, the image is unaltered. The output brightness at every point is equal to the input brightness. Clicking and dragging any point along the line reshapes the line into a curve. Unless you drag the actual endpoints of the line, they remain fixed. Dragging the curve upward, as in the image on the left in Figure 5.18, makes each point along the horizontal axis map to a higher, or brighter, point along the vertical axis—it brightens the image without altering the shadow or highlight points. Dragging it down, like in the example on the right, darkens the image.

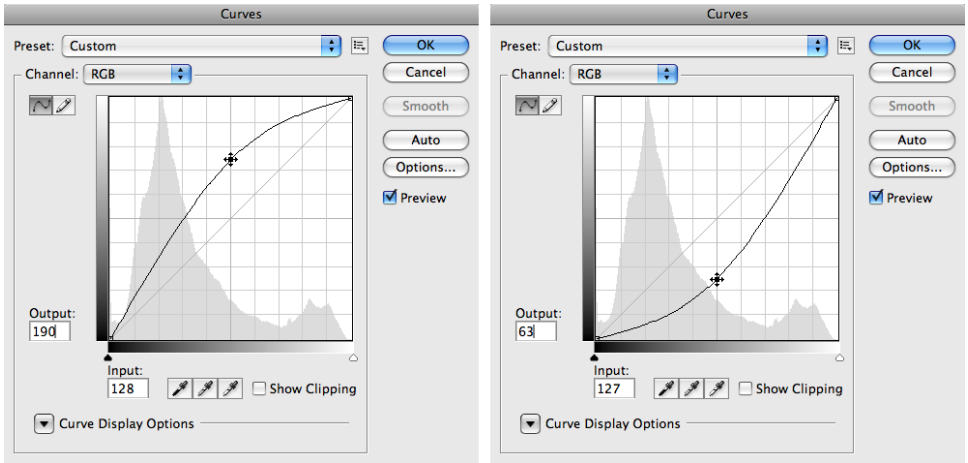

Figure 5.18. Dragging the curve up lightens the image; dragging it down darkens the image

Dragging just one point on a curve gives you much the same benefit as you would gain from moving the midpoint triangle in the levels control. The real advantage of the Curves control is that you can

move multiple points on the curve. Some applications might restrict the degree to which you can do this. Lightroom, for example, divides its curve into four segments—shadow, dark, light, and highlight; each can be adjusted independently, but no further points can be added. Photoshop CS3, as shown in Figure 5.19, allows up to 14 adjustment points that can be added to a curve. The curve here darkens the mid-tones while lightening the darker tones and the brighter tones, leaving the white and black points alone.

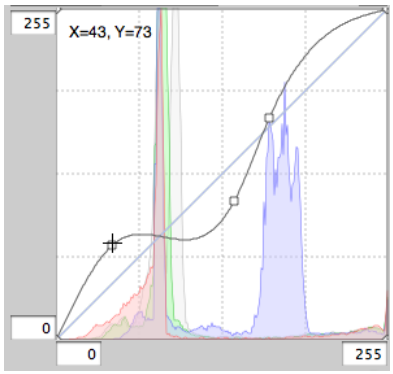

Figure 5.19. Multiple curve adjustments

With curves you can do more than just correct a slightly off exposure. You can bring detail out from the shadows, dim a light that's too harsh, and soften a hard contrast—all in the one adjustment.

Curves are a very powerful adjustment tool, particularly when combined with adjustment layers and masks in Photoshop and other applications. The full extent of their use is beyond the scope of this book, but you'll find detailed tutorials on how to greatly improve your images with them at Digital Photography School.[4] If your image editing application offers curves, the best way to gain an idea for what they can do is open an image or two and play with them.

Color Casts

I first mentioned color cast in the section called "White Balance" in Chapter 2. The tools we use to correct a photo's tonal range can also be used to correct color casts. If the color cast is caused by one of the standard preset lighting conditions, it can be automatically corrected in most applications by selecting the white balance option that best describes the light source for the scene. If it doesn't fit into one of the preset categories (or if the nearest preset slightly misses the mark), you might also find a manual **color temperature** control. The control in Figure 5.20 from the Adobe Camera Raw utility demonstrates the options.

[4] http://digital-photography-school.com/

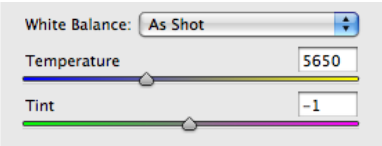

Figure 5.20. The white balance controls from Adobe Camera Raw

You can select a preset from the menu or adjust the balance manually with the sliders. The main control lets you choose a color temperature on a range from blue to yellow. The color temperature is, basically, the white balance. Hotter objects tend to produce bluer light when they glow, while cooler objects glow more yellow.

If your image is too blue, slide the temperature slider toward the yellow end; if it's too yellow, slide it towards the blue.

Some light sources have a further tint to them and most applications provide another adjustment option. Fluorescent tubes have a slight greenish tint to their color. If your image color still looks a little off-color after sliding the temperature slider, so to speak, the tint slider might fix it if your application has one.

If you have an object in the image that you know is a neutral color, a white balance eyedropper tool (seen in Figure 5.21) will let you use that object to set the balance. Just select the eyedropper, click on the neutral-colored area, and the application will adjust the other colors to match. Make sure that the area you choose isn't too dark or bright. Clipped highlights and shadows might give you inaccurate results—remember that they're missing data that was beyond the range of the sensor. Pick a gray area. (If you have a gray reference card,[5] keep it with your camera and take a shot of it before shooting anything important.)

Figure 5.21. Lightroom's white balance control with prominent eyedropper

Don't Shoot Until You See the Whites of Their Eyes

If you need to color balance a portrait and you have no obvious neutral reference, zoom in and check the whites of the subject's eyes. How successful this is depends on how visible they are and if whether they're a healthy white, but many portraits have been saved by balancing on the whites of the subject's eyes. Avoid trying this with teeth, though; they're often far more yellow than they look.

[5] A gray reference card is often standard kit among photographers; it's a card colored 18% flat gray and is used as a reliable reference for color balance, as it remains neutral under any illumination.

Adobe's Lightroom makes its eyedropper really obvious in its **Develop** module, and you can usually find a similar control in other applications. Generally it looks like an eyedropper, but be careful: some applications use an eyedropper tool as a paint color picker. To confuse matters more, Photoshop uses eyedroppers for both functions. The eyedropper in Photoshop's toolbox is the color picker; the eyedroppers in the **Levels** (pictured in Figure 5.22) and **Curves** interfaces are used for adjusting colors and tones.

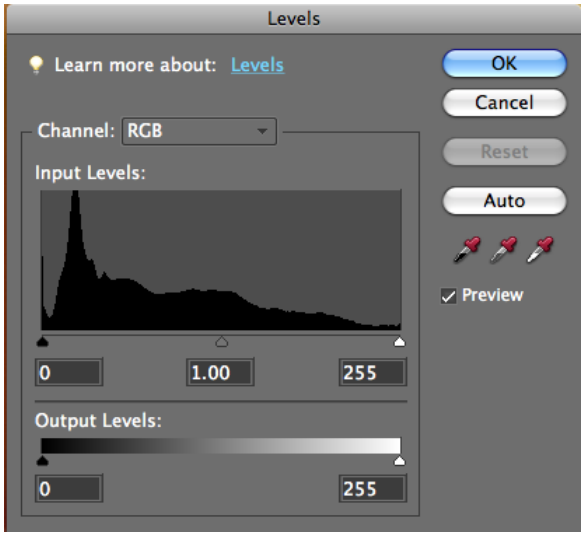

Figure 5.22. The middle eyedropper (below the **Auto** button) sets the white balance

When you have no neutral colors and none of the preset white balances look quite right, you might have to adjust the color balance manually. Without a neutral reference this will be a matter of trial and error—often, just error. You may recall the photo in Figure 5.23 from earlier:

This was deliberately shot with a completely wrong white balance to produce an exaggerated color cast. The camera was set to shade (the bluest setting) when the scene was lit by a tungsten bulb (the yellowest). The camera increased the yellow to offset the blue it was set to correct. The raw file has enough information in it to correct the problem, but if this was shot as a JPEG the color cast would be difficult to remove.

The levels adjustment feature has one further trick up its sleeve. Each pixel of an **RGB color** image is made from three combined color values—a red, blue, and green component. Each color component is called a **channel**, and in many applications these can be adjusted independently. You can see hints of the color channel controls lurking around the edges of some of the histogram examples we looked at earlier. If a pixel has an equal value for all three channels its color is neutral. The color is black if there's no color in any channel, and if each channel has the maximum amount of color, it's pure white; it's gray anywhere in between.

Figure 5.23. Too yellow

In Photoshop we can see separate histograms for each of the channels, as Figure 5.24 illustrates.

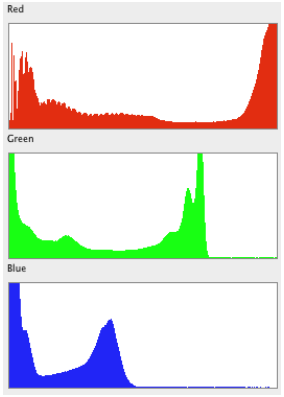

Figure 5.24. Histograms in living color

We can see from the histograms that the colors are unbalanced. There are few, if any, neutral colors in the image apart from the black top the subject is wearing (which is too dark to balance from). The peaks at the right ends of the three histograms represent a big bright area. If it was neutrally colored those peaks would line up evenly. The wall behind the subject is the brightest part of the scene, so it's reasonable to assume that those peaks are the wall. In reality the wall is off-white, and far less off-white than the photo depicts. If we balance the levels for each channel we should reach somewhere close to its original color.

In Photoshop you can adjust each channel separately via the pop-up menu at the top of the **Levels** panel. Other applications usually have a similar option near their Levels or Curves equivalents. If we adjust the blue and green channels, as in Figure 5.25, so that the peaks are closer to the red peak, the balance will be better. Figure 5.26 shows the result.

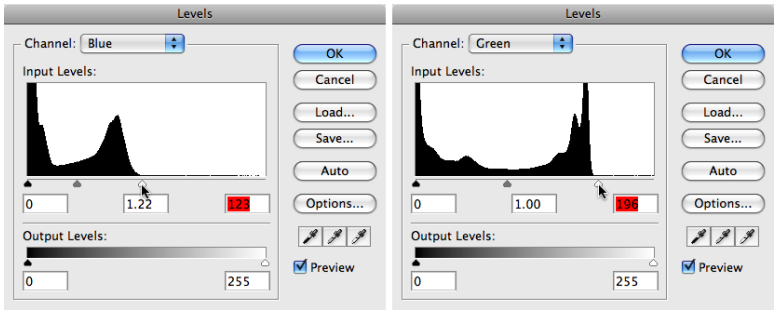

Figure 5.25. Adjusting the blue channel in the **Levels** interface on the left, adjusting the green channel on the right

The image still has a slight yellow cast and some of that can be made to go away with more fine-tuning of the levels. When working with JPEG files, you should take care with tweaking levels as you can introduce noise that's tricky to eliminate. In the above example, we've filled in the missing information in the blue channel by spreading what blues we have across the full tonal range. Instead of 255 values for blue, we have around half that amount. When spread out this makes the transitions from one level of blue to another a bit more abrupt, and so transitions between shades becomes less smooth, and the end result is a much grainier-looking picture. If you're unable to shoot raw, having the white balance right in camera is much more important. The lesson is: if you can shoot raw, you should shoot raw.

Figure 5.26. The image still has a yellow tinge, but at least now she looks human

Cropping and Rotating

In earlier chapters we looked at zooming in to scenes. Longer focal length lenses make objects look closer. Moving closer to objects makes them actually closer. Sometimes, you're unable to do either and then you have to crop.

Cropping an image—trimming away the unwanted parts—is often easier than trying to move closer to a subject, and is much cheaper than buying a lens with a longer focal length, but it should be the tool of last resort for increasing the magnification of a subject. Cropping an image throws away information. It might be information that you never needed anyway but the end result is still less pixels, which means that the maximum size you can show the image before the pixels are evident will be smaller. If you're only shooting to display your photos on screen, you can probably get away with a lot of cropping. But it's probably a different scenario if you want to print large pictures.

By cropping, we cut away the bits of the image outside the area we want to keep. Most applications have a specialized tool for doing this. In Photoshop and in many of the applications that imitate it, the cropping tool can be seen in Figure 5.27.

Figure 5.27. Photoshop's Cropping tool

If you're unhappy with your image's composition and feel that cropping will help, it's best to do it before making any other adjustments to the image. Some of the tools we use to diagnose and correct problems with brightness, contrast, and color measure those properties across the whole image. If your cropping cuts off a bright spot, those measurements will change.

To crop the image, click on the tool icon, click and drag the cursor across the image, and apply the command once you're happy with the edit.

In applications without a dedicated cropping tool, you'll usually find a crop command that works with a rectangular selection tool; this selects the area that's kept after the crop command is applied. A good crop tool will dim or obscure the parts of the image outside the selected area, so you can gain a better idea of what the cropped image will look like. As well as fixing zooming issues, you can use this tool to adjust the proportions and placement of your image. If your subject was centered in the frame, you might like to crop the image to place the main point of interest off-center.

Figure 5.28. The ruler tool tells the application the horizon is meant to be horizontal

Cropping tools are usually combined, or at least grouped, under the same heading as rotating and straightening tools. They're a natural combination. If an image is to be rotated and retain its rectangular shape, corners will need to be cropped. It's best to combine all these functions so you can make all your changes to the size of the image in the one preview and see what it will look like before you commit the crop. Most cropping tools allow you to grab a corner of the selection and turn it by dragging. Many add a ruler-like tool, seen in Figure 5.28, that you can drag along a straight edge in the image to set that line to horizontal or vertical.

Thumbnails and Avatars

Even when the framing is right for an artistically perfect shot, you might still need to crop the resulting photo for certain purposes. The principles of composition we looked at in Chapter 2 should always be considered when creating a beautiful image, but sometimes an image's purpose might be better served by ignoring them. Sometimes you need a small image, for use as a thumbnail.

Consider a license or passport photo. The government departments that oversee these items don't care how artfully composed or lit the images are. Their purpose is to identify the subject. They need to be clearly shown and recognizable at a fairly small size. The same goes for images we use to identify ourselves online: our avatars. If you want to show people what you look like and you need to fit your likeness into an image that will only be displayed at 100 by 100 pixels (for example, for sites such as Facebook[6] and Twitter[7]), you don't want to waste any of those pixels on anything other than you. It seems obvious, yet blogs, galleries, and even dating sites—where showing yourself would seem to be a priority—are full of images of landscapes with the human subject a near-indistinguishable blob in the distance or pictures of walls with a face right down the bottom of the tiny frame.

Thumbnails need to be representative of the whole photo: a teaser that can entice someone to view the larger image (or read your profile). Thumbnails are created with a combination of cropping and scaling. **Scaling** reduces the number of pixels in an image by averaging values and combining them. Fine details and subtle shading can be lost in the process, so you'll need to be careful to ensure that the detail you want to keep remains in the finished picture.

Most applications you'll use have a scale feature to accomplish this. The notable exception is Adobe's Lightroom, which only lets you choose a new size for an image when you export it. Lightroom's approach is a good one, as it forces you to avoid scaling the image until you're done working on it (and it keeps the original unscaled so you can go back to it later). If you're producing a small image, you should always wait until the very end of your editing to scale it to its final size.

If a small photo is intended to show the viewer the subject rather than the scene, it's best if the subject fills as much of the frame as possible. Get in close when shooting, or crop away unnecessary

[6] http://facebook.com/
[7] http://twitter.com/

parts afterward. Your head and shoulders should be enough to show people what you look like. You can use the rest of your profile (or blog) to tell them who you are.

Of course, if you want to show off a landscape, you have a completely different problem. Showing enough of a vast scenic vista in a thumbnail to encourage a person to want to click on it can be tricky, as conveyed by Figure 5.29.

Figure 5.29. Shrunk to thumbnail size, this nighttime cityscape loses a lot of its impact

If the thumbnail version of an image in your web gallery or photo blog lacks enough detail to show what the image is, consider creating a thumbnail of a cropped area with a major point of interest, and then linking it to the full image. Figure 5.30 offers up three alternatives.

Figure 5.30. Picking a colorful or dramatic portion of the image makes for a much more interesting thumbnail

If the original image contains a lot of fine detail, remember that a lot of it will be lost when you scale the image to thumbnail size. (Notice how there's very little detail visible in the buildings in the background of the example above.) Lights in far buildings, textures of fabrics or hair, text, and more can easily be lost. If a detail like that is important, try sharpening the image before scaling to its final size.

Distortion and Lens Correction

Extremely short or long focal length lenses, particularly less expensive ones, can introduce some distortion to your images. With a wide-angle lens, images can be bowed outward. Telephoto lenses can cause images to bow inward a little. These distortions are called **barrel distortion** and **pincushion distortion**, and can be seen as a diagram in Figure 5.31. It isn't always obvious, especially if the image lacks straight horizontal or vertical lines.

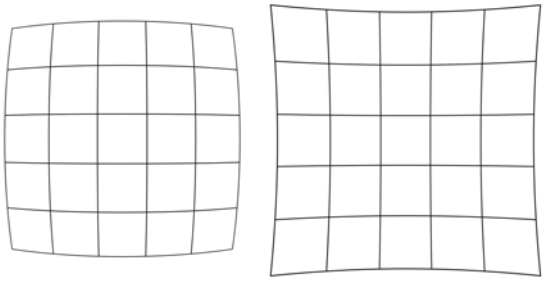

Figure 5.31. Barrel distortion (left) and pincushion distortion (right) bend straight lines near the edges of the frame

The effects of barrel and pincushion distortion are most pronounced near the edges of the image. If you know your lens suffers from either problem, you can eliminate it to some extent by shooting a wider view than you need and cropping the most distorted portion. Some image processing applications include solutions for distortion. Photoshop has a filter called **Lens Correction**, accessed from the **Filter** > **Distort** > **Lens Correction** menu,[8] which includes functions to correct other kinds of distortion, most notably **perspective distortion**. This is where objects closer to the camera appear abnormally large in relation to objects further away. An example is shown in Figure 5.32. Other applications have different names for the function, but the word "distortion" is usually evident if they have it.

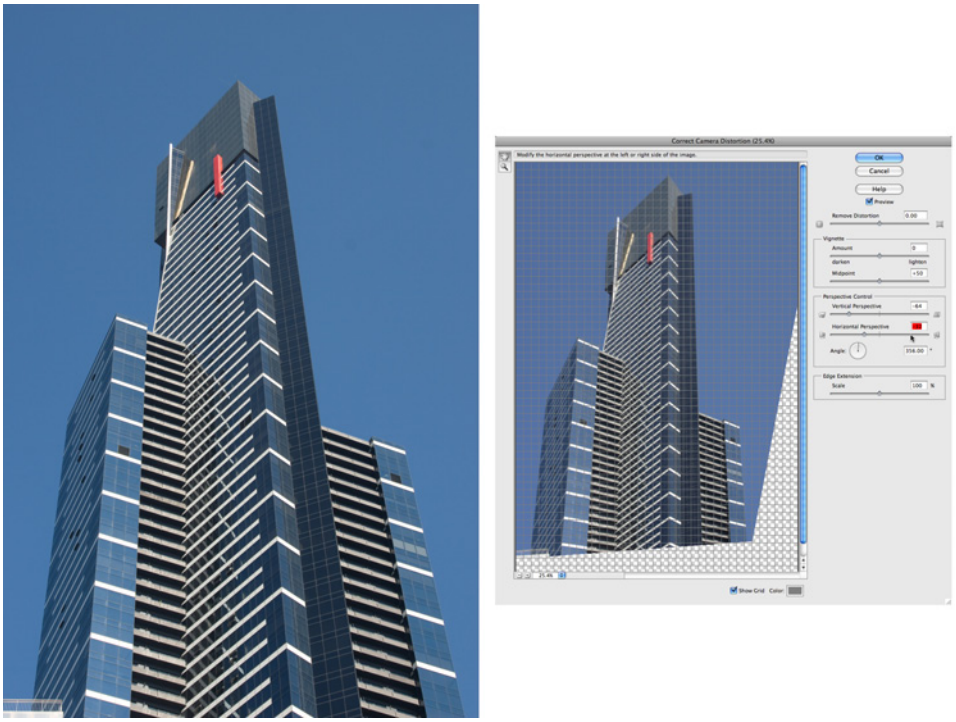

Figure 5.32. The distorted image (left) caused by perspective is corrected (right) using Photoshop's Lens Correction filter

[8] called **Correct Camera Distortion** in Photoshop Elements

Take some test shots with straight vertical or horizontal lines near the edge of frame at maximum and minimum zoom to see if your camera suffers from barrel and pincushion distortion. If it does and the bundled software lacks any way to correct the distortion, you might have to consider investing in better equipment.

Blemish Removal

Spots in images might be a part of the scene, or they might be from a dirty camera. Dirt is especially a problem for SLR owners. Every time you change a lens you expose the inside of the camera to a world full of dust. Over the last few years most camera makers have begun to incorporate ultrasonic devices to keep dust away from camera sensors. Yet even a totally dust-free sensor is unable to prevent the odd blemish appearing on the surface of your subject. Whether it's a spot of dirt on an object you're selling on eBay, or a pimple on your MySpace portrait, fortunately you can clean it up in most applications.

The tools to clean up spots go by many different names. Some tools have a hint in the title; for example, "spot removal." The original tool for repairing blemishes was the **clone stamp**, a feature of Photoshop since the very first version. The clone stamp copies pixels from one part of an image over another. If you pick a patch of pixels that are the color of the area surrounding your spot and stamp them over it, the spot disappears. Photoshop, in its CS and Elements incarnations, has moved beyond this. The clone stamp tool is still there, but spot removal is accomplished more easily with the **healing brush**, which automatically matches surrounding textures and blends the concealing pixels with the background in a single mouse click. Lightroom goes one step further and finds suitable background areas to cover the spots by itself. As indicated in Figure 5.33, each circled spot is paired with another circle of background that's then blended over it. If you don't like the look of the result, just drag the background circle elsewhere.

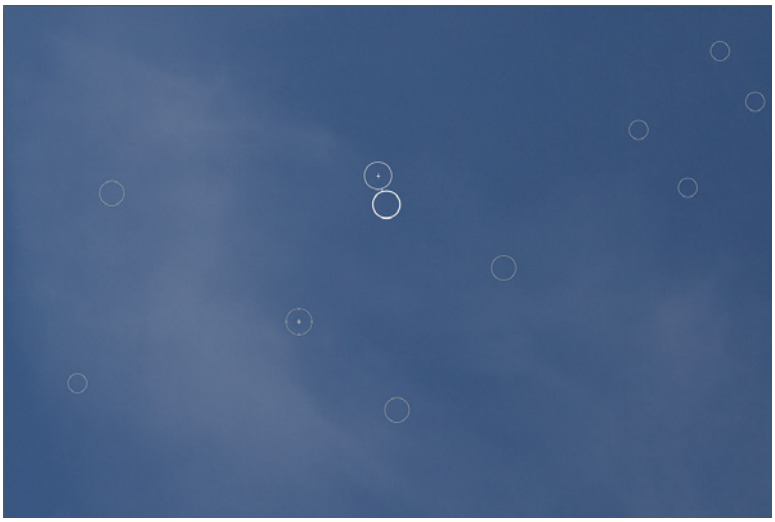

Figure 5.33. Spot correction in Lightroom

Of all the spot correction methods available, nothing beats prevention. But there's little you can do to prevent unsightly skin blemishes when you need to shoot a portrait. Pimples seem to lie in wait for photo shoots and pounce when there's no makeup to be found. All you can do is edit them out later. Spots from dust in and on cameras *is* preventable. Keep your camera clean by leaving the lens cap on when carrying it around, and wipe the front of the lens with a soft cloth whenever anything lands on it, immediately. Avoid changing lenses in dirty environments. If your camera has a self-cleaning function, make sure it's turned on.

If you already have dust in your camera, it's not the end of the world, or even the end of your photos. The tiny spots of dust are not actually on the sensor itself. The sensor is isolated from even the inside of the camera by a few layers of protection and filters, so the dust is actually a very small distance above the sensor surface. Because of this, dirt will only show up when shooting at very small apertures (the example above was shot at f/22). If you find that you have spots at f/22, try shooting at a wider aperture and they might just disappear. Later, you can have your camera professionally cleaned.

Black and White

Black and white seems simple—take away the color and what's left is your image. Your camera might even have a preset option to do this for you. Photoshop and most other applications provide a command that will remove the color data, leaving only the brightness. The results can be disappointing, though. Two objects of very different colors but similar brightness can end up looking too similar when you take away the color. For instance, in Figure 5.34, the photo on the left shows red flowers on a green, leafy plant. In color you could not ask for much stronger contrast. But when the color is removed, the leaves and the petals are very similar; only their shape distinguishes them from each other. The black-and-white version on the right was made using the **Desaturate** feature in Photoshop (**Image** > **Adjustments** > **Desaturate**). If you use the automatic black-and-white functions in your application, you might find yourself with contrast problems like this.

Figure 5.34. Strong contrast in color disappears when the color is removed

Some applications, like Photoshop's CS3 in Figure 5.35, offer controls that allow you to alter the brightness of different colors as you convert (**Image** > **Adjustments** > **Black & White**).

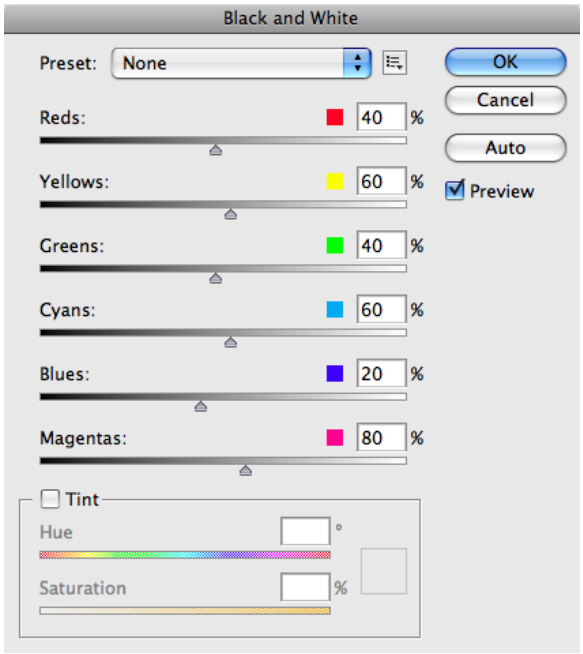

Figure 5.35. Photoshop CS3's **Black & White** command

If you have the option to do this, you can adjust the brightness of different colors so that they're distinct when converted to black and white; you can make the reds brighter and the greens darker or vice versa, as Figure 5.36 demonstrates. You can produce black-and-white images where the flowers stand out from the leaves, just as they do in color.

Only a few applications offer the option to adjust your black-and-white balance with this much control. Photoshop CS3 and later versions do, as well as Lightroom. Photoshop elements gives you half a dozen preset mixes and slider controls for red, green, blue, and contrast. GIMP and Photoshop.com[9]—Adobe's online version of Photoshop—offer a choice of several different looks when converting to black and white, each emphasizing different colors in their mix. Nikon's Capture NX 2 takes a slightly different approach. It simulates the old black-and-white film technique of using filters to alter the apparent brightness of colors. It looks a bit less intuitive to use—a filter of one color darkens the opposite color—but you get the hang of it fairly quickly by playing with the controls.

If you plan on making a lot of black-and-white images, you'll have more control over them if you use the more expensive applications. Photoshop and Lightroom are beyond the budget of many casual photographers, though Photoshop Elements is a good compromise.

Figure 5.36. Making the greens lighter than the reds (left), making the reds lighter than the greens (right)

[9] http://www.photoshop.com/

The Best Images You Can Make

Image processing software is to digital photography what a darkroom is to film. Mastering the techniques of color correction, cropping, and spot cleaning will allow you to go from having the best images your camera can take to the best images you can make. Beyond the basic adjustments we've mentioned here, with software you're able to produce images your camera is unable to capture by itself. We've looked at panoramic images, and there's a whole world of other techniques that can expand upon what you achieve with your photographic skills and a camera alone. Those advanced skills are beyond the scope of this book. When you're ready to learn more you'll find friendly discussion forums at Digital Photography School.[10]

The best way to learn and refine your skills is practice. In the previous chapters I urged you to go out and shoot lots of photos. Since you paid attention to that advice, you no doubt have recently accumulated more than a few less-than-perfect photos. Rather than deleting them, load them into a photo editing application and try to improve on them. Brighten the dark shots; darken the overexposed ones. Even if you're unable to salvage anything great from the bad photos, you'll learn the limitations of your software, your camera's image files, and the scenes you shoot. The next time you go to shoot a scene that's beyond your camera's capabilities, you can use your knowledge of image editing software to guide you in capturing the sorts of shots with which you can work.

[10] http://digital-photography-school.com

Chapter 6

Sharing Your Images

You've learned how to operate your camera. You know how to compose a shot to best show off your subject, and you've spent several chapters practicing taking photos of everything in sight. You have filed your photos, tagged them, and sorted them into albums. The best images have been selected from these, and you've corrected their minor flaws to make them perfect. You can hardly leave them sitting hidden on your hard drive after all that, can you?

If a photo is worth taking, it's worth showing off.[1] If you spy something worth seeing and capturing in a scene, chances are good that other people will enjoy seeing it too. Bringing enjoyment into the world is a worthwhile pursuit.

Personal subjects aside, even if you're feeling a little self-conscious about your early efforts, showing them to people can help you learn. After a few hours of sorting, filing, and editing images it can be hard to tell anymore which ones are good and which are rubbish. You get too close to the images and you become so used to them that you stop noticing the details. A fresh pair of eyes can help you sort the good from the bad.

Even the bad ones are not worthless at this stage. That over-familiarity can also blind you to flaws in an image. The opinion of another person about an image—especially *why* they feel the way they do—can teach you a lot about how to improve your style and technique.

[1] It does not necessarily follow that every photo that's shown was worth taking, as the average Facebook self-portrait demonstrates.

Sharing your images with friends can be fun and is likely to attract lots of compliments, but little help. There's nothing wrong with that, but to really learn what works and what fails to impress in your photos, consider displaying them in front of a bunch of anonymous strangers and inviting critiques. There will be **trolls**—people intent on causing conflict for its own sake—but not everyone who has a negative opinion about your work is a troll. If you can accept unfavorable comments and learn from them, you'll become a better photographer much quicker.

Placing your images online is the most cost-effective way of sharing them with other people. Whether you share them one-to-one via email or put them on a public image-sharing site for the whole world to see, the cost per image is too small to be worth calculating. There are other significant costs involved in online image sharing, but they're not of the monetary kind.

On your own computer in your own home under your own lighting with your own eyes, you can look at your images and adjust them until they look exactly the way you want them to look. As soon as you put them online, other people look at them on other computers under other lights with other eyes. You're unable to control the conditions under which other people see your images, so you must give up any idea that they'll see them exactly the way you do. Their display might be too dark or too light, or the room might be lit in a way that gives the images a color cast. The person looking at the pictures might even be color blind.

Given all these possible problems, is there any point in sharing your photos online? Absolutely!

Unless you're a total perfectionist there's probably no need to worry about poor image reproduction. Yes, it's possible that the end viewer of your image is seeing it differently to the way you intended, but if that's the case they aren't seeing anything online correctly. There's nothing you can do about it. There are, however, many people with decent monitors that display photos fairly close to the way they should look—and that group of people may include those who are likely to hire a photographer or license an image.

Email

It's easy to email photos; you could say it's a bit *too* easy. You can drag and drop an image file into a mail application, and often you can email the image from within your photo organizing application. Be warned, though, not all of them have sufficient warning of the dangers of sending a lot of really large files.

There's nothing like an email full of photos from a new parent, or from a friend just returned from a long vacation to bring joy to your morning, but it soon begins to wane after the half-hour wait for the pictures to download. *You* might have the world's fastest connection and most generous ISP, and laugh at 100-megabyte attachments, but not everyone does. Email applications and services may limit the size of attachments and prevent large messages reaching the intended recipient. Slow connections and small data quotas might prompt the receiver to skip downloading a message rather than wait hours for it to arrive and use up a significant chunk of their download allowance.

The problem with large images is not so much to do with the size of the image on screen. Though it can be annoying when a photo is too large to see all at once, it's easy to view it with an application that will scale it to screen size. The bigger problem is with the size of the files and the amount of time and space needed to transfer them. Email is a very inefficient way to move lots of data. If you're sending only one file, one megabyte for a large JPEG file should be fine, but when you're sending dozens, people on slow connections can easily become annoyed.

There are a few ways to reduce the size of an image file. The first is to pick an image file format that allows a decent amount of compression. For emailing, JPEG files are ideal. They compress a lot. Dialing down the image quality will compress the image more and give you a smaller file. You should find an option in your **Save** or **Save As** dialog to set a quality level when saving a JPEG file.

If you're using Photoshop you can use the **Save For Web & Devices** command, seen in Figure 6.1, to gain a side-by-side comparison of the compressed image and the original. This allows you to make sure you're not destroying important detail in the process. If your image editing application of choice has no preview of the compression, save the file using a moderate amount of compression—say 50%—then open the saved file and look at it at 100% magnification to see if there are any obvious compression artifacts.

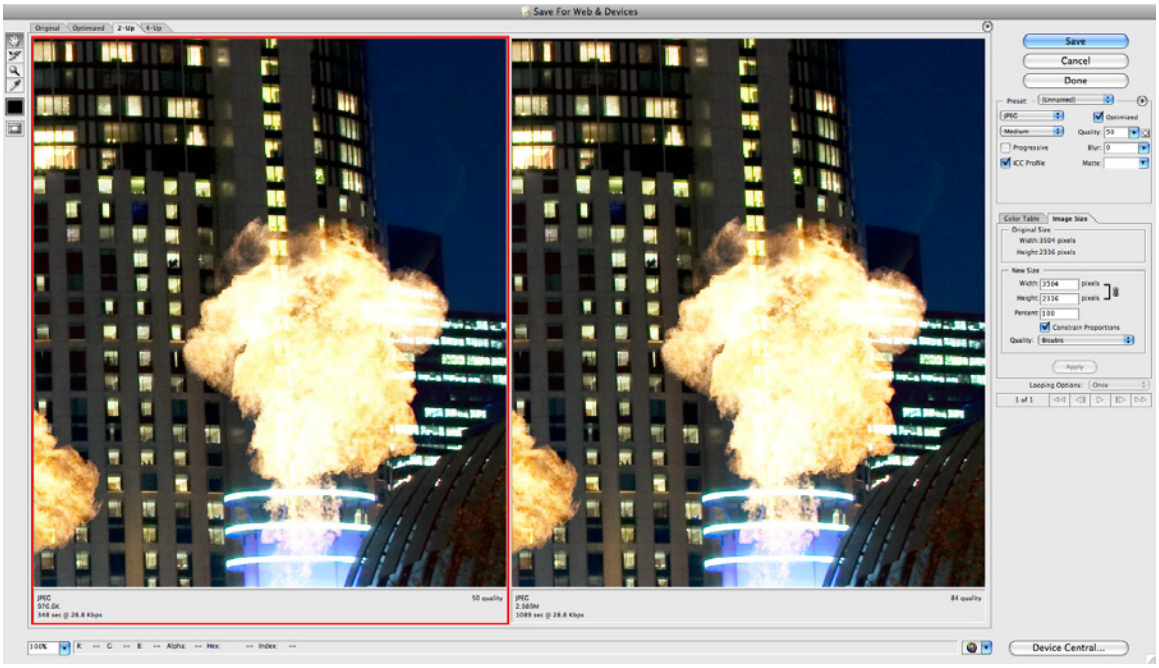

Figure 6.1. Photoshop's Save For Web & Devices dialog

Of course, the easiest way to reduce the size of an image file is to reduce the size of the image. Less pixels means a smaller file, though it also means less detail. Unless you're sending them to be printed at large sizes and high quality, an emailed image can be relatively small compared to the original. You really only need it to be large enough to fit on an average-sized monitor in a window

already cluttered with menu bars, message headers, and so on. Anything larger than can be fully seen on screen without scrolling is a waste if the image is only going to be seen on a monitor. If you do feel that the message recipient might want to see a larger version of the image, it's usually a better idea to send the smaller image with a link to the larger one.

Exactly how small is small enough can be difficult to judge exactly. Monitors vary in size and resolution. People's reading habits and preferences in size for windows are impossible to predict, but if you keep the longest side of an image below 600 pixels you should be okay for emailing it to anyone who's receiving it on a device other than a phone. No matter how much detail you lose in shrinking and compressing the file, you can always save the image at its full resolution elsewhere online and send a link to its location in the text of the message. If the recipient likes the smaller image, they can download and view the larger version in their own time and on their own terms.

Several of the image hosting sites we'll look at a little later automatically resize your images. If you send your images through their services, you can have all the work done for you. Otherwise, you'll need to scale the images yourself.

Blogging

Posting photos to your blog is a great way to share images with your friends and family, and that's the primary reason for a lot of people having blogs. A photo blog can also be ideal for tracking your progress and development as a photographer. By scrolling back through your posts, you can easily see how your shooting is improving. You'll spot common themes in your images that you might want to develop further or try to avoid, depending on how you feel about them. Blogging your photography can also be an excellent way to motivate yourself to keep practicing and improve on your photography. When you post your photos in public you'll have an extra incentive to produce the best work you can, and have people cheering on your improvement. If you're so inclined, you can push yourself to improve for the sake of not wanting to disappoint your loyal readers.

As your skills develop, should you wish to take photos professionally, the blog can be a starting point for you to market yourself.

If you're posting your images to a blog for all the world to see, the same guidelines apply as for email. An individual image need only be the size of an average monitor, and should probably be smaller to allow for all the other bits common to a the browser window. Images should also be kept small in file size to keep the loading time for any image-filled pages of your blog to a minimum. A single image might take up little space but dozens on a page certainly will use much more, and a reader who has to wait ten minutes for your images to load will probably go elsewhere before the time is up. The point in blogging your photos is to show them to everyone: grab their attention with smaller versions, but link to the larger images so they can browse them when they're ready

Starting a photo blog is easy. If you want all the features of a regular blog but with good photo support, many of the major blogging services offer templates for photo blogs. WordPress.com[2] and Tumblr[3] both offer free accounts and templates that will help you launch your photo blog with ease. Their content management systems handle a lot of the fiddly tasks for you; for example, they automatically generate thumbnails from your full-size images.

Photo Websites

If you don't have a blog and you're disinclined to build your own website, but you still want to show your images online, there are a large and growing number of image hosting services available. Many photo hosting services also allow you to place enough text in comments on images that can serve as a rudimentary blog. Several of them are tied in (though not exclusively) to some of the image editing applications we looked at in Chapter 5. Others are tied to larger providers of online services. Some are free, others charge a fee, but in general, what they provide is closely related to what you pay.

We lack the scope here to look at every photo hosting site in detail, but I can give you an overview of some of the more popular options. Since most of them have a completely free of charge option, you can start with one while you check out what's on offer, taking your time to settle on what's best for you before you part with any money.

Flickr

Flickr[4] is probably the best known photo-sharing site. It's owned by Yahoo and features some lively communities in addition to providing a substantial amount of storage space for your photos. At the time of this writing, a free account is allowed 100 megabytes of photo uploads per month, but only the most recent 200 photos are viewable in your **photostream** (Flickr's term for your total collection of photos, as shown in Figure 6.2). Photos displayed in a free account are limited to a maximum size of 800 pixels along the longest side. You can upload larger images that will be resized for display, but the larger versions will be kept in case you upgrade to a paid Pro account later. Free accounts also limit you to only four collections of photos within your photostream.

A Pro account costs US$24.95 per year and has unlimited storage and no upload limits, and images can be seen and retrieved at their full resolution. You can build as many collections as you like and even nest collections within other collections.

[2] http://wordpress.com/
[3] http://tumblr.com/
[4] http://flickr.com/

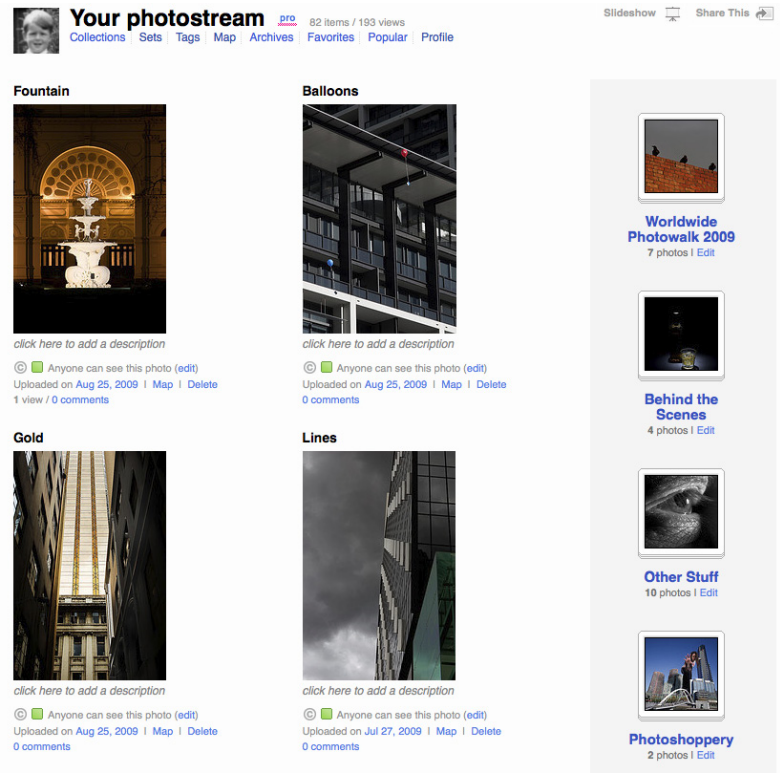

Figure 6.2. Your photostream on Flickr

As a hosting service Flickr is excellent. An uploader application, called Uploadr, lets you post new images without having to log into the site. After a brief setup procedure, any public photos can be posted directly to your blog from within Flickr. If you choose to allow it, other Flickr users can add tags and comments to your photos. The idea is to make the cataloguing, organizing, and indexing of photos on Flickr into a collaborative effort and make its search more useful.

You can use Flickr just as an image-hosting service, but it can also be a great place to learn. Flickr supports and encourages the pooling of images and groups forming of like-minded photographers. No matter what subject or style of photo you're interested in, there's a Flickr users group discussing it and comparing their shots. If you want to learn how a shot was taken, Flickr can store a large amount of a photo's metadata. Finding the shutter speed, aperture, ISO, focal length, camera model, and much more is quite easy if the photographer has chosen to include that data. If you find the information is missing, there's always the option to post a comment asking how it was done (the option to allow comments can be turned off by the photo's owner, but is usually left on).

For sharing, showing, and discussing photos Flickr is a terrific resource, thanks largely to the size of its community of users. The only part of Flickr that's a bit disappointing is the limited available options for laying out your photo pages. You can rearrange the order of the images to your heart's content, but there's little you can do about the page layouts, with only a half-dozen presets available. The plain white backgrounds look clean and neat, and show off photos better than some of the more

garish displays elsewhere online, but after a while they seem a little dull. Fortunately you can use an alternative source for presenting your images. So long as you link back to the site, Flickr is quite okay with you using the service to host your images, then displaying them on a different page of your own design.

Picasa Web Albums

Picasa Web Albums[5] is the online end of Google's image organizing and sharing application, Picasa. The Picasa application on your computer is designed to synchronize with a web album, shown in Figure 6.3, which provides online storage and some advanced functions excluded from the desktop application.

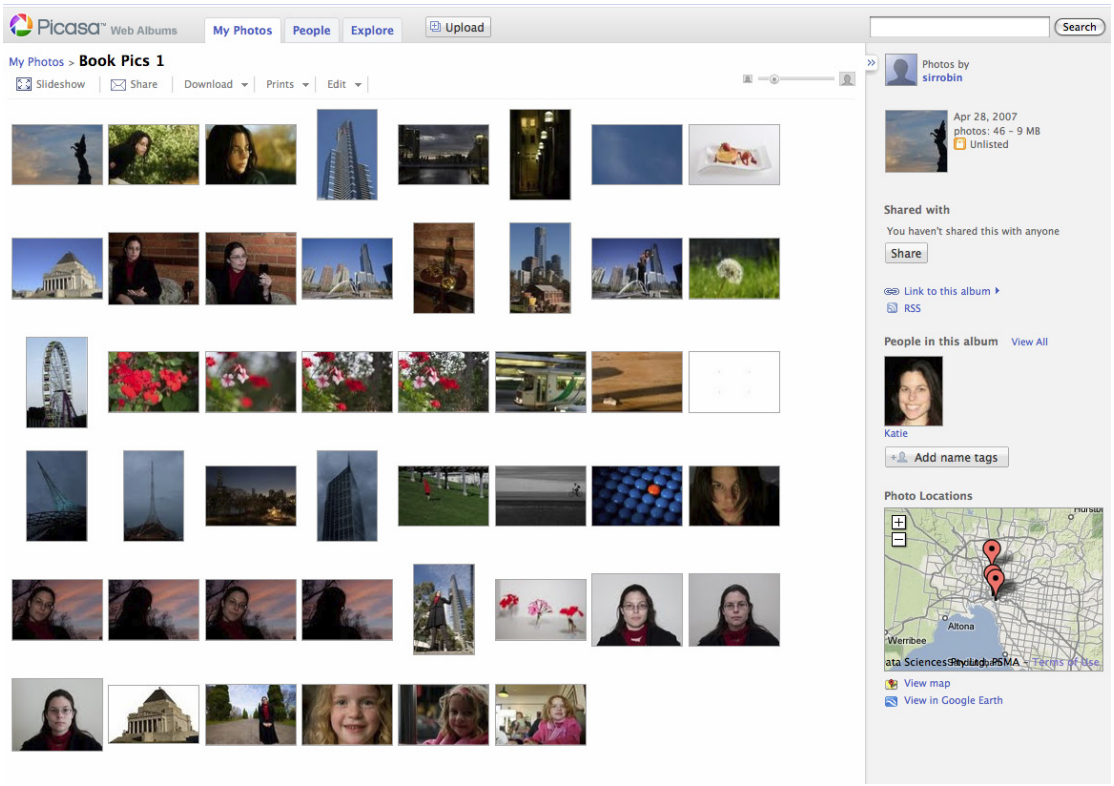

Figure 6.3. A Picasa Web Album

Figure 6.4 shows what an individual photo page looks like in Picasa Web Albums.

[5] http://picasaweb.google.com/

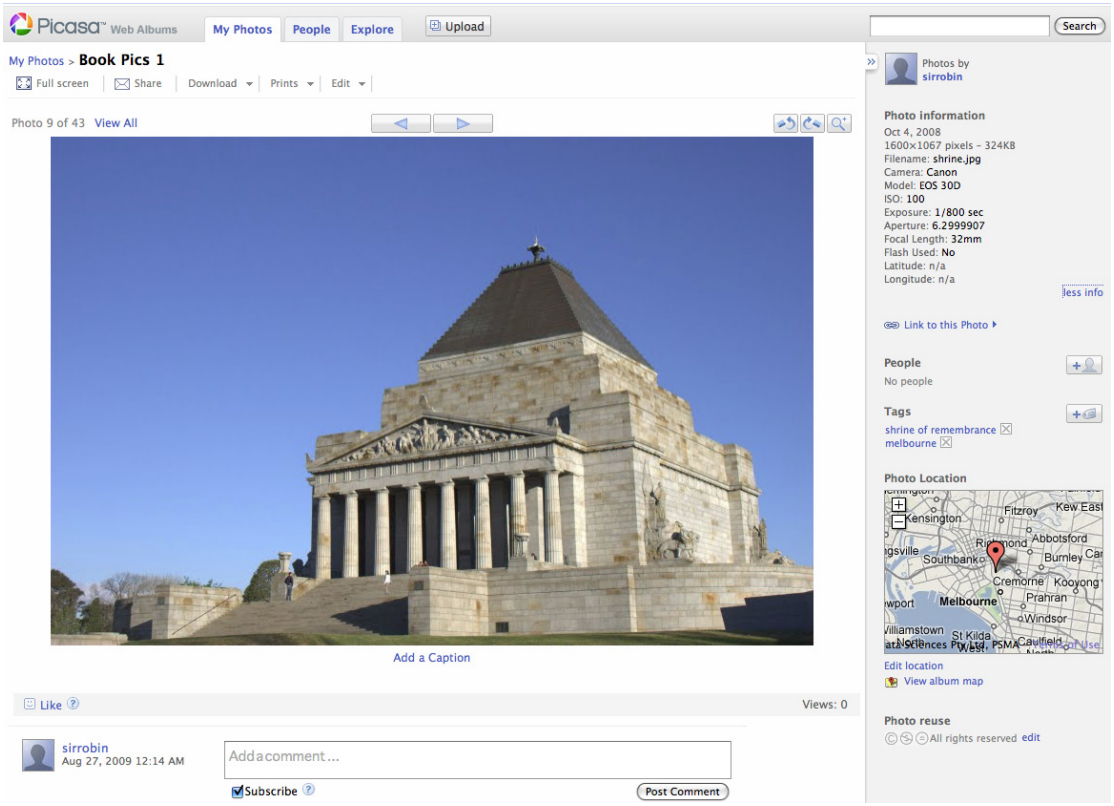

Figure 6.4. The detail page for an individual photo in Picasa Web Albums

Picasa Web Albums is free. If you don't want to use the offline organizing and editing application, you don't have to. Plugins for uploading to Picasa Web Albums from several other applications are available and, if your application of choice is not one of them, you can always transfer files via the Uploader function on the Picasa site.

Windows Live

Windows Live Photos[6] is the online end of the Windows Live Photo Gallery application. The concept is basically the same as that of the other free sites. You can host your images on the Windows Live sites, organize them into albums (as depicted in Figure 6.5), share them, display them in your blog, or embed them in your own sites elsewhere. The Windows Live Photo Gallery application is only available for Windows. If you're a Mac user you can use Boot Camp[7] to run Windows, and if you use Linux you can run the application using WINE. Incidentally, all the screenshots for Windows Live and Picasa in this chapter were made on a Mac running Windows via Parallels.[8]

[6] http://photos.live.com/
[7] http://www.apple.com/support/bootcamp/
[8] http://www.parallels.com/

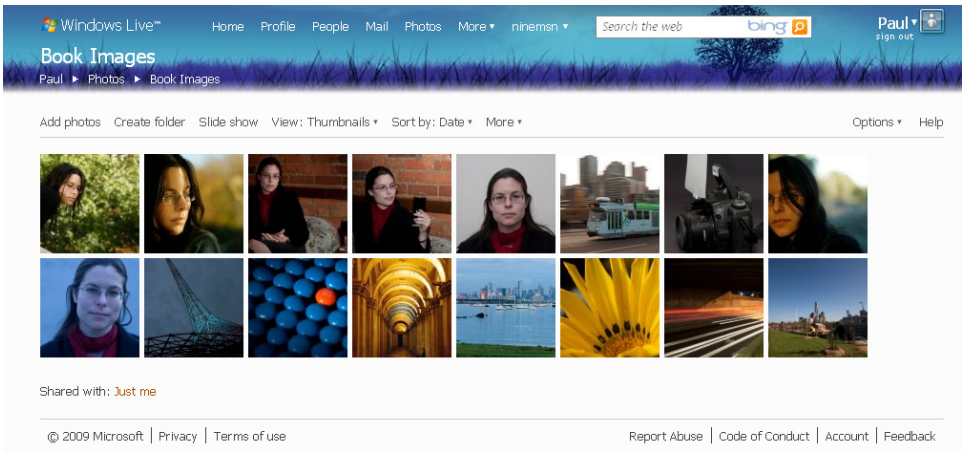

Figure 6.5. An album of images in Windows Live

All that the online functions require is a web browser. Functionally, the Picasa and Windows Live photo websites are very similar; go for whichever feels better to you. There's no need to use their respective editing and organizing applications to communicate with them, nor even need to buy their products (during the making of this chapter, work was done on a Windows Live gallery in Safari on a Mac without the world ending). If you're after free image hosting, either will work.

SmugMug

SmugMug[9] is not a free site, but we'll take a look at it because what it offers lies between the limited options of free sites and the flexibility of building your own photo website from scratch. Its cheapest accounts are more expensive than a Flickr Pro account, but you do receive quite a bit more for your money.

At the time of writing, a standard account at SmugMug costs US$39.95 per year, a Power account is $59.95, and a Pro account is $149.95. A standard account includes unlimited uploads and storage, and all the standard features that are offered elsewhere; plus, you can choose from several layout options, and apply a visual theme from a dozen serious, silly, and seasonal choices, as can be seen in Figure 6.6.

All SmugMug accounts include a personalized URL in the form of *username*.smugmug.com.

[9] http://smugmug.com/

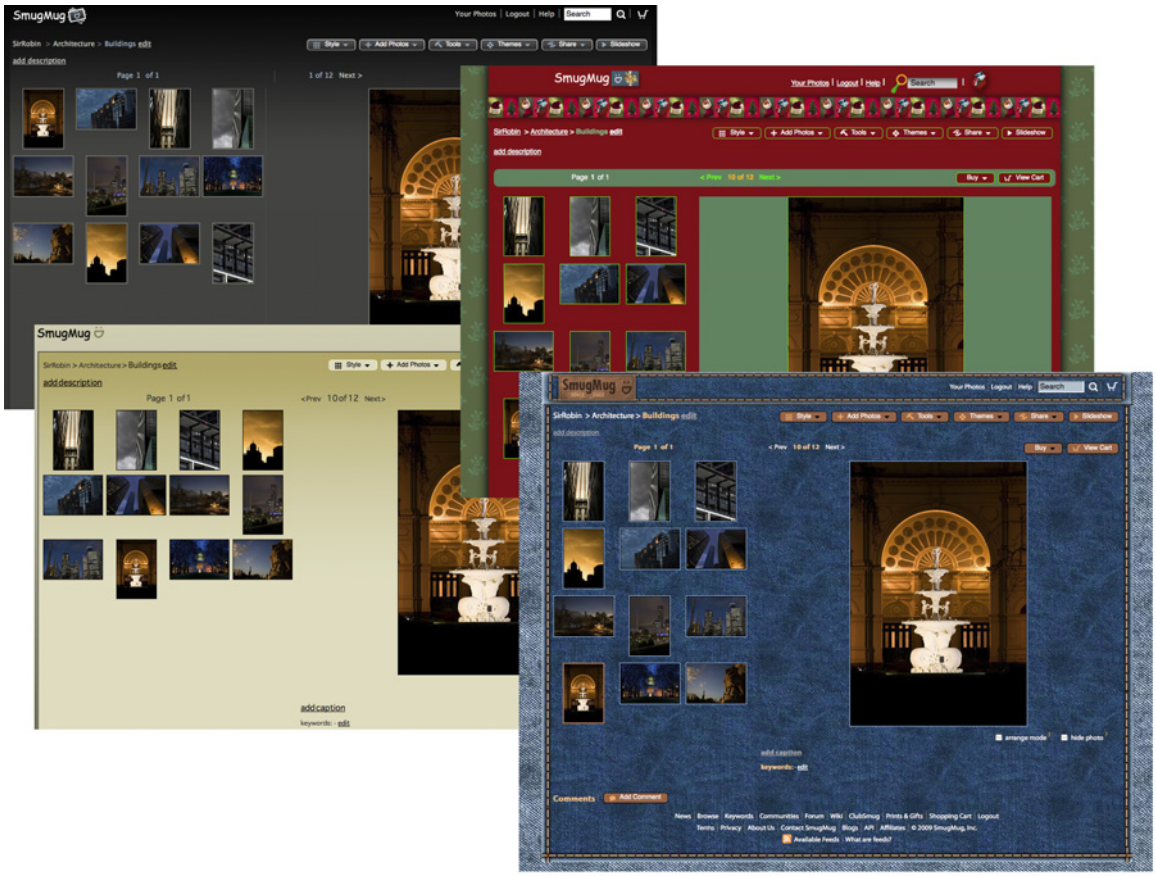

Figure 6.6. Some of the themes available from SmugMug galleries

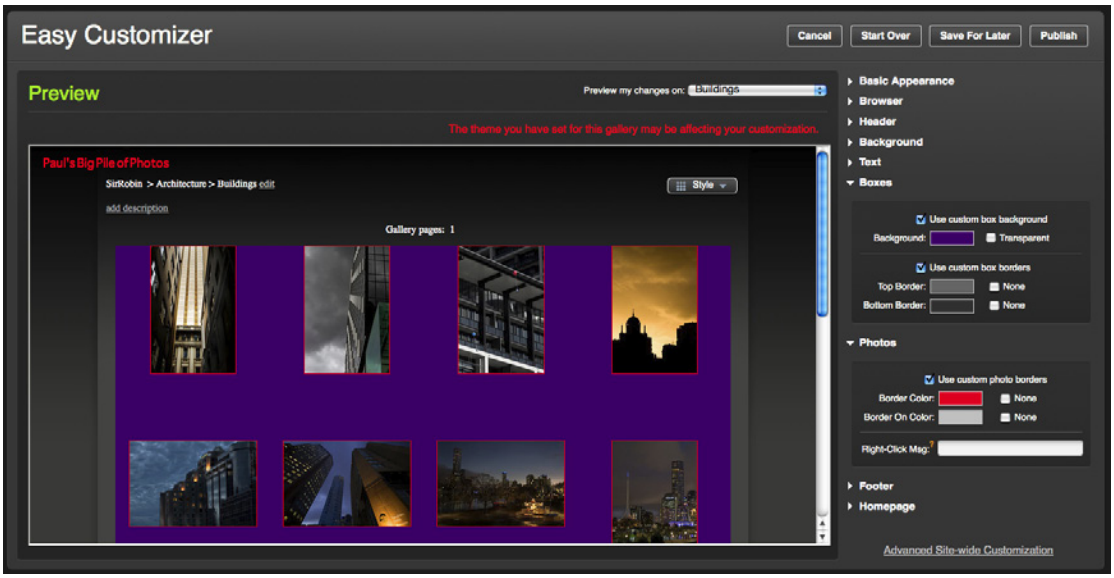

Figure 6.7. With SmugMug's Easy Customizer, you alone are to blame for the awful color scheme

With a Power or Pro account you can further customize the look of your pages. By using the online customizer, seen in Figure 6.7, you can build your own theme and select colors, fonts, background images, the lot. All elements of the page layout can be changed. If you like, you can even remove all the logo and textual references that identify the page as SmugMug (except the URL, of course).

A Pro account adds options for selling prints and digital copies of images, as well as the licensing of rights to both personal and commercial end-users with a price markup of your choice. You might not be ready for this yet but if the day arrives when you want to sell your images, SmugMug's Pro account gives you a good starting place.

Making Your Own Website

Your internet service provider probably supplies you with enough online storage to hold a very large number of photos. You could build a website of your own to show them off, or you might wish to use your photos as elements in another type of site altogether. How to build your own website is a subject for another book.[10]

The guidelines we looked at for emailing images also apply to websites. You're unable to know the size of the viewer's display or how fast their internet connection is, but you definitely want to avoid making a first-time visitor wait ages to see oversized photos. As I mentioned before, using smaller, more compressed images as an index to larger, higher-quality images is a good idea.

If you wish to use a photo as a background image to a site, you'll need to be especially careful with the file size and compression. To keep the loading time down you'll want to compress the image quite a bit, but you run a far greater risk of leaving visible **compression artifacts**—visible flaws such as a loss of clarity, fuzziness, or blockiness. An index thumbnail can escape with having a few blocky areas—it's okay for it be inferior to the full-size image. A background to a website needs to look decent, especially if it's on a site that's designed to show off your photography. Pick a size for your background, produce the best image you can to fit that size and build the rest of your site's look around it. If you have Photoshop, use its **Save For Web & Devices** feature to optimize the image's compression. If your application lacks a similar function, save copies with varied levels of compression, and preview them in a web browser to spot any visible compression artifacts; this will help you make the compromise between file size and image quality. No matter what method you use, make sure you preview the images at 100% of their full size, otherwise you might not spot the artifacts.

[10] *Build Your Own Web Site The Right Way Using CSS and HTML* [http://www.sitepoint.com/books/html2/] by Ian Lloyd provides an excellent start.

The following example features two close-ups of the background from the bee image in Chapter 3. The one on the left has no compression, while the one on the right has noticeable blocky artifacts from too much compression. The compressed version takes up almost no space but looks horrible.

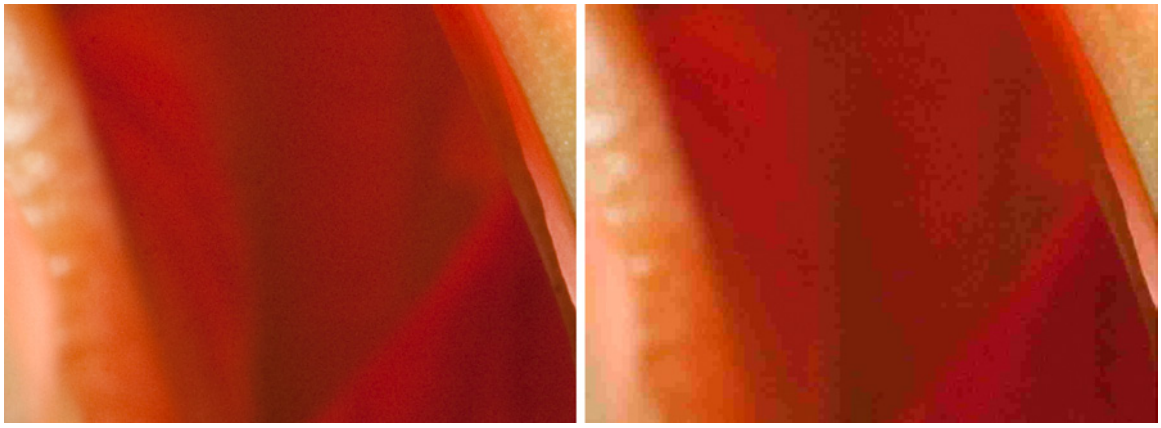

Figure 6.8. These two images reveal the dangers of compromising on compression

So, while compromise is necessary, you need to find a balance.

Sharing on Paper

Printing your images has a few advantages over other ways of sharing your pictures, and it has a pile of disadvantages too. On the plus side, once you have a printed image, no extra hardware is required to view it apart from a light source. You can take a print anywhere, hang it on a wall, or post it to friends and family who spend little time online. On the minus side, they can be very difficult to get exactly right.

To have a photo printout looking the same as it does on screen can be tricky. Your display and your printer show colors in different ways: the monitor mixes colored lights, the printer mixes inks. Even the most expensive printers on the market—machines with prices in the same range as small cars—are unable to reproduce the same range of colors as an average monitor. But it's possible to go close and that's usually good enough.

Many online photo services have options to order printed photos through their sites. Plain photo prints are available through most of them; bound books and more through others. Availability of options may vary between countries. Flickr, in particular, have arrangements with a number of vendors for incorporating your images into a range of printed products through the website, and iPhoto can build and order printed products from within the application.

The biggest problem, and the source of many complaints from novice photo printers, has nothing to do with the shortcomings of ink on paper, but from the omission of a very important step in setting up most computer systems.

Color Calibration

Computer monitor settings are adjustable. Depending on your hardware you might be able to change brightness, contrast, color saturation, and a whole lot of other settings, whether it's on a whim or just to make them look better to your eyes under the light near your desk. When Photoshop thinks it's displaying a very bright red, you could well be seeing something darker and murkier if your monitor's brightness and saturation settings are turned down. Naturally, you can fix that by brightening the red in Photoshop; that will make it look right on your screen, but send it to a printer and it will appear too bright. The printer can only work with the data from the image file, and this may be totally different from what's visible on your uncalibrated monitor.

To be sure your printer and monitor agree on what colors should look like, you need to calibrate your monitor. For a few hundred dollars you can buy hardware that will do this for you, but that might be too much for a casual user on a limited budget. If you have a Macintosh, the **Displays** control panel in your **System Preferences** contains an option under the color tab to calibrate your monitor visually. The **Display Calibrator Assistant**, seen in Figure 6.9, will guide you through a series of screens where you adjust controls to match colors.

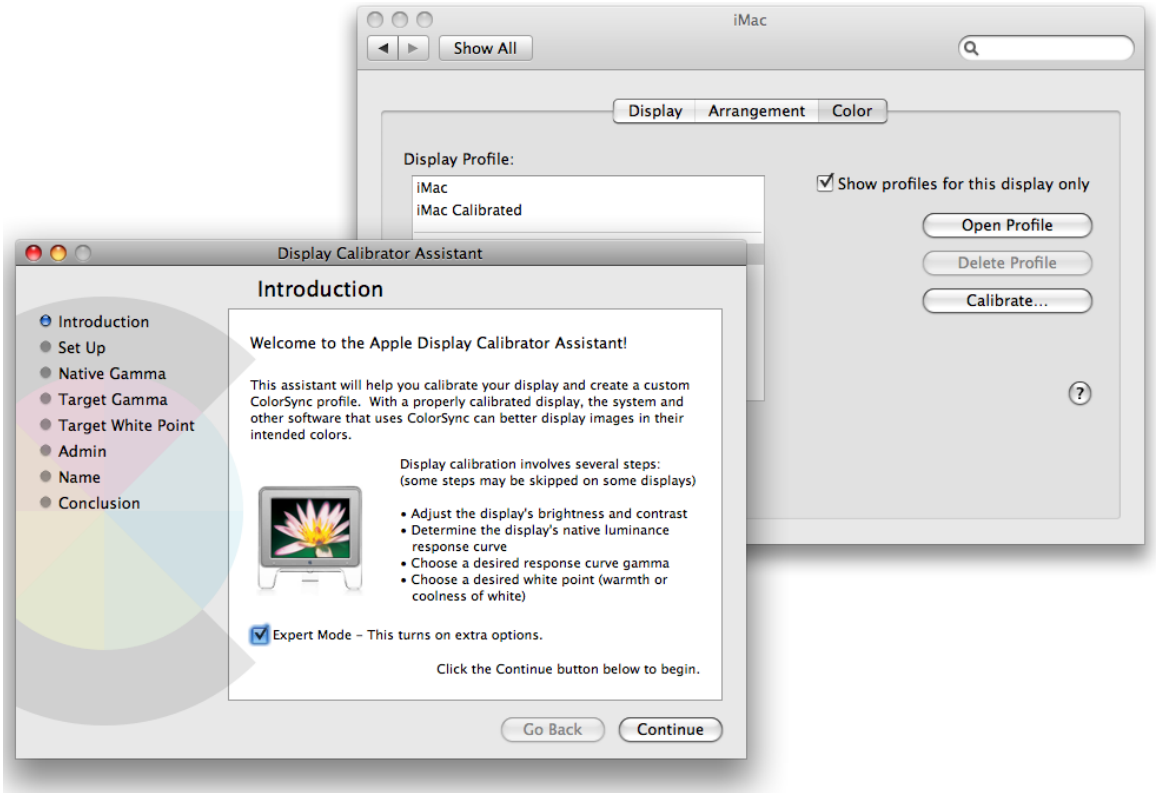

Figure 6.9. The Apple Display Calibrator Assistant

Windows lack this built-in feature, but several solutions are available. Adobe Photoshop for Windows prior to version CS3 used to install the Adobe Gamma utility, which worked very much like Apple's

display calibration tool. If you have an older version of Photoshop handy, installing that should add Adobe Gamma to your Windows **Control Panel**. If you're unable to grab Adobe Gamma, Monitor Calibration Wizard[11] (seen in Figure 6.10) or Quick Gamma[12] are good freeware solutions. For Linux, Monica[13] does the same job.

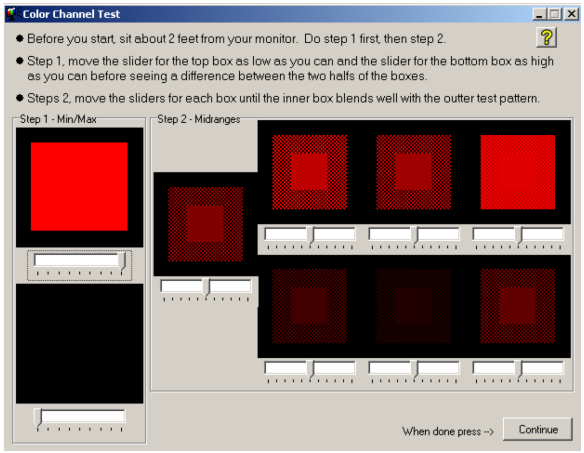

Figure 6.10. The first step in calibration with Monitor Calibration Wizard: making the reds right

The end result of this calibration process is a **color profile** for your display. The color profile is used by image editing applications to match what colors should look like to your screen and to your printer. The color profiles created using visual methods of calibration (your eyes) are less accurate than those created with a colorimeter or spectrophotometer and a large pile of money, but they should be good enough for amateur use.[14]

To ensure that other people see your images the way you do, you should always save your image files with the color profile embedded. Check your **Save** dialog for an option called **Embed color profile**, or any checkboxes labeled **ICC Profile** or similar, and enable that option.

Ideally, your printer should be calibrated too, but that needs more than software and eyeballs. Calibrating a printer really does require specialized hardware that's even more expensive than monitor calibration tools, and needs to be done separately for every ink and paper combination. Fortunately, printer and paper manufacturers often do this for you. If you stick to using your printer maker's branded inks and papers you should produce good results, so long as you select those options in the print setup. If you use a photo paper by another manufacturer, check its website for downloadable profiles and choose the one that matches the paper to your printer.

[11] http://www.hex2bit.com/products/product_mcw.asp
[12] http://quickgamma.de/indexen.html
[13] http://www.pcbypaul.com/software/monica.shtml
[14] Assuming the person calibrating the monitor has no significant vision problems.

Output for Other Media

You might be content to keep all your photos to yourself, or share just a few of the best online, and that's fine. A lot of people like their photos to have some physical form.

Before you plan to put your photos on paper or any other medium, you should be aware of the limitations of your medium of choice. As I said in the previous section, the range of colors that a computer display can show is considerably greater than that of any printing device. A printer's color range (or **gamut**) can be further reduced by the choice of paper (or other material) on which you print the image. How your image will be affected can be challenging to predict. If you're using Photoshop and you have a color profile for the printer and paper you plan to use, you can gain an idea of how the output will appear by viewing the image using the **View** > **Proof Colors** option, once you've set the device profile in **View** > **Proof Setup**. For a beginner, this can become complicated very quickly, but all options for printers, ink, and paper have one element in common: they'll lose some color from what you see on screen. It may be that you barely notice it, but you should be prepared for darker areas to look muddier, some colors to be less vibrant, and more subtle gradations in tone to be lost.

When you give your digital files to the average camera store to print they usually avoid any attempt to minimize the losses or improve the print quality. They might even subject your photo to automatic brightness and contrast adjustments, ruining the effect you were trying to achieve. If all of your photos have mid-key lighting and a full tonal range they'll usually come out fine, otherwise you might be disappointed. Taking your files to a professional photo lab, doing test prints, and adjusting your images further before committing to a final print run will earn you much better results but at a much higher price.

Media other than papers designed for photo printing can give even worse results. You must always remember that once printed, regardless of what your image looks like on screen, the brightest highlight can never be any whiter or brighter than the surface it's printed on, in the light under which you view it. Quality photo papers produce a fairly decent white. Coffee mugs and T-shirts, much less—especially after they've been used a bit.

In every case, the results you receive will be affected by the amount you pay. Many home ink-jet printers can produce iron-on transfers to put on T-shirts; it's cheap, but not especially durable. The image is printed onto a coating that's transferred with the ink to the ironed fabric, basically gluing the ink to the shirt. Direct-to-garment printing can produce a better-quality, longer-lasting image by printing dyes that color the fibers of the fabric, but the hardware is well out of the consumer price range.

The art of creating the best possible print from your image, even on high-quality photo papers, requires a book of its own and takes much practice to master. Whether you print your own images or hire professionals, it's best to stick closely to the instructions from the manufacturer or service provider. Achieving optimal results will often require at least one round of test printing and adjust-

ments to work with the limitations of the medium and hardware. On unusual media, especially those not designed for photo printing, you'll usually extract the best results with bright, high-contrast images so that, when some brightness and contrast are lost, there will still be enough left to see.

Start a Range of Merchandise

There's hardly any limit to what you can have your images printed on. Businesses like Photojojo,[15] Zazzle,[16] and SnapFish[17] earn their living selling custom-made products with their customers' images on them. Why stop at showing off your photography skills with a website when you can have your best photos on a T-shirt, coffee mug, or bumper sticker? If that seems a little cheesy, business cards, postcards, calendars, stationery of all kinds, and a whole range of other objects can be produced with your photos. There are even companies who will print your photos on toilet paper.

Show Your Stuff and Improve Your Skills

By now you have a lot of photos and, I assume, you've cleaned them up, tagged and indexed them, stored them, and made backups.[18] But you still need a lot of practice. (We all need more practice.) For the practice to work, you need feedback. As I've said, it's easy to be too close to your images. You can come to hate some excellent photos just by looking at them too long while working on them. You can also become so enamored with an image that mostly works, that you fail to see the bits that don't.

Now that you've read this chapter, why not take the photos you've created and show them to the world? Email them to friends and family if you want some easy praise, or pick an image-sharing site, set up your free account, and show your stuff! They might like it; they might hate it. Either way, you'll gain knowledge that you can build on.

[15] http://photojojo.com/
[16] http://www.zazzle.com/
[17] http://www.snapfish.com/
[18] Yes, I do go on about that a lot; it's important!

Chapter 7

Further Steps

There's far more to be learned about the art and technique of photography than can be contained in this book or, indeed, any other book. A large part of the art lies in the way you see the world around you. Every photographer sees and interprets the world differently, and finds specific aspects of a scene interesting. I've shown you some techniques to gain more from your camera, and provided tips on how to make an image more interesting to a viewer; finding the image that will capture a scene and making it your photo, however, is what you'll have to figure out for yourself, but not necessarily *by* yourself.

If you've taken a few first steps into the communities that have evolved from the online photo-sharing sites we looked at in Chapter 6, you will have noticed that there's a large number of enthusiastic photographers in the world, willing and eager to discuss their work.

Even professional photographers tend to be keen to share tips and hints. It's possible that they may end up advising a person who could compete with them for jobs, but that's rarely a cause for concern, as clients tend to choose photographers for their style as much as their skill. Most photographers choose photography as a career because they enjoy looking at well-crafted images as much as they do making them. Sharing skills to enable newcomers to create better images means more images for everyone to enjoy.

While taking photos can be a solitary activity—there's only room for one eye behind most viewfinders—there are a lot of photographic communities that will welcome you, no matter what your level of skill.

Online Forums

The easiest way for most people to find like-minded photographers is through online communities, blogs, and forums devoted to photography. The interest groups and comments at Flickr and other photo-sharing sites we looked at in the previous chapter can be very useful when you're starting out.

There's a tendency at many of the larger photo-sharing sites for the comments to be a bit more congratulatory than necessary for improvement. Members will happily comment favorably about the images they like, but hold back on the negative commentary. Knowing that a fellow photographer likes your image is great, but knowing *why* they like it is even better. That way, you can learn what works and how to repeat it. If you know why a person dislikes your image you can learn even more from it. If it's just a difference in taste you can agree to disagree, but if the critic is able to articulate the reason why they dislike an image and what might improve it for it to work for them, then you can add one more item to your repertoire of photographic knowledge.

The forums at Digital Photography School[1] are among the biggest and liveliest online. It's home to thousands of photographers ranging from absolute beginners, who've only just bought their first camera, to seasoned professionals. Several feature articles and a newsletter each week provide a constant stream of new information and advice, while forum discussions give you the opportunity to ask questions, show your work, or look at the work of others for inspiration. The pool of talent at DPS is vast; ask how to shoot a particular type of scene and you'll receive several answers, all of them different and none of them wrong.[2]

If you end up choosing SmugMug[3] to host your online images, you'll want to visit the Digital Grin forums.[4] SmugMug management maintains its official support forums there, so it's a handy way to keep in touch with the people in charge and the communities surrounding SmugMug. Everyone's welcome, SmugMug user or otherwise, to participate in the discussions.

If you're just looking for a venue to talk photography and share a few photos, Flickr[5] groups will suit you, as will most photography forums. You can learn about photography from anyone who cares to post their advice. To really improve as a photographer, search for sites that offer serious critiquing of images. Then, when you're feeling brave, post your best and let the members have their say. Even if the person giving you feedback is a fellow photographic newbie, knowing their thoughts will help you see past your own feelings about an image.

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[1] http://digital-photography-school.com/

[2] Yes, there are sometimes disagreements and debates, but good moderation keeps everything civil. DPS is a safe place for the young and the sensitive.

[3] http://smugmug.com/

[4] http://www.dgrin.com/

[5] http://www.flickr.com/

Social Groups

Feedback online is valuable—you hear from a lot of people with a wide range of tastes and experience, and receive an impression of how your work appears to others—but it can be slow; the advice comes long after you've taken the photo. Sometimes you need tips and advice on the spot, while you're taking photos. Taking photos in groups, with experienced photographers, is a great way to learn a lot, quickly. Feedback is faster, more personal, and can be applied instantly.

Camera Clubs

If you feel up to regular socializing with people who also like photography, you could investigate photographic clubs or societies in your area. Chances are good that there's such an organization near you—Google searches for "camera club" and "photo club" return almost a million hits for each term.

What a photo club provides its members varies. Larger, better-established clubs might have studio space or equipment available for members to use. Many run competitions; some offer formal instruction in the art and techniques of photography. All of them provide support, knowledge, and the company of fellow enthusiasts.

A well-organized and well-attended camera club can have other advantages beyond the obvious social and educational ones. You might have noticed that photography can be an expensive pastime. It has never been cheap. Cameras used to be cheaper when we all shot on film, but producing viewable images was expensive and messy. With digital photography, cameras are expensive and output is cheap. Manufacturers and retailers of photographic gear love camera clubs, and many will offer specials or discounts to members.

Photowalks

Photowalking is, unsurprisingly, walking with a camera with the aim of taking photos. As an everyday activity for photographers it's unremarkable, but when you make it a social activity, it can be lots of fun, a great way to learn and practice photography, and good exercise too.

As a recreational and social activity, photowalking has been going on for a long time, but it's only since digital cameras have become common and affordable that photowalking has really taken off. With instant feedback and online sharing, photowalks have become much more attractive to the casual photographer. The largest such event, the annual Worldwide Photowalk[6] organized by Kelby Training, attracted more than 32,000 participants in over 900 locations around the world on a single weekend in 2009, and awarded some significant prizes for the best photos from the event.

[6] http://worldwidephotowalk.com/

Photowalking need not be a global event. You can do it by yourself, or with a few friends. You can even do it to find new friends. There are many photowalking events all around the world; some are associated with photography clubs, others are open to anyone who wants to join. Many local clubs have websites for their walks, but there are few websites dedicated to photowalking in general at the time of writing. The most useful is PhotowalkList.com,[7] where you'll find links to local photowalking groups and a list of upcoming photowalks.

Taking Photography Beyond a Hobby

If you like, you can just take photos for your own pleasure as most photographers do. However, you might be inclined take things further. You could potentially earn money from your photography. After all, photography can be expensive, and earning a little extra money from it will help offset the cost of your next camera upgrade. You don't have to turn professional, but as an amateur there are ways to sell your images online that are available to you right now.

Entering Competitions

Hardly a day goes by without a new photography competition being announced. Competitions are run at all levels of the field, from simple photo-of-the-week awards to major competitions, with prizes ranging from a virtual pat on the back to high monetary stakes.

As a way of earning income, photography competitions are about as unreliable as you can get. However, when entering for fun, competitions can provide a chance to see how your work compares with others. In addition, you're able to see what other people are shooting and what's currently popular in photography. If you want to turn professional, whether full-time or casual, knowing what's popular is invaluable knowledge, and seeing what kinds of photos win competitions is a good way to track trends in the industry.

In this book, though, I'm all about learning and practicing; that's why I keep going on about it endlessly. Regular competitions are a great motivation to keep practicing because they provide a goal, a set of requirements and limitations, and a time frame. They challenge you more than you would be by going out and shooting the same old subject matter every day.

Most online photo forums run regular contests among their users. The Photo Competitions website[8] lists many reader-submitted competitions for both professionals and amateurs.

[7] http://www.photowalklist.com/
[8] http://www.photocompetitions.com/

Caveat Competitor

When you're considering entering a photographic competition, read the terms and conditions carefully. Not all competitions are created just to encourage new photographers or promote the camera company running them. Some are also run as a way for companies to cheaply acquire a library of photos for their own use. Lurking in the fine print of some contests are conditions that rob you of ownership of your photo. Watch out for terms that state that by entering the competition, you're giving the competition holders permission for unlimited use of the work anywhere in the world.

You may be thinking that only dubious small-scale outfits try these scams. Unfortunately, large multinational corporations, who can easily afford to pay a fair market rate for good photography, often slip these sorts of conditions into their entry rules too. I strongly recommend you avoid entering any competition that requires you to surrender your rights to your work.

Selling or Giving Away Stock Images

Stock photos are commercial images that, rather than being shot for a particular purpose, are offered for sale for whatever use the buyer needs. Stock photography agencies maintain huge libraries of images of almost anything anyone could possibly want. The larger companies, sourcing their images from professional photographers, have been challenged recently by the emergence of online **microstock** websites that distribute user-submitted photos for lower rates.[9]

The largest and best known microstock site is iStockphoto.[10] iStockphoto, now owned by Getty Images, offers over four million image and video files for sale. Contributors receive a percentage of the sale price of any photos they've sold.

Stock.xchng[11] is halfway between an image-hosting service and a stock photography outlet. They host images from members and offer them as free stock images. Some uses of the images at Stock.xchng are prohibited (for example, for reselling or using as part of a logo), and using the images in commercial projects requires the permission of the photographer. Other than that, images are free. Think of it as another way to share your images.

Education

If you want to master photography, there's a limit to what books can teach you. Practice is the key; many of the world's greatest photographers were self-taught. They learned when photography was in its infancy, discovering and inventing the techniques their successors teach today. Practice is essential, but guided practice is even better. Reading, shooting, sharing, and receiving feedback

[9] And in response to the challenge, the two largest professional stock companies, Getty Images and Corbis, have bought the biggest microstock sites.

[10] http://www.istockphoto.com/

[11] http://www.sxc.hu/

from people online will help you build your skills, but it's unstructured. Nothing beats a formal lesson from a professional photographer with years of practical experience.

If you find that you really want to be a professional photographer, seek professional training and education. You should be able to find colleges that teach photography as short courses for the beginner, degrees for the dedicated, and usually a few variations in between. There might even be a specialized photography college within reach of you. Many very skilled photographers take teaching jobs and, unlike some other fields, it's easy to see if a photography teacher really knows their stuff: just look at their photos.

Show Us What You See

I hope that you now realize there's a whole lot more to photography than you imagined when you first picked up a camera. Photography has been around for less than 200 years and has only been practical for the everyday hobbyist for a little over a century. Digital photography has been with us for less than 20 years, but photography is new enough an art form that techniques and styles are still being invented. There's always more to learn.

Where you take your photography—and where it takes you—is what you must decide for yourself. Over the last seven chapters I've provided a lot of facts, principles, and suggestions. If you've been doing as I suggest—practicing, practicing, practicing— you've probably discovered a few pointers for yourself. Keep doing that!

This book is only intended to be an introduction to the art and techniques of photography. It should help you through that rough patch that many new photographers experience: when the novelty of taking a shiny new camera out of its box wears off before you really master your new toy. Learning photography is an ongoing process; you'll not only become better at taking photos, you'll become better at seeing the world.

It's time now to put down the book and show us what you see.

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