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Time and the Digital Image:

Blur, Jitter, and Scan

Within our broad topic of time and the experience of art, specifically in the field of photography, this is an investigation of the digital image. How can digital images help us to experience photographic time differently?

These notes towards an answer begin with the digital image and perceptions of its fast and slow time, and then consider the history of photography and the collapse of the duration into the instant. After discussing how chemical photography registers time as the blur, I'll present two artists whose digital art practices shift our understanding of time and the image: animated stereography and scanner photography. Where the blur records time as space, animated stereography divides space into time, resulting in diffraction. Where the blur superimposes time onto space, scanner photography parses time into space, resulting in compression and rarefaction. These unfamiliar artifacts make the digital images strange to us, yet they also suggest the strangeness of the older chemical photography – and of our own organic vision.

Malleably Fixed – Digital Images and Time

Digital technology and the computer appear to alter our experience of the photographic image in countless ways. Digital editing changes our perception of the visible product of photography – how we survey the image which is animated, annotated, filtered, juxtaposed, or transformed. Digital editing also changes our conception of the invisible process of photography – how we understand the image to have been detected,

captured, transmitted, stored, and presented. Our perceptions and conceptions may mislead us, however, as many hallmarks of digital photography (such as the manipulation of the image) are more continuous with the older chemical photography than they are discontinuous. Photo editing *software* may be new, but photo *editing* is as old as photography. Yet, if the manipulation and transformation of the photographic image is old, what in the digital image is new?

There are many good places to start hunting for newness, from a consideration of the materiality of the digital image (as electrons or magnetic patterns on media or in the network) to its abstract logic and structure (file format, embedded metadata, color profile, etc.). We might also consider its cultural reception – for example, although digital files have fraction of the lifespan of physical media, many feel that, as electrons do not age, a digital file "is forever." This last is closest to our topic of art and time. What are the temporal registers of the digital image?

First, digital images appear both slower and faster than their chemical counterparts, more fixed and more malleable. The online digital image is doubly fixed, for not only are its patterns of electrons immune to the decay suffered by film or paper, but its home on the internet was built (as the story goes) to resist nuclear war. Online, the digital image is unmoved by sun or moisture or grubby fingers pressed against the screen, and it appears safe even from apocalypse within a fortress of military-informatics. Yet if the digital image is perfectly fixed, it is simultaneously perfectly malleable. The myth of the invincible internet is founded in part on the duplication and speed of information that can always be *elsewhere* – instantly transported to wherever a mushroom cloud is not. This speed is the hallmark of the network, and of the computers that comprise it, but it is

also the hallmark of the digital photography process. In fact, the most common claim that digital images are a unique mode of art begins as a claim about speed. In the age of computation, the argument goes, the digitized photograph is *so* quickly duplicated and *so* seamlessly manipulated that the difference in degree eventually becomes a difference in kind, transforming photography into something else. The processes of duplication and manipulation may be old, the thinking goes, but speed has made them new again.

Light Writing – Photography and Time

In 1839, the same year that Jacques Daguerre announced the "Daguerreotype" process, Sir John Herschel delivered a scientific paper in which he coined the term "photograph." Photo•graph comes from Greek roots meaning "light•drawing," – or, perhaps, "light•writing." Today, writing and drawing may sound like much more time-consuming and deliberative processes than those associated with photography, which is commonly described using words such as "snap", "shoot." If the process of snapping a few shots during a shoot sounds swifter to our ears than the process of drawing with light, there is a reality behind this speedy language. Contemporary photography is primarily associated with recording intervals of hundredths or thousandths of a second. However it has not always been so. From the early use of mirrors and prisms for tracing, through patterns slowly exposed onto a metal plate, and on into early film processing, the origins of photography lie not in the instant but in the passage of time. When Joseph Nicéphore Niépce, Daguerre's predecessor and collaborator, called his experimental images "heliography," it captured this even slower sense of the rhythms of the sun – which was appropriate, as Niépce's process initially took eight hours.

The common interval of photography has changed, however at heart the process remains a bearing witness to accumulations and superimpositions of light over some duration. Even today, this shortened common interval can never be reduced to an infinitesimal "instant" – for the instantaneous photograph is the photograph of Xeno's paradox, a black surface which no ray of light could reach, for to do so it must cross space, and to cross space takes time. Rather than describing it as the art of timelessness, we could describe photography is the craft of time-artists, whose shutter-speed adjustments slice time into delicate wedges. The practice of long exposure also endures in contemporary photography, as well as in the awareness of its audience. When we view a long exposure of a nighttime freeway, we perceive within the river of red streaks a history of moving taillights, each red point along one continuous line testifying to a different instant in the passage of a single vehicle. Our ability to see this arises in part out of direct experiences with the blurring of our own vision, but at least as much out of our literacy in the operations of the exposure. We see the cars because we have learned to read the streaks. Still, although photographs are durations in time, and although we know this, a user of the latest auto-focusing, auto-exposing, cellphone-embedded digital camera can be forgiven if she mentally classifies her video clips as moving *in time* and *being time*, while her photos she considers the opposite – "freeze-frames," "stills," or arrested and indivisible units *outside time*, of *not-time*.

Our contemporary casual photographer might, for example, be an owner of the world's very first camera phone, the Sharp J-SH04, released in 2000. Yet no matter how recent her equipment, her perception of photography as *not-time* resembles that of another camera owner, the purchaser of a Kodak Brownie. The Brownie, the first

popular “snapshot” camera, was a simple, low-cost device marketed to capture moments in daily life. It was released in 1900.

While the technological history of photography has changed our experience of the photograph, the most basic effect of that technology on the time of the process (speed) has been to collapse the time within the common photograph from the managed duration of a seated portrait into the automatic “instant” of a snapshot – and this basic shift from duration to instant has been a part of the mass perception of photography for over 100 years. Photos have always witnessed durations – whether they be hours, seconds, or milliseconds – and yet we have long acted like they didn’t. Is anything new?

The Blur

Perhaps instead of the process of photography, we should consider the product of the photograph, where computing has changed many things about the way we understand images to be stored, edited, and displayed. Effects of computing on the mass culture of photography range from the widespread availability and use of photo editing software (such as procedural Photoshop filter transformations) to the common presence of compression artifacts – a strange lattice of sharpness that creeps into digital images whenever they have been packed into a small file size and then algorithmically re-expanded. However, instead of working backwards from, say, digital compression artifacts to some chemical equivalent, I’d like to work forward from the trace of time in chemical photography to different digital traces. In chemical photography, we see the traces of time passing in the phenomenon of the blur.

By blur, I do not mean soft or incorrect focus, but rather motion. Within the space of a photograph, a blur is a *place* that corresponds to a *time* – that is, it is a set of points that correspond to the motion of a single point in time. This motion may be specifically localized within the image, as in the blur of a set of receding taillights. This motion may also be general, suffusing the entire frame. In a blurred shot of a nightclub interior, we may not be able to tell if the camera or the crowd was moving. Without a fixed point of reference, however, the distinction ceases to matter – physics teaches us that all motion is relative, and the camera has witnessed relative motion occurring over some period of time. The blur inscribes that passage of time into the space of the frame and, when we view it, we read back out of the blurred space the passage of time, perhaps the wobble of a hand or the sway of a crowd.

Where the photograph captures the traces of time, the image blurs. Blur is the mark of time's passage successfully recorded. For this reason, the icon of the blur is a vector pointing into the future – in television, in film, or in comic books, we follow the blur forward until we find the bullet train, the spaceship, or the superhero. Yet, for the photographer, too often the blurred image is considered a failed image. The photograph has succeeded in capturing time, and in doing so has failed to sufficiently exclude it, failed to approach the successful imitation of not-time. If the process failed, why did it fail – was the world too fast, or was the shutter too slow? The answer can only be a relative one, that there existed some difference, the product of some change.

Is change bad or good? Is time good or bad? The answers, again, are relative, part of your individual, emotional relationship to time – to the past you desperately want to keep fixed, or to the future you welcome with open arms. Of course, as dystopian

literature teaches us, the future might be bearing down on us instead – or we might be hurtling headlong into it.

> "Have you ever watched the jet cars racing on the boulevards down that way?"
>
> "You're changing the subject!"
>
> "I sometimes think drivers don't know what grass is, or flowers, because they never see them slowly," she said. "If you showed a driver a green blur, Oh yes! he'd say, that's grass! A pink blur! That's a rose garden! White blurs are houses. Brown blurs are cows. My uncle drove slowly on a highway once. He drove forty miles an hour and they jailed him for two days. Isn't that funny, and sad, too?"
>
> "You think too many things," said Montag, uneasily.
>
> (Ray Bradbury, Farhenheit 451)

With the blur as our point of departure, here are some examples of other ways that the new media transcribe time into space and back again.

Animated Stereography: Jim Gasperini

[WARNING: web images could cause seizures in epileptic viewers]

http://www.well.com/user/jimg/stereo/stereo_list.html

In addition to being an interactive story designer and video game author, Jim Gasperini is a stereo photographer, or stereographer. Stereography involves taking two pictures of the same object from slightly different angles, either simultaneously or in quick succession. These two images can be viewed together to recreate the human experience of spatial depth we are accustomed to from our stereoscopically separated eyes. This depth effect can be created by isolating the views of each eye, either by using a stereoscope box with two eyeholes, or by coloring or polarizing the images and viewing them with special 3d glasses, or even through an act of concentration, crossing or

uncrossing the eyes while staring at similar images until the illusion of a third “magic image” appears. Stereo or series photography may also be embedded in holographic prints, causing the image to change as the viewing angle changes.

What do these 3d image techniques and their representations of space have to do with time? Gasperini uses animated and interactive computer formats (GIF and Flash) to encode his stereography in a format that appears three dimensional on a computer screen. He does this using a technique that he calls a "time-for-space wiggle" in which the image is animated to *jitter*, rapidly cycling between left- and right-eye views of the scene. The effect is at turns fascinating and deeply disorienting, as if a holographic print was vibrating in front of your nose, or as if a turn-of-the-century nickelodeon movie box was cranking through the same two frames at a breakneck pace. Yet this is not a cinematic effect, like two frames clipped from a fast-moving camera pan, nor is it merely a workaround for stereo-separated vision. Instead, it relies on the ability of the digital display to show arbitrary nonlinear information, both endlessly looped and interactive. In the Flash versions of his images, for example the viewer may switch at will between the left- and right-eye views with the gesture of a mouse. This is somewhat like the act of tilting a holographic print, except, in holography, the space of the false image is hidden within other space (the angle of the holographic film). Here there is only the same small square of pixels, changing over time. Just as we read motion in time out of the space of the blur, here we read the depth of space out of the small slice of time Gasperini steals to create it. I’d call this time diffraction – the stereo separation of deep space, not into red and blue channels (as in traditional 3D glasses), or into vertically and horizontally polarized channels (as in modern 3D glasses), or even as two distinct images (as in

classic stereopticons and modern VR helmets). Instead, space has been stereo separated across time. Interestingly, this is the technique used by full-body immersive 3D environments such as The Cave – with the only difference being that oscillating eyewear in The Cave carefully filters out interference for the incorrect eye. Here we are confronted with that interference, the artifacts of the illusion.

The Scanner Photography Project - Michael Golembewski

http://www.scannerphotography.com/photographyGallery/index.html

Michael Golembewski adapts flatbed scanners into deep-focus digital cameras, and then takes photos that time-lapse, from left-to-right or from top-to-bottom. As the scanner "reads" the scene, artifacts of its passage are created, yet these artifacts exist within a detailed photographic scene in a way quite unlike long exposure photography. Where the camera compounds time into space in a serious of superimpositions, the scanner assembles space by parsing it over a period of time. A sixty second camera exposure of city traffic might render vehicle motion as blurs, but the scanner shows them as a collection of compressions and rarefactions – impossibly long vehicles race ahead of the reading line, while others rush into it and are crushed to almost nothing.

Where the blur superimposes time into space, scanner photography parses time into space, compositing it in a continuous process that results in compression and rarefaction. Interestingly, this is quite unlike most photocopier collage art (e.g. Wallace Berman's "verifax" photocopier works of the 1950s and 1960s). There, the photocopier was focused on primarily as a tool for composition, assemblage and pastiche rather than time-based art – although there are some signs of artifacting (e.g. Sarah Jackson "Bride's

Thoughts"). For supplementary examples of scanner photography, see Leif Mangelsen and Jung Oh's "Timescanned." Mangelsen and Oh's student project uses a very similar technique to Golembewski's, however they use a motorized tripod to create extremely long 180 or 360 degree panoramic shots with a more impressive scope but a much rougher look. <http://itp.nyu.edu/~jmo297/itp/icm/TimeScanned/main.htm>

This roughness is not necessarily a problem, however. It is an artifact of the motorized tripod – a slight vertical jittering that registers everywhere in small misalignments of what should be stright lines. If the exposure were a regular one, of course, this slight up-and-down motion would cause blurring. But it doesn't – in "Timescanned," as in "The Scanner Photography Project," the image is most interesting where it fails, and in failing reveals itself.

What do Gasperini and Golembewski's works do for us? At the very least, I'd suggest that they make the experience of time in photography unfamiliar and strange. By forcing us to read photographic time in a new way, they also give us new perspective, making our old ways of reading photographic time unfamiliar and strange, if only for a moment. There, in the strangeness of chemical photography, we might recognize a reflection of the strangeness of our own organic vision. Our vision, with its stereo separation, its electro-chemical processes, its quirky artifacts and afterimages, its ticking, and all its preposterous limitations… vision is both the old technology that we cannot escape, and the one that, through media, we constantly make new.