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The Epistemic Value of Photographs

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Photographs play epistemic roles that most other pictures cannot. Firstly, they can provide compelling evidence that the things they depict existed at the time they were taken. We might doubt that the unfamiliar animals drawn by zoologists of the past ever existed, but be convinced by photographs of Tasmanian tigers that this now extinct marsupial once populated its namesake state. Likewise, a photograph of a politician lunching with a known criminal may convince us of her corruption, when a drawing of the same scene would not. Secondly, photographs play a unique investigative role, enabling us to identify features of their objects that are easily overlooked. Police detectives consult photographs, rather than paintings, of crime scenes, looking for clues that will help them solve cases. Similarly, consumers pore over photographs of potential purchases on eBay, looking for flaws that a hand-drawn picture would not reveal, whether unintentionally or through deliberate omission.

This does not mean that all photographs are alike in respect of epistemic value. While many photographs are suited to the epistemic roles described above, others—for example, those that are badly focused—are not. Token photographs may lack the epistemic significance that photographs generally possess, and token non-photographic pictures might have such epistemic

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significance, although non-photographic pictures generally do not. For example, a painting by Vermeer may better enable us to identify readily overlooked features of the scene it depicts than would a photograph of that scene. Photographs have a distinctive epistemic value because the epistemic properties they generally possess differ from those that non-photographic pictures generally possess. The contrast between the epistemic properties of photographic and non-photographic pictures obtains between photographs, considered in general, and non-photographic pictures, considered in general.

Nor does it follow that photographs generally have *greater* epistemic value than non-photographic pictures generally do. Their epistemic significance simply differs. Non-photographic pictures can play epistemic roles that photographs generally cannot. For example, botanical drawings may make salient features of plants that would not be prominent in photographs of them, but information about which is of particular epistemic value to us. The scope of non-photographic pictures also lends them an epistemic significance that photographs do not have. Whereas photographs can depict only particulars, non-photographic pictures can depict, in addition, objects of a certain type that are not existent particulars of the type at issue. Unlike photographs, they can thus be used to depict the prototypical features of a type in isolation from the accidental features of particular instances of that type. What non-photographic pictures can teach us may be just as valuable as what photographs can teach us, but each teaches in virtue of different epistemic capacities.

My aim, in this chapter, is to explain why photographs are generally able to play the epistemic roles described above, and why non-photographic pictures generally are not. This requires accounts, first, of the difference between the two sorts of picture and, second, of the form of epistemic value (let us call it EV) that a picture must have in order to play those roles. These I offer, respectively, in Sections 1 and 2. In Section 3, I examine three proposed explanations of why photographs generally have EV and non-photographic pictures generally lack it, and argue that none is adequate. In Section 4, I explain why non-photographic pictures typically have little EV. In Section 5, I explain why the EV of photographs typically exceeds that of non-photographic pictures.

1. Photographic versus Non-Photographic Pictures

For the purposes of this chapter, we can understand a picture as something that depicts. Depiction is a distinctive form of representation, characteristic of figurative paintings, drawings, and photographs. Some philosophers claim that pictures depict their objects in virtue of looking like, or visibly resembling, them (Hopkins 1998). Others deny that depiction can be explained in terms of resemblance (Kulvicki 2006; Lopes 1996). Nevertheless, none denies that pictures generally seem, to those viewers who successfully interpret them, to resemble the things they depict (Kulvicki 2006: 81; Lopes 1996: 4). Although it is beyond the scope of this chapter to provide an account of depiction,[1] we can therefore understand a picture's depictive content as that content a grasp of which is generally accompanied by the visual perception of apparent resemblances.

In specifying a picture's depictive content, we must be careful to distinguish between its internal and its external object. Its internal object is what it depicts, whereas its external object, if it has one, is the independently existing object whose properties are causally responsible for the picture's surface being marked in the way it is. A black and white photograph of you has a person of indeterminate colour as its internal object, but a person of perfectly determinate colour as its external object.

What distinguishes photographic and non-photographic pictures is not the form of representation each employs, but the way in which each is produced. Photographs are produced by largely mechanical means, whereas non-photographic pictures are not. Moreover, photographic mechanisms operate such that all photographs have external objects, and the design features of any photograph (those features in virtue of which it depicts its object) depend causally on the features of its external object, such that the former depend counterfactually on the latter. When I photograph a mountain, for example, the mountain causes my photograph to have the design features it does, such that, had the mountain been different, my photograph would likewise have differed. By contrast, not all non-photographic pictures have external objects (there need be no existent particular which they depict) and, while the features of some of those that

[1] I provide such an account in Abell (2009).

do are counterfactually dependent on features of their external objects, not all are. I might seek to draw a mountain accurately such that the features of the drawing I produce depend counterfactually on those of the mountain. However, faced with the same mountain, I might instead employ a schema or formula for the depiction of a mountain, in which case the features of my drawing need not depend counterfactually on those of the mountain.

One might likewise sever the counterfactual dependence of a photograph's features on features of its external object—by over-painting it, for example. However, this would render the photographic mechanism redundant. Consequently, the resultant picture would not be genuinely photographic. Photographers' intentions play a significant role in determining what their photographs depict. Their intentions determine where they point their cameras, what kind of cameras they choose, and how they set their variable parameters. They can also affect depictive content after the photographic mechanism has been employed. By using the darkroom technique of dodging and burning, for example, photographers can realize their intention to represent certain aspects of the photographed scene as darker, and others as lighter, than they would otherwise have been depicted. Likewise, by cropping, they can select which aspects of the photographed scene are depicted.[2] However, photographers' intentions can sever the counterfactual dependence of features of the photograph on features of its external object only by overriding the effect of the photographic mechanism, and producing a picture that is not purely photographic.

2. An Account of EV

What features enable a picture both to provide compelling evidence that an object existed and had certain properties at the time the picture was produced, and to reveal features of an object that are easily overlooked? We need a clear grasp of EV, the form of epistemic value that enables a picture to play these roles, before attempting to explain why photographs and non-photographic pictures play different epistemic roles.

[2] This understanding of what it is to be a photograph is thus broader than Scruton's notion of the ideal photograph (Scruton 1983).

A picture provides compelling evidence of an object's existence, and of its possessing certain features, only if it is produced by a reliable process. That is, the process linking picture and object must be such that we are likely to form true beliefs about objects on the basis of pictures produced by that process. This requires two things. Firstly, the pictures produced by this process must be likely to carry information about their external objects. Secondly, they must be likely to do so in depictive form.

For the purposes of this chapter, we can understand information carrying, with Jonathan Cohen and Aaron Meskin, as a counterfactual relationship between independent variables, such that *x*'s being *F* carries information about *y*'s being *G* if and only if the counterfactual conditional (if *y* were not *G*, then *x* would not have been *F*) is true (Cohen and Meskin 2006: 3). A picture's having a certain feature carries the information that an object has a certain property if and only if, had the object not had that property, the picture would have lacked that feature.

Things may carry information in virtue of a variety of different features. A tree trunk may carry information about the tree's age in virtue of the number of rings in its bark. A history book may carry information about a war in virtue of the words written on its pages. A picture-production process is reliable only if the pictures it produces are likely to carry information about their external objects *in depictive form*. A picture carries the information that an object has a certain property in depictive form if it both carries that information and depicts the object as possessing that property. Pictures may carry information about objects without doing so in depictive form. For example, a photographic negative may carry the information that an object had a certain colour because, had the object's colour differed, the colours of the negative would also have differed. Nevertheless, the negative does not depict the object as having the colour it had: adequate knowledge of the photographic process involved may enable one to work out, from the negative's colour, what colour its external object was, but doing so does not make the negative appear to resemble that object in respect of colour.

It is difficult to work out, from a colour negative, the colour of the object about which it carries information. By contrast, it is easy to discern such information from a picture which carries it in depictive form. The information pictures carry in depictive form is easier to grasp than that which they carry in other forms. Consequently, we are more likely to form

true beliefs about objects on the basis of the former information than the latter. It is an interesting question why this is so. One possible explanation is that the interpretation of depictive content engages our visual recognitional abilities (Lopes 1996; Schier 1986), and thus inherits the reliability of our perceptual processes. Nevertheless, detailed discussion of this issue must await another occasion.

The upshot of these two conditions is that a process will be more reliable the more likely it is to produce pictures whose depictive content is accurate: whose internal objects have only features possessed by their external objects. Consequently, it is tempting to analyse the reliability of a picture-production process as the probability, given any picture produced by that process, that its object was as it is depicted as being at the time it was produced. However, doubts that there is any non-epistemic account of probability able to accommodate probabilities of inverse conditional properties make this approach seem unpromising (Cohen and Meskin 2006: 4).

Fortunately, an alternative, modal analysis is possible. If a picture depictively encodes information about its object, then, according to David Lewis's semantics for counterfactuals (Lewis 1973), its depictive content will differ in the closest possible world in which its object differs. The likelihood that a process will produce pictures that depictively encode information about their external objects can be construed in terms of the distance between worlds in which the depictive content of pictures produced by that process is accurate, and worlds in which it is not.[3] Accordingly:

> A given picture-production process[4] is more reliable the greater the distance, for any non-actual picture produced by that process, between the nearest possible world to the actual world in which the picture exists and its external object was as it is depicted as being at the time the picture was produced and the closest possible world to that world in which the picture exists and its external object was not as it is depicted as being at the time the picture was produced. This construal of reliability assumes that the actual world is closer to the former than to the latter world.[5]

[3] In what follows, I construe the likelihood of this outcome in the way specified, not as synonymous for its probability.

[4] The level of generality at which any picture-production process is to be individuated depends on how it is conceived by those who designed it (where it is mechanized), or those who use it (where it is not).

[5] As Cohen and Meskin point out, Lewis construes distance relations between worlds as interest-dependent, which would make counterfactuals depend tacitly on the doxastic (Cohen and Meskin

We cannot understand EV solely in terms of the reliability of picture-production processes. Even if it is the result of a reliable process, a picture will not reveal features of an object that are easily overlooked unless it carries a reasonable amount of information about that object. To play such a role, a picture must also be rich, where richness is a measure of the amount of depictively encoded information a picture carries. The more such information it carries, the richer it is. How much information a picture carries is a measure of the number of features of its external object about which it carries information in depictive form. How finely the features of its object can be individuated is determined by the relations of counterfactual dependence that obtain between picture and object. If a difference in the shape of a single hair on a woman's head would result in a corresponding difference in the shape a portrait of that woman depicts the hair as having, the shape of the hair counts as a feature of the woman about which the picture depictively encodes information. However, if she would have to have lacked hair altogether in order for the portrait to depict her hair differently, her having hair counts as a feature about which the picture depictively encodes information, but neither the shape nor the existence of the individual hair counts as such.

A picture may be richer—and the process by which it is made more reliable—regarding some types of features than others. For example, black and white photographic processes may be very likely to produce pictures that depictively encode information about the shape properties of their external objects, and may produce pictures that carry a lot of information about such properties, but are generally both unlikely to produce pictures that depictively encode information about the colour properties of their external objects, and incapable of producing pictures that carry much information about colour properties.

We can understand a process's reliability relative to features of a certain type as follows:

> A given picture-production process is more reliable, relative to features of type *F*, the greater the distance, for any non-actual picture produced by that process which depicts *F* features, between the nearest possible

2006: 10). However, like Cohen and Meskin, I take the distance relations between worlds to be mind-independent.

> world to the actual world in which the picture exists and its external object had the *F* features it is depicted as having at the time the picture was produced, and the closest possible world to that world in which the picture exists and its external object did not have the *F* features it is depicted as having at the time the picture was produced. Again, it is assumed that the actual world is closer to the former than to the latter world.

A picture is richer, relative to features of type *F*, the more information about *F* features it carries. We thus need to distinguish between a picture's EV *simpliciter*, and its EV relative to features of a certain type. A picture's EV *simpliciter* is a measure of its richness and of the reliability of the process by which it was produced, while its EV relative to features of a certain type is a measure of its richness relative to features of that type and the reliability of its production process relative to features of that type.

This account construes EV as independent of individual viewers' particular interests and attributions. A picture could have a high EV *simpliciter* despite the information it conveys being less important to some viewers than the information conveyed by a picture with a lower EV *simpliciter*, and thus of less overall epistemic value to them. As I noted earlier, EV is not the only form of epistemic value a picture may have. Nevertheless, given that information about features of a certain type is important to viewers, one picture may have greater EV than another relative to features of the type at issue.

I have not specified how richness and reliability combine to determine EV. Rather, I construe them as independent dimensions, each of which may contribute to EV in isolation from the other. This reflects the fact that different purposes impose differing demands for reliability and for richness. Someone consulting a picture to determine whether a galloping horse ever has all its hooves in the air simultaneously seeks reliability above richness. The detective who consults pictures of a crime scene looking for information that will enable her to solve the crime seeks both richness and reliability. A fashion stylist who consults pictures of the Paris catwalks looking for inspiration seeks richness over reliability.

Individual viewers may make erroneous attributions of EV. A viewer who mistakenly takes a photorealist painting to have been produced by a photographic process will attribute to it greater EV than it possesses.

Moreover, even when their attributions of EV are accurate, viewers will derive inappropriate beliefs from pictures if they misidentify their external objects on the basis of their internal objects. Suppose the photographs apparently showing the first moon landing were in fact taken in a Hollywood studio. While our beliefs about photographic processes may justify an attribution of high EV to such photographs, it would be wrong to construe them as providing good evidence that a moon landing occurred, since their external object is not a moon landing.

Let us now consider three different explanations of the epistemic differences between photographic and non-photographic pictures. Their adequacy will depend on whether they explain it as a difference in EV.

3. Existing Explanations

3.1. *Photographs as Transparent*

According to Kendall Walton, photographs are aids to vision, not mere representations (Walton 1984: 263). Just as we see a scene when we examine it through a telescope or regard its reflection in a mirror, so too, he claims, we literally see a scene when we look at a photograph of it. Photographs are *transparent*: we see through them to their objects. Like mirrors, they are transparent although their surfaces are visible when we see through them, and although they afford only indirect visual access to things. Unlike mirrors, photographs enable us to see spatially and temporally distant scenes. Seeing through photographs is a unique form of perception that enables us to see things that could not otherwise be seen. Contrarily, Walton argues, most non-photographic pictures are *opaque*: when we look at them, we see depictive representations, not the scenes they depict.

He identifies three conditions that, he claims, are individually necessary for transparency. Firstly, to see one object through another, the object through which it is seen must be counterfactually dependent on the object seen through it. Secondly, this relation of counterfactual dependence must be belief-independent. Walton asks us to suppose that an explorer goes into the jungle and comes back with either photographs or sketches of a dinosaur. Both the photographs and the sketches may convince us that there is a dinosaur in the jungle. However, he argues, 'The important difference is that, in the case of the sketches, we rely on the picture maker's

belief that there is a dinosaur in a way in which we don't in the case of the photographs' (Walton 1984: 263). If the explorer did not believe there were a dinosaur in the jungle, Walton thinks, his sketches wouldn't depict a dinosaur, whereas his photographs would depict a dinosaur no matter what he believed.

Finally, Walton claims, transparency requires the preservation of the real relations of similarity and dissimilarity between objects. Pears are similar to apples and dissimilar to bears. Visual experiences of pears reflect this fact: perceivers may mistake pears for apples, but not for bears. Both photographic and non-photographic pictures, and our visual experiences of them, likewise preserve the similarity relations among objects: we may mistake a picture of a pear for a picture of an apple, but would not mistake it for a picture of a bear. However, neither written descriptions nor our experiences of them preserve real similarity relations between the objects they represent. 'Pear' is more like 'bear' than 'apple', and this is reflected in the mistakes we are likely to make about a description's content. Even though a mechanically generated description might exhibit belief-independent counterfactual dependence on its object, therefore, it is not transparent.

Walton's account suggests an explanation of photographs as having EV because photographic processes have the reliability of perceptual processes and the richness of perceptual experiences. However, while many visual experiences may be the rich products of reliable processes, not all are. The visual experiences of the myopic and the colour-blind are not. The transparency of photographs therefore does not ensure that they have EV, since photographic processes may be among those visual processes that are unreliable. To explain the EV of photographs, we need an explanation of why photographic processes typically count among reliable visual processes, and why photographs are akin to rich visual experiences.[6]

Walton suggests that photographic processes are reliable in virtue of 'the fact that our photographic equipment and procedures happen to be standardised in certain respects' (Walton 1984: 273). However, there are many respects in which photographic equipment and procedures are not standardized, but differ considerably. For example, while most

[6] A general evaluation of Walton's claim that photographs are transparent is beyond the scope of the present chapter, which is concerned solely with its epistemic implications. For criticisms of this claim, see Cohen and Meskin (2004), Currie (1991), and Dretske (1984).

cameras utilize visible light, infra-red cameras do not, and both camera types may have either analog or digital mechanisms. Moreover, the mere standardization of such equipment and procedures would achieve only uniformity, not reliability. More needs to be said about the respects of standardization at issue and how they ensure reliability if this explanation is to succeed.

One could relinquish the claim that photographs are transparent and simply insist that their epistemic value is explained by their meeting Walton's three conditions. On his account, photographs differ from those non-photographic pictures that depend counterfactually on their objects only in their belief-independence. However, many non-photographic pictures are also belief-independent, but lack the EV of photographs. Picture makers may, and often do, depict objects by employing schemata, or formulae, for the depiction of objects of particular types. In such cases, which schema they employ depends on what they believe about the object they seek to depict. However, many picture makers instead depict objects by attending carefully to their visible features and allowing those features to guide the way in which they mark the picture surface. As Dominic Lopes notes, 'In drawing, the eye and the hand work together, perhaps bypassing the mind, or rather that portion of the mind that deals in concepts and beliefs' (Lopes 1996: 186).

There is empirical evidence to support this claim, which suggests that the visual information that guides our motor actions may differ from that carried by conscious visual experience. For example, subjects presented with disks arranged to produce the Tichener or Ebbinghaus illusion have conscious visual experiences that misrepresent the relative sizes of the disks. They experience disks of the same size as differing in size, and disks of different sizes as being of the same size. Nevertheless, when subjects reach for those disks, the aperture produced between finger and thumb is perfectly suited to the actual sizes of the disks, rather than the sizes they are represented as having in subjects' conscious visual experiences (Milner and Goodale 1995: 168).[7] Since it is the information carried by conscious visual experience, rather than that used for visually based motor control, that is made available for conceptual mobilization, this evidence suggests that the

[7] For philosophical discussion of these results, see Clark (2001) and Jacob and Jeannerod (2003). In their chapters in this volume, Lopes and Nanay discuss further the implications this experiment has for the philosophical understanding of depiction (see Lopes, Ch. 2, Sect. 3; Nanay, Ch. 7, Sect. 7).

information that guides picture makers' actions could indeed bypass their cognitive centres.

Walton acknowledges that some non-photographic pictures, such as tracings and 'doodles done automatically, while the doodler's mind is on other things', may be belief-independent (Walton 1984: 267). They too, he claims, are probably transparent. While some such pictures may have EV, however, not all do. An automatic doodle of a crime scene would lack the EV of a photograph of that scene. The belief-independence of photographs does not suffice to explain EV.[8]

3.2. *Photographs as Necessarily Accurate*

Robert Hopkins has argued that photographs are necessarily accurate (Hopkins 1998).[9] For something to depict an object, he argues, it must not only have the right appearance, but also the appropriate history of production. This history comprises a *standard of correctness*, which determines whether something that appears to depict an object actually does so.

Hopkins argues that the standard of correctness for non-photographic pictures is intentional. Something is a non-photographic picture of an object only if its maker intended it to represent that object. Even if it is visually indistinguishable from a picture of a lion, the blotch made by accidentally spilling a bottle of ink is not a picture, since it was not produced with the requisite intention.

However, he claims, the standard of correctness that governs photographs cannot depend on photographers' intentions, since photographs that are taken accidentally depict scenes that photographers did not intend them to depict. Instead, he argues, this standard depends on the intentions of those who design the mechanisms with which photographs are taken. Since camera designers cannot always control how these mechanisms are used, their intentions are, of necessity, quite general. Hopkins argues that 'the relevant intention is better put thus. The camera's designer intended that we see in the photographs whatever is causally responsible for those surfaces being marked as they are' (Hopkins 1998: 72). In his view, therefore, the

[8] One might think the real difference between photographic and non-photographic pictures lies in the latter's dependence on, and the former's independence from, their maker's intentional states in general, not their beliefs in particular. However, as I will argue in Sect. 5, some photographs depend on developers' visual states.

[9] See also Scruton (1983) and Currie (1999: 288).

standard of correctness for photographs comprises both an intentional and a causal element. The ink blotch is not a photograph, since it is not the product of a mechanism designed with the relevant intentions, and no lion is causally responsible for its appearance.

Since it follows from his characterization of camera designers' intentions that they intend the photographs produced with the mechanisms they design to depict their external objects accurately, Hopkins concludes that photographs necessarily depict their objects accurately (Hopkins 1998: 72–3). However, the nature of camera designers' intentions is an empirical matter, not one that can be determined a priori. Like makers of non-photographic pictures, camera designers may intend that the photographs produced with the mechanisms they design misrepresent their external objects. For example, the designer of a camera whose lens systematically distorts the shape of the things seen through it is best understood as intending that the photographs produced with his camera depict their external objects as having shapes that differ in various systematic ways from the shapes they actually possess. Moreover, even if camera designers' intentions were as Hopkins claims, this would not ensure the accuracy of the photographs produced using their cameras, since development processes are beyond camera designers' control. To the extent that techniques such as dodging and burning are available, which enable the depictive content of photographs to be altered during the development process, photographers can produce photographs that misrepresent their objects, irrespective of camera designers' intentions.

Photographs are no less able to misrepresent their objects than other pictures. There is a sense in which photographs are necessarily accurate, but the form of representation at issue is causal (indexical, in Peirce's terminology), rather than depictive. Just as the number of rings in the trunk of a tree may accurately represent the tree's age, in virtue of the causal relation between its age and the rings, so too photographs accurately represent the objects that caused them. When photographs depict their objects accurately, their depictive and causal contents coincide. However, the two kinds of content can come apart.

Even if photographs were necessarily accurate *qua* pictures, Hopkins's claims do not yield an adequate explanation of their epistemic significance. His claims would explain their reliability: there would be no possible world in which a photograph exists but its object was not as the photograph

depicts it at the time the photograph was taken. However, they would not explain their richness. Badly focused photographs have relatively little EV, not because they are produced by unreliable processes, but because they are not rich. Despite their accuracy, a detective would clearly prefer to consult a properly focused photograph of a crime scene.

3.3. *Photographs as Spatially Agnostic Informants*

Cohen and Meskin argue that photographs are epistemically valuable because they are *spatially agnostic informants*: they carry information about their objects' visually accessible properties other than their egocentric spatial locations, without carrying information about their egocentric spatial locations (that is, about their objects' spatial locations relative to oneself) (Cohen and Meskin 2004: 204). Contrarily, visual experiences can carry information about the former properties of their objects only if they also carry information about the latter. On Cohen and Meskin's view, photographs are epistemically valuable because they can provide information about their objects' visually accessible properties, in conditions in which information about those objects' egocentric spatial location is unavailable (Cohen and Meskin 2004: 205).

Many non-photographic pictures are also spatially agnostic informants. Cohen and Meskin construe the epistemic differences between photographs and such pictures as merely apparent, not real. Viewers take photographs, but not most other pictures, to be spatially agnostic informants, they argue, because the type *photograph* is salient to viewers and because they believe tokens of that type typically to be spatially agnostic informants, whereas this is not true of most non-photographic picture types. A picture type is salient if viewers typically categorize tokens of the type in question as belonging to that type (Cohen and Meskin 2004: 205). The type *photograph* is salient because viewers typically categorize token photographs as belonging to that type. Contrarily, the type *accurate landscape drawing* is not salient, as viewers will typically categorize tokens of that type as belonging, not to it, but to the more general type *landscape drawing*. Whereas viewers believe that tokens of the type *photograph* typically carry information about visually accessible properties, they do not believe the same of tokens of the type *landscape drawing* (Cohen and Meskin 2004: 205). Viewers do not take tokens of most non-photographic picture types to be spatially agnostic informants because the types at issue are either not salient to them, or

they don't believe that tokens of those types are typically spatially agnostic informants.

There are two reasons why Cohen and Meskin's account does not suffice to explain our attributions of epistemic value. Firstly, like the type *photograph*, the type *photographic negative* is salient. Moreover, while some viewers may not believe that photographic negatives typically carry information about visually accessible properties, others—those with insight into the nature of information—believe that they do. Nevertheless, such viewers will take the photographs produced from such negatives to differ from the negatives in respect of EV. A lawyer would not use negatives, in lieu of the photographs produced from them, to provide a jury with evidence about an object's colour, even if she knew the members of the jury believed the negatives to carry information about the object's colour, since it would be much more difficult for them to derive such information from the negatives than from the photographs. Cohen and Meskin's account fails to accommodate the relevance of the form in which information is carried.

Secondly, we may attribute different EV to pictures of two different, salient types, both of which we know to be spatially agnostic informants. For example, we attribute different epistemic value to court drawings than to photographs. If it were permissible to take photographs in the courtroom, most newspapers and television news programmes would show photographs instead of court drawings, precisely because of their distinctive epistemic properties. Like the type *photograph*, the type *court drawing* is salient to viewers. The distinctive content of such drawings, and the contexts in which they are usually presented—on television news programmes and in newspaper reports—mean that viewers typically categorize such pictures as belonging to the type *court drawing* rather than to some more general type. Moreover, viewers also usually believe that court drawings typically carry information about their objects' visually accessible properties. We attribute different epistemic capacities to court drawings and photographs because we take the latter to be both richer and more reliable sources of information about their objects. Because Cohen and Meskin's account does not mention the amount of information pictures carry about their objects' visually accessible properties, it does not capture the epistemic significance of richness. Neither does it capture the epistemic significance of reliability: it appeals to our beliefs about the information different

types of picture typically carry, but not our beliefs about the likelihood that pictures of the relevant types will carry information. It therefore fails to capture the epistemic differences between photographs and court drawings.

None of the accounts considered here succeeds in explaining why photographic and non-photographic pictures differ—or appear to differ—with respect to EV. In the remaining sections, I propose an alternative explanation of this difference, which I construe as an actual difference in the EV pictures of the two types actually possess.

4. The EV of Non-Photographic Pictures

Non-photographic picture-making processes typically lack the reliability required for their pictures to play the epistemic roles to which photographs are suited, because their makers' intentions affect the relations they bear to their objects. Picture makers' intentions are variable. Sometimes they intend to depict objects accurately, while, at others, they intend to misrepresent them. The fact that someone who uses any non-photographic process might have done so with the intention of misrepresenting an object severely limits the reliability of that process. Generally speaking, those non-photographic pictures that are the product of intentions to misrepresent objects will misrepresent their external objects. However, it is not true that non-photographic pictures that are products of intentions accurately to represent objects will generally depict them accurately. Picture makers' ability to realize their intentions is constrained both by the limitations to their technical abilities and by the reliability of their visual processes. Even in cases in which they intend to depict something accurately, the former constraint in particular significantly diminishes the likelihood that they will succeed in doing so.

Picture makers' intentions affect the reliability of some non-photographic processes more than others. The processes involved in court drawing are more reliable than many other non-photographic processes, for example. A variety of factors—professional norms, the threat of unemployment—make the likelihood that such processes are exploited for the purpose of misrepresenting objects much lower than the likelihood that many other non-photographic processes were used for such a purpose. However, the

fact that their makers might have intended that they misrepresent their objects affects their reliability nonetheless. The possible world in which a picture produced by a non-photographic process depicts its external object accurately is therefore never very much closer to the actual world than one in which it misrepresents that object.

Furthermore, even when non-photographic pictures do carry information about their external objects, the serial process by which they are made limits their richness. Picture makers cannot mark a picture surface so as to achieve simultaneous depictive encoding of information about the various different features of an object. Instead, they must encode information little by little. Consequently, the more information a picture maker seeks to encode depictively, the longer the picture-making process takes. This places practical limits on how much information picture makers can encode in depictive form. Moreover, many of the scenes picture makers seek to depict change during the time taken to produce rich non-photographic pictures of them. This further limits how much depictively encoded information most non-photographic pictures can carry. Some picture makers (Vermeer, for example) possess the tenacity required to pursue richness despite the time required to achieve it. Nevertheless, it is no accident that many of those non-photographic pictures that rival photographs in richness are still lifes or are copied from photographs.

5. The EV of Photographs

Most photographic processes are parallel, rather than serial: they enable the simultaneous depictive encoding of information about the various different features of objects. Most cameras simultaneously record light reflected from the various different parts of the scene photographed. While some photographic processes are serial—such as those involved in astronomical photography—this does not affect the richness of the resultant photographs, in so far as the things they are used to photograph remain unchanged during the time taken to photograph them. Moreover, the automation of such serial photographic processes means that there are fewer practical limitations on their employment than on that of serial non-photographic picture-production processes, which require their makers' participation throughout.

Photographs are therefore generally immune to the factors that limit the richness of non-photographic pictures. However, this alone does not explain why they are typically richer than the latter. Poorly focused photographs may be the result of parallel processes, but are less rich than many non-photographic pictures.

Photographic richness is a technological achievement. The richness of the photographs that could be produced using early cameras was no greater than that of many paintings. Later cameras could be used to produce much richer photographs, and the advent of colour film further enhanced their capacity for richness, by enabling photographs to encode information depictively about more kinds of features of their objects. Contemporary colour film has enhanced the capacity for photographic richness further still, by enabling photographs to encode more information depictively about the colours of their objects.

The fact that a photograph was produced using photographic technology that enables a high degree of richness is no guarantee that it is rich. There are certain conditions that need to be met in order for such technology to yield rich photographs. For example, many cameras will produce them only if there is a certain level of ambient light in the photographed scene, or if the film is exposed for a suitable length of time. Nevertheless, photographs are typically considerably richer than non-photographic pictures because most photographs are produced using photographic technology that ensures a high degree of richness under the conditions in which they are taken.

The reason why both photographic technology has developed in the direction of increasing richness and the conditions required for richness are usually met is precisely that, in general, we value richness. We may not value it enough to pursue it at the expense of the other activities we could pursue in the time required to produce a rich non-photographic picture, but we value it enough to want it when the time required to achieve it does not prohibit us from pursuing other activities we value.

The reliability of photographic processes results from the standardization, not of the processes themselves, but of the functions they perform. This standardization is enabled by the fact that photographic processes are largely mechanical. Although there is a variety of different photographic mechanisms, both analog and digital, the mechanisms involved in the production of most photographs are alike in respect of the outputs they produce, given certain inputs. In particular, given a certain scene, most such

mechanisms will yield an accurate depictive representation of that scene. This is a purely contingent fact about photographic mechanisms. Contra Hopkins, camera designers might have intended that the photographs produced with the mechanisms they designed misrepresent their external objects, and thus have designed mechanisms that function to produce inaccurate pictures. The reason why they did not—in the most part, at least—may be that they designed them for consumers who, they assumed, generally value depictive accuracy over inaccuracy.

There are two respects in which this standardization is incomplete. Firstly, it is incomplete to the extent that photographic mechanisms do not function to produce accurate photographs. As we have seen, some photographic mechanisms, such as those that incorporate distorting lenses, do not produce accurate photographs. Moreover, many mechanized processes are reliable relative to most, but not all, feature types. For example, many produce photographs that, while otherwise accurate, misrepresent the determinate colours of the scenes they depict. Even those mechanisms that generally produce photographs that are accurate in all respects may have the potential to produce photographs that misrepresent the scenes they depict. This may be because, while the mechanisms at issue produce accurate photographs given most inputs, there are some inputs—for example, scenes of very low absolute illumination—given which they produce inaccurate photographs.

Secondly, it is incomplete to the extent that photographic processes are not mechanized. Whereas photographs taken with instamatic cameras and developed in commercial labs are produced by wholly mechanized processes, others are not. To the extent that photographic processes are not mechanized, their outcome is subject to the influence of the same factors as affect the reliability of non-photographic processes.

For example, non-mechanized development procedures may depend, not just on photographers' intentions, but also on their visual states. Photographers sometimes include colour charts in the scenes they photograph so that, when they come to develop their photographs, they can check the colours the photographs depict the charts as having against the colours of such a chart (Snyder and Allen 1975: 162). This process will only ensure colour accuracy if photographers both intend to depict objects' colours accurately, and they are not colour-blind.

Photographic processes are reliable only to the extent that they function to produce accurate pictures. The easier it is to produce an inaccurate

photograph using a given photographic process, the smaller the distance will be between the nearest possible world in which a picture produced by that process depicts its object accurately and the nearest possible world in which it depicts it inaccurately (assuming the latter world to be further from the actual world), and the less reliable that process will be.

Nevertheless, the extent to which photographic processes standardly function to produce accurate pictures makes them considerably more reliable than non-photographic processes. The great majority of photographic mechanisms either function to produce such pictures, or do so under most conditions, or function to produce photographs that are accurate in most respects. Moreover, although the processes by which many photographs are produced are not wholly mechanized, and although photographers' intentions need be no less variable than those of other picture makers, two factors make it considerably harder for photographers to realize their intentions to misrepresent objects than for the makers of non-photographic pictures to do so.

Firstly, unlike the latter, they can affect depictive content only if they preserve the counterfactual dependence of features of photographs on features of their external objects. This makes them dependent on the existence of techniques such as dodging and burning, or the use of colour filters, that enable them to influence the causal relation between picture and object without breaking it. Secondly, the extent to which photographic processes are governed by standardly functioning mechanisms significantly restricts the range of available techniques, and thus the capacity for photographic misrepresentation. For example, the use of distorting lenses is one of few techniques that enable the photographic misrepresentation of shape. However, the fact that the process of recording light reflected from scenes photographed is largely governed by standardly functioning mechanisms means that this technique is not readily available to photographers.

What of photographic manipulation? There has been a dramatic rise, in recent years, in the frequency with which photographs are intentionally manipulated to misrepresent the scenes they depict. This is a direct result of the increasing prominence of digital photographic equipment; the greater accessibility of the computer technology required to manipulate digital photographs; and the spread of the skills required to use this technology. Digital photographic processes, it seems, can readily be exploited to produce photographs that misrepresent their objects.

However, it is important to distinguish two forms of digital manipulation. The development of techniques which enable the systematic alteration of the shape or colour a digital photograph depicts its object as having, while preserving the counterfactual dependence of features of the photograph on features of its external object, has made photographic misrepresentation much easier than it previously was, and thus reduced the reliability of digital photographic processes and the EV of the photographs produced by them. By contrast, while techniques which enable the pixel-by-pixel retouching of photographs produce pictures which misrepresent objects' shapes and colours, they override the effect of the photographic mechanism by severing the counterfactual dependence that features of those pictures would otherwise bear to features of the objects photographed, and thus produce pictures that are not purely photographic. Such techniques do not affect the reliability of photographic processes, because they make them redundant. Consequently, although they can be used to undermine the EV of particular photographs by transforming them into non-photographic pictures, they do not diminish the EV that photographic pictures generally possess.

Nevertheless, such techniques affect the EV we are likely to attribute to the pictures they are used to produce. The seamlessness of the manipulation enabled by such techniques makes us likely to mistake such pictures for photographs, and thus to attribute to them the EV that photographs generally possess. While digital manipulation of the first kind is still sufficiently rare for the EV typical of photographs to exceed that typical of non-photographic pictures by a comfortable margin, the epistemic future of photographs is by no means assured. As Barbara Savedoff notes, advances in digital photographic processes may one day eradicate the epistemic differences between photographic and non-photographic pictures (Savedoff 1997: 212).

Conclusion

On two of the explanations I have considered, the epistemic differences between photographic and non-photographic pictures result from essential differences between the two types of picture. Walton sees the difference between the two as consisting in the fact that photographs are aids to vision,

while non-photographic pictures are mere representations. Hopkins sees it as consisting in the fact that they are governed by different standards of correctness. By contrast, while they take photographs to differ epistemically from those non-photographic pictures that do not carry information about objects, Cohen and Meskin take certain of the epistemic differences attributed to pictures of the two types to be merely apparent. I have steered a somewhat different course, arguing that, while photographs in general do differ epistemically from non-photographic pictures in general, this difference is due to wholly contingent factors, namely advances in photographic technology and the standardization of the function of photographic processes.

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