



## UNDERSTANDING LIGHT

*Available light is any damn light that is available!*

—W. Eugene Smith

Edward Hopper's painting *Nighthawks* is as representative of the realist movement in American paintings as any work in that genre. College students have posters of the painting hanging in their dorms, and it's been reproduced so many times that it has become an iconic image. The painting, a view into a well-lit diner from the gloomy outside street, is an excellent example of

My first opportunity to travel to the Antarctic was aboard the *National Geographic Endeavour* as the "expert" on this ship. My job was to make myself available to the expedition travelers, providing my expertise and advice on all things photographic. It was an exhausting trip, as the light was stellar for most of the day, with early morning starting at around 4 A.M. and sunset occurring near 11 P.M. In the entrance to Terror Gulf, we passed the sensory overloading scenery of the Antarctic Peninsula. Everything started coming together—the boat slowly passing the peninsula, an iceberg moving into position, and penguins "porpoising" through both air and water in graceful leaps. Rays of the sun illuminated the rugged peaks in the background and painted the edges of the iceberg, its blue ice electrified by the light. 50–200 lens at 158mm, 1/160 second at f3.5, 125 ISO

how adding or removing light affects an image. Starting with a white canvas, and adding dark colors intersected by coldly bright hues, directs the viewers' attention to the stark and fluorescent-lit interior of this lonely place.

The photographer does the same within his or her own "canvas," adding, removing, and controlling the light to "paint" the subject. Without light, we wouldn't have much to work with. This chapter deals with different types of light and the issues of controlling and/or creating light.

The camera allows light in to strike its sensor, recording the image. Too much light, and the image is washed out; too little light, and the image is too dark to make out. The correct amount of light is the correct exposure.

The streets of central Loreto, Baja California Sur, Mexico, are colored a deep and rusty red. I was working with National Geographic/Lindblad Expeditions, when we came upon a street crew paving a new stretch of road. I watched them work for a while, and as the late afternoon light improved, the workers began tossing red powder on the surface of the wet concrete to embolden the hue. I love the look of the powder floating away from this fellow's hand. The backlighting emphasizes the structure and provides definition to the dust as it rolls off his fingers. 50-200 lens at 200mm, 1/500 second at f5.6, 100 ISO



## THE VIEWFINDER IS OUR CANVAS AND LIGHT IS OUR PAINT

### Available Light

*Available light* is the most common form of lighting that all photographers use. If we're shooting outdoors, available light is the light from the sun or other available sources. Indoors, it's the light provided by lamps and other light sources in the room. Using the available light to your benefit is the key.

We have at our disposal six "flavors" of available light:

- **Frontlight** This is the light coming over your shoulder and falling on the subject. Frontlight creates a flat, often dull light. If you want to shoot in frontlight, try moving around the subject so the light comes more from behind, and try using a flash.
- **Sidelight** As the name implies, this light comes directly from the side. Great for landscapes and scenic shots, this light is pretty severe for people pictures, unless you're trying to emphasize character in a face (lines, crags, and the like). Be kind here, because you want to be remembered in Aunt Bettie's will. This being such perfect light for landscapes, as it creates dimension in your photos, you can perhaps include a person in the shot to provide a sense of scale, placing him or her at the edge of the shot, and shooting wide—just establishing the human presence.
- **Toplight** Noon, with the sunlight illuminating the subject from the top down, is not a favorable light for photographing people, because it creates harsh shadows and tends to be colorless. This is a *great* time of day to scout areas, however, so you can decide when to come back. If you have to shoot in this light, use a graduated filter, which will help saturate the sky's color and create a bit more interest. It's also a great time, if you are photographing Aunt Bettie, to use the on-camera flash to "fill" the harsh shadows with light.
- **Backlight** This light comes directly from behind and can create an ethereal look, emphasizing the spray in ocean waves, adding depth and magic to smoke, and creating halos when used in portraits. This is wonderful light, but it does weaken the saturation of color. Try popping in a little flash to bring up the light on the backlit side and strengthen the colors.
- **Overcast/shade** This is one of the kindest types of light for photographing people. Clouds create a giant "soft box," softening the light and smoothing out the skin. This light also helps out the exposure, as the dynamic range of light that the chip can capture is within range; often side/front/toplighting will provide an exposure range greater than the sensor can capture in the frame.
- **Twilight** Twilight can be the "magical hour" for taking great shots. The sun has nearly or just passed the horizon, and

the ambient (aka available) light starts moving toward the blue range. Shooting on a daylight setting will emphasize this effect, but do *not* set auto-white balance, because that will remove this cool/cold effect. Try setting the camera to the correct exposure, manually, for the scene, and then use a strobe to fill-flash the subject. This will create a wonderful dichotomy in light—the warm light from the flash and the cool ambient light.

### The Golden Hour

It's noon at the Grand Canyon. Everyone is standing in herds on the South Rim, photographing the giant expanse of canyon. The noon light is sterile, with no character of its own—yet this is the most common time that the tourists turn out. Inevitably, their images are a disappointment—horribly bright and with a lot of contrast, almost monochromatic images.

This scenario is a perfect introduction into a discussion of *The Golden Hour*. The light during this magical time, the hour before sunset, produces a gigantic warming filter, and it's almost difficult *not* to take a good photograph in this environment. One benefit of air pollution is that light passing through all that crud in the air is softened and warmed, creating a beautiful glow.

I'll often arrange shoots so I can benefit from this great light, which occurs not only in the early evening, but in the early morning as well. Shooting at either of these times can result in better photos. I like shooting in the

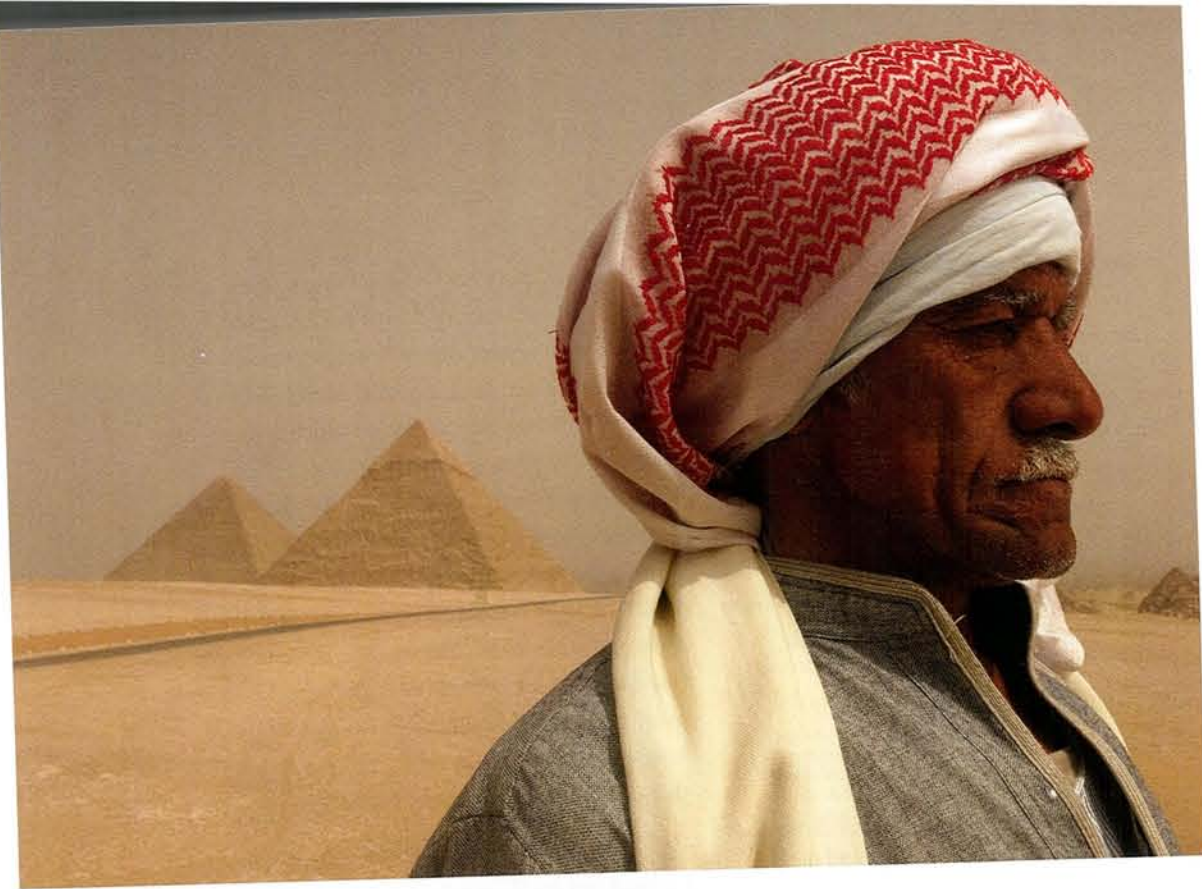
evening best, not only because I don't have to get up at the crack of dawn, but because, as night approaches, the light keeps getting better and better, reaching its crescendo in the final minutes before the sun touches the horizon. The photographer working in the late afternoon/early evening light has the opportunity to work the subject, moving around the shot to find the best place to be when the light reaches its peak. Early morning light is also beautiful, but we have to be in place as the sun crests the horizon, and the quality of light deteriorates the longer we work into the morning, away from the crescendo that occurs at the moment of sunrise.

Back to that scene at the Grand Canyon; I'll head out for these scenic vistas and other "photo-op spots" in the late afternoon or early morning, and I'll usually be shooting alone or with little company, save for other serious photographers. The tourists are filling the restaurants or sleeping in (which *is* one of the benefits of a vacation). However, with just a little rearranging of their schedules, these folks could make time for visiting spectacular views that coincide with The Golden Hour.

### Chimping

Most experienced digital photographers are familiar with the term "chimping." Not a reference to our Simian cousins per se, but it does take on one characteristic of those critters.

The next time you are at a function that may draw a number of digital photographers, say a sporting event, watch the clutch of photographers from the sidelines. After a play



It's always great to be able to photograph in the best light possible, but sometimes that's not realistic. This was the case on a shoot in Cairo, Egypt, when I had a very short window to photograph the pyramids—at noon, not a good time of day. I ran into this fellow at a classic overview of all three Pyramids...and I had less than three minutes to figure out a photo as our bus was leaving for the airport. Hours before there had been a sandstorm in the area, and enough of the particulate matter was still hanging in the air to cause a diffusion of light. I placed him looking out of the frame, positioning him asymmetrically with two of the three pyramids, finishing off the composition. The overhead and diffused light worked in my favor in this simple portrait as the sand-filled air acted as a giant "lightbank," causing a soft and flattering light. 12–60mm lens at 20mm, 1/80 second at f13, 100 ISO.

is over, you'll see a number of those digitally-equipped individuals direct their vision, and attention, to the monitor on the back of their digital cameras. As their latest and greatest work of art is displayed on the screen, you can almost hear the "Ooh, ooh, ooh!!!" utterances of admiration coming from their lips over that image.

This is all well and good when photographing an event that has a defined

start and finish of action, but it can be a habit that mistakenly diverts the photographer's attention from the subject they are photographing. There's nothing worse than snapping the shutter at what you think is a perfect moment, stopping to admire your work on the monitor, look up to see the real moment occur before your eyes, and then not have the camera ready. So remember, no chimping!

#### Tips for Golden Hour Photography

Here are a few hints for using that Golden Hour light:

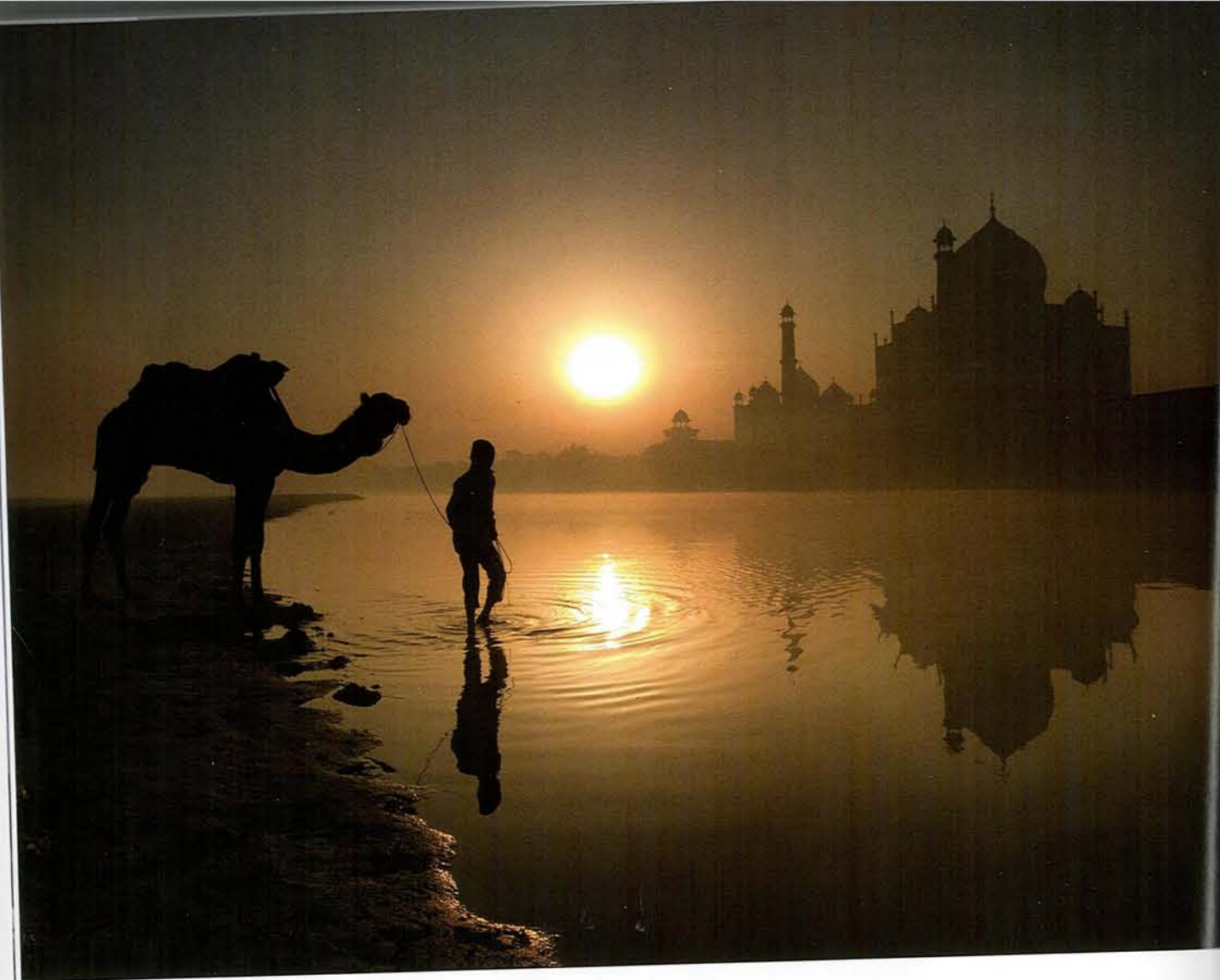
- Add the tiny strobe atop many consumer and prosumer cameras to the mix of Golden Hour light, and you have the recipe for successful people pictures.
- Plan your day to make the most of The Golden Hour. Use the middle part of the day to scout and reconnoiter the area to determine where you want to be during the late afternoon.
- Use a compass! I always carry one in my photo vest. A number of websites offer exact compass points for finding the location of sunrise and sunset from your

present or projected location. Carrying this information, along with a compass, can help you choose your spot with the knowledge of where the solunar event will occur (sunrise or sunset, I mean).

- I also carry a page I've printed from the website of the US Naval Observatory, "Sun or Moon Rise/Set Table for One Year": [http://aa.usno.navy.mil/data/docs/RS\\_OneYear.php](http://aa.usno.navy.mil/data/docs/RS_OneYear.php). This information tells you, for a specific domestic or international location, the exact times of sunrise and sunset. Another great site for determining sunrise/sunset in addition to moon phases, moonrise, and moonset is [www.sunrisesunset.com/custom\\_srss\\_calendar.asp](http://www.sunrisesunset.com/custom_srss_calendar.asp).

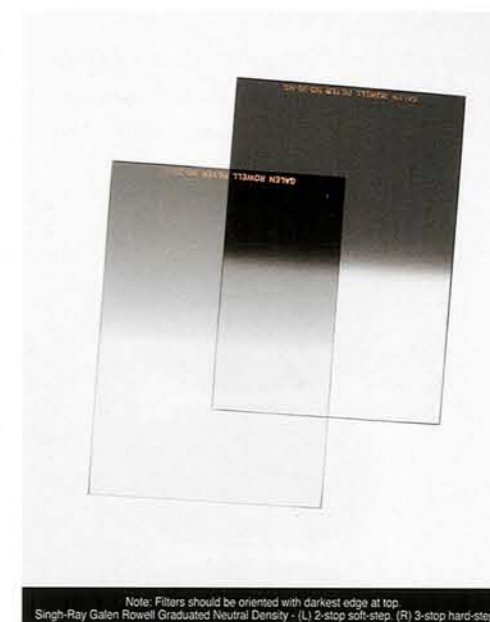
Guadalupe Peak is the tallest mountain in Texas, at 8479 feet. This image was shot for *Texas Highways* magazine, part of a story on the "Seven Great Wonders" of the state. I found pilots George West and Richard Davies to fly me over the rugged terrain shortly before dusk, so I could take advantage of the low setting sun to emphasize the structure and striation of the landscape. I intentionally included the wing of the Cessna because I thought it provided a bit of human perspective to this stunning landscape. 12–60mm lens at 12mm, 1/250 second at f5.6, 200 ISO.





One of the most beautiful monuments in the world and one of the most thoroughly photographed sites, the Taj Mahal in India is a challenge for the photographer to come up with something different. I was part of a National Geographic Expedition, the Taj being one of the stops. Pre-dawn, I gathered a group of the photographically-driven Expedition members and headed out to photograph the building. I'd been there before, and I knew there is a classic vantage point just across the Yamuna River. We arrived early, photographers spreading out to capture dawn from different angles. Shortly after the sun rose, this camel driver appeared, taking his camel to drink for the Yamuna. The scene was illuminated by the heavily-diffused sunlight (pollution is good for something—adding so much particulate matter to the air, acting as a giant “lightbank,” softening and warming the harsh light), but I still had to use a Singh Ray Galen Rowell Graduated Neutral Density filter to allow the exposure on the foreground to balance out the brighter exposure value of the sky. 12–60mm lens at 12mm, 1/500 second at f6.3, 100 ISO, Singh Ray Galen Rowell 2-stop, hard step Graduated Neutral Density filter

- Take a tripod. To quote the Boy Scout motto, *be prepared*. You may want to extend your shooting into the evening hours, and there's nothing more frustrating than not having a simple piece of gear that can make a huge difference in your ability to keep shooting.
- A graduated filter can make the difference between a successful shoot and one that is *almost* there. A scene where the sky is brighter than the foreground is the perfect situation for this type of filter. These filters are dark at the top, graduating, either sharply or in a soft change, to clear at the bottom. This allows the photographer to capture the bright sky and the darker foreground in the frame; without using a filter, this would be impossible, due to the great difference in exposure in those two areas. Singh-Ray makes some very good filters; I like them because they are rectangular and can be moved up and down in front of the lens, giving you far more control over where the impacted area will be (see [www.singh-ray.com/grndgrads.html](http://www.singh-ray.com/grndgrads.html)). The Singh-Ray filters can be purchased in varying degrees of density, from one stop all the way to five full stops. The filters can also be purchased with different colorations for different effects.



Singh-Ray graduated filters, seen in both hard step and soft step. The hard step is for an exact horizon line, and the soft step is for a more subtle change. Photo courtesy Singh-Ray

- Many photographers carry a neutral density (ND) filter. This filter reduces the overall amount of light entering the lens. Why not just stop the lens down? If you want to use a low ISO setting and shoot a slow exposure, perhaps a waterfall at midday, using an ND filter is a great idea.

NDs can be purchased with one, two, or more stops. Singh-Ray sells a Vari-ND filter that allows the photographer to dial in the amount of reduction infinitely from one to eight stops.



The same neutral density filter, Singh-Ray Vari-ND, offers three phases of controllability.

### Sometimes the Simplest Light Is the Best

I always carry a flashlight with me for lighting purposes—just a small one, either a standard bulb or a halogen, with an adjustable beam. A flashlight can offer a spot of light for a dramatic effect. I was on Alaska's Yukon River, working for National Geographic, photographing a story about the river. The day was cold and dark, and the village, Kotlik, was nearly empty. This was an important village in that it is the last outpost on this mighty river. An old man walked by and I started a conversation with him. Turns out Tom Prince was the oldest

man in the village, and I felt that warranted a photograph. I wanted to maintain the icy cold, blue look of the scene, so instead of using a warming filter or white balancing the blue out of the frame, I shot it as is, a daylight balance, and lit Tom's face with my flashlight. The exposure was about 1/15 of a second; I had to move the flashlight slightly to smooth out the light. The effect is exactly the look I was hoping to capture. His face is very warm, tending toward an orange-gold, because the flashlight bulb provided a tungsten light source, and I knew that it produced that warmth when recorded on a daylight-based setting. The village in the background appears in a bluish cast, which is exactly what I was after.

Cloudy days can provide a beautiful soft light that is ideal for close-ups of people. The light is very kind to human complexions, and your subjects' eyes won't be squinting, as they can be when the subject faces the sun.

### Dynamic Range

The human eye is amazing in its adaptability. We look over a scene, and our eyes are able to see the full range of light, from shadowed areas to the parts lit by full sun. The eye has the ability to see a dynamic range, or ratio of dark to light, of about 100 to 1, where the camera sensor is able to see a range of only about 10 to 1. Photographers are often surprised when they look at their images and the shadows are totally black or the highlights are completely washed out. The histogram on the back of the camera can display the five-stop range that the sensor can cover.



Tom Prince is the oldest fellow in Kotlik, Alaska, the last village on the Yukon River. I used a small flashlight to illuminate his face, 20–35mm lens, 1/15 second at f3.5

We can now address the limited dynamic range of the camera by using software packages featuring High Dynamic Range (HDR). The photographer captures several different exposures, exposing the first for the very darkest areas of the photo, with the next frame closed down one or two stops, and so on, until the final exposure captures the very brightest

area in the photo. Using HDR, the software “averages” the images together, using the broad range of exposures to create an image that more closely matches what the eye is seeing. The power of this is that the photographer can create an image with an even greater dynamic range than the eye can see.

1/125 second at f4



1/15 seconds at f4



1/2 second at f4



These three images were "combined" using Photomatix Pro, one of several software applications specifically built to blend or "tone map" HDR images. I shot the first image exposing for the brightest area outside, another exposing for midtones in the interior, and the last exposing for the shadowed areas of the cabin. The final image shows a dynamic range far greater than the sensor could have captured in a single frame. All images shot with 7–14mm lens at 7mm, 100 ISO



The final image, a combination of the three images

## Reflectors

A reflector offers an easy way to add a little light to a face in the shadow to bring interest to the subject. I always travel with these tools, and I use them often. Sometimes, all it takes is just a little bit of extra light thrown in somewhere to make the picture work. You want your photos to be noticed for the image content; you don't want a viewer to comment that you've used too much/too hard/too unflattering light. This is often a case for simplification of the lighting—a little strobe fill, a little reflector fill.

Reflectors can be as simple as a piece of paper used to redirect, or bounce, light into the desired area. If you're photographing flowers in a field, try using something as simple as a piece of paper to reflect, or bounce, light into a shadowed area of the scene. This simple trick can take an image from ordinary to exquisite.

Reflectors come in lots of styles and sizes—from models small enough to fit in your pocket, to those so large they require an assistant, or two, to set up. In my car, I carry four reflectors: a large one, 54 inches across, that comes with a reversible cover and provides five functions; a medium-size one of the same type; a very small one that folds to about 6 inches across and fits in my vest pocket; and a large scrim, used to soften the light. All of these fold to smaller sizes and are very portable.

Here is a list of reflectors that you may want to make a permanent part of your shooting kit:

- **Large** A 54-inch reflector is large enough to bounce light back and cover a standing person, or it can be used for portraits. The benefit of the 54-inch size is the softness of the light reflected from such a large area. Move the reflector in for the softest light. Seem like a contradiction? It's not—the closer a light source, the softer the light will be. Think of moving away from the subject with the reflector, until it's about the size of a flashlight from the subject's perspective. The light would be very focused, from a very small point. This type of reflector offers several options, and your choice on which option to use is a matter of taste. One side is a solid gold color that reflects a very warm light. This side reflects about 85 percent of the light, which can be too warm when shooting people. The next side is usually a gold/silver mixed surface that is not as warm as the solid gold, and is a bit more efficient—about 90 percent in the amount of light it reflects. The solid silver side reflects about 95 percent of the light, but this light can be a little too harsh. The other side may be black, which can be used to reduce light—if, for example, you're shooting a portrait and a bit too much shadow appears on one side, the black side can be placed on the side of the subject to cut down on the light.



As a mentor for an American Photo Mentor Series trek, I was visiting Belgium's Ruins de Montaigle fortress for an early morning private visit. I wanted to show the trekkers how much impact a reflector could have on a photo. This photo is shot without any additional light, either flash or reflector. It's a nice photo, nothing special.



The same scene, with the addition of a reflector that bounced light into the shadowed area of the falconer's face and on the falcon. This light opens up the photo, making it much more interesting. 17–35mm lens, 1/125 second at f5.6

- **Medium** The medium-size reflector is used in situations for which a little harder light is desired—say you are photographing your pet black lab. The large reflector would provide such soft light that the dog's black coat would absorb a lot of the light; this is an ideal situation for a smaller reflector that creates a more direct light source, effectively brightening his coat.
  - **Very small** A small reflector is easy to keep with you always, because it fits in a vest pocket or in the pocket of a camera bag. When I was on an assignment photographing scientists collecting bugs on the Amazon, I needed a simple light source to use for shooting the bugs they collected. This small reflector (about 12 inches across, unfolded) worked perfectly. I could get it in close, and it could be pivoted to create the exact light I needed.
  - **Scrim** These are a Hollywood favorite, as their purpose is to soften a direct light source, which is very nice for portraits taken on a direct-sun day. Open the scrim, have your assistant (spouse, traveling companion, innocent bystander) hold it in between the light source, such as the sun, and the subject. It creates a very pretty light. I often use a scrim to soften the direct overhead sun, and I'll use another reflector or flash as my main light. This is called controlling your environment.
- Understanding light does not always mean working with an abundance of light.



Often, simply using your flash in midday light will make all the difference in a photo being a disappointment, as shown here, or...



...a success, as shown here. Balancing the foreground and background is necessary, and this can simply mean pointing the camera at the general scene in the background, and holding the shutter button halfway down to lock in the exposure. Then, with the flash set to TTL (Through the Lens), point the camera toward your subject and press the shutter. 11–22mm lens, 1/60 second at f5.6



At times you'll want to use the selective ray of light coming through a window to partially light the subject's face and create an air of mystery. This involves seeing and thinking out of the box. Watch a professional work a scene; he or she will work harder at getting the lighting right than at just about any other aspect of the picture-taking process. Light is everything.

## FLASH, ON OR OFF CAMERA

The flash can be either the most overused tool or the most underappreciated feature of the camera. Properly used, a flash can fill in harsh shadows and turn a ghastly lit midday photo into a pleasing portrait. Here are some tips for using your in-camera flash or accessory flash:

- If shooting at midday, turn on the flash and allow it to fill the shadows, creating an evenly lit image. You can use your camera's Program mode for this: go into your flash control and turn it on; it's usually indicated by a lightning bolt icon. Or, in Manual mode, turn on the strobe and set the exposure to the ambient light.
- If using an off-camera flash, consider purchasing a remote cord. This lets you move the flash off to the side, and this trick alone will either eliminate or dramatically lessen the effect of red eye. Red eye occurs when light from the flash bounces off the back of the subject's eyeball, creating an image in which the subject sports bizarre red eyes.
- Try bouncing the light—if you are shooting inside a place with a roof of a normal height and a colored light source, you can point the flash toward the ceiling during shooting. This disperses the light, flooding the scene with it. It creates an image with a much more natural look than direct flash can provide, producing a more even light across the frame.
- You can also use a "bounce card," which can be as simple as a piece of white paper taped to the strobe (make sure the paper is on the backside of the flash, from the perspective of the subject). This setup still uses the flash bouncing off of the ceiling, but it will direct a wee bit of light directly on the closest subject. This creates a nice fill light, but it still takes advantage of the light illuminating the area—providing a much more natural look. LumiQuest offers several bounce devices as well as mini light boxes that fit on the flash. I always carry the ProMax 80-20, a reflector that I can attach to my strobe; it allows 80 percent of the light to hit the ceiling, with 20 percent used to fill in shadows on the subject.
- Get really creative and use the flash with a reflector. Have your fabled assistant hold the reflector to direct the light just to the side of the subject's head or torso. Then, use the flash as the main light. With this method, you can create a more "dimensional" light source. Try not to go overboard with the reflector—just bring up the level of light, or use it to light a shadowed side of your subject.



The LumiQuest ProMax 80-20 device attaches to your external flash with hook-and-loop fasteners; the reflector can be attached quickly or pulled off at a moment's notice.

- In the old days of film, many pros using hand-held flashes would tape a filter over the business end of the flash. I kept a very soft gold colored gel attached at all times to "warm up" the light a bit, and this helped quite a lot, by making skin tones look more natural. Inherently, flash light tends to be a bit blue. You can acquire little sample packs of filters from many theatrical lighting companies, or some top photo shops carry them. I carried the Roscolux filter pack. Conveniently, they fit perfectly on many popular strobes, with no cutting necessary. Many different samples of the full range of lighting

filters are included, so don't limit your experimentations to one.



This inexpensive pack of theatrical filter samples makes a perfect warming/cooling/softening filter that will fit over the business end of an external flash. Use a little electrician's tape or gaffer's tape to secure it. Don't use duct tape, as it will leave sticky residue. Gaffer's tape (available at the same theatrical supply or pro photo store) will not leave a residue, even under heat.

In the digital era, the effect of this trick is usually white balanced out. However, if you are shooting in Raw, this will work. Remember that Raw is how the scene looks, and white balance will not impact the file, so the effect of filters on the lens of the camera, or on the strobe, will be recorded.