

## Tone Control: The Basics

The two examples below point out the basic problem of tone control. The snow image is predominately high key, using values at the far right of the gray scale. Measured with the spot meter, there is a range of only two stops between the sunlit snow and the open shadows. To the eye or to the meter, it lacks contrast.

The portrait is predominately low key, with the exception of the cat's fur and the stripes on the boy's shirt, which make the entire image a very full scale from darkest black to pure white. It is a struggle to fit such an extreme range onto either film or a digital sensor without giving up something important, so exposure for this image is critical.

If you stand away from this page and squint your eyes, you will understand the problem at a glance.



Neither image would look right if it had been exposed at the middle gray reading given by an averaging light meter, whether hand held or in a camera. Both are good examples of subjects that require interpretation. And to interpret the tonal values of these images you must start with a basic level of tone control. Here is where to start.

There is an old adage that goes "Expose for the shadows, develop for the highlights." Like most quaint sayings, this one contains truth if you know enough truth to begin with. Understand that it was good advice when all film was black and white negative film. A modern equivalent would not have the same ring, but would get you much closer to the truth— *Expose for the thinnest part of your image.*

If you are using negative film, B&W or color, that would be the shadow area. If you are using transparency or direct digital capture, that would be the highlight area. You are interested in keeping important detail where it is needed, and although dense film or noisy digital shadows are not ideal, absolutely nothing can come from clear, blank shadows on a negative or hollow highlights on an overexposed transparency.

### **Threshold Exposure Test**

Start by testing to see whether the combined errors of your exposure meter, lens aperture dial, and shutter give you a result that you can live with. There is a wealth of knowledge about how to map subject reflectance exposure to negative to print. It's a fascinating process, but life is short and if this is not what floats your boat, here is a quick way to see if you know what you need to know about your exposures.

Focus on this page, then take a light reading from a blank sheet of white paper with the same reflectance. (The back of this page will do fine.) *Apply an extension factor* to your exposure as noted below. Expose two frames of film, one at the setting you just read and one at a setting three stops darker. Process your film normally and check your results. You are looking to see where the thin black line disappears. On the first (normal) exposure you should be able to see the line all the way to the end of the thinnest part of the scale. If you can't, repeat the test with a lighter exposure. (The markings along the side of the scale are approximately one stop apart.) Decrease the number in your ISO setting.

The underexposed negative provides the gauge for where your exposure lies in relation to the results your film speed/camera setting/light meter combination has left you with—the scale should disappear entirely somewhere near its mid-point on this dark exposure. If you made it through the lighter exposure above, you can add the three stops difference between the metered exposure and how far down the scale you read the line on the dark exposure. For example, if you can see the line down to the -1 mark your exposure threshold is 4 stops below your metered "normal" or middle gray value.

If you can see the line all the way to the bottom of the dark exposure you are over-exposing your film. Try increasing your ISO setting by at least a factor of 2.

### **Bellows Extension Factor**

The f numbers on your lens are calibrated to the focal length of the lens when focused on infinity. When working closer, the lens is farther from the film, the light falls off, and exposure diminishes. For small extensions the change in distance is not significant, but the closer you focus, the more significant the correction. At 1:1 the correction is 2 fstops! Here is the formula to apply:

$$(\text{Extended Lens to Film Distance} / \text{Infinity Focal length})^2$$

For example, if with a 50mm lens I can include the whole sheet when I have extended the lens 5mm:

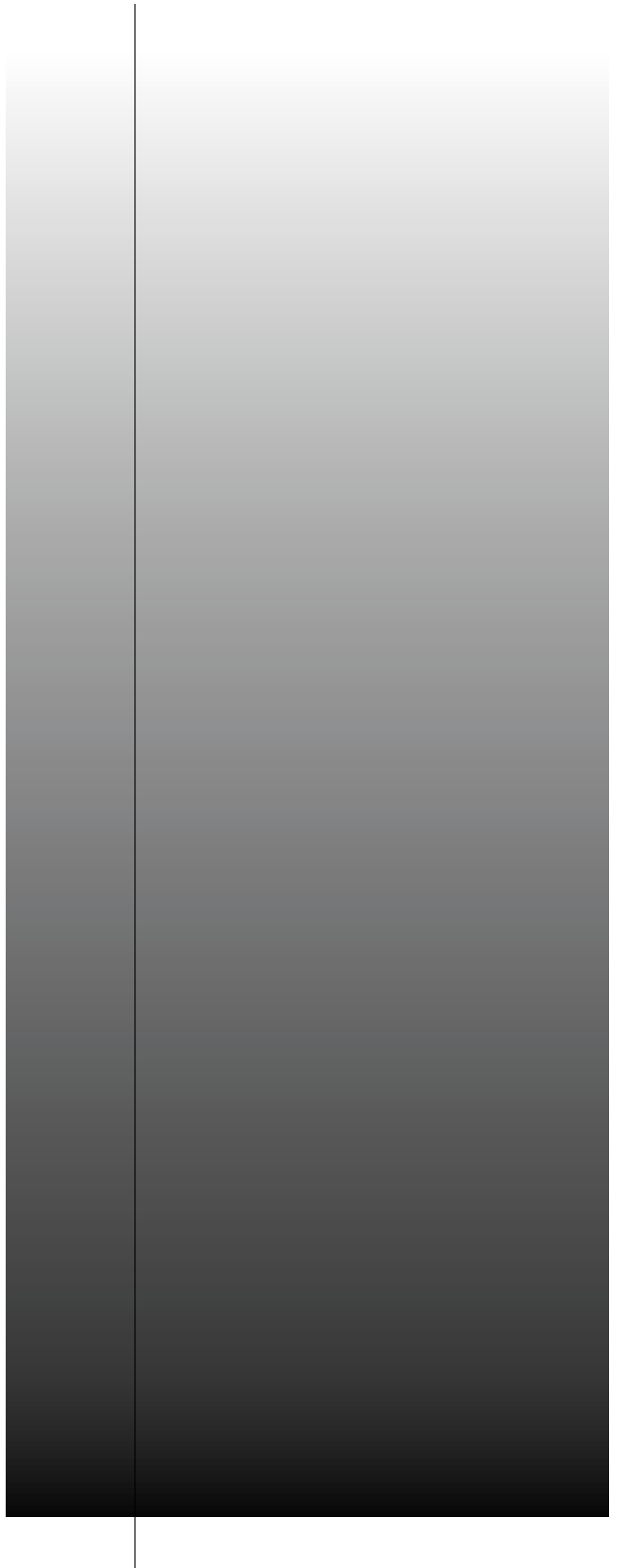
$$(55\text{mm} / 50\text{mm})^2 = 1.21$$

or ~ 1/5 of a stop—in this case not very significant.

-1

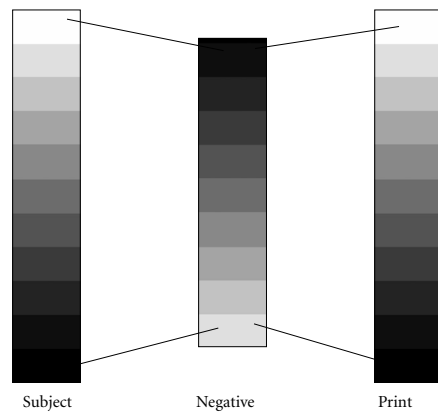
-2

-3



## Tone Control: Pushing and Pulling Values

Once you have tested your light meter and shutter, have made it through the exposure threshold test, and have results that are reasonably close, you are ready to start to push tonal values around. The process of making a fine print is a series of translations from one range of lightnesses to the next, each step imposing its limits on the next. At any step along the way you may be limited by the capacity of the next step to record the range of light you supply to it. A perfectly balanced process would look like this:

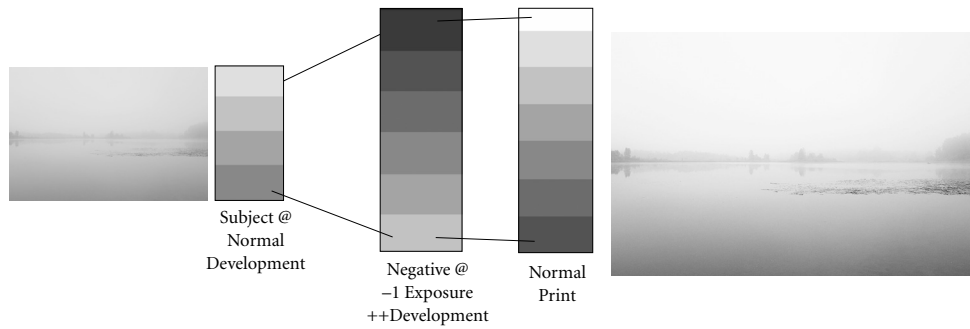


Most real life situations are not as simple as this, and many creative opportunities arise that are not satisfied with a straight mechanical mapping of subject values to print values. The goal at any step is to capture the tonal range that you need to pass on to the next step. In most cases this requires judgement. In many cases it requires compromise. In all cases, making the right decision should leave you with negatives that are much easier to print and prints that are much closer to your goal than if you leave these decisions to luck or to some film manufacturer's guideline. Within limits, you have the ability to expand or contract the range of brightnesses you can capture on your negative, and the ability to re-map those brightnesses to different parts of the gray scale.

Even without making any adjustments to development time, you now have the ability to measure the brightness of a scene and *Place* it above or below the neutral gray that an uninterpreted meter reading would give — opening up to make the image lighter or stopping down to make it darker. Exposure corrections are the first step in getting control of the values of your prints. But exposure corrections don't always do enough because exposure is only part of the problem of matching subject range to print range. The other half of the problem is contrast, the brightness difference between the lightest and darkest values in your subject, negative, or print.

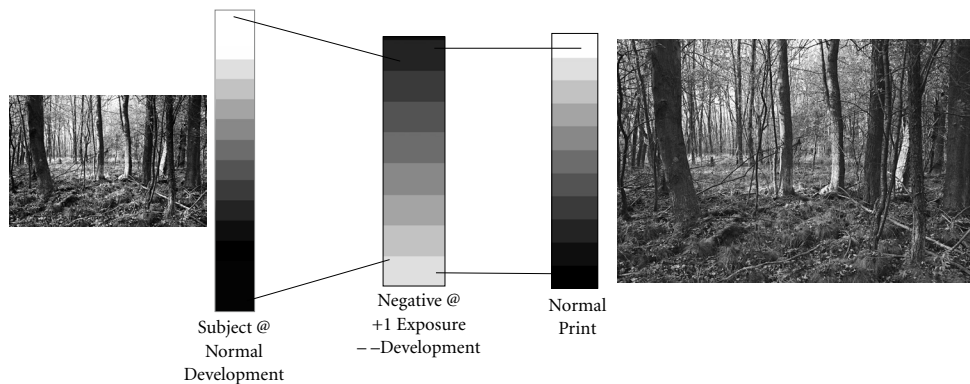
In the studio contrast is relatively easy to control in the subject. In the field, it is much more difficult, or sometimes impossible, to control. The Zone System is a methodical way to try to match subject contrast to intended print densities by placing exposures, and adjusting negative contrast by varying development time. This is not a lesson in the entire Zone System. This is a short synopsis, and a couple of handy tests to get you through some difficult situations in better shape than you would be otherwise.

Consider a very flat scene.



In this case, the judgement is made that the original scene is both too dark and too flat. The first correction made is to exposure. To get a shadow area that is darker than in the flat original, we need to start by giving less overall exposure. This leaves us with an even darker image, with no more contrast. To produce that contrast—more separation throughout the image and more density in the light areas of the sky—a significant *push*, or increase in development, is given to the negative.

A scene can have too great a range to fit on normally developed film. You compress or *pull* that range by decreasing the development time. (When the correction is large you may need extra exposure to make up for the film speed loss at the reduced development time.)



An entire career could be made of the process of testing, measuring, printing tests, measuring test prints, re-testing... Technical mastery of the medium has its own rewards for some. I find that many decisions about how a print should look do not happen until I make the print, and though understanding the underpinnings of the Zone System are very helpful in making that printing possible, I am not convinced of the absolute value of having perfect negatives. At the bare minimum I want to *place* shadow detail at a safe level, so that I have enough there even if I decide that I want a little more when I am printing. Close behind, I am looking for highlights that are printable without resorting to masking or very localized burning. For the right image, I am willing to dig deeply into my bag of darkroom tricks, but day to day, I am looking for basic raw image-making material. My goal is to get negatives (or transparencies) with as much useful, printable information as possible. To do this I need to know two things:

1. What is the brightness range of my subject, which includes consideration for the placement I have made of its tonal values? (This tells me whether I am going to need special treatment in the darkroom, and even whether I should shoot a couple extra sheets of film.)
2. What processing push or pull does it take to shift those values by a zone? (If I know my normal time and + -1, I can get very close by interpolation.)

Once you are comfortable with the answer to these two questions you can get back to the pressing issues you will face as a photographer—what to put in front of your lens to produce an interesting image.