The current abundance of scholarship concerning the technological development of photography has coexisted with a proportionate absence of recent critical analysis of photographic images. Given photography’s long-standing embrace of technological advances, even predating the portable camera or roll film, this article revisits some early uses of scientific photography in order to clarify the impact of digital technology on contemporary photographic practice. The author uses scientific photography and photographic archives as the groundwork for photographic experiments into what might be called analytical photography. The essay concludes with a reconsideration of the photographic portrait.

The Archive

In the nineteenth century, photographic images were seen as a radically objective form of documentation, replacing the subjectivity of hand-drawn sketches and illustrations. These new images held the promise of mechanical precision. For the first time, scientists could communicate the precise curve of a smile with something more than a mathematical formula. Some of the earliest applications of photography involved attempts to correlate the functioning of the human mind with the appearance of the human body. Phrenology, eugenics, early psychology, physiognomy and criminology all made use of photographic technologies.

Working independently, outside any strict scientific model, the German photographer August Sander amassed and categorized some 40,000 images of the German people, three-fourths of which are now lost [1]. George Baker writes:

Sander’s ambition was to present a series of portrait photographs that would catalogue, in essence, the total existing social world of Weimar. The unequivocally positivist slant of Sander’s goal finds its correlate in the systematic attempt at technical objectivity on Sander’s part, for the photographs he made for the project are remarkably uniform in their style and mode of presentation. Their uniform style, however, is not conceived in a manner that attempts to inscribe Sander’s personal touch as a photographer. Rather, these photographs rely on already-established conventions of portrait photography [2].

In England, in the last decades of the nineteenth century, scientist Francis Galton had already developed his own particular use of the archive, with which he was able to create composite images of what he believed to be the various universal criminal and ethnic types. Pre-dating digital morphing by a century, the photographic composite was created by selectively exposing multiple negatives of different individuals onto a single piece of photographic paper [3]. The result was a slightly blurry meta-portrait of the various dominant and, presumably, telling features. In France, Alphonse Bertillon used photography to create an elaborate system for criminal identification using 11 essential features for profiling repeat offenders [4]. Allan Sekula, in an essay entitled “The Body and the Archive,” summarizes the relationship of photography to these early projects when he writes:

The first rigorous system of archival cataloguing and retrieval of photographs was that invented by Bertillon. Bertillon’s nominalist system of identification and Galton’s essentialist system of typology constituted not only the two poles of positivist attempts to regulate social deviance by means of photography, but also the two poles of these attempts to regulate the semantic traffic in photographs. Bertillon sought to embed the photograph in the archive. Galton sought to embed the archive in the photograph [3].

Regarding photographic archives, Baker writes, “Photography archives, like photography itself, are suspended between the discourses of science and art, providing a dual collision with both empirical and aesthetic truth” [6]. Perhaps this is nowhere more true than in the work of G.-B. Duchenne de Boulogne; his 1862 manuscript *Mechanisme de la Physionomie Humaine* presented the first published physiological experi-
ments to rely on photographic illustrations. Duchenne sought to “study and discover the mechanism and laws of human facial expression” [7]. Duchenne created a series of “synoptic charts” documenting what he referred to as the primordial expressions—pain, joy, lasciviousness and laughter, just to name a few [8]. The idea of semantic traffic or message of which Sekula writes can be applied to the control Duchenne achieved in his own arrangement of the portraits into grids. The grid format promoted comparative analysis over aesthetic contemplation and was a recurring element within such early scientific projects. Duchenne eventually bequeathed the complete series of his original large-format photographs to the École des Beaux Arts, where they finally achieved true archival status. By 1874, the principles of physiognomy were incorporated into all anatomy courses [9].

Duchenne was able to identify each muscle, or muscle group, associated with a given expression by applying a small electrical current to the facial muscles of his models. He carefully documented each expression with a photograph, which was intended as a form of objective verification. This idea of the photograph as a verifiable fact or document continues to linger with contemporary viewers despite the radical impact of digital technology on photographic practice. It was this notion of mechanical objectivity that led Duchenne to turn his attention to the analysis of well-known sculptures. Based on his research into human expression, he went on to reconstruct in clay a number of historically significant sculptures, “corrected” for anatomical accuracy. Writing of his improved Laocoön:

I have tried to restore the natural relation of the central lines and the lateral planes of the forehead with the obliqueness and sinuosity of the eyebrow and we can see how much more beautiful the expression would have been if Agésandre had sculpted Laocoön’s forehead in accordance with the immutable laws of nature [10].

What is so fascinating about this passage is not that the Laocoön is not anatomically accurate but that Duchenne thought it should be. One can recognize this as good science, but the expectation of an exact relationship between art and life has more to do with the impact of photography on art than with the aesthetic merits of a particular sculpture. For Duchenne, photography extended the objectivity of the scientific method. Duchenne wrote, “Photographs furnish evidence . . . something seems proven when we’re shown a photograph” [11].

But trouble lurked ahead for photography, and one begins to see the split within Duchenne’s own project. When one surveys the range of his photographs, one set of images stands out for their particular exuberance. In them, a female model appears dressed in a series of costumes with electrodes pressed to her brow or cheek. Duchenne’s own hand, or body, can be seen at the edge of the frame. These images are truly surreal—part experimentation, part theater. In plate 79 (not pictured here), one sees the model posed as a young mother kneeling before a crib. Duchenne’s arm can be seen on the right side of the image holding the two electrodes to her temple. By controlling the current and the placement of the electrodes, Duchenne believed he could recreate any facial expression. Captured on film, his experiments were intended to embody all the promise of objective science. Describing the scene that he wanted to portray, he wrote:

A mother comes to lose one of her infants. Another infant—the only one that remains—is equally gripped by a mortal illness; he is on the point of succumbing. Sitting at the foot of the cradle, she abandons herself to the greatest of sorrow. Yet a last hope can save him: A crisis may deliver him! Clinging to the life of her poor child, she anxiously follows the progress of the disease and discovers in these features the first signs of this happy crisis; she cries: “He is Saved!” [12]

We know from even the most basic understanding of modern anatomy that the two small electrodes at the woman’s tem-

Fig. 1. Untitled #96, C-print mounted on aluminum, 60 × 45 in, 1999. (© Ken Gonzales-Day) Here the grid documents the passage of time represented by the continual loss of tissue, nails and cuticles. Shot with a conventional 35mm camera and a 35mm microscope camera.
people are incapable of generating such an emotionally specific expression as seen in the photograph. Therefore, one must surmise that the expression is, at least in part, contrived. This also explains why these images appear in a chapter entitled “Further Aesthetic Electrophysiological Studies” and not in the “Scientific Section.” The point being that without language, without the analytical dimension, the photographic image becomes illegible. As a photographic document, plate 79 is beguilingly deceptive; and distinguishing its poetic details—in this case, the open mouth of the model—from the irrefutable scientific events of Duchenne’s “scientific section” is nearly impossible. Likewise, Duchenne’s expectation that the photograph could communicate all the emotions mentioned in the quoted passage is both unrealistic and physically impossible. It is the extreme mutability of his aesthetic images that strikes the greatest blow to his own claims for “scientific” photography. In separating the “scientific” images from the “aesthetic” ones, Duchenne positions them as authentic and inauthentic forms of speech, respectively, and, like the mythic Tower of Babel, leaves each type of photographic image speaking its own language. This means that aesthetic pleasure requires not only text, but context.

THE GRID

As I begin the discussion of my own work, it is my hope that the reader will recognize how the notion of an analytical photography has contributed not only to the construction of the work but also to its specific aesthetic claims. Figure 1, Untitled #96 (1999), takes the exfoliate materials of fingernails and cuticles as its starting point. Photographed with a microscope camera, the images are first arranged in a grid pattern and then mounted to an aluminum sheet as a single image. The coloration was digitally altered to appear blue to standardize the appearance of the skin, thus diverting the viewer’s attention away from any racially identifiable characteristics within the sample. The grid format also facilitates a comparative analysis of the images, revealing the slow but continuous exfoliation process. A re-grown nail can be identified in one section, while the smallest of fingernail shavings hovers weightlessly in another. Additionally, the grid form is a direct reference to the modernist grid so prevalent within late-twentieth century art. In “Grids,” Krauss wrote, “By ‘discovering’ the grid, cubism, de Stijl, Mondrian, Malevich . . . landed in a place that was out of reach of everything that went before. Which is to say, they landed in the present, and everything was declared to be the past” [13]. The grid was employed by artists in order to assert the two-dimensional surface of the canvas itself. The Modernist rejection of perspectival space was seen as a rejection of one of the most fundamental goals of painting since the Renaissance. Art historian Clement Greenberg wrote, “The essence of Modernism lies, as I see it, in the use of the characteristic methods of a discipline to criticize the discipline itself—not in order to subvert it, but to entrench it more firmly in its area of competence” [14]. Greenberg continued, “It quickly emerged that the unique and proper area of competence of each art coincided with all that was unique to the nature of its medium” [15]. By this he meant to critique the manipulation inherent to the illusionism of representing a three-dimensional object on a two-dimensional surface. Photography did not figure into Greenberg’s model, and he could scarcely have anticipated digital technology’s potential to redefine how we look at photography Shot with a large format 4 × 5 camera.

Fig. 2. Untitled #132 (Composition with Lines), ektacolor print, 18 × 24 inches, 2000. (© Ken Gonzales-Day) This highly fragmented torso playfully considers both Piet Mondrian’s fascination with pure form and digital technology’s potential to redefine how we look at photography.
Writing in 1937, Mondrian expressed his passionate enthusiasm for non-figurative or abstract art. Writing on this new form, he argued that “pure plastic art” would enrich the daily lives of everyone it touched [16]. Its underlying emphasis on utility and form highlights the utopian wishes of his day. Today, the use of digital technology in the arts is as ideologically loaded as Mondrian’s “pure plastic” ever was and reminds us that if technology can change how we make images, it can also change how we understand them.

Photography has always resisted abstraction. One must remember that while a photographic work may seek to acknowledge its two-dimensionality, it is the full tonal range of the photographic image that ultimately resists the optical flatness inherent to Greenberg’s arguments for painting. Today, digital technology allows for a radical rethinking of the photographic surface. In Fig. 3, Untitled #99 (1999), one finds what might be called an indexical portrait. Few would recognize the sitter for this curious study, and yet its specificity is undeniable. In a Greenbergian or formalist sense, its form is derived from the technology of its production. Constructed from a grid of rectangles, one can make out horizontal and vertical bands of imagery though a slightly degraded grid pattern. Highly stylized, it may have more in common with Galton’s composites than with a traditional portrait. To some degree, all the works in this series resist the conventions of portraiture, ultimately derailing the objectifying gaze so central to traditional photographic technologies. One might argue that if one takes a portrait, cuts it into pieces and rearranges it, then it is no longer a portrait; but could there be any advantage to such a portrait? Certainly it would be less recognizable, at least at first. One might remember that the mug shot and the fingerprint both evolved from the need for quick and reliable identification. Each emphasized the indexicality of an individual trait, or set of traits, over the iconic value of the full portrait. Furthermore, given the conventions of photographic portraiture, is a warm smile or a tearing eye inherently any truer a representation? Sekula and others have argued that the very concept of the portrait could not exist without cultural consensus, but under what conditions has that consensus been established? In replacing drawing and painting with a photographic image, portraiture has shifted away from the interpretive in favor of the optically precise. With regard to formalism, what could be

Fig. 3. Untitled #99, C-print mounted on aluminum, 50 × 38 in, 1999. (© Ken Gonzales-Day) Fragmented portrait from digital composite. In this image, the measured grid of images begins to dissolve—specificity giving way to universality. Shot with a conventional 35mm camera.

Fig. 4. Untitled (Bingo) #80, C-print mounted on aluminum, 10 × 16 in, 1999. (© Ken Gonzales-Day) The models responded to an ad in a weekly newspaper and to online requests for models. Shot with a conventional 35mm camera.
more central to portraiture than skin, and photography’s ability to depict it? In Fig. 4, *Untitled (Bingo) #80* (1999), one encounters a small grid of twelve images of human skin complete with scars, tattoos and other epidermal anomalies ranging from self-inflicted burns to a benign hernia. All suggest more an archive than a portrait. The models were found through an ad placed in the *LA Weekly*. Taken with a conventional 35mm camera and digitally assembled, it is the thematic unity of the intrusions and/or protrusions from the skin that becomes the subject of the piece.

Like Fig. 1, Fig. 5 (*Untitled #93, 1999*) makes use of another exfoliate material, human hair. Waving spears of hair are captured with a microscope camera and arranged in a grid. The crystalline shards of hair gel are suddenly visible to the naked eye. Using a grid, larger-than-life-size images, and an unfamiliar camera vantage point, these micro-portraits intentionally wrestle with the question of characteristic methods posed, in Greenberg’s sense, to critique the discipline itself. This is not to suggest that the works are reactive formalism, but rather to try to explore how the photographic image resists two-dimensionality. Put another way, does fragmenting the body alter our ability to identify the specific identity of the sitter? Will that affect our reception of the image, of the person?

THE PORTRAIT

Returning to the question of portraiture, consider a self-portrait by F. Holland Day, an English photographer (1864–1933). In it, the artist appears dressed in formal attire in the foreground. One can also make out the scantily clad body of a black man in the background. In this image (not pictured here) one can see how Holland Day’s own self-portrait, his image of self, is predicated on the presence of the racial Other. Used as a symbolic or semantic framing device, it is his difference from the black man that is intended to alert the viewer to his status in the world. He is distinguished, well dressed and rich. The black man is in shadow, is his shadow, is not well dressed and appears to be poor. Though he is physically robust, his features remain indistinguishable in the haze of this soft-focus image. Race and class are immediately compressed, and the viewer immediately perceives that the sitters are not equal, are not friends. Whether this is true or not, each is lessened in the juxtaposition. Clearly, the social conditions of race and

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**Fig. 5. Untitled #93, C-print mounted on aluminum, 50 × 38 in, 1999. (© Ken Gonzales-Day)** Under extreme magnification hairs become lines. The images were shot with a 35mm microscope camera and capture more than is possible with the human eye.

**Fig. 6. Untitled #95, C-print mounted on aluminum, 27 × 21 in, 1999. (© Ken Gonzales-Day)** This image has a shallow focal plane and is optically flattened by the graphic overlay representing the structures of the human epidermal layer. Human skin, hair and fingernails are all shed, and thus play an indexical role within the criminal system. They are proof of presence precisely because they are left behind. Shot with a 4 × 5 camera on a 36° rail.
class have shaped photographic conventions, but, sadly, while society may change, this picture can do little more than perpetually assert their unfortunate socio-historical stasis. Intended as a loose pairing, Color Plate A No. 1, *Untitled (double-portrait)#94* (1999), presents a very different kind of portrait. Again, one encounters a grid, but this time it is filled with the fragmented facial details of two sitters. Photographed with a 4 \(\times\) 5 camera, digitally scanned and then output as an ektacolor print, this image transforms those overlooked details of the face into something akin to the fragmented physiological experience of sight itself, assembled in the mind and not the eye. Like the Holland Day image, it too contains two figures of different racial/ethnic backgrounds, but this time there is no hierarchy. The image is arranged as a series of fragments; each square and rectangle contains precise clues to the original subjects. One can recognize the minute details of the human face. The effects of age are both captured and transformed; whiskers become fantastic patterns, while wrinkles act as compositional devices. Admittedly, a fragmented portrait may not change societal relations, but at least it can disrupt expectations and resist some degree of objectification.

**THE INDEX**

As one might imagine, not all of my images refer to the grid. Figure 6, *Untitled #95* (1999), presents a single image, a detail of skin overlaid with the faintest of drawings. The drawing alludes to actual medical illustrations identifying the microscopic structures of the human epidermal layer. Closely linked, Fig. 7, *Untitled #100* (1999), begins with a detail of a human face. Like a scar, a delicate linear tracery appears embedded within the skin’s surface. The ghostly presence of this drawing asserts an indexicality that is visible—if temporally displaced. That is to say that each layer of the image is photographic in origin, and yet their composite confounds a straight photographic reading. In a similar vein, Fig. 8, *Untitled #102*, takes the idea of the index and turns it on itself, literally mirroring the original image. This simple process of doubling, a well-known surrealist trope, compounds the unfamiliarity of the image and suggests something of the Freudian uncanny.

In her seminal essay, “Notes on the Index: Part I,” art historian Rosalind E. Krauss wrote, “Every photograph is the
result of a physical imprint transferred by light reflections onto a sensitive surface. The photograph is thus a type of icon, or visual likeness, which bears an indexical relationship to its object” [17]. First published in 1977, the essay could not have anticipated that by the end of the century film would be obsolete for many commercial photographers. The fundamental principles of Krauss’s definition remain intact, however. Splicing hairs over whether digital data and laser printers are derived from the same physical imprint as a chemical-based technology is really beside the point. The photographic image remains, and the baby picture, birthday cake and puppy dog manage to find their way into both photo albums and e-mails. To further clarify the indexical, Krauss explained, “into the category of the index we would place physical traces (like footprints), medical symptoms... Cast shadows could also serve as the indexical signs of objects” [18]. As will become clear, for Krauss, the photographic image, whether staged or simply recorded, can be read as either icon or index or both. Unfortunately, as with Duchenne’s work, distinguishing between an objective (e.g. scientific) index of a stimulated muscle and a subjective (e.g. aesthetic) icon of “sorrow” can be anything but self-evident.

Figure 9, Untitled #116 (2000), is part of an experimental series of drawings. Meticulously drawn over a photographic image of skin, iconic cells fill every surface on the image. Intended as a drawing, it was created as an attempt to reverse the duality of the icon/index with which we began. The photograph of the skin may certainly be an indexical trace of the skin itself, but the skin also functions iconically. This particular patch of skin is able to stand in for all skin. The drawing, or any symbolic language, is typically said to function as icon, but it could also function as index. As cited earlier, Krauss argued, “Cast shadows could also serve as the indexical signs of objects.” If this is true, then it certainly does not take much of a stretch to see that each circular cell is an exact record of the repetitive gesture from which it was formed. Figure 10 is a diagram clarifying the notion of an indexical mark. The basic argument is that each mark is like a frozen shadow. Exact in its translation from tip to paper, the drawing provides a precise index of the event that created it, leaving the image to function as both icon and sign. While somewhat rhetorical, this ambiguity clarifies the precise problem surrounding photographic images. Photographic images can function as both index and sign. The artistic process can complicate this. Whether in the darkroom or in the studio, manipulated images and negatives can alter the photographic message. All of the images presented here were photographed frontally, with deep space eliminated, in an effort to force the two representational systems to merge. In “Notes on the Index: Part 2,” Krauss suggests that “the effect of the work is that its relation to its subject is that of the index, the impression, the trace. The painting is thus a sign connected to a referent along a purely physical axis. And this indexical quality is precisely the one of photography” [19]. If Krauss can conceptualize a painting functioning indexically, then perhaps one can reconsider the conventional index/icon duality in photography. The problem is not only in combining the two, which Krauss does on several occasions with both photographic and non-photographic works. It is the
larger formalist question of fundamental or unique properties that presents the greatest challenge, because, as I have argued, though the optical impact of photography may not have changed, our understanding of it has. Perhaps, as I have tried to suggest, it raises a new set of questions about the fundamental qualities of photography in an increasingly digital age. After all, following little more than 150 years of photography, it would be unfortunate if the best the medium had to offer were behind us.

References


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