Happy Summer

This month we tackle a couple of photography's more confusing concepts: Depth of field and exposure from radiation.

Let's tackle the harder concept first. Depth of field is the distance in front of and behind the plane of focus that is deemed to be in relative focus. Precise terms here. All lenses, your eye included, focus light from a specific distance and project that focused image onto the film plane. That distance in front of the lens is referred to as the plane of focus. A quality of better optics is that they can be adjusted to focus at a variety of planes in front of the lens (between its closest focus and infinity). For example, if a lens is focused at 18'1.5", that distance is the plane of focus. To your eye, however, 18'1.0" also appears equally focused. So does 18'0", as well as 17'11". Objectively, only 18'1.5" is actually in focus. Our eyesight cannot differentiate the difference in sharpness for any of the distances listed above. These distances are therefore deemed to be in relative focus because we can't tell otherwise. The distance between the near and far limits is referred to as the depth of field.

Let's try a little experiment right here at the computer. Please look at something 5 – 6 feet away, holding 1 finger up about 12" in front of your face. Focus on your finger, and you will notice that details on the item 5 – 6' away are blurry. Now focus on those details and you will notice that your finger will appear blurry. Now squint and you will notice that both your finger and the more distant detail will both seem to be in relative focus! A similar example would be waking up at 2 a.m. and looking at the clock. If it first seems fuzzy, you naturally squint to get it to clear up.

You've undoubtedly seen pictures with great depth of field and with shallow depth of field. How do you control it? **TWO THINGS, AND ONLY TWO THINGS CONTROL DEPTH OF FIELD: APERTURE and IMAGE SIZE (MAGNIFICATION).** Nothing else. Period. Knowing this, how do we apply it?

Pretend we have a tripod and a camera with a 28mm wide angle lens mounted sent to an aperture of f/5.6.. We focus the camera on a parked car in the middle of a crowded parking lot, and it appears sharp. Cars nearer and farther away also look sharp. Let's now remove the 28mm lens and replace it with a 300mm lens at f/5.6 focused at the same distance. Cars nearer and farther no longer seem clear. This is because the image size (magnification) is greater in the second instance. The greater the magnification, the shallower the depth of field. Always.

Many of you own single lens reflex (SLR) cameras with a depth of field preview button. For those of you who don't, I will have an example for you in a minute. For the group that does, set your aperture to f/16. When you look through the camera, the scene looks the same as it did before (because you are again

looking at the scene through the lens's largest aperture). Now, push the depth of field button. This button allows you the view through the lens when it squints. It will look dark, but you can see an enlarged depth of field. In fact, if you can push the button in very slowly, you can see the depth expanding as the lens closes down. The viewfinder gets dark, but your picture will still be properly exposed. For those of you with simpler, yet adjustable cameras, take a series of pictures changing only the aperture control. Looking at the pictures, you will see the depth of field enlarge as you move to smaller apertures.

There is a widely held misconception that focal length also controls depth of field. This is absolutely untrue. In the above examples, only the focal length of the lens was changed. With the telephoto lens on, the image size increased. With the wide angle lens on, the image size decreased and the depth of field expanded. Changing the focal length of the lens changed the image size of the subject, which directly affected the depth of field. A proof for this is to take two pictures (in the parking lot as mentioned earlier) from the same place, over the same distance, at the same aperture. Make a print from the negative made using the telephoto. Now make a print from the wide angle's negative, enlarging and cropping to get the same image size on paper as appeared in the first print. Voila! Notice that the depth of field is identical, disproving the concept that focal length affects depth of field. Focal length is a tool that allows us to vary our image size without changing our camera to subject distance!

Sound confusing? It is. This is about the most difficult concept in photography. Almost all cameras using traditional film have adjustable diaphragms for control of the depth of field. Digital cameras do not. They use variable voltage to control exposure without any effect on depth of field! This is another instance where simple film cameras can take a better picture than a $1000 digital camera. (Digital SLRs costing upwards of $5000 using interchangeable lenses from existing 35mm SLR systems continue to employ aperture control, as the professional requires this precision.)

Let's change gears for a moment as soon as your head stops hurting.

Film that we generally use can be exposed by the radiation (light) we can see. It can also be exposed by radiation (light, heat, etc.) which we cannot see. Take X-Rays, Cat Scans or Alpha rays for examples. Kodak has been known to store some high ISO films in caves to protect against cosmic ray exposure. Airport security also uses radiation that exposes film. Whether they admit it or not, your films receive exposure at security.

As far as we can see, a single exposure to the security rays used for carry on baggage at domestic airports where the machines are in perfect tune cause insignificant detrimental exposure. Most of us, however, travel round trip. The effects of these exposures are cumulative. After 2 or more exposures, most

people can see an effect on the pictures. We have examples in both stores of such damage.

This is the best advice we can offer: Use a lead or barium lined bag when you travel. You must be sure the bag offers enough density to protect the film ISO you'll be taking with you. Some of these bags get expensive. Close to $50. I personally think this high price is unconscionable, but I don't know a better way to solve the problem. The good news is that these bags are reusable for a very long time. They offer very good protection in carry on luggage, but are worthless in checked luggage. You should NOT PUT FILM IN CHECKED LUGGAGE UNLESS IT HAS BEEN PROCESSED. The amount most of us pay for the trip, the film and the processing, make the lead foil bags a mere pittance of expense. Don't fly or sail away from home without one. We are attaching a synopsis of such bags from Sima, the major source for such items.

The Nikon field trip this year seems to be a trip to a medieval fair on Sunday, September 17. More details will follow.

Many of you have inquired about scanning your existing slides and negatives into your computers and writing them to a CD-rom for posterity. We are pleased to announce that we now carry a film scanner to accomplish this for only $199.95! The ScanAce P1800U scans at 1800 dpi (optically) and interpolates up to 9600 dpi, with a dynamic range of greater than 2.85. It connects via USB, and comes with software. Nice unit.

Also, our processing special for July features 4" prints from 35mm color negatives, black & white negatives, color slides, and all Advanced Photo System negatives. For every four prints you have made, you are entitled to an additional print an no charge. Couple this savings with the quantity price breaks we offer, and you could get 4x6" prints from 35mm color slides for as low as 38¢ each!