Portrait of an

Artist

by Cathy Lu

How one man is taking digital photography to new heights

Some people might say Stephen Johnson lives a charmed life. That's because as a digital landscape photographer, he's had the opportunity to see some of the most beautiful places in the country. From Olympic National Park in Washington State to the Everglades in Florida, Johnson has traversed approximately 75,000 miles and entered 50 national parks, all in the effort to become the first photographer to document these landmarks digitally. The project, called "With a New Eye: A Digital National Parks Project," has been Johnson's labor of love for the past six years. He conceived it in 1994 as a way to test and showcase a new technology he had just started experimenting with—the scanning camera. "With a New Eye" endeavors to highlight the powers of the budding medium.

Yet this medium still lacks the recognition it deserves, even though Johnson, whose work has appeared in *Life* magazine and on *ABC News*, has produced some astounding images of nature. In all of this he relies on his PowerBook G3, working in harmony with his camera equipment to produce the realistic colors and incredible detail for which he's known. But that's not the only way the Mac has served him. Back in Apple's early days, Johnson laid out an entire photography book on California's Central Valley using PageMaker and Mac models including the Macintosh SE, II, IIfx, and Quadra.

In some ways, it seems unnatural: capturing nature with cutting-edge, high-tech equipment. But the way Johnson sees it, his method is the most accurate way to preserve nature's beauty on paper.

Q&A with Stephen Johnson

Back in August, *MacAddict* talked with Stephen Johnson in his Pacifica, California, studio about the finer points of digital photography. We were also curious as to how a traditional film landscape photographer ended up going the digital route. That story starts with a man named Michael Collette (www.betterlight .com), who was building a scanning insert for a view camera. In September 1993 he demonstrated a working prototype to Johnson, who had already seen what the technology was capable of.

Stephen Johnson: [When Mike called,] I said, "Mike, let's do a little test. Let's shoot some film and let's shoot your digital camera, side by side." It seemed amusing to go to every clichéd tourist spot we could think of in San Francisco, and that's what we did....What really amazed me was what I saw when I went home and opened up those files on a big 20-inch monitor. I saw detail in those photographs unlike anything I had ever seen in the history of photography. I saw an ability to record highlight and shadow detail way beyond film. We had been doing gray balances all day, so the color was just dead-on because we kept balancing the sensor to light. And the resolution was stunning. There was no grain....And in a sense—a very profound and real sense—film died for me that day.

MacAddict: Is there still a reason to shoot film?
Stephen Johnson: I would say you have to ask yourself what is the reason for shooting digital—you have to want that kind of quality and be willing to make sacrifices to use it. The scanning camera requires at least a one-minute exposure for full resolution...and there's the sheer cost. The BetterLight 6000, which I'm using for most of my work at this point, is a $16,000 camera insert.

MacAddict: How has the maturing technology changed your photography over the years?
Stephen Johnson: I remember when we used the first color PowerBook in 1994, the 540C. If I wanted to open one of the full-resolution files, I had to download it from the camera onto the hard drive of the PowerBook and turn around and open it in Photoshop. The whole process took almost 20 minutes....Now I open almost every file I shoot in the field. [The process now takes about 1 minute 20 seconds.]

MacAddict: In terms of image editing, how much do you do?
Stephen Johnson: First of all, any photograph [I make]...comes in as a vertical whether it's shot horizontally or vertically. Since I shoot mostly horizontal, I've always got that rotation to do. I also have to run a slight unsharp mask, because CCD images by their very nature are somewhat soft. I'm very careful to take the sharpening back to what I would call the native sharpness of the lens—I don't try to recover from any softness in the original focus, I simply try to get the edges commiserate with what I was seeing on the ground glass through the lens to begin with.

MacAddict: But you won't retouch your work too much.
Stephen Johnson: The last thing I'm going to do in this project on the national parks is start editing things out or putting things in. My ethic remains the same as it always was. If you make the photograph strong and well-seen, then you merely try to get the best print you possibly can—not by changing it, but by being true to it.

MacAddict: It seems like a lot of your work is about conservation.
Stephen Johnson: Yes, and it always has been—from that first work at Mono Lake, when I discovered it was dying because of water diversion to Los Angeles....That's what the "At Mono Lake" exhibit [a group exhibit Johnson curated featuring more than 150 years of photography] was about—not to say, "Save Mono Lake," but to say, "Look at Mono Lake. Here's how all these photographers for over 100 years have been looking at it. Pretty remarkable place, isn't it? By the way, this is what's happening to it." You don't need to say anything that overt with art. What you need to do is show people what something is. If you can do that in an elegant and beautiful manner, and the place in and of itself has an inherent eloquence, it can speak for itself. In a sense, as landscape photographers, what we do is try to record the beauty we see.

Tips for Digital Dilettantes

Here are professional photographer Stephen Johnson's tips for amateur photographers.

Tip 1: Do not use a high JPEG compression ratio—either turn off compression or use the highest image-quality setting you can.

Tip 2: Turn off your digital camera's built-in sharpening feature if it has one. According to Johnson, this feature oversharpens images and ends up building halos around contrasting areas. Sharpen the images yourself in Photoshop by inspection.

Tip 3: Save your images as TIFFs rather than JPEGs, if your camera offers this feature. You'll end up with larger files and use up disk space more quickly, but your images will be more detailed.

Tip 4: Think about what you want to do with your pictures. If you want to make 11 by 14 or 8 by 10 prints, even with a 3-megapixel camera, you're better off with film. According to Johnson's discerning eye, 5 by 7 is as large as you'll want to go with a digital print from a consumer camera, although, he says, many people are happy with larger digital camera prints.

In May 1997, Johnson took this photo of an eroded hill in Badlands National Park, South Dakota, as part of the Parks project.

The Inner Workings of a Photo Shoot

G oing on a photo shoot with Stephen Johnson feels a little like a weekend camping trip. His load, however, does not contain tents, poles, and 12-packs, but rather a tripod, digital scanning insert, PowerBook G3, 4 by 5 view camera, and GPS receiver (to record the exact location where shooting takes place). While Johnson has the process of packing, hauling, and unpacking his equipment down to a quick-and-dirty science, the job doesn't lack peril. Take the time he journeyed to the Grand Canyon. As his camera was busy scanning the scenery, his PowerBook tumbled over the edge of the canyon and hung on by a SCSI cable. (To the Mac's credit, when Johnson reeled the machine in, it was still scanning.) On this particular photo shoot—to the Fitzgerald Marine Reserve in Montara, California—we experienced nothing so heart-stopping. Here we show you the anatomy of taking a panoramic picture and what it's like when technology, the Mac, and nature converge.

1 The Setup

After picking a location, Johnson sets up his equipment. Here he's planning to make a panorama, so he sets up a panoramic tripod head—he uses a level to make the camera sit straight on the tripod. Johnson then drapes what photographers call a dark cloth over the camera and looks through the camera to make sure he has found an image he likes. If he has, he plays with the composition, works with the depth of field, and adjusts the aperture, all by eyeballing the scene through the viewfinder. This is trickier than you might think as the images appear upside down and backward.

Once he finishes setting up the picture, he inserts his BetterLight scanning device into the camera and hooks the camera to his PowerBook via a SCSI cable. Both the scanning camera and the Mac have 6GB hard drives, so he can save the image to either device. Johnson also carries two removable expansion-bay hard drives, one 8GB and one 12GB, to store those hefty high-res shots—some panoramas can amount to as much as a gigabyte each.

Stephen Johnson (right) and his assistant Eric Doyle work on leveling the pano head and camera.

2 The Prescan

The next step is to take a 750-by-1,000-pixel, 2MB prescan of the image via BetterLight scanning software. This low-res scan allows Johnson to inspect the composition onscreen. It also creates a histogram that displays highlights, shadows, and distribution of brightness values, and indicates whether the exposure is off. Depending upon what he sees and how much time he has, he sometimes opens the file in Photoshop to look at a more detailed

histogram and to zoom in and examine the focus. In this particular image, Johnson pays close attention to where the highlights fall and whether they are overexposed.

3 Color Balance

The next step is to color-balance the scanning camera to make sure the sensor adjusts for ambient light. To do this, Johnson holds up a gray card in front of the lens and does a prescan. He then picks a densitometer point in the scan that he wants to make neutral gray. Performing an autobalance tells the software to neutralize the gray balance point, and rescanning the gray card confirms that the software achieved that result. He then looks at the red, green, and blue values—equal numbers for R, G, and B mean the sensor is reading the card as dead-on gray. If the values vary, Johnson needs to tweak the color balance.
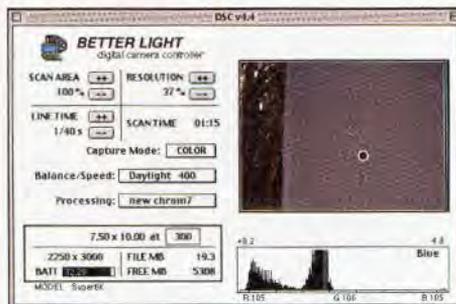
The grays have it. What Johnson is looking for here is almost equal R, G, and B values—here, they come close enough to satisfy him.

4 The Scan

Before doing a high-res scan, Johnson performs another prescan of the scene to make sure the color balance looks accurate. He's now ready to do a conventional rectangular (as opposed to panoramic) full-resolution scan, which will produce a 140MB file. On a typical, bright day, a scan at 100 percent resolution would take 66 seconds. Since this is a particularly overcast day, and the shoot is taking place in the woods, a full-res scan takes a whopping 3 minutes and 20 seconds.

Got time to kill? The scanning software indicates that a full-res scan in this light will take a full 3 minutes and 20 seconds.

5 Inspecting the Scan

When the scan finishes, Johnson scrutinizes the image for problems (preferably in Photoshop, if he has time). He notices that some of the foreground branches lying on the ground are unfocused, and that the depth of field is insufficient for this particular scene.

6 Making Adjustments

To fix the focus and depth of field, Johnson compensates in two ways: He stops down a lens (this means reducing the aperture from f-11 to f-16, or taking the lens from a wider opening to a smaller opening), and adjusts the image plane of the view camera to provide more foreground sharpness. To compensate for the smaller aperture, he must change the exposure, which means an increase in scan time. To alter the exposure, he changes the line-scanning time in the software from $\frac{1}{40}$ of a second to $\frac{1}{20}$ of a second per line (there's a total of 8,000 lines). This doubles the scan time and also means starting over again with a prescan and another full-res scan. Since the software indicates that a full-res scan will take 6 minutes and 40 seconds, Johnson decides to scan a quicker 8MB file, which is sufficient to show him that the branches are much more in focus this time.

7 The Panorama

Now it's time for Johnson to try his hand at a panorama. He first locates a starting point for panning—he does this by rotating the camera via the software while looking through the viewfinder to make sure the camera lines up properly. He then sets how many degrees he wants the camera to rotate—in this case, 90.

It takes 2 minutes for the camera to pan 90 degrees and make the lowest-resolution scan possible—a 5MB, 750-by-2,500-pixel file. The prescan reveals a pleasant surprise—the sheer range of trees the panorama captured is much greater than Johnson had anticipated.
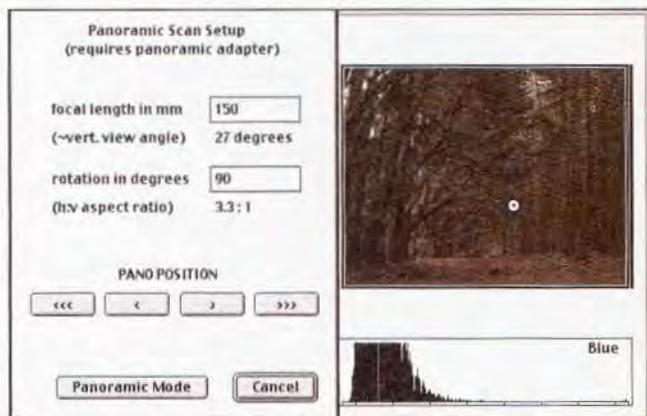
Here, Johnson sets the camera's range of motion and uses the arrows to line up where he wants the camera to start panning. In the focal length setting, he indicates the type of lens he is using (in this case, a 150mm).

He also notices that the image is a little underexposed and lacks some detail. To capture more nuances of shadow detail, he increases the bit depth from 8 to 14 (which the software ends up saving out as a 16-bit file)—in other words, from 256 levels of gray per channel to approximately 16,000.

Now he's ready to scan the scene at full resolution in panorama mode, which will produce a 6,000-by-19,634-pixel, 674MB, 16-bit file. The process takes a tedious 16 minutes and 21 seconds, during which time Johnson and his assistant decide to shield the camera with an umbrella so the wind does not disturb the scanning process—any wind or movement may cause a jitter or distortion in the image. Once the image finishes scanning, Johnson—not having enough time to open a 674MB file on his PowerBook—packs up his gear and heads home to review the results.

Mac Pack Rat

Looking at Stephen Johnson's Mac collection is a little like looking at Imelda Marcos's shoe collection: You don't know where to start counting. Here's what his collection includes: one Mac IIfx, two Quadra 950s (upgraded to PowerPCs), four Power Mac 9500s (upgraded to G3s), one Power Mac 9600 (upgraded to G3), one Daystar Genesis (upgraded to G4), one Workgroup Server 9150 (upgraded to G3), one SuperMac S900, one Twentieth Anniversary Mac, two Wall Street PowerBook G3s, one PowerBook 3400, one PowerBook 540C, and—last but not least—one Power Mac G4.

Trip Tools

With 65 pounds of equipment, you're probably wondering, what *is* all that stuff he carries around? Here are his tools.

Sinar-X 4 by 5 camera; BetterLight Super 6000 digital scanning insert (6,000-by-8,000-pixel trilinear sensor); lenses: Sinaron 65mm, 150mm, and 300mm, Schneider 90mm and 210mm, Goertz Red Dot 600mm; Gitzo carbon-fiber tripod; Prototype panoramic adapter by BetterLight and BayHouse; an additional camera: Kodak DCS 460 on Nikon N90 body; Garmin GPS receiver; and a PowerBook G3 (Wall Street edition)

The finished panorama...well worth the wait.

Cathy Lu wants to travel to national parks for her job. Ahem.