

An Infinite Number Of Monkeys

Topic: A warning to professional photographers of difficult times ahead, as digital cameras improve to the point that amateurs can now get professionally usable results—provided that they are willing to shoot over and over again. Plus, a look at packages that attempt to increase resolution of existing images, with results compared to doing them in Photoshop.

Column first appeared: April 2001, *Electronic Publishing* magazine.

Source of this file: The author's draft as submitted to the magazine.

Author's comment: 2001 is not so very long ago. It is hard to believe that this column was controversial—but it was. Many photographers were still in denial about what was occurring, and insisted they could never be displaced by these developments.

This archive, to be released over several years, collects the columns that Dan Margulis wrote under the *Makeready* title between 1993 and 2006. In some cases the columns appear as written; in others the archive contains revised versions that appeared in later books.

Makeready in principle could cover anything related to graphic arts production, but it is best known for its contributions to Photoshop technique, particularly in the field of color correction. In its final years, the column was appearing in six different magazines worldwide (two in the United States).

Dan Margulis teaches small-group master classes in color correction. Information is available at <http://www.ledet.com/margulis>, which also has a selection of other articles and chapters from Dan's books, and more than two hundred edited threads from Dan's Applied Color Theory e-mail list.

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An infinite number of monkeys

Less than \$1,000 now buys a digital camera of stupefyingly fine quality. That's great for the graphic arts generalist, but what of the professional photographer whose bread and butter is threatened?

There's an old saw to the effect that if an infinite number of monkeys are given an infinite number of typewriters, one of them will write poetry to rival Robert Burns.

Its truth has never been better illustrated than by the most significant development in the our industry in the last several years, one that is to many of us is a great blessing. But another important segment of our industry—professional photographers—find themselves face to face with a 300-pound gorilla.

Ten years ago, we were just beginning to see flatbed scanners. To be sure, very expensive flatbeds already existed, but I'm talking about ones that not only fit on a desktop but were ridiculously cheap in comparison to past practice. They were also ridiculously bad. This didn't last long; by 1996 there were some highly capable ones on the market. Vastly more professional work is now scanned on such devices than on drum scanners.

The same has just happened—although not everyone has realized it yet—with digital cameras. Five years ago, these filmless marvels were confined to high-volume studios. A reasonable setup, speaking only of the digital equipment and not other photographic necessities, would run at least \$25,000, and one needed a professional camera to begin with, as the digital camera devices were backs only, lacking lenses.

These devices delivered great quality, but were slower than Florida recounts, so one couldn't take a picture of anything that moved. Also, an attached computer was a necessity, which pretty much limited the work to a studio.

Nowadays similar setups cost about a quarter as much, and falling. But they're still studio-only, still not the sort of thing that non-photographers should monkey around with. For the rest of us, there are "consumer-level" digital cameras. Up until recently, these have been somewhat of a joke.

No more. Kodak, Nikon, and Olympus now offer, for a little less than \$1,000 list, shockingly fine instruments. The three megapixel barrier has been broken, meaning that a capture has close to enough resolution for a full-page newspaper or magazine ad.

The images live on a memory card that holds around 25 images, but you can buy ones that will hold several hundred. Or, rather, you can buy *one*. Whenever you're ready, you



dump its content to a computer via a convenient USB cable. Or, if there's no computer handy, you can preview the images right on the camera and start trashing those you don't like, generating more room.

Poor beastie, thou maun live!

Because there is no film to buy and no photo lab to pay, there's no incentive to economize. Because they have auto-focus and auto-balancing routines, amateurs can often get quite good results from them. And because doing so produces a file that can be used for most professional purposes, a lot of amateurs are becoming their own photographers, using the infinite-number-of-monkeys method.

In other words, suppose you are an art director doing an advertising layout that involves a certain car. You know Photoshop, but not how to take a picture. Not to worry. Go outside, point the camera in the general direction of the car, and pull the trigger. Then do it again. And again. And again, until you have filled your memory card. Really good INOM practitioners can do this in about five minutes.

Granted, if you don't know anything about how to take a picture, you will have shot several of these directly into the sun. A few may have your thumb over the lens. And surely, the camera will sometimes have been shaking when you clicked the shutter.

Equally surely, by pure accident, some small percentage of the images will be professionally acceptable. As you learn not to put your thumb over the lens and not to shoot into the sun or shake the camera, the percentage will increase. It will still compare very unfavorably to the percentage a professional photographer would get, but so what? If a project contains three images, the client doesn't care whether it took twelve exposures to get them, or twelve hundred.

Thou saw the fields laid bare and waste

This is all very well if you are the art director. It's not such a good thing if you are the person the art director used to hire to take car pictures.

There is most surely still a place for the skilled photographer. In difficult shooting conditions, or where quality is

paramount, you don't want to use the INOM method. Hire a professional.

Yet INOM is satisfactory for a substantial percentage of real work. While some people are already using these cameras in creative and intelligent ways, the word hasn't really leaked out to the general graphics public. When it does, one of the consequences is clearly going to be, it's going to be a bad thing for professional photographers. For some, it will be a catastrophic thing.

The reason I chose this topic this month is that it's the five-year anniversary of a similar pair of articles I wrote under somewhat analogous circumstances. At that time, it was just becoming clear that studio digital photography was going to wipe out traditional catalog shoots, and that royalty-free stock photography was not just something to generate screen savers with.

Many photographers were irate at the suggestion that they would have to become digitally literate. They said that the studio digitals were of unacceptable quality and that what stock was available royalty-free was even worse, not to mention the fact that somebody else might use the same picture in a competing project. And Photoshop? What? We should become computer geeks?

All this had, for a change, been true two or three years previously. When things get better in this industry, however, they get better rapidly. By the time these mice raised their protest, there was excellent royalty-free available, and in such quantity that the chances of somebody else using any one of them in a similar way were next to nil.

And so, it lopped away a considerable chunk of business from professional shooters.

Photographers survived the wound, even as I predicted, because of two mitigating factors. First, color use became far cheaper, thanks to Photoshop and shorter-run output devices.

This caused a phenomenal growth in actual image use. Much of this growth was in images of such low quality that professional photographers weren't going to be hired to shoot them no matter what, and much of it went to royalty-free stock, but professionals did enjoy some of the benefits.

Second, the last five years, at least here in the United States, have been a boom time beyond comparison in this century. Almost every segment of the

CCD devices like flatbed scanners and digital cameras are thought to be poor at retaining shadow detail. Film could probably capture more in the deepest part of the cat's fur, but that hardly matters here. If the original at top had been in film, and someone tried to correct it into the bottom version, it would be overwhelmed by the natural noise in the film.



graphic arts has been doing well, and some, like retouchers and Web designers, have been doing phenomenally.

These two safety nets are not in place this time.

And weary winter comin' fast

Once again, we hear that the innovation isn't ready for prime time. Once again, those saying so would have been right three years ago. When cheap digicams first hit the market, they were, to put it mildly, of dubious quality. Today, they are in some cases better image recorders than traditional high-end cameras.

The torture-tests on these pages are from my own camera, which I bought in early 2000 for somewhat less than \$1,000. I decline to name it here, because the manufacturer makes better and cheaper models today.

If you're looking to demonstrate how well cameras hold shadow detail, the textbook picture is one of a black cat at night. I happen to have one here.

The corrected version could have been made a lot better. In the interest of time, I just used multiple applications of Photoshop's Screen command, with layer blending options set to exclude the lightest parts of the image, and a final tweak of the black channel.

This cat has a better chance of hiding successfully in a snowbank than we do of getting a result even close to the astonishingly detailed bottom version if we start with conventional film and a drum scan.

From time to time, color "authorities" assure us that we need extra data to assure fidelity in detail. They want 16 bits per channel, rather than the customary 8.

That bottom version needs only *five* bits per channel. Each channel only has around 32 levels of information, rather than the recommended 256. And yet there's no posterization, no artifacts of the massive monkeyshines the picture went through. Image success depends on quality of data, not quantity of bits.

Similar things happen in the image on Page **, shot in the middle of a 6-inch-per hour snowstorm. And the one on this page was shot directly into the sun, without any type of filter.

It's no use, either, to complain about resolution. These devices don't *need* as much as conventional cameras, because their data is better.

The best-laid schemes o' mice and men

These little wonders do have drawbacks. The lack of resolution isn't really that bad, but inadequate zooming capability is. Also, most of these cameras, believing that they are targeted at an amateur audience, employ some type of autofocus plus automated color correction that is difficult if not impossible to turn off.

So, a lot of professional photography is not being threatened by this development, and probably won't be for a long time. But the photographer who says, "obviously we have nothing to fear from chimpanzees shooting with these toys.

Shooting unfiltered directly into the sun is a recipe for photographic disaster—if the medium is film. Digital cameras do a better job.

My own work isn't threatened!" is only partially correct. The chimp and the toy don't threaten him—but the other photographers who've lost work to them do.

They need to replace those jobs

somehow. If they don't feel like working at McDonald's or Burger King, they'll do the logical thing, which is to call up their colleagues' clients and ask them if they wouldn't like to pay only half as much for photography services.

Similarly, wedding photography will remain healthy, but really work is simian heaven. Realtors have discovered that houses sell better if pictures of their interiors go onto the Web. Somebody has to shoot them, but things that don't move are easy fodder for realtor-apes and their cheap digital cameras. The professionals who this displaces may have to start looking for wedding business.

With such downward pressure on prices—and many photographers already haven't been able to raise fees significantly in several years—the last thing that's needed is for expenses to go up. Photographers historically spend their money on equipment that lasts a long time. Computers don't; they become seriously dated in three years or so. Digital cameras are even worse. Every year one can buy better quality for a fraction of the price. Plus, there is a somewhat lengthy unpaid learning curve.

And new competitors are getting, or will get, into the act. For some time, service bureaus have had digital studios, often staffed by young, inexperienced photographers. They've snarfed up a lot of product work, but haven't had much of an impact on jobs that have to be shot in the field.

That will change. At these prices, design studios and quick printers will buy these cameras and tell the world that they now have a staff of expert photographers. And, like the service bureaus, these are pesky competitors, in that they don't particularly care whether they make money off photography. Their goal is to lure clients in for their other services. If they need to sell the photography at a loss to do so, too bad. Especially for the professional photographers who can't afford to do the same.



Genuine Fractals: The Resolution That Isn't There?

The limited resolution of cheap digital cameras has posed a problem for those needing large-scale reproductions, such as posters. Into this breach has charged Altamira Group, whose Genuine Fractals (\$140 street price, RGB only) and PrintPro (\$250, RGB, CMYK, and LAB) claim to be able to help out.

JPEG, the scheme used to compress file size of images without loss of detail, is getting long in the tooth. The Altamira technology is one of several more complicated algorithms that try to do intelligent image analysis. Such sophistication would have been impossible when JPEG was in its infancy; we'd might have died of old age waiting for a single image to compress.

But in addition to its compression capability, which I didn't evaluate, Altamira lets us *increase* an image's resolution. Here is its startling claim: "Why scan and work on high-resolution images in Photoshop when you can get the same results from a low to medium-resolution original?...Genuine Fractals can make the enlargement look as sharp as the original."

Because of this purported capability, Nikon and Olympus bundle Genuine Fractals with certain of their digital cameras. But is it really any better than just upsampling in Photoshop? I beat it up with around 50 images, and my results were far from conclusive.

To be sure, we sometimes get great results from what the conventional wisdom considers grossly inadequate resolution. But that's because the conventional wisdom—a resolution of



double the screen ruling—is messed up. As images get larger, as screen rulings get finer, and especially as subjects get softer, less is needed.

The resolution issue emerges when the subjects have fine detail. The left third of the two sets of images above are small sections of files that undeniably have enough resolution to fill the entire page. The top one is a drum scan, the bottom a Kodak Photo CD capture. The alternate versions (Altamira at center, Photoshop resampling at right) were done from, respectively, a second drum scan at a third the resolution, and the PhotoCD opened at a quarter.

In the top picture, neither low-res is even close to the detail of the properly scanned one. For my money, the Photoshop and Altamira versions are identical.

The bottom image, being softer in character, is better—but this time Photoshop seems to me to have gotten the better result. And neither upsampled

version is able to get the gold of the earring, for the simple reason that it was too small to pick up in the original version.

So, the claim that it does as well as a high-resolution scan is a crock, but what about when no high-resolution scan exists? In many cases, Altamira gives better results than upsampling in Photoshop, especially at extreme magnifications. The ties at lower left are appearing at five times the size they should. Altamira's algorithm does well at recognizing edges and not letting them get blurry during enlargement. That's why its version, left, is crisper and better—at least at high magnification on the monitor. I have my doubts that on this printed page you'll be able to see a difference.

The gain of using this enlargement technology seems marginal, and the extra computing time involved is mildly inconvenient. Still, if you do a lot of enlarging, it may be worthwhile. You can see for yourself by downloading a demo version from www.altamira-group.com. —DM



The east coast blizzard of December 2000 was literally a blinding snowfall, blanketing some localities with 20 inches in four hours. In such conditions, the original will be gray, but if a version like the bottom one is desired, a digicam capture is better than film.

But och! I backward cast my e'e

Five years ago, here's what I wrote:

"When a compatible and user-friendly better way emerges, though, those in the way of the locomotive had best watch out. That is the position of photographers today. They stand on the tracks, and the train of the digital revolution is headed right at them. Two of their choices are quite unpalatable. They can remain where they are and find out who will survive the inevitable collision. They can also cede their territory and their business, by stepping aside.

"There exists, however, a third alternative: getting a running start, so that when the train roars by they can jump on board."

Of those disregarding that advice, few remain; and they won't be around much longer. Photoshop can't be learned overnight, and neither can the general knowledge of the graphic arts that is going to be a prerequisite for survival.

The astute person is going to have to be perhaps a photographer first and foremost, but one who is able to provide a complete package of image management if need be. This is going to encourage further loose affiliations—you can learn Photoshop, but can you learn to make an effective web page with it, can you place it in Quark or InDesign, can you negotiate with the printer, can you generate your own graphics in Illustrator or Freehand? It becomes necessary to have friends who can fill in the gaps in one's own expertise.

We are apparently headed for some difficult economic times. Those planning ahead will have a decisive advantage.

There's no shortage of clients who are interested in reasonable image quality. People with a photography background are the most likely to be able to provide it.

Service providers have been dumbed down considerably in the last five years, just as photographers have gotten more sophisticated. Then, it would have been quite unlikely that a photographer knew more about print reproduction than a printer or service bureau. Today, it's not so unthinkable.

The day when a lot of work is placed depending on how many expensive lunches are purchased for the buyer isn't over, but the practice is less prevalent than it used to be. Now, it's more a matter of confidence.

Those who can persuade the client that his product will look the way he wants it to will get the business. If I were a client, I would feel a lot more comfortable discussing these matters with a photographer than with some salesman. It wouldn't matter a whit to me whether the photographer was



the one who actually shot the images or not.

Those who can produce images effectively for a variety of purposes from a variety of sources will be able to prosper, if not as photographers, then at least as service providers with a strong specialty in photography.

The attack of the infinite number of monkeys is indeed fearsome. The twenty-first century photographer has the choice of preparing for battle, or of huddling in the cold, waiting for events to overtake him:

*But, och! I backward cast my e'e
On prospects drear!
And forward, tho' I canna see,
I guess and fear.*

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