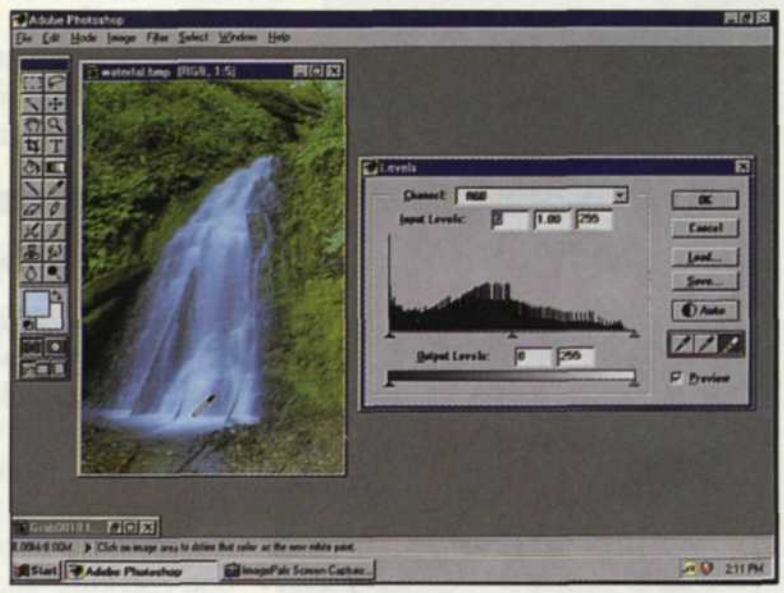
DIGITAL DIRECTIONS

"PIXEL PHYSICS"

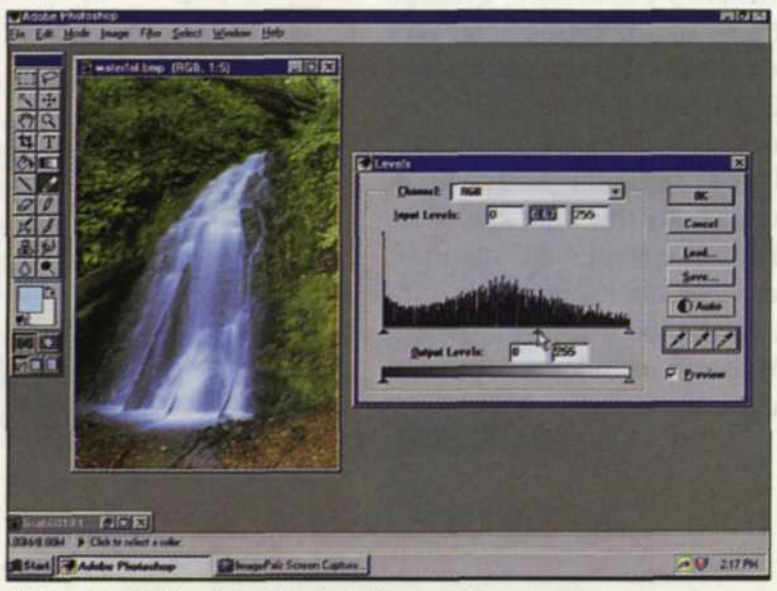
Original scan

Final image

Original Scan



Using the Eyedropper tool to select highlight area.

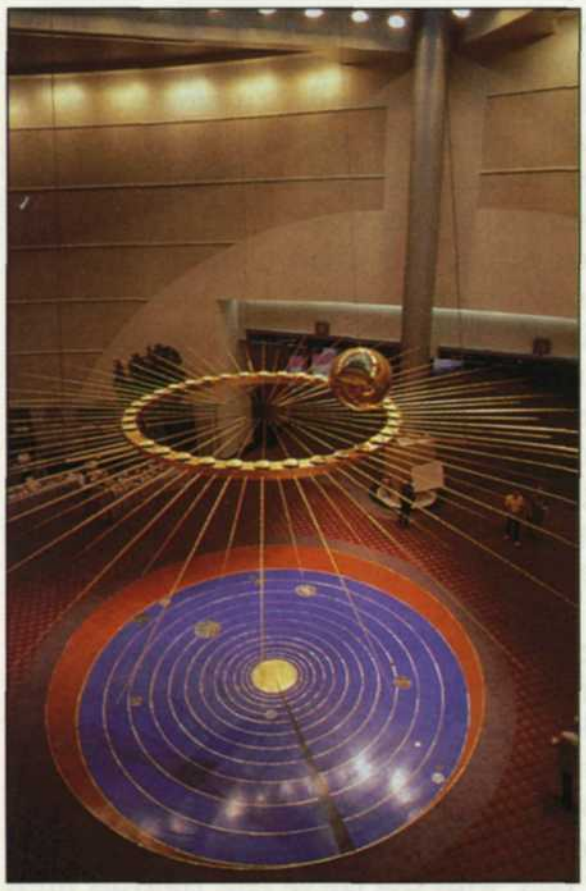


Using the Slider to adjust midtone area.

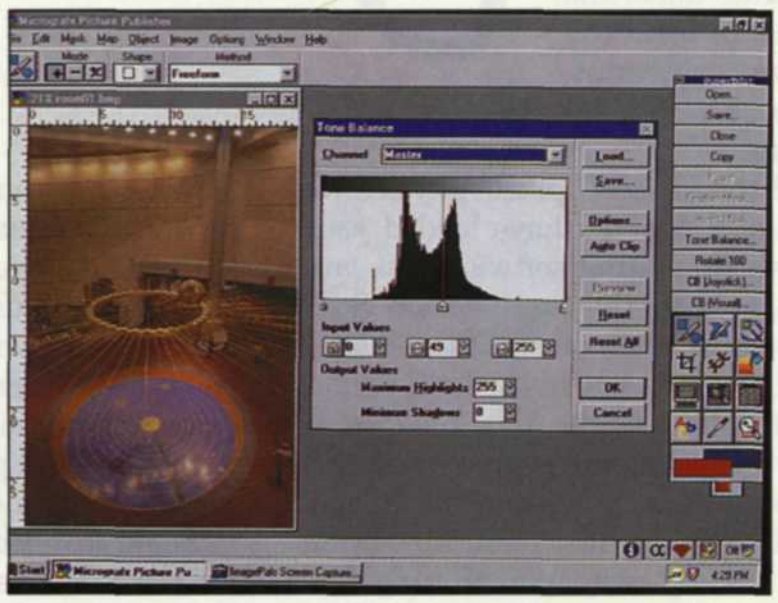
Before and after adjustmnet to tone curves.

Based on Digital Curves

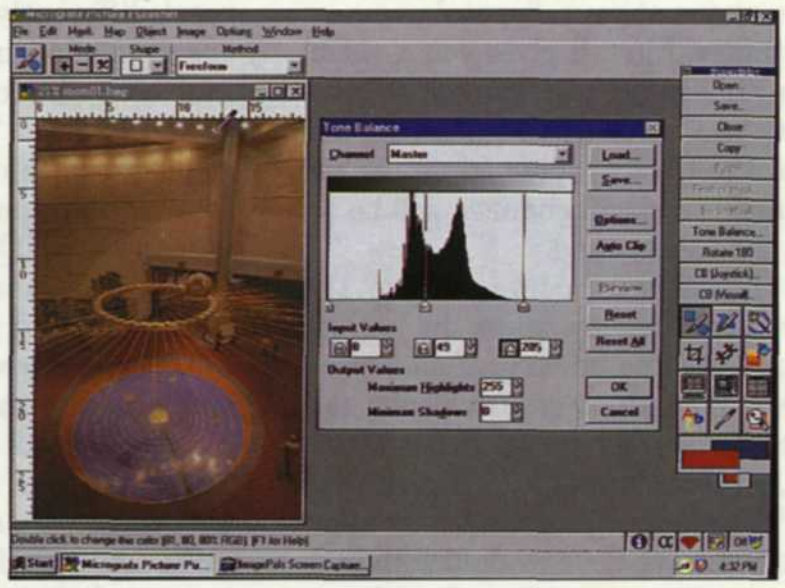
Original scan



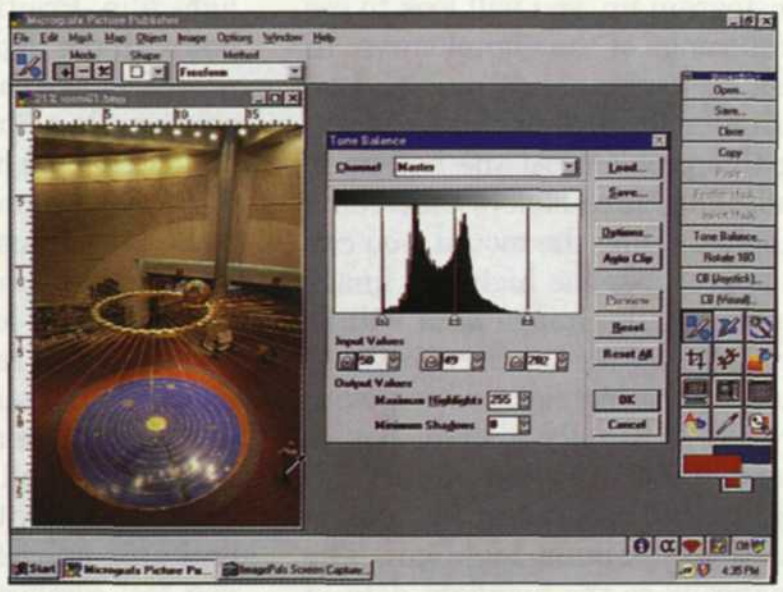
Final



Histogram



Eyedropper selection of highlight curves.



Eyedropper selection of shadow curves

Jack & Sue Drafahl

WHEN TRADITIONAL photo labs first venture into the digital world, they often think it will be as simple as just adding new equipment. Install it, turn it on and it will immediately generate income. Unfortunately, the digital world is a lot more complicated. It's this complexity that often leads digital labs to become frustrated by all the possible variations available.

Quite often the source of problems occurs during the editing portion of the "input-edit-output" process. In order to achieve total control over the range of the input image, you need a good understanding of traditional photographic curves.

COMPUTERS ARE NOT totally infallible.

Without this background, you will spin your wheels in digital. In the digital lab, you are no longer restricted to the laws of "silver" physics. Instead you now operate under the laws of "pixel" physics. You can bend the photographic curves any way you want. This increased flexibility can be very helpful, but it can also be dangerous.

To completely understand the laws of "pixel" physics we need to start at the beginning. Once you have loaded your scanned image into your favorite editing software, you are ready to edit the image range using the curve editor. Software manufacturers can't seem to agree on what the digital curve editor should be called. It can be called the level editor, curve editor, tone curve editor, tone editor, tone balance or histogram editor. Whatever it is called, its primary function is to modify the digital photographic curves of the image. First-time image editors find cropping, dust removal, editing color or exposure fairly easy, but shy away from altering tone curves. This is a shame because the curve editor is one of the most powerful digital tools you have at your disposal.

The curve editor does two things. First, it gives you a visual display of how the data in your image fits on a standard photographic curve. Second, it lets you move and re-arrange this data, so that it fits better on the photographic curve. At the same time all this is happening, the visual changes will be reflected in the actual image in the background.

Two types of displays are available for curve editing. The first type is called a histogram. This display shows the percent of gray values along the x-axis and the amount of each pixel within each value on the y-axis. The second type of display is a standard digital curve representing your image. Most of the more advanced programs allow you to edit the curves with both displays, while some of the simpler programs only allow you view the data in the histogram. We have worked with both displays, and find the histogram editor easier to work with.

When you first bring the histogram up, you will look to see if the image fits within the full range of the digital curve. In many cases the scan may not be perfect, and the highlight data will fall short of the maximum allowed. At this point you have two ways of correcting this problem. At the bottom of the histogram you will usually find three sliders controlling shadows, midtones and highlights. Using the mouse, you can move the slider over until it approaches the highlight image data. When you release the mouse, the image data will be adjusted so that the highlight data now fits the curve better.

The second method of changing the highlight data is with the highlight pointer control. It is usually a small box or eyedropper in the highlight end of the histogram. Select this function with your mouse pointer, and then touch the area in the image that you want as the maximum highlight. The curve will then adjust automatically so the highlight data in the image fills the digital curve.

Next, look to see if the shadows in the image fit the digital curve. In most cases, there is a small space at the left with no data. Move the slider so the shadow data fits the curve.

Finally, look at the overall image. If the important midtones in the image still look dark, move the slider to the left, and the midtones will increase. If they are too light, move it to the right. You can also use the midtone pointer and select an area that you want to be the middle of the curve. Once you do this, the remaining data will automatically fall in place.

The auto curve editor is a short cut that lets the computer do all the operations we have just described. When you first decide to edit the curves, you can press this button and view the results. If they are satisfactory, you have saved yourself a lot of time, and you can move on to perform other edit functions. If the computer did a poor curve edit, you can select the "Undo" and manually edit the curve. Computers are not totally infallible.

Some scanned images will have what is called a cross-over in colors. This is due to mixed lighting in the original image, bad processing, or a poor scan. In this case the color curves react differently when a general curve edit is done. A good example of an image crossover is one with yellow highlights and blue shadows, or one with a magenta highlight and green shadows. These images require separate edits for each color curve that is crossed. A specific color to edit can be selected via a pulldown menu. If you are editing a 24-bit color image, you will be able to edit the red, green or blue curves.

First, you must analyze which curve is crossed. Select that curve edit and play with the highlight and shadow sliders until the crossover is minimized. Once you adjust this curve, you may find that you also have a smaller crossover in a different color. All this tells you is that you had more than one color crossover, but couldn't see it until you fixed the main one. Work with each until all are corrected.

We use this function in our lab when a client brings in images shot under tungsten or fluorescent lighting on daylight film. Printing the image in a traditional lab is difficult, but with the digital curve editor, you can easily create an improved image that can be output as a new negative or transparency via a film recorder.

Now that we have given you a taste of these practical curve edit tools, we must issue you a warning: Don't overuse these tools. If you push the sliders too much, or try to drastically change the data, you risk the chance of getting a posterization effect and loosing data. When an image needs a massive correction, we recommend making the changes in steps, saving the image out under a different name each time. You may find that the image partially corrected is more desirable than one corrected all the way.

The best way to learn to use the curve editor, is to take several poor images and play with the curve edit controls until you feel comfortable with them. Remember, each time you make a change, the visual results are displayed. If you are not satisfied with the change, simply "Undo" and try again. You only risk the loss of time and pixels, but we think you will find the end results will be well worth your effort.

Jack and Sue Drafahl own and operate a custom lab in Portland, OR. They are also professional photographers, specializing in underwater photography.