



ONE MAN'S TRAVELS  
**BEYOND THE ZONE SYSTEM**  
OR  
ADDING MORE TOOLS TO THE KIT

by Bill Waldron

**In 2000, Bill sent a letter to Phil Davis, author of *Beyond the Zone System*, in which he offered some suggestions for the tool then called the WonderWheel. Davis integrated Bill's ideas, along with others, into the renamed BTZS Power Dial ©. Bill apprenticed with Davis for seven years and credits him with weaning the author from sole reliance on his spot meter and for opening his eyes to the systems *Beyond*.**

*Rocks, Tree, Oak Creek*  
All photographs courtesy © the artist

**B**lame it on the weather in Ohio where, if anything was constant, it was change. At least that's how it was thirty years ago when, after carefully aiming (but not focusing) my newly acquired Graflex 4x5 press camera at a test card affixed to the shaded side of my apartment building, clouds would appear in the sky from out of nowhere. One minute, there'd be a clear, unwavering spot-meter reading reflected from the card; the next, anywhere from ½ to 2 exposure values less. Or more.

When quite young, I'd watched from my father's side as, after composing a photograph, he held up a Weston light meter before clicking the shutter on his 2 ¼ by 3 ¼ Graflex camera. Narrating his thoughts for my benefit, he'd explain how he'd made exposure adjustments to produce a "good" negative. I can recall little from those days except that he had a system<sup>1</sup>, one that required more than pointing and clicking. Many years later, it became apparent that many if not all of the master photographers whose work I so admired had systems, too. To judge from their results, these systems were exceptional indeed.

And so, I studied my Adams<sup>2</sup>, Picker<sup>3</sup>, White, Zakia and Lorenz<sup>4</sup>, choosing Ansel's film testing procedure, which had taken me to my back yard, aiming at that card. After days spent mostly waiting for steady and sufficient light, I'd established what seemed to me a reasonable effective personal film speed (somewhat slower than the manufacturer's rating) and developing time for a normal seven-stop subject (eight minutes, if memory serves.) More waiting and testing produced data for contracted and expanded development, at least to the normal-plus-or-minus one ranges. With that, and with attending to full and part time jobs, I began to run out of time. Fortunately, the data I'd derived seemed to serve me well and I also had what every gadget-loving photographer needs, two tools for the field: a modified Pentax spot<sup>5</sup> meter with zone sticker on the meter dial and a Zone Systemizer dial (by Dowdell and Zakia.)

I began to enjoy some excellent negatives, ones that required little if any darkroom manipulation to render the tonality I'd hoped for. There were also some significant flops, especially when attempting non-normal development. Or, when I hadn't yet developed sufficient "zone vision" to match a scene's luminances with the desired print values.

The process itself though was intensely gratifying. Not only was there the magic of the sparkling ground glass, the "huge" negative, and the gradual emergence of the image in the developer, there was a sense of *insight* into the behavior of the photographic materials under different conditions. Here was some science to satisfy the soul. There arose in me dual, complementary desires to know more about both the process *and* its ultimate outcomes. Sure, I wanted to make outstanding photographs, but I also wanted to understand and control the tools that led to, and were essential to, that outcome. I wanted the fullest possible arsenal of photographic weapons at my disposal when coming upon a memorable image. The zone system principles to which I'd been exposed so far were clearly on the mark and whetted my appetite for *more*.

There was a rub. To even approximate the proficiency of craft so abundantly evident in the work of the masters would require the same thing a musician must do to play Carnegie Hall: practice, practice, and practice some more. In the particular case of photography, this meant developing the most penetrating knowledge possible of the materials and methods, including their limitations and possibilities, and using this knowledge *in the field*, repeatedly applying theory to practice, and then feeding both successes and failures back into the process data to refine the outcome. For me, the rub was time (not to mention native ability!).

Then, a staggering coincidence. While browsing the books in one of two photographic shops (remember those?) in my hometown, I locked on as if by magnetic attraction to the title *Beyond the Zone System*, 1st edition, by Phil Davis (fondly shortened to BTZS). I swear I heard a trumpet fanfare and angel song. Right up front, in the preface<sup>6</sup>, Davis argued that the discipline (sensitometry) advocated in his book is "actually quite easy, and there's a dramatic saving in time and materials."

1 Looking back, I realize that my father usually took one shadow reading or, in some instances, an averaged reflectance reading

2 Ansel Adams, *The Negative*, 1981, Little, Brown and Company

3 Fred Picker, *Zone VI Workshop*, 1974, Amphoto Books, American Photographic Book Publishing

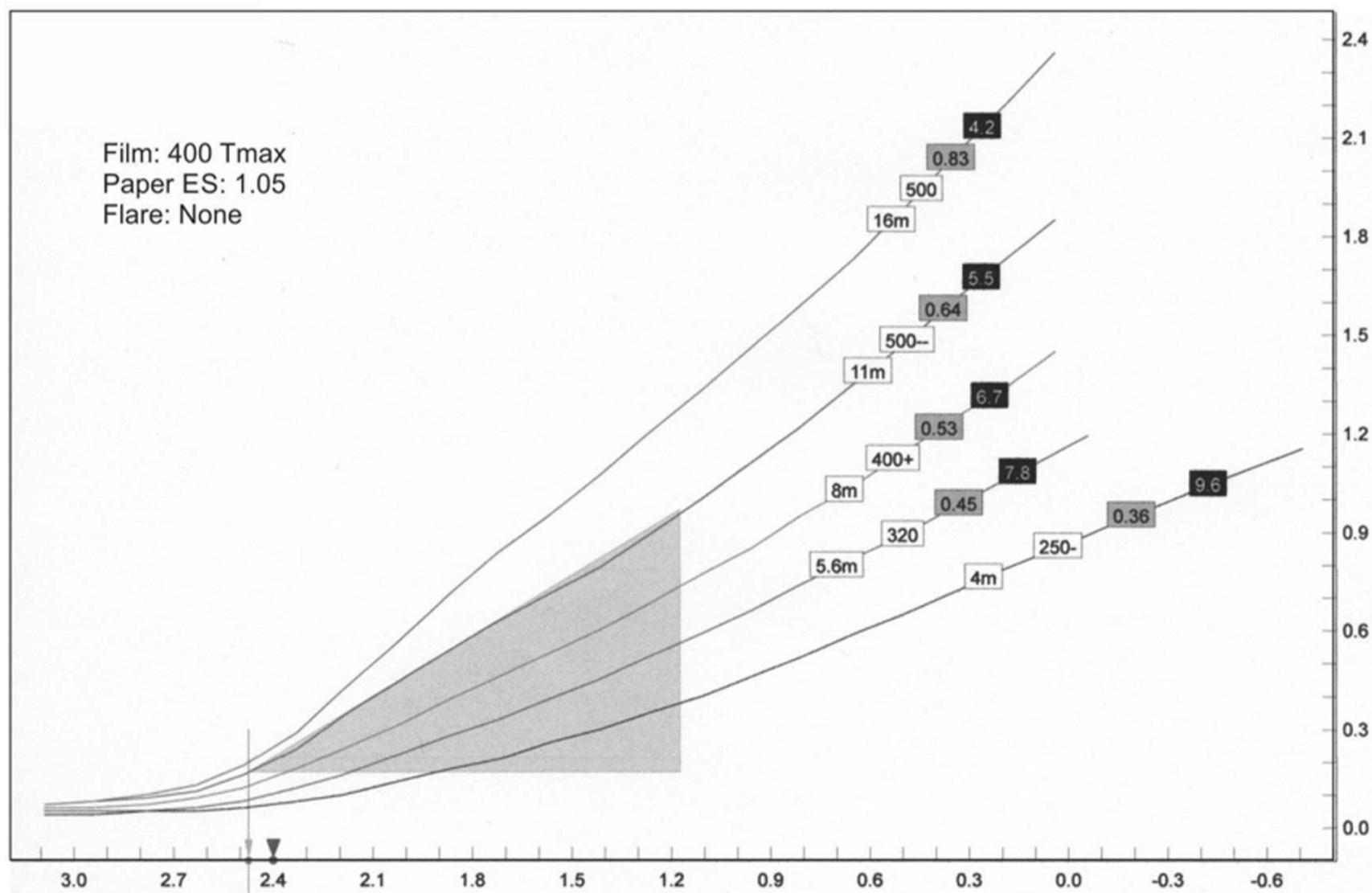
4 Minor White, Richard Zakia, Peter Lorenz, *The New Zone System Manual*, 1976, Published by the authors

5 Obtained from Zone VI studios, Newfane, Vermont

6 This quotation is from the preface to the 4th edition (1999) of *Beyond the Zone System*, but I recall the same, or similar, language in the 1st edition, which I no longer have.

I wasn't in the market for an entirely new approach, having very nearly accepted the dictum often heard (or read) amongst zone system practitioners, that "if it was good enough for Adams, it's good enough for you!" Some may have, and probably did, say that I sounded like a true believer, with all that means in terms of openness to new ideas, when it came to the zone system.

But the book *included* a detailed and objective review of the zone system, reducing my entrenchment just enough that I read on. When I reached the point where the recommended film and paper testing approaches, which were conducted *indoors*, were laid out, I was sufficiently hooked that I chose to build the author's improvised densitometer. The assembly cleverly mounted a light meter on a stand that focused the meter's sensor on small areas of negatives or paper. For the first time, I not only could gauge the elusive ".1 over b+f" speed point, I could *plot the film's and paper's* complete characteristic curves (see figure 1 for an example of a film curve family). One sheet of film, exposed through a Kodak twenty-one step tablet, then developed in chemistry of my choice for a specified time was enough to plot the curve. Four more sheets, exposed identically, but developed for different times (across a reasonable range), filled out the curve family. Paper tests were done similarly and gave insight into the density ranges and exposure scales of various papers. Done with care, the curve families produced by these procedures were the foundation for all that followed, including zone system methods.



**Figure 1.** Example of typical film curve family derived by actual BTZS test methods. Note that each curve is described by development time, effective film speed, average gradient, and subject brightness range for the selected paper exposure scale of 1.05 (typical for grade 2 of the paper in question.)



**Figure 2.** *Kingwood Greenhouse Atrium.* Zone VI 4x5 camera, 120mm lens. Negative made after establishing film and paper characteristics for Kodak 400 TMax film and Fine Art VC paper, respectively. These data established that the exposure scale for the paper was 1.05 for grade 2 and .84 for grade 4. Because I wanted the low zones to be “expanded” somewhat in the print, I exposed and developed the negative for grade 4 (ES=.84). The plant in the distant alcove was spot-metered and placed on Zone II, the bright blooms of the mums, on Zone VIII. Exposure was 5 seconds at f64, development, to an average gradient of .34 (4 min. in Ilford DDX 1+6 at 70°. Effective film speed was 220. This type of zone gradation choice is one of the effects possible with BTZS data and is explained in the text. The negative prints effortlessly on the desired paper grade.

There were hiccups along the way. The improvised densitometer read films with reasonable accuracy, but flare degraded reflected readings from the high densities of papers. In the early days of practicing BTZS methods, just as when first establishing zone system readings, I found myself saying “close enough” and worked with the data I could reasonably derive. Later, as I more fully realized the potential of the BTZS system, I invested in mid-range transmission and reflectance densitometers<sup>7</sup>, the total cost of which was about that of a good large format lens. I thought it a good investment at the time as I do to this day.

Another hiccup was that of establishing a calibrated light source that would provide consistent exposures of film and paper. Davis again came to the rescue, recommending the use of one’s enlarger to provide a light source, and either a timer or shutter to time the exposures. Calibrating this setup for the film’s speed point took a few trials (a total of about six hours), until the curve family (of 100 TMax<sup>8</sup>) organized itself around a useful point in the graph space. This point on the axis of the graph became the speed point standard for other films, exposed identically to the calibrated illuminance.

Despite the hiccups, which were small matters in hindsight, I persisted and ran successful film and paper tests on four frequently used films and on three different papers. It would have been unthinkable, and probably unaffordable, to gather this much data with traditional techniques. These data, alone or in combination, enabled me to use zone system methods (measuring a portion of a subject’s luminance range with a spot meter, matching these to shades of grey, usually zones III and VII, to determine exposure and development time) with much more confidence and accuracy. More science for the soul. If by now you’re wondering how my negatives looked in these early BTZS day, have a look at figure 2.

But I hadn’t yet learned all of my BTZS lessons. Having graphed data of both film and paper characteristics enabled me to graphically “follow” a subject’s luminance zones from the metered value through to their appearance on the final print. The film photographic process necessarily introduces distortion of the evenly illuminated scene. The pattern of this distortion, from the lowest grey value to the highest, is called gradation. I’d learned from visual inspection that some negatives “looked better” on certain papers than the same negatives on others. The differences could be attributed to, among other things, the gradation characteristics of the film-paper combinations. With BTZS data, I could combine film and paper curves to anticipate this distortion and, in a sense, shift, expand, or contract the zones within an image. A brightly illuminated subject, say, where zones VII through VIII predominate, may be enhanced if these zones were slightly expanded to favor their contrast. Figure 3 charts the gradation characteristics of prints made on three papers from TMAX 400 negatives, processed in three different developers to a paper exposure scale of .88 (about grade 4.) I’ve never taken a chart like this to the field, but I certainly have used them to narrow down the material combinations I plan to use, based on the subjects I’m likely to find.

My BTZS journey was made much easier along the way with the appearance of a software application, called BTZS Plotter, which quickly and easily took my raw test data and converted it to the graphs I’ve described and/or illustrated thus far in this article. This application is relatively inexpensive and is distributed exclusively by TinyOctopus, LLC.<sup>9</sup> The Powerdial ©, a “slide rule” device, is available from the View Camera Store<sup>10</sup>, is calibrated to typical film curves, and serves as a handy backup in the event of an I-device accident. Also available, through the Apple App Store, is an extraordinarily useful application, BTZS ExpoDev ©, which uses your personal materials test data to calculate exposure and development information, using spot or incident metering. The View Camera Store can also perform many of the sensitometric tests mentioned in this article. For example, a set of films exposed to the standard lighting described can be sent and then read/plotted after you’ve developed it using your preferred methods.

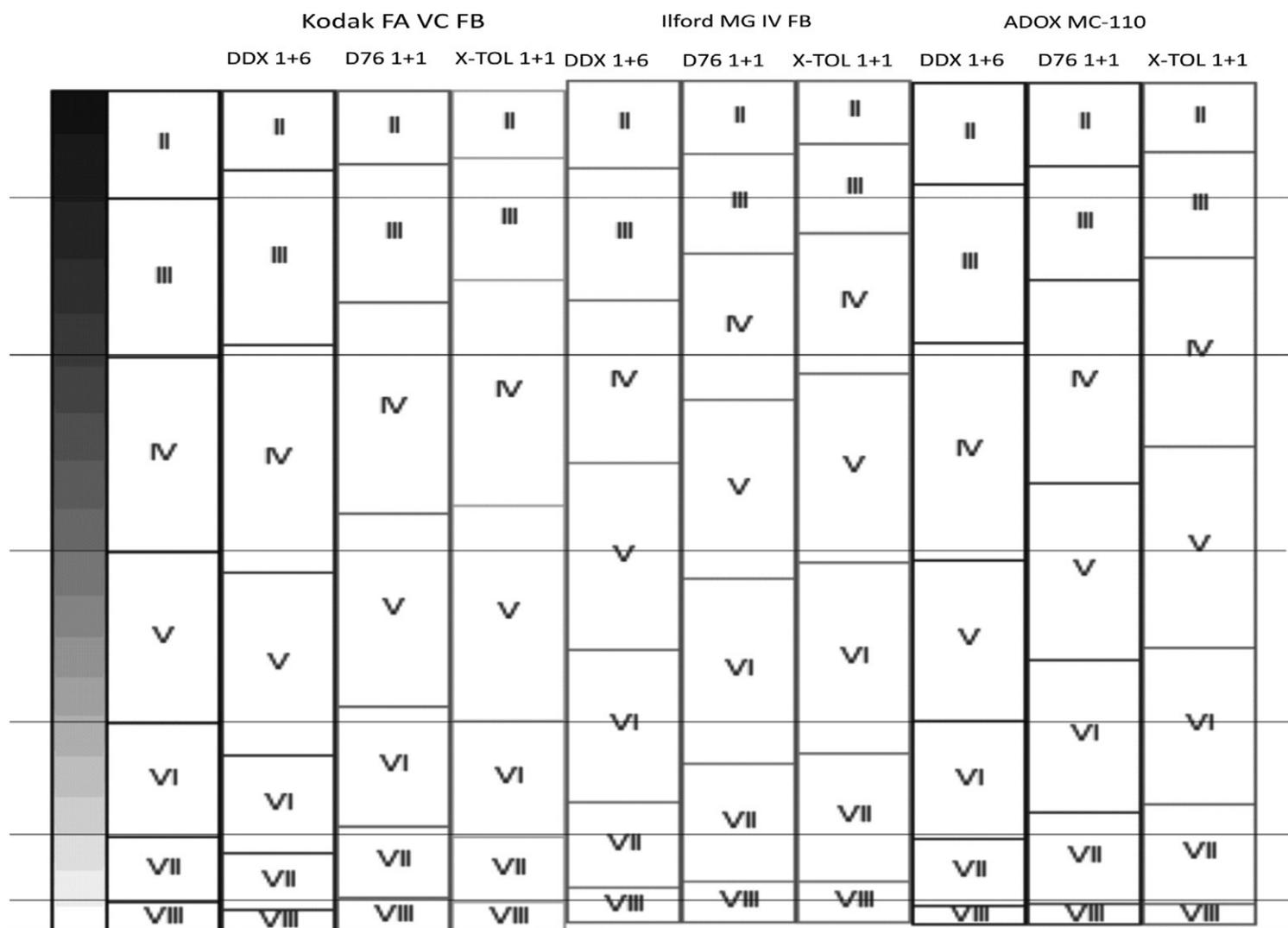
You may have been tripped, as I initially was, by the mention of *incident* metering. In fact, in the early stages of my BTZS studies, I stubbornly stuck with my spot meter, assuming that I could achieve more precise zone

7 By X-Rite, Inc., Grandville, Michigan

8 The effective speed of this film had been previously determined, by Davis, to be very close to 100.

9 <http://tinyoctopus.net>

10 <http://www.viewcamerastore.com>



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**Figure 3.** Gradation bar chart for the combination of Kodak 400 TMAX film, developed to exposure scale. 84 (about paper grade 4.) in three different developers, and Kodak FA VC, Ilford MG IV, and ADOX MC-110 papers. The far left bar (shaded) and the lines projected to the right represent “normal” print gradation. Note the zone changes in all the other material combinations. It may be useful to visually follow, say, Zone V from left to right, noting the changes in grey value and width of the zone. More useful science for the soul.

placements by studying areas of the subject and placing them (or noticing where they fell) on appropriate shades of grey. In two BTZS workshops, I continued to use my spot meter despite some gentle nudges from the instructors and the very obvious way in which I stood out from my companions, most of whom were busy with their incident meters. We were having equal success, from what I could see...and they weren't working as hard.

Then, about ten years ago, I was asked by Fred Newman and Phil Davis to play the role of photographer in a short BTZS video<sup>11</sup>. With videographer (Fred) in tow, we visited about ten subject sites. In each, I was asked to set up, meter, and photograph the scene *using incident metering* while Phil observed and offered advice (quietly and often, if memory serves.) Phil taped a brief tutorial that led into the series of examples. Sometime during this exercise, I “got it.” And the negatives, some of challenging subjects, were excellent. Figure 4 is one the negatives made during this production.

Incident metering, as it turned out, was (and is) a matter of lassoing the subject's brightness range, from low end to high end, and letting the zones in-between fall where they will, safely caught in the lasso. The incident meter is placed in the brightest area of illuminance, which pegs the upper end of the brightness range (the upper end of Zone VIII.) Then the meter is placed in a shadowed area, in a location where the slightest hint of texture appears (corresponding to the lower end of Zone II.) The difference in readings from these

11 Clips from this video can be seen at <https://www.facebook.com/pages/View-Camera-Store/159930977409995>



**Figure 4.** *Stump, lichen, leaves, Davis residence.* An example of an incident-metered scene of low contrast, expanded in development to the print values seen here. Zone VI 4x5 camera, 120mm lens, positioned about 3 feet above the subject, necessitating a bellows factor adjustment. Kodak TMax 400 exposed for  $\frac{1}{4}$  second at f22. Developed in Ilford DDX 1+6, 70°, to an average gradient of .77 (12m, 48s). Expansion achieved by setting both high and low meter readings to the same EV, 10.5, for and SBR of 5.0.



**Figure 5.** *Flywheel, Gears, Jerome, Arizona.* Example of incident-metered scene contracted in development by tipping the meter toward the sun to raise the high EV reading (and thus to “lasso” the bright edges of the metals.) Zone VI 4x5 camera, 210mm lens. Subject brightness range (SBR) 8.1, 100 TMax exposed ¼ sec @ f22 and developed to average gradient of .47 (7m 31s at 70° in Ilford DDX 1+6.)

two areas, with the addition of five stops for the subject<sup>12</sup>) is the subject’s brightness range (the SBR), which determines development time (and the subsequent high value), and the low reading establishes the exposure. Expressive adjustments (expansions, contractions) to most subjects can be easily achieved with changes to the meter placement in the scene. See Figure 5 for an example of such and adjustment with a subject of “long” brightness range. For a more thorough (and doubtless more articulate) explanation of the incident system, see <http://btzs.org/Articles/Sensitometry%20Part%205.pdf>.

The Zone System is designed to capture the same data as the incident system (subject brightness range, shadow value) but does so from the “inside out.” It carves out a portion of the brightness range (typically zones III and VII) and extrapolates the data from there to determine development time and exposure.

Both systems are proven and, together, constitute a formidable, complementary combination. In my experience, most scenes can be incident metered and thus require a bit less visualizing effort than spot metering. Where the high value cannot be “walked into” or read at the camera position, the spot meter is probably the wiser choice. Figure 6 gives an example of a subject that was inaccessible for incident readings.

12 The difference in most subject’s luminance values, from brightest to darkest, rarely exceeds five stops. These stops are included in the “lasso.”

I've been told that some photographers have objected to some or all BTZS practices. Fortunately for me, I hadn't practiced so extensively with the traditional zone system that it had become deeply habituated. I was still developing zone "eyes", ones that could readily and reliably find various zones in a scene. And, as I've said, the time-consuming trial and error procedures of the traditional zone system were limiting my ability to obtain all the data I needed. BTZS came along as I was struggling with issues like these.

But nothing (that I know of) in BTZS practice suggested that the traditional zone system had to be discarded or that, in the hands of a competent practitioner, was in any way inferior to BTZS methods. Instead, BTZS practitioners were offered *additional* processes to augment, or to provide alternatives to, other methods. At the very least, BTZS is so efficient that it can produce detailed working data for every material combination you are likely to use in much less time than most, if not all, of the previous systems required. As an example, a few weeks ago, after acquiring my first 8x10 field camera, I ordered film sheets exposed to a calibrated step tablet light source at the View Camera Store. I processed the films, read the densities, and plotted them in the BTZS Plotter Software, deriving good working data in less than two hours. In another few hours, I will match the negative data with my preferred contact printing papers and have all I need to know to develop my negatives to a targeted exposure scale (ES) and to evaluate the gradation possibilities of developing to different ES values. I'll plug all the data into my iPod Touch<sup>13</sup>, enabling me to take my personal working data with me into the field.

My BTZS travels have been rewarding and deeply edifying. I've learned much more about *how* the photographic process works and developed a fact-based understanding of what my materials can (and, just as important, cannot) do. I go to the field with efficient methods and tools, which begets confidence and liberates me from the "technical" side of the craft to concentrate on the *art*.

The system offers all the advantages of traditional, spot-metering approaches along with a novel and proven use of the incident meter. And, though the system is most often used with sheet film and large format cameras, it is equally valuable with smaller and lensless formats.

And, when I goof, BTZS data can often help me to pinpoint where I went astray.

Good shooting.

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13 Running the BTZS ExpoDev application, previously cited.



**Figure 6.** *Tree, Icicles, Old Man's Cave Gorge.* This striking image was tucked into a gorge wall on the other side of an unfordable stream. Because lighting conditions in this and many other areas of the gorge area are very uneven, I was not confident that I could simulate the subject's illuminance values from the camera position. Further, the subject's brightness range (5) was much narrower than that seen in the developed negative, calling for expanded development. Spot-metering led to this quite acceptable negative.



*Brothel, Ruins, Rhyolite, Nevada*

# BILL WALDRON

## *Bio*

**B**ill Waldron lives in north central Ohio, where he has practiced large-format, fine art photography as a hobby for over thirty years. Retired from dual careers in the telephone industry and the Ohio Air National Guard, he now devotes his time to volunteer roles in the community.

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