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The photographic surface: between substances and spaces

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Chapter 4



The PHOTOGRAPHIC SURFACE *as* PROCESSUAL INTERFACE



FIGURE 4.1. Ger van Elk, *Russian Diplomacy*, 1974.
Acrylic paint on chromogenic photograph mounted on Perspex, housed in a black triangular wooden frame with matte PMMA glazing, 159×298cm. Stedelijk Museum Amsterdam, The Netherlands.

Almost half a century after its genesis, the colour palette of *Russian Diplomacy* (1974) (fig. 4.1), a triangular overpainted photowork by Ger van Elk, has changed to such an extent that the impression of the image as a whole has been disturbed. These changes have disrupted an original continuity between paint and chromogenic print. The subjects of the photograph, two men who are embracing and whose faces are almost entirely obscured, rise out of painted colour clouds that meet on a 'neutral' white background. Initially, the gentleman on the left was dressed in a beige suit and was stepping through a painted colour cloud of exactly the same yellow ochre tone. He held the arm of a man dressed in black, who came out of the right-hand side of the image and trailed behind him a dark grey painted cloud. Van Elk's colour choice derived from the colour palette of the photograph, it was intended to merge the photograph with the painted additions.



FIGURE 4.2. Detail of *Russian Diplomacy*, 1974.

Over the following years and decades, the dyes of the chromogenic photographs (the work consists of two horizontal bands of colour photo-paper) have changed tremendously (fig. 4.2). The blue dye in particular has lost density and the photograph has taken on a red-tinted appearance, no longer corresponding to the painted colour clouds.

From a curatorial and art historical perspective, the artist's concept is no longer reflected by the materials' condition.¹ From a theoretical point of view, the photograph's surface makes manifest the passage of time, starting at the moment of its creation. Through and beyond the détente of the Cold War (1969–1975), as diplomatic relations, world powers, and world orders, have changed over decades, so too the colours of the photograph have shifted. As the political climate has changed over the years, why not allow the photographic reflection to fade correspondingly? To accept the changing appearance of a photowork would mean accepting that the photograph is an object in constant transformation.² My intention in this last chapter is to understand the processual character of the photographic material through different periods of its existence: during processes of creation, and then as it is archived or exhibited.

In the very early days of chemical photography, the inventors' main challenge was how to 'fix' the processes that create photographic images.³ Henri Damisch rightly states that the history of photographic inventions was not only determined by discoveries of 'writing with light', but more significantly, by this question of how to fix the image (Damisch 1978, 71). Attempts to capture photographic images date all the way back to the eighteenth century, but these workings of light had no durability because the image-makers lacked the means and the knowledge to fix them. And in any photochemical process, image-fixing solutions are as important as image-creating substances. Recalling the distinction between the short-term and long-term reactions of photographic agents, as we discovered in the first chapter, the material is not necessarily stable and therefore its future is unpredictable. The photograph's reaction to internal as well as external factors is 'lifelong': its nature is not constant but processual.

In this final chapter, my intention is not to reduce the behaviours of the photographic surface to such processes, but to consider the surface itself as a *processual interface* that relates and acts according to various phases of the photographic process, encounters, and material conditions. As those processes can be conducted intentionally by artists and other people, but also by non-human beings and circumstances, I come to the following question: How does the photographic surface transform through processes with and without the intervention of human beings, therewith itself becoming a processual interface?

Three aspects are particularly relevant to my analysis. First, we have the materialization and visualization of the various imaging phases through which photoworks can come into existence. I focus on chemical based photographic techniques from the 1970s (the period from which Ger van Elk's photoworks originate), up to the deployment of (historic) chemical processes by contemporary artists working now. My question is: how and in what form are these developing phases present in the final photowork? This concerns the 'choreography' of photographing and developing the photographs, the movements prior to and during the processes of image-making which are neither visible to us (usually), nor a part of the photowork. (I do discuss one photographic installation, which is an exception to this.) Secondly, my attention shifts to the processual character of the photographic surface itself.

What happens when the surface is no longer perceived as mere reflector or receiver of (light) information, but as an active force in and of itself?⁴ My final concern then uses the insights of the previous to create an inclusive understanding of the photograph as a transformative phenomenon, both in artistic and in conservation contexts.

In the preface to his book *The Interface Effect* (2012), writer, programmer, artist, and activist Alexander Galloway sets out his understanding of interfaces as effects that cause “transformations in material states” (Galloway 2012, vii), rather than as things. He looks beyond “the threshold theory of interfaces”, challenging the approach to the interface as a “significant surface” or a portal (2012, 30–33). Thinking with a ‘digital’ point of view, he explains how theoretical engagement with interfaces can help us to understand contemporary culture:

While readily evident in things like screens and surfaces, the interface is ultimately something beyond the screen. It has only a superficial relationship to the surfaces of digital devices, those skins that beg to be touched. Rather, the interface is a general technique of mediation evident at all levels; indeed it facilitates the way of thinking that tends to pitch things in terms of “levels” or “layers” in the first place. These levels, these many interfaces, are the subject of analysis not so much to explain what they are, but to show that the social field itself constitutes a grand interface, an interface between subject and world, between surface and source, and between critique and the objects of criticism. Hence the interface is above all an allegorical device that will help us gain some perspective on culture in the age of information (2012, 54).

With this broad scope in mind, as described by Galloway, I will now characterise the “grand interface” of the photographic process, by which I mean the various transformative phases of image making that highlight the processual character of the photographic surface. *Art Beyond Representation: The Performative Power of the Image* (2004), Australian artist and art theorist Barbara Bolt’s materialist ontology of the work of art, serves as a theoretical guideline. Her conception of the work of art as a performative process, rather than a merely representational practice, might help me to open new ways to view photographs as performing and transforming objects, beyond their predominantly representational function.

4.1. THE *Photographic Surface* IN PHASES

At the beginning of this millennium, another photowork by Ger van Elk, *C’est moi qui fais la musique* (1973) (fig. 4.3), was treated for serious discolouration problems. The work underwent a complex conservation treatment involving a complete remake, supervised by the artist. Art historian and modern art conservator Sanneke Stigter, who has collaborated with the artist on various damaged photoworks over

the years, has critically reflected on the implications and consequences of this particular reproduction. In terms of materials, this photowork is similar to *Russian Diplomacy* (1974), despite the fact the paint is applied with an airbrush. *C’est moi qui fais la musique* depicts the artist playing a grand piano. The outer ends of his tailcoat and the piano bend with the shape of the triangular frame. This whole image has been broken up by the different ageing behaviours of colour dyes and paint.



FIGURE 4.3. Ger van Elk, *C’est moi qui fais la musique*, 1973. Collage of three chromogenic photographs, airbrushed dilute acrylics and felt-tip pen, mounted on cardboard, housed in a black triangular wooden frame, 60×120cm. Stedelijk Museum Amsterdam, The Netherlands.

One interesting element of Stigter’s narrative is her evident discomfort about reproducing the work as a one-piece glossy Cibachrome print, treated by a professional airbrush expert, given that the initial photowork was a collage of three chromogenic colour photographs with a matt finish, airbrushed by the artist himself. For the artist, the materials were of minor importance beside the more significant (visual) conception. However, the conservator claims that “[t]he materials and techniques employed by the artist contribute significantly to the meaning of many of Van Elk’s works and furthermore they reflect the imaging techniques of the day” (Stigter 2004, 107). I consider here these two versions of *C’est moi qui fais la musique*, together with the discolouring of *Russian Diplomacy*, so as to make us aware not only of their material and visual differences, but also of how both works came into being – their phases of creation. How, if at all, are their steps of creation (visually) present in the final photoworks? Do they matter?

According to Stigter, Van Elk chose his materials carefully, selecting Kodak’s chromogenic prints above Cibachrome’s silver dye-bleach process in the 1970s:

[...] he disliked the harsh colours, the unnatural, vivid red and the glossy surface that characterized Cibachrome at that time. The chromogenic prints that Van Elk chose often had a silkscreened surface, typical of matt photographs in the early 1970s. Photographs with this finish were less vulnerable to scratches than glossy paper and this suited his unconventional use of photographs in sculpture and installations (2004, 105).

Where the chromogenic process involves colour couplers in developer liquid, the dyes here are already incorporated within the three emulsion layers of the silver dye-bleach material. The top layer is sensitized to blue light, the middle to green and the bottom to red; within each, the dyes of the respective opposing colour are dispersed. Unlike the chromogenic (and silver gelatin) process's negative/positive procedure, this is a positive direct process and the print is made from positive colour transparencies. As the colour development is not part of the silver-dye bleach process, it is said that these prints have enhanced and more durable resistance to colour fading and chemical contamination. The sharpness and colour richness of Cibachromes, which Van Elk initially perceived as too harsh, is a product of the fact that the irradiation within each emulsion layer of the silver dye bleach material is minimal, when compared to silver-based light-sensitive materials. In the latter process (of chromogenic as well as silver gelatin materials), minimal light is always scattered by reflection during exposure as it passes through overlapping silver grains, thereby creating less sharp images.⁵ The glossiness of silver dye-bleach prints results from the difference in carrier material. As the name suggests, dyes are bleached in a bath with such high acidity that a standard paper carrier would be corroded and so it is replaced here by a cellulose triacetate base.

Twenty years later, in the 1990s, Van Elk's taste and the means had changed. He chose Cibachromes above chromogenic prints not only for the reproductions of his 1970s photoworks, but also for his newer ones, as we see in the later *Kinselmeer* works. From the 1980s on, Van Elk deployed the technique of *Dutch Grey* (as discussed in section 3.3) to make his *Kinselmeer* waterscapes. With the technical means of the 1990s, he developed a more complex pathway, creating layered representations of the lake using many (invisible) steps that were pursued repeatedly. He photographed the Kinselmeer shores again and again, then digitally retouched them on computer, then printed the photos in black-and-white, only to overpaint them by hand and in colour. He subsequently re-photographed these overpainted black-and-white prints as colour diapositives (using reversal film), and developed them as Cibachromes. Combining two halves of the Cibachromes horizontally, he framed them individually in a wedge-shaped Plexiglass box and mounted them counter staggered (fig. 3.16), as he did his very first *Kinselmeer* photoworks in 1984 (figs. 3.15a & b).

The many stages Van Elk evolved for the creation of one of the later *Kinselmeer* works is by no means unique. Many other contemporary artists and photographers have experimented with different imaging, developing, and printing processes within a single body of work.⁶ When creating complex photoworks, indeed, the immaterial and material processes of digital and film-based techniques are often mixed

and entangled to such an extent that a dissection becomes useless if not impossible. Still, seeking to understand how the many imaging phases (and therewith actions) relate to the final photowork, I wonder how the photowork's surface reflects those visible and invisible processes that shape its appearance.

LAYERS OF PROCESSES

Initially, the most prominent traces of processes on *Russian Diplomacy* were the sloppy painted colour fields that were created by Van Elk's brush movements. Over the years, the colouration of the chromogenic dyes has itself become a trace. It has morphed into an indexical reference to the chromogenic process, which Van Elk chose in the 1970s as the basis of this photowork. Both subject matter *and* material degradation, then, refer to the moment of the photowork's creation. Monica Marchesi's dissertation characterizes the colouration as a photographic patina – a degradation index for the print. "It confirms the viewers' expectation of looking at something aged that has altered due to the passage of time, and this is charged with positive connotations" (Marchesi 2017, 116). In a footnote she states that

[...] the reddish colour shift typical of the 1960s and 1970s chromogenic prints, are nowadays often perceived as a kind of patina, as an index that indicates past times. In many instances the red tint is not associated with degradation, and many digital camera applications try to mimic this nostalgic look with red filters that give a '1970s vintage look' to modern digital images (ibid.).

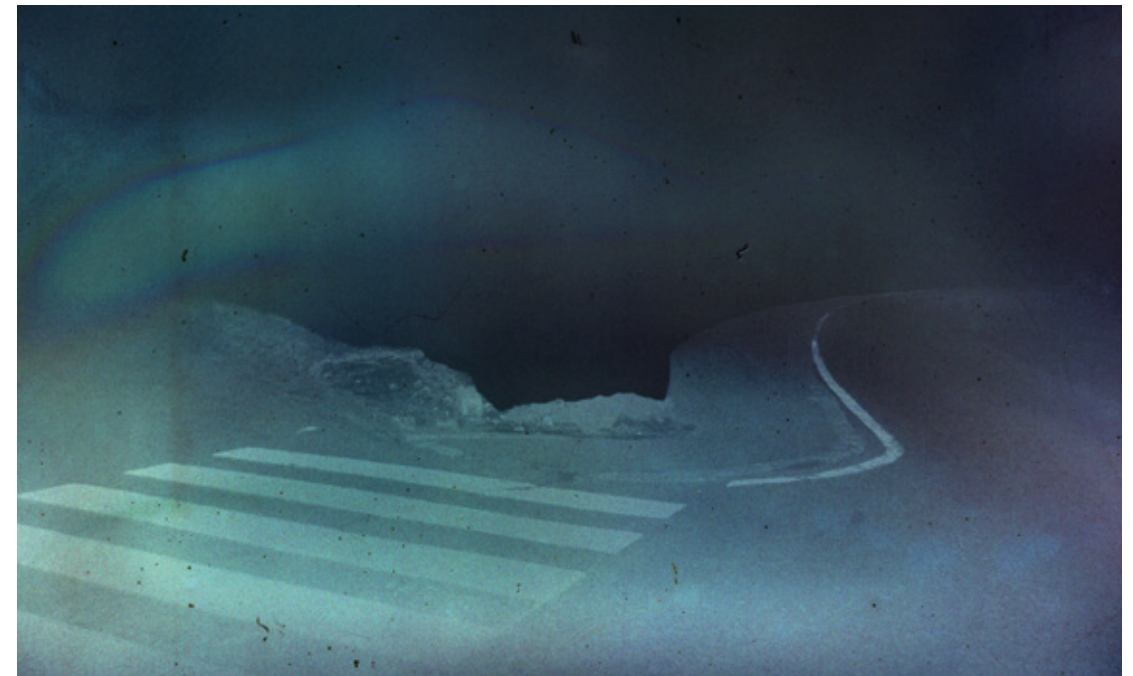


FIGURE 4.4. Daisuke Yokota, *Untitled 2* from the series *site/cloud*, 2013. Inkjet print, size unknown.

I would like to understand how the photograph's colour shift, as rooted in the matter of the photowork, affects our perception of the processual nature of the photographic material. It is for this reason that I turn now to photoworks by several contemporary artists (of a younger generation than Ger van Elk) whose works deliberately manifest the forces of materialisation and the signs of image-creating processes.

Japanese photographer Daisuke Yokota (b. 1983) pushes photographic image-making processes to an extreme. Viewers will lose their way if they attempt to distinguish the various stages of Yokota's creation process for the series *Site/Cloud* (2013, fig. 4.4). He uses time and technique to extend the process, beginning, for instance, with a compact digital camera; printing the photo as an inkjet print; re-photographing it with a camera using colour film; experimenting with the temperature during the developing process – and all the while, aiming, ultimately, for a black-and-white photowork: Yokota passes through many stages of the photo, as he shares his approach in an interview (Crabbé 2015, unpagéd).

As we move along this path on which he 'translates' the image, passing through the darkroom, through Photoshop, via various imaging devices such as scanners or photocopiers, traces accumulate and these traces refer to the different materials, spaces, and devices. A friction comes to dominate the final photowork: it visually reveals various (material) phases while, at the same time, physically concealing them. That is, the surface of the previous print is visually narrated, but it is physically replaced by a new texture. By the end, the viewer is dealing with a layered photowork that has gathered and concentrated many references to various successive 'image carriers' that have contributed to its form. In some of Yokota's works, it seems that the initial photo loses its meaning en route to the final artwork. That is, the layers of processes and materials cover over the photo's initial subject matter, as these layers themselves become the focal content of the photowork. Barthes's *noème* of photography as the manifestation of that which has been, shifts here from the photographic image to the traces of the various image carriers. In Yokota's works, as they admit all kinds of traces left by devices and material processes, the proof of 'that-has-been' is proof of the physical and digital image-making processes.

For example, the typical texturing of the gelatin's micro-cracking pattern can be perceived on the left side of *site/cloud no.11* (fig. 4.5). The negative of this photowork must have been developed in liquids of different temperatures. By changing the temperature of the developer and the stabilizer (which should usually have a relatively stable temperature), the gelatin was made to harden too quickly, bursting into these little visible cracks which are a known symptom of gelatin degradation. Another visual reference to the analogue process can be identified in the little mots (see, for example, in the upper left corner), which can rest on negative film and will come to the fore when enlarged (as digital scan or developed print). However, if Yokota had used a negative slide, the colour of the mots on the final print would have been white – not black, as is seen here. And so I must conclude that one of his many and various stages of production involved his digitally inverting the photographic image.



FIGURE 4.5. Daisuke Yokota, *site/cloud no.11*, 2013. Inkjet print, size unknown.

When, at the beginning of *Philosophy of Photography*, Van Lier considers the photograph as an "abstractive imprint", he isolates eight different categories of imprints, one of which is the "positive-negative imprint". He describes the positive print as a negative of the negative. The many (more) conversions that precede Yokota's photoworks draw the viewer's attention to this ontological characterization of any film-based photographic print, which "[...] retains a hesitance between darkness and light, the opaque and the transparent, the convex and the concave [...]" (Van Lier 2007 [1983], 15). Van Lier speaks of this doubled presence of apparent opposites within a single photographic print as a "pulsation". The analogy can help us to think about the processual character of the photographic surface as interface. The simultaneity of opposites is not only woven into the many successive phases of photographic picture-making, it is also present in each form that the image takes (negatives, transparencies etc.), as well as in the final photograph.

Immaterial imaging processes can only be visually retraced if the final photowork has a pixelated surface texture or marks that can be linked to certain tools of image software such as Photoshop (for example, photoworks by Lucas Blalock manifest a 'clone stamp' tool; fig. 4.6). By the end of Yokota's process, the subject is foremost the material process itself, formed by image capturing devices and through his many manual and chemical interventions. The penultimate outcome is a digital image



FIGURE 4.6. Lucas Blalock, *Lite Blues*, 2017.
Archival inkjet print, framed, unique, 154.5×192cm.

file of this ‘multi-mediated’ photo, which materialises as an inkjet print when exhibited. As inkjet print, the final photowork does not materially relate to its analogue predecessors, nor to the initial photo. In his article ‘Die Simulation von Fotografie. Konzeptuelle Überlegungen zum Zusammenhang von Materialität und digitaler Bildlichkeit’ (‘The Simulation of Photography. Conceptual Reflections on the Interrelation Between Materiality and Digital Imagery’), media studies theorist Stefan Meier argues that digital photographs do not create a material image, rather, data files produce “potential imagery” (Meier 2012, 136). Due to the essential separation between the units that structure the surface (pixels) and the carrier medium, we can no longer regard the digital image as an autonomous feature; its material form is dependent on data formatting and on the output medium (Meier 2012, 137; 142). In brief, the surface of Yokota’s inkjet does not at all materially present the processes of its making. Alternating between analogue and digital processes, his engagement with the image does not concern one single surface. There is no single material surface that we can regard as a processual interface. Instead, actions and handling, which occur throughout the different (temporal and practical) stages of the various intermediary forms, are the true processual interface, or better, interfacial processes.

The series *Smoke* (2011–) by New York-based artist Lisa Oppenheim (b.1975) re-establishes a relationship between the material and the subject matter (the digital image) (fig. 4.7). For this series, Oppenheim created transparencies or “inter-negatives” from digital image files of fires that she sourced from online image databases by performing generic searches on ‘bombing attacks’, ‘volcano’ or ‘industrial pollution’. She then cropped these images so that only the smoke of the events was in the frame, thus dismantling the documentary legibility of the photographs to explore a tension between the presence and absence of the photographed events. One by one, photosensitive papers were exposed to her transparencies with the flame of a lit match (rather than an enlarger’s light).⁷ Oppenheim consciously embraces the irregularity of this process. Variations in time and studio debris mean that the outcome is a series of handcrafted, unique photographic prints. The bodiless digital image files are rendered and reframed in a new physicality



FIGURE 4.7. Lisa Oppenheim, *Billowing*. As we were driving up to Norfolk yesterday I saw the Enfield fire; where a Sony distribution centre set ablaze by rioters was just pouring out smoke over the motorway. The sheer amount of smoke was quite surprising, and today smoke was still covering the motorway. I feel such despair at people who have taken to looting; so angry at the destruction people can cause, 2011–2012 (Tiled Version II).
Silver gelatin photograph on bromide paper, exposed and solarized by firelight, 94×117cm.

that hides the light source (of both the pictured fires and the lit matchsticks), therein, paradoxically, renewing the value of the photographic process – writing with light.

We can approximately subdivide the imaging phases and therewith timeframes for the creation of one of the *Smoke* photoworks, seeing it in four stages or more. The process begins with the actual moment of photographing a scene that involved smoke (this is an image taken by an unknown photographer, who uploaded and shared his/her/their image selection online). After this, Oppenheim consults online image databases, selects and downloads image files. In the third phase she crops the image on her computer, removing everything except the depiction of smoke, reversing the colours and therewith generating a digital file as a ‘negative’. The actual materialization of this digital image begins after that, when the cropped image file is printed on transparent foil. The fourth and last stage takes place in the dark room. Oppenheim lights up matches to solarize the photo-sensitive paper that lies under the negative transparency. Not only the light of the matchsticks, but also the smoke it leaves behind (after burning out) could, theoretically, be absorbed into the material of the photographic print. All this heightens the relation between subject matter and material matter. In contrast to Yokota’s work, the surfaces of Oppenheim’s gelatin silver prints *do* embed the visible and invisible processes of this last stage of exposure and development. Yokota’s complex process of image creation can be characterised in its entirety as a form of interface that leads to a depiction, ultimately presented as inkjet print. In contrast, the material surface of Oppenheim’s print can itself be considered a processual interface.

So, there is a crucial difference between the traces of processes in Yokota’s and in Oppenheim’s works. When applying this distinction to *Russian Diplomacy*, we can see that Van Elk’s photowork tends ontologically toward the latter. The appearance of the photographic surface of the chromogenic prints has been determined by the time and the spaces it has passed through. However, the reproduction of *C’est moi qui fais la musique* is cognate with Yokota’s works: it materially inhabits no relation to the original’s process. The second version of *C’est moi qui fais la musique* represents the original photowork conceptually and visually, but its material surface has nothing to do with the processes that created the original. To summarize, then, the photographic surface itself can only be regarded as a processual interface when it is the element of the photowork that has passed through processes, spaces, and time. To deepen this understanding of the surface as key element, I turn now to the movements ‘around’ the light-sensitive surface prior to, and during, the process of creation.

GESTURES AND MOVEMENTS OF IMAGE-MAKING

The processes that give rise to photographic images are primarily mechanical, chemical, or electronic, so it can be easy to overlook the human gestures that are hidden within them. *Russian Diplomacy* is, before anything else, a portrait of a gesture – a hug between two men – and I want to give centre stage to the various gestures that precede the final photowork. Van Elk staged the photograph to mimic a practice of

(Russian) politicians of the time: performatively embracing, in front of the press, for diplomatic reasons. He extracts this gesture from, or better, empties it of, any political connotation. Here, floating on a white background, the two figures become symbolic rather than political. Van Elk said that he was not interested in commenting on a political climate, rather, he plays with the genre of this particular strand of press photography (*Op het Tweede Gezicht* 1979, 29). Today, ‘hug diplomacy’ is less associated with Russian politicians than with Narendra Modi, the current prime minister of India, who is known for embracing other world leaders. The hug that Van Elk captures is therefore a form of emotional diplomacy – a political deployment of emotional display (and the feelings they can invoke), as Todd H. Hall writes in *Emotional Diplomacy: Official Emotion on the International Stage* (Hall 2015, 26). The press photographs that Van Elk references here are aimed at external audiences. Hall describes them as something that “state actors can employ to frame issues, to maintain or alter their own image, and even to transform the character of relationships [...]” (ibid.). *Russian Diplomacy* presents the ‘shell’ of the diplomatic hug and enables us viewers to observe, with closer inspection, how this gesture is already intrinsically emptied of any heartfelt significance. If we regard the photowork and in particular the photograph as a husk or shell – as a remnant – what does this reveal and what does it hide, of the physical gestures through which the artist brought it into being?

When a photograph is combined with other imaging techniques such as Van Elk’s or Tacita Dean’s painting, our attention to the human contribution to the photowork is heightened. As briefly discussed in the second chapter on haptic interactions with the photographic surface, traces of these gestures are part of Gwenneth Boelens’s installation *Exposure Piece (Sensitizing)* (2010) (fig. 2.3a). This photowork magnifies the process and its forms to convey the physical movements that give shape to a chemically created photograph. Although there is a world of difference between Boelens’s wet collodion process and the chromogenic process used by Van Elk for *Russian Diplomacy, Exposure Piece (Sensitizing)* reveals the darkroom’s insights to us outsiders. The fact that chromogenic prints are developed in total darkness, as was explained in the first chapter, means that this photowork is revelatory. For instance, the German photographer Jessica Backhaus (b. 1970), who used to develop and expose her own colourful chromogenic photographs, compared the bodily actions that she used in the darkroom to those of an acrobat. According to her, the perfect print can be achieved only through an extreme discipline of body knowledge and control.⁸

The outsize dimensions of the glass plate that Boelens chose for her photowork not only enlarges the picture, it also expands the field of the gestures and movements that are involved in the wet collodion process (which was invented around 1850). The work captures the bodily movements on the white vinyl flooring (the viewer does not know whether these movements were conscious or unconscious), and thereby brings the performative aspects of making and developing a photographic print into the exhibition space. In normal circumstances, these specific gestures and movements remain hidden in the intimacy of the darkroom. Yet in film-based photography these ‘invisible’ gestures and decisions are

instrumental to the picture's coming-into-being, just as much as the shutter release or the photographer's eye.

The title *Exposure Piece (Sensitizing)* may at first evoke the object quality of this installation. Boelens's addition of the verb – the *act* of sensitizing – shifts its meaning. The idea of a performance begins to emerge, a performance that has been recorded, and which extends beyond the spatial zone of the static installation. It is not just a piece of materialized exposure to light, but a choreographic piece which deals with the dynamics of the picture-making process. Nickel van Duijvenboden, who edited Boelens's artist book, characterizes the photowork as “a lucid, impulsive action performed on an impossibly large and unwieldy material, lending the gesture a solemn permanence” (Boelens 2014, 75). When talking to photographers who still develop their photographs in the darkroom, one often hears about the practice and skill needed to strike the delicate balance between repeatable, precisely timed, and spatially defined routines, and unrepeatable, improvised elements or outside factors such as temperature, humidity, and water hardness. The choreography of *Exposure Piece (Sensitizing)* thus does not stand solely for itself, but epitomizes this interaction of light, light-sensitive materials, chemical solutions, human gestures, and time, which goes into every analogue photograph.

Choreography derives from root words meaning writing and movement, and is classically understood to be the written notation of (bodily) actions. Photographers who develop their own photos know their own darkroom choreography. The development of chromogenic colour prints takes place in a completely darkened room and thus involves a blind, haptic acrobatics. Would it then be appropriate to expand our understanding of photography to a broader concept of *photochoreography*? Choreography means also “writing in space with the moving body” (Barthel 2017, 31). It exists not only as danced inscription, but also as moving presence. Boelens's work can herein be understood in two senses: as writing, in the notation of scuffmarks on the floor (fig. 2.3b), and as a choreography of the installation, drawing in all the parts that stand or lie within the space. These parts elicit new movements from the visitor and are thus restaged and enacted in a new narrative context. In his publications on contemporary dance and social criticism, Flemish cultural sociologist Rudi Laermans has developed an expanded concept of choreography. Freed from its narrow association with dance and bodily movement, this conception views assemblages of heterogeneous materials, for instance, as choreography. Artefacts become performers, too. Performances combine installations, human and non-human movements, and material and immaterial elements (such as light and sound). The central ground and commonality of these choreographies is always space. Laermans thus describes choreography in broad terms as “the space in which dance is written” (Laermans 2015, 195).

The space in which photography is written is usually associated with a closed-off darkness. But the darkroom became part of standard photographic practice only at the start of the twentieth century, when photographic paper became widely available on the market. This industrially manufactured paper was much more light-sensitive than its nineteenth-century precursors. Yet before the rise of darkroom pho-

tography, there was a move in precisely the opposite direction. During the 1840s, when the Daguerreotype was pioneered, glasshouses were built in large numbers (sometimes on the roofs of buildings) in the great urban centres of Europe and the United States. The intention was to capture as much light as possible for the long exposure times required for the process.⁹ In this age of *Daguerreomania*, multitudes of people had themselves immortalized on this unique silver-plated copper plate, despite the fact that it meant having to sit still for 15 to 20 minutes.

Whereas the ‘enlarged’ physical movements and (dis)placements of Boelens's photoworks might be exceptional in contemporary photography, it was quite normal for nineteenth-century photographers to haul cumbersome photographic equipment on expeditions. Before the invention of dry plate negatives in 1871, this could include heavy plate cameras, tripods, glass plates, and chemicals. Today we can hardly imagine the physical effort and movements required to create those images. For example, Boelens refers to and makes use of the wet collodion process in her performance/installation. Historically, the photographer who elected to use this process had to prepare collodion wet plates onsite, probably in a small tent he had brought with him, before sliding them into his plate camera, exposing them to light, developing them, allowing them to dry, and finally placing them on prepared albumen paper to create a positive image, which he would later develop. This effort makes those historic photographs especially impressive, despite their humble size.

To be aware of the physical engagements that are involved in the exposure practices of the photoworks discussed here is to value the key role of the photographic surface as interface, as it passes through many stages and encounters, and is transformed. There are some photoworks, like Boelens's, Oppenheim's, and Van Elk's from the 1970s and 1980s, in which one single surface transfers and transforms throughout the whole picture-making process. In these cases, clearly, we can speak of this surface as a processual interface that reflects the material's physical engagement with chemicals and human handling throughout its period of existence. However, other works such as Van Elk's Cibachromes (the remake and the later *Kinselmeer* works) and Yokota's photoworks have a surface that is materially characterized by the final phase of development – even when it visually references earlier image-creating stages. Van Elk's remake does not refer materially to the many different actions and phases of its original coming-into-being. This underlines how the *final* physicality of the photowork is a decisive factor when considering whether we can speak of the surface as a processual interface. Nevertheless, recapitulating Alexander Galloway's approach, we might see the entire image-creating process (including the temporal extension that can lead to [dis]colouration) as the “grand interface” of the photowork, in which a mediation at all levels and times is apparent.

A visually mimetic remake of the discussed photoworks which removes the gestures, phases, spaces, and tools involved, would annihilate their essence. Shaping the photowork visibly or not, these processes convey far more than just the representation of an image. What is notable, though, is that Boelens's photoworks in general are ex-

PLICITLY sculptural photographic objects whose depictions are abstract. This makes me wonder whether the photographic surface also acts as a processual interface in figurative photoworks. This, in turn, led me to the multi-exposure works of Canadian photographer Jessica Eaton (b. 1977). In the next section, my discussion of Eaton's works supports an approach to the surface as performing interface within the grand interface of the studio space and contemporary screen culture.

4.2. THE *Surface* PERFORMING AS INTERFACE

As we magnify the stages and phases that the photographic surface passes through before a photowork is 'finished' and ready for exhibition, we explore a realm of intention. The actions, gestures, and circumstances 'around' or with the photographic surface are (more or less) the grounds of the artists' conception and intention – even when these intentions involve choosing to work with unpredictable materials. And so I suggest we see the photographic surface as the central *reflector* of these elements and intentions, something that accumulates and processes external influences.

In this section, I take this approach one step further by considering the surface as the central *actor*. The notion is especially relevant to historic photoworks which can look back on (exhibition) history and are stored in archives or collections. In the present, the only external intention that is projected onto these works is that of the gatekeeper who wishes to keep the work in the optimal conditions so that it can be viewed by future generations. Enduringly, such a photowork has its own life, (inter-)acting with room temperatures and humidities, insects, damp, light, etc., and also its viewers and handlers. Even where there is no single clear external reason, photoworks like the overpainted chromogenic prints of Van Elk's *Russian Diplomacy* can alter their appearance simply because they are what they are: unstable media. Or, more truly, live, as endlessly transforming media.

Despite the close relation between my argument here and my preceding thinking, this shift, from thinking about the photographic surface as reflector to thinking of it as actor, opens new angles on its processual character. The question that arises is: which processes characterize the photographic surface as an acting force (and interface) in the context of its own appearance and therewith our viewing experience?

To help us see and understand the photographic surface as actor, I turn to Jessica Eaton's work to clarify what happens when a surface (like that of *Russian Diplomacy*) changes its appearance. This second part of my fourth chapter should therefore be taken as an intermediate analysis of image creation, exploring the processual capacity of the photographic negative in the context of contemporary (digital) image creation and presentation. This may suggest questions as to how this section relates and can contribute to an overall analysis of *Russian Diplomacy*. My response is that we will understand the transforming nature of such a historic photowork only when we understand the con-

temporary (photographic) culture in which we perceive it, and which colours our perception or gaze. For this reason, I pause here, turning my attention away from direct analysis of the discoloured photowork, so as to examine those contemporary photographic interfaces.

In film-based practice, the surface retains ongoing receptiveness to new photons right up to the moment it is developed and fixed. This is a key characteristic of the practice, when considering the surface as processual interface – and it is not comparable with digital image creation. The following analysis of the insides of digital cameras and (touch-)screens offers an understanding of the intrinsic difference between these omnipresent contemporary surfaces, which mediate most of our daily (image) experiences, and the photographic surfaces of Van Elk's and Eaton's photoworks.

INTERFACE EFFECTS ON THE *Surface*

Jessica Eaton's photographs of geometric compositions in saturated hues are deeply rooted in a process whose visible effects are not accessible to the senses until the moment that the sheet of film is developed. For each photograph in her series *Cubes for Albers and LeWitt* (2010–ongoing; often abbreviated as *cfaal*) (fig. 4.8), she photographed a sequence of wooden cubes that had been painted in various shades of white, grey, and black, and placed against a monochromatic background on a single sheet of colour film. She created rich colours by placing different colour separation filters over the lens for each successive exposure. The dark cubes, reflecting the least light, leave the negative almost untouched. The lighter the cubes, the more light they reflect. Increased light reflection diminishes the negative's capacity to register. There are three variables here: the cubes' differing positions in front of the camera; their reflective value; and the colour filters. Eaton has described her practice as a "strategy game", involving the manipulation of these variables over several timeframes. The camera and the large single sheet of film are her constants, and the cubes and filters her variables.¹⁰ Although Eaton tries to conceptualize and to track the exposures in order to predict how each exposure will affect the other(s), the process of creating a single photowork involves a high failure rate and long periods of waiting.

The photographs that result from Eaton's repeatedly looking through the 'window' of the viewfinder can be seen to reveal the inadequacy of the transparency paradigm when it comes to the camera's mediation of the cubes. The many colour-filtered exposures produce the geometric colour constructions on film, but only in-camera. Hence, Eaton's photographs are not merely reflections of the painted cubes. Rather, they present optical phenomena that are created through the intra-action of the many exposures. As the negative is multiply exposed, single images commingle to such an extent that a distinction between the exposures becomes obsolete: it manifests in the common materiality of the silver halides. The final visual outcome only becomes visible after the film negative has left the black box and is chemically developed. What happens in the camera during the process of the multiple exposures can be steered, but is not accessible to Eaton as she works. Consequently, the camera's inside can be characterised as an interface.



FIGURE 4.8. Jessica Eaton, *cfaal 346*, 2013. Archival pigment print, 127×101.5cm. National Gallery of Canada, Ottawa, Canada.

In *The Interface Effect*, Alexander Galloway argues that the interface shouldn't be seen as a doorway or a window, because a window does not testify to the mode of representation that it imposes on anything that passes through it (Galloway 2012, 39–40). In contrast, he defines the interface as a “fertile nexus”. He quotes and reflects on the French philosopher François Dagognet:

‘The interface [...] consists essentially of an area of choice. It both separates and mixes the two worlds that meet together there, that run into it. It becomes a fertile nexus.’ Dagognet presents the expected themes of thresholds, doorways, and windows. But he complicates the story a little bit in admitting that there are complex things that take place inside that threshold; the interface is not simple and transparent but a ‘fertile nexus.’ He is more Flusser and less McLuhan. The interface for Dagognet is a special place with its own autonomy, its own ability to generate new results and consequences. [The interface] is that moment where one significant material is understood as distinct from another significant material. In other words, an interface is not a thing, an interface is always an effect. It is always a process or a translation (2012, 32–33).

Whereas the shutter (release) of the camera could be considered a threshold (to a photon, it grants access to the inside of the camera), the photographic surface of the film negative is the real “fertile” ground that generates Eaton's colour constructions. This is what processes every light particle that enters the black box. Through Eaton's additive process, overlapping colours become brighter, sometimes to the extreme of blanching out altogether – and thus running counter to the subtractive colour theory of many printing and painting techniques (fig. 4.9). The centre of the geometric figure is therefore – especially in the earlier (and simpler) works of the *cfaal* series – the brightest part of the photograph.

In *Meeting the Universe Halfway*, Karen Barad introduces the notion of *diffraction* as a physical phenomenon that can be a metaphorical tool of analysis for understanding differences and their effects. She explores *diffraction* as a useful analytical counter-point to *reflection*, because for her, reflection implies mirroring and sameness whereas diffraction includes patterns of difference (Barad 2007, 71–73). She draws on Donna Haraway's use of diffraction as a metaphor to rethink “the geometry and optics of relationality” and brings the “effects of differences” – rather than simply differences – into focus (Barad 2003, 803).

We need here to understand the intra-action of the silver halides and their entanglement, as triggered by the various colour lights: how they are temporally layered, without automatically accumulating (physical and spatial) layers. To do so, I want to consider this physical and optical phenomenon in more detail. In a classical sense, a



FIGURE 4.9. Subtractive (left) and additive (right) colour interactions.

diffraction (pattern) is created by waves that overlap, appear to bend, and spread, as they combine or as they encounter an obstruction (Barad 2007, 74). Many kinds of waves, including light waves, create patterns of diffraction. The photographic process is induced by the reflection of light from the photographed objects, and accordingly, notions of reflection and of indexical mirroring tend to dominate photo-theoretical discourse. Of course, Barad's intention in using diffraction as a metaphor for analysis “in order to study the entangled effects differences make” (ibid.) aims at a far wider scope than mine here.¹¹ Nevertheless, in this context it enables us to think about the processual character of multiple exposures, not from a single linear point of view but as an entangled pattern of viewing-points.

This can be applied to the additive colour system on which Eaton's works rely. And as a perceptual system, it is also the basis of the

process through which we see colours on a device screen, where the display is comprised of three illuminating colours (red, green, and blue, hence RGB) in combination.¹² Eaton's approach is often placed in relationship with her historic predecessors (such as the photographer and inventor William Henry Fox Talbot; Josef Albers, who undertook colour studies; and the methodical minimalist Sol LeWitt). However, her additive process technically corresponds more directly to the workings of contemporary screens and screen devices. Critics who have written about Eaton's work have not picked up on this, but in the context of my study it can offer a valuable entrance to the surface as (processual) interface. As we (inter)face with and are immersed in a dominant electronic culture, it feels necessary to side-step towards this culture in our exploration of Eaton's film-based photoworks. New 'techno-logics' begin "to alter our perceptual orientation in and toward the world, ourselves, and others" as film and media scholar Vivian Sobchack writes in '2.1 The Scene of the Screen: Envisioning Photographic, Cinematic, and Electronic "Presence"' (Sobchack 2016, 91). Sobchack's writings are essential to the phenomenological discourse on cinema and film studies, but in this particular article she builds a helpful bridge between the three perceptual and representational technologies of photography, motion pictures, and computers.

CONTEMPORARY SCREENS AS INTERFACES

To confirm (or dispel) the parallelism between Eaton's colour constructions and the functioning of screens, it is necessary to think about the role and workings of contemporary screens as interfaces. Stephen Monteiro, who edited *The Screen Media Reader* (2017), has argued in his article 'Fit to frame: image and edge in contemporary interfaces' (2014) that the screen's form (its size and rectangular shape) preoccupies and dominates contemporary images *and* our visual experiences. As digital images are meant to fit screens, regardless of their own specificities, he proposes that the screen itself becomes the message, one that is shaped by frame and surface (Monteiro 2014, 361–362). Monteiro asserts a parallel between this contemporary "frame-oriented image processing", and modernist image-making, because of a common guiding concern for the "the relationship between image and surface, or the material interface of canvas and paint" (2014, 363). However, what may be more relevant here is his analysis of the relationship between these forms, as determined by a screen-dominated culture and the forms of 1960s minimalist painting. With the latter, he argues, the exploration of the image field was wholly determined – and therewith dependent upon – the shape of the object that supported it (2014, 373). This analogy offers a surprising angle, particularly in the context of Eaton's own reference to minimalism. Her colour constructions explore the negative's potential to act as a canvas for the light that enters in. The negative is of course delimited by its rectangular frame, but it is also defined by its capacity to be receptive to the multiple exposures of Eaton's additive colour system.

However, Monteiro does not consider the role of the screen as mediator of light – and this, in my opinion, is its most essential characteristic, affecting how we see the image just as the frame and the

surface do. While Monteiro concentrates on the screen as 'hardware', an object that relates to and interacts with users, I would argue that the workings of the light projections in, behind or against the screen, determine the true edges of the screen's interface. In 'Mediations of Light: Screens as Information Surfaces', new media scholar and curator Christiane Paul distinguishes between screens which are technically 'just' display mechanisms for software-driven processes, and other (touch) screens that are receptive interfaces: the latter will 'read' and 'react' to their viewer/user and/or environment (Paul in Cubitt 2015, 184; 191). By questioning what exactly is being interfaced by the screen, Paul provides a simple but helpful distinction between different contemporary interfaces. Drawing on Florian Cramer's work, she states that an interface can operate "between hardware to hardware; hardware to software; software to hardware; software to software; humans to hardware; humans to software" (Paul in Cubitt 2015, 184). With these various interfaces in mind, Monteiro's argument then offers a telling insight into the interface between the screen device as hardware, and the software that moulds the image.¹³

In the contemporary world, the surface has acquired an unprecedented centrality to the experience and modification of images. These things happen with, through, and on screens, many of which are responsive to touch. Monteiro describes how the stretching and over-magnification of digital images can reveal how the image remains an animated performance for as long as it is on screen: "The image is animated, even if visibly still, within the flux of the system as data are continually received, sent and processed by the screen device and network to produce and sustain this visual performance" (Monteiro 2014, 376). Any notion of an entirely stable image belongs to the past: it has become a production of continuously operating devices. These operations are driven by complexities which are not necessarily understood by the viewer, beyond a basic understanding of the creation or imitation of an image by the light in the screen. Sean Cubitt who co-edited *Digital Light* (2015) (in which Paul's article can also be found) contributed an essay, 'Coherent Light from Projector to Fibre Optics', in which he outlines the history of the technical development of visual displays, focusing on the workings of the light.¹⁴ A passage on Digital Light Programming (Cubitt 2015, 48–51) focuses on the functioning of today's most-used projection technologies: DLP (Digital Light Programming), LCD (liquid crystal display), and LCOS (liquid crystal on silicon). While DLP and LCOS technologies are used mainly in projectors, LCD technology is in a wide range of devices such as computer screens, tablets, digital cameras, mobile phones, smartphones, digital watches, televisions, projectors, and other forms of displays.

A very simplified account of how these technologies works is as follows: each sends three versions of an image in red, green, and blue (RGB) to the screen.¹⁵ Each pixel (in the many image-building arrays of pixels of LCD and LCOS screens) is built of the three colours red, green, and blue (RGB). The intensity of each colour is created by the quantity of electronic light waves sent to the individual pixel. Intensity value ranges between 0 and 255, with 255 admitting the maximum

light and zero not letting any light waves pass through from the LED backlight source.¹⁶ If the red and the green, for instance, are at full value, while the blue is at a value of 50, the pixel will appear yellow. Where all colour values stand at 0, the pixel is black, and where all are at 255 the display colour is white. The liquid crystal layer is responsible for determining how many electronic waves actually reach the three colour filters for each pixel. This is positioned between the LED backlight and the pixel layer (fig. 4.10).

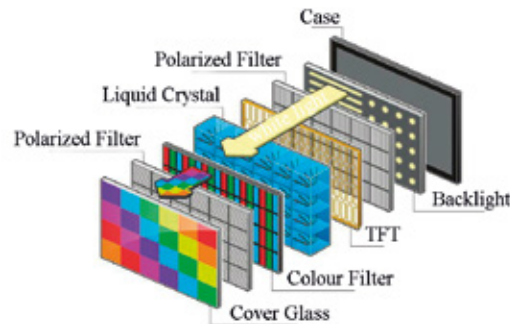


FIGURE 4.10. Layers of Liquid Crystal Display (LCD) screen.

A *Surface's* STRETCHED TEMPORALITY IN MULTI-EXPOSURE PHOTOWORKS

Like the screen, Eaton's negative operates as an interface. She 'sends' different colour lights to it by changing the filters over the lenses and the shutter of the camera. The receptive layers of the chromogenic colour negative react selectively and successively to the colour-filtered light waves. The chromogenic film negative holds three coupler-incorporated colour layers separated by interlayers which ensure that the blue, green, and red lights react only with each specific colour-sensitive layer. From top to bottom, the order of emulsion layers on negative is as follows: the blue-sensitive layer (with a yellow-coupler), the green-sensitive layer (with a magenta-coupler), and the red-sensitive layer (with a cyan-coupler). The negative remains in a susceptible state and its material will register any encounter with light, right up to the moment when it is enveloped by the colour developer that will ultimately react with the couplers. In its initial state, the negative retains the capacity to react fully with the three primary light colours (RGB), so as to produce the primary pigment colours (cyan, magenta, yellow, or CMY). Multiple

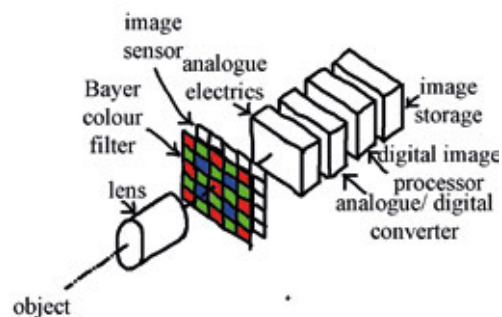


FIGURE 4.11. Processing layers inside the digital camera.

exposures are rooted in film-based practice because they arise from this feature of the negative – its ongoing receptiveness to new photons. A single exposure doesn't 'freeze' or max out the receptor's potential. In comparison, when the shutter of a digital camera closes, the numeric code of each individual pixel in the image field is saved to the flash memory card (fig. 4.11).

Here, the process of reading and storing the reflected light passes through several steps and therewith layers, of which – again, much simplified – the first is the lens, the second an infrared filter (which keeps harmful light out of the camera), and the last, just above the image sensor, the Bayer colour filter. The Bayer colour filter is particularly interesting in our context. It is a mosaic of tiny red, green, and blue colour filters, which splits the light into primary colours before the information reaches the image sensor. Each of these little RGB-filters covers one pixel. On reception, the sensor transforms the photons into analogue electronic signals. Up to this moment, when the electrons reach the digital converter, all of the image's information is transferred in analogue. From here on, however, it is a matter of numeric codes that are 'developed' by a digital image processor which acquires the numerical information that has been created by the Bayer colour filter and the individual pixels, and mosaics this information in grid-form. This processor also averages the information (via a software algorithm) to make the image smoother. Afterwards it is stored on a memory buffer and flash memory card.

Although there are several transformation processes involved, the pixel's information itself is not held in a consistent state. Once that information has been set, it cannot be receptive to further information from another exposure. In a temporal as well as a spatial sense, the pixel is limited to its individual position. Sobchack describes this characteristic of the pixel as follows:

Digital electronic technology atomizes and abstractly schematizes the analogic quality of the photographic and cinematic into discrete pixels and bits of information that are then transmitted serially, each bit discontinuous, discontiguous, and absolute – each bit 'being-in-itself' even as it is part of a system (Sobchack 2016, 109).

This "being-in-itself" excludes any modification at the time of shooting. The pixel can be processed afterwards, which means that it is erased and supplanted by a new pixel that has no reference to the previous one. This quality reminded me of the distinction between particles and waves that Karen Barad makes – as a form of crash course in quantum physics and diffraction theory – in an interview for *New Materialism: Interviews & Cartographies* (edited by Rick Dolphijn and Iris van der Tuin, 2012). Here Barad explains:

According to classical physics, there are only two kinds of entities in the world; there are particles and there are waves. Particles are very different from waves. Particles are localized entities that occupy a particular place in space and in time, and you cannot have two particles in the same place at the same time. On the other hand, there are waves, and waves are

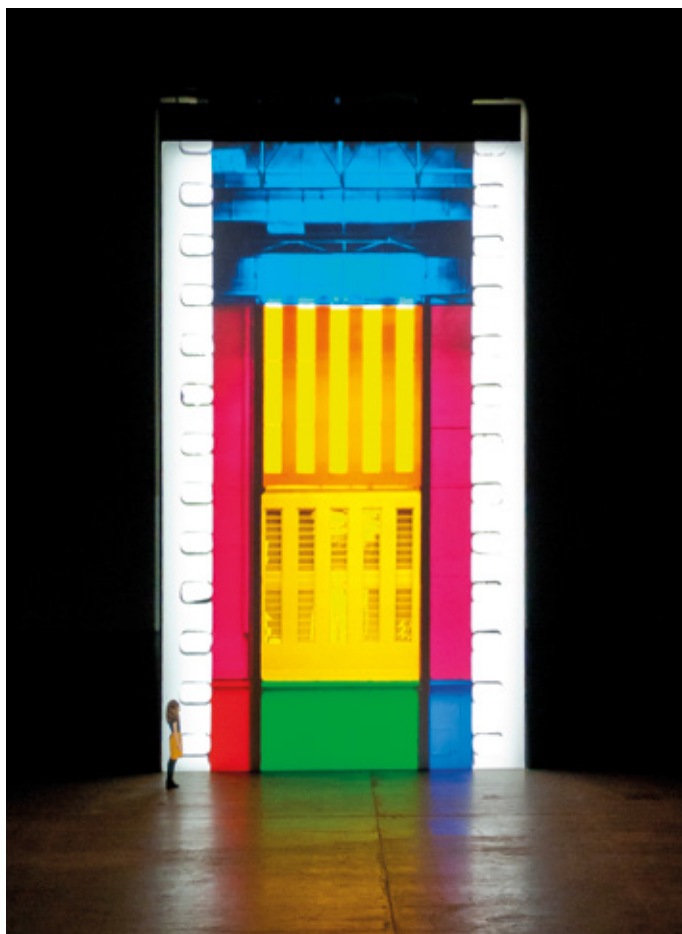


FIGURE 4.12. Tacita Dean, *FILM*, 2011. 35 mm colour and black and white portrait format anamorphic film with hand-tinted sequences, silent, 11 minutes, continuous loop. Large front projection, projection booth, free-standing screen, loop system. Installation view Turbine Hall, Tate Modern, London, 2011.

not entities at all. Waves are disturbances in fields (Barad in Dolphijn and Van der Tuin 2012, 60).

The pixel occupies a single and particular place in space and time, a place which cannot be ‘inhabited’ simultaneously by another pixel, unlike any spot on the film negative, which can receive new light input even after previous exposures. The consequence is that the already-exposed silver halides of a particular colour commingle with the newly exposed particles. This unique characteristic of film, its openness to multiple exposures, is explored by Tacita Dean in many of her cinematic works. In *FILM* (2011) and *Antigone* (2018), for example, she exposed 35mm films several times, using a complex masking system over the camera’s lens to make a kind of collage of moving images within the camera (fig. 4.12). Both Dean’s and Eaton’s work have a mesmerizing effect on the viewer who is accustomed to digital post-production image manipulation. It is almost impossible to believe that these artists create their complex images purely ‘in analogue’ on film.

The consistent presence of the exposed silver halides (and of the non-exposed areas) from previous exposure(s), throughout a series of multiple exposures, gives the photographic surface of the negative a processual character. When viewed together with the pixel (grid), it immediately becomes apparent that the negative’s material has a comparatively stretched temporality. Sobchack argues that “the primary value of electronic temporality is the discrete temporal bit of instant present” (Sobchack 2016, 112). This exists in opposition to photographic and cinematic temporality. In an earlier passage, she describes the electronic as something that has absolute presence in the present, in contrast to the enduring character of the photographic, having presence in a present that is always past (2016, 101). When considering photographic material, its presence in the present is not only determined by the photographed past, but also by the period of its existence. This means that the photograph’s appearance is subject to the (ageing) processes that I will turn to in the next passages.

It is not possible to predict the behaviour, over time, of the primary pigment colours cyan, magenta, yellow (CMY) of a chromogenic photograph. Therefore we can say that the photographic surface acts according to its own internal processes. It is, to use Galloway’s phrase, a “fertile nexus”, autonomous in the sense that it has its own ability to generate new effects. The effects we witness on *Russian Diplomacy* include its fading to magenta and the yellowish discolouration of the white background. When we acknowledge the photographic surface of *Russian Diplomacy* as the photowork’s fertile nexus that processes, translates, and mediates throughout its existence, we become aware that to witness the fading is to perceive, momentarily, an ongoing effect which lies outside the realm of the intentional.

4.3. THE TRANSFORMING PHOTOGRAPH

In the concluding remarks of his essay ‘Image as Trace: Speculations about an Undead Paradigm’ (2007), German art historian Peter Geimer calls for an analysis of the unforeseeable or unintentional in images, which he opposes to the study of meaningful and intentional pictures:

Especially against the background of an art-historical and cultural tradition of interpretation that has developed its methods above all through the analysis of intentional, composed, and “meaningful” pictures, the question still remains: what place will the study of images concede to contingency, to the unforeseeable event, to that which is unsusceptible to being composed – that is, the trace? (Geimer 2007, 24)

His analysis of the (photographic) image as trace concerns both the material coming into being of a photograph, and also those unexpected visual elements that converge with the photographer’s artistic intention as they press the shutter (2007, 19). For Geimer, photographic traces “are not ‘produced’; rather, they are brought about deliberately but in an uncontrolled way” (2007, 20). Returning to his call for an analysis

of the unintentional and unforeseeable in pictures, it strikes me that photography theory's concern with the notion of the trace focuses foremost on the photographic event: the encounter between light-sensitive material and light emitted from the photographed objects. And yet, this figure of the trace can also be of value when we consider the photograph's full lifespan. While certain dyes vanish, silver particles oxidize, surface textures change, the photograph remains a trace of a trace of a trace of... It does not transform into non-material, the non-photographic, but it is 'alive'. We need a term that can do justice to the precarious nature of photographic material in its continuous development, without implying the extreme end-point, destruction. I suggest the *transforming* photograph.¹⁷

The previous sections adumbrated an understanding that the photographic surface can be considered as a processual interface not only in the creation of the photowork but also after it has left the artist studio or darkroom. Here, in this final section, this processual passage itself comes centre-stage, to take my full attention. The aim that now I permit myself is to see how the changing photographic surface can ontologically shift our understanding of, and engagement with, photographs.

The reality of objects is blurred by expectations of visual accuracy, and contrived institutional narratives that seek to preserve the unpreservable or to present the impeccable. One of the editors of the volume *The Permanence of the Transient* (2014), which addresses precariousness in art, describes precariousness as something that can be inherent to many different facets of an artwork including "form, material, method of production, medium, presentation, reception, documentation, narration, collection, and conservation" (Maroja, Menezes, and Poltronieri 2014, xvi). Without going into the fine detail of what, precisely, the precarious nature of photoworks could entail, this angle raises an awareness of the ways in which institutions and artistic frameworks can misunderstand photoworks. In the real world, such misunderstanding can lead to situations in which the very collections that aim to protect photoworks for future generations can be destructive. Institutions become enemies of photoworks when they apply policies of reproduction and replacement – or even, in the worst cases, systematically destroy originals. This is, after all, a very delicate matter. Nearly fifteen years ago, the acclaimed French curator Nicolas Bourriaud alleged that endurance, whether of objects or relations, has become a rare thing, and this made him advocate for an appreciation of the transitory:

Today, we need to reconsider culture (and ethics) on the basis of a positive idea of the *transitory*, instead of holding on to the opposition between the ephemeral and the durable and seeing the latter as the touchstone of true art and the former as a sign of barbarism. Hannah Arendt: 'An object is cultural to the extent that it can endure; its durability is the very opposite of functionality, which is the quality which makes it disappear again from the phenomenal world by being used and used up.' In this new configuration, the physical duration of the artwork is dissociated from its duration as information and its

conceptual and/or material precariousness is associated with new ethical and aesthetic values that establish a new approach to culture and art (Bourriaud 2009, 23 and 32, emphasis in original).

Although Bourriaud's argument exceeds any medium specific boundaries, it can inspire us to throw wide our narrow understanding of what a photowork must be. In the following passages I discuss a number of contemporary photoworks which are unusual in that they expose their processual and transitory character when exhibited. By apprehending and enlarging this aspect of these works – an aspect that is present, to a greater or lesser degree, in any chemical based photograph – we can become aware of how every analogue photograph is a transforming photograph.

A CONTINUOUS STATE OF BECOMING

American artist Meghann Riepenhoff (b. 1979) is known for her site-specific photoworks. She sensitizes and develops photographs in particular natural locations, therein embracing and drawing attention to elements of chance and transience. For Riepenhoff, time and natural phenomena, as well as the photographic materials, are ingredients of her photographic process. When 'finishing' a body of work, she documents the outcome with digital photographs, thereby acknowledging that the photowork she has created is not fully fixed and will change its appearance over time. She sees the resulting digital files as documenta-



FIGURE 4.13. Meghann Riepenhoff, *Littoral Drift Nearshore #209* (Springridge Road, Bainbridge Island, WA 02.12.15, Fletcher Bay Water Poured and Fletcher Bay and Fay Bainbridge Silt Scattered), 2015. 63 cyanotypes, 289.6 × 548.6 cm. SFMOMA, Accessions Committee Fund purchase, San Francisco, United States.

tion material, meanwhile, the photoworks take on their own lives after leaving the artist's hands.¹⁸ For the series *Littoral Drift* (2013–2017) (fig. 4.13), she used the cyanotype process, sensitizing sheets of paper with a mixture of an iron complex and citric acid, which become light-sensitive and are ready for exposure when dry. She placed her prepared sheets on the shores of various lakes and of the Pacific, then poured over and/or partially buried the sheets under sand, exposing them for a period that was measured in breaking waves (a duration of between one and five waves per exposure). Thus Riepenhoff registered all of it: time, place, light, water, sand, salt, silt, and her all-embracing gestures.

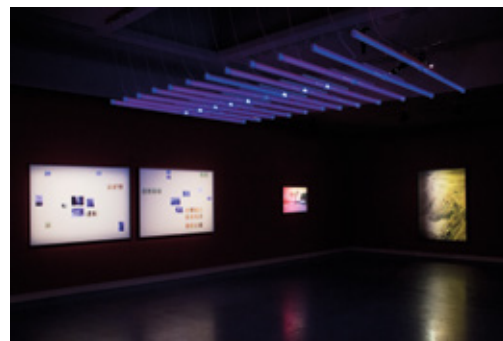
The developing and fixing of cyanotypes happens as a single step: with washing in water. This removes the soluble chemicals, leaving the blue image embedded in the structure of the paper's fibre. Riepenhoff's reawakening of this historic process is what draws these photographs into the contemporary world. Beyond that, their material and subject matter recall a rather dateless being, images that are still changing, as the seawater did not fully 'fix' or stabilize them – hence her term "dynamic cyanotypes". These dynamic photoworks admit their changing character, and so bring the processual quality of their creation and of their existence to the fore. Riepenhoff shares her thinking:

Photochemically, the pieces are never wholly processed; they will continue to change over time in response to environments that they encounter. As part of the larger project, I selectively re-photograph moments in the evolution of the images, to generate a series of static records of a transitory process. [...] Perhaps where the fugitive cyanotypes are analogies for a terrifyingly fleeting and beautiful existence, the process of re-photographing them is a metaphor for the incorporation and mediation of photography in the contemporary human experience (Riepenhoff n.d., unpagged).¹⁹

The creation of the photoworks is as important to her as their longer evolution. After washing her exposed sheets of paper, Riepenhoff no longer intervenes in the development of the material; she leaves it up to the matter to change in natural response to encounters with its environment. In the fifth and final chapter 'Working Hot: A Materialist Ontology' of *Art Beyond Representation*, Barbara Bolt develops a theory of practice that accounts for the matter (of bodies and objects) that is involved in a process of creation. Herein, she refers to a characterisation of the aesthetic object by W.J.T. Mitchell in his article 'Representation' (1995) in order to alter it. Mitchell argued that "the aesthetic object does not 'represent' something, except incidentally; it 'is' something, an object with an indwelling spirit, a trace in matter of the activity of the immaterial" (Mitchell 1995, 16). While Mitchell regards the matter itself as "*not* eloquent" (Bolt), and the aesthetic object as "only" a trace "of the activity of the immaterial on matter", Bolt herself suggests that the object is a trace of the activity of matter *itself*, both human and non-human and "not a trace *in* or an impress *on* matter" (Bolt 2004, 170–171, emphasis in original). Here, Bolt develops an understanding of the work of art as a process that includes the mutable nature of the materials (and therewith matter) that the artist uses and which we witness in Riepenhoff's work.

When contemporary artists play with the impermanence of the photographic material, the game is consciously conceptual. The work *Standards & Poors* (2013), by French artist Sylvain Couzinet-Jacques (b.1983), is a series of Polaroids and silver gelatin photographs of abandoned construction sites in Spain, taken after the housing market had collapsed due to forecasts of real estate and financial crises between 2008 and 2011 (fig. 4.14). Couzinet-Jacques presented the photographs in rooms illuminated with UV lighting, which caused the Polaroids to darken, while the silver gelatin photographs were mounted in frames behind various colour-tinted glasses. In some cases, the colouration of these glasses protected the photographs' being affected by the UV light, while others were completely destroyed during the exhibition period. The destructive effect of UV lighting on photographic material becomes a metaphor for the Spanish sun and for the devastation of the financial crisis. More broadly, the installation is a meditation on the temporality of the material, the image, and life. Both Riepenhoff and Couzinet-Jacques use the transformative nature of the photographic surface to materially reflect their respective subjects. Both artists embrace the malleability of photographs (through internal and external factors), opening space for a more inclusive reception of life, afterlife, and the transcendent. The morphic quality of the analogue material is the metaphor for – or synecdoche of – the relentless progression of nature. These works evaporate a kind of material immediacy. They touch us through their genesis as well as in their continuous and receptive 'exposedness'.

When Bolt broadens the 'representationalist' logic of the work of art by drawing such processes of transformation into it, "the body becomes language rather than merely inscribed by language" (Bolt 2004, 171). This sentence hints at a later concern of hers: how to theorize this entanglement of materiality and signification (she delves into the writings of several semioticians to work out her own answer). Her main interest, here, is the continuity between a work of art (the process of creation) and an artwork. However, her arguments can also be applied to the unfolding and extensive process of transformation that an artwork undergoes throughout its existence. Assuming such continuity, Bolt asks rhetorically whether "it is possible to argue that an image can exceed its structure as representation in a radical material performativity where it performs rather than stands for its object" (2004, 173)? This brings her to her materialist ontology of the work of art in which "the materialisation is not just enacted discursively" but "more radically, through material and somatic processes, materialisation implicates the life of matter" (ibid.). Such thinking is still provocative in the photographic context, where representationalist logic tends to dominate the general understandings of photoworks or, in Bolt's reverse formulation, of "the work of photography". In this last chapter, I introduce photoworks whose changing nature is part of the artist's conception. These works might engage us in a more inclusive understanding of the changing character of photographic materials in general, while also helping us to see how the matter *performs* the image, as opposed to *being* that which it depicts.



FIGURES 4.14. Sylvain Couzinet-Jacques, *Standards & Poors*, December 13, 2013–January 12, 2014. Photographs and installation view, Le Bal, Paris, France.

PROCESSES OF (DIS)COLOURATION

Historic photographs and photoworks that visually age are usually seen as troublemakers by photographers and photo conservators in archives and museums. For the sake of preserving these sensitive objects of cultural heritage, acclaimed research centres like the Image Permanence Institute in Rochester, the Getty Research Institute in Los Angeles, or the Icon Photographic Materials Group (PhMG), assemble new research-based insights to develop methods and practices which can ensure the survival of these unstable artefacts. The Science4Arts research project to which this dissertation contributes was initiated after Monica Marchesi, paper conservator at the Stedelijk Museum, discovered the drastic discolouration of *Russian Diplomacy* while making a general inventory of photoworks in the collection. Van Elk's photoworks, in particular, led to an investigation of the problematic issue of photographic instability in mixed-media artworks.

The fading of *Russian Diplomacy*'s photographs to magenta, and the yellowing of the white background, are exemplary of the (dis)colouration of chromogenic prints from the 1970s and 1980s. This form of deterioration is familiar as the reddish cast that historic colour photographs sometimes take on in our family albums. It is fading not in the sense of bleaching out (which causes a loss of detail or

contrast) but as an odd, complete, shift in the colour palette, through the (partial) lack of one or more of the three dyes. The reason it happens is that the cyan dye is the least stable of the three, which fade at different speeds. Counterintuitively, this disappearance of the blue dye, which is termed *dark fading*, has nothing to do with the overdose or lack of light (as is the case with *light fade* that arises through ultraviolet radiation and light). Dark fading is caused by the ambient temperature of the storage space. When it arises, there is an overall colour shift but not necessarily any loss of highlight detail. The recommended conditions for the dark storage of chromogenic prints are around 2°C temperature at a humidity level of 40 per cent (Pénichon 2013, 205; 231).²⁰ However, *Russian Diplomacy* was and is stored in a space with a temperature around 20°C (Winter: 18°C ± 2°C / Summer: 20°C ± 2°C) and a relative humidity of 50% ± 5%. As I explained in section 3.3., the mismatch is a consequence of the Stedelijk Museum policy wherein art-works are catalogued and stored in accordance with the artist's identity as photographer, conceptual artist, painter, or other. Van Elk regarded himself as a conceptual artist and his works were acquired by the department of paintings. Ultimately, this led to the destruction of this photowork, which has been held under "works on paper and mixed-media works (objects made from a combination of materials, such as paintings, installation art, or furniture)".²¹

In conservation terms, the current condition of the chromogenic photographs of *Russian Diplomacy*, like the contemporary photoworks made by Riepenhoff and Couzinet-Jacques, could well be identified as "chemically damaged", as described in Kristel van Camp's extensive 'Damage Atlas for Photographic Materials' (2010). I will now give a brief account of this conservational approach, with a view to proposing a new theoretical take on (dis)colouration – one that offers a different angle on visual and material changes to photographs.

"Chemical damage", as Van Camp defines it, is when the chemical constitution of a photograph has undergone change on an atomic and molecular level. It can be caused by hydrolysis, oxidation, or photochemical processes. As substances and/or gasses interact, certain chemical bonds in the photographic material are broken, and/or compounds change. Temperature and light can provoke and accelerate these molecular alterations, as is made particularly apparent in Couzinet-Jacques's exhibition. Such damage visually manifests foremost as material decomposition or a change of colour. However, as Van Camp states, chemical changes in the first phase are difficult to detect. One reason for this is that the causes are both external and internal. In certain photographic processes, such as the chromogenic process, there is always a possibility that the appearance will change over time because of the inherent instability of the dyes. Internal causes reside in the material itself, though they depend on many factors during the production of the photographic material and through its development following exposure.²² Geimer refers to this inherent material changeability as the "original accident", something that he describes in detail in the context of inadvertent texture phenomena:

The possible destruction is not an event that suddenly befalls a technological product – or a technique of depiction – from somewhere else. The accident is original. To manufacture an apparatus and set it in operation is also to produce “a specific failure, or even a partial or total destruction”. By consequence, it is virtually impossible to maintain a systematic distinction between internal and external, immediate and subsequent, agents of destruction (Geimer 2018 [2010], 34).

Hence, characterizing these changes as forms of damage should always be queried.²³ This is a process that concerns internal qualities of the material, qualities that naturally change over the lifespan of the photograph, and it doesn’t seem appropriate (outside the conservation context) to define these internal, even inevitable processes as damage. In the beginning of her damage atlas, Van Camp herself addresses the imprecision of definitions of damage (and by extension of the undamaged).²⁴ Later, she questions whether natural ageing should be seen as damage, and concludes that a decrease and therewith deterioration in condition – albeit through inevitable ageing processes – can nonetheless be seen damage. However, the internal or external causes “are not always clear-cut”. In a concluding remark she asks: “If natural aging can not be considered as damage, then where is the thin line between the two and who decides on the context and the interpretation?” (Van Camp 2010, 14). The context and interpretation usually falls to photographers, curators, and conservators and they are, accordingly, dictated by practical and preservative concerns, based on an artist’s intention or an audience’s values and expectations.

In an article in the *Journal of the American Institute of Conservation*, philosopher Kayley Vernallis extrapolates from the impact of colour fading to consider the meaning of photographs within aesthetic theory. This is a more reflective side of the discourse concerned with the changing appearances of photographs, and it is a quieter side – often underexposed. Vernallis described how, on one side, philosophical literature has not tended to address specific practical problems such as the colour fading of images, and on the other side, the conservational judgment and treatment of photographs doesn’t tend to accommodate (or afford) philosophical reflection (Vernallis 1999, 475). Vernallis asks *why* the ageing of colour photographs is conflated with a loss of meaning. As response, she investigates the consequences of colour fading for the representational and intentional meaning of photographs, and considers the formalist aspects of photographs, before additionally discussing the *virtues* of colour changes. Opinions on how to deal with a changing photographic surface are subject to present opinions; just like photographic materials and technologies, they change with times and (cultural) environments. In a contribution to the 2008 ICOM CC conference²⁵, ‘Changing perspectives on color photography’, Peter Mustardo and Nora Kennedy (of The Better Image photo restoration company) assert that in general, audiences are becoming used to certain ‘patinas’ in/on/of photographs:

Just as we have grown to favor salted paper prints with yellowed highlights and gelatin silver developed-out images with a silver mirror sheen in the maximum density or dark areas as

acceptable and even desirable signs of age, unbalanced color (or color-shifted) images are gaining a certain charm that their creators never intended and in many cases are horrified by (Kennedy and Mustardo 2008, 693).

Nowadays, in many cases, a whiff of nostalgia adds value to ageing photographs. There is a blossoming market for, and interest in, *vintage prints*, and this doesn’t necessarily align with conservational sorrows. Of course, a dramatic change of colour is usually still a big loss, but as with photographs from the nineteenth century, certain effects of deterioration are tolerated, if not appreciated, and can be seen to add the value of singularity to the artefact (2008, 694). Kennedy and Mustardo relate this change in attitude to the increasing rarity of original works “from the heyday of chemical colour photography”. Vernallis frames things a little differently, but she too thinks of the precariousness of photographs that have been passed down, and will continue to travel through the generations, and she sees this precariousness as something that will affect opinions about the condition of these photographs:

[...] while it does seem plausible that *today* our hopes of grasping a color photographer’s vision depends upon arresting fading, the situation may be different for viewers late next century, especially since effective conservation measures would undoubtedly affect only a small percentage of color photographs, while the vast remainder of fading photographs may set the paradigm for future viewers’ sense of the photographic look most conducive to retrieving the intentions of 20th-century photographers (Vernallis 1999, 472, emphasis in original).

In Geimer’s essay on the trace, we find a fruitful characterization of historic (dis)coloured photographs as “evidence for an archaeology of photography” (Virilio, quoted by Geimer 2007, 9). This might explain our interest in them. As the editors of *Materialities of Passing: Explorations in Transformations, Transitions and Transience* (2016) explain, the *raison d’être* of archaeology is not only in the objects of study as remnants of the past, but also in their function as compasses with the potential to help us navigate the present and the future (Bjerregaard et al. 2016, 4). The mobile or motional aspect of this passing of photographic objects will be elaborated in the next and final part of this section. To return to the processual nature of colouring photographs, we must first understand our perception of the colours they hold and present.

Given that the colours of a chromogenic photograph are only ever an approximation of the photographed objects’ reflected colours, and limited by technical means, why would we necessarily characterize any change as *dis*-colouration?²⁶ In this context, Sean Cubitt’s genealogy of visual technologies can once again offer a useful overview into the nature of colour in the realm of print and digital media. For Cubitt, colour is neither subjective nor objective, but projective. It comes about through the synergy of our cerebral perceptions and wavelengths, or, as Cubitt puts it, “[n]either produced by us alone nor an exclusive property of the world, it belongs to the intersection, the mutual greeting of human and universe” (Cubitt 2014, 112).²⁷

The consequence is that colour as a variable is inherently processual – it is not a static parameter: “[...] the complexity of colour

perception at the brain end of the process and the equally immense complexity of light sources and spectral and specular reflection suggest that colour may well be unrepeatable” (2014, 112).²⁸ The photographic recording of light not only gathers light, but processes it according to the configurations of the techniques and the apparatuses used. Cubitt explains that there are some sixty thousand elements of photoreceptors per square millimetre at the centre of the human retina. Colour photographs, by comparison, have about thirty thousand (and digital cameras, twenty thousand) (2014, 113). The reduction leads to *new* colours every time, thus making every photograph an ontological “evidence of the gap between the light of the world, the light in our eyes, and the light reflected from a photo” (ibid.).²⁹ As the colours of the photograph change over time, the gap between the initial reflected light, and the picture’s current light, widens – and is naturally bridged by the viewer’s imagination and/or memory. We even might argue that intra-action (between our perception, the processing of the visual information offered by the photograph, and the transformational power of imagination and memory) is the true processual interface in this encounter between (dis)coloured photograph and viewer.³⁰

“Discolouration requires seeing them [things] in another light”, writes the philosopher Eli Friedlander, in his analysis of Walter Benjamin’s autobiographical text *Berlin Childhood around 1900* (in which there is a passage entitled ‘Color’) (Friedlander 2011, 45). Friedlander, seeking to understand the relationship between mood and the experience of colour in childhood, touches briefly on the phenomenon of discolouration. He considers the mood created by looking at colour as an experience of *immersion*, and suggests in opposition to this, a vision of discolouration as causing a *detachment*.³¹ Discolouration means “a falling out of attunement with the world, as though by losing the texture that makes a being belong to its world” (ibid.). When photographs lose their colour reference to the depicted past, a similar anxiousness might creep into our veins. The lost dyes are as irretrievable as



FIGURE 4.15A. Louis Jacques Mandé Daguerre, *Boulevard du temple*, 1838. Image from reproductions, originally Daguerreotype, 15×18.5cm. Bayerisches Nationalmuseum, Munich, Germany.



FIGURE 4.15B. Sylvia Ballhause, *The Munich Daguerre-Triptych (left)*, 2010 (2014). C-print, 72×90cm. Detail of Louis Jacques Mandé Daguerre’s *Boulevard du temple*, 1838 (in current state).

the moment that has passed. I want Friedlander’s and Benjamin’s take to exemplify here how discolouration is entangled with emotions and associations of affect.

But as Friedlander says, “not to see things is different than seeing them discoloured” (ibid.). One extremity of photographic (dis)colouration manifests as a monochromatic (sometimes speckled) surface where both contrast and colours have evened out. As Geimer recounts, the very first iconic photographic images (such as Daguerre’s *Boulevard du Temple* (ca. 1838), or the images in Talbot’s *Pencil of Nature* (1844–46)) populate photo history compendiums as phantom images. Meanwhile, the archived originals are now plates or papers with an abstract patterned surface beyond any subject recognition (fig. 4.15a & b). “So the surviving pictorial inventory of the history of photography stands in for a larger reservoir of effaced and vanishing images” (Geimer 2018, 32). A metaphorical and literal “fog” surrounds the beginnings of photography (to borrow from Walter Benjamin’s *Kleine Geschichte der Fotografie*, 1931) and this fog will also suffuse the beginnings of chemical colour photography of the more recent past. And on it goes, as representations (will) vanish from the photographic surface, the surface itself continues its transformative processes. Continual

movement is the emergent property of this processual characteristic of photographic surfaces. This movement lingers in the – for the present – static appearance of photographic objects. Only by comparing of two or more moments of apparent stasis from different points on the trajectory of a single photograph can one intimate the material's *motional* change in between.

TRANS- (TRANSFORMATION, TRANSIENCE, TRANSITION): MOVEMENT IN PHOTOGRAPHS – PHOTOGRAPHS IN MOVEMENT

In photography, permanence and transience go side by side. Both are intrinsic to almost every photo that holds a fraction of a passed moment. “Photography [...] is the uneasy maintenance of binary relationships; it is the desire to represent an impossible conjunction of transience and fixity” (Batchen 2000, 11) writes Geoffrey Batchen, in pursuit of Talbot's metaphorical take on the (at that time) “new medium”. The frozen subject matter refers naturally to the passing of time and metaphorically to our own mortality, and because of this, photography is widely discussed in analogy with death. In this last section, I focus instead on processes of passing *within* a photograph, processes that connote some intrinsic movement which can be opposed to a static existence. But what movements can we think of? And how might we address them theoretically?

As previous sections and chapters have revealed, there can be an upwards migration of silver particles during the various phases of developing silver gelatin and chromogenic prints (through washing and bleaching). In this migration, the particles ‘leave’ the photographic surface. And later, silver particles can travel through the gelatin emulsion of an ageing photograph, up to the surface, where they form a silver mirror or oxidize (as described in chapter three). In deteriorating chromogenic prints, dyes (or dye couplers) can react with external chemicals to cause the formation of stains. All of these (molecular) movements (and many others, dependent on material and photographic processes) are closely related to the consistency of the gelatin layer, which is determined by temperatures and humidity (as described in chapter one). Beside the motions of particles, we also have the flexibility of the gelatin layer, which can swell and shrink when soaked or dried. The effects of this spreading and upward movement become especially visible when juxtaposed with craquelure paintwork, which is more rigid when dried (as in Dean's *Crowhurst II*, chapter one), or, when the gelatin takes on its own micro-cracked pattern following extreme temperature differences during development (as in Yokota's *site/cloud no.11*, section 4.1). The passage of time manifests in space.

The prefix trans- is common to the closely linked processual phenomena of transformation, transition, and transience. It implies movement beyond or across, a point of attention in my third chapter, in which I discussed the biography and itineraries of photographs. In this last chapter, the temporality of movement joins the previously discussed spatial aspects. Through this, we can understand the various forms of interfaces (as dynamic spaces of relations, again following Johanna Drucker's characterization) that play a role in a photograph's life. Batchen, quoting Talbot, characterizes the photograph as

“[...] an emblematic something/sometime, a ‘space of a single minute,’ in which space becomes time, and time space” (2000, 11). I read Batchen here as saying that the photographed moment in space is condensed in the form of a flattened fraction of time. And also, this slice of time is spatially stretched through the photograph's existence. The space and time of the photograph's passing are nevertheless hardly perceivable, as any time we experience them they are fragmented, like snapshots of snapshots. To convey what I mean here, I would like to invoke Tim Ingold's description of the temporality of landscape in *The Perception of the Environment*:

[...] what appear to us as the fixed forms of the landscape, passive and unchanging unless acted upon from outside, are themselves in motion, albeit on a scale immeasurably slower and more majestic than that on which our own activities are conducted. Imagine a film of the landscape, shot over years, centuries, even millennia (Ingold 2000, 201).

The pace of a changing landscape might appear incomparable to the photograph's pace, but it exemplifies the shortfall of human perception when attempting to track these kinds of long-term mutations.³² The only act of transition *in* the photograph that can be witnessed by human perception is the moment when a latent image appears within the developer bath in the darkroom. Rising slowly through the liquid from the plain ground of the exposed support, this is the most visible gesture of the photographic surface as a processual interface. When we think of the *dark fading* of chromogenic photographs in darkened storage spaces (as was and is the case in *Russian Diplomacy*), a dialectical parallelism is striking. With both, the appearing and fading movements of the dyes are manifestations of passing; they are equally acts of transition. As the editors of *Materialities of Passing* explain, these “materialities of passing” can sometimes offer us an understanding or conception of time and temporality, even though time and death have no intrinsic materialities (Bjerregaard et al. 2016, 1). They argue that

[...] particular sensuous and material qualities constitute frameworks for reflecting on or understanding the temporality of death and decay. In different ways, time and temporality assume pace, scale or volume, and essentially become available to the senses and not simply to abstract reflection (2016, 7).

The continuously changing matter of photographs can (at once referentially and metaphorically) trigger reflections on the binary relations between life and death, impermanence and permanence, transience and fixation, and, as Talbot adds, the momentary and the eternal (Batchen 2000, 11). I argue that a photograph moves in the interface between these opposites – as if it were itself a dynamic space – by never quite relating fully to one or to the other. For this reason I am inclined to see the photograph through analogy with the vicissitude of passing, rather than the more prevalent analogy which considers the photograph's relation with the stasis of death. Many ontological writings on photography return to this analogy. But a photograph is a transforming object, not a dead one; although depicting one moment in time, it lives on materially.

Anca Cristofovici's *Touching Surfaces: Photographic Aesthetics, Temporality, Aging* (2009) argues that the photographic me-

dium is able to construct visual analogies to inner psychic experiences by illuminating reciprocal relations between photography and ageing. A photo of ourselves reveals us as alike subject to transcendent physical processes. There seems to be some deep human urge to freeze aspects of our fleeting life, to extend its singularity. This urge manifests in photo preservation just as it does when we preserve ourselves through contemporary (digital imaging) technology.³³

Absence of Existence (2016), a work that Dutch photographer Phelim Hoey (b. 1984) produced for his degree show, comes to mind here. Hoey portrayed cryonicists and other people who wish to be (cryo)preserved after death. The subjects contract American companies such as Alcor and CI to store their bodies in extreme cold conditions after legal death, in the hope that advances in science will make it possible to revive them and restore them to health in the future: the possibility of a new (immortal) life. The method that Hoey used to ‘preserve’ these persons in his photos is rather peculiar. He collaborated with Chris Voigt, a synthetic biologist who manipulates cells in order to fight diseases (that is, to extend life). Voigt offered Hoey a modified *E. coli* bacteria to which he had added a photosensitive gene, which he had extracted from a photosynthesizing blue-green algae. In brief, Hoey suspended colonies of this light-sensitive bacteria in flat glass petri dishes, and then exposed them, to create portraits of the cryonicists (fig. 4.16). These living photos are now stored in the cooling cells of the laboratory at Wageningen University in the Netherlands (after exposure they were not allowed to leave this regulated secure space). But their images live on in the digital realm, assuming a ghostly new afterlife just like the phantom images of the earliest photographs whose originals are



FIGURE 4.16. Phelim Hoey, *Garret* from the series *Absence of Existence*, 2016. Image retrieved from a solution of light-sensitive *E. coli* bacteria exposed under a negative.



FIGURE 4.17. Julia Margaret Cameron, *Sir John Frederick William Herschel, 1st Bt*, 1867. Albumen Silver Print, 35.4×27.3cm. NPG P201, National Portrait Gallery, London, United Kingdom.

safe behind closed rooms, away from public view. One of Hoey’s photos reminds me of Sir Herschel’s iconic albumen silver print portrait that was made from a glass negative in 1867 (fig. 4.17) by Julia Margaret Cameron (1815–1879). 155 years old, this Cameron portrait is kept in the cooled dark storage of the National Portrait Gallery in London. The images are associated in my mind because both depict a male subject, rising out of a dark background, with a concerned expression on his face. There was also something else that gave me a sense of *déjà-vu*: the visual edges of the photosensitive emulsions that present themselves in the upper part of both photographs. In Herschel’s portrait we see that Cameron did not apply the emulsion of egg white (the albumen) over the whole glass plate, or perhaps the emulsion of the glass negative was abraded along the edges before the albumen paper was exposed to it. In the Hoey portrait, ruptures in the bacterial emulsion visually reveal the image carrier – the petri glass.

These signs – abrasions, ruptures, stains, mirrors, or colour changes – in short, any and all traces of the photograph’s processual nature, take us not only “beyond the sign to the facts of matter”, as Barbara Bolt has phrased it (Bolt 2004, 179–180), but to the movement of transforming matter.

In the mid-nineteenth century, soon after the introduction of albumen paper (on which Herschel's portrait was developed), many photographers were surprised to observe that their photographs were fading and yellowing. Photos that were exhibited were vanishing even before the end of the show. To arrest this disappearance, a Fading Committee was established in England in 1855, and there were similar initiatives throughout Europe, as has been recounted by Geimer (2018, 32). This history indicates that the changing nature of photographs is itself a phenomenon that has endured across history. To be aware of it is to acknowledge and perhaps even to value the reality that matter *performs* an image, rather than *becomes* that which it depicts. Ageing continuously, we move along with these artefacts of passage. We bear witness to the fact that they belong to a temporality that is suspended in a movement which stems from their own inner matter. As we look at these transforming photographic surfaces with different lights and angles, there is so much we can learn about our own becoming, being, and passing.

In conclusion, the photographic surface becomes a processual interface through the many stages and encounters it passes through – from its initiation, via exposure and development, and through to its existence in the world. The *last* physicality of the photograph is particularly significant to my concluding argument: I am thinking here with this singular photographic surface that transfers and transforms throughout the whole picture-making process. The famous ability of a photograph to show that has been, Barthes's *ça a été*, is also present as accumulated visual traces (from the artist's gestures, various image devices and carriers, or chemical intra-actions), along the path of its processing. A surface's ongoing receptiveness to new photons (over multiple exposures), right up to the moment at which it is developed and fixed, is a key characteristic of this processual interface. Our consideration of the negative through comparison with the digital process has revealed how the negative's receptive material contains a temporality that can be far more stretched than that of the pixel, which is temporally and spatially limited to its individual position.

If the material itself does not physically carry all the successive states of its coming-into-being, nonetheless, we can still speak of the entire image-creating process – including the continuation that can lead to (dis)colouration – as the photowork's "grand interface" (Galloway). Here, the photographic surface can be encountered as a force that *reflects* as well as a force that *acts*: something that (re)acts to both internal and external processes (and chemical bonds) which contribute to it embodying a "fertile nexus" (Galloway), as we witness in *Russian Diplomacy's* 'processing'. The long-term development of the photograph underlines the fact that its surface *performs* the image, as opposed to *being* that which it depicts. A continual movement springs from this processual characteristic and the motion lingers in the – for the present – static appearance of photographic objects. If we were to speed up a film recording of the photograph's full life, from the process of development through to its final existence in storage spaces – passing through the transformative movements of becoming and passing, or appearing and fading – we would witness what a "dynamic space" (Drucker) the surface truly is. In this movement, photography's analogy with death becomes obsolete.

ENDNOTES

1

During his lifetime Van Elk consented to replace other deteriorated photoworks with completely new photoworks. This has been documented and theoretically discussed by art historian and modern art conservator Sanneke Stigter in two articles (Stigter 2004 and 2005).

2

For a conservator, the question of how to deal with ageing photographs is even more difficult when the photographic surface is partly painted or permanently covered through face mounting or plastic lamination. A replacement of the photograph is then an even more delicate matter, if not an impossible endeavour.

3

Sir John Herschel introduced the term 'photography' to the Royal Society of London (and thereby to the world), in a lecture on March 14, 1839. The ensuing excitement concerned the possibility of fixing a silver image, rather than the possibility of creating one. Herschel found that sodium thiosulfate was a perfect solvent of silver halides. He introduced it to the photographic process as an essential fixing agent: it was able to wash away non-exposed halides after exposure, thereby stabilizing the latent image. Halides continue to be susceptible to light if this susceptibility is not removed. Without Herschel's panacea, therefore, the whole image would soon vanish into black oblivion.

4

I also consider the interior of the camera as a form of interface, through comparison with contemporary interface theories. In this context of electronic cultural dominance, it is important to relate to digital technologies as they alter our perceptual orientation in and toward the world, and therewith also to the chemical-based photographs that take centre-stage in this dissertation.

5

For in-depth reading on the (historical) development of Cibachrome print materials and their specifics, including their image sharpness, see Michael Talbert's <https://www.photomemorabilia.co.uk/Ilford/Cibachrome.html> (accessed March 10, 2019).

6

See, for example, the list of artists in the catalogue *Light, Paper, Process: Reinventing Photography* (2015) by Virginia Heckert.

7

Information retrieved from an email interview with the artist, July 2014.

8

Information retrieved from a conversation with the photographer on February 3, 2017.

9

For further reading see the subsection 'Studios: Dark Rooms, Glass Houses, Black Tunnels' in Noam Elcott's *Artificial Darkness – An Obscure History of Modern Art and Media* (Elcott 2016, 34–46).

10

This is the case, unless she were to flip the film holder at the back of her large format camera.

11

Barad describes the mystery of diffraction in quantum physics as follows: "So while it is true that diffraction apparatuses measure the effects of difference, even more profoundly they highlight, exhibit, and make evident the entangled structure of the changing and contingent ontology of the world, including the ontology of knowing. In fact, diffraction not only brings the reality of entanglements to light, it is itself an entangled phenomenon" (Barad 2007, 73).

12

Light is made up of the respective wavelengths of the different colour. The negative, like the eye, 'reads' the wavelengths that are reflected from the photographed or seen object as colours. The visible spectrum runs from dark red at 700nm, red (665 nm), orange (630 nm), yellow (600 nm), green (550 nm), blue (470 nm), Indigo (425 nm), to violet at 400 nm.

13

With touchscreens, this can include the interface between humans and hardware *and* software.

14

This text is also included in the fourth chapter of *The Practice of Light: A Genealogy of Visual Technologies from Prints to Pixels* (2014).

15

Single-chip projectors do this sequentially, so that the three versions mix optically in the viewer's eye and create an image

there. More complex and expensive three-chip systems do it simultaneously: there is one chip for each of the three colours; the image is then sent 'at once' to the screen. The difference between DLP technology and LCD/ LCOS technologies is that DLP uses rotating filters to achieve the threefold colour projection.

16

Cubitt mentions how difficult, if not impossible, it is to achieve perfect black or dark. He explains why: "The distinction, read in machine code as that between ones and zeros, is however less clear in engineering terms, where the residual refracted light of a previous 'one' will always interfere with the present 'zero': absolute dark, like the absolute absence of electrical charge, is a physical possibility only under extreme laboratory conditions. To produce the effect of difference, which is the crucial feature of digital information, requires careful manipulation of the material form of the wave constituting the passage of a photon through the fibre" (Cubitt 2014, 57).

17

Changes to the photograph that are produced by mechanical damage due to harmful treatment by people (such as folding, fingerprints, stains, or other forms of vandalism), are not included in my argumentation.

18

To assist my consideration of the changing nature of *Russian Diplomacy*, I want to zoom in on Riepenhoff's practice of digitally photographing her photoworks. Artists including Sylvain Couzinet-Jacques and Riepenhoff visually 'preserve' fractions of their photoworks's lives when documenting them like this (either in exhibition shots or in digital photographs of single works). Their practice suggests another possibility for the conception of a discolouring photowork such as *Russian Diplomacy*. Taking, or having taken part in, the photowork's biography, these documentary photographs are not part of the actual photowork but rather, references to points along the axis of its existence. Van Elk made several studies leading up to *Russian Diplomacy*. One of these studies, made with pencil and gouache on colour photograph, is held in the collection

of the Kröller-Müller Museum, Otterlo (53 x 50cm). Six others, on a single sheet of sketching paper (75 x 103cm, at that time in the hands of the artist himself), are displayed in the four-page brochure for *Russian Diplomacy* that was published by the Stedelijk Museum, Amsterdam. In those six studies, Van Elk experiments most prominently with the angle of the triangular frame and the positions of the figures within it. He uses (coloured) pencil on paper and colour photographs. In 1977, Van Elk made another photowork, with the same title and same technique as our case study, but with a more acute angle on the upper part of the frame. All of these photoworks can be seen as references to the coloured *Russian Diplomacy*, along with the various photographs of it that were taken by the staff of the Stedelijk Museum for publication and registration purposes. And when there is a new (reproduced) version of the work, as with *C'est moi, qui fais la musique*, the original photowork is kept as reference material 'underneath'. A paradoxical shift.

19

For Riepenhoff's complete statement on *Littoral Drift* see <http://meghannripenhoff.com/project/littoral-drift/> (accessed November 15, 2018).

20

Whereas for silver dye-bleach prints, for instance, a temperature below 20°C and humidity between 30 and 50 per cent are sufficient for a stable environment. See also Marchesi 2017, 236.

21

For further reference on the storage policy of the Stedelijk Museum see <https://www.stedelijk.nl/en/dig-deeper/collection-care-conservation/collection-care/storage> (accessed January 23, 2023).

22

We have a substrate and emulsion, chemicals and tools (machinery, pincers, hands etc.), all of which can be used when making the photographic object (Van Camp 2010, 17–19) – and any of which can be contaminated.

23

Perhaps the term failure would be more appropriate? See the introduction to *Photography and Failure: One Medium's Entanglement with Flops, Underdogs and*

Disappointments (2017), edited by Kris Belden-Adams.

24

Van Camp's solution fuses two descriptions of damage, one from a conservation perspective, the other from a juridical. Her description reads as follows: "Damage is something that by an effect on our level of understanding and enjoyment or on the object's life-span causes a decrease in condition. It can be determined by comparing two states, the actual state after the wrongful action and the initial state where the damage has not yet occurred" (Van Camp 2010, 11).

25

Abbreviation for International Council Of Museums – Committee of Conservation.

26

Relatedly, Geimer questions the characterization of chemical failure in the second chapter 'Visibility by Destruction/ Disturbance: Incidents of Photography' of *Inadvertent Images: A History of Photographic Apparitions* (2018): "The chemical and physical processes as such cannot be described in these terms. What happens in the developing bath is what happens; there are no correct or incorrect outcomes; the chemical behaviour of an emulsion knows neither success nor failure" (Geimer 2018, 48).

27

Karen Barad's conception of intra-action is again relevant, here showing how a differentiation between subject and object is obsolete.

28

Generally, as Cubitt rightly asks, the critical question concerns whether colour as perception is communicable at all, and to what degree – given that everyone seems to see slightly differently, or even, in the case of colour-blind people, extremely differently (Cubitt 2014, 113). When we grant that the senses themselves are products of cultural conditioning, as Cubitt says (citing historian of colour John Gage), we realize that we are always already in a speculative domain when it comes to judging the colours of a photowork.

29

An alternative conservational treatment, briefly examined by Stigter, is particularly interesting in this context. Photoworks can be retouched within the

exhibition space with the use of specific coloured lighting, like theatrical stage lighting. Projected coloured light visually absorbs (dis)coloured parts of the photowork and thereby 'recovers' the colour balance in the photograph, without harming its material condition (Stigter 2004, 107–108). This is an example of an intra-action between the gallery's lighting, the viewer's perception and the photowork's appearance.

30

See Johanna Drucker's reference to Donald Hoffman's "interface theory of perception" in *Humanities Approach to Interface Theory* (Drucker 2011, 15).

31

Drawing on Benjamin's passage *The Moon*, here, the 'mood of colour' clarifies as day shifts to night and the whiteness of moonlight discolours the universe of Benjamin's childhood bedroom. In the context of Friedlander's analysis, this link between being and discolouration establishes that colour is an important facet of a child's fantasy and of memories of childhood. Friedlander opens his essay by explaining why certain images of childhood (whether photographs or phantasy images) can awaken feelings of homesickness and prompt a profound insight or experience of the "irretrievability" (Benjamin) of the past (Friedlander 2011, 45).

32

Fortunately, densitometric monitoring of black-and-white and colour prints can detect anomalous changes (through regular density readings) and so it is used by museums for the care of photoworks. See Chapter 7 in Wilhelm Henry, *The Permanence and Care of Color Photographs: Traditional and Digital Color Prints, Color Negatives, Slides, and Motion Pictures* (1993).

33

For instance, Thomas Ruff and Rineke Dijkstra, both highly acclaimed photographers, decided (in collaboration with collectors and collections) to reproduce chromogenic colour prints of certain works which they had made in the 1990s. The reproductions were made either as inkjet prints, a very different technique, or again as chromogenic photographs, but with the technological means and papers

of today. I argue that a change of material also changes the artwork and ultimately affects its production of meaning. The works that I encountered in these projects were portraits of people made in the nineties with the fashion 'look' corresponding to that particular period. In the photographs, a common red discolouration, and fading and/or vanishing of the blue tints, will be recognizable to anyone who has albums at home from the seventies, eighties or nineties. Monica Marchesi discusses critically the wish of three Dutch photographers, including Rineke Dijkstra, to reproduce their chromogenic works held in the collection of the Stedelijk Museum in her dissertation's coda (Marchesi 2017, 248–260).