

THE MAKEREADY ARCHIVE

Column 42 of 77

When Things Can't Get Much Worse

Topics: Reminiscences of the late Tom McMillan, who had the original idea for the *Makeready* column, wrapped around the correction of a single extremely difficult image.

Column first appeared: August 2000, *Electronic Publishing* magazine.

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

Author's comment: The techniques shown in this column, though effective, are no longer to be recommended. I showed a better way to handle this image in *Professional Photoshop 6* (2000), involving the use of a false profile, a trick I was just developing. Consequently, as the book was going to press, I discovered that there was an even better way and was forced to include a note saying that I would clarify it in the next edition!

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 a hundred edited threads from Dan's Applied Color Theory e-mail list.

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When things can't get much worse

In the age of consumer digital cameras, retouchers have to prepare themselves to handle some mindbogglingly bad images. In life, we sometimes have to prepare ourselves for mindbogglingly bad news.

The most dangerous phrase in our frustrating, unreasonable and mistake-prone industry is, "I don't see how it could get much worse than this."

Over the years, artists, photographers, printers, supervisors, Web designers, and clients who have uttered these fatal words have usually found out that God is not merely a great educator, but also a creative and witty one. Doubt that things can get much worse, and He is always pleased to demonstrate how it is possible.

Right up there as an invitation to catastrophe is "After all, how bad can it be?" This one usually emerges from the lips of a salesperson or other desperado who has just accepted, sight unseen, a job from an unknown or unreliable client who has alluded to the fact that a problem exists with it.

A little over a year ago I got such a call, asking if I might try to correct a digital image that was purportedly not very good. Nonchalantly, I said to send it over and I'd take care of it, saying to myself, "After all, how bad can it be?"

My reward was the Version B you see below. Being experienced in these matters, I did not compound things by

saying, as I examined it, "I don't see how it could get much worse than this." Otherwise, it would probably have had to go up to poster size as well.

Even such atrocities can be repaired, as you can see. Doing so requires lots of thinking. As I talk about how, I'll tell a story, which will, among other things, explain why this column contains dorky-looking highlighted tip boxes, of which the first follows.



Think about the big picture first.

The problem with images like this is that there are so many things wrong that it is tempting to wade in and start correcting willy-nilly. This can quickly degenerate into a document with so many extra channels and layers that one runs out of disk space in the process of producing a horrible mess. The sensible approach is the conservative one. Selections imply artificiality. They need to be kept to a minimum—and you should know in advance what areas are going to be selected, not make it up as you go along.

For those who think that the best strategy might be to throw this original back in the face of whoever pro-

vided it, I'm sympathetic, but in this case it really wasn't possible.

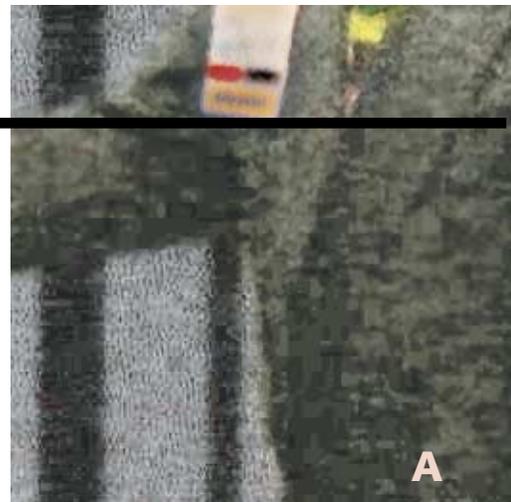
The image is from the Spring 1999 Seybold conference in Boston. On the right is Craig Kevghas, president of CPR Marketing, a public relations firm. He is presenting an award to the graphic arts editor of the year, Tom McMillan, formerly of this magazine. On the left is Tom's wife, Nancy.

Ordinarily this would be a happy occasion, but there were few dry eyes in this audience, which knew very well that Tom was gravely ill. This is not the only recorded image of the ceremony, but the others are worse, if possible.

Successful image strategists would take one look at Version B and know that the box containing the prize must be handled separately. In the original, it's much lighter than anything else. That can't be. Everything else needs to be lightened so drastically that the box will be blown away. We have to assume that the box will be pasted in later, and go for a white point in Craig's collar.

Tom was a strategist, too. This column would not be appearing today had it not been for his ability to evaluate, as it were, the picture as a whole.

Seybold conference: March, 1999: the late Tom McMillan, left, receives the editor-of-the-year award. The image at right was derived from the one below.





A preliminary move to open range in RGB results in DEF above, the red, green, and blue channels. G is the composite image. The blue is worthless and is largely replaced by the green. The red has serious noise in the background, but the face has more snap than the background. The solution is to blend the green (E) into the red (D) using Lighten mode. The new red channel is J below, along with the new composite color, K. Center left, greatly enlarged: there's still colored noise in the background of H, but it's missing from Version I because of a blur of the A and B channels in LAB.



After a curve correction in LAB aimed at increasing contrast in the faces and jackets and reducing the yellow cast, the image stands as L above. The white splotches represent areas where the original was absolutely black, no detail at all in any channel.



Do the things that can't hurt first.

Many maneuvers, such as unsharp masking or working with local selected areas, can look good at the time only to be exposed for the artificialities they are later on when some other correction exaggerates them.

Opening the overall range of the image seems obvious enough. Having done so (never mind how for the moment) we are left with Image G, a yellowish entity only slightly less objectionable than Image B. Its component channels, shown to its left, are nauseating. The red (D) has adequate contrast, but a revolting pattern of noise in the background and hair. The green (E) has no specific defect, other than being flatter than a pancake that has been run over by a steamroller. And the blue is like a John Grisham novel: it has its amusement value, but otherwise is without redeeming social importance.

The blue is so worthless that it should be largely replaced by another channel. I've chosen here to blend in 75% of the green (using, with the blue

channel exposed on the monitor, Image: Apply Image; Mode Normal, Opacity 75%.) It can't be bad to do this. Your mileage, and opacity percentage may vary.

As for the red channel, the difficulty is killing the noise without damaging the faces. The solution is to blend E into D in Lighten mode. This only affects the noise, the only part of D that is darker than E. The result is J.

This is exactly the sort of move that would never have occurred to anybody in 1993, when Tom McMillan became editor of *Computer Artist* magazine, for which I had previously written a couple of articles.

One of Tom's first official actions was to propose that I write a regular column for the magazine. Instead of the usual 1-page affair, though, he wanted it to be more comprehensive, a 5- or 6-pager if necessary, to deal only with production issues and to be "full of tips." He thought the title should be *Make ready*. I told him that this was the stupidest idea I had ever heard and that nobody would read it.



Kill colored noise by blurring the A and B.

In Version G, Tom has a green beard. This is not just color imbalance, but a revolting patterning of red and green that pervades the picture.

Fortunately, there's a way to get rid of it. I converted the file to LAB and applied a Gaussian blur of 2.0 to the A channel and 2.8 to the B. That's the difference between versions H and I.

This technique was also unknown in 1993, because nobody would ever have had the gall to attempt to work with an image this bad. Even if they had submitted a piece of, er, film that looked like Version B, it could have been saved by a good scanner operator. Drum scanners see miraculously well into deep shadows.

Here, however, there isn't any scan, because there isn't any film. The shot comes from a cheap digital camera. Also, in all likelihood this was not a professional photographer, who might be expected to know that the flash mechanism on such a device is not there merely for decoration.

The series of streaks and other garbage that pervades the red channel, and the complete worthlessness of the blue, are both symptomatic of this class of photography. We can moan all we like, but we can't stop people from taking these shots and asking us to print them or post them on the Web.

We need solutions, not excuses. One of the better solutions is to work in LAB. Blurring the A and B channels, which don't have contrast information but only color, wipes out the colored noise without harming detail.

It is therefore a better noise-reduction move than anything known seven years ago. If you already use this technique and like it, you can thank me for thinking it up, but you can thank Tom McMillan more for publicizing it.

Although I'd been experimenting with LAB for several years, it wasn't till late 1995 that I became convinced of how powerful a tool it was. In writing about it, I ran into a traditional problem, shared by this present piece.

In discussing subtleties of color, the illustrations have to be large. But the space requirements of magazines are forbidding. Note how tightly I've had to crop these images!

One often sees magazine articles on scanner capture and sharpening and the like, full of thumbnail-sized graphics that prove absolutely nothing.

All editors suffer the same pressure but some respond better than others. Tom was disinclined to lavish a dozen pages on a technique nobody had ever heard of. But he gave me an hour to demonstrate what I was talking about and after 15 minutes he stopped the show and told me to take the dozen pages. Today, LAB is widely used by professionals.

TIP In color correction, the key is the K.

This concludes the easy part. These moves would work in any similar image. Now, given version L, it's time to do some serious planning, starting with retouching decisions.

Despite the AB blur, the image remains so grainy that further blurring seems needed. One hates to do this. It should probably be limited to the

background, which we can afford to defocus, and the faces.

Both men, especially Craig, practically vanish into the background. We have to find a way to combat this, perhaps with a channel blend, perhaps by making the background less colorful.

And, above all, we need to gain contrast. The normal CMYK way of doing this is by engineering an ultra-peppy black plate. This can usually be done routinely but in a nearly hopeless case like this special handling is in order.

A setting of UCR in Photoshop's CMYK Setup, with a maximum black of 100% and a dot gain set to 0%, is a very nonstandard way of doing things. It is, however, the way to get the highest-contrast black possible. One can't just make an entire separation this way; it would be far too dark. Instead, we need two copies of the RGB (or LAB) file, one taken into CMYK normally, the other with these weird settings. We use the CMY from the normal separation and the black from the other, trashing the remainder.

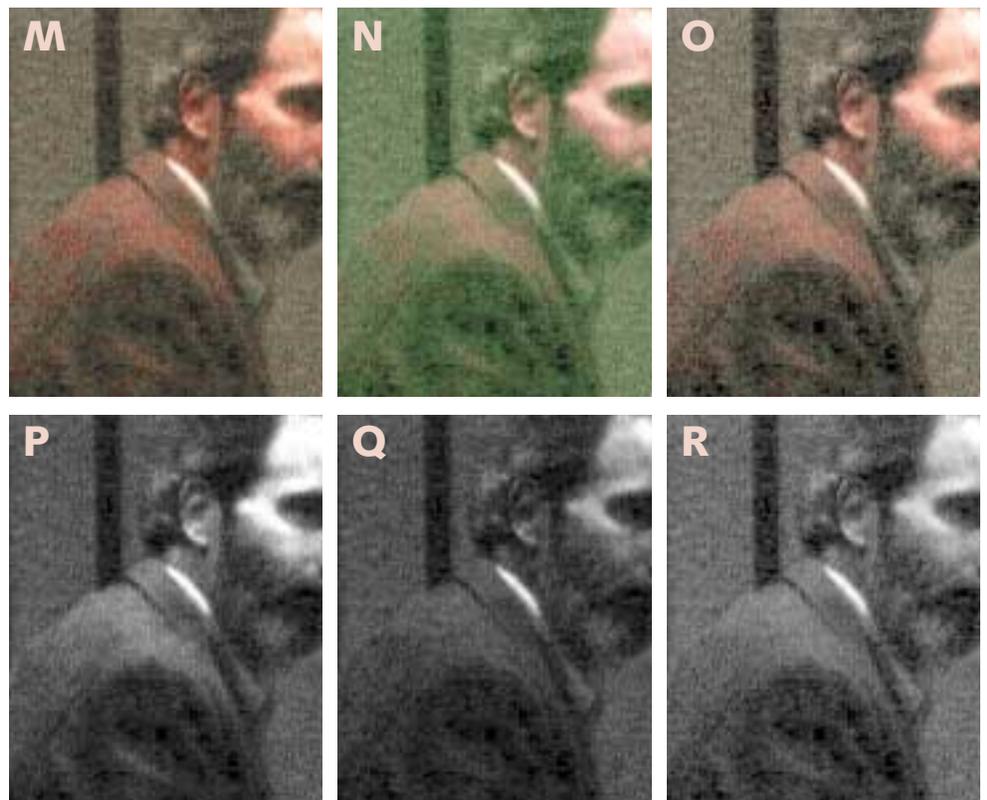
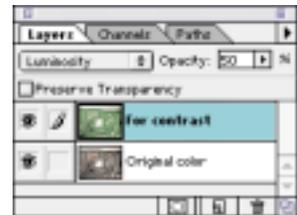
One of the things that this demonstrated was the obvious, that the im-

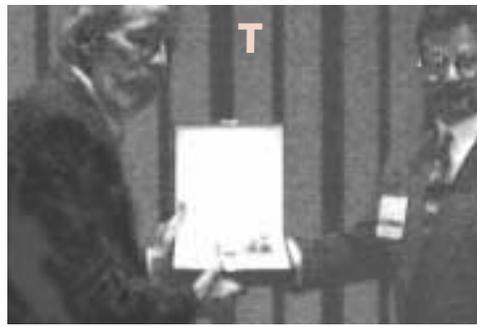
age is full of garbage. In Version L, I've whited out the parts of the original that were absolutely black, zero in all three RGB channels. These areas are as free of detail as the Gulf of Mexico is of icebergs. You can bet that in such circumstances there will be many more places that are saved from total blackness only by a point or two in a single channel and realistically have no detail either. The quality of such an image, when opened up, will be granular beyond all names of granularity.

By using a 100% black ink limit, a lot of that noise finds its way into the black channel, where it can be targeted fairly easily. There are several methods of doing so. Mine was to make a rough selection of the men and invert it so that only the background was selected. I then blended the yellow into the black, Lighten mode. As the only parts of the background where the black was darker than the yellow would represent noise, this worked well. Then, the snappy black can be further corrected with curves.

The role of the black plate was the

The luminosity blend: the idea is to have more differentiation between the jacket and the background. In the green channel (Q) there isn't much, so it's blended with the red (P) and the L (R). This changes the existing image from M to the overly green N, but using the luminosity layering shown yields O.





Top left, the image is about right for color, but is too dark and lacks contrast. The main culprit is the magenta plate, top right. Center row: After blends from the L channel of an LAB version of the file, the magenta is much happier, but the color is too gray. Bottom row: restoring the original color in layer mode retains some of the extra pop in the magenta.

cate layer, work the contrast-enhancing mumbo-jumbo on it, and then change the layering mode from Normal to Luminosity, retaining the new contrast while reverting back to the old color. In doing this, channel blending becomes very important. Often the best approach is to make a copy of the image, convert it to LAB, and use the L channel as a source for the blend, throwing away the copy when finished.

This has happened twice here. In versions M-O, still in RGB, the idea is to break Tom's jacket away from the background. The green channel, Q, which carries the most contrast in RGB, doesn't help with this. The L does. With the green channel exposed, using Image: Apply Image, I made an LAB copy of the image and blended 50% of the resulting L into the green. As you can see in Version N, this creates nauseating color. But reverting to Luminosity in Version O created the desired result.

Later on, I tried the same thing in CMYK. Version S's faces look flat. I made another LAB copy (this one was better than the one shown as Version R, due to all the intervening horsing around). I set up a duplicate layer in the CMYK document and blended the L channel 50% into both the magenta and yellow, and 35% into the cyan, which was more reasonable to begin with. Then, I again reverted to Luminosity, yielding Version W.

To try to cut back on some of the noise and graininess, I also treated the image as if it were a prescreened original. Using three layers, two layer masks, and both the Unsharp Mask and Gaussian Blur filters, I softened the faces and the background while adding snap to critical areas such as the eyes and hair.

real start of my friendship with Tom, which had gotten off to a rocky start.

For various career reasons I felt I had to oblige his request for a regular column, but I turned thumbs down on ridiculous-looking boxes advertising the tips that it was to be full of. My first effort, in August 1993, was called *Why That Job Won't Run*. It listed the familiar ways that amateurs can create havoc down the line. When it appeared, an irritated Tom said it read just like articles in five other magazines, only not as well written and with fewer useful tips. He indicated that he didn't see how it could possibly have been much worse. On hearing my reply to that, Tom, whose own vocabulary was not remarkably pure, felt obliged to ask in what New Jersey sewer I had learned to speak English.

That did it. I had not been a pre-press manager for so many years without having learned how to retaliate. He didn't like my language? Fine. I titled the next one *Color as a Four-Letter Word*. He wanted something technical? Great. I wrote about the most bor-

ing and misunderstood topic I could think of, GCR. And, knowing Tom was one of those who thought that 1994 was going to be the year that everyone would adopt color management, I started with a gratuitous slur against color scientists.

With that, we both prepared to write off the two-column experiment as a waste of space and effort, when a remarkable thing occurred. Several people wrote in saying that this was the kind of thing that was missing in other magazines and that they wanted more. We were both flabbergasted by this response, and resolved to try one more time. The title of the third column was, you guessed it, *In Color Correction, the Key is the K*.



Blend with—and into—Luminosity.

Pictures as poor as this one cry out for treating contrast and color separately. The color of Version L is close to acceptable. The detailing is obviously not, and the drastic moves required to fix it may knock the color for a loop.

The solution is to establish a dupli-

A full description of that technique took several pages in a 1997 series on descreening that turned out to be our final columns for *Computer Artist*. After several years of adequate but unimpressive performance, the publisher pulled the plug and merged it into *Electronic Publishing*, where Tom and I continued to work together.

As far as I was concerned, this was a change for the better, but Tom, whose interests were more in artistic technique than of coverage of business, was quite sad about it. Also, he had to cope with a major personal and professional problem. When tired, Tom slurred his words, as if he were drunk, which he wasn't. This had been going on for a while, but in late 1997 it got worse, to the point that strangers had trouble understanding him.

This is the last thing that an editor who has to interact with people needs. If Tom had now said, I don't see how things could possibly get any worse, could you have blamed him?



When in doubt, work the background.

Criminals know enough to try to restrict their activities to places where no one is looking. The same goes for retouching, which is always detectable if somebody looks hard enough for it. The trick usually is to do it where they won't be looking too hard.

Accordingly, one should try to avoid fooling around with the important parts of the image. There are usually ways to accomplish the same things by working the background.

Similarly, although making selections is inevitable in an image like this, one tries to make small moves. When necessary, it looks more natural to change color in the selected area than to change detail. This is why the earlier channel blends were so important, to avoid having it look as though the two men were cut out and pasted onto the background.

I've indeed made a selection of the background here, and lightened it a bit, but it's also moved toward blue, to differentiate it more from the men. It's also been blurred slightly.

To my mind the bigger background move is to add apparent snap. A lot of times, what the viewer thinks is contrast depends not on the whole picture but on certain small areas such as those shown in Versions Y and Z. No matter that there weren't any bright colors in the original subject; the viewer will still think the result looks monochromatic. So one creates bright colors somewhere, anywhere. I gave Nancy a blue blouse, and Craig a more colorful tie. Also, I built up his name-tag. The viewer isn't likely to be concentrating on any of these three, so my scam is less likely to be detected.

The tool of choice here is the paintbrush, set to Color mode, meaning it can't alter detail. Also, the paintbrush, unlike the airbrush, doesn't increase its effect the more one applies it. Noticing that Tom's jacket had lost its reddish hue everywhere except in the shoulders, I picked up that color and painted it into the rest of the jacket. Because this doesn't affect the darkening of the fabric, it looks natural, not the flat result that sometimes happens when painting.

Likewise, the apparent detail in Tom's hair is a trick. There were natural areas of gray there. I lightened them with the burn tool, forcing in what seems to be more contrast.

Fixing the foreground by messing around with the background tickled Tom's sense of humor. In February 1998, he suggested a column about it. This was a rarity; I've almost always originated the topics. But this one was Tom's. It took more than an hour of labor on the phone for him to describe his idea, as his speech had become almost indecipherable. He added that he had finally consulted a doctor and had been told he must have had a mild stroke. We agreed that this guy was a quack, as strokes are sudden events, not a long slide. Tom said he planned to see specialists in Boston next.

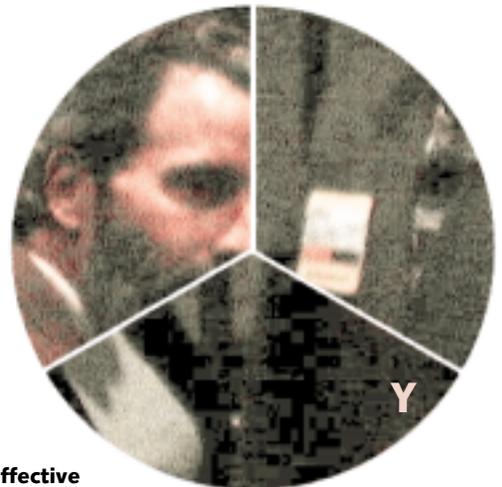
It was the last conversation we ever had. Three weeks later, with his power of speech completely gone, he e-mailed me news of the cruelest, most heartrending diagnosis of all: ALS, better known as Lou Gehrig's disease.

Even at such grim moments one does not like to tempt fate. The correct phrase, after a deep breath, goes something like, *Lord, I do acknowledge that something worse than this probably exists, but I give thanks that Thou hast not suffered Thy servant to be able to imagine what it might be.*



Don't let yourself be colorspace-centric.

Our correction has flitted merrily between CMYK, LAB, and RGB. I'm pretty sure this is all necessary and not just smoke. Having used the image in classes, I've seen around 50 reasonably good retouchers spin their wheels in its mire. Those who stuck with a single colorspace couldn't come close to acceptability. If you'd like to try for yourself, we've posted the original JPEG at the *Electronic Publishing* web site.



Retouching is most effective when it adds the suggestion of contrast either in color or in darkness. In an enlarged comparison of sections of Versions C and L, do you see where hand work has been done?



AA



BB



CC

In an image this complex, there are often several alternate versions used for specific purposes. Left, top to bottom: a blurred, desaturated version for the background; a darker, yellower version for the faces; and a much darker version for the box. Right: the final file with the black plate deleted.



DD

For example, one key move involves a temporary change to Photoshop's RGB Setup: setting the Gamma to 1.0, rather than the 1.8 or 2.2 that virtually everyone uses. This makes the mid-range significantly lighter.

Next comes what is widely considered a duffer move: using the white eyedropper tool to establish a white point in Craig's collar, sacrificing the award box. This is more effective than storming in with curves for the same reason the change in gamma was: this is the rare image where there is so little valid data to begin with that it must be hoarded. Have a look back at Version A, which is a blown-up section of the final picture. It shows how horrible the texture is, even after careful moves to preserve what little image integrity there was to start with.

If this seems mind-numbing, get used to it. The digital camera is the wave of the future, and it will more and more often be used by nonprofessionals. Neither Tom or I realized in 1993 that we would ever have to deal with images quite this bad. But we did foresee that the major trend of the decade would be a continual worsening of the quality of the original.

Tom would surely have approved of using his picture here. By promising to include his stupid tip boxes, I might also have been able to talk him into allowing references to him in the text, but probably not.

In his final year as editor, he did not want any fuss to be made over his condition. He let the world know why he was no longer able to speak in a brief note at the end of one editorial.

He continued to communicate by e-mail for a few months, but that soon petered out. Nobody knew why; ALS isn't thought to affect the mind. I suspect that Tom had been doing some investigation. If so, he'd have found out that ALS usually, as it did with Lou Gehrig, attacks the muscles first, causing a loss of coordination and, after years of suffering, total paralysis. It's rarer for it to attack the voice first. If it does, one is spared the years of torture because in such cases ALS kills rapidly.

He drifted slowly away from the magazine, officially retiring in April 1999. One of the few responsibilities he kept until then was to edit the column he'd proposed calling *Makeready*. The last one he handled was, appropriately, *A Briefing on Background*.



If it's dark enough, we can see the stars.

Only a couple of steps remain to finish the picture. The award box itself has to be pasted in, using Version CC. As the faces are a bit too pink, the darker, yellower Version BB comes into play. Merged through a layer mask, it gives a healthier appearance to the flesh.

I still felt the image was muddy, and blamed the contrasty, black channel that I was at such pains to create earlier. I resolved to fix it, but first I decided to show how important the black is. So I made Version DD by deleting black ink completely.

I'd intended to correct the black with curves, but the colorful DD gave me an idea. I put it on a separate layer, and blended it into the existing document using Soft Light mode.

This lightens the gradation, and

brightens the color, in the lighter half of the image. It also gave a better-looking result than a curve. Whaddaya know! A new technique!

So it goes. Not exactly comparable to a drum scan—yet. But the learning process continues. Two years, three years from now, I think I'll be able to do it. When I discover how, you'll be the first to know.

Things are only as bad as they can possibly be if we let them be so. ALS is such a ghastly diagnosis because doctors can do little more for it today than they could for Lou Gehrig, namely, express sympathy and make the patient as comfortable as possible.

That, however, is changing. As with all brain-related illnesses, what has seemed impossibly complex is yielding up its secrets. Doctors are rapidly starting to understand how ALS does its deadly work. In five to ten years, I truly believe they'll have it licked.

In every field of human endeavor, blessed are those who make such learning possible.

This spring in Boston, Stephen Edwards of the Seybold Report on Publishing Systems won the prize as top editor of the year, which is now called the Tom McMillan Award.

Tom McMillan died July 23, 1999, at age 48. Contributions to a memorial fund in Tom's name, sponsored by GATF and aimed at providing scholarships for future graphic arts journalists, may be directed to National Scholarship Trust of the Graphic Arts, c/o Tom McMillan Foundation, 200 Deer Run Rd., Sewickley, PA 15143. This is the 42nd *Makeready* column written by contributing editor **Dan Margulis**, who can be reached at DMargulis@aol.com.