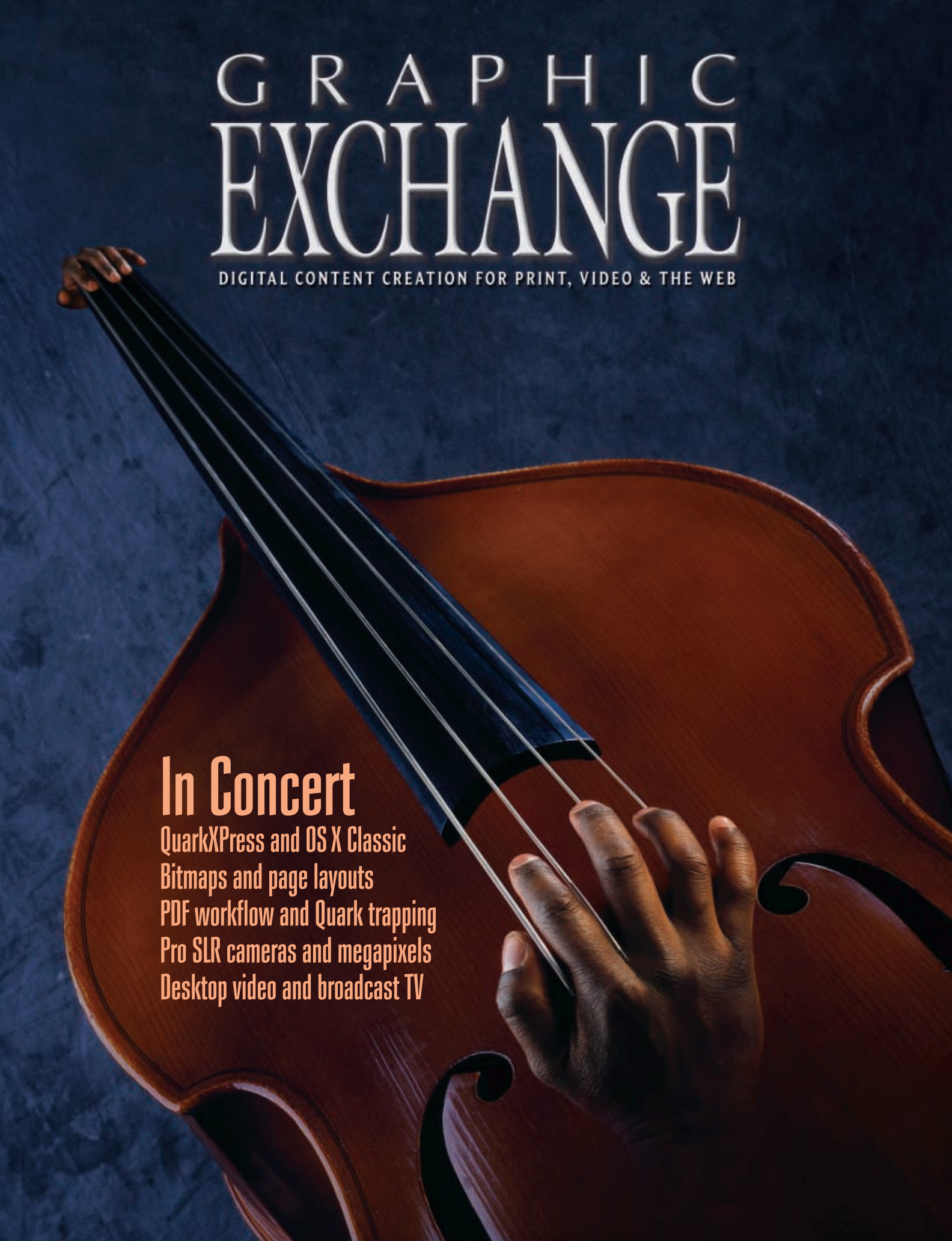
GRAPHIC EXCHANGE

DIGITAL CONTENT CREATION FOR PRINT, VIDEO & THE WEB



In Concert

QuarkXPress and OS X Classic
Bitmaps and page layouts
PDF workflow and Quark trapping
Pro SLR cameras and megapixels
Desktop video and broadcast TV

Professional digital SLRs keep getting better faster

DIG IT

So much has happened in digital camera technology since summer '02, it's impossible to absorb it all in one sitting. Those amazing new 5 to 6-megapixel cameras will soon be blown away by the 10 to 14-megapixel models announced at September's Photokina in Cologne. And while users take sides on CCD versus CMOS, optics technologies are undergoing a major redesign and on-board storage is reaching the size of hard drives.

WHAT'S A PHOTOGRAPHER TO DO?

Is there any question that high end digital photographic imaging has reached—indeed surpassed—the quality of 35mm film?

Anyone still leaning on that as an excuse for not buying a digital camera can't use it any more. If you know what MTF tests are, check out *www.wyofoto.com/Digital_Image_Quality/Image_Quality.htm*.

The first question becomes one of usability. A photographer with a top-of-the-line collection of lenses (perspective control, super wide-angle, etc.) would do well to look at the digital body which accepts those lenses. The next problem becomes that of the size of the imager. Most CCDs (an inheritance from video cameras) are smaller than full-frame 35mm, mean-

by Ron Giddings

ing lens focal lengths are increased by 1.3 to 1.7%. This is great for increasing the reach of telephotos, but it also means your 24mm lens becomes the equivalent of a 35mm wide-angle!

More to the point, in September 2002 German research group Anders Uschold Digitaltechnik released a scientific test report (*www.uschold.com/htm/Uebersicht/uebersicht.htm*) that reached the following conclusion: "The generation of 6-megapixel sensors has reached the limitation of 35mm SLR lenses. The resolution bottlenecks, formerly caused by the sensor, are now defined by the lens' abilities. To improve resolution it is necessary to say goodbye to an old tradition. The analog architecture of 35mm SLR lenses underlines serious restrictions when used with high resolution digital sensors. New lenses, optimized for the sensors' needs, are necessary."

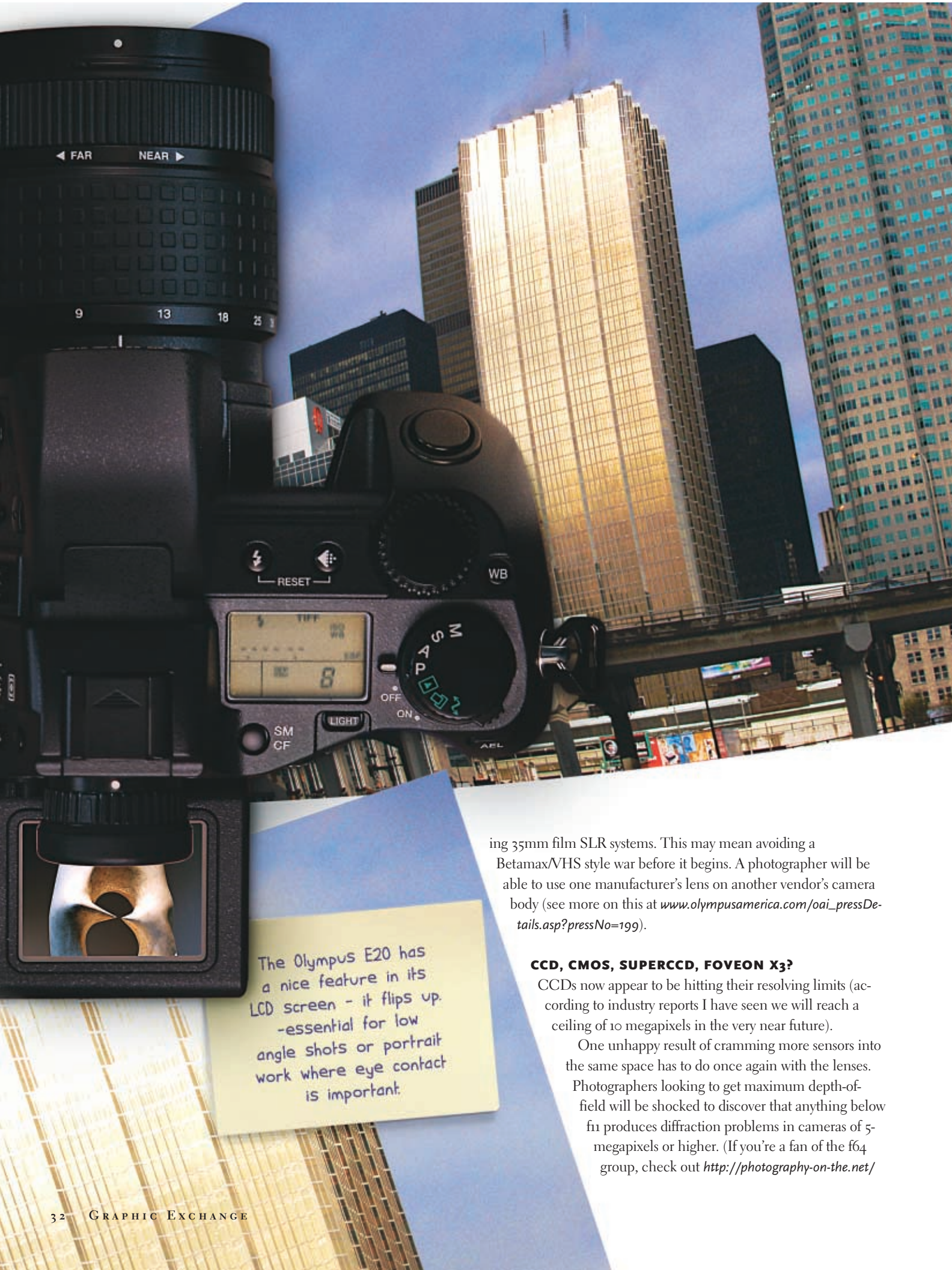
Here are three samples of current digital photography technologies, blown up and sharpened to show the patterns created by a digital matrix and film grain: (top) Fuji 6.17-megapixel S2 Pro, (middle) Olympus 5-megapixel E20, and (bottom) Kodak PhotoCD of 35mm film. Interestingly, we got a glow off the highlights of the S2 Pro, and not the others. This is because the S2 was using a 24-120mm zoom, a lens difficult to design and prone to flare.

Moore or less: These three relaxed ladies were shot at the Art Gallery of Ontario, where a flash is not allowed. The large 11x17" was captured by Fuji's Finepix S2 Pro; the next size comes from a regular PhotoCD of 800ASA film; the smallest is Olympus' E20 at 250 dpi and maximum image size.

STARTING FROM SCRATCH

Those companies which have decided to create models from scratch have all decided small is better. Built-in zooms are appearing with focal lengths of 9-36mm f2-2.4. That's a big difference from using a 24-120mm f3.5-5.6 zoom from a 35mm camera to get the same coverage. The new lenses are now lighter, brighter and cheaper as well as more efficient.

Olympus and Kodak have agreed to implement a "Four Thirds System" standard. The idea is to standardize lens mounting systems, something that has been impossible to achieve with digital SLR cameras based on exist-



ing 35mm film SLR systems. This may mean avoiding a Betamax/VHS style war before it begins. A photographer will be able to use one manufacturer's lens on another vendor's camera body (see more on this at *www.olympusamerica.com/oai_pressDetails.asp?pressNo=199*).

CCD, CMOS, SUPERCCD, FOVEON X3?

CCDs now appear to be hitting their resolving limits (according to industry reports I have seen we will reach a ceiling of 10 megapixels in the very near future).

One unhappy result of cramming more sensors into the same space has to do once again with the lenses. Photographers looking to get maximum depth-of-field will be shocked to discover that anything below f11 produces diffraction problems in cameras of 5-megapixels or higher. (If you're a fan of the f64 group, check out *http://photography-on-the.net/*

forum/viewtopic.php?TopicID=2975 &page =0.) What this means is that we won't be seeing medium or large format cameras with CCDs at resolutions this high any time soon—unless somebody changes the way they're made. Like Fuji, for instance.

Fuji's Super CCD (as in the FinePix S2 Pro) is able to grab more information in the same space by rotating each sensor and reinterpreting the signals received (see diagram at top right). This allows the S2 Pro to get 12.1 million pixels (4256 x 2848) out of a 6.17 million sensor array! That's an 11 x 17" image at 250 dpi!

But—what about not using CCDs at all?

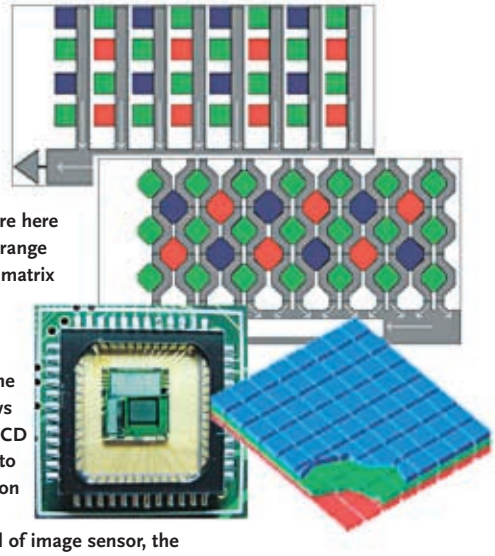
A CMOS (Complementary Metal Oxide Semiconductor) uses a hundred times less power than an equivalent CCD sensor and can be fabricated on any standard silicon production line, making it extremely inexpensive to manufacture. With a much longer development history, CCDs have been able to generate higher quality pixels…until now.

The Canon EOS-1DS, a CMOS-based, full 35mm-frame SLR with 11-megapixel specs(!), just hit the market in November. There's a fabulous field review of this stunner by Canadian photographer Michael Reichmann at *www.luminous-landscape.com/reviews/cameras/1ds/1ds-field.shtml*.

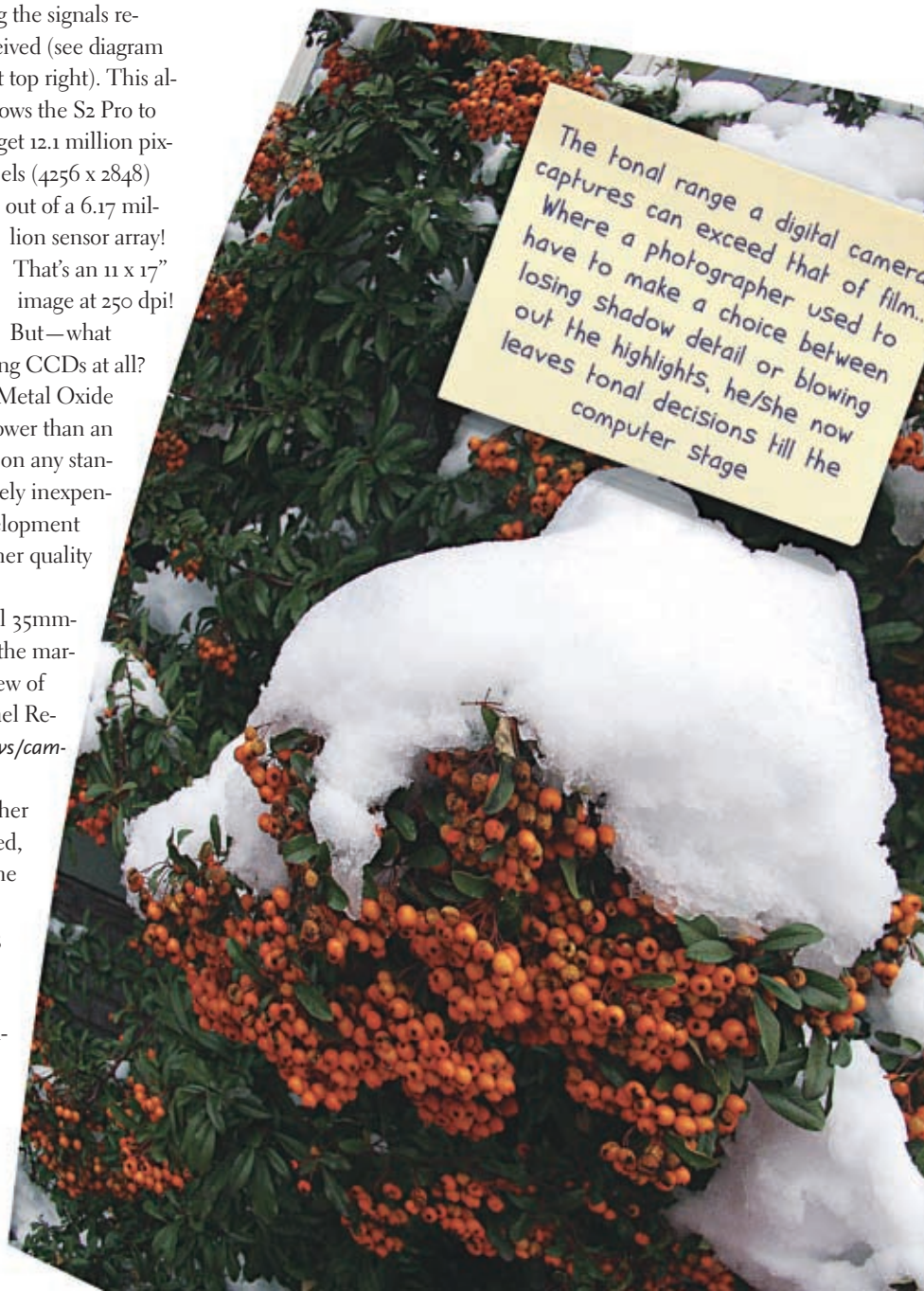
And the new Sigma SD9 camera uses another type of imaging sensor which stacks separate red, green and blue sensors behind every pixel of the sensor array. This Foveon X3 image sensor (*www.foveon.net/index.html*) claims to have 10.3 million (2268 x 1512 x 3) photodetectors.

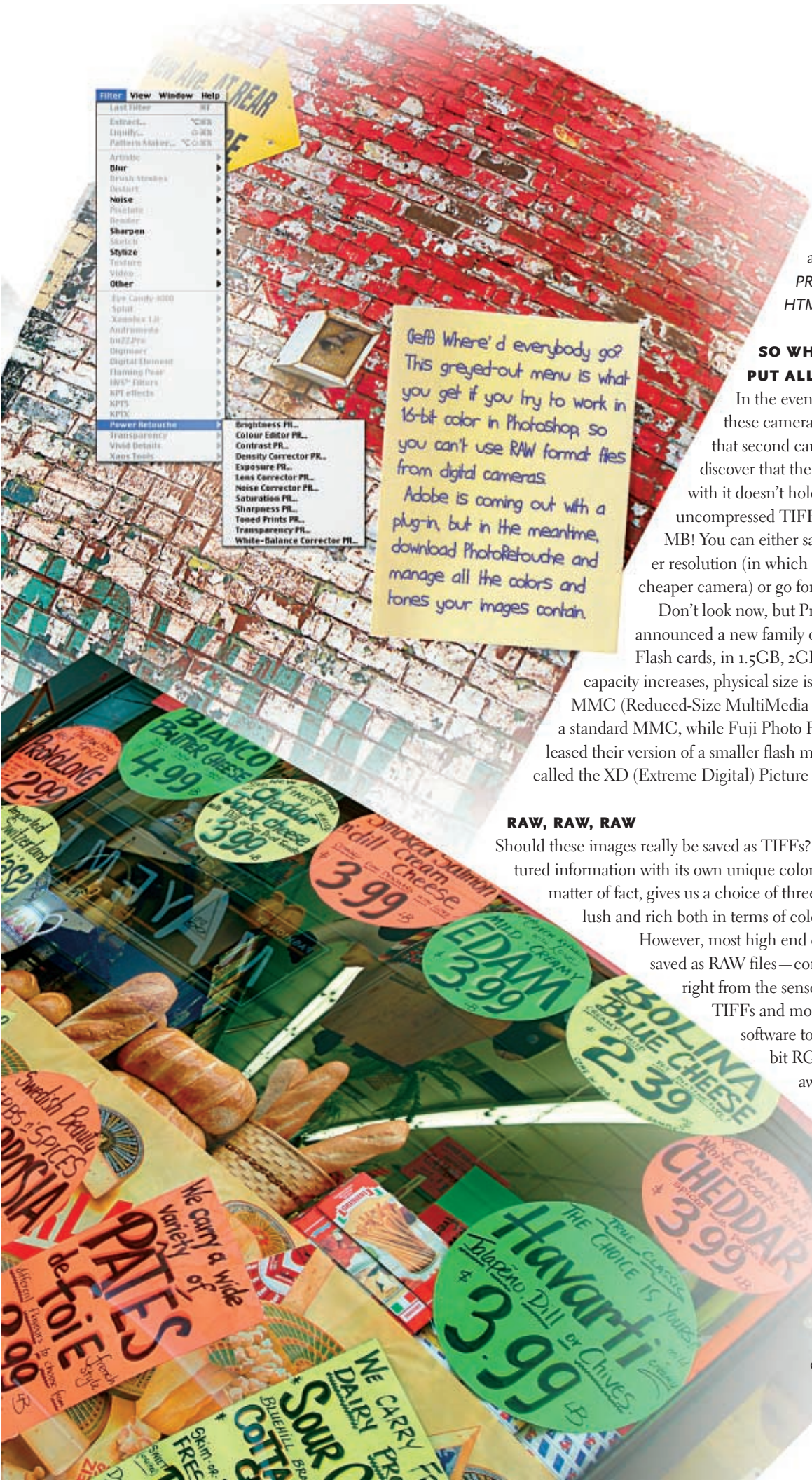
But wait!

Kodak (who, by the way, started all this digital camera stuff in the first place) has just announced a Nikon-based CMOS camera capable of capturing 14 megapixels per image!



(right) The top picture here shows how CCDs arrange color sensors into a matrix (apparently humans need to see twice as much green as the other two colors!) The second picture shows how the Fuji SuperCCD rotates each sensor to grab more information from the same size CCD. The new breed of image sensor, the semiconductor CMOS, is shown next. Finally, because silicone absorbs different lightwaves at different depths, Foveon has been able to create sensors that collect Red, Green and Blue together instead of building a color matrix.





For a terrific site with comparison pix of these hot new releases, you should take a look at *www.imaging-resource.com/PRODS/SHOOTOUT/SHOOTOUT.HTM?photo=46*.

SO WHERE AM I SUPPOSED TO PUT ALL THIS?

In the event that you decide to get one of these cameras—and forego the purchase of that second car for the family—you'll quickly discover that the tiny memory card that came with it doesn't hold much. The Fuji s2 Pro gave us uncompressed TIFFs that each weighed in at 34.7 MB! You can either save them as JPEGs, shoot at lower resolution (in which case you could have bought a cheaper camera) or go for the gigs.

Don't look now, but Pretec Electronics Corp has just announced a new family of three high-capacity Compact Flash cards, in 1.5GB, 2GB and 3GB sizes! And as storage capacity increases, physical size is shrinking—Hitachi's new RS-MMC (Reduced-Size MultiMedia Card) is a half-length version of a standard MMC, while Fuji Photo Film and Olympus have just released their version of a smaller flash memory card (only 20 x 25mm) called the XD (Extreme Digital) Picture Card.

RAW, RAW, RAW

Should these images really be saved as TIFFs? Each camera translates captured information with its own unique color palette (the Fuji S2 Pro, as a matter of fact, gives us a choice of three palettes). The results are often lush and rich both in terms of color and tonality.

However, most high end cameras allow images to be saved as RAW files—complete, unfiltered 16-bit info right from the sensor. RAW files are smaller than TIFFs and most cameras come with plug-in software to convert them back to usable 8-bit RGB. But what's getting tossed away in the conversion?

Recognizing that pro photographers are naturally going to want everything their cameras grab, Adobe is now developing a Photoshop plug-in to work with RAW files. But while we were waiting for that to come along, we discovered *www.powerretouche.com*, the

address for an excellent suite of imaging tools out of Denmark. Power Retouche supports 16-bit images in both RGB and CMYK (Mac version) and gives photographers fine control over such in-camera stuff as White balance, noise removal, and black-and-white conversion. We even get lens distortion correction and sharpening without creating negative edgelines. If you're going to save digital images as RAW files, you'll want these tools.

POWER TO THE PEOPLE

So what drives all these digital cameras? Batteries, of course. But you'll soon discover that it's very difficult to take twenty high res pictures and not completely kill the bunny.

These cameras require rechargeable nickel-cadmium (NiCd) or nickel-metal hydride (NiMH) batteries. Fortunately there are a number of ultra-fast rechargers appearing on the market (try to get one that you can plug into the cigarette lighter in your car).

Revolutionary technologies going into the next generation of digital cameras will make it a very exciting time for professional photographers. And the battleground will be won or lost not just on quality but on overall cost. Canon dropped the price of the EOS-1DS to US$7,999 (approximately CDN$12,640) before it was even released. Within a week, Kodak announced that by year end it would be shipping its 14-megapixel DCS Pro 14n (also CMOS)—street price about US$4,595 (approximately CDN$7,270). Photographers can only benefit when these giants are fighting it out, so stay tuned.

Ron Giddings (e-mail giddings@rgiddings.com) is a Toronto photographer and digital artist. View a portfolio of his work at www.rgiddings.com.

(right) The Fujifilm FinePix S2 Pro combines many features of the Nikon F80 camera with the second generation of Fuji's own SuperCCD. It's an excellent 6.17-megapixel SLR, especially for photographers who already own Nikkor lenses. We got gorgeous, sharp, colorful 34.7MB images, although size has its price (street price, body only, US$2,399/approx. CDN$3,800). The S2 is capable of capturing bursts of seven frames in 0.5 seconds, but it's wise to remember that it still has to 'digest' these images. We lost a couple of these bursts by turning the camera off after seeing the last preview on the LCD. A batch of hi-res TIFFs can take well over two minutes to be copied to the camera's memory card. That's over two minutes of wait time before the next shot can be taken!