

# THE ART OF PHOTOGRAPHY

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[Revised August 2005]

This essay responds to the proposition that those who take fine art photographs using digital cameras should be required to identify use of that technology, thus differentiating their work from traditional, film-based photography. A corollary argument holds that those who process their photographs digitally should so state on prints made of those photographs, as opposed to those using traditional darkroom techniques. Both these propositions represent attempts to denigrate digital photography and relegate its practitioners to some form of second-class status.

## Summary

Artistic digital photographers and those who use digital technology to process their artistic photographs are obliged to disclose no more information about their art than do traditional film photographers, because:

- The essential artistic steps used to create a photograph are virtually identical regardless the technology used.
- Photographs may be judged aesthetically or technically superior or deficient for many, many reasons, and the medium used will not be evident in a superior photograph. (Similarly, the medium used may be painfully evident in a deficient photograph, and therefore similarly need not be announced.)
- We are artists, not journalists, and therefore the fact that a photograph may have been altered from the original image is a meaningless is-

sue. (Moreover, film photographers have been altering their photographs since the beginning of the art form, with no one suggesting they should announce the alterations.)

- How a photograph is taken or manipulated is not primarily of interest to the ultimate consumer, the buyer/collector. Instead, that consumer will be interested in the technical and aesthetic quality of the print he acquires, and the only factor that should be disclosed is the physical nature of the print itself, since that will often suggest its value and determine its likely archival quality (or lack thereof).

## Discussion

Photography as an art form records visible artifacts by focusing their luminance on light sensitive media (“picture taking”) and subsequently transferring that information to a (usually) two-dimensional surface (“printing”), both pursuant to an artist’s intentions. The process involves several steps, including the following:

1. Previsualization. Under ideal conditions, the artist anticipates the eventual print when viewing the scene, prior to taking the photo. Previsualization is not always possible, as some photographs are taken under adverse or candid conditions without much prior contemplation. A great artist, however, can pre-visualize

even then (*e.g.*, the late Henri Cartier-Bresson).

2. Taking the photograph. Artistic and technical judgments are combined to achieve the previsualized or immediate artistic intent. Artistic judgments include framing the shot, deciding depth of field, determining desired exposure, and timing the exact moment of exposure. Technical judgments include adjusting a zoom lens's focal length – or physically moving oneself forward or backward if necessary, adjusting the aperture and shutter speed, and manipulating a number of other factors.
3. Processing the photographic image. Processing involves: first, translating the latent image into a form that may be manipulated; second, manipulating the visible image preparatory to making a print or displaying the image for others to view.
4. Making the print or displaying the image. By whatever media are chosen, the artist makes the image available for others to view.

Of these four steps, only in the fourth does the artist use one of several significantly different technologies, whose disclosure is important to the prospective buyer/collector. After all, the most important consumer of a photograph is usually the person buying a print of it. The buyer decides based on aesthetic and technical factors. The technical factors relate to the visible appearance of the image (*e.g.*, its clarity, color quality, detail visible in shadows or highlights, etc.) and the print's medium and its durability – *i.e.*, its archival qualities. As shown below, print technologies – including “silver gelatin on fibre paper,” “C-print on RC stock,” “pigmented ink on archival paper,” etc. – become very important. The following discussion explains why differentiating digital

from film technologies makes no sense for the first three steps.

### **Previsualization**

Previsualization is independent of technology, except that some scenes are better captured using a particular film medium or using special digital techniques, which must be decided beforehand. From an artistic standpoint, however, few are interested in the artist's decisions when preparing to take a photograph.

For example, if the film photographer looks at a scene and sees extremes of contrasty light, the film may be overexposed and underdeveloped to assure that details in shadows are retained. For that scene, the digital photographer may take multiple photos of the scene using different exposures, knowing that he can merge them later in the computer to retain those details.

Either approach yields an artistically superior photograph. Judged aesthetically, the photographer succeeds independently of the techniques used.

### **Taking the Photograph**

Those who say that digital photographers should identify themselves say that the different technologies become relevant at the point that the shutter is clicked. Why is that, however?

First, we exclude everything in the process other than the medium on which the image is recorded. If using an SLR, the lens is detachable and interchangeable between film and digital cameras. Both film and digital technologies have “point-and-shoot” cameras, often using inferior lenses with built-in zoom capabilities.

A film camera records the image on a single-use physical medium (the “film frame”), and the light causes a permanent chemical change in coatings on the film. The image is recorded in analog fashion – *i.e.*, the chemi-

cal changes occur at a molecular level on a black-to-white continuum depending on the amount of light striking each molecule when the exposure is made.

A digital camera records the image on a multiple-use medium (the “sensor”), and the light causes a momentary change in the sensor’s physical (*i.e.*, electronic) characteristics. The process is technically more complex than this simple explanation, but in essence the image is recorded by each sensor element “reading” a numeric measurement of the light’s intensity at that location in one of the three primary colors. That reading is transferred immediately to the camera’s computer buffer, and in due course is transferred to a digital recording medium (*e.g.*, a compact flash card), often with some in-camera processing along the way.

The difference between registering the light qualities via analog (“continuous”) or digital (“incremental”) technology is meaningless, since the gradations of the digital record are so very fine (in a twelve-bit image 4,096 of them for each color from pure color to pure black! a total of 69 *billion* possible colors!) as to be imperceptible to the human eye.

True, sensitivities to various parts of the spectrum differ between the technologies, but then there are also differences (sometimes even more meaningful) among different films and different film manufacturers. Even the ISO of the film can affect how the photo looks when captured (*e.g.*, grain in the film at higher ISOs), yet we have never demanded that photographers disclose what film was used for their photos. Some photographers do disclose such details, but purely voluntarily.

The best digital cameras permit adjustments according to lighting conditions, not only by changing ISO (sensitivity) on the fly, but as well by changing the color balance (*e.g.*, choosing among “daylight,” “cloudy skies,” “incandescent lighting,” etc.).

We should focus on a photo’s resolution and the human eye’s ability to discern resolution differences between film and digital technologies, because those differences are real and visible under some circumstances.

I have heard some profess that film resolution is infinite. This is clearly wrong. Not only is the absolute limit determined at the molecular level, but as any film photographer recognizes, it is even more significantly affected by two factors: (1) clumping of the molecules, which we see as “grain,” (2) and the quality of the lenses used for the photography. (The latter factor is much more significant than one might think, and too often overlooked – photos taken with “consumer” lenses are often distinctly inferior to those taken with professional lenses, at any decent enlargement level.) However, for the sake of argument, let us accept that under the best of circumstances, even with 35mm film, film resolution is currently superior to most digital SLR sensor resolution. For reasons that will become apparent, I won’t debate precisely where film and digital resolutions intersect. Instead, consider the question: at what point do resolution differences become meaningless?

(A digression – one approach that is qualitatively unassailable: photograph with a large format camera on 8x10 sheet film, drum-scan the negative, process in Photoshop, and print using the best laser or inkjet technology. I recently attended an exhibition of Craig Blacklock’s new prints in the *A Voice Within* series of Lake Superior nudes, done using this approach and printed on high-end inkjet printers, and the prints were astoundingly beautiful, the detail exquisite, and the sepia gradations equivalent to or better than anything that might be accomplished in a “wet” darkroom.)

We can take two approaches to judging the adequacy of digital images: the first is to run the numbers; the second is aesthetic.

First, the numbers. I photograph with the 8 megapixel Canon 20D digital SLR. The sensor resolves at 3504x2336 pixels (16-bit or 8-bit color). Let us say that I am photographing a five-foot tall person. Leaving an additional foot above his or her head, that means a total height within the frame of 72 inches. The technology of sensor resolution is complex, so this is a simplification. The foregoing measurements mean that each pixel resolves approximately 0.0205 inch, or 0.52 millimeters. While very much larger than a single human hair, this clearly means small collections of hair strands or very small freckles will be distinct. This resolution will reproduce details with crystalline clarity in prints up to 16"x24", and often with highly acceptable results in prints of even larger formats. For most purposes, this resolution equals anything achievable by 35mm film.

More important than any quantitative analysis, however, is the qualitative judgment. In other words, is the photo indistinguishable from or superior to a photograph of the identical scene taken with film? This judgment must usually await making an actual print. We cannot judge a photo's quality by examining a film negative (or contact print) except with a jeweler's loupe, or even more so examining a digital photograph on the back-of-camera LCD display. This judgment is possible after processing the photo, discussed immediately below, and then finally when the print is viewed.

### **Processing the Photographic Image**

At this point the path to an eventual print divides into two, for the most part entirely exclusive, processes: the "wet" darkroom and the "digital" darkroom.

#### *The Wet Darkroom*

In the wet darkroom, the exposed negative is first developed in a chemical solution that

removes silver from the film's emulsion side in inverse relationship to the intensity of light striking the film, leaving the photo's frame at each point more-or-less transparent or opaque (thus the term, "negative" – the more the film was exposed, the less silver is removed, so the less transparent that portion will be when viewed after development). Once developed (a process whose results are dependent upon the chemicals used, their purity and dilution, the temperature at which development takes place, and the length of time the emulsion is exposed to the chemicals, all of which can be varied to achieve artistic effects), the film's development is "stopped" by another chemical bath, and finally all chemicals are removed by flushing the film with a continuous stream of water. The film is dried and protected from dust, scratches, etc.

The negative itself is not a fixed record of the photograph. For example, it may be air-brushed (benignly, to remove defects in a subject's complexion; or less benignly, to physically remove a person or object – one of the most egregious examples of which was the total removal of a Soviet official who had fallen into disfavor). Portions may be bleached or darkened to change their appearance. Some photographers have even scratched the negative as purposeful artistic expression. These are only a few of the manipulative techniques that might be applied to negatives.

After developing the negative, subsequent processes relate to "making the print," and will be discussed later.

#### *The Digital Darkroom*

In the digital darkroom, an image is loaded into a personal computer (or Apple Mac), stored on its hard disk (or sometimes on a CD-ROM), then loaded into memory using a program such as Adobe's Photoshop, and processed up to the point of creating a print.

There is no “negative” in the digital darkroom, a major difference between it and the wet darkroom. The exposed image is always displayed and processed as a “positive” image. Some might say this is a distinction without a difference, except that to the extent that a photographer previews an image on the camera-back LCD display, certain judgments regarding exposure – especially areas where highlights have been blown out or shadows are overly dense – may be detected and exposure adjusted before taking a second photograph.

Although digital darkroom processes fall along a continuum once the image is in the computer, nearly everything done to the image is more analogous to “making the print” than to processing the image (*i.e.*, little is analogous to developing a negative), discussed in the next section.

### **Making the Print**

(A preliminary note: the photographer may not be the person creating the print, in either the wet or digital darkrooms. Some photographers do not enjoy the printing process, choosing to concentrate on the artistry of creating the photographic image; some digital photographers are not adept at the considerable skills required to use Photoshop effectively; and some photographers will hand their negatives or digital images to a *master printmaker*, knowing that the results will always be the best print possible using the chosen technologies.)

#### *The Wet Darkroom*

In the wet darkroom, to create the print, light is projected through the negative, with or without use of lenses to focus and enlarge the image, ultimately falling upon a light-sensitive surface, usually a sheet of coated paper. That sheet may be sensitive only to blue light (resulting in a monochromatic

print), or may be sensitive to a major portion of the visible spectrum (a color print).

In projecting light through the negative, the artist/printer can create print effects by selecting the paper for the print; and if using an enlarger: use of filters; over- or underexposing all or portions of the projected image (“burning” or “dodging”); projecting multiple images on the print surface, either simultaneously or seriatim; etc.

The artist may even scan the negative, process the resulting image in the digital darkroom, create a new negative, and print that using traditional techniques!

#### *The Digital Darkroom*

Once the image is in the artist’s computer, following are some of the techniques that may be applied, each of which has an analog in wet darkroom processes:

- Correcting general over- or underexposure, or lightening or darkening the entire image for artistic purposes.
- Increasing or decreasing the image’s contrast.
- Changing hue or saturation of color images.
- Applying any of these effects to selected portions of the image using masks (the term “mask” is derived from a wet darkroom technique where portions of an image intended not to be affected are physically masked).

Myriad techniques beyond those described above may be applied to digital images, some to improve the resulting product and some to achieve particular artistic goals. Some even replicate film deficiencies – such as grain – for artistic purposes!

By comparing wet and digital darkroom techniques, we illustrate that altering an image between its appearance “out of camera”

and its appearance on a print is not the exclusive province of either approach, and that it is ludicrous to suggest that one or the other approach is somehow “impure” and should be disclosed to eventual buyers/collectors.

The technology used to make the print is the sole information that should be disclosed to anyone who views or purchases a photographic print, because (1) differentiating among print technologies based on visible characteristics of the image printed has become impossible; and (2) all other judgments of the photo’s content are matters of personal preference, aesthetics, and technical appraisals of its appearance, and are not dependent on the technology employed in taking and processing the photo. Let me be clear: it is every bit as possible to take a defective photo with lesser quality film cameras as with lesser resolution digital cameras. *For that matter, even a professional camera in the hands of an inept photographer will result in inferior photographs, whether via film or digital.* Such photographs will be deficient as fine art prints.

But fine art prints’ appeal (and perhaps price) will depend in part on the print medium.

Three print technologies are used for most fine art prints brought to the market today:

1. Silver gelatin prints
2. Coupler prints, or C-Prints as they are more commonly known
3. Pigmented ink on archival paper (archival inkjet) – for which the standard industry term is *Digital Pigment Print*.

The silver gelatin print is a proven technology of long standing. It has several sub-technologies, including selenium toning, sepia toning, split-toning, solarization, and others, all of which involve post-processing

of the developed print. Some of these sub-technologies are known to extend the prints’ lives. A silver gelatin print on fibre paper has long represented the pinnacle of print making from the standpoint of broad acceptance, archival stability, and aesthetic appeal. In general, digital images cannot directly create silver gelatin prints.

C-Prints have a checkered history, and long suffered from color instability and deficient print-making technologies. Arrival on the scene of Fuji Crystal Archive paper, however, which can be printed using either enlargement or laser equipment, lets a digital or film photographer make color or monochromatic prints with an estimated 60year color stability under normal display conditions. The prints are made on RC (polyethelyne “resin coated”) stock, in the past notorious for suffering layer separation. No one warns about such degradation of Fuji Crystal Archive prints, however.

Until recently, inkjet prints have been the poor stepchild of print technologies. In the beginning, even aside from deficiencies in resolution, inkjet prints used dye-based inks, so colorfastness of fewer than ten years was a major drawback. Pigmented inks, however, printed on archival (fibre) quality coated papers, are claimed by companies like Epson to have 100+ year archival quality (claims that for Epson’s most recent printers and inks have been validated by the respected testing lab, Wilhelm Imaging), and resolution improvements in dot size and precision now exceed the human eye’s ability to differentiate Digital Pigment Prints from silver gelatin prints made with an enlarger. With Epson’s latest printers, Digital Pigment Prints now contend with silver gelatin prints in terms of aesthetic appeal and superb tonal reproduction.

Since the casual – and perhaps even the more experienced – observer can no longer distinguish silver gelatin prints, black &

white C-Prints, and black & white Digital Pigment Prints, when displayed under glass, it makes sense for those producing such prints to label them with the technology used.

### **Postscript**

I have spent time over the past two summers visiting several art fairs in our region, including one that brings in photographers from across the country. I have noted with some humor the tendency of “wet” photographers to post a notice somewhere in their exhibit that essentially reads as follows:

*My photographs are taken on film and developed and printed in a darkroom using traditional photographic methods. No computer has been used to process or enhance the photographs in any manner.*

The notices read so much like a chant to ward off evil that I’m surprised they don’t go further by saying, “*No computer has been permitted to come within twenty yards of these photographs at any time*”!

### **A Personal Postscript**

I photograph with the high-end Canon 20D digital SLR, using mostly professional zoom lenses from Canon’s “L” series. As mentioned already, this camera’s eight megapixel resolution is measured by a 3504x2336 sensor rectangle. I regularly make prints as large as 20”x30”, although my favorite format is 12”x18” (on 13”x19” archival matte paper). At this size, I absolutely *defy* anyone to look at a print of one of my photographs and detect characteristics indicating that it is from a digital instead of a film camera. (Ironically, the one hallmark that might lead to such a pronouncement is the utter *perfection* of these prints.) I *always*

disclose the print medium used – formerly C-Prints, but for my best work I now prefer DPPs made on the Epson 4800 printer using the new Ultrachrome K3 inks – but consider the images themselves to be part of the larger universe of fine art photography and therefore able to stand on their own.