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Title

"Against Imprinting: The Photographic Image as a Source of Evidence"

Abstract

A photographic image is said to provide evidence of a photographed scene because it is a causal imprint of reflected light: an indexical trace of real objects and events. Though widely established in the history, theory and philosophy of photography, this traditional imprinting model must be rejected because it relies on a 'single-stage' misconception of the photographic process: the idea that a photographic image comes into existence at the time of exposure. In its place, a 'multi-stage' account properly articulates different production stages, such as registering and rendering, that are relevant to understanding the relation between a photographic image and the photographed scene. By denying that any photographic image is a causal imprint, the multi-stage approach proposes a more demanding evaluation of photographic evidence. This has implications for documentary film and photojournalism along with specialised applications such as forensics, surveillance and face-recognition technology.

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Biography

Dawn M. Wilson is a Lecturer in Philosophy at the University of Hull and a Trustee of the British Society of Aesthetics. She works on language, thought, images, technology and art. Her article, 'Photography and Causation', launched a debate called 'The New Theory' of photography and her latest project explores analogies between photography and music.

Introduction

Photographic images can be a source of evidence about the scene in front of the camera. This modest claim is not in dispute, but it is a conclusion that can be pursued from different directions. I will argue against the traditional route to this conclusion and offer a better alternative, based on a multi-stage account of photography. This novel approach has implications for documentary film and photojournalism along with specialised applications such as forensics, surveillance and face-recognition technology.

The status of photographs as sources of evidence is traditionally founded on assertions about the photographic production process, including the idea that the image stands in a causal relation to the scene before the camera, the idea that the image is autonomously produced rather than authored, and the idea that the image detects and depicts features of the scene precisely at the time of exposure. Photographic evidence is duly challenged by questions about staging, photographer bias, in-camera or darkroom tools and techniques, post-processing manipulation, editorial bias, and Deepfake simulations. But, even when individual examples or photographs of specific kinds are discredited as sources of evidence, a defence of the status of photography in general can default to the exemplary case of a straight, fully automated, unmanipulated photographic image: the 'ideal photograph' that has been the basis for much philosophical theorising. Supposedly, when a properly designed photography system is working as it should, an exemplary photographic image incontrovertibly provides evidence of the scene before the camera at the time of exposure. Such an image is said to be a transparent representation (Friday 2002: 49), have a special kind of realism (Dretske 1984: 73), support factive seeing-in (Hopkins 2012), provide perceptual contact (Walton 1984: 273), phenomenological proximity (Pettersson 2011: 191), and special emotional access (Currie 1999: 289); it is considered necessarily accurate (Walton 1984: 266), objective (Walden 2005: 261, fn.3), reliable (Rini 2020: 12), informationally transparent (Dretske 1984: 73) and epistemically valuable (Cohen and Meskin 2004).

My aim is to show that the traditional conception of the ideal photograph is misconceived because it relies on a model of imprinting that should be rejected. I further aim to show that defaulting to the ideal photograph is the wrong way to evaluate the status of photographic evidence. The proposed multi-stage account differentiates separate stages of production that need to be acknowledged and scrutinised when a photographic image is used as a source of evidence.

I Index, Imprint and Ideal Photograph

Light, shadow, reflection and trace are natural phenomena that are traditionally conceived of as the basis of photography. Photography was said to be a discovery as well as an invention because it was characterised as a naturally occurring phenomenon,

first harnessed then eventually mechanised.[1] When light from a scene is channelled through a small aperture into a dark chamber it forms a pattern of light and shadow and, if focussed, produces an image that reflects features of the scene outside. Like any reflection, the optical light image inside a camera obscura changes in real time as the scene changes, but eventually vanishes without leaving a trace. The history of photography details many different attempts to preserve a trace of the reflection, so that it could be viewed after the scene had changed. According to Geoffrey Batchen, the advent of photography was not when pioneers such as Nicéphore Niépce, Louis Daguerre and Henry Fox Talbot devised and published their technical methods.[2] Rather, photography originated as an established idea, in the form of a shared aspiration, that predated their technical achievements by decades. This analysis is helpful for a critical understanding of the early reception of photography and subsequent theoretical and philosophical debate.[3] In this section, I will describe how the goal of preserving the light image led to the traditional conception of an ideal photograph as an imprint of reality and explain why, if it were correct, that model would make it incontrovertible that an ideal photograph is evidence of the photographed scene. In the next section I will present an alternative account, then raise my objections to the imprinting model.

First, some remarks about the natural phenomena that the pioneers of photography exploited for the photographic process. Light, shadow, reflection and trace serve as natural sources of evidence. They are classified as indexical signs because they are visible effects that in different ways indicate, or 'point to', their causal origins.[4] Light on the wall is evidence of the burning candle and a shadow in the pool of light is evidence of someone moving across the room. The reflection visible in my rear-view mirror is evidence of the car behind me. My footprint in the snow leaves a trace that is evidence of the shape of my boot. These phenomena are effects that serve as unmediated evidence of their causes as they have 'natural', belief-independent counterfactual dependence: the dependence relation between the cause and its effect does not need to pass through the intervening beliefs of any human agent. Admittedly, human agents have engineered the candle and the mirror and may deliberately intend to produce a shadow or a footprint, but such intentional acts are a harnessing of fundamental cause-effect relations that are independent of human beliefs. An immediate causal relation, rather than any relation to the agent's thoughts, is what makes these effects a source of

[1] The Bill presented to the Chamber of Deputies, France, on June 15 1839, recognises a balance of discovery and invention. (Goldberg 1981: 33).

[2] Batchen dates the emergence of this discursive practice, the 'desire to photograph', to the 1790s, specifically in 'Europe or its colonies in the two or three decades around 1800' (Batchen 2001: 16). 'We might say that photography is the desire, conscious or not, to orchestrate a particular set of relationships between these various concepts [nature, knowledge, representation, time, space, observing subject and observed object]' (Batchen 2001: 140).

[3] I take this approach in a different direction to Batchen's own analysis.

[4] Rosalind Krauss states that indexes, such as footprints and cast shadows, "establish their meaning along the axis of a physical relationship to their referents. They are the marks or traces of a particular cause, and that cause is the thing to which they refer, the object they signify." (Krauss 1977: 70).

evidence: features of the pool of light, shadow, reflection and footprint causally depend on features of the flame, moving object, rear-view scene and boot respectively.

There is a significant difference between lighting, shadow and reflection on one hand and trace on the other. The former are sources of evidence during the time an event is occurring and counterfactually depend on real-time changes: when I stand still my shadow stops moving; the candle flame and its light are extinguished at the same moment; the car in the mirror is overtaken by a motorbike. In comparison, a trace counterfactually depends on an initial causal event, but does not continue to change in real time. It can continue to provide evidence about the occurrence of an event after the event has ended. Patterns of light, shadows and reflections are temporary visible effects: when their cause is removed, they disappear. A trace, such as a footprint, outlasts the causal event. Traces can also be relatively temporary: a footprint in cement will last longer than a footprint in snow. But all traces are effects that persist beyond the cessation of their cause and some, such as a fossilised footprint, can be rendered permanently 'fixed'.

As John Berger puts it, "what makes photography a strange invention […] is that its raw materials are light and time" (Berger 1982: 61). Unlike the natural phenomena previously mentioned, time is not the visible effect of a cause, and it is not a source of evidence, but it plays a significant role in any photographic process. The conceit at the heart of the traditional conception of photography is that, by capturing light from a scene, the appearance of the scene can be arrested in time. For 'Magicians of Light', a collection of the National Gallery of Canada, James Borcoman remarked that "The purpose of art since the days of the cave dwellers has been to arrest the passage of time in order that the moment may be contemplated at leisure" (quoted in Walton 2008: 157). Photography is said to fulfil that ambition. In Berger's words,

> What the camera does however, and what the eye in itself can never do, is to *fix* the appearance of that event. It removes its appearance from the flow of appearance and preserves it, not perhaps for ever but for as long as the film exists. (Berger 1978: 52 – emphasis in the original).

Photography supposedly fixes the appearance of an event by fixing the image that appears in the camera obscura. To achieve this, it must secure a trace of the light image. A pattern of light and shadow is temporary, but a trace is an effect that persists over time and while it lasts it preserves evidence of its cause. If the light image could be made to leave a trace, then time and change could be overcome and features of the scene could be arrested – metaphorically, at least. A trace of the light image inside the camera would be a source of evidence of the scene as it was in the past, and specifically, evidence of the moment when the trace was caused to exist.

In texts from the 19th century, this conceit is described in various ways as the capture of light, the capture of shadow and the capture of reflections. In all cases, the idea is that photography uniquely uses the capture of light effects to seize a moment in time. In a letter to Charles Chevalier, Louis Daguerre claimed, 'I have captured the light and arrested its flight! The sun itself shall draw my pictures!' (Quoted as an epigraph in Watson & Rappaport 2013). Henry Fox Talbot claimed that:

> The most transitory of things, a shadow, the proverbial emblem of all that is fleeting and momentary, may be fettered by the spells of our "natural magic," and may be fixed forever in the position which it seemed only destined for a single instant to occupy. (Talbot 1839: 41).[5]

'Capturing' the light image was the prize that eluded inventors for centuries. It is possible to reproduce a light image by hand and this activity can be called 'tracing' in cases where the agent is entirely guided by lines that are already visible, rather than freely deciding what to draw. However, manual tracing would only approximate to a causal trace in the strict sense described above, because to some extent the beliefs of the agent are likely to affect the outcome. A causal trace in the strict sense is belief independent. The pioneers of photography sought to devise a process that would enable the light image to produce its own trace. Temporary, natural images reflected in the camera obscura would autonomously preserve themselves, resulting in a permanent image also entirely produced by nature.[6] This outcome would not only be conveniently labour-saving, but also grant this new kind of image the special status that became known as photographic realism, distinguished by hallmarks such as objectivity, fidelity, reliability and credibility.[7] An index may point to its cause without visually resembling its cause, but the trace of an image is classified as an *iconic* indexical: it represents its cause through visual resemblance.[8] For this reason, the realism of an iconic index can be considered categorically different from images that are drawn or painted by hand.

Manually tracing an image is a linear process. Although the term 'photography' – from *photos* (light) and *graphis* (paintbrush) or *graphê* (drawing) – implies 'drawing with light' and the process was picturesquely described as the 'hand of nature' or the 'pencil

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[5] Talbot is describing a photogram rather than a camera obscura image.

[6] Hubert Damisch critiques the notion that camera obscura images are 'natural' by pointing out that they were artificially contrived according to cultural convention. He calls the supposition of photographic realism an "ontological deception" that "carries with it a *historical* deceit" (Damisch 1978: 289 – emphasis in the original).

[7] Photographic realism has many forms, but, very broadly, it is the notion that a photographic image has, or is believed to have, an extraordinary relationship to reality: real objects, scenes, and events. A photographic image, it is said, is more than a picture of reality – it is an imprint of reality – it carries a trace of the existence of real objects (Currie 1999), a transfer of their being (Bazin 1960), and it puts the viewer in a kind of perceptual contact with those objects (Walton 1984). Realism does not imply accurate representation: a blurry photograph is said to carry this special relation to reality (Wilson 2013: 586-587).

[8] "Every photograph is the result of a physical imprint transferred by light reflections onto a sensitive surface. The photograph is thus a type of icon, or visual likeness, which bears an indexical relationship to its object." (Krauss 1977: 75).

of nature', the pioneers of photography did not seek the linear production of a trace.[9] Rather, the light image should cause a complete trace to be formed all at once, like a footprint: an image "impressed by nature's hand" (Talbot 1844: 1).[10] This is the route to the idea that a photographic image is an impression or imprint of a light image. As Talbot remarked, "How charming it would be if it were possible to cause these natural images to imprint themselves durably, and remain fixed upon the paper!" (Talbot 1844: 4). The breakthrough came when the light image could be exposed onto a chemically sensitized surface and processed to produce a fixed photographic image. Berger claims that, "the photographic image is produced instantaneously by the reflection of light; its figuration is not impregnated by experience or consciousness." (Berger 1982: 68).

The imprinting model is well established in the *imaginaire* of the history, theory and philosophy of photography. Some of the following influential and widely repeated quotations will be familiar to theorists and practitioners of film or photography:

> "A photograph is not only an image (as a painting is an image), an interpretation of the real; it is also a trace, something directly stencilled off the real, like a footprint or a death mask." (Sontag 1977: 154)
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> "For photography is an imprint or transfer off the real; it is a photochemically processed trace causally connected to that thing in the world to which it refers in a manner parallel to that of fingerprints or footprints [...]. The photograph is thus generically distinct from painting or sculpture or drawing. On the family tree of images it is closer to palm prints, death masks, the Shroud of Turin, or the tracks of gulls on beaches." (Krauss 1981: 26)
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> "Light bounces off an object or body and into the camera, activating a light-sensitive [surface] and creating an image. Photographs are therefore designated as indexical signs, images produced as a consequence of being directly affected by the objects to which they refer. It is as if those objects reached out and impressed themselves on the physical surface of the photograph, leaving their visual imprint [...]" (Batchen 2004: 31)
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> "One might consider photography in this sense as a molding, the taking of an impression, by the manipulation of light" (Bazin 1960: 7, fn. 3). "The photograph as such and the object in itself share a common being, after the fashion of a fingerprint." (Bazin 1960:8)

[9] According to an anonymous writer in the Edinburgh Review, January 1843: "Self-painted by the rectilinear pencils of light, every fixed object transfers its mimic image to the silver tablet; and the only deviation from absolute truth which can intervene, is the imperfection of the lenses by which the image is formed." (Goldberg 1981: 56).

[10] A further analogy with an engraved or moulded printing plate is also relevant – not least because Niépce and others envisaged photography as a tool for printmaking. But the primary analogy is a natural imprint.

> "The material relation between the image and what it represents […] is an immediate and unconscious one. And it is indeed like a *trace*. […] Where [the photographer] does not intervene – and cannot intervene without changing the fundamental character of photography – is between the light, emanating from the tree as it passes through the lens, and the imprint it makes on the film." (Berger 1982: 67 – emphasis in the original)

The model has also influenced analytic philosophy of photography. For example, Kendall Walton groups photographs with mirror images, fossils and footprints rather than with drawings (Walton 1984: 252, fn. 13). Fred Dretske (1984: 73) and Gregory Currie (1999: 287) claim that, like footprints, photographs are natural signs. Currie takes this to entail that "the content of a photograph is determined fully by brute causation" (1999: 291). Mikael Pettersson concurs that, as "photographs […] are literally traces of what they are photographs of" (2011: 189), they provide epistemic access "to the origins of which they are traces" (2011: 191).

The imprinting model of photography supplies the key assertions that traditionally support the conclusion that a photographic image is evidence of the photographed scene. As an imprint, the photographic image stands in a relation of causal dependence to the photographed scene, because it is entirely the product of natural phenomena that all causally depend on the scene. As a causally imprinted trace, rather than a manual 'tracing', the production of the image is fully autonomous rather than authored. The imprint is a trace that is caused to exist by a particular event – the exposure of light to a photosensitive surface – and the imprint exists as soon as that event is finished. The image therefore preserves the appearance of the scene precisely at the time of exposure. Together these notions deliver the traditional conception of an ideal photograph: an indexical imprint of reality. Robert Hopkins claims that 'the idea of allowing the world to form its own image by a process of imprinting is central to photography's self-conception' (Hopkins 2015: 330). Admittedly many actual photographs fall short of this ideal, but imprinting is the model for the exemplary case of the 'ideal' or 'authentic' photographic image. If the model is correct, it is incontrovertible that an ideal photograph is a source of evidence of the photographed scene.

II Registering and Rendering

The imprinting model supposes that a photographic image is the result of one principal causal event: the exposure of a light image onto a photosensitive surface. Before the event occurs, there is no photographic image. Once the event has ended, a photographic image exists. This explains why, from the moment the causal event ends, the

photographic image is evidence of the occurrence of that event.[11] The indexical relationship between the photographic image and the scene at the time of exposure is direct and immediate.

The imprinting model may seem plausible, but only because it is a misleading oversimplification. The model does not attend to the separate stages required to produce a photographic image. It is what I have called elsewhere a 'single-stage account' of photography (Wilson 2021 and 2022). The alternative that I propose is a multi-stage account that differentiates separate stages of production. When proper attention is given to the production stages, the imprinting model is no longer plausible. Fortunately, it is also unnecessary, as the multi-stage account is equipped to explain how a photographic image can be a source of evidence of the photographed scene.

The multi-stage account denies that a photographic image is caused to exist by the occurrence of an exposure. Instead, multiple stages of production are necessary before a photographic image exists.[12] For ease of reference, I will refer to two of the principal stages as registering and rendering.[13] I will argue that, to avoid confusion in theoretical contexts, registering and rendering are more useful concepts than exposure and development. This is not a terminological change; it is a conceptual shift. Rejecting the single-stage view in favour of a multi-stage account is a way of seeing photography differently.

Registering is the first principal stage to consider. After the light image has formed in the camera, a photographic event occurs: the light that forms the light image interacts with a photosensitive surface and causes material changes during a specific time interval. This time interval is the duration of the photographic event. The photosensitive surface might be a chemically treated plate or roll of film, or it could be an electronic sensor – the notion of a photographic event accommodates any type of light-sensitive substrate. The photographic event is the causal registration of the light that forms the light image: causal effects are registered by the photosensitive surface, as either chemical change or electrical charge, which accumulate as a tally of the distribution and intensity of light.[14] A photographic event causes a photographic register – not a photographic image – to exist. Unlike an exposure, at the end of a photographic event, no photographic image exists.

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[11] According to Siegfried Kracauer, a photograph "must be essentially associated with the moment in time at which it came into existence" (Kracauer [1927] 1995: 54).

[12] Photograms and other camera-less photographic artefacts can be accommodated by the multi-stage account, but here I am concentrating on typical photographic images produced using camera apparatus.

[13] The multi-stage account is not narrowly limited to these two stages. Other stages include, preparing the apparatus, pre-visualising the image, preparing the scene, forming a light image, post-processing, reproducing and storing the image.

[14] In chemical photography, these are material changes that outlast the event that caused them, so they are a kind of trace and they are evidence of an event that has occurred. But the crucial point is that such traces are not visible until they are rendered, so they do not constitute an imprint that shares visible characteristics with the light image.

Although the notion of a photographic event is a replacement for the traditional notion of an exposure, it is not simply a different label for the same kind of event. Historically, the notion of an exposure is entwined with the imprinting model; it can mean many things, but it is commonly supposed that making an exposure is, in effect, making a photograph. As Guy Rorbaugh writes, "[Photographs] come into existence when they are taken. At the moment the button is pressed, the shutter opens and closes, exposing the film, and we say that we have 'taken a photograph'." (Rorbaugh 2003: 190). A photographic event is significantly different, it sets apart the event of registering light from the event of making an image. Rorbaugh's description might arguably fit my proposed alternative given a particular construal of the term 'photograph': it would be possible to call the photographic register a 'photograph' while insisting that a photograph in this specific sense is not an image. As a technical term, it might be desirable to reserve 'photograph' for this purpose. But doing so is not feasible because 'photograph' does not function solely as a technical term, it has a complex history that has come to be synonymous with visible images. In what follows I signal this difference by distinguishing the photographic register from the photographic image and by associating the term 'photograph' with the latter or avoiding it altogether. Although the primary traditional use of 'photograph' applies to visible images, one aspect of the problem that I am addressing is the fact that the term extends to plates and film that are exposed but undeveloped. A photographer who uses up a roll of film might ordinarily claim to have taken 36 photographs, even though nothing is visible. Conversationally, it makes sense to say my smart phone stores several thousand photographs even when none are displayed. I don't seek to police the use of everyday terminology by insisting that these items should be called photographic registers, to distinguish them from photographic images. However, in theoretical, philosophical and scientific discourse it is useful to acknowledge this distinction with separate terms.

Unlike a photographic register, a photographic image has determinate visible properties. In this discussion, I am concerned with properties that are structural rather than perceptual or epistemic: properties that are objectively present, rather than subjectively experienced (Wilson 2022, 153). Here I am assuming John Kulvicki's distinction between 'skeletal' content and 'fleshed out' content (Kulvicki 2017). The skeletal content consists of those properties of an image that could be recorded by a witless replayable process (Kulvicki 2017: 275-6), such as photocopying. Fleshed out content consists of features that a viewer recognises in the image, including features that the maker of the image intended a viewer to see. What matters for my purpose is that a photocopier causally reproduces a pattern of marks, not a haughty face, even if a haughty face is what we see in the image.

According to a single-stage account, such as the imprinting model, the determinate visible properties of the photographic image are secured during the principal causal event: an exposure. In chemical photography, this kind of causal event typically results

in a plate or sheet of film that has been exposed but displays no visible properties. To account for the lack of any visible imprint, the single-stage account postulates that that the image exists as an invisible latent image, awaiting development. A chemical development process supposedly reveals or makes visible the properties of an image that was imprinted during exposure. I have argued elsewhere that this conception of a latent image is not coherent and that the determinate properties of a patent, visible image cannot be adequately explained by the properties of a so-called latent, invisible image (Wilson 2021). If correct, this means that the traditional notions of developing and printing in chemical photography must be reconsidered. To resolve this problem, it is useful to think of the production process in terms of rendering.

Rendering is the second principal stage for consideration. According to the multi-stage account, the determinate visible properties of the photographic image are only secured once the register from the photographic event has been rendered as a visible image. Like the notion of registering, 'rendering' is an expansive term that applies to all chemical and electrical photographic processes; it is not limited to one method or technique. For example, a Daguerreotype must be treated with mercury fumes and fixed in a hot salt solution: this type of rendering starts with a photographic register on a metal plate and converts it into the final photographic image, displayed on the very same plate.[15] Here it might seem that there is little difference between developing and rendering, but the conceptual difference is important. Developing is revealing an image that already exists. Rendering a register is producing an image that does not yet exist. Developing converts a latent image into a patent image. Rendering converts a register into an image. When a register is rendered, the determinate visible properties of the resulting photographic image will, at most, be dependent on the register, but never fully determined by the register. A rendering process, such as treatment with mercury fumes or hot salt solution, contributes properties to the image that are consequently contingent on the rendering process. Different rendering processes can result in the image having different properties, so the final image content is mediated by the rendering stage rather than immediately given at the exposure stage. Although the imprinting model of photography is most plausible with a seemingly 'direct positive' method such as the Daguerreotype, in fact a Daguerreotype is a mediated multi-stage process, not an immediate imprint. According to the multi-stage account, this is true for every kind of photography: no photographic images are immediate imprints of reality.

III Against Imprinting

The imprinting model supposes that the photographic image is an entirely causal imprint of the light image, so that features of the light image are directly transferred to the photographic image. This makes it a source of evidence of the photographed scene,

[15] Fixing does not happen after the rendering process; it is a vital part of the rendering process. Printing-out processes require fixing, so they are multi-stage rather than single-stage.

although not every feature of the light image is directly transferred to the photographic image. One particularly important difference is that colour is not imprinted: a coloured light image does not imprint a coloured photographic image. There is no chameleon-like chemical substance that turns red where red light falls and blue where blue light falls (Blanc-Benon 2019: 155). This speaks against the plausibility of the imprinting model and supports the proposed alternative. A multi-stage process is needed, to first register separate information about separate wavelengths, then render the registered information as visible colour. However, as Laure Blanc-Benon has argued, so-called 'indirect' processes for colour photography were initially discredited, then neglected precisely because they 'did not match the idea of an automatic and miraculous image' and were considered 'manipulation and artifice' (Blanc-Benon 2019: 159). This exclusion of colour processes was a self-reinforcing prejudice, protecting the traditional preconception that the only true photographic image is a direct imprint.

The imprinting model underwrites the traditional ideas that an ideal photographic image is naturally causally dependent, autonomous rather than authored, and indexically linked to the photographed scene at the time of exposure. Discrediting the imprinting model will have repercussions for all these ideas, but they can be revised rather than fully rejected. First, it is still true on the multi-stage account that photographic images are causally dependent on the photographed scene in highly significant respects. The design, manufacture and operation of camera systems typically ensure that features of the photographic image counterfactually depend on features of the light image to deliver accuracy and fidelity. But when it occurs, this causal dependence is mediated rather than immediate. Features of the photographed scene cannot be visually retrieved directly from the register – instead the register must be rendered to make the features visually accessible. [16] Causal dependence can be secured, although it is contingent on a relationship between separate process stages, rather than granted as a gift of nature. Second, the multi-stage approach is not obliged to privilege autonomous images over authored images because it encompasses various types of image production, rather than one single type. It is possible for the registration and rendering stages to be fully automated, delivering an image that can legitimately be described as the product of the machine, rather than a human agent.[17] But, using the same photographic register, it would be possible for an agent to render a photographic image that could be legitimately described as authored. An objection claiming that only the former but not the latter counts as an authentic photograph would be a prejudice carried over from the traditional conception of an ideal photograph. A multi-stage account undercuts that hierarchy. [18] Third, as the image is not caused to exist by the

[16] Catharine Abell has argued that a multi-stage account could specify that registered information be channelled from register to image "through a communication channel of a type that is effective at carrying such information" (Abell 2018: 214).

[17] The earlier notion of autonomous or natural images can be revised and understood as 'automatically' or mechanically produced.

[18] I argue this in greater detail in Wilson 2022.

occurrence of an exposure, there is no longer an indexical link between the image and the photographed event precisely at the time of exposure. Nonetheless, the timing of a photographic event has undeniable significance for every photographic image. It is always possible to ask when, as a matter of fact, the photographic event occurred, and the answer will tell us when the photographic register was produced.[19] A separate question can be asked to find out when a photographic image was rendered from the image. The former question typically has greater significance, particularly when the status of evidence is at stake, but the relationship between the photographic image and the photographed scene can no longer be considered indexical. A photographic image is not a natural sign that, magically or mechanically, arrests and preserves features of the scene at the moment it was caused to exist. It is, more mundanely, an image rendered from a register that in certain circumstances can provide evidence of what the photographed scene looked like when the photographic event occurred.

The discussion so far has been an examination of the traditional conception of photography that emerged along with early chemical processes. The arrival of electrical or digital photography makes it even easier to accept that there is no direct imprint, visible or invisible, occurring during a photographic event. The sensor registers light from the light image without afterwards bearing any indexical physical trace. However, as with colour photography, the fact that digital photography does not fit the model of direct imprinting was initially used as grounds for arguing that digital images are not authentic photographs. The imprint model divides chemical and digital photography into two distinct media.[20] By contrast, my approach shows that digital photography confirms what was true of photography all along: a photographic image is the product of a multi-stage process that includes registration and rendering, it is not, and never has been, an imprint of reality. The multi-stage account makes electrical photography continuous with chemical photography. An electronic sensor is not an indexical sign, but if we have an image electronically rendered from an electronic register, it can still be a source of evidence of the photographed scene.[21]

IV Photographic Images as Sources of Evidence

The imprinting model appeared to offer an attractive way to understand how a photographic image and the photographed scene fit together. From one direction, the

[19] In practice, when dealing with historical documents, it is common to infer the time of exposure from what is independently known about the time of the photographed event, rather than the other way around. Digital metadata now carries significant authority, though it is not infallible.

[20] Mary Ann Doane voices this widely discussed concern when she states that, "With the advent of digital media, photography, in particular, has seemingly lost its credibility as a trace of the real" (Doane 2007: 1). See also Batchen (2001: 139-140).

[21] Doane notes "the persistence and strength of an indexical imaginary even in the realm of digital photography" but sees this as potential for continuity: "In a sense, the digital has not annihilated the logic of the photochemical, but incorporated it." (Doane 2007: 5). My approach is the opposite: continuity comes from denying indexicality in both chemical and electrical photography.

content of the photographed scene causally explains the content of a photographic image: the fact that a cat was up a tree causally explains why the photographic image shows a cat up a tree. From the other direction, and because of the causal relation just described, the content of the photographic image is a source of evidence of the content of the photographic scene: when we view the photograph, the fact that we see a cat in a tree is evidence that there really was a particular cat up a particular tree. If this model were correct, a photographic image could be treated as evidence of its cause – the photographed scene – without any requirement for additional information. Admittedly, even at best it could only offer partial evidence, but the value of an imprint primarily lies in knowing that is has a direct relation to a real event. [22] By analogy, if I find an imprint in the snow, I might not have enough evidence to know what animal left the imprint, but I do have direct evidence of the actual shape of its foot. A natural sign does not require contextual information to serve as evidence; it is self-evidently an index to its cause.

I have argued that this traditional analogy with imprints cannot be sustained and that it is not legitimate to claim that a photographic image is a kind of natural sign. If a photographic image is not an index to its cause and does not have a direct relation to a real event, we must give up the attractive idea of a simple fit between image and photographed scene. The photographed scene does not by itself explain the content of the image. In its place is a more complex picture: facts about the photographed scene, facts about the formation of the reflected light image, facts about the occurrence of the photographic event and facts about the rendering of the image are, together, what explains the content of the image. In return, the content of the image cannot possibly stand as a source of evidence entirely by itself. We require information about the production history if we are to treat a photographic image as evidence of an event in front of the camera.[23] Umberto Eco may have had something like this in mind when he wrote:

> "We know that sensory phenomena are transcribed, in the photographic emulsion, in such a way that even if there is a causal link with the real phenomena, the graphic images formed can be considered as wholly arbitrary with respect to these phenomena. Of course there are various grades of arbitrariness and motivation, and this point will have to be dealt with at greater length. But it is still true that, to differing degrees, every image is born of a series of successive transmissions." (Eco 1970: 33)

[22] The possibility remains open that you are in fact seeing photograph of a stuffed toy in a model tree. The point is that the content of the image is caused directly and entirely by the real scene, whatever that scene happens to be.

[23] Claire Anscomb has examined the epistemic implications of the multi-stage account and concludes that "epistemic warrant should rest on the regulated processing *and* dissemination of the image" (Anscomb 2018: 8 – emphasis in the original). She proposes some general conditions for testing the reliability of the image as a source of knowledge, including criteria for image integrity and image authenticity (Anscomb 2018: 15).

Eco makes the point that, even allowing for a causal link, the relation between real phenomena and a photographic image can have 'various grades of arbitrariness and motivation'. One photographic image may be the product of a highly regulated and automated system. Another may be the product of considerable intervention by a human agent. Yet they might conceivably have the same visual appearance. If we are to treat any image as evidence, we need to know relevant facts about the 'series of successive transmissions' that have caused it to acquire its determinate visible features. There is no 'ideal' photograph capable of avoiding this obligation.

V Conclusion

In a thin sense of evidence, the existence of a photographic image is evidence that a photographic event occurred, which caused a photographic register to exist; and that some image-rendering of the photographic register has occurred. I call this evidence 'thin' because it is constitutively, or trivially, true of every photographic image. But it serves a useful purpose because it distinguishes photographic images as a kind of evidence distinct from non-photographic images. It is a commitment to saying that the categorical difference between a photographic and non-photographic image is aetiological, even if not perceptual. It carries the important implication that, if we are to treat a photograph as a source of evidence, it is always relevant, in fact necessary, to consider facts about the production history of the photographic image. Attending solely to the visible features of the image will never suffice because there are no photographs, no 'ideal photographs', that are truly an immediate imprint of the scene before the camera. Even an image such as a Polaroid, the outcome of an entirely automated process where every step is causally determined from beginning to end, is not a brute cause-effect imprint.

The traditional view is that a photograph is a source of evidence of the scene in front of the camera because there is a fundamental cause-effect relation between the scene and the photograph: the photograph is an immediate imprint of the scene – or at least an imprint of a reflection of the scene. My alternative view is that a photograph can be a source of evidence of the scene in front of the camera in cases where there is causal dependence between the image and the scene. But causal dependence is mediated through a multi-stage process that includes registration and rendering, rather than being the result of an imprint.

If any photographic image were an immediate imprint of reality, its determinate visible properties would be effects caused entirely by the imprinting event. This would require a single-stage conception of photography. However, the multi-stage account of photography is correct, so a photographic image cannot be an imprint. Photographic images can serve as sources of evidence, but to use a photographic image as evidence, we always need more than the image itself. It is always necessary to seek contextual information that is not visibly available within the image.

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