

PHOTOGRAPHY

Beyond Technique

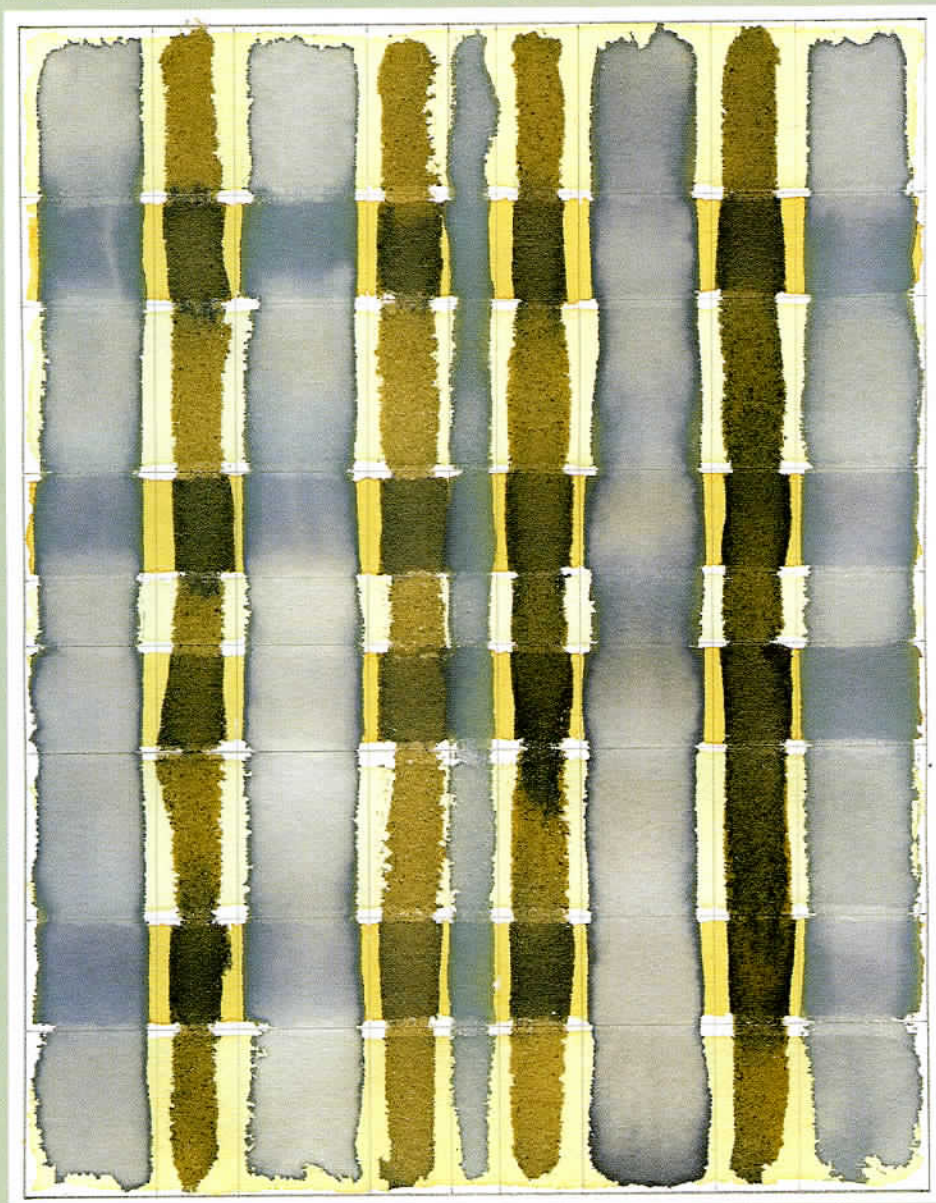
Essays from F295 on the Informed Use of
Alternative and Historical Photographic Processes

Edited by
Tom Persinger



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Experimental Cyanotype, No. 7, 2010.
Digital scan of an unfixed cyanotype on paper, 8½ × 6½".

IMAGINARY WHOLE-PLATES

OR, NOTES TOWARDS THE REINVENTION OF PHOTOGRAPHY

Alan Greene

Upon publication of *Primitive Photography* in 2002,¹ the fresh, liberating knowledge obtained from my personal study of the subject had led me to the conclusion that the contemporary alternative-process and pinhole movements were suffering from a kind of collective malaise, characterized by the same set of procedures and methods being endlessly repeated. If I was not desirous of making a break with these movements at the time, I was, at least, trying to present a different approach. And on many occasions, this approach involved letting voices from the past speak for themselves.

Setting my technical manual aside, I now would like to talk about what I call “the reinvention of photography.” This includes components of my earlier book, but differs from it in the sense that it is more aesthetic and philosophical in orientation.

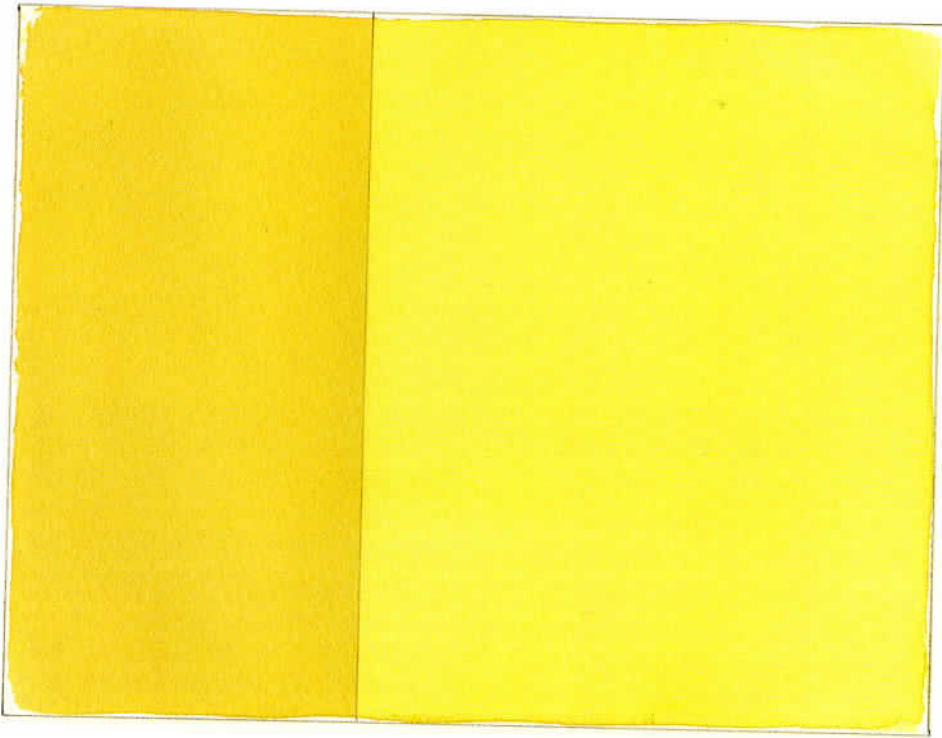
Part of what I mean by the reinvention of photography is the desire that a photographer may have to be self-sufficient – or independent from the vagaries of industrial manufacture – be it in the construction of a camera or lens-aperture system, gaining more control over negative-making or positive-printing operations, or any such combination. So in addition to all the labels we use or have used to describe this tendency – alternative photography, alternative-process and historical-process photography, pinhole photography, lo-fi analog imaging, etc. – I suppose what comes closest to what I have in mind is do-it-yourself photography.

“Do It Yourself” is all the rage these days, because we need an escape from the Internet. If it is applied to the reinvention of photography, then it comes with the following condition: that “do it yourself” means just that, do it yourself. In other words, when confronted with a procedural or equipment-making problem, the do-it-yourself photographer should attempt to achieve as much as he or she can to resolve the question at hand, before turning to another for help. For when we turn to others too soon, the self-reliant aspect in the do-it-yourself approach is compromised. Call everything into question from the start, even if it means reinventing the wheel.

Self-reliance thus being taken as a working philosophy on an individual level, John Donne’s remark that “no man is an island” also holds true.² And this is where historic texts, hands-on workshops, and forums come into play. For we all need the help of others at times, and to pose questions is an important aspect of our shared existence. Likewise, an overly strict adherence to the goal of doing everything oneself can lead to a number of quandaries. For example, many years back, I told another photographer of my desire to make paper negatives from scratch, and he just laughed and said, “What would you do after that? Buy a mine and pickaxe and start digging for silver on your own?” And having worked in a building where glass had once been ground into lenses on an industrial basis, I also can add that I have no desire to grind my own lenses – even if Spinoza is noted for having eked out a living doing this.³

My adopting the stance of a do-it-yourself photographer has largely been done out of necessity. Today, we all are faced with the phase-out of industrially-made films and paper; but in the period leading up to the writing and publication of *Primitive Photography*, no one, as far as I could tell, seemed overly concerned about traditional (or chemical-based) photography – an art form practiced throughout the 20th century – being rendered obsolete. With one possible exception, there was no one to whom I could turn for help on a repeated basis. Those in the know did not seem to know, or at least they did not have time for individuals lacking the proper credentials. And since I could neither afford nor obtain access to vintage period equipment, I fell back upon my own limited experience – jobs I had held as a furniture-maker and a camera-repair technician, art-school training in view-camera photography, and perhaps, most importantly, a passing acquaintance with a Turkish folk musician, who had inspired me in that he made his own musical instruments.

My concept of the reinvention of photography distinguishes itself from other sub-genres of photography in its concern for photographic origins; for it is in the origin of things that potentiality is found, in the knowledge of causes rather than effects. Here I am not just referring to the invention of photography as related by historians, but a photography



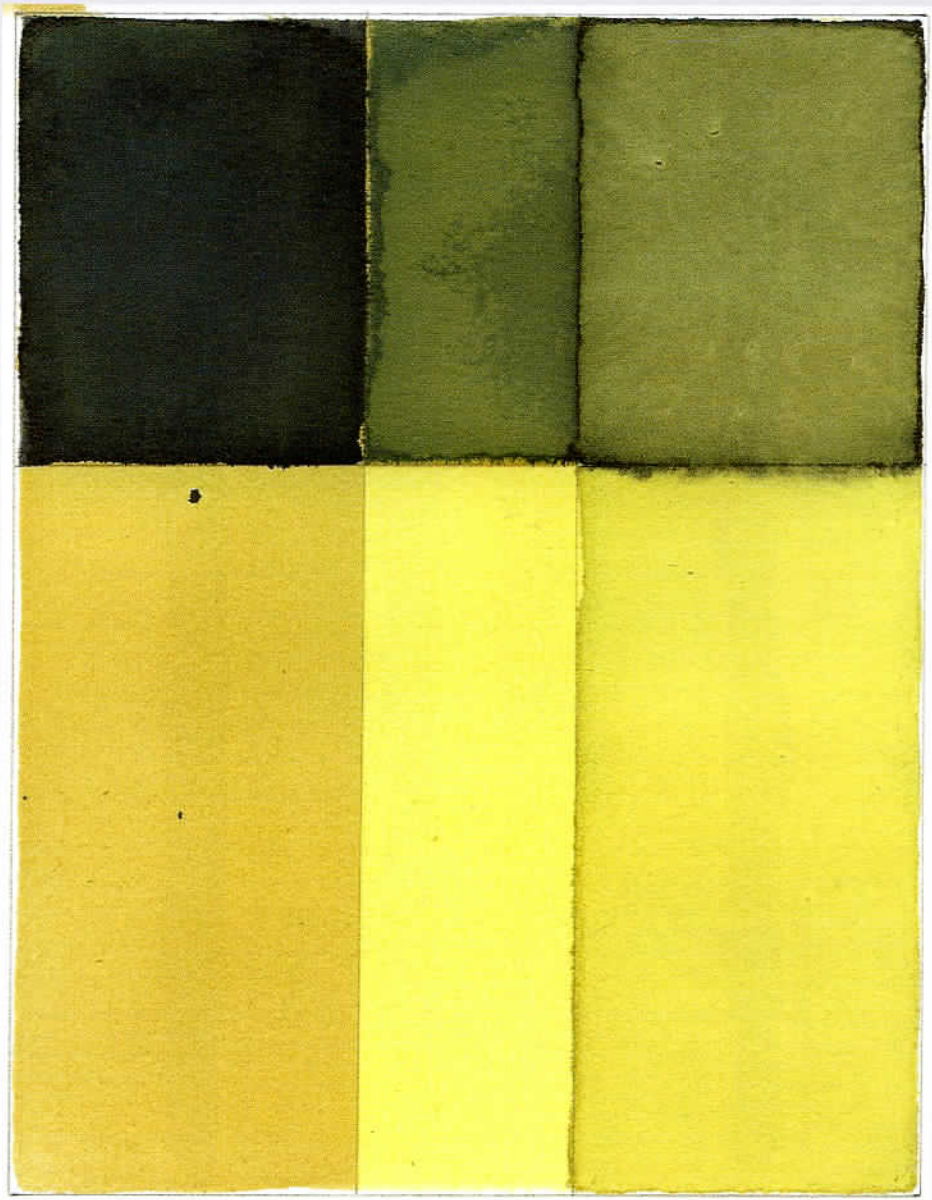
Experimental Cyanotype, No. 1, 2010.
Digital scan of an unfixed cyanotype on paper, $6\frac{1}{2} \times 8\frac{1}{2}$ ".

considered as part of a larger regenerative natural process.

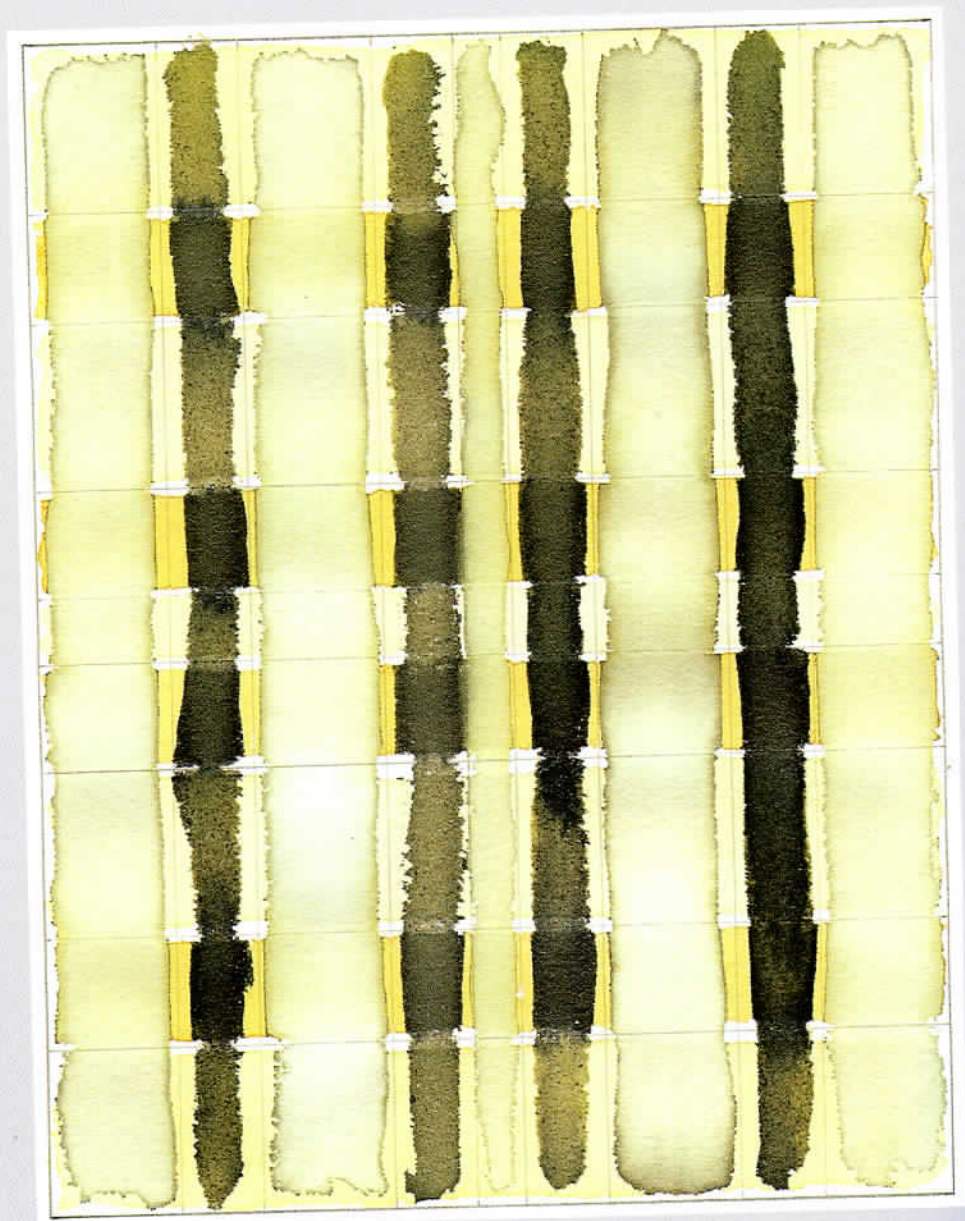
For a long time, I believed what I was told: photography was invented by a great man. Scheele, Charles, Wedgwood, Davy, Niépce, Florence, Daguerre, Talbot, Herschel, Bayard – pencil in whatever period or nationalistic prejudice you want here. The idea was to select the historical process deemed most worthy or useful, try to replicate it as closely as possible, and consider it a success upon achieving a degree of consistent, technical proficiency. In my case, I turned to procedures that seemed useful from a practical level – and which, coincidentally, were languishing in historical obscurity – reviving a paper-negative process by Amélie Guillot-Saguez,⁴ developing-out salted paper procedures by Thomas Sutton and Frederick Hardwich,⁵ and a dry, paper-negative process by Arsène



Experimental Cyanotype, No. 2, 2010.
Digital scan of an unfixed cyanotype on paper, 8½ × 6½".



Experimental Cyanotype, No. 3, 2010.
Digital scan of an unfixed cyanotype on paper, 8½ × 6½".



Experimental Cyanotype, No. 4, 2010.
Digital scan of an unfixed cyanotype on paper, 8½ × 6½"

Pélegry.⁶ In a similar way, others have brought back various versions of the daguerreotype, collodion negatives, albumen printing, ambrotypes, tintypes, printing-out paper, gelatin-bromide emulsion-making, and so on.

In noting that these occurrences have largely followed lines of photo-historical interpretation, I begin to wonder if this is the right path to be taking. And this leads to the following question: for how long can we rest content with the replication of various procedures, styles, and equipment derived from the past, instead of directing our efforts towards the creation of procedures, styles, and equipment that have never existed? For example, a recent invention like the digital Lytro camera shows that other possibilities still await discovery.⁷

Rather than appropriate and perpetuate the tastes and practices of the Victorian and Edwardian art establishments, we should be seeking to establish our own contemporary tastes and practices. Given the banishment of traditional photography to the Black Sea of obsolescence, what we should be striving to achieve is a state of *tabula rasa*: to be operating as if photography, as we have known it, had never existed. To reiterate, photography's furthestmost potential is contained in its unexpressed origin.

This situation is not unlike the circumstances in which Francis Bacon found himself, in relation to the received Scholasticism of the late sixteenth and early seventeenth centuries.⁸ Then, as now, alleged knowledge was often based on mere appeals to authority, the result being that so-called truths were endlessly repeated, not because they were necessarily true in themselves, but because people had repeated them so many times that they could not stop from believing they were true.

In other ways, this situation might be analogous to what the Dadaists and other early twentieth-century modern-art movements were rallying against—academic orthodoxy as espoused in the art institutions of the time.⁹ Thus, a reversion to brutish infantilism and a breakdown of the relative quality of artistic execution could be expected for a time, if they cannot be avoided. Obviously, the lessons of the past still have something to teach us; but we should use them as touchstones to future discoveries, rather than model ourselves after the previous example of 19th and 20th century photographic art and technique.

Taking a step backwards, let us suppose that this state of *tabula rasa* actually existed in the 1980s-90s,¹⁰ and that today, we are instead reaping the harvest of seeds that were sown then. Confronted as we were at the time, with the initial possibility of traditional photography's demise, it was only natural that we – a generation of photographers who had used

industrially-manufactured films, paper, and equipment up to this point – should return to 19th century procedures, since they offered the most complete and immediate examples of hand made photographic processes. At first, since we were living one or two centuries from when these procedures were practiced, our innovations were largely predicated on our disjuncture in time from the original events. But now, we risk establishing an institutional doctrine that requires that the same set of procedures continually be taken off the bookshelf, dusted off, and modified slightly. The procedures having become familiar to all, competition then replaces innovation with an emphasis being placed on the supposed mastery of technique.

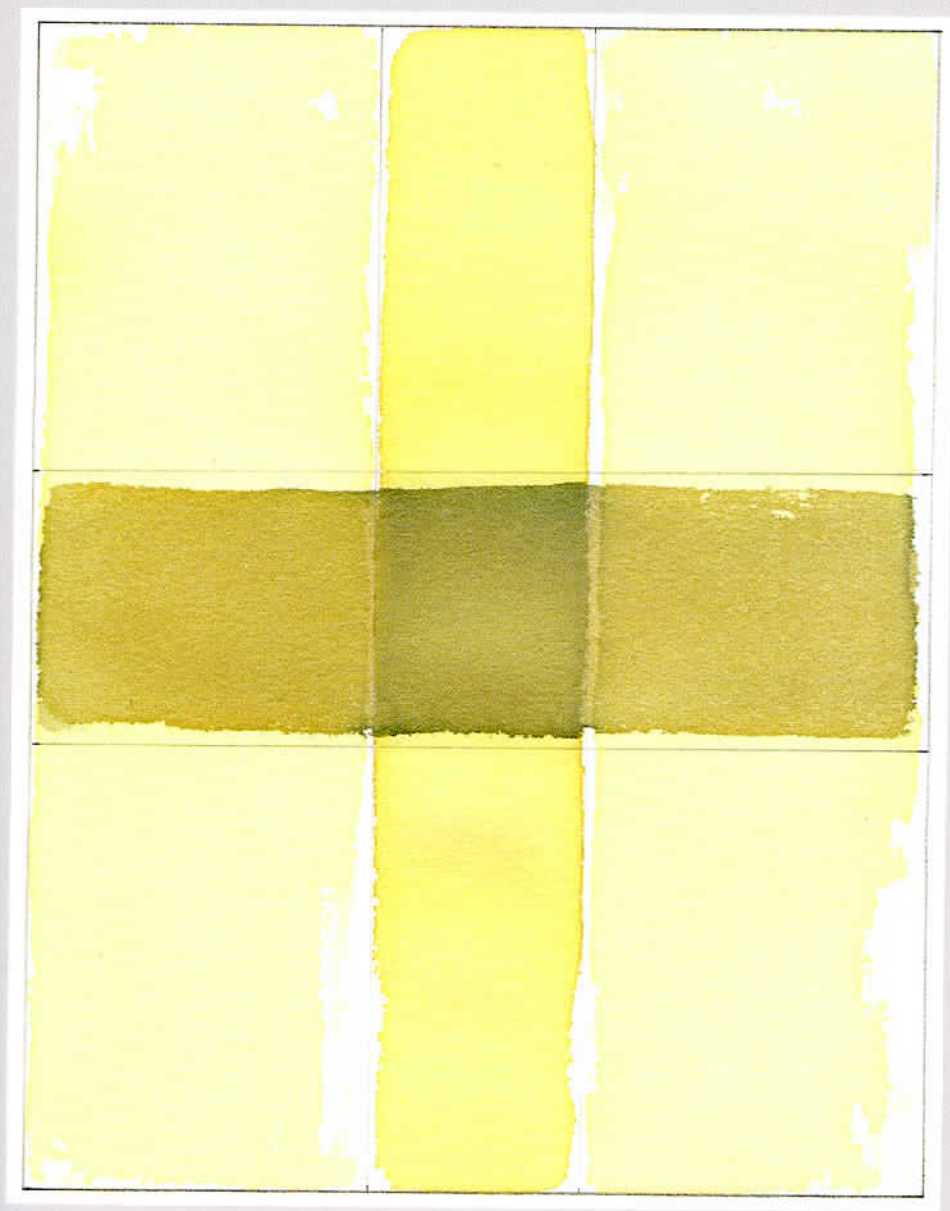
Where is the freedom of invention in this approach? It seems more reminiscent of the malaise I mentioned at the start. When we consider what was achieved by the middle of the 19th century, from what had been suggested at the beginning of that same century, we must concede that our own accomplishments, however promising at first, have been slight indeed.

Still, to our credit, we must recognize that the situation in the mid-19th century was different from what it is at present. Then, the entire thrust of Western civilization was behind the establishment of a new-found form of expression, photography. But now, the winds have changed; and we, the traditional photographers of today, like the grasshopper in the fable, find ourselves left out in the cold, because society has laid traditional photography aside like an outgrown plaything.

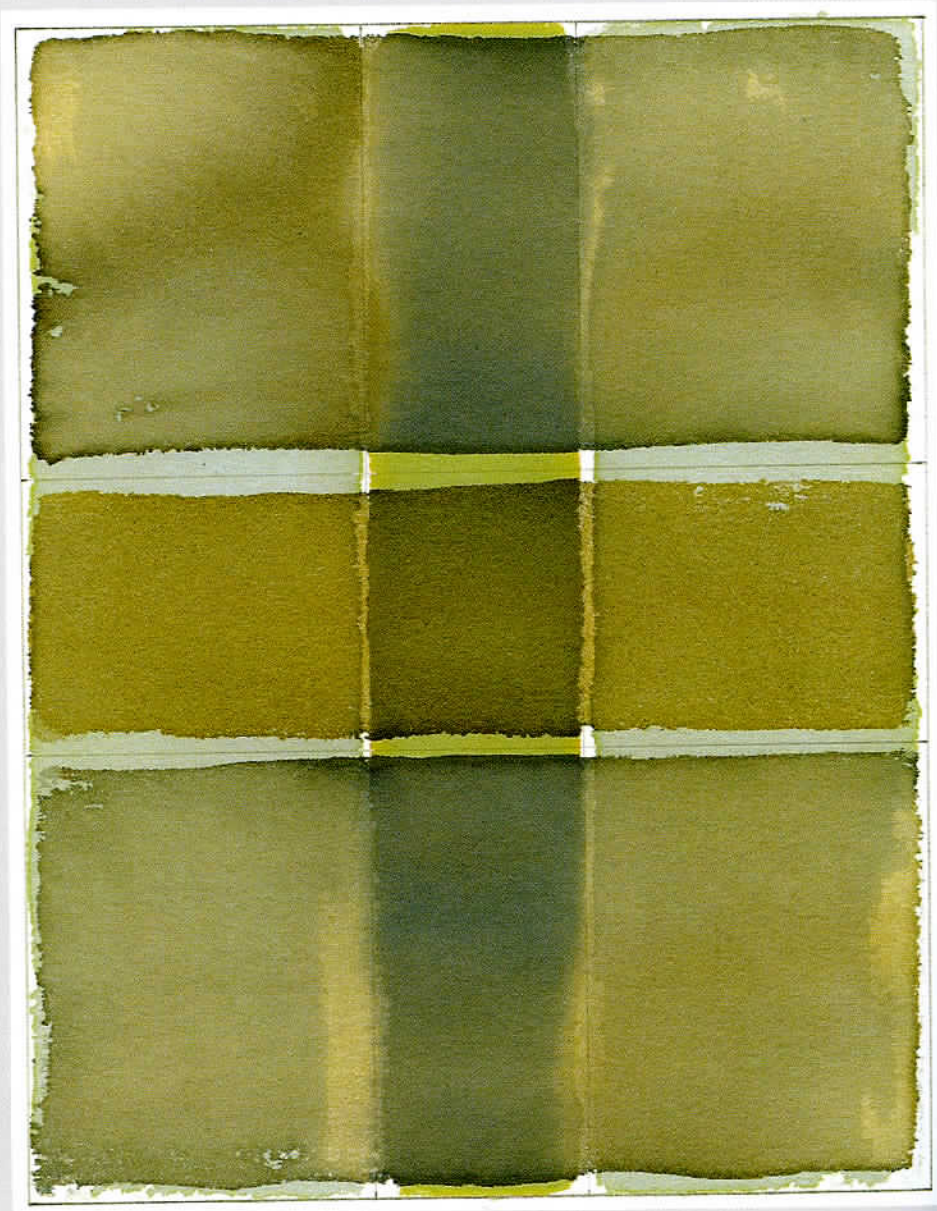
Is this really such a tragedy? Indeed, throughout our respective lifetimes, hasn't the practice of black-and-white photography seemed a bit of an anachronism anyway? Sure, we could always find C-41 process film at the local pharmacy, but what about sheet film and graded paper? And when we set up a modern view camera in public, didn't a passerby almost always ask, "How old is that thing?"

The solution I have in mind does not involve a complete break with the past; it also does not involve putting the torch to any libraries or museums. The solution involves returning to the origins of photography – to redefine or alter our understanding of it. And just as there are two creations at the beginning of Genesis, it is time for us to accept that photography does not really start in 1839, with Daguerre. It is also time for us to accept that photography does not start with a barrel-distorted view from a window at Le Gras. And it is time that we agree with Thomas Sutton that the only thing Talbot really invented was the patent as applied to photography.¹²

Rather, let us acknowledge that photography begins with our closest stellar neighbor,



Experimental Cyanotype, No. 5, 2010.
Digital scan of an unfixed cyanotype on paper, 8½ × 6½".



Experimental Cyanotype, No. 6, 2010.
Digital scan of an unfixed cyanotype on paper, 8½ × 6½".

the sun. In spite of it all, this fiery orb still remains our primary source of light – and the phrase, “light is everything in photography,” is already a commonplace. From the sun, photography branches out, embracing plant and animal biology: tree leaves turning different shades and colors in autumn, before bronzing over; untreated lumber and furniture – darkening, ripening with age; visible tan lines on our exposed bodies in summer; the seasonal changes of snowshoe hares and whitetail jackrabbits.

As it is impossible to assign an exact date or place to any of these natural phenomena, perhaps we should rein things in a bit and stick to the written record instead. After all, what distinguishes our present understanding of photography from a mere appreciation of nature is our knowledge of how to initiate and control a given sequence of photochemical reaction. Combine this with the manipulation of light through the use of optical instruments and the controlled exposure of projected images focused upon a photosensitive surface and we start to arrive at photography as commonly understood.

In this case, let the timeline start in antiquity; and let the location be Tyre, a city located along the shores of modern-day Lebanon. Here, photography might be said to have evolved from the Phoenician craft of dyeing cloth purple; and its historical existence can be elicited from the ancient accounts of Aristotle, Pliny the Elder, and Vitruvius.¹³

For those who may be unfamiliar with this historical detail, the Tyrian dyeing method is summarized as follows: a mollusc, the murex, found along the shores of the region, contained a gland from which a light sensitive yellow liquid was extracted; the yellow liquid was blended with salt water, followed by the introduction of undyed cloth; and after soaking, the cloth was exposed to sunlight, where a series of gradual color changes took place – yellow, green, brown –before arriving at the final desired state, purple.

The difficulties inherent in dyeing cloth purple made it very expensive, to the point where it became associated with nobility. But in Roman times, purple-dyeing nonetheless expanded in operation, until the murex was almost harvested to extinction. The Romans were also manufacturing convex and concave lens elements from glass and crystal,¹⁴ so it was only a matter of time before one and one made two. Sadly, this had to wait quite a while. Just before the Glorious Revolution of 1688-89, a group of English scientists began studying the possibility of obtaining a purple dye from a similar mollusc found along their shores.¹⁵ Then, in 1711, a French savant named Réaumur took their research a bit further, speeding up the time needed to make dyed cloth reach purple by condensing the sun's rays with a magnifying glass.¹⁶

By now, I hope it is becoming clear that what I am advocating is an emphasis on texts written prior to 1839, in order to write a history of photography as an older and broader phenomenon, and to arrive at a different kind of photography than the one that has already been practiced. For example, 18th and early 19th-century treatises concerning the theory of vision, leather tanning procedures, the light-sensitivity of plants and animals, and the light-fastness of dyeing formulas might be considered as being more pregnant in untapped photographic possibility than the well-hammered procedures contained in 19th century photo manuals like Towler's *Silver Sunbeam* or Wilson's *Cyclopaedic Photography*.¹⁷ For it is only by a thorough investigation of the so-called proto-historical record that we can ever prepare ourselves to return to the post-1839 treatises again – not looking so much for the celebrated, successful procedures, but overlooked, unsuccessful ones, which may hold secrets, like unturned stones.

Undoubtedly, the view I am expressing here could be taken as extreme – especially by those who maintain that the theory and practice of the photographic art, as it has come down to us, contains inherent truths that cannot be altered because they have been repeatedly proven to be true, and that what we have received from the past, by way of equipment and methodologies, is in its most-improved state via the process of elimination. Bearing this in mind, I would like to mention a few post-1839 examples of equipment or procedures that have remained essentially unchanged for over a century, but which really should be improved upon or simplified to meet the present needs of the individual, do-it-yourself photographer – rather than the needs of industry, which was the original determining factor. These are as follows: film-holder design; ground-glass focusing screens; bellows focusing systems; dark cloths when focusing or composing; cylindrical barrels with lenses; and gelatin-bromide emulsion-making. And this is just a personal selection. Surely others must have their own lists of similarly needed changes; and if so, these need to be addressed as well.

As much as anyone, I too would like to see traditional photography survive the threat posed to it by digital photography. Yet many believe that traditional photography has been long dead as a cultural phenomenon, having been conceived in the 1820s, born in the 1830s-40s, and having died at the start of the present millennium when digital photography became the predominant mode of taking family snapshots.¹⁸ My own view, as expressed here, is that the error of this belief lies in an overly rigid conception of the historical evolution and definition of photography, as well as a tendency to give preference to certain pet procedures. In this, I have first-hand experience of limitations in the photo-historical view, for when I began making developed-out salt prints, the photo-historical and photo-conservation consensus was stacked against me. The received opinion being

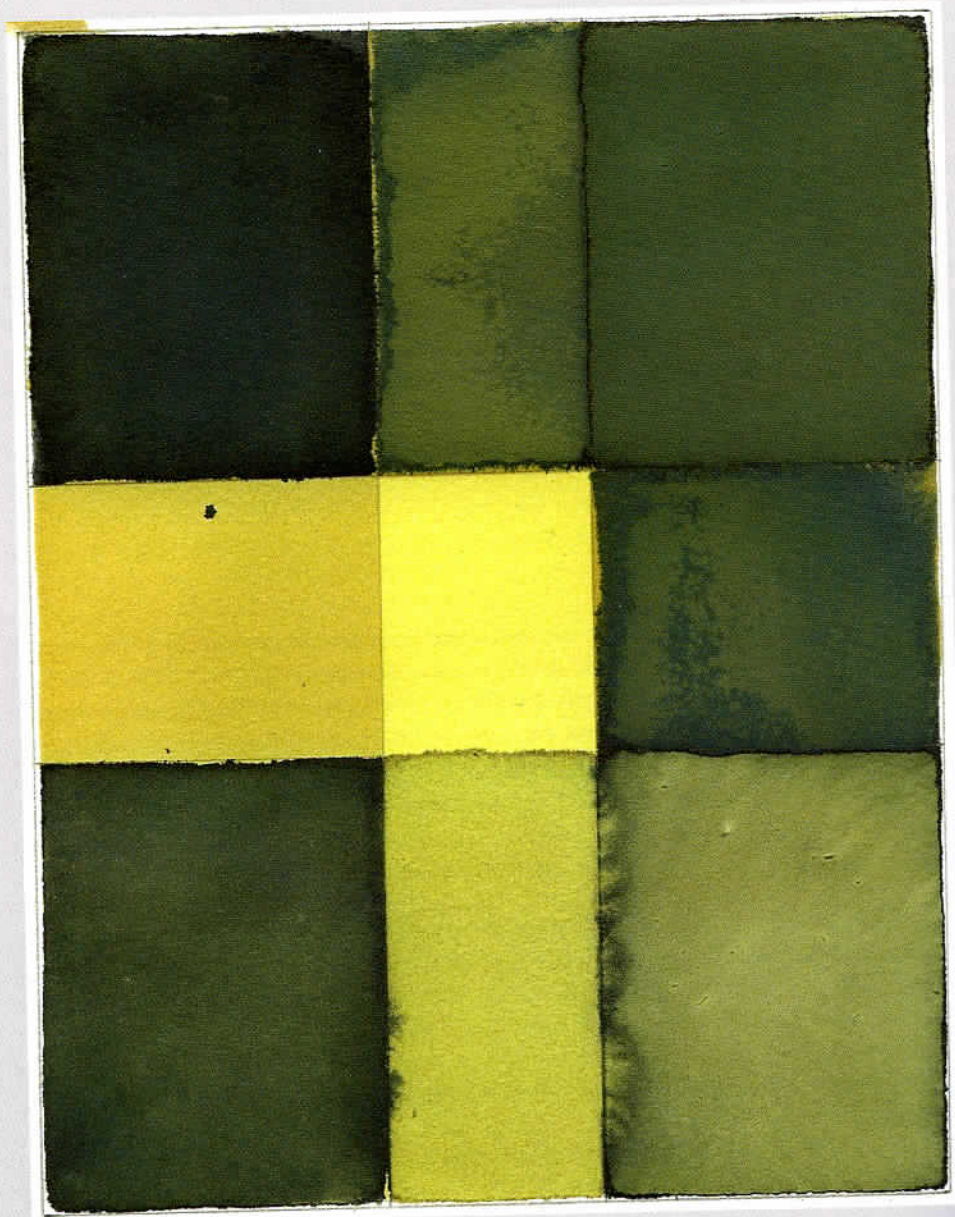
that developed-out salt prints were inherently neutral in tone and more stable than printed-out salt prints, hardly anyone could appreciate it when I told them that my own results in using Sutton's developed-out procedures – rather than Blanquart-Evrard's, as canonized – could be warmer, showing that this subject needed to be reconsidered.¹⁹

If we seek to promote a new view regarding the theory, practice, and history of photography, perhaps there is no greater barrier to our progress than the generally held view that a photograph entails a fixed, stable image. This view can be traced as far back as John Locke's stated wish regarding visual perception in the human mind: "[W]ould the pictures coming into such a dark room but stay there, . . ." ²⁰ It is certainly present in Sir Humphry Davy's account of Thomas Wedgwood's attempts to secure photograms, wherein Davy wrote, "No attempts that have been made to prevent the uncolored parts of the copy, or profile, from being acted upon by light, have as yet been successful."²¹ And it continues to be present in Talbot's comments on the art of fixing a shadow: "Such is the fact, that we may receive on paper the fleeting shadow, arrest it there, and in the space of a single minute fix it there so firmly as to be no more capable of change, even if thrown back into the sunbeam from which it derived its origin."²² From there, this view has endured to this day.

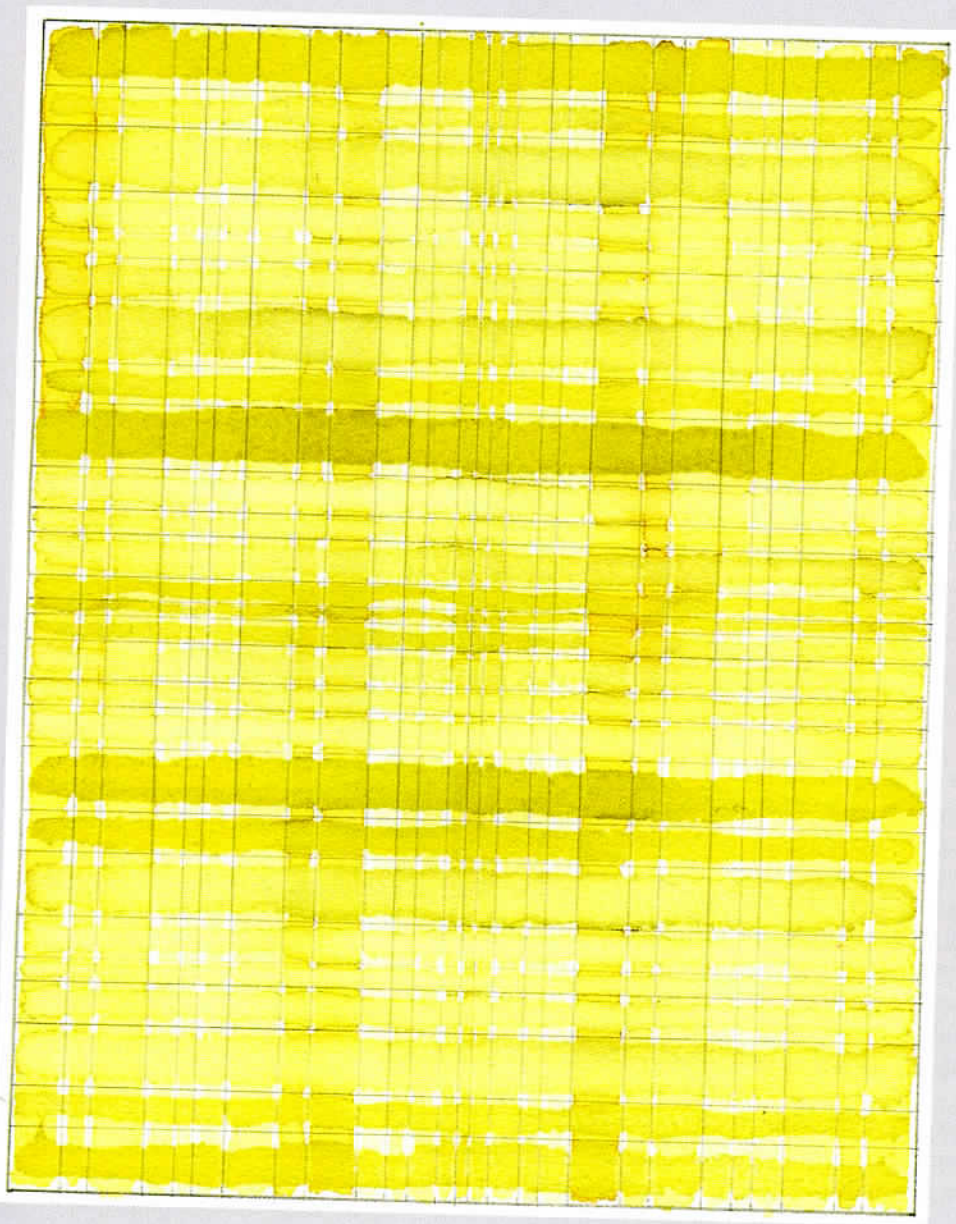
However, if we succeed in passing over this barrier, a new dimension of photographic possibility opens up to us. Here, it might be consoling to recall that Talbot's earliest photogenic drawings were made without sodium thiosulfate; and if they have managed to survive until the present day, it is only because they have been protected from additional exposure to light.²³ In spite of his main interest in "fixing a shadow," Talbot remained open-minded enough to comment once to Herschel, regarding some of the latter's fading prints, "The slow changes which take place in your photographs are certainly very remarkable; do not you think they might be hastened?"²⁴

For me, one of the most exciting events in the photographic process has always been to witness the image first appearing in the developer – and this is why I preferred to use paper negatives over panchromatic sheet film, since with paper, I could see the negative image manifesting itself under a safelight. Like Talbot suggests, how equally exciting it might be to control the disappearance of a photograph in a similar way – as in bleaching a print prior to sepia-toning, or in the reversal processes of old.

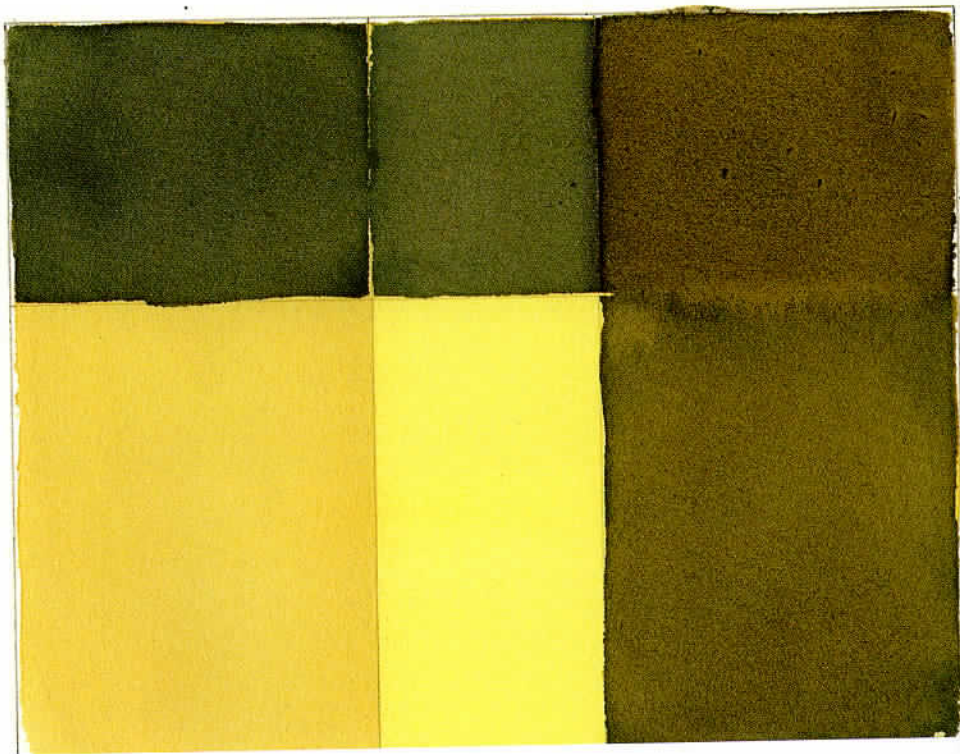
Since John Locke has been cited,²⁵ perhaps his general criticism of innate ideas might also be taken as the prevailing view when applied to the history of photography as it has come down to us.²⁶ Photography, under such a conception, would be said to have appeared



Experimental Cyanotype, No. 8, 2010.
Digital scan of an unfixed cyanotype on paper, 8½ × 6½".



Experimental Cyanotype, No. 9, 2010.
Digital scan of an unfixed cyanotype on paper, 8½ × 6½".



Experimental Cyanotype, No. 10, 2010.
 Digital scan of an unfixed cyanotype on paper, 6½ × 8½".

in the early nineteenth century like a clean slate or founding, without prior experience or understanding, and as a result, could only characterize itself by what it subsequently borrowed from established fine-art practices like painting and drawing. But what if, as mentioned above, photography could be shown to have existed well prior to the early nineteenth century, or of its own accord, as part of a natural life-process? Would it not then be innate in the world itself?

Here, a comparison to the example of late Gothic printmaking might reveal how limiting and egotistical the Enlightenment influence on the invention of photography can be. For in contradistinction to great showmen like Daguerre,²⁷ late Gothic printmakers never claimed to be the inventors of their craft, or that their art arose independently, as if in a vacuum; rather, they attributed their ingenuity to an apocryphal personage, Veronica,

who as their patron saint and ideal precursor was shown holding her outstretched veil, which in turn bore their art's exemplar, the "true image" or impress of Christ's face.²⁸

The images I have included to accompany my text represent experimental cyanotypes, or a belated attempt to put a few of the principles I have laid down here into practice. In making them, I was thinking about three points as given: (1) that the present situation in traditional photography might be analogous to what certain modern-art movements were reacting against; (2) that one should challenge the notion that photographic techniques, as they have come down to us, are in their most improved or final state by virtue of the process of elimination; and (3) that one should accept that a photograph can exist without needing to be stable.

It seems that traditional photography is currently facing a crisis that resembles what academic painting faced at the beginning of the 20th century, in that traditional photography's primary function as the preferred medium of detailed visual representation has been usurped by another technology—digital photography. And for the most part until now, a photograph, conceived as the end-product or ultimate expression of the technical process, has generally been about anything other than itself: portraits, landscapes, still lifes, oppressed classes, important events, naked women, naked men, animals, catalogues of flora, and so forth. Even August Strindberg's efforts to throw chemicals onto light-sensitive surfaces, extreme as they were at the time, were considered by him to be representations of the soul.²⁹

Although I have nothing more than a passing acquaintance with the cyanotype process, what has always intrigued me about it is the inherent limitation linked to the perceived garishness of its end result, a Prussian blue series of tonalities. In studying the subject prior to the present execution, I began to suspect that Herschel, in his first experiments with the process, had been seeking to obtain a full-color progression, rather than just shades of blue. At least this is what he had been seeking in his prior experiments with the anothype process, which were subsequently abandoned upon his use of the ferric salts.³⁰

The images I have submitted are the fruits of an endeavor to put the above suspicion to the test, and to show and exploit the fact that other colors lie hidden in the cyanotype process, colors that are sadly eliminated as a consequence of washing the print as a final fixing step. Starting from a classic, textbook formulation – an eight per cent solution of potassium ferricyanide (solution A) and a twenty per cent solution of green ferric ammonium citrate (solution B) – I have modified this proportionally to explore a working range of color possibility.

The results I obtained display a wide variety of colors: yellow, orange, chartreuse, olive green, dark green, jade green, bronze, gray, gray-blue, light blue, navy blue. The only portion of the spectrum that seems to be lacking is red. Was it this range of colors that first fascinated Herschel, rather than blue?

Of course, the Faustian part of the bargain is that these prints were not fixed in water; and thus, they remained susceptible to further light-exposure and eventual fading. Their only permanence, relatively speaking, is their documentation in the form of digital scans made during various stages of chemical combination and exposure.

For the reader who is only familiar with my photographic work as contained in *Primitive Photography*, I suppose these abstract images must come as a bit of a surprise. Suffice it to say that I, as a photographic artist, must remain sensitive to the world around me and continue to evolve. In relation to my work in the past, these images, which I consider as token proofs of the larger argument outlined above, have surprised me as well. Perhaps their main value, if value can be assigned, lies in the element of surprise, or chance discovery.

As a student at Emerson College and the Museum School, I was initially attracted to Dadaist literature and art. Upon graduation, I was working in a conceptual or minimalist vein, creating photo-mosaics leading to large geometric forms and patterns. The actual subject being photographed, or its representation, meant little to me at the time, apart from its formal contribution to a final assembled end. At most, the subject was elemental – sky, water, horizon lines, etc. – with the theme being limited to the transformative presence of humanity on the planet. The idea of making a straight photograph, or an image that was self-contained or told a story in itself, was never the goal.

After graduating, I entered the harsh realities of the nine-to-five work week, and my outlook hardened and grew more conservative. Given the limited free time I had for making photographs, it was enough for me to concentrate on making one image at a time – or a straight photograph. Consequently, I began to find more studied compositions to my liking, with an emphasis being placed on black-and-white photographic technique. Individual photographs, which now spoke for themselves, led to strings of related photographs dealing with a variety of topics that interested me.

Such an outlook prevailed through the writing of *Primitive Photography*. Yet the relative novelty of the subject at hand there – an attempt to arrive at black-and-white photography from scratch – and the research and experimentation involved in doing this, led me to a

point where the theory of the process seemed as creative as the making of a photograph, if not more so. Meanwhile, the industrial black-and-white photography I had been practicing prior to this was largely being forsaken by society, in favor of digital photography.

Following the publication of *Primitive Photography*, I began working with a French experimental poet, Jean-Pierre Bobillot. His work is saturated with the influence of early twentieth-century art movements like Dada and Futurism; and as a result, I returned to my first fascinations at Emerson College and the Museum School. Fearing there was little time left for black-and-white 35mm photography, I embraced it one last time, to create a series of found experimental poems or collages that would serve as a photographic equivalent to my friend's literary work.³¹ Formal these photographs remained in execution, but modernist they were in outlook.

This returns us to the present endeavor. Having presently tired of the representation game, I have started to find hints to an alternative approach in modernist works like Kazimir Malevich's suprematist compositions and Piet Mondrian's geometrical obsessions with the golden section – although here it must be mentioned that they too believed that they were dealing with something spiritual in their work.³² Wanting to distance myself from this tendency, I am instead trying to make a group of photographs that are about nothing other than themselves, or the by-product of a technical process, which is to say, the end result of a series of highly controlled photochemical operations and light-exposures taking place upon two-dimensional, rectangular pieces of paper. Ideally, both viewer and maker have little to do with this; it is mostly about execution and end result as part of the theoretical process.

In conclusion, for traditional photography to move past the impasse I believe it has reached, what is needed is a more open-ended approach: one that incorporates philosophical writings, historical commentary, observations of natural phenomena, and attempts to understand the biological functioning of the human body. Are the lens and its aperture anything else than a model of the workings of the eye? Are the camera and its photosensitive surface anything else than a way to register the inquiries of the mind and the subjective qualities of our emotions? And is photography, as it has thus far been practiced, anything else than an attempt at human understanding? These questions, inspired by John Locke,³³ I leave for us all to answer.

NOTES

1. Alan Greene, *Primitive Photography: A Guide to Making Cameras, Lenses, and Calotypes* (Boston: Focal, 2002).
2. John Donne, *Devotions upon Emergent Occasions*, meditation 17.
3. See Frederick Copleston, *A History of Philosophy*, vol. 4 (New York: Image, 1994), 205. First published 1963 by The Newman Press and Burns & Oates.
4. [Jean-Michel] Guillot-Saguez, *Méthode théorique et pratique de photographie sur papier* (Paris, 1847).
5. Greene, *Primitive Photography*, 181-210.
6. Arsène Pélegrin, *La Photographie: des peintres, des voyageurs et des touristes* (Paris, 1885). First published 1879.
7. Thanks to Tom Persinger for mentioning the Lytro camera.
8. See Frederick Copleston, *A History of Philosophy*, vol. 3 (New York: Image, 1993), 292-309. First published 1963 by The Newman Press.
9. See Hans Richter, *Dada: Art and Anti-Art* (London: Thames and Hudson, 1965); and Caroline Tisdall and Angelo Bozzolla, *Futurism* (London: Thames and Hudson, 1977).
10. See Lyle Rexer, *Photography's Antiquarian Avant-Garde* (New York: Harry N. Abrams, 2002).
11. Jean de la Fontaine, "La cigale et la fourmi," *Fables*, bk. 1, fable 1.
12. [Thomas Sutton], "Sir William Newton's Letter in the Last No. of the London Photographic Journal," *Photographic Notes*, vol. 2 (March 15, 1857): 103-04.
13. Aristotle, *History of Animals*, bk. 5, chap. 14; Pliny the Elder, *Natural History*, bk. 9, chaps. 36-39; and Vitruvius, *On Architecture*, bk. 7, chap. 13.
14. See *Le Verre dans l'Empire romain* (Florence: Giunti, 2006), figs. 4.4-4.7, 4.9, and 4.13. Cité des sciences et de l'industrie, Paris, exhibition catalog.
15. See René Antoine Ferchault de Réaumur, "Sur une nouvelle pourpre," *Histoire de l'Académie Royale des Sciences* (1711): 11-14.
16. *Ibid.*
17. For example, see George Berkeley, *An Essay Towards a New Theory of Vision* (Dublin, 1709); Jean Senebier, *Mémoires physico-chymiques, sur l'influence de la lumière solaire pour modifier les êtres des trois règnes de la nature, et surtout ceux du règne végétal*, 3 vols. (Geneva, 1782); and Claude-Louis and Amédée-Barthélemy Berthollet, *Eléments de l'art de la teinture*, 2 vols. (Paris, 1791-1804).

18. See Grant B. Romer, "What Was Photography?," Getty Conservation Institute, 2010, accessed August 11, 2013, http://www.getty.edu/conservation/publications_resources/teaching/photo_tn_whatwas.pdf.
19. See Alan Greene, "Les épreuves salées par développement," *Études photographiques*, no. 14 (January 2004): 130-39; and Greene, *Primitive Photography*, 181-84.
20. John Locke, *An Essay Concerning Human Understanding*, bk. 2, chap. 11, sect. 17.
21. Humphry Davy, "An Account of a Method of Copying Paintings upon Glass, and of Making Profiles by the Agency of Light upon the Nitrate of Silver. Invented by T. Wedgewood [sic], Esq. with Observations by H. Davy," *The Collected Works of Sir Humphry Davy*, vol. 2 (London, 1839), 242. First published in the *Journals of the Royal Institution*, vol. 1, no. 9 (June 22, 1802).
22. Larry J. Schaaf, *Out of the Shadows: Herschel, Talbot and the Invention of Photography* (New Haven, CT: Yale University Press, 1992), 51.
23. [Sir David Brewster], "Paper Read by Sir David Brewster at the first Monthly Meeting of the Photographic Society of Scotland, held April 8th, 1856," *Photographic Notes*, vol. 1 (May 25, 1856): 54-56; and Schaaf, *Out of the Shadows*, 40-41.
24. Schaaf, *Out of the Shadows*, 124, note 48.
25. See note 20 above.
26. See Frederick Copleston, *A History of Philosophy*, vol. 5 (New York: Image, 1994), 73-76. First published 1963 by The Newman Press and Burns & Oates.
27. See Helmut and Alison Gernsheim, *L. J. M. Daguerre: The History of the Diorama and the Daguerreotype*, 2nd ed. (New York: Dover, 1968).
28. For the apocryphal story about Veronica and Christ, see Jacobus de Voragine, *The Golden Legend: Readings on the Saints*, trans. William Granger Ryan (Princeton, NJ: Princeton University Press, 1993), vol. 1, 212. For late Gothic printmaking examples of Veronica's veil, see *Fifteenth Century Woodcuts and Metalcuts*, prepared by Richard S. Field (Washington, DC: National Gallery of Art, n.d., ca. 1965), illustration 249; and *Fifteenth Century Engravings of Northern Europe*, prepared by Alan Shestack (Washington, DC: National Gallery of Art, 1967), illustration 80. The latter two are exhibition catalogs.
29. See Douglas Feuk, "Dreaming Materialized: On August Strindberg's Photographic Experiments," in *Strindberg: Painter and Photographer* (New Haven, CT: Yale University Press, 2001), 116-29. Exhibition catalog.
30. Mike Ware, *Cyanotype: The History, Practice and Art of Photographic Printing in Prussian Blue* (London: Science Museum, 1999), 23-26.