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Medium Rare.

Photography and Media Theory

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Abstract

Photography's definition as a distinctive medium has often been contested, but seems increasingly challenged in foundational terms in the 21st century. This article will explore photography's rather unsettled relation to media and media theory by drawing on the writings of Vilém Flusser, Friedrich Kittler, and Bernard Stiegler, who have all — albeit in different ways — positioned the emergence of photography in the 19th century as a signal event in the history of media. Photography marks the point at which cultures long organized around 'writing' began to cede ground to cultures in which 'technological images' play a growing role. In the 21st century it has become increasingly common to ask whether photography remains faithful to its past or has become something else. My approach here is slightly different: what does the historical transformation of photography tell us about how we understand 'media' in the present?

Keywords

Photography, writing, images, media theory, Flusser, Kittler, Stiegler

The problem of photography

The major transformations that have reconfigured photography over recent decades — from digitization and the integration of cameras into mobile devices to networked distribution, platformization, and computerization — have generated numerous debates. These have gradually morphed from the claims and counterclaims made about the 'death' of photography beginning in the 1980s to arguments about whether 21st

century image-making is still part of a longer history of photography or has turned into something else.

The editorial for the first issue of *Photographies* in 2008 captured something of the ambivalent tenor of this later moment. On the one hand, it signalled the need for greater plurality in approaches to photography, while on the other hand it also registered a growing uncertainty about what can or should be gathered under photography's name. However, after citing John Tagg's (1988: 63) decades-old provocation that "Photography as such has no identity", the editorial went on to bolster Tagg's call for situated photographic histories with an appeal to the continuity of a recognizable photographic project:

> One thing seems certain: there is now more photography, possibly of more kinds, than ever before. We are dealing with a truly expanded field where deep continuities run alongside unforeseen and radical transformations (2008: 3).

This attempt to gather all the different 'kinds' of photography into an expanded field runs counter to some of the more pointed calls for a new paradigm —most polemically, Andrew Dewdney's (2021) provocation to "forget photography". However, it is easy to overstate these differences. Despite his title, Dewdney advocates a rather strategic forgetting: one that is geared to better appreciating the differences of the photographic present compared to the past. This task had, in fact, formed the core of the problem that the *Photographies* editorial set itself to address.

More to the point, Dewdney's solution to forgetting photography by adopting a new nomenclature such as 'networked image' has its own issues. Is it really an advance to assimilate the heterogeneity of visual images now circulating on digital networks into a single overarching category of 'networked images'? Would this include the billions of photographs produced with personal digital cameras, the vast array of screenshots captured on all kinds of devices, and the immense databases, from 'stock photos' to art gallery and museum collections to Google Street View, that are now clustered online? What about the burgeoning streams of images made by generative machine learning algorithms? What is gained by bracketing all these visual images together under a single heading?

At the heart of these debates about whether we should adopt a model emphasizing continuity or discontinuity in photography — and most writers, including Dewdney, tend to end up opting for a 'both' approach, albeit couched in different terms and with different emphases — lies the question of photography's identity as a *medium*. Is photography still a distinctive medium? More to the point, was it ever?

Photography has long seemed an obvious candidate for analysis as a specific medium since it involved a historically novel and technologically distinctive mode of image-making. And yet, despite the plethora of origin narratives that photography has inspired, complications emerge. Photographic practice has been defined from the start by ongoing technological changes in camera design, lenses, film emulsions and processes, and so on. The method outlined by Daguerre was arguably as far removed from the practice of someone like Cartier-Bresson as the latter is removed from the contemporary photographic culture of Instagram and Xiaohongshu. At what point is it legitimate — or necessary — to posit a break in 'kind' rather than 'degree'?

A second issue is that, for a long time, 'photographic theory' maintained its distance from 'media theory'. This was partly a function of historical circumstance: to the extent that photography entered the academy it was initially aligned with visual art schools and this inevitably shaped approaches to its theorization. But the inclusion of photography into contemporary media theory has proved no simple matter. Theorists such as Friedrich Kittler and Bernard Stiegler — part of a relatively small group who both explicitly sought to place photography in a longer lineage of media — tend to subsume the photographic within the cinematographic. It seems that — even in advance of Dewdney's call — photography has a history of being forgotten.

This situation prompts me to recall John Tagg's quote in more detail than the *Photographies* editorial provided:

> [T]he so-called medium of photography has no meaning outside its historical specifications. What alone unites the diversity of sites in which photography operates is the social formation itself: the specific historical spaces for representation and practice which it constitutes. Photography as such has no identity. Its status as a technology varies with the power

> relations which invest it. Its nature as a practice depends on the institutions and agents which define it and set it to work (Tagg, 1988: 63).

Tagg's positioning of photography as a 'so-called medium' exhibits a particular understanding of the relation between technology and society where the constitutive role of the 'social' dominates that of the 'technological'. Tagg was undoubtedly reacting to the primarily formalist and aesthetic understanding of photography that was dominant at the time. He wanted to shift debates away from a narrowly construed agenda organized around the study of photographs, photographers, and genres and instead create space for critical questions about social use, knowledge, and power. But, in putting so much emphasis on the constitutive role of the 'social formation itself', he elides the question as to how we might define a 'social formation' without considering the role of technology and technological change in its production. Avoiding this kind of slide into 'social determinism' has been a common topic in science and technology studies for some decades. But, as Leah Lievrouw (2014) notes, paying attention to the historically specific *materialities* of media technology has, somewhat paradoxically, been slower to gain traction in the field of media studies.

This history generates a set of intersecting trajectories that shape the space of my analysis:

1. While technical transformation has been endemic to photography, this process has often been apprehended in a narrow and limited way.

2. Most attempts to treat photography as a distinctive medium have considered it in isolation, and have rarely placed it within a broader theorization of 'media'.

3. Media studies as a field has, until recently, had relatively limited engagement with critical theories of technology and technological change.

As a result of these different trajectories, it is unsurprising that critical assessments of the recent transformation of photography have been prolific, varied, and uneven. I want to approach these debates about photography as a medium from the other side, so to speak. Instead of trying to define or redefine photography — as networked, digital, computational, soft, algorithmic, mathematical, or something else[1] — I want to

ask: what does the historical transformation of photography tell us about how we understand 'media' in the present?

In what follows, I'll use the work of three writers —Vilém Flusser, Friedrich Kittler, and Bernard Stiegler — who each, albeit in different ways, position photography as a critical threshold in the passage from social formations dominated by *writing* to ones in which visual images play a heightened role. My overall approach is deliberately strategic: I'm less interested in attempting to establish whether photography is or isn't a single medium, and more concerned with exploring what different ways of formulating the concept of medium might allow us to think or stop us from thinking.

Photography and/as media

In his famous final book *Camera Lucida*, Roland Barthes (1984: 87-88) argued that it is photography rather than cinema "that divides the history of the world". The rationale for this division can be summarized, if not comprehended, by the bald assertion that the invention of photography marked the point at which social forms organized around the archives, practices, and logics of 'written' culture began to be displaced by the new archives, practices, and logics of 'visual' culture.

Of course, it should go without saying that the matter is scarcely so simple. Since images and visual culture existed for millennia prior to photography, what we are immediately concerned with is a paradigm change in visual production, organization, and operation — the transition to what Vilém Flusser calls the 'technical image', what Friedrich Kittler calls 'technological media', or what Bernard Stiegler understands as a distinctive mode of 'tertiary retention'. It is their common understanding that photography signals a new epoch of human history that provides my rationale for bracketing these three writers together here.

In Flusser's (2000) account, while photography is an industrial process, it was pivotal to the advent of post-industrial society.[2] In this respect, photography is positioned as something of a transitional technology, as it was for Marshall McLuhan.[3] But, rather than rubbing photography's name out, as McLuhan tends to, Flusser magnifies it. To this end, he argues that photography provides the model for all 'technical images' and

even the prototype for the computer itself.[4] Kittler will also arrive at the computer as the culmination of the historical evolution of 'technological media', but reaches a very different conclusion about photography. While *Gramophone Film Typewriter* develops a more detailed and comprehensive archaeology of recording media than Flusser attempts, photography remains only a shadowy presence in its pages. If photographic recording forms the undeniable precondition of 'film', Kittler quickly skips past photography to focus on phonography and cinematography as exemplars of 'technological media'. It was not until his lectures on *Optical Media* delivered in 1999 towards the end of his life that Kittler paid more systematic attention to photography. But even there, his account slides ineluctably towards film and computer. Stiegler's case proves equally complex. As with Kittler, it is 'cinema' — which for Stiegler, unlike Kittler, includes television — that assumes centre stage. In his three-volume *Technics and Time*, it is not until the second volume that Stiegler directly focuses on photography, where his brief commentary on Barthes' *Camera Lucida* gives it a role that is both critical and seemingly short-lived.

What emerges from these three accounts is a photography that is seemingly always at risk, susceptible to both radical enlargement and equally radical contraction. On the one hand, photography can be elevated to become the origin of the entire techno-logic of 'programming' that characterizes post-industrial society, while, on the other hand, it is continually subsumed by its own progeny such as film, television, and computation. What, then, can we make of this seemingly rare medium that is characterized by both its ubiquity and its disappearance?

Photography and/as program

The 'Introductory note' in Flusser's *Towards a Philosophy of Photography* begins by positing two 'fundamental turning points' in the history of human culture:

> The first, around the middle of the second millennium BC, can be summed up under the heading 'the invention of linear writing'; the second, the one we are currently experiencing, could be called 'the invention of technical images' (2000: 7).

Flusser's framework here depends on several key delineations: distinguishing 'images' from the texts of 'linear writing' and distinguishing 'traditional images' from 'technical images'. These distinctions are critical to his understanding of the historical dynamic by which one symbolic system can be 'transcoded' into another. [5] Transcoding implies a process of translation that is not simply a linear succession from one system to another but productive of displacements in both. For Flusser, traditional images belong to the 'circular time' of ritual and magic (akin to what McLuhan would understand as 'pre-literate' or 'mythic' society). Human relations to traditional images enter into 'crisis' with the invention of 'linear' writing.[6] Flusser argues that the new 'texts' of linear writing function as a 'metacode' for (traditional) images, enabling its 'circular time' to be transcoded into the "linear time of history":

> This was the beginning of 'historical consciousness' and 'history' in the narrower sense. From then on, historical consciousness was ranged against magical consciousness — a struggle that is still evident in the stand taken against images by the Jewish prophets and the Greek philosophers (particularly Plato) (Flusser, 2000: 10-11).

Flusser understands the development of historical consciousness as part of a progressive 'abstraction' of human experience from direct sensory apprehension of the world. While traditional images abstract from the 'concrete world', texts abstract from the culture of traditional images. The growth of written culture (including archives) profoundly changes human relations to traditional images: in Flusser's characteristically abrupt language, linear text *tears up* traditional images:

> Thus with the invention of writing, human beings took one step further back from the world. Texts do not signify the world; they signify the images they tear up (2000: 11).

This 'tearing up' of images by texts registers a dialectic that is fundamental to Flusser's argument. In the same way that the conceptual thinking enabled by (linear) text could become a metacode for (traditional) images, images can themselves become 'conceptual' and so form a metacode for texts. [7] But this development, which eventually starts to 'tear up' the historically instantiated culture of the book, will depend on the emergence of the new type of image that Flusser designates as 'technical image'.

This is where Flusser introduces the other key terms that support his understanding of photography: namely, *apparatus, program,* and *information*. The 'technical image' is one that is produced by 'apparatuses' (Flusser, 2000: 14). By definition, it necessarily operates at a greater level of 'abstraction' than the traditional image:

> […] traditional images are abstractions of the first order insofar as they abstract from the concrete world while technical images are abstractions of the third order: They abstract from texts which abstract from traditional images which themselves abstract from the concrete world (Flusser, 2000: 14).

Why do technical images 'abstract from texts'? Flusser argues this is because technical images depend on an apparatus that is itself the product of the conceptual abstraction enabled by scientific texts. In other words, the technical image not only presupposes a 'mathematical' understanding of image-making, but the application of this understanding into a technique capable of being standardized and automated. 'Photography' names the historical materialization of this apparatus enabling the standardization and automation of image making. This formulation enables Flusser to posit an *ontological* difference between 'traditional' and 'technical' images: "Ontologically, traditional images signify phenomena whereas technical images signify concepts" (Flusser, 2000: 14). This assertion is pivotal to Flusser's account of photography. But is it supportable?[8] Before trying to answer this question, we need to deepen our understanding of Flusser's argument.

Flusser's main concern with photography is that its basis as 'technical image' is persistently forgotten. The problem, as he states it, is that technical images "do not appear to be symbols that one has to decode but symptoms of the world through which, even if indirectly, it is to be perceived" (Flusser, 2000: 15). This restates the problem of the uncanny 'realism' that has defined photography ever since its inception as what Barthes (1982: 196) famously termed the 'message without a code'. Flusser worries, as have so many before and since, that the tendency to treat technical images as 'transparent' means that "criticism is not an analysis of their production but an analysis of the world" (Flusser, 2000: 15). The logical corollary of his stance is that criticism of the technical image "must be aimed at an elucidation of *its inner workings*.

As long as there is no way of engaging in such criticism of technical images, we shall remain illiterate" (Flusser, 2000: 16).

Putting aside Flusser's presumption that most photographic criticism displays precisely this illiteracy, we can now better discern the coupling that defines his analysis. Because photographs are "discourses re-encoded into symbolic states of things" (Flusser, 2000: 44) — 'concepts' that have been transcoded into (technical) images — they amount to a *re-enchantment* of the world. It is *this* 'deception' that must be decoded.[9] This commits Flusser to advancing what amounts to an *avant-garde* strategy for decoding the photographic 'program'. However, identifying this stance doesn't register the full historical significance that Flusser gives to photography. This lies in his assertion that the photograph constitutes "the first of all post-industrial objects" (Flusser, 2000: 51).

Flusser understands the 'post-industrial' as a setting in which *value* resides less in the material 'object' than in the information it carries. If human-made objects have always involved 'information', what distinguishes the post-industrial is the heightened *detachability* of information from object. Flusser gives the example of the way a shoe is 'in-formed' by the needle used to stitch it (Flusser, 2000: 25). With a handmade shoe, detaching that information — the way a shoe is given form through the know-how and skill of the tool-wielding maker — is difficult. With the industrial production of shoes, it has become more possible and more economically attractive to separate information from object. But, even so, the material shoe retains significant value. Flusser's contention is that the photograph is the first object in which material value has become 'trivial' in comparison to informational value.

Flusser's casting of photography in this role is explicitly strategic. He argues that the photograph illustrates "the devaluation of the material thing" more clearly than do electromagnetic media where "the material basis of information has completely disappeared" (Flusser, 2000: 52). There are a couple of issues to consider here. First, Flusser's appeal to a generalized process in which information is 'dematerialized' is problematic. While this kind of rhetoric became prominent in the 1980s and 1990s, it has proved inadequate to understanding the conditions in which information and media now operate. Electromagnetic media are certainly materialized *differently* to media such as oil paintings or to photographs printed on paper, but nevertheless depend on

a variety of material elements such as screens, computational processors, fibre optic cables, satellites, servers and routers, and so on. This dependence demands a more complex relation between materiality and information than the one that Flusser mobilizes here.

My second concern with Flusser's analysis here is his choice of the photograph as exemplary of the post-industrial. Wouldn't any printed media be a candidate for the same role? The industrialization of the printing press that begins in the 1820s means that the informational value of 'texts' such as newspapers and magazines (as well the cheap books that emerge towards the end of the 19th century) also start to far exceed their material value. Moreover, the industrialization of printing is itself the precondition for photography to leave behind the distinctive materiality of its early decades (such as the polished metal Daguerreotype or various glass plate photographic processes) and enter the new condition of surplus and potentially throw-away images that emerges in the 20th century.

Putting these problems aside, we can see that Flusser is able to posit photography as the threshold of the 'technical image' and the revelation of humanity's 'post-industrial' fate because he treats photography primarily as an information technology. Hence photographers are not 'workers' belonging to industrial society but are essentially involved in the creation, processing, and storage of symbolic information. [10] Information presupposes a *program*, which, for Flusser, raises seemingly intractable questions of determination and determinism. Flusser (2000: 29) positions the camera as the *ur*-type of the new 'smart tool' that illustrates the "robotization of work and this liberation of human beings for play." In freeing humans from the manual labour of making images, the camera opens up a new domain of symbolic 'play'**.** Flusser's use of play in this context is informed by game theory, in which play involves making choices or decisions, but these are all understood as choices that exist within a given program.

For Flusser, then, the full historic significance of photography as a medium is that it reveals the ongoing contest between human 'freedom' and the growing role of programmed and programming apparatuses in social life. The camera preempts the computer, which merely completes a trajectory that was already set in train a century before Turing. The strategic importance Flusser gives to the role of photography has

another aspect. Insofar as photography is the technology or medium that signals the advent of post-industrial information society, it also offers the last vantage point from which we might perceive the outlines of such a society. Echoing McLuhan's thesis that dominant technologies become 'invisible', Flusser asserts:

> The totalitarianism doing the programming, once it has realized itself, will no longer be identifiable by those participating in it: it will be invisible to them. It is visible only in the embryonic state it is in today (Flusser, 1999: 94).

What is most striking to me here is the way that the teleological nature of Flusser's thesis means there is no need to consider any transformations of photography after its initial 'invention'. Technical developments such as faster film emulsions or the advent of half-tone printing that turned photographs into popular media don't enter the picture, since they merely confirm a trajectory that was always-already established. This may make for a thought-provoking account capable of narrating a pattern of technological activity over a long time span. But its capacity to provide purchase on photography in the present — a moment in which text-to-image generative machine learning programs are subjecting the historical relation between texts and images to new exigencies — seems more doubtful.

Photography and/as optical media

Photography occupies an equally vexed place in Friedrich Kittler's media theory. In *Gramophone Film Typewriter*, Kittler (1986: 4) narrates a history of media transformation that extends from the monopoly of 'writing' to the (emergent) monopoly of "bits and fiber optics". In between lies the period that forms his primary concern in the book: namely the rupture that occurs in the 19th century as the three technologies that give the book its title were invented and instantiated, setting the stage for the relatively siloed media *industries* that dominated much of the 20th century.

For Kittler, the invention of *mechanical* media such as phonography, cinematography, and manual typography holds historical significance insofar as this marks the moment when the role of writing in assuming the primary responsibility for registering and

conveying the gamut of human experience was brought into question in a new and potentially radical way. Mechanical media were novel inasmuch as they enabled the storage of 'direct' sensory data such as sights and sounds:

> Unable to amplify or transmit, they nevertheless were the first to store sensory data: silent movies stored sights, and Edison's phonograph (which, unlike Berliner's later gramophone, was capable both of recording and reproducing) stored sounds (Kittler, 1986: 3-4).

Once sights and sounds can be stored, the 'monopoly' of writing comes to an end.[11]

This profound disturbance to writing, which Kittler analyses across various cultural fields from gender relations to intellectual property law, enables the era of typewriting to be distinguished from the earlier eras registered respectively by the proper names 'Greece' (alphabetic writing) and 'Gutenberg' (the printing press).

So far, so good. But what can we make of Kittler's claim that phonography and cinematography 'were the first to store sensory data' such as sights? Surely the photographic camera had accomplished this feat some decades earlier? The absence of photography in Kittler's *Gramophone Film Typewriter* is made even more pointed by his argument that the threshold of the modern era of technical media has been poorly recognized. Hence his dig at Foucault's discourse analysis: "Even writing itself, before it ends up in libraries, is a communication medium, the technology of which the archeologist simply forgot" (Kittler, 1986: 5). What, then, are we to make of his own forgetting of photography as a mode of sense-recording?

Kittler's justification for his equation of 'technical media' with the invention of phonography and cinematography is framed primarily in terms of their novel capacity for recording *time*:

> What phonographs and cinematographs, whose names not coincidentally derive from writing, were able to store was time: time as a mixture of audio frequencies in the acoustic realm and as the movement of single-image sequences in the optical (Kittler, 1986: 4).

This focus on time storage can certainly stand as a rationale for downplaying analysis of the still photograph. However, the distinction — which does not fit the typewriter at all — is not pursued consistently throughout his text. In fact, his account of film in *Gramophone Film Typewriter* hardly develops the theme of time (unlike a contemporary media philosopher such as Deleuze), but rather explores the issue of the double (*doppelgänger*), which was also a prominent theme in 19th century writing about photography.

It was not until he delivered his lectures on *Optical Media* at Humboldt University in Berlin in 1999 that Kittler gave photography a more explicit place in his media history. And yet, even here, photography's status remains uncertain, hedged on the one side by its dependence on a range of prior inventions and practices, and on the other by all the developments in camera-related media that succeed it. Kittler's decision to use *Optical Media* as his title flags this uncertainty at the outset. It not only signals his intent to align his account with 'history of technology' rather than sociology, cultural studies, or media studies (Kittler, 2010: 33), but also his desire to create a unified framework stretching from the invention of linear perspective in painting to contemporary computer imaging:

> The path of the lecture leads, to sum it up in one sentence, from Renaissance linear perspective, past the almost already old-fashioned technologies of photography, film and television, to late twentieth century computer graphics (Kittler, 2010: 20).

Far from being recognized as establishing a new mode of encoding human sensory experience, photography is figured here above all as *untimely*. It arrives late, riding on the back of geometric perspective and the *camera obscura* and — by the time of Kittler's analysis — has been rendered 'old-fashioned' by the computer, the implacable event horizon that looms so large in Kittler's work.

Like Flusser, Kittler's media theory was strongly shaped by information theory, and his history of media is organized around his identification of key changes in modes of storing, transmitting, and processing information. The advent of 'technological media' in the 19th century can thus be distinguished by several characteristics. Firstly, media become technical when operations that were previously carried out manually can be

displaced by automated operations, whether these are mechanical, electric, or electronic. Second, automation means that technical media are defined by "standards rather than style" (Kittler, 2010: 38). Where style belonged to art, standards enable repetition and seriality. Drawing on Foucault's framework, Kittler declares that, after 1880, media enter an "empire of standards" (Kittler, 2010: 36).

This framework enables Kittler to sketch his history of optical media in terms of the common problem of producing, storing, and transmitting images. On this basis, he provides a concise and original assessment of key mechanical-optical devices such as the *camera obscura* and magic lantern:

> The *camera obscura* was one of the first technologies for receiving images and the *lanterna magica* was one of the first technologies for sending images (Kittler, 2010: 118).

The invention of photography, then, is primarily a matter of automating image *storage* (Kittler, 2010: 123), as it was for Barthes (1984). Defining the threshold of photography in terms of information storage means that other elements of the 19th century photographic apparatus — such as its embedding of geometric perspective in the portable, lens-based *camera* — are confined to the 'pre-history' of optical media. This arrangement is worth further consideration, not least because it marks out the gap between Flusser's 'technical images' and Kittler's understanding of 'technological media'.

Where Flusser largely ignores the history of linear perspective in his account of the technical image, Kittler pays close attention to its development. He mostly reiterates a history which is relatively well-known.[12] While Greek geometry had established the principles for linear perspective, Kittler argues that the Greeks never developed linear perspective as an art form due to their understanding of the nature of light and the cosmos (Kittler, 2010: 50). However, in the very different cultural setting of Renaissance Europe, a new type of pictorial space was able to emerge, one that not only broke with existing images such as religious iconography by generating a uniform and continuous representational space, but also played a pivotal role in grounding the 'infinite' universe of the new sciences:

> The dismantling of images into portrayable, constructible elements like points, lines and surfaces similarly brought an end to the painting of icons, and on this so-to-speak clean slate new forms of mathematical analysis emerged, such as Leibniz and Newton's new arithmetic and the geometry of Descartes… (Kittler, 2010: 58).

Kittler's most original argument here is his contention that the popularization of linear perspective in European art and architecture from the 15th century was far more dependent on the practical 'support' of the *camera obscura* than on the abstract logic of geometry. While trigonometric calculations became hugely important in European sea exploration through the 15th century, Kittler argues that their cumbersome nature meant they gained little or no purchase in visual art. The *camera obscura* provided a catalyst for change by replacing the need for manual calculus with the automatic production of an image that could be traced manually. This hybrid system, in which the automated production of the image is combined with manual 'storage' dependent on the artist's hand, underpinned a 'revolution in seeing' that was entirely pre-photographic:[13]

> Together with the new firearms of the modern age, the *camera obscura* started a revolution of seeing, which was nothing other than the introduction of perspective in general. Humans have painted since the Stone Age, as we know, but it is only since Brunelleschi that these paintings have been based on a constructed central vanishing point to which all elements of the image refer (Kittler, 2010: 58).

Where Flusser positions photography as the advent of 'technical images', insofar as they depend on an apparatus that is itself dependent on the application of abstract scientific principles, Kittler's history of optical media suggests that Flusser should perhaps locate this threshold much earlier, from the time when painting "became the engineering of illusions, because a more or less explicit geometry stands behind every painted image" (Kittler, 2010: 49).

In Kittler's account, the distinctive historical contribution of photography in the 19th century was to 'close the loop' by combining the automatic image generation enabled by the *camera obscura* with automated storage. However, unlike Flusser, Kittler doesn't

adopt photography as a master category that is capable of determining the subsequent trajectory of all camera-based media. Instead, he emphasizes how different material processes for storing and transmitting images constitute different media. Thus, television forms part of his history of 'optical media' but its dependence on electron-activated vacuum tubes means it is clearly not part of photography.

Kittler's *media archaeology* — to use the term he rejected but which nonetheless seems apt here — pays close attention to the different techno-material, institutional, and cultural currents that media fertilize and are fertilized by. But, in narrating media history as a series of thresholds that all lead to the single destination of the electronic computer, photography is once again hypostatized in its infancy. Despite its status as 'technological media', Kittler, as Thomas Elsaesser (2016: 194) has shrewdly observed, somewhat paradoxically treats photography as 'art' rather than 'media'.[14]

Perhaps for this reason, his account of photography never approaches the richness of his account of the typewriter, which, by altering the conditions of both handwriting and printing, was implicated in profound shifts in the relation between literary genre, gender relations, and human subjectivity. By treating photography as something that is fixed at its inception, Kittler leaves the question of its transformation hanging. How, then, should we understand ongoing social investment in still photographic images that persists in the 21st century?

Photography and/as tertiary retention

Stiegler enters this terrain differently to both Kittler and Flusser. His primary concern is not 'media' in a narrow sense but what could be broadly described as human-technology relations. However, while all technologies or *technics* involve a distinctive relation to time and temporality, Stiegler pays particular attention to what he calls *mnemo-technics*: specific technical forms that directly support the making of 'records'. This brings different modes of recording — from writing to photography, cinematography, and beyond — directly into his analysis. Before considering this development, I will establish key elements of his broader project.

Stiegler's starting point is his insistence that technology is not 'outside' the human, and never has been. Rather, 'humans' came into being, via the process known in evolutionary anthropology as *hominization*, precisely through a distinctive relation to 'technics'. For Stiegler, 'technics' embraces both 'tools' and 'language' — terms that must be carefully detached from their most common usage. In an interview, Stiegler (2017: 31) describes the entwining of 'language' and 'tool' as forming a 'cross':

> I do not consider myself as a 'philosopher of technics', but rather as a philosopher who contributes with others in establishing that the philosophical question is, and is through and through, the endurance of a condition that I call techno-logical: both technical and logical, always-already forged on the cross that forms language and tools, that allows the externalization [*extériorisation*] of the human.

Technological 'exteriorization' is fundamental to the evolutionary process of *becoming human*. But what Stiegler calls exteriorization entails a peculiar spacing and rhythm. Inasmuch as exteriorization is not simply the 'expression' of a pre-existing thought or mental state — however this might be conceived — it is not a matter of depositing ready-made content at a new site where it would sit neatly outside the human. Rather, the process of exteriorization names a dynamic that is *productive* of both 'exterior' and 'interior': the "interior and exterior are [...] constituted in a movement that invents both one and the other" (Stiegler, 1998: 142). This is why (contra McLuhan) *media* cannot be comprehended in terms of a chain of relations that can be grounded, at some point, in terms of the *expression* of originary mental states such as thoughts or emotions.[15]

Another way of putting this is that *humans* and *technics* are bound in a transductive relationship: a structural coupling of elements that don't exist without one another. This confers an irreducible tension on their relation. The fact that human being is technical being opens a in human life, certain *indetermination* rendering the human that distinctive animal that actively works to transform its conditions of existence.[16] The process of historical evolution — Stiegler borrows Simondon's term 'individuation' — involves the ongoing and iterative transformation of individual psyche, collective cultural heritage, and technical apparatus in co-constitutive relations.

The 'event' of exteriorization marked a decisive rupture in planetary life.[17] It creates the capacity for what Stiegler calls 'tertiary retention', which he argues is a third form of memory supplementing the functions of genetics and somatics.[18] What is so important about 'tertiary retention' is that it opens new modes for the inter-generational transmission of knowledge and know-how. Exteriorization and tertiary retention underpin the formation of 'culture' as we understand it: the transmission of knowledge through gestures, symbols, rituals, and stories, and the stockpiling of cultural heritage in archives.

One way of understanding this evolutionary dynamic is by considering the historical development of tools such as flints. Learning to make use of flint demanded new mental capacities, most importantly the capacity to imagine and perform a sequence of actions such as finding appropriate stones, shaping and sharpening them, and wielding them in a certain way. This is the basis of Stiegler's assertion that the invention of technics is also the invention of 'time'. Tool use demands novel mental capacity: the ability to anticipate a future, to undertake coordinated actions in a sequence designed to bring that future into being, and to recollect this ordering of actions so as to be able to repeat it again and again. But, as much as it required such mental capacities, tool use is also the field of practice in which these capacities were incubated. The co-evolution of technics and time is not a matter of cause-and-effect but a slowly sedimented process linking adaptive changes in brain and hand function with novel uses of tool and symbol. New capacities to recollect and to anticipate become the basis of human consciousness.[19] On this basis, we can understand 'exteriorization' as the setting in which human ritual emerges as a collective *calendrical* relation to what were previously 'natural' phenomena.[20]

As noted above, while all *technics* involve a distinctive relation to time, Stiegler pays particular attention to what he calls *mnemo-technics*: technological forms that directly support the making of 'records'. Mnemo-technics renders the *already-there* of culture transmissible across generations in new ways. Mnemo-technics includes the different forms of writing discussed by those such as Harold Innis and McLuhan, but equally the invention of modern 'technical media' such as photography and sound recording discussed by Flusser and Kittler, as well as the construction of the new planetary infrastructure of digitized networks, platforms, and databanks. Each of these

thresholds is profoundly implicated in a new *politics of the archive*, understood in terms of the different protocols and affordances that shape the selection and distribution of cultural heritage as cross-generational inheritance.

Like other media theorists including Flusser and Kittler, Stiegler emphasizes the historical development of *alphabetic* writing as a critical threshold in human development. But he does this in a particular way that brings photography explicitly into his analysis. Stiegler emphasizes that alphabetic writing differs from known earlier forms of writing (hieroglyphs, cuneiform, etc.) in terms of its ambition to provide 'exact recording'. This new technical exactitude of alphabetic or what he calls 'orthographic' writing inaugurates fundamental changes in human society. By enabling a new accumulation of recorded knowledge, orthographic writing alters the conditions for cultural reflection, and fosters a milieu in which 'philosophy' and 'science' can emerge as explicit undertakings.[21]

If orthography is most evidently a displacement and reconfiguration of oral culture, it also marks a new threshold in *media*. Stiegler stresses that orthography is a techno-logic through which *matter* is organized:

> The essential characteristic of ortho-graphic (called phono-logic) writing is the exactitude of the *recording* of the voice rather than the exactitude of the recording of the *voice*: it is a matter of recording rather than voice (2009: 13).

What is important for our discussion here is that Stiegler then goes on to argue that photography can be understood as initiating a similar kind of historical displacement. However, this time it is the written record (the book) that begins to be displaced: "Contemporary technical mediation destroys the process of communication that once grounded orthographic writing" (2009: 9). What motivates Stiegler's comparison between alphabetic writing and photography is precisely their shared ambition for *exactitude*. For Stiegler, this is not simply a matter of *visual* resemblance but relates to photography's distinctive temporality. Drawing on Barthes' *Camera Lucida,* Stiegler (2009: 14) situates the 'miracle' of photography in terms of its claim to a novel temporal repetition: the improbable and paradoxical return of "a singular instant [that] has disappeared forever, which at the same time will remain forever and return endlessly".

Photographic exactitude understood as temporal repetition or *replay* fundamentally alters the dynamics of cultural memory by challenging the privilege of writing as cultural record:

> *Camera Lucida* presents one kind of historical break produced by photography, a break that results from the emergence of a new relation with 'the past' seen as the reality which suspends the privileging of writing's traditional *historical* access to certifiability, verifiability, and sense of being true (Stiegler, 2009: 118).

Despite this 'suspension' of writing and written culture, Stiegler (2009: 119) acknowledges that History as a discipline has tended to "reject photographic or cinematic documentation" in favour of orthographic evidence. This rejection circles around the ever-present challenge of providing 'context' for interpreting photographic evidence. Stiegler makes two related points here. First, drawing on Derrida's imagined science of 'grammatology', he notes that writing has always been subject to a similar 'wrenching' of context — as Plato's lament about the impact of writing on human memory in the *Phaedrus* famously established. Second, he argues that the rejection of photographic documentation by a discipline that was itself formed by the culture of writing and written records registers the way that photography profoundly disturbed the temporality of the social milieu into which it emerged.

The nature of this disturbance is precisely a function of the repetition-displacement of orthography, or what Stiegler dubs *orthothetics*, by photographic exactitude.[22] Despite the shocking verisimilitude of photographic appearances, the past does not return 'as such'. Insofar as it 'returns', it is as a spectre of itself. Here it seems pertinent to recall the question posed by John Berger (1984: 50) in his essay 'Uses of photography', where he asked what "served in the place of the photograph before the invention of photography". While acknowledging that the more obvious answers are visual arts such as drawing, painting, and engraving, Berger suggests that the more *revealing* answer is memory. With photography, something that could previously only occur 'internally' — appearances evoked as mental image — could suddenly be 'exteriorized' in a new way.

Stiegler is particularly attentive to the temporal tremor that this possibility generated:

> The photographic vision is a re-vision. Its delay is originary. The past returns completely as that present that it was, without loss and yet only as a remainder: a spirit, a phantom (2009: 15).

In this respect, he follows Barthes' argument that photography is always a form of 'necromancy'.[23] But only to a point. He also pursues the temporal shock effect that this spectral trace initiates, in both lived experience and in attempts to theorize it. This is most evident in his argument that photography forms both the basis for and the blind spot of Husserl's phenomenology.[24] Pursuing this part of his argument is beyond the scope of this essay. What I want to draw attention to here is that, after having established a distinctive role for photography in modern mnemo-technics, Stiegler then largely abandons it. As for Kittler, it is the capacity of 'moving images' to trace an exact record of duration that becomes Stiegler's primary concern. It is the cinematograph (which Stiegler extends to television and digital video) that will establish the conditions for a new industrialization of 'tertiary memory' and become the route by which "global memory has itself finally been subsumed into an industrialization directly affecting our psychic processes and collective identifications and differentiations: that is, individuation itself" (2009: 3).

What, then, remains to be said of photography in the 21st century? What has happened to the distinctive temporal tremor that the still image first initiated in the 19th century? How can we make sense of the ongoing role of still photography — which, of course, has never been completely *immobile* — as a contemporary phenomenon?

Still the image

What can we make of these three philosophical media histories? They each, in their different ways, encourage thinking about photography's relation to other media, and especially its role in the changing conditions of cultures that have been organized around 'writing'. The questions they pose seem particularly relevant in a present where 'handwriting' is becoming obsolete and digital computation is reconfiguring historically sedimented relations between 'speech' and 'writing', as much as between 'image' and 'text'.

But, at the same time, I find myself dissatisfied by the way that photography appears in these accounts. It either loses its specificity by becoming the general model for all the technical programs that follow (Flusser), or is all too rapidly surpassed by further technological innovation such as the development of cinematography (Kittler and to some extent Stiegler). If photography is merely the prelude to the moving image, why do still photographs remain so popular in the present? And if chemical photography already set in train all that has followed, up to and including computation, how do we address ongoing changes in photographic practices?

To develop my analysis, I'm going to risk zooming in on a small sample of contemporary photography practices. In what follows, I don't want to make these practices exemplary of all photography or even of much photography. Rather, I want to use this example as a way of demonstrating that photography in the 21st century has implications for developing critical 'media theory': particularly in how we might think more explicitly about analytical scale in establishing relations between 'technology' and 'society'.

Over the last few years, some colleagues and I have been involved in a research project investigating what people do with their photographs — how they take them, how they store them, how they circulate them, and so on.[25] The research has involved long interviews with individuals conducted in their own homes, where we look at and talk about photographic prints on walls, fridges, and in shoeboxes alongside the (many more) photographs stored on a variety of digital devices and platforms. One of many themes that has emerged from this research concerns the way that people regularly use photographs as a mode of 'real time' communication. This shift has been observed for some time now (see for example van House and Churchill, 2008). So it didn't surprise us that many interviewees described using photography in this way.

Many interviewees also reported to us that they no longer posted photographs to social media platforms such as Facebook or Instagram. While there were some exceptions, such as posting to family groups or when travelling, it seems that the regular posting of everyday photographs to the broad quasi-publics of digital platforms is now seen as *a bit much* by many people. Photography on social media platforms has increasingly become the preserve of professionals and (would-be) influencers. Nevertheless, the

same interviewees reported that they still regularly took and sent photographs to other people, often doing this several times a day. These photographs were usually sent via text message or instant messaging services such as WhatsApp.

While the content of photographs sent in this way varied from interviewee to interviewee, the common thread was that they all involved photographs made in response to the experience of seeing something 'interesting'. This might be something the sender considered weird or humorous, or it might be a momentary set of appearances such as a flower in a garden, the behavior of a pet, or the light in the sky. The important thing is that this image was captured and sent in the moment, and it was not sent to a large group of people, let alone the world at large, but to a particular person (or sometimes several people) who would appreciate it. 'Appreciate' needs to be read here as meaning that the recipient would be happy to receive an image from the sender, but also that the recipient would appreciate the deeper meaning of the image, in part because it formed part of an ongoing communicative chain.

I think this evolving practice registers something distinctive about photography in the present. While it clearly has its roots in an older understanding of photography, in which the accurate rendition of appearances opened the possibility for the uncanny reprise of the moment (according to Stiegler's *orthotetics*), it mobilizes this historical possibility in a new way. Most analyses of networked photography miss this kind of practice, insofar as they focus on images that are 'visible' because they are posted to social media platforms. At the same time, much sociological analysis of networked communication pays little attention to the fact that *photographs* are being exchanged in this way: this is often considered more or less irrelevant compared to general use of 'real time' communication to both re-enact and recalibrate social bonds.

But sending a photographic image — rather than a text, an emoji, or making a voice call — is a distinctive communicative act. Sending a photograph to a specific person is certainly a way of saying 'I am thinking of you now' — common to any 'instant message' — but it is also a way of communicating 'this is what *I* am seeing now'. More than this, it asserts that what *I* am seeing has significance for me and, in the process of exchange, invites the recipient to become a witness to this personal way of seeing.

Understanding photography as communicating this kind of *personal way of seeing* is a techno-cultural construct which, like all such constructs, has a history. Photography famously begins with its public acclamation as an automated mechanical process that — to use Daguerre's words in his 1839 subscription broadsheet — gives nature the "power to reproduce itself" (reprinted in Gernsheim, 1968: 81). There is no space for photographic subjectivity when the human operator is entirely disavowed. But, over time, and certainly by the first decades of the 20th century, collective understanding of photography had undergone a major transformation. Photography had come to be recognized as a process that was shaped, at least in some respects, by its human operator. This recognition or acceptance was uneven and this unevenness has been a key attribute of photographic history. While the role of the (human) operator has been consistently disavowed in various forms of 'scientific' photography, it was eventually embraced as the very definition of photographic 'art'.[26]

What might be called an aesthetic understanding of photography, crystallized in the evaluation of those such as Steichen and Atget in the early 20th century, eventually results in a specifically *photographic* aesthetic*,* constructed around the idea of the photographer as an artist who can wield a camera to capture a distinctively personal vision of the world. A professional photographer came to be someone capable of translating their own way of seeing the world into photographs.

Today, this aesthetic understanding of photography has significantly expanded its reach. As more and more people carry cameras with them all the time, and the cost of taking and exchanging photographs has become negligible, understanding photography as a way of communicating a personal vision has found new purchase in everyday life. While few, if any, of the photographers we interviewed made any claim to being either a photographer or an artist, their use of photographs in their everyday communication clearly emerges from the cultural terrain that was once the exclusive preserve of professional photographic artists.

Let me push this analysis a bit further. Another recurring theme from our interviews was the degree of ambivalence that many interviewees felt about contemporary photographic practices, including their own. This ambivalence was expressed in many ways: by a pervasive sense that photographs have become less precious and less

meaningful than they once were; by a feeling of being overwhelmed or numbed by the number of photographs in their lives; by their wondering *why* they were making and storing so many images, many of which were rarely looked at. And yet — *at the same time* — the very same people clearly valued their photographs and invested emotional energy in making, circulating, and viewing them. Many of our interviewees acknowledged worrying about losing their photographs — and most people had stories of such losses — but they also wondered why they were so worried.

At one level, the different ripples and eddies in these stories reveal the limitations of understanding photography in purely informational terms. Flusser, for instance, famously dismissed all 'snaps' as *redundant* because they provide no new information. They offer no new 'moves' in the game that pits photographer against programmed and programming apparatus.[27] Everyday photography of the type that I am discussing here is — by definition — a cultural repertoire that lends itself to being understood in terms of banality, cliché, and stereotype. If we simply focus on the information they contain, the photographs that our interviewees describe exchanging will inevitably be 'redundant' in Flusser's sense. Yet, for those sending and receiving them, they are anything but redundant.

John Berger (1984) long ago made a productive distinction between public and private images. The private image, he argued, is one that is read in the context of the life of the person who took it or is shown in it, while the public image is one that comes to us stripped of any such knowledge. Of course, the relation between public and private images is always porous and unstable. Private images — even singular moments in everyday life that are intended for one particular viewer — can all too easily become something else when they are deployed in new contexts.[28]

The images that our interviewees described making and exchanging in 'real time' communication belong to what Berger calls 'private' images. But techno-cultural changes — including the miniaturization of cameras, the integration of cameras with mobile devices, and the emergence of pervasive and low-cost data networks — mean that such images can now assume new valences. It becomes feasible — in the sense that it is *affordable*, *practical,* and *conceivable* as a socio-technical logic —for large numbers of people to use photographs to communicate their 'personal' way of seeing the world

as an ongoing part of their everyday existence. It's important to pay attention to the historical distinctiveness of this moment.

This is where I want to come back to the (still) photograph's distinctive relation to time. Is the still photograph always a form of necromancy, as Barthes thought? Is photography always the intimation of our own future demise — dead for having been seen, as Christian Metz (1985) so memorably put it? In *Bladerunner* (Scott, 1982), as the replicant Roy nears his end, he mourns: "I've seen things you *people* wouldn't believe […] all those moments will be lost in time like tears in rain" (emphasis added). This impending sense of loss — the loss of our own subjective experience, of our experience as subject which is uniquely our own and yet never ours alone — is undoubtedly at work in the ambivalence that our interviewees displayed in relation to their own practices of making and especially *storing* photographs.

But is something else also going on? To explore this possibility, we need to return to the entanglement of human beings with different technical systems as co-evolutionary partners. An essential part of 'being human' has been the development of different techno-cultural arrangements for apprehending time. In Stiegler's terms (following Leroi-Gourhan), human culture evolved by translating what was once experienced as 'natural' phenomena into the temporal apparatus of techno-cultural phenomena such as calendars, rituals, and festivals.

The industrialization of society profoundly disturbed the concordance of this older temporal apparatus. By the late 19th century, a new standardization of time had been formalized with 'the world' posited as a set of inter-related 'time zones'. This standardization of social time was counterpointed by a growing sensibility of individual time including heightened importance given to subjective experience. The division between personal and social time, and between individual and collective memory, became a key characteristic of modern experience (see McQuire, 1998: 112-126).

By the second half of the 20th century, the specific techno-temporal accommodation that had grounded industrial society was itself coming into crisis. As Paul Virilio (1986) has observed so cogently, the acceleration of information exchange enabled by new opto-electronic media disturbs all previous frames for comprehending and demarcating time. For Stiegler (2009), this disturbance meant that the present is

characterized by the loss of older 'cardinal orientations', resulting in a condition of profound *disorientation*. Individual time, like individual points of view, prospers in this context. But its prevalence is also a symptom of growing social disconnection and intersubjective estrangement. Addressing the contradiction between individual and collective experience has become an even more acute challenge than when those such as Walter Benjamin first posed it in the 1930s.

This setting allows us to better appreciate the stakes at play when photography begins to be widely appropriated as a form of 'personal vision' that can be exchanged with significant others. Inserted into the 'real time' communication infrastructure of global digital networks, photography is no longer primarily a 'death mask' but becomes a recognizable means by which people *mark* their personal time. When everyday users feel empowered to appropriate photography as a way of showing someone else what *I* am seeing right *now*, this underlines an increasingly *intimate* relation to photography. Photographs exchanged in this way are not about the sender (mis)taking the image for the real, or claiming that the image captures phenomena objectively, or that they form a 'decisive moment'. Rather, photography is being used here to make a more modest offer: to allow you to bear witness to seeing moments of my time, even as I might bear witness to yours.

What I find so interesting about this *modest* photography is not just its role in registering time's passing, but also its capacity to foreground the *technicity* that is always-already part of our subjective experience. As photography has become ubiquitous today, it has arguably become a way of scratching the itch of our own technicity as much as probing our own finitude. Another way of saying this is that photography today enacts the intimate relation of 'technics' to human beings in a way that alphabetical writing once did but perhaps no longer can.

Photography and the spectre of medium

I began this essay by asking what attempts to think photography as media can contribute to media theory today. The most obvious answer for me is that 'medium' — like other meta-categories such as the 'social' that Latour deconstructs — is, at best, a useful fiction. The concept is useful insofar as it might enable a range of different

phenomena to be identified and assembled into a pattern or system that has not previously been recognized (for instance, Innis' pioneering work on writing and empire, or McLuhan on the space-time effects of 'electric' media). But there will always be border disputes in relation to any medium. One of the challenges in the present when we use a term such as 'photography' to name a field of techno-cultural practices is to become more explicit that we are always naming a space of dispersion.

It's all too easy to break photography apart. As soon as you start asking what might join all photographs or photographic practices together as a unity — is it the camera, is it film, or something else? — cracks emerge. Camera-less photography is as old as its camera-based siblings. Photography has a much more varied history of 'supports' than celluloid 'film'. Defining photography in terms of the capture of reflected light has the advantage of encompassing both 'analog' and 'digital' modes of storage. However, it also immediately leads into a new thicket of discussions about which portions of the electromagnetic spectrum can be legitimately considered 'light' for these purposes. In 2006 NASA's Landsat Outreach team wanted to restrict 'photography' to the capture of light that is visible to human eyes, in order to differentiate it from 'visualization'.[29] Such a distinction might make sense at one level, but it also brings into question all those photographs — from Muybridge to Edgerton and beyond — that gained their fame precisely because of the way they exceeded the perceptual limits of human vision.

Having acknowledged this, I want to argue that, while medium might be a fiction, it is a *necessary* fiction. This brings me to a point about the scale at which medium analysis operates. For Flusser, Kittler and Stiegler, the appropriate scale for considering photography as a medium was in relation to the displacement of *writing* and the culture of the book. This long *durée* stands in contrast to much writing about photography, which tends to focus not only on a smaller timeframe, but also on much smaller sets of situated practices. These different scales of analysis, which are not simply opposites, clearly have different emphases and ambitions. They generate vastly different images of 'photography'. The contemporary tendency to understand photography (and other media) in terms of approaches informed by assemblage theory, including actor-network theory, offers advantages in terms of paying attention to historically contingent sets of relations. But it is important to acknowledge such frameworks tend

to find it harder to broach the questions raised by Flusser, Kittler, Stiegler, and others concerning the changing relation of 'images' to 'writing'. My point here is not simply an argument for pluralism, in the manner of the *Photographies* editorial with which I began. Rather, I am suggesting that a *critical* media theory needs to deliberately and explicitly combine different analytical scales, paying close attention to the seams and interference patterns that such unruly combinations generate.

In his final book, Siegfried Kracauer (1969) — one of the more perceptive writers on photography and photographic culture in the 1920s and 1930s — posed the relation between 'history' and 'philosophy' in terms of their relative distance from the object of their knowledge. In simple and deliberately 'photographic' terms, Kracauer argued that where history zoomed in closer, philosophy adopted the more distant perspective of the long shot. One approach was better suited to addressing smaller-scale variations while the other flattened these differences with the aim of establishing a pattern at a more abstract level. Both approaches are right — *and* wrong. Long ago, Gayatri Spivak (1986: 45-46) spoke perceptively about the demands of theorization, identifying the contrasting needs to move strategically between moments of 'essentialism' when one works within concepts that are both necessary but inadequate, and moments in which those concepts must themselves be put into question. Spivak's point was that, if the problematization of concepts becomes the only endeavour, theory will become paralyzed and paralyzing rather than enabling orientation and action within a field. *Critical* theory emerges from explicitly engaging in a process of 'shuttling' between these different moments.

A critical media theory demands a similar kind of dynamic, one that is more attuned to the way in which different analytical scales will inevitably reveal different patterns of relation within the dispersed space that constitutes any 'medium'. How far and how gaseous this dispersion can become without amounting to a new threshold — a new medium — is a matter of endless contention. While there is no final answer to such a question, we can still aim for greater clarity about the interplay between our media and our thought.

This is why attending to the *future* — as much as the past — of photography remains so important. This is less about boldly proclaiming new ends or new beginnings than

patiently shuttling from the 'empirical' to the 'conceptual' and back again. Contemporary photography, redefined by processes of digitization, mobile and networked distribution, and integration with computational processes, easily lends itself to analysis in terms of processes of technological adoption and adaptation, to understanding its field as relational assemblage of disparate and heterogeneous actants, and so on. But paying attention to these developments should not stop us from thinking about the bigger picture that media theory has traditionally sought to offer. For me, this is about the ongoing transformation of cultures organized around 'writing' into something else. This is something I have tried to gesture toward here, through my brief account of the morphing of everyday photography into a new mode of communication; one that is understood by its producers as embodying a personal way of seeing, but which also registers a shifting relation to time and temporality. Becoming more explicit about the need to combine different analytical scales in and as media theory might help us to compose a new relation to photographic images, one that is more appropriate to the vastly changed conditions of image production, circulation, and exchange that characterize the present. A critical theory of photography might even provide new insight into our evolving condition as finite and mortal *technical* beings.

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Notes

[1] All these terms have been proposed in recent writing on photography. I'm not attempting to critique these arguments but simply establishing that my orientation is slightly different.

[2] In what follows I'm restricting myself largely to Flusser's *Towards a Philosophy of Photography*.

[3] McLuhan (1974) posited three principal media 'eras', namely oral, writing/print, and electric. In this framework, photography (like cinematography) is figured primarily as an *in-between* medium, one that originates in mechanical (print) culture, but which serves to propagate the new 'electric' environment.

[4] Flusser (2000: 71) argues that "the invention of photography will prove to be the point at which all cultural phenomena started to replace the linear structure of sliding with the staccato structure of programmed combinations; not, therefore, to adopt a mechanical structure such as that in the Industrial Revolution, but to adopt a cybernetic structure such as that programmed into apparatuses."

[5] Unfortunately, Flusser isn't consistent in his use of terms, and often simply refers to 'images'. I have tried to specify whether he is referring to traditional or technical images.

[6] Unlike Stiegler, and those such as Innis and McLuhan, Flusser does not pay much attention to different forms of 'writing', such as the shift from pictographs and hieroglyphs to alphabetical writing. Nor does he pay close attention to the different 'supports' of writing such as stone, clay tablets, papyrus, parchment, and paper.

[7] "Conceptual thinking admittedly analyzes magical thought in order to clear it out of the way, but magical thought creeps into conceptual thought so as to bestow significance on it. In the course of this dialectical process, conceptual and imaginative thought mutually reinforce one another. In other words, images become more and more conceptual, texts more and more imaginative. Nowadays, the greatest conceptual abstraction is to be found in conceptual images (in computer images, for example); the greatest imagination is to be found in scientific texts. Thus, behind one's back, the hierarchy of codes is overturned. Texts, originally a metacode of images, can themselves have images as a metacode" (Flusser, 2000: 11-12).

[8] In my discussion of Kittler (below), I note that the invention of geometric perspective in quattrocento architecture and painting raises the question of whether these were already 'technical images' in Flusser's sense.

[9] Flusser (2000: 44) writes, "It is precisely this deception that has to be decoded so as to identify the true significance of the photograph, i.e. programmed concepts, and to reveal that in the case of the photograph one is dealing with a symbolic complex made up of abstract concepts, dealing with discourses re-encoded into symbolic states of things."

[10] Flusser (2000: 25) floats an analogy between the informational work of photographers and a rather curious 'class of workers' ("book-keepers, writers, painters, managers"), noting that "Currently this sort of activity is being taken over by apparatuses. As a result, the objects of information created in this way are becoming more and more efficient and more and more extensive, and they are able to program and control all the work in the old sense."

[11] Of course, positing a 'monopoly' of writing risks forgetting the role of other media — such as painting, sculpture, and the architecture that Victor Hugo famously celebrated — in storing and communicating human experience.

[12] The most unconventional aspect of his history is his speculation that Brunelleschi in fact used a *camera* to make his famous (and now lost) image of the Florence Baptistry (Kittler, 2010: 60).

[13] "[T]he *camera obscura* combines for the first time the optical transmission of information with the optical storage of information; the former function is already fully automatic, whereas the latter is still manual" (Kittler, 2010: 63).

[14] Elsaesser (2016: 194) writes: "Kittler's emphasis on the recording (the trace), the storage (memory), and the transmission (access) of sensory data privileges the phonograph and cinematograph (as well as the typewriter, the technology of alphabetization) over photography. From a media archaeological perspective, this is a shrewd tactical move because it avoids some of the apparent problems when thinking about cinema, since the individually framed image with celluloid as its material support, i.e. the photographic ontology, stand in the way of adequately understanding cinema in and for the twenty-first century. For Kittler, photography does indeed belong more to the history of art than media theory […]".

[15] McLuhan's (1974: 16) contention that the message or content of any medium is another medium posits a chain that extends all the way back to his claim that the content of speech is 'an actual process of thought'. By establishing thought as *originary*, McLuhan does not — *and cannot* — broach the question of an originary relation between media and (human) thought. On one level, this is strange because he recognizes, or seems to want to recognize, that changes in dominant media impact 'inner life' in a fundamental way. And yet, he still finds it difficult to give media or technology an active role in the origin of *human* thought. As Stiegler (following Derrida) has argued, this gesture has authorized an entire epoch of media theory, organized on the basis that technology or media are external to 'properly' human being.

[16] It has to be noted that the relation between the human animal and 'other animals' commonly posited in philosophy (including Heidegger) remains highly problematic. Stiegler's account (2006: 161) offers a way of recognizing that humans are not different 'in kind' from other animals, while also acknowledging that humans have nonetheless developed distinctive characteristics and tendencies over their evolutionary journey.

[17] Of course, describing exteriorization as an 'event' fosters the tendency to look for the moment in which this change happened. What was the first tool? Who made the first symbolic mark? Who uttered the first word? The impossibility of answering such questions is not simply an empirical failing, but a matter of poorly formed questions. In place of these 'simple origins', Stiegler (1998) installs what he calls the 'default origin' — told through the myth of Epimetheus and Prometheus — which acknowledges that there never was a simple origin but only a process of co-constitution between human and technics.

[18] Genetic memory refers to the cellular memory guiding the 'reproduction' of each specific organism. Somatic or epigenetic memory refers to the experiences acquired by living organisms and 'stored' in their individual nervous systems. Where genetic memory is transgenerational, epigenetic memory perishes with the death of the individual organism. Stiegler (2009: 71) grasps the emergence of 'tertiary retention' through his compendium term *epiphylogenesis*, naming a new modality of retention that is irreducible to either the genetic memory studied in zoology or the somatic memory studied in psychology.

[19] The role of anticipation and retention as the key elements of coordinated human activity are the basis of Marx's (2001: 257) famous, if problematic, distinction between the 'humblest' human design and

forms of animal construction such as the building of hives by bees. Where one is understood as merely (animal) instinct, the other is interpreted as a conscious process of self-actualization.

[20] Leroi-Gourhan observes: "[Humanity's] great effort for thousands of years has been to organize time and space with rhythm, calendar, architecture…" (in Stiegler, 2009: 87)

[21] Stiegler also positions orthographic writing as fundamental to the emergence of the *polis* as a distinctive form of human inhabitation, since it enables a codification of law that underpins the idea of citizenship as a new organization of ethnic difference.

[22] 'Orthothetic' is Stiegler's (2017: 61) neologism: "I had to create this neologism from the Greek *orthotēs* and *thesis*. *Orthotēs* means 'exactitude', and *thesis* 'position'. What I call an 'orthothetic statement' (for instance, alphabetic statements) posits exactly the past. This way, it allows for an intensification of the cumulation, which I was referring to earlier in relation to technics in general and to mnemotechnics in particular."

[23] In *Camera Lucida*, Barthes (1984: 96) argued: "Whether the subject is already dead or not, all photography is this catastrophe."

[24] This is the subject of extended analysis in the third volume of *Technics and Time*, where Stiegler argues that Husserl's founding opposition between perception and imagination is untenable, and, moreover, that this situation is 'exposed' by the new temporal objects that technical media enable.

[25] See Acknowledgement for details of this project.

[26] Gallison (1997) offers a detailed account of the way that the threat of various subjectivities — from changing equipment, processes, and technical standards to intepretative protocols and photographer's preferences — have continually dogged the claims of scientific photography to objectivity.

[27] Flusser (2009: 26) writes: "It is true that one can, in theory, take a photograph over and over again in the same or a very similar way, but this is not important for the process of taking photographs. Such images are 'redundant': They carry no new information and are superfluous."

[28] A notorious contemporary example is the way that millions of personal photographs posted to social media sites in the early 2000s have become training data for the development of face-recognition algorithms.

[29] "Photographs are taken in the visible portion of the spectrum. Photographs are registered chemically on paper. Sensors measure data in certain segments of EMS [Electromagnetic Spectrum] (visible or not), digitally record that, and then people *convert* this to color" (NASA, 2006).

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