
David Kachel's

The Primacy of Local Contrast



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Nota Bene: Though this article was written from a Zone System and analog materials perspective, its basic concepts about local contrast are equally applicable to digital practices. No attempt has been made to explain or replace the Zone System terminology used in this document.

In another article, "Zone System Contraction – A New Theoretical Approach," I discussed the importance of viewing contraction (contrast reduction) as a problem of too little contrast. This is an unconventional perspective because most of us have learned to think of it as a problem of too much contrast. I pointed out that contraction negatives, with rare exception, suffer from a characteristic curve that is too flat. Such a negative has insufficient local contrast for printing on grade 2 paper, despite the fact that the density range of that negative may be matched perfectly to grade 2 paper. See Figure 1.

In this article I will expand on the theme of local contrast and its importance, indeed its central position, to the application of the Zone System at all levels. This goes against what Ansel Adams and others have taught, so it's another instance where I open myself up to charges of heresy. I ask you to bear with me. I promise to provide ample support for my contentions.

Expose for the Shadows, Develop for the Highlights

The cornerstone of the Zone System and universal point of agreement among Zone System authors since the inception of the Zone System has been the admonition, "expose for the shadows, develop for the highlights". This advice tells the photographer to place primary importance on overall contrast (density range) of the negative. Although certainly not wrong, this concept is often not entirely correct. In fact, exceptions to the rule are so common, it is surprising there have been no challenges to the rule before now.

The rule might better read: Expose for the shadows, and unless considerations of local contrast dictate otherwise, develop for the highlights. I admit my version isn't as catchy, or as easily remembered. However, I feel the new rule is more accurate, leads to better understanding of the Zone System and to negatives that are more easily printed than does the simpler admonition. For proof of this statement you need go no further than your own darkroom experiences.

Whether or not we are consciously aware of it, most of us place extreme importance on local contrast in our printing. When printing, the concept of exposing for the highlights and developing for the shadows is almost universally ignored until the photographer can first establish acceptable local contrast. If, for example, a face or sky or any portion of a subject is too flat and pasty in a print, we will resort to higher paper grades to counteract this unpleasantness, regardless of the amount of burning

and dodging that may prove necessary as a result. Likewise, if that face or other portion of the subject is too harsh, we will resort to a lower paper grade or other contrast reducing method, ignoring the sacrifices we must make in ease of printing. But the ultimate proof lies in the popularity of modern variable contrast papers for their ability to apply different grades of contrast to different portions of the same print. In other words, regardless of what we say about how we print, the reality is that we all place local contrast ahead of overall contrast when printing. This experience is so universal that I feel no further evidence is needed to establish the primacy of local contrast above overall contrast with regard to the print.

If local contrast is so critical when printing, it follows that local contrast must be equally important when exposing and developing the original negative. In fact, I'd say it's substantially more important.

Our failure to place the importance of local contrast above overall contrast (density range is almost always what we actually mean when we say, overall contrast) when controlling negative exposure and development leads to negatives that are frequently over or under-scaled (have too long or short a density range for the paper on which they are ultimately printed) and are often difficult to print. To better understand why this is so, we must first examine a logical error we have all been making for a very long time.

Misled by Our Own Experience

Ever since we Zone System photographers learned what a characteristic curve was we have been repeatedly making the same logical error. We have assumed that the only major sensitometric requirement for a good negative (aside from correct exposure) was that the density range of our negative be paired to the exposure scale of a medium-contrast printing paper.

Unfortunately, not all parts of a subject always require the same local contrast treatment. If, as discussed above, we turn to a higher or lower paper grade to satisfy local contrast needs in some part of a print, then it should be plain that negative development originally ought to have been planned so that the negative would be properly scaled to match the higher or lower paper grade we are actually using. Why bother matching a negative to a paper (your medium contrast standard) that you won't really be using?

It should be obvious that something in our approach has been very wrong for a very long time. That something is the fact that we are always thinking in terms of overall contrast (subject reflectance range and negative density range), failing to see what is right in front of us.

What is in front of us is a chaotic natural environment with its own agenda for a reflection scale that often has nothing whatsoever in common with our original calibration tests. While we are virtually driven to see each area of local contrast as having uniform, evenly spaced steps of reflectance just like a step wedge, the reality is that one part of a subject may have high local contrast while another has very low, local contrast. Any given subject can, and almost always does, have broad variations in local

contrast, each calling for different contrast controls. One part of a subject may require normal development while another absolutely cries out for increased contrast. Were we confronted by such a situation in the darkroom we wouldn't hesitate to deal with it immediately and effectively, by selecting a paper grade suitable to the kind of local contrast we want to see in the print. However, in the field we seem to become just so much venison caught in the headlights. Struck apoplectic by these variations, we just ignore them, falling back on, expose for the shadows, develop for the highlights. This leaves us at the mercy of whatever demands for heroic printing efforts may later be made on us by local contrast needs. Fortunately, there is a new and better way.

When to Control Local Contrast

The mere act of evaluating local contrast in the field frequently leads to immediate recognition of not only the problem, but also its solution. At the time you're determining negative exposure and development, you should also determine the local contrast needs of the image, and how best to achieve them. Typically, subjects have one key area where a specific degree of local contrast will be required. Although normally we don't consciously think about this, it is always there and becomes most obvious at the time of printing. In making the print, you discover that you need a specific visualized level of local contrast in a specific area. I refer to this area as the key contrast core. When you learn to recognize your subject's key contrast core in the field, you can deal with it by way of exposure determination, filtration, development, paper grade, etc. A low-contrast core requires increased contrast. A high contrast core requires reduced contrast, precisely as it does in the darkroom when printing. However, the choice of method for raising or reducing the contrast of that key contrast core is all-important. Also, making these choices in the field allows you to get the most out of the distinct characteristics of film and paper. And it can save a lot of work and grief.

What Works Best?

When asked whether to use a low or high contrast paper emulsion to elevate the contrast of a low contrast negative, any photographer will answer, "the high contrast emulsion of course." Likewise, if asked which type of paper emulsion is best for reducing the contrast of a high contrast negative, we would all correctly answer, "the low contrast emulsion."

By design, most films have a medium contrast emulsion, while most papers have a moderately high contrast emulsion. These facts are hardly news to most photographers. From the above paragraph then, it should be obvious that we need to use film to lower local contrast and paper to raise it. It's my conclusion that most of our local contrast problems arise when we try to use these materials for the wrong type of contrast control, at the wrong time.

How to Control Local Contrast

The most common wrong-type/wrong-time error made by Zone System photographers is using film (a medium contrast emulsion) to raise local contrast. If you look at a group of medium-contrast film curves, you'll see that two closely spaced subject tones (i.e., low local contrast) will remain closely spaced, regardless of the amount of development applied. (See Figure 2.) With increased development, two similar tones will tend to increase in density in a parallel fashion, providing little or no significant local contrast increase. Sadly, any attempts to meaningfully increase low local contrast by expanded film development will meet with failure. Expanded film development works wonders with low overall contrast (short reflectance range) but is virtually useless for improving low local contrast.

Increasing low local contrast can be accomplished better through the use of a moderately high contrast paper emulsion: a higher grade (3 or 4) of paper. (See Figure 3). The experience of a dramatic increase in local contrast resulting from the use of higher paper grades is universal.

The key to controlling local contrast lies in using film (a medium contrast emulsion) for reducing local contrast, and paper (a moderately high contrast emulsion) for increasing local contrast. We are now at the point where we can examine the different variations of local contrast control requirements that we are likely to encounter in the field, to see how best to deal with each.

This new approach to the Zone System does not require any drastic changes in the way you have practiced the Zone System all along. You first determine exposure and development (expose for the shadows, develop for the highlights), as always. Only after making this determination, do local contrast considerations come into play.

After determining the need for N, N+ or N- development, you then find the subject's key contrast core. This is the area where you need a specific degree of local contrast and is usually the area of greatest visual interest. If such an area is not found, then simply proceed as always. (Until one has more experience searching them out, some key contrast cores will not be obvious until the time comes to print the negative.) After locating the key contrast core, you then determine whether it has low, normal, or high local contrast. Although this is very easy to do, it is something that is learned only through experience, and I can therefore provide no set formula or technique to follow. And my opinion about the key contrast core in your photograph has no validity. Only your opinion matters. However, I can state that areas of low local contrast are far more common than areas of high local contrast, although both frequently occur. Spot meter analysis of local contrast is often helpful, although not always conclusive.

Normal Development – Normal Core

If the overall subject contrast (reflectance range) requires normal development based on the rule “expose for the shadows, develop for the highlights,” and has a key contrast core that contains normal local contrast, then things are pretty simple: give normal development, and expect to use a medium grade paper.

Normal Development – Low Contrast Core

If a subject requires normal development but contains a key contrast core having low local contrast, then that key contrast core requires expansion. Said core must take precedence over overall contrast, making this a difficult situation with no obvious solution. Fortunately, there are a few things we already know.

Applying expanded development to such a negative will only serve to create a difficult-to-print, over-scaled negative (density range too long for the intended higher grade of paper) while not significantly increasing local contrast (see Figure 2). However, since local contrast takes precedence, we must increase local contrast in some way, and the proper way to increase local contrast, as previously stated, is to use a higher grade of paper.

Unfortunately, giving such a negative normal development, then printing on a high contrast paper means the negative will again be over-scaled, this time for printing on the higher contrast paper. The solution is to instead, contract the negative, probably to N-1) so that its density range will be matched to a higher contrast paper.

Since changes in development of a medium contrast material have little effect on the closely placed tones of a low local contrast area (see Figure 2), the resulting local contrast of the low contrast, key contrast core will remain essentially the same as if it had been given normal development. In other words, reducing development of an already low local contrast area in a negative will not significantly diminish its local contrast further. Printing on the higher contrast paper will however, simultaneously produce expansion of local contrast in the key contrast core while accommodating the contracted overall density range of the N-1 negative.

Normal Development – High Contrast Core

The remedy for a subject that needs normal development to properly reproduce its reflectance range, but has a key contrast core of high local contrast may surprise you. I’ve found that such a subject is best handled by increasing negative exposure and applying N- development. The contracted development reduces the high local contrast, while the additional exposure increases the negative’s overall useful density range. This makes the negative suitable for printing on a normal paper grade.

Not very long ago, I might have developed such a negative normally and resorted to a lower contrast paper in the darkroom. However, when you use a lower contrast paper instead of contracted development to lower high local contrast in a key contrast core, the normal local contrast of the rest of the subject often is reduced to unacceptable levels. Likewise, the negative's density range would be too short for printing on a lower paper grade.

I prefer lowering high local contrast by manipulating the film, to using a lower contrast paper for two reasons. First, as previously discussed, film emulsions are better suited to reducing contrast by design. Second, film contraction (contrast reduction) produces proportionately greater compaction in areas of high local contrast than in those of medium or low local contrast. (See Figure 4.)

The astute reader may well ask at this point why the rule that contraction negatives are best printed on high contrast paper is, in this case, broken. The answer is that contraction negatives are printed on higher contrast papers because of their inherently low, local contrast. The negative resulting from the above procedure will not have low local contrast (in its key contrast core), but rather normal local contrast (after the prescribed contracted development) and should print well on normal paper.

Normal Plus Development

Now we will deal with low overall contrast subjects (short reflectance range) requiring expanded development and having key contrast cores of varying local contrasts. It is this group of subjects, and in fact only one of them, that produces the most frequent difficulties when you place more importance on overall, rather than local contrast.

Normal Plus Development – Normal Contrast Core

A subject that needs expanded development but has normal local contrast in a key contrast core will generally not require treatment any different than has traditionally been given. It is unlikely that expanded negative development will produce an offensive level of local contrast in the key contrast core. However it is somewhat more likely that you'll get offensive levels of local contrast if you use higher paper grades instead of expanded negative development, or in addition to it. Regardless of the circumstances, the combination of expanded negative development and normal local contrast is not likely to produce difficulties.

Normal Plus Development – Low Contrast Core

The subject type that produces the most difficulty when local contrast is ignored in the field combines low overall contrast (a short reflectance range) and a key contrast core exhibiting low local contrast. We know that any attempt to increase low local contrast by way of increased negative

development is doomed to failure (see Figure 2), yet we have traditionally dealt with these negatives by giving expanded development for the low overall contrast (short reflectance range). The resulting negative must be printed on normal paper for its overall contrast (density range), but at the same time needs a high contrast paper to increase the low local contrast in the key contrast core. Since local contrast always has priority, such negatives typically get printed on a grade 3 or 4 paper. This forces us to do extensive dodging and burning to accommodate a negative that is now severely over-scaled for the paper being used. (I venture to guess that the foregoing description sounds more than slightly familiar to every experienced Zone System user.)

I've found that the proper treatment for a subject requiring expansion while having low local contrast in its key contrast core is to eliminate or reduce expanded negative development, replacing it in part or in whole with a higher contrast paper. The high contrast paper not only does the job of expanded development, but also significantly increases local contrast in the key contrast core. The resulting negatives are much easier to print than those produced by the old approach.

Unfortunately, this technique has its limits. Higher paper grades can offer overall increases equivalent to only about N+1 to N+2, and can therefore replace negative expansion only to a limited degree. As a result, it may often be necessary to combine higher paper grades and expanded negative development. For example: if you need N+2 expansion and an increase in local contrast, but can get no more than N+1 out of your highest paper grade, combine N+1 negative development and the higher contrast paper. This will achieve both ends.

Normal Plus Development – High Contrast Core

A subject with low overall contrast (a short reflectance range) and a key contrast core exhibiting high local contrast is an extremely unlikely situation. However, if you find one I suggest you refuse the blindfold and accept your fate with quiet dignity. This is the Catch-22 of local contrast. If you attempt to expand overall negative contrast, the already high local contrast in the key contrast core will be severely increased. If you try to reduce local contrast in the key contrast core by applying contracted negative development, the overall density range of the negative, too short to begin with, will become shorter still, requiring a higher paper grade. Naturally, the higher paper contrast will partially nullify the contracted development of local contrast. Since there is no way around this dilemma, the best approach is to proceed as always (expose for the shadows and develop for the highlights) ignoring local contrast, and make the best possible compromises under the circumstances, when printing.

N Minus Development and Other Issues

The final group of negatives with which we must deal are those requiring contraction (contrast reduction) and having varying (low, normal or high) local contrast in a key contrast core. This group can be simply dispatched all at once. In a previous series of magazine articles, Zone System

Contraction: Part I – A New Theoretical Approach, I showed that all contraction negatives suffer from insufficient local contrast. This lack of adequate local contrast results directly from contracted development. By printing such negatives on higher contrast papers, you can restore much of the lost local contrast. This rule of course still applies, and you can safely assume that considerations of local contrast will not override contraction decisions made in the field.

In the future, this article will be updated, and expanded to include material on local contrast in digital photography.

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