How COLOR MANAGEMENT Failed

By DAN MARGULIS

A universal language of graphics, or the emperor's new clothes? A year after Photoshop 5, the debate rages on—but the cause is lost. Here's why it happened.

In 1887, a Polish scientist constructed a "neutral international language" he called Esperanto. His idea was that, while nobody would grow up speaking it, everyone needing to communicate with foreigners would use it as a second language.

To that end, all grammatical irregularities, weird syntax, and gender-related conjugations were ruthlessly excised. Esperanto is more like Italian or Spanish than anything else, but the idea was that it would favor no cultural group.

The problem is, who are you going to speak it to? Not that the language is dead—indeed, its adherents claim as many people understand Esperanto today as, say, Hebrew or Lithuanian—but its moment came and went more than half a century ago. The need was there, the idea was a good one, but the educated populace went for the time-tested alternative of learning the language of a dominating culture.

A century after Esperanto was proposed, other scientists detected a similar problem in an area more pertinent to this publication. They perceived a difficulty in the way people exchange color files. Their proposed solution is rather harder to explain than Esperanto, but the result is the same. It lost out in the marketplace.

Unlike Esperanto, which got good, but not great press, the conventional graphic arts wisdom, dutifully echoed by nearly every trade publication, is that Next Year will be the one in which we all will adopt Color Management.

Sound familiar? Every "next year" this decade was also going to be the one. In retrospect, the articles trumpeting the inevitability of this come together as a kind of poetry, elegant in its cadence as much as in its annual repetition.

> *We've finally turned the corner,*
> *Just a few more pieces must fall into place,*
> *Ev'ry vendor will adopt it soon,*
> *All we need do is educate users,*
> *It really works now; next year for sure!*

<p style="text-align:center">*   *   *</p>

Last year was *absolutely* supposed to be the year, because Photoshop 5, which stopped just short of requiring it, was released. Instead, it saw an angry and unseemly debate— probably because the disputants do not have a common language. The principal color management advocates approach the subject from an analytical, scientific point of view. Some have real-world production experience, but by and large they are theoreticians only.

Their opponents, who wouldn't know a tristimulus value from a contacting frame, nevertheless have instincts that tell them there's a problem. But they aren't capable of articulating what it is. If only both sides spoke a type of graphics Esperanto, so they would not talk past one another!

I will therefore try to explain in simple terms what has gone wrong, relying heavily on direct quotations, both pro and con. Let's start with a real-life example. Your printer disappointed you the last time. Your job looked too green. Hoping to compensate, you make the next one with a bit more magenta, magenta being an opponent of green casts.

This is an attempt to get things to look alike, or to *manage color*. To do so, a *conversion* is usually needed. Here, you are making your image data more magenta. The conversion is based on *profiles*, which, in this case, are in your head. However flimsy your evidence, you have decided that the printer is biased toward green.

From, this mental profile and manual conversion, things can get more formal, as in a Photoshop conversion from RGB to CMYK. Because this is so easy, it may not be obvious that it is color management, too. The conversion is automatic. The profile exists in Photoshop's internal definitions of the colors of the CMYK inks, the expected dot gain, and how much black ink to generate. If you don't like the result, you can alter the settings, changing the profile and hopefully making your next conversion a little better.

Profiles can also be kept in a format proposed by the International Color Consortium. These *ICC profiles* can be embedded in files, or used to, for example, adjust how a monitor looks. Pairs of profiles can be used to convert from one colorspace to another. An ICC tag can identify the origin of a file. Another can define what colors a printer can handle, and, presto, perfect output. And if you later wish to make a PDF file of it, this can be taken care of too,
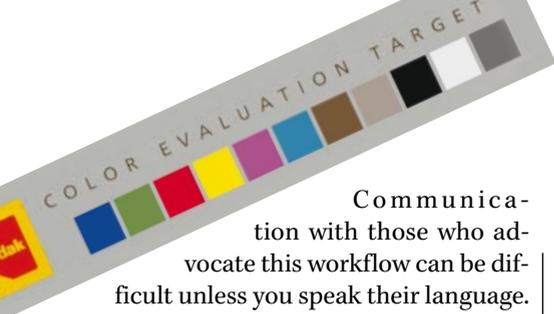
Communication with those who advocate this workflow can be difficult unless you speak their language. I offer the following guide as a start.

⬤ The *ICC workflow* is an imprecise term. Many use it to signify the color equivalent of free love, with all files bearing profiles and subject to conversion by strangers. An *ICC partisan,* to me, is one who now or in the past has advocated this sweeping approach.

⬤ In the dialect used by these people, changing settings because your images have all turned out too green is called *screwing up the monitor to match the print*. Screwing up—er, altering—the settings on the basis of a *single* image, however, is known as *characterizing and calibrating*, provided that the image is the IT8 target shown at the top of the preceding page, that an artificial device agrees that it is too green, and that the settings are changed by means of an ICC profile rather than an equivalent method that doesn't require the purchase of software.

⬤ Specifying color by numbers, such as $70^C 30^M$, is called *device-dependent,* because, unless we know the final output conditions, we won't know what colors these numbers will create. This is as opposed to *unambiguous colorimetric data,* which means specifying the color we want to get. In that case, unless we know the output conditions, we won't know the numbers needed to create our color. This data, as I understand it, is especially unambiguous if it is to be interpreted by a program that allows several different choices of *color management module,* each with four possible *rendering intents*.

As with monitor calibration, the new way is actually the same as the old way. To revert to another language, traditionally we know a fixed CMYK (or RGB) value, but not the LAB. The ICC method is merely a mirror image. It knows a fixed LAB value, but not the CMYK. We need both. If we know the output conditions, we win, either way. If we don't, we're just as dead one way as the other. The two are different dances to the same music, equally device-independent, equally effective.

An upgrade with an attitude

In May, 1998, the release of Photoshop 5 more than just adding the ICC capability, tried to enforce it. Files were, without warning, altered for color as soon as they were opened.

Most industry commentators aren't color experts, and were utterly baffled. In an replay of the emperor's new clothes story, they therefore saluted the new features as great progress. Fawning five-star reviews of PS 5 appeared. It won industry awards. The first books on PS 5 either ignored the color changes altogether or offered incorrect explanations of them.

Back in the real world, many of those who bought the upgrade trashed it. Most of the rest turned color management off. The rejection of the concept by service providers was near-universal. Users of Epson printers, which require RGB rather than CMYK data, found that what had worked well in PS 4 now yielded horrible color. Burned by unexpected color shifts, companies forbade freelancers to use PS 5. On-line forums were flooded by furious comments, with almost no positive replies except from Adobe employees and vendors of color management services.

The development team had a series of beta-period warnings from power users and its own support staff that users would find the changes incomprehensible. But, seduced by theories it didn't fully understand, it forged ahead with a hard-line version, believing it to be for the general good.

It didn't realize how many users wanted to use PS 5 and PS 4 side by side. Calibration isn't notably easy. Those who had succeeded at it and did not wish to reinvent the wheel had no choice but to turn off the new features.

And it ignored history: the market has been rejecting similar workflows for a decade. EfiColor, the failed color management of Quark 3, is the most prominent example. It closely resembled the current ICC workflow.

This could have led practical executives to wonder whether they might be betting on a three-legged horse. The development team, however, was clear: past attempts may have failed, but our product is so dominant that we can dictate to the market. If we build it, the world will adapt.

The discovery has since been made that it is the market that does the dictating. The tuition for this lesson was remarkably high. In addition to mortgaging the company's biggest source of revenue and badly damaging Adobe's credibility in the professional community, no release of graphics software has ever created such fury among so many users.

Faced with this nightmare, Adobe released a corrective version, 5.0.2. eliminating the booby traps that were causing most of the havoc. But the toothpaste could not be gotten back into the tube. The Photoshop universe was split into users of PS 5 and those frozen in time, unlikely to purchase future versions.

While the number of those who have switched to PS 5 is growing, by early April around half of potential PS 5 users hadn't done so fully. Of those who had, about half had configured it to match PS 4.

I'm familiar with many sites in North America and Europe, and users from a variety of backgrounds, so I had little doubt about this. In March I nevertheless floated some numbers to people on both sides of the issue at the Seybold conference. I also sent them to over a thousand individuals who had corresponded with me about color.

The consensus was that my figures were too generous. Most disagreed that as many as half of potential users had migrated to Photoshop 5. Most also felt that more than half of PS 5 users were trying to mimic PS 4.

I had suggested that 5 to 10 percent of PS 5 users use profiles for some internal purpose other than calibrating a monitor. Some thought that this number might be too low. Everyone agreed, though, that at least 95 percent of service providers don't support profiles, and that nobody intentionally allows strangers to convert their files.

ICC advocates don't dispute these facts, or hide their disappointment, but they naturally disagree with me on how to interpret them.

These people, in my view, are in denial: the ICC workflow has gone the way of Esperanto. The legacy of the first PS 5 release is a minority who will *never,* ever, voluntarily embed profiles. The group is big enough to forever ensure that the overall concept will fail. And even when Photoshop 4 is finally gone, its color model will remain, thanks to everyone who tried to run it alongside PS 5 and wound up turning the new version's features off.

Adobe has faced up to this with its new page layout program, InDesign, which will have support for color management, as it should. By default, it will be turned *off,* as it should have been in Photoshop 5. Few will turn it back on.

The rejection by the service bureaus, prepress houses, and printers nails the coffin firmly shut. Their opinions carry a lot of weight with typical users. Although some are ignorant, the majority know practical color better than most ICC advocates do. The unanimity with which they advise against it suggests the obvious.

Why the large users said no
The current implementation of the ICC method is so loaded with ways to go wrong and missing so many important pieces that only the most disciplined operations dare deploy it. It thus becomes even less open than the closed systems it purports to replace.

The problems mostly have to do with losing or misapplying a profile. A service bureau has a screamingly clear need to open and resave a client's file without either converting its colors or changing whatever profile may have been embedded. A printer needs to be able to bury an arbitrary profile in a file regardless of what's currently there. But neither feature is there.

A company with many freelancers doesn't want to store megabytes upon megabytes of profiles, which chow down on system performance and are impossible to identify without a coherent naming or organization system—which doesn't exist yet.

Above all, a quick and cheap way to edit profiles for such things as black generation and dot gain is missing.

These things can be done in seconds in Photoshop's internal settings, for free. Using ICC profiles, it requires 10 to 15 minutes in a separate, expensive application.

And on and on. The current implementation, as with many first releases, isn't ready for life in the big city. Furthermore, modern graphics software is incredibly intricate. Insectivora are hard to spot until tens of thousands of users have tried tens of thousands of variations. Adobe products undergo a massive beta testing program, and are usually more bug-free than those of competitors.

But how many tested PS 5's color features? And whose responsibility is it to find workarounds? There are repeated reports that some apps occasionally ignore profiles, or, worse, misinterpret them. Is it true? I don't know, and neither does anyone else. It might take weeks or months of investigation to track it down. Meanwhile, who wants to be in the line of fire?

Early this year, Apple introduced version 2.6 of ColorSync, the enabling technology for all the conversions. It promptly turned profiled color images in PageMaker into negatives. A fix was forthcoming, but the lesson is that with so few users, such unexpected bugs are, well, to be expected.

For the privilege of substituting this unreliability for something known to work, the large user is asked to invest tens of thousands of dollars in profiling devices and software, recalibrate all its equipment, offer the resulting profiles for free to one and all, retrain at least one person on each shift to become expert in the new workflow, bear the cost of educating its clients, and not charge for the inevitable files that print with the wrong profile.

Why some smaller ones said yes
A solo practitioner or a small group is not nearly as likely to be victimized by profiling accidents. And, although there's little that can be done with ICC
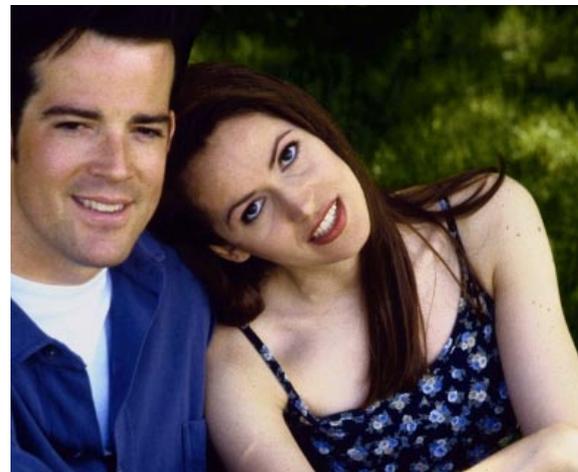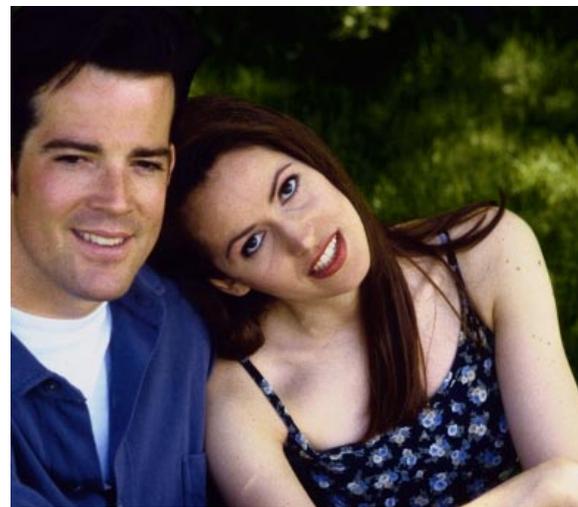

In Photoshop 4, different monitor setups caused slight variations in output (above). Photoshop 5 eliminated this questionable problem, in favor of something much worse: an increased chance that an incorrect profile will be used (below.)
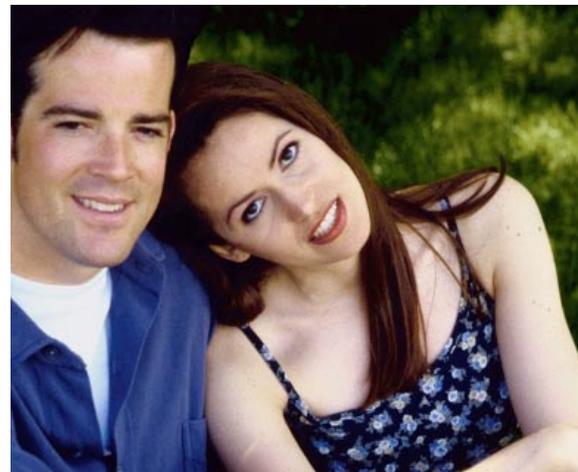
profiles that can't be done with Photoshop's internal color settings and/or scripting, some people find it advantageous to calibrate with them.

Professional photographers, being relatively quality-conscious, willing to invest time in learning, and inexperienced in the vagaries of the CMYK colorspace, are the prime beneficiaries.
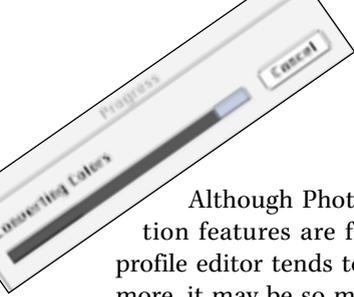
Although Photoshop's calibration features are free and an ICC profile editor tends to cost $1,000 or more, it may be so much easier for a photographer to learn and implement that it will justify the expense.

Doing this pretty much requires that previous versions of Photoshop be trashed all at once. Photographers often can do that; larger companies often can't. And the workflow is more attractive to those who make significant use of RGB than it is to the larger companies, who typically favor CMYK.

It is also tempting for those whose jobs often have to be output in several different forms. Better quality can be had by personal attention to each conversion, but that isn't always practical. If you have to prepare one ad every week for the same four publications plus a Web site, think ICC.

Back when large companies did most publishing work, there was usually an on-site calibration guru. Today's smaller workgroups may need someone more portable, who can be hired to come in part-time. The convenience of ICC profiles make it a lot easier for such someones to ply their trade. There's no need to learn umpty-nine proprietary systems. And they can set up calibration using ICC profiles even if they can't get at the internal workings of each output device.

When close is good enough

Justifications for the ICC workflow are stunningly close to the ones used by advocates of Esperanto.

"Imagine four people in a room," suggests an Adobe technical paper. "One speaks Swahili, one speaks French, one speaks Mandarin, and one uses sign language…to communicate, they need an interpreter who knows all four languages, as well as an agreed-upon neutral language."

This is supposed to be, and is, a good analogy for the ICC workflow—and also for its limited, er, weltanschauung. Such a multinational group would "need" neither interpreter nor artificial language. The fate of Esperanto, indeed, suggests this would *not* be the method of choice.

Colorspace conversions are just not all that tough. The same document advises that "CMYK is…targeted to a specific set of output conditions, thus images cannot easily be repurposed or used on different presses." In fact, such repurposing is fairly trivial. The group needing translation services would be more like an Australian, a Scot, and a Texan. Problems in communication, yes, insurmountable ones, no.

Even a group consisting of a German, an Italian, and a Belgian wouldn't need an interpreter. Nowadays, there's a good chance they'd try speaking English to one another, even if none of them were fluent in it. That's like the traditional color workflow. A fully developed language, an Esperanto, might be better. This way works.

If you send an image file out to one shop for a Matchprint, to another for a FujiProof, and a third for a Signature—oh, heck, even if you send it out to three Matchprint shops—you will get back three different results.

They will, however, be close, because everyone supposedly adheres to

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Meanwhile, in the Trenches...

I keep a mailing list of everyone who's ever sent me questions about color. In late March I asked it to verify, which it did, my estimates of how widespread adoption of ICC features is. Here's a cross-section of comments about their own practices. These people come from a range of graphic disciplines. I know two personally (one green, one yellow light) and two others, both book authors, by reputation (two red lights). Perhaps because this is a sophisticated group, only a few refuse to use PS 5 at all. Other than that, the numbers agree with what I see in the field.

—DM

🟡 "As far as PS 5 is concerned, I have been using it from the moment it came out of the box (with the profiles turned OFF!) with little or no problem…I think the people that are having trouble are those who rely on automated profiles or workflows to make up for what they are not willing to learn how to do for themselves."

🔴 "I'm one of those who has not yet installed PS 5! I'm prepared to install the updated 5 (haven't had the time), but do not intend to use the 5 colorspace 'features.' "

🟢 "All of my friends are using PS 5. We love it, especially the multiple undos….Most of my friends either don't know about color, or they have disabled the conversions in PS 5. I'm not sure if I've set mine up correctly, but I get really great color both on screen and proofs and Matchprints, so I must be doing something right."

🔴 "Your numbers sound exactly like what I've observed in talking to the people who've attended the seminars that I've given. The only addition I would have is that those people I've talked to who have put PS 5 back into the box because of color issues, got very excited when they learned that they could make it behave more like PS 4 and at least said that they would try using it again when they got home."

🟡 "I have used PS 5 since 10/98. I use the different RGB colorspaces for different kinds of work. However, I don't embed ICC profiles. I really don't like them at all. But I've had to find out all I can, because in my work (image manipulation etc. in European prepress) I may meet people with many kinds of thoughts on ICC profiles…my job has not been made any easier."

🔴 "We use PS 4 for color correction and PS 5 for creative work…with the color management features turned off….In my opinion the color management tech-heads got to Adobe and conned them into releasing PS 5 with a bunch of features the real world didn't ask for or want. Only a VERY few of our customers (we are a general commercial printer) even know what an ICC profile is and NONE of those few have a clue on how to use them. I am not convinced that Color Management accomplishes anything new or useful, though I am keeping an open mind. Until it makes more sense to me I can't recommend its use to our clients."

🔴 "After reading for 2-3 days all this stuff about ICC, profiles, color space conversions etc., I think I'd better keep on using PS 4 and wait till PS 6 arrives!!!"

🔴 "Haven't even bought the PS 5 upgrade. I felt it was too soon and too little value for me. I got the impression Adobe needed some more money, so they released PS 5."

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a standard called SWOP. Not too precise, but *it doesn't need to be.*

If it were such a horrible thing, there always was a simple fix. SWOP or some other industry group could have distributed actual prints, digital files, and settings, saying, calibrate not to an imaginary standard, but to *this.*

Likewise, in Photoshop 4, if you separate an RGB file into CMYK you'll get one result, whereas if you give it to me to convert, I'll probably get something slightly different. This is because, in PS 4, monitor settings affect conversions.

The top two pictures of the couple on Page •• use the same PS 4 separation preferences, but compare the relatively eccentric monitor settings I used to use to pure PS 4 default.

Again, if this small variation were such a tragedy, an easy fix was always there. You could have converted your RGB file to LAB before giving it to me.

The market's failure to implement these easy solutions suggests it will never be interested in costlier ones.

The third version shows what happens when, as is common in this workflow, a profile is misplaced or misread. This file was translated into PS 5's default, sRGB, but not out of it. If the client is looking for one of the top two, the bottom one isn't acceptable.

In both color and language, workflows with extra translations are vulnerable to this kind of error. Somebody will say *out of sight, out of mind,* and by the time the interpreter is done it comes out *invisible idiot.*

The easy way is the best way

The graphic at the top of the next page appears in a textbook co-authored by a color scientist, who had the temerity to write, "To most people the green segments at the top appear to be darker than the ones at the bottom, but both are the same."

Whaddaya, blind? *Anybody* can see that they're different. There is a defect in all artificial color-measurement devices, however, that causes them, in situations like this, to imagine that the two greens are the same. This is doubt-

less how the scientist erred.

How tiresome language can be! If a gun were held to our heads, the two of us would probably agree on this statement: *the two greens don't look alike.*

Most ICC partisans nevertheless take the wholly illogical position that profiles are only valid if a machine approves of them. As noted earlier, color management boils down to making things look alike—not *measure* alike.

The success of a calibration is not determined by how much time and money is thrown at it. The old-fashioned way of guessing at the settings and then tweaking isn't just easier, it's better. (This goes for making ICC profiles, too.) And the more different the devices one is trying to calibrate, the bigger the gain by forgetting about what the opinion of machines may be.
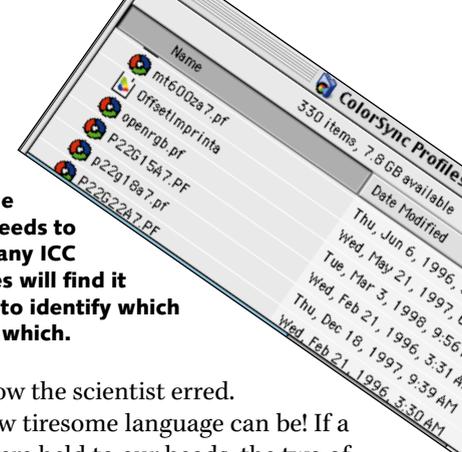
🟢 "As a PC user I really appreciate that my on-screen display of CMYK images is now much closer to what I see on print than I could ever manage with PS 4. I continue to do manual RGB-CMYK separations to take advantage of GCR settings…but now prefer to use one of the the ICC profile settings while editing the image. I use 'what I see' on the screen to make general adjustments and then head into the numbers for the fine tuning. I've already used a custom ICC profile…and the results are very close to GREAT! Much better than the operator was ever able to do by hand."

🟡 "I was cursing the day I installed PS 5.0 (at first)….It is essential that you upgrade to the newest level (I'm running 5.0.2), and that you get away from the dreaded PS default colorspace sRGB. I switched to Adobe RGB, turned off the profile embedding, and have PS set up to 'ask before converting.' Things are much better now."

🔴 "As someone who is a software professional first, a photographer second, and a printer out of necessity…the concept of ICC profiles is truly appealing. Obviously the reality…is far less attractive."

🟡 "I think the lineup for color is going to boil down to relatively few pros who need and can take advantage of ICC profiles and the like, but due to its complexity and need for professional depth and human knowledge, the masses of people…will not pay for that human expertise."

🔴 "I would echo the comments of others that the Adobe PS 5 color settings are incredibly confusing…none of the settings or commands really support a results oriented approach….doing the conversion to the output device color-space and then saving the file without a tag to prevent

further conversion seems to be favored, but having to go through those contortions and have everyone along the way agree to a secret handshake on whether and how they are using profiles seems unfortunate."

🔴 "My solution for ICC's is simply to use the 5.0.2 install wizard's option to disable them, thank you, and at this point I regard the whole issue as a 'frog and mouse' battle between the calibrationists and us good guys."

🟢 "I think that Adobe's only real fault was in the documentation. I really believe it was one of perspective. Those who wrote and developed PS 5 pretty much already had it figured out and couldn't view it from the perspective of those just being introduced to it….Here in Los Angeles, I am still finding widespread confusion about the color features. As someone who has figured it out, I find it quite easy to explain…It WAS hard to learn. It took an enormous amount of time and study and asking stupid questions and enduring you're an idiot type of answers…There's a lot to be aware of in PS 5, but it isn't impossible to learn. I wouldn't trade it back for 4.0 for any amount of money you could think of."

🔴 "I'm one who didn't panic, but simply chose to do nothing, thus PS 5 sits still shrinkwrapped on my floor. Both of my Mac systems are 'calibrated' by what has been a tried and true method for me…This has resulted in repeatable and ACCURATE color with judgment by artists I do work for who see far more subtle nuance than I do…As far as I'm concerned color management as currently being foisted upon us by the powers that be is incomprehensible and sounds incredibly time consuming and complex…I don't consider myself stupid, but this is absurd."

In the lakeside on the facing page, the snow and some sailboats seem red rather than white, and the greens of the trees are rather subdued.

This image uses *no yellow ink at all.* It is therefore quite impossible to construct the colors red and green—and yet they are there. To you and me, that is. A machine will over-correct in such a situation.

It's unimportant that machine profiles can be generated by a monkey, whereas eyeballed ones require skill. Anyone hoping to manage color needs that skill anyway. In calibrationist heaven, nobody has to make profiles without the benefit of an IT8 sample. On this planet, life's not so easy. We get back a bunch of images that are too green and we have to wing it.

Machine-generated profiles work fairly well to calibrate monitors, but badly in preparing Web images. As the scientist's example shows, perception of color depends on its surroundings. The Web is full of loud colors. If we don't up the volume ourselves, our pictures will look too dull in comparison.

That well-known color theoretician, Yogi Berra, has commented, "You can observe a lot just by looking."

The legion of the misinformed

Ever since its introduction, the party line has been, as Adobe's principal on-line voice puts it, "[Photoshop 5 is] not poorly conceived—it's just that most of the users are poorly informed or misinformed."

That school of public relations invites replies like the one it actually got: "It's really quite simple. No matter what I try I can't get PS 5 to make my files to look like they did in PS 4. Worse

than that is the suggestion that I'm a moron to consider wanting things as they were in PS 4. That the service bureaus I use are 'incredibly stupid' for not accepting ICC profiling as the new religion. The Adobe dogma on this subject has pissed me off completely."

That's actually pretty mild. Angry users have resorted to unprecedented namecalling. Some ICC partisans have helped out by demeaning those who question the new order. But, as the user noted, they save their most vitriolic attacks for those who they think betrayed their revolution, to wit, the service providers.

For example, the Adobe programmer quoted above explained as follows why users shoot for a good-looking contract proof: "They're trying to achieve reliable, quality color while dealing with brain-dead print shops who refuse to even consider using color management….if I give them data that prints a good proof then they can match it on press without having to worry about 'all that new-fangled Calibrationist ColorSync Crap we don't need because we know the numbers and my daddy didn't need it or his daddy before him blah blah blah…' Having reliable presses and a profile of the press would be better—but this is one way to manage things until the print shops wake up."

A well-known author who supports ICC methods added this: "Service bureaus, so-called, are in my experience

noteworthy primarily for their absolute refusal to do two things: 1) Change, 2) Learn. Twelve years from now, the five service bureaus still in existence will be accepting Page-Maker 14 files, printing them to disk, and placing them in XPress 3.3r5 for output. The only thing I'd ever dream of asking a service bureau to do would be to run film."

He continued, "Desktop color management systems are finally becoming a reality…[they] are the long-awaited keystone of digital color, the piece of the architecture that holds the entire structure together."

Well, he didn't exactly *continue*. He wrote that second part in mid–1992. Since then, while the color management record has been stuck on the same note, service bureaus have reinvented themselves several times.

The suggestion about profiling presses is also characteristic of the approach of some ICC advocates, who often, like the Adobe programmer, lack real-world production experience. The idea makes sense—it's just very naïve.

Despite advances in technology, trying to fingerprint a modern press is like trying to profile the wind. Anything you come up with will be obsolete in an hour, or the next time paper gets changed or any one of a hundred other variables do. Print shops calibrate to the contract proof because it's more stable, not because they're somnolent.

Having dealt with a number of brain-dead printers myself, I observe that quality control is a state of mind. If the shop doesn't care about it, it's unlikely that changing its color management system will help.

Plus ça change, plus c'est la même chose

For all the ugly rhetoric, some on both sides are doing the smart thing, analyzing each feature, adopting some, rejecting others. Many ICC partisans have backed off the grand concept in favor of an emphasis on soft proofing. As a result, it's tough to say who this "ICC partisan" actually is. Some who identify themselves as advocates of the ICC workflow make less use of ICC profiles than even I do.

And the more sensible ones have distanced themselves from the claims of years past that the new method would magically cause all images to become works of art.

More than that, they understand that such ridiculous claims are one of the major reasons for the failure of the concept to date. Chris Murphy, a consultant who advocates the use of ICC profiles, summed it up in April: "The problem is that too many people expect this to be pushbutton technology instead of a commitment. There are a lot of people…that will tell you about their pain to get to success but that they actually did make it to success, and it works for them very well. This is not magic box technology."

It's that way with traditional methods, too.

If you decide to invest serious time and effort into using ICC profiles, and you like the results, don't give the credit to ICC. Have a look in a mirror, at the person who became a manager of color.

If I were an ICC partisan, I would now know that if adoption ever comes, it will come from below, not from experts.
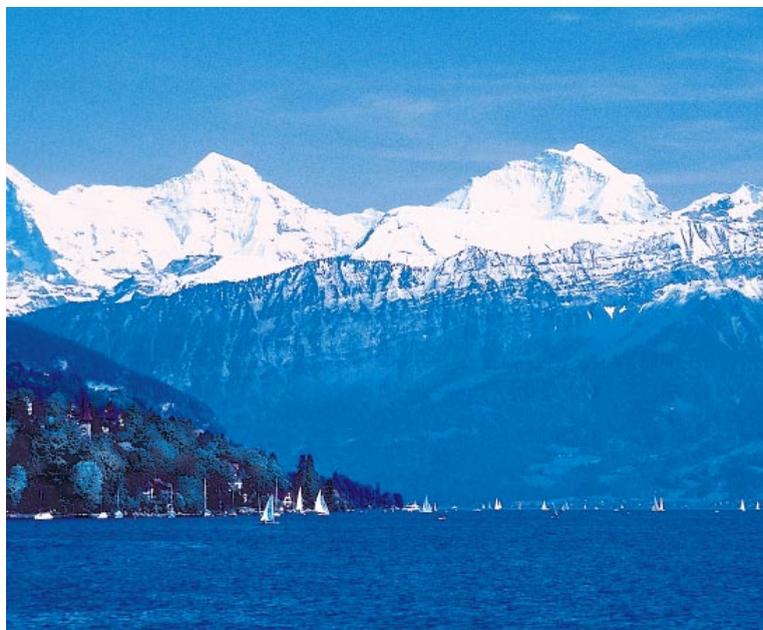
The more eccentric the output conditions, the worse the results a machine-generated profile will yield. The human visual system makes trees seem green—even if there isn't any yellow ink in use.

I would therefore concentrate on making the whole thing easier. I would understand that if the concept ever takes off, it will do so slowly. And I would realize that unless profile editing becomes freeware, preferably as a part of Photoshop, in the year 2005 the refrain will still be what it is today and was ten years ago: everyone is going to adopt this, we've turned the corner now, next year for sure…

If I were Adobe, I would not abandon the ICC standard, but I'd accept the market's verdict. I'd hire fewer theoreticians and more real-world experience. And if anybody suggested that the problem with Adobe's product line is that it doesn't *require* the use of ICC profiles, I would ram a keyboard down the throat of that person.

If I were a confused user, I wouldn't feel ashamed. If I saw myself as one of those who could benefit from this type of color management, I'd go for it. But until I decided to do so, I wouldn't embed profiles. (To its credit, PS 5 distinguishes between earlier files, which *can't* contain profiles, from newer ones where a profile was deliberately omitted. An accidental conversion is less likely in the second case.)

ICC proponents often liken naysayers to the typesetting companies who were skewered by the desktop publishing revolution. This is an excellent analogy. Not because a traditional way of doing things was overthrown, though; this happens very rarely.

The typesetting companies had superior technology and superior quality, but they died anyway. They died because they represented elitism; the average user had no way to access or make use of their power.

So it is with ICC color management. It has found its niche, as a worthwhile way for a small minority of people to do certain things. As a universal interchange format, it's dead. Like Esperanto, it was arguably an improvement over traditional methods, but not so compelling, by no means so profound, as to warrant overturning them. Like the typesetting industry, it was elitist: too difficult, too expensive, and too inaccessible.

If you don't know any foreign languages, but wish to become a linguist, you could do a whole lot worse than starting out with Esperanto, even if you never wind up speaking it to anybody. It's easier than any "natural" language, and will make moving on to other tongues a relative snap.

If you aren't getting accurate color, but want to, you could do worse than starting by learning the ICC color model. With even a partial understanding of it, you'll get good results. If you master it, though, you will understand that all such systems are basically the same, and then you can live with it if it suits you and without it if it doesn't. And you will appreciate that it is no contradiction to say, color management is dead: long live color management.

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