Day 26: Avoid Blown Highlights and Black Shadows

This picture of the Tower Bridge in London was created using HDR software. It was created using bracketed exposures centered on shutter speed of 2.6 seconds; Aperture f/5.6; ISO 100. As you saw in the video lesson for today, you don't really need to go through all of that anymore. You can make similar moves in Lightroom in just a few seconds.

There is an inherent challenge in digital photography that I want to help you solve. We have talked about it some already, but this lesson will reinforce some concepts, and also show you some heavy artillery for fixing the problem.

First, what is the problem? The problem is a limited *dynamic range* of the camera. We have talked about this some already, but to refresh your recollection, that means the camera cannot accurately capture really bright tones and really dark tones in the same picture.

The Dynamic Range Problem

Let's start at the beginning. The best way to understand dynamic range is to first consider it without a camera. Your eyeballs have a limited dynamic range, so let's start there.

Imagine you are in a movie theater in the middle of the day. Having sat through a movie in a dark theater, your eyes are accustomed to the darkness. You can see everything around you in the dark theater pretty well. But when the movie is over and you walk outside, the light is blinding. It actually hurts to open your eyes all the way. Bright areas just seem white. But if you stand outside for 10 or 15 minutes, your eyes adjust fully to the brightness. You can now see everything around you in detail just fine.

This example shows you how dynamic range works. There are three takeaways here:

- You can see in the dark just fine (once your eyes adjust). When you are in a dark theater, your eyes have no trouble making out detail.
- Your eyes are capable of seeing in the bright light just fine as well. When you are outside on a bright sunny day, you can see everything in detail.
- But your eyes *cannot do both at the same time*. When your eyes are accustomed to darkness, you cannot make out tones in bright light. And when your eyes are accustomed to a bright scene, you cannot make out tones in a dark room.

Thus, your eyes have a limited dynamic range.

The Camera and Dynamic Range

Essentially, it works the same way for your camera as it does for your eyes. If your camera is set to capture tones that are on the *darker* end of the spectrum, it has trouble handling very *bright* tones. Those bright tones may appear as *pure white*, which is referred to as "blown out." This is the equivalent for your camera of eyes that have been adjusted to darkness, which now cannot handle brightness.

Conversely, when the camera is set to capture a bright scene, it has a hard time distinguishing darker tones. The darker areas may show up in your picture as pure black without any detail. This is the equivalent for your camera of eyes that are adjusted to brightness walking into a dark room.

Your camera can only make out a limited number of tones at the same time. The range your camera can handle is actually much narrower range than what your eyes see.

Application to Photography

This happens all the time in photography. If you are taking pictures of anything outdoors, much of the time you will have the sky in your photo. The sky will be brighter than the ground, and if you expose the photo so that the ground is properly exposed, the bright sky is just pure white. There is no detail at all. Conversely, if you expose your photo so that the sky is properly exposed, the ground will be completely black with no detail in it. You cannot win.

It goes beyond the standard outdoor photo. If you have any sort of bright lights in the picture, they will likely be blown out in a properly exposed photo. Any shadow is likely to be pure black. This includes shadows on a person's face caused when the sun comes in at an angle. When you look at the shadow with your eyes, you see the underlying detail. The camera cannot handle the range in tones though, and everything in the shadow is just pure black.

Fixing the Problem

Now that we're got our arms around the problem, we need to consider the fix. Actually, you already have the fix for most cases, and you've already used it in this course.

For those pictures where the disparity in tones is not too great, you can use Lightroom to bring the highlights back or lighten up the shadows. You just pull down the Highlights slider and/or push up the Shadows slider. Often, that's all there is to it. This will go a long way toward improving your picture.

Incidentally, this problem is one of the main reasons you use RAW files. RAW files have WAY more flexibility in bringing back detail in highlights or shadows. If you shoot in JPEG only, this detail is likely lost forever.

But what do you do when the disparity in tones is too great for Lightroom to handle? That's where we break out the aforementioned heavy artillery. It is called HDR, which stands for High Dynamic Range photography.

Do You Need HDR?

I'm going to spend the rest of this lesson talking about HDR. Even though there is going to be a lot of discussion about HDR, I don't want you to think you have to use it. Usually, you don't.

Every iteration of Lightroom and ACR get better and better at bringing back highlight and shadow detail. Every new generation of cameras has a slightly larger dynamic range. As a result, you really don't need HDR much anymore. If this was 2002, then yes, you would probably need to use HDR. But today? Nah. You don't need to.

My personal experience might be illustrative, so I'll mention that. Five or ten years ago, I was using HDR all the time. I shoot mostly landscapes and city scenes, so the high contrast made it a necessity. I was using software called Photomatix, which at that time was really the only good way to do HDR. As time went on, Photoshop's HDR improved and Lightroom added a version (which initially was not very good). I dabbled in them but kept using Photomatix.

The struggle with HDR was always how to make it look realistic. If you weren't careful, you would end up creating very surreal scenes (some people like that, so I'm not knocking it, but it wasn't what I was after). I was always trying to get the detail without the surreal effect. As Lightroom and ACR got better and better, I noticed that I could bring back more detail and not have to worry about that effect. Little by little, as Lightroom improved and cameras improved, I was able to

shift so that, whereas I once used HDR probably 50-60% of the time, I now use it less than 5% of the time. Even when I do use it, I generally only use it for specific parts of a picture.

Further, I'm no longer chained to Photomatix (although I like it and it does a good job). Photoshop's HDR process has improved greatly, and it is probably the best option for the most realistic HDR possible. Lightroom's HDR has gotten a lot better as well, and it is now a viable option. There are other options coming on line too.

What does this mean for you? Mostly that you are fortunate. You are starting out in an era where this HDR tool is available to you in the event you want to use it, but you don't have to use it. You can definitely get by using only the Highlights and Shadows sliders in Lightroom or ACR. If and when you decide to use HDR, it is there and you now have a lot of options for doing so. But, again, I want to stress that this is definitely not something you need to use day to day (or maybe ever).

HDR Explained

Here's the general idea of HDR, somewhat simplified. The idea is that it would be awesome if you could just take multiple photos of the same thing at different exposure levels, then you could cherry pick the best tones from each, and then smoosh them all together into one picture that is properly exposed across the board. That's the idea.

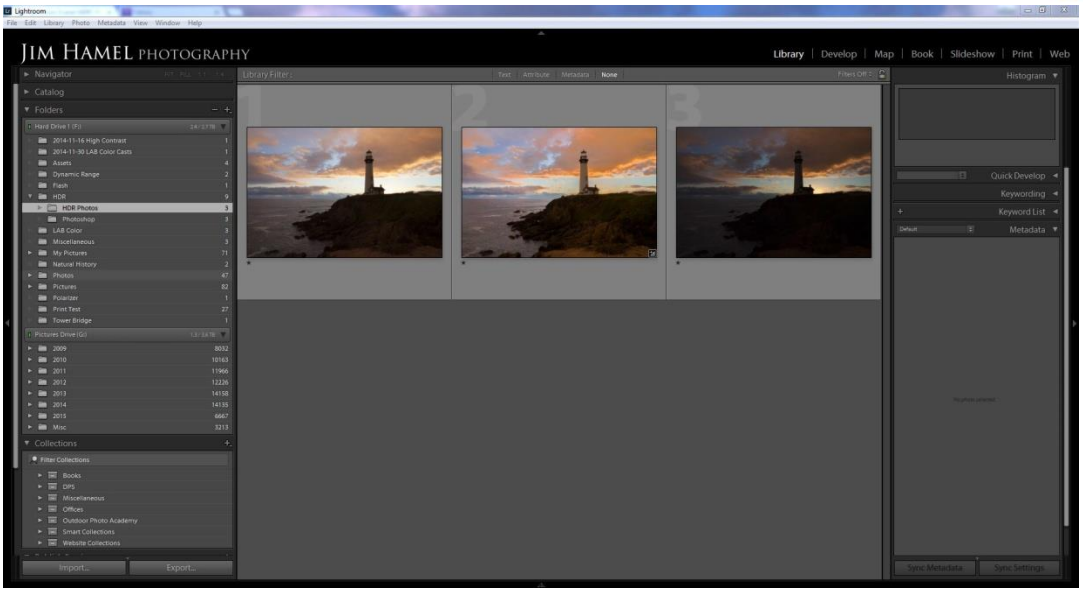
It starts when you are taking your photo. You set up to take your photo like normal, but you change one thing. You turn on your camera's bracketing function. What that does is set your camera to take 3 photos (or 5 photos in some cameras, but I find that 3 is enough). The first photo will be exposed normally. The second photo will be underexposed. And the third photo will be overexposed. You can also do it manually if you want, but for now I'd stick to the automatic function.

Before we go on further, let's think about this for a second in the context of the standard outdoor photo. In your normally exposed photo, you have problems everywhere, in that the sky is too bright and the foreground is too dark. But when you bracket you have also taken an underexposed photo. What do you do with that? You use the part of the photo that is the sky. You wanted to tone down the sky, and underexposing the picture will certainly do that. Conversely, you also have an overexposed photo as the final shot in your bracket. What do you do with that? You use the part of the photo that includes the foreground. Recall that the ground was too dark, and overexposing it fixes that right up.

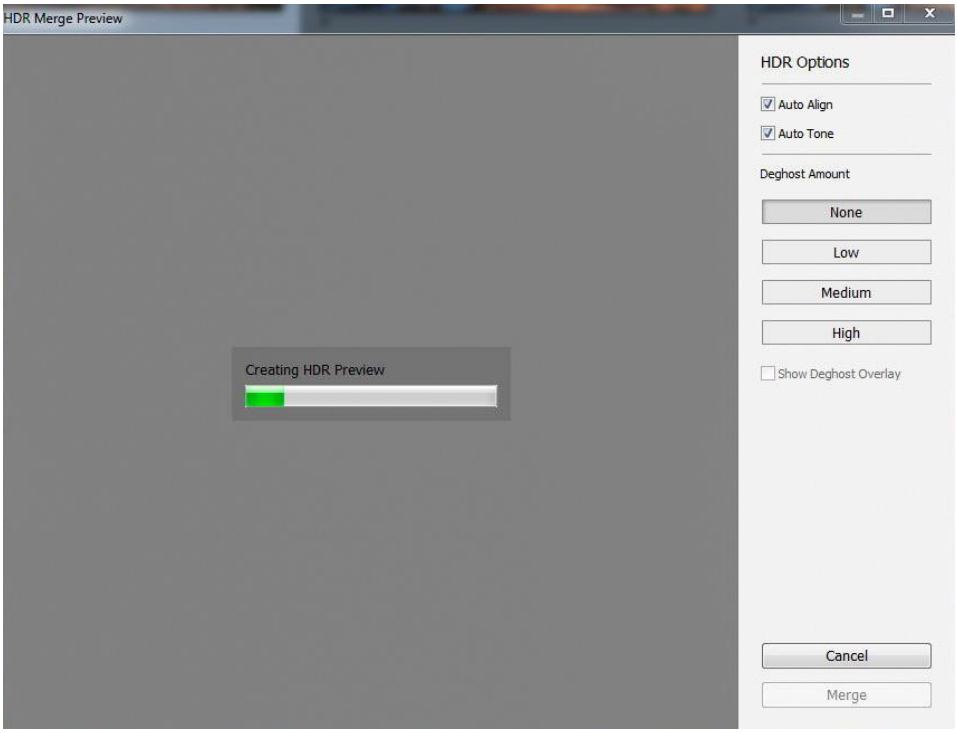
But wait a second, does this mean we have to go into Photoshop and try to manually blend these photos together? Nope. That is what the HDR software does. And, fortunately for us, Lightroom has HDR processing in it.

HDR in Lightroom

Now, let me say up front that there is other dedicated HDR software that will do a much better job of this than Lightroom. In fact, of all the HDR Software available, Lightroom's HDR processing is probably the least robust. It is actually a fairly recent addition to Lightroom, and the early versions weren't very good. So why are we using it? Because it now does an adequate job and, as you might expect with Lightroom, it is super-simple.



Here's how you use it: all you do is select the photos you want to use and select Lightroom's Photo Merge function (Photo > Photo Merge > HDR). That's it, and Lightroom immediately goes to work processing the images.



There are only two options for you to check when Lightroom processes your image: Auto Align and Auto Tone.

- **Auto Align:** Leaving this box checked causes Lightroom to align your images for you. You will almost always want Lightroom to align your images, so leave that box checked.

- **Auto Tone:** The next box allows you to decide whether Lightroom should apply processing to the photo. Leave this box unchecked. If you apply it, Lightroom applies some "processing." If you leave this checked, you will discover when you get the picture back into your Develop module that all Lightroom has done is moved the sliders around for you (mostly reduced the highlights and increased the shadows). While leaving it checked does give you a sneak preview of sorts, you can do the processing yourself, and better.

When Lightroom is done, just click Merge and it will create the tone-mapped image and automatically import the file into your Lightroom Library. From there, you can edit it as you please.

Other HDR Software

So now we have covered Lightroom's HDR process. In the video lesson, you saw how to use Photoshop's HDR process, and also how to use Photomatix. If you would like additional written materials on those processes, rather than attempt to lay them out here, I'll point you to some articles I have written on the topics. First, here are articles that walk through the HDR process for Photoshop and Photomatix. In addition, even though we have covered Lightroom in this packet, here is an additional article on using Lightroom's HDR function. If you want additional information about the more in-depth blending process I sometimes use, check out this article as well.

Using HDR

Anytime you think you might be dealing with a dynamic range problem, go ahead and bracket your photos. Even though I don't use HDR as much anymore, I still bracket my photos much of the time. When you do bracket, you are better off using a tripod, so there is no movement between photos, but you can also do it while hand holding.

You don't necessarily even have to *use* the underexposed and overexposed images. Just think of them as insurance. You will have them if there is a problem with your normally exposed picture. It costs you nothing but a little data, and it can save you later. It is sort of like insurance without the premium, and how great is that?

Day 26 Assignment

Fix Dynamic Range

Description:

Find a picture with a dynamic range problem. Good candidates are outdoor pictures where you have a very bright sky and a dark foreground. Fix the problem using Lightroom. If you have bracketed photos, use one of the HDR techniques from the lesson to fix it.

Keys to Success:

- Rely on Lightroom for most changes. Often simply pulling down Highlights and increasing Shadows will fix the problem.
- Decreasing the Blacks a little bit is the "secret sauce" that adds contrast and realism to your changes.
- If you are looking for the most realistic HDR, use Photoshop.
- Be careful with your HDR. Some photographers get unreasonably upset about pictures with an "HDR look."

Upon Completion of this Assignment:

You can now fix a problem that has plagued photographers for a long time. Ever since film photographers went to small film this has been a problem – and it was exacerbated by the move to digital. These tools are simple and powerful – and getting more so all the time. Use them wisely.