

Intention and Artifice

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Claims to Credibility

Photography's sesquicentennial year opened, fittingly enough, with an international drama turning on the credibility of photographs as evidence--on a claim that the camera does not lie. On January 4, 1989, US Navy fighters shot down two Libyan MiG-23s over the Mediterranean near the Libyan coast.^[1] Libya denounced the action and called for an emergency session of the United Nations Security Council to condemn it. Ali Sunni Muntasser, Libya's UN ambassador, said that the planes were unarmed reconnaissance craft on a routine mission. A US spokesman challenged that assertion and noted, "We have the pictures to prove they were not unarmed," which means, he added, that "the Libyan ambassador to the UN is a liar." The Libyan diplomat responded in kind: "The man who said that I am a liar, he is a liar, because we are sure that our planes were not armed." Later, US Ambassador Vernon Walters exhibited blurred photographs of what he claimed was one of the MiGs visibly armed with air-to-air missiles (figure 3.1). "Do you think this is a bouquet of roses hanging under the wing?" he demanded. Libyan Ambassador Muntasser immediately suggested that the photographs were doctored. "It is completely fake," he protested, "It is untrue!" The pictures were "fabricated," they were "directed in the Hollywood manner." ^[2]

This cynical and loutish dialogue reveals very little about what actually took place off the Libyan coast that January day, but it does demonstrate the extraordinary tenacity of the camera's claims to credibility: as Susan Sontag has put it, "A photograph passes for incontrovertible proof that a given thing happened." Ambassador Walters could urge with a straight face that "you can see for yourself whether there were or were not missiles," even though his photographs were barely decipherable as images of aircraft and showed no detail at all. Aware, like all of us, of the powerful presumption that a photograph shows something that *did* exist, Ambassador Muntasser chose not to dismiss the photographs as simply meaningless. Instead, he made the more damning suggestion that they were false evidence--fabrications produced to deceive the gullible by trading on the photograph's privileged connection to reality. This suggestion is by no means technically implausible: anybody with access to some pictures of aircraft, an image-capture device, and a personal computer with inexpensive image-processing software could produce this sort of image in a few minutes.

The play of claim and accusation over the Libyan fighter incident recalls the cogent symmetries of Aristotle's definition of truth--to say of what is that it is, or to say of what is not that it is not, is the truth; but to say of what is not that it is, or to say of what is that it is not, is falsehood--and raises some urgent questions. How is it that photographs seem to say of what is that it is? What is the foundation for their undeniably powerful implicit truth claims? When should we be wary of these? Exactly how are these claims subverted by the emergence of digital imaging? Must we now, like jesting Pilate, throw up our hands? Not surprisingly, as we shall see, the most useful answers turn out to be intimately bound up with different philosophical doctrines about the nature of meaning and truth.

Adherence of the Referent

For these questions to become meaningful we must assume, first of all, that a photograph depicts

something, that it is not just an abstract pattern resulting from a chemical reaction. Whether photographs depict through resemblance (as suggested, for example, by James J. Gibson) or through the action of a denotative symbol system (as vigorously argued by Nelson Goodman) is an interesting and vexed question, but one that need not detain us here.^[3] One way or another, a photograph provides evidence about a scene, about the way things were, and most of us have a strong intuitive feeling that it provides better evidence than any other kind of picture. We feel that the evidence it presents *corresponds* in some strong sense to reality, and (in accordance with the correspondence theory of truth) that it is true because it does so.^[4]

A photograph is fossilized light, and its aura of superior evidential efficacy has frequently been ascribed to the special bond between fugitive reality and permanent image that is formed at the instant of exposure. It is a direct physical imprint, like a fingerprint left at the scene of a crime or lipstick traces on your collar. The correspondence with reality is thus causally established. According to Sontag, "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." ^[5] The death-mask metaphor goes back (at least) to Andre Bazin's 1945 essay "The Ontology of the Photographic Image," in which he compares photographs to mummies and relics-- objects that exhibit a "transference of reality from the thing to its reproduction"--and mischievously describes the Holy Shroud of Turin as a combination of relic and photograph. ^[6] In *Camera Lucida* Roland Barthes (perhaps recalling Rene Magritte; see figure 3.2) introduces another telling metaphor--that of the windowpane and the landscape and claims that "the referent adheres."

In his brilliantly epigrammatic essay "Understanding a Photograph," the influential Marxist critic John Berger insists that the interest of a photograph depends totally on this tenacious adherence of the referent.^[7] Photographs, as he defines them, are quite simply "records of things seen . . . no closer to works of art than cardiograms." They engage us because they result from some photographer's decision "that it is worth recording that this particular event or this particular object has been seen." Every photograph becomes "a means of testing, confirming and constructing a total view of reality

This attitude has, no doubt, been reinforced by photography's successes in showing aspects of the physical world that would otherwise escape us, and sometimes in doing so exposing the errors of painting. Eadweard Muybridge's famous photographs of horses in motion, for example, showed that the "flying gallop" position depicted in many earlier paintings simply does not occur (figure 3.3). His sequences of instantaneous photographs, made at closely spaced intervals, provided the irrefutable evidence. As Aaron Scharf commented: "The meaning of the term 'truth to nature' lost its force: what was true could not always be seen, and what could be seen was not always true. Once again the photograph demonstrated that for many artists truth had really been another word for *convention*."^[8]

After more than a century and a half of photographic production, we also have to contend with the powerful "reality effect" that the photographic image has by now constructed for itself. In his influential 1921 essay "On Realism in Art," ^[9] Roman Jakobson sketched the mechanism by which certain types of images come to seem "natural" and more "faithful to reality" than others: The methods of projecting three-dimensional space onto a flat surface are established by convention; the use of color, the abstracting, the simplification, of the object depicted, and the choice of reproducible features are all based on convention. It is necessary to learn the conventional language of painting in order to "see" a picture, just as it is impossible to understand what is said without knowing the language. This conventional, traditional aspect of painting to a great extent conditions the very act of our visual perception. As tradition accumulates, the painted image becomes an ideogram, a formula, to which the object portrayed is linked by contiguity. Recognition becomes instantaneous. We no longer see a picture. Extending this line of argument from painting to photography yields the seemingly paradoxical proposition that, since photographs are very strongly linked by contiguity to the objects they portray, we have come to regard them not as pictures but as formulae that metonymically evoke fragments of reality. Barthes has elucidated another, complementary aspect of the reality effect by pointing out that works of realistic art often incorporate seemingly functionless detail just "because it is there," to signal that "this is indeed an unfiltered sample of the real." ^[10] Since photographs are rich in such details, they always connote the real.

For all these (not necessarily consistent) reasons, then, the camera has commonly been seen as an ideal

Cartesian instrument a device for use by observing subjects to record supremely accurate traces of the objects before them. It is supereye--a perceptual prosthesis that can stop action better than the human eye, resolve finer detail, remorselessly attend to the subtlest distinctions of intensity, and not leave unregistered anything in the field of its gaze. And photographs seem to bond image to referent with superglue.

Intention and Objectivity

Even more tellingly, we can also point to the fact that there is no human intervention in the process of creating the bond between photograph and reality, this apparent Kryptonite connection to the referent: it is automatic, physically determined, and therefore presumably objective. Photographs are thus connected to the ancient Judeo-Christian tradition of *acheiropoietai*--"true" images of Christ made "not by human hand" (figure 3.4).[\[11\]](#) Furthermore, this automaticity accords splendidly with poststructuralist hostility to the idea of authorial control of meaning: photography can be seen as a kind of automatic writing. [\[12\]](#)

Andre Bazin--among many to tackle this theme of physical determination--crisply formulates the crucial difference from painting as follows:

For the first time, between the originating object and its reproduction there intervenes only the instrumentality of a nonliving agent. For the first time an image of the world is formed automatically, without the creative intervention of man. The personality of the photographer enters into the proceedings only in his selection of the object to be photographed and by way of the purpose he has in mind. [\[13\]](#)

Such exclusion of human bias is the point of many standard scientific procedures, such as random sampling, double-blind clinical trials, and setting statistical significance levels before conducting experiments. It also motivates the "plain," ostensibly unrhetorical style of formal scientific discourse. The photographic procedure, like these scientific procedures, seems to provide a guaranteed way of overcoming subjectivity and getting at the real truth. Indeed, it has often been taken as the quintessential way, and writers who want to suggest neutral recording without the subjectivity introduced by human selection or organization often invoke the image of the camera. Thus Christopher Isherwood memorably opens *Goodbye to Berlin*, "I am a camera with its shutter open, quite passive, recording, not thinking." [\[14\]](#)

This impersonal, objective neutrality has ontological implications. Isherwood's camera eye supposedly records real people in a real place, "the man shaving at the window opposite and the woman in the kimono washing her hair." The conservative philosopher Roger Scruton--wanting like the Marxist Berger to distinguish photography from fine art, but for different reasons--has usefully formulated this point by teasing out the differing intentional relations of the painter and the photographer to the objects that they depict:

If a painting represents a subject, it does not follow that the subject exists nor, if it does exist, that the painting represents the subject as it is. Moreover, if x is a painting of a man, it does not follow that there is some *particular* man of which x is the painting. Furthermore, the painting stands in this intentional relation to its subject because of a representational act, the artist's act, and in characterizing the relation between a painting and its subject we are also describing the artist's intention. The successful realization of that intention lies in the creation of an appearance, an appearance which in some way leads the spectator to recognize the subject. [\[15\]](#)

But he makes this analysis of photography: A photograph is a photograph of something. But the relation here is causal and not intentional. In other words, if a photograph is a photograph of a subject, it follows that the subject exists, and if x is a photograph of a man, there is a particular man of whom x is the photograph. It also follows, though for different reasons, that the subject is, roughly, as it appears in the photograph. In characterizing the relation between the ideal photograph and its subject, one is characterizing not an intention but a causal process, and while there is, as a rule, an intentional act involved, this is not an essential part of the photographic relation. The ideal photograph also yields an appearance, but the appearance is not interesting as the realization of an intention but rather as a record of how an actual object

looked. In other words, the nonexistence of angels need not prevent you from painting a picture of one, but it certainly prevents you from taking a photograph of one. (We must make an exception to this general rule for convinced realists: recall Courbet's famous remark "Show me an angel and I will paint one." [16]) The existence of horses means that you can take a photograph of some particular horse, but it does not prevent a horse painting from showing no horse in particular. You cannot, however, take a photograph of no horse in particular. Thus the representational range of paintings is wider than that of photographs because a painter does not have to accept a causal relation between a depiction and the object to which it refers.

Scruton exaggerates the second part of his case by reducing the photographer's intentional acts to inessentials. Selecting a station point, framing the scene, and choosing the moment to expose are all intentional acts--the essence, for example, of Henri Cartier-Bresson's photographic art. This is demonstrated by the fact that photographers are sometimes accused of deliberate deception through tendentious framing or selection of moment to expose. (The documentary photographer Lewis Hine remarked that, "while photographs may not lie, liars may photograph." [17]) Many serious photographers (though not amateurs who use autoexposure, autofocus, point-and-shoot cameras) also regard manipulation of exposure and focus variables as important means of realizing their intentions. And in some views of photographic practice--as represented, for example, by Ansel Adams--the darkroom acts of development, enlarging, cropping, and printing are also taken as essential.

However, Scruton's distinction between intentional and causal components in image-production processes is helpful, particularly if we do not insist on a clearcut dividing line between paintings and photographs but think rather of a spectrum running from nonalgorithmic to algorithmic conditions--with ideal paintings at one end and ideal photographs at the other. A nonalgorithmic image, which is the product of many intentional acts, neither establishes that the object depicted exists nor (if that object does exist) provides much reliable evidence about it, but reveals a lot about what was in the artist's mind. An algorithmic image, which to a large extent is automatically constructed from some sort of data about the object and which therefore involves fewer or even no intentional acts, gives away much less about the artist but provides more trustworthy evidence of what was out there in front of the imaging system. In between, there are images that are algorithmic to a degree.

Freehand sketching, for example, is a mostly nonalgorithmic process: every freely made mark that the artist chooses to execute is the realization of an intention, and the result is usually something that has a strongly personal character. Prestige attaches to skillful and accurate work of this kind: not everybody can do it. But when an artist traces a form with the assistance of a stencil or physiognotrace, or a scene with the aid of a camera obscura (as Fox Talbot did on the shores of Lake Como), the process has a much more algorithmic character: there is little prestige to be had through accuracy. [18] And, when hand tracing is replaced by a highly standardized, automatic chemical process, there is almost no room left for the realization of intention. [19] So modern photography, as conceived of in the famous slogan "You press the button, we do the rest," stands near the algorithmic, depersonalized extreme of image-production processes. [20] As Sontag has said, "Photographs don't seem deeply beholden to the intentions of an artist . . . the magic box insures veracity and banishes error."

So, if you want to attack the veracity of a photograph (as did the Libyan ambassador), you can suggest that the standard procedure was not actually followed--for example, that some airbrushing was done or that the negative was flipped before printing. [21] (In a similar way, scientists may attack reported experimental results--such as those purporting to show cold fusion--by arguing that norms of scientific procedure were violated.) Conversely, if you want to defend its truthfulness, you can produce confirmation that the standard procedure was followed. You might produce the original negative to show that it had not been retouched or witnesses to attest that no deviation was introduced. Courts, passport authorities, and the users of clinical photographs often specify particularly detailed algorithms (leaving very little discretion to the photographer in choice of lens, lighting, framing, and so on) for production of photographs that will be acceptable as reliable evidence. [22] The United States Immigration and Naturalization Service, for example, requires identification photographs to be three-quarter color portraits with the right ear exposed (no earrings or hats), framed so that the head fits within an oval of strictly specified dimensions, made with a white background equal in reflectance to bond typing paper, sharply focused and correctly exposed, unretouched, printed on

glossy paper at a standard size, and not stained, cracked, or mutilated. Snapshots that deviate in the slightest way from this specification are rejected, so the seedy photo studios that cluster around immigration offices set themselves up to produce the standard product and have a steady stream of clients.

Digital imaging dramatically changes the rules of this game. It creates a condition in which the image maker may choose among many different devices and procedures for mapping from intensities in a scene to intensities in a display or print, in which image fragments from different sources may quickly and seamlessly be combined, and in which arbitrary interventions in the image-construction process are easy to introduce and difficult to detect. The distinction between the causal process of the camera and the intentional process of the artist can no longer be drawn so confidently and categorically. Potentially, a digital "photograph" stands at any point along the spectrum from algorithmic to intentional. The traditional origin narrative by which automatically captured shaded perspective images are made to seem causal things of nature rather than products of human artifice--recited in support of their various projects by Bazin, Barthes and Berger, Sontag and Scruton--no longer has the power to convince us. The referent has come unstuck.

Coherence

If we cannot find grounds to conclude that a given image is a true record of a real scene or event, we can take the opposite tack and at tempt to demonstrate that it could not be a true record. [\[23\]](#) We can try, like a suspicious jury, to see whether the visual evidence that is presented really hangs together. We can look for inconsistencies--play a sophisticated game of "What's wrong with this picture?" This, then, grounds the analysis on some kind of coherence theory rather than a correspondence theory of truth--a move that will commend it self to those who want to remain uncommitted to the existence of a unitary extrapictorial reality.

We can start by trying to show that the visual evidence cannot yield any consistent, plausible interpretation as a perspective projection of illuminated three-dimensional objects. Let us consider, for example the simple image shown in figure 3.5a. We unhesitatingly interpret it as a view from above of a cube, with the Y shape in the center seen as a convex exterior corner. (We can debate whether interpretation of the Y shape as a convex corner helps us decide that the whole thing must be a cube or whether recognition of the whole thing as a cube tells us that the Y shape must be a convex corner. Either way, interpretation of the part must be consistent with interpretation of the whole.)

With equal certainty, we interpret the next image (figure 3.5b) as a view from below of a hollow cubic box. Notice, however, that the same Y shape appears in the center, but it is now seen as a concave interior corner. The same piece of visual evidence, seen in a different context, is interpreted very differently.

The image in figure 3.5c has two consistent interpretations. We can see it as a wireframe cube from above or as a less plausible skewed object from below. The central Y shape is a convex corner in one interpretation and a concave corner in the other, but we cannot see it as simultaneously convex and concave. The context of the whole here allows two consistent interpretations of the part, and we use an assessment of relative likelihood to choose between them. (Most Westerners immediately plump for the interpretation of this figure as a cube and probably do not even consider the other. But someone from a culture less populated with right-angled objects might see it the other way.) Or, if we like, different interpretations of the part prompt different interpretations of the whole.

Figure 3.6 shows the image translated, in various ways, from line to tone. A painter might accomplish these translations by first constructing the outlines of the faces and then filling them in. Some of the translations read as two-dimensional patterns, some are teasingly difficult to interpret, and some vividly suggest a three-dimensional cube. Those that read three-dimensionally have a common formal characteristic: the shading is consistent with the foreshortening. More precisely, if we assume a consistent direction of incident light and diffuse reflection from the faces, we can expect that the intensity of a face will vary according to its orientation to the light; so intensity provides orientation information that we can use to assist in interpretation of foreshortened shapes. Conversely, if we interpret the skewed quadrilateral shapes in the image as perspective projections of square faces at different orientations to the picture plane, we can then read the shading as the result of consistent lighting. Either way, an interpretation suggested by one kind of

visual evidence is confirmed by another. Such consistency still does not necessarily constrain us to a single interpretation, however; some shaded objects can be read as either concave or convex, depending upon our assumptions about lighting direction.

Figure 3.7 contains still more visual information: in addition to surface shading there is a cast shadow. The shape of the shadow is consistent with reading the faces as foreshortened squares, and the light source suggested by the direction of the shadow is consistent with that suggested by the variation of shading. The weight of all this consistent evidence makes it very difficult (though it remains a logical possibility) for us to read the presented pattern of shaded polygons as anything but a cube on a plane surface illuminated by a single source of light. (I do not exclude the possibility that somebody with very different cultural background and expectations might find some other reading equally compelling.)

The final image in this series (figure 3.8) is more insidiously constructed. It appears, at first glance, to show some kind of three-dimensional object, and we can find reasonable interpretations of vertices, lines, and polygonal faces that begin to confirm this conjecture. But if we look closely we can always find other visual evidence that does not fit the same interpretation. We must conclude that this is an impossible object--something that, contrary to first impressions, does not have a consistent three-dimensional interpretation. [24] The works of Maurits Escher often depend for their paradoxical effect on this sort of ambiguity in the visual evidence (figure 3.9).

In forming interpretations of images, then, we use evidence of the parts to suggest possible interpretations of the whole, and we use the context of the whole to suggest possible interpretations of the parts. (Depending on your presuppositions, you can regard this process as high-flown Gadamerian hermeneutics or as mundane and fairly mechanical consistency checking programmable by an MIT undergraduate. It is, in fact, the basic process of many computer programs for scene interpretation. [25]) Some images turn out to have unique consistent interpretations, some like the Necker cube are ambiguous in the sense that they have multiple consistent interpretations, and some while by no means meaningless--contain irreconcilable contradictions.

Photographs, unlike for example simple line diagrams, present rich arrays of visual evidence for us to interpret: shape and shading are registered with high precision. Furthermore (if the exposure was instantaneous) we know that they must be in essentially correct perspective projection and consistent light. So we can think of them as highly redundantly coded messages, like digital transmissions that incorporate redundancy for error-correction purposes. This redundancy gives them a ring of truth, since interpretations suggested in one way are usually confirmed in numerous other ways: no matter how we cut it, we find that the visual evidence always adds up to the same result. [26] The "layers" of visual information in a photograph are like independent witnesses that perfectly corroborate each other.

This unrelenting internal consistency also distinguishes photographs from handmade drawings and paintings, which, even when they adopt much the same conventions of perspective and shading, characteristically contain Rashomon-like ambiguities and inconsistencies. The resulting play among the visual codes of a drawing or painting yields more complex interpretations, and may even support ludic Derridean readings of the image against itself. [27] A painting may, for example, show different objects in a scene from different vantage points--but a photograph must depict them all within a single, fully consistent perspective space. And the spatial cues given by foreshortening and shading of surfaces in a photograph must be precisely consistent with each other, while this need not be so in a painting.

It follows that we can refute claims that an image is a photographic transcription of physical reality by cross-checking the visual evidence and identifying inconsistencies. [28] This requires a suspicious frame of mind: if we do not somehow expect inconsistencies, we are likely to overlook even quite blatant ones in our effort to make sense of what we see before us. Photographic manipulators do not necessarily have to do a very good job in order to fool us, at least initially. But if we are alerted we can ask, for example, whether the foreshortening, shading, and cast shadows are consistent with each other and with reasonable assumptions about viewpoint and lighting conditions? Do indicators of time, such as clocks and shadows, seem consistent with each other? When a viewpoint suggested by the weight of visual evidence is assumed, do

objects seem to be in plausible scale relationships? Do some objects seem surprisingly light or dark in relation to their surroundings? Are inserted objects betrayed by lack of expected cast shadows or by shadows cast at angles different from those cast by other objects? [\[29\]](#) Do unexpected discontinuities in the background suggest that objects must have been deleted from the foreground? Are there shadows that do not seem to be cast by any object? Are shadows and specular highlights consistent with the same assumptions about locations of light sources? Do highly specular surfaces show mirror reflections consistent with our spatial interpretation of the scene? [\[30\]](#) Are modifications of surface and shadow intensities due to interreflection effects between surfaces consistent with our understanding of surface shapes and relationships? Are the scale and gradient of texture on a surface consistent with assumptions about the surface's size and orientation? Are geometric and aerial perspective consistent with each other? Is there a consistent gradient of sharpness from some focus plane? If there are n different types of visual evidence to consider, there will be n -squared interrelationships to cross-check for consistency, so this sort of forensic analysis can be elaborated almost endlessly. Often it will unmask as spurious an image that, at first glance, had readily passed as an authentic photograph.

The more information there is in an image, the harder it is to alter without introducing detectable inconsistencies: usually it is much quicker and easier to introduce undetectable changes into fuzzy, low-resolution, black-and-white images like that of the Libyan MiG than to do the same with sharp, high-resolution, full-color images. Furthermore, the difficulty of convincing alteration grows exponentially with the variety of types of visual evidence present. If an image shows only a silhouette, you have to give convincing shape to only the altered profile. But if there is differentiated surface shading, you also have to alter the distribution of shades to make this consistent with the new profile. If there are cast shadows, you must adjust them to maintain consistency with the geometry suggested by the new profile and shading, and so on. If you manipulate a stereo pair, you must very carefully coordinate the marks made on the left and right images; otherwise, when the images are viewed in a stereoscopic display, your marks will appear to "float" implausibly in space. A photographic manipulator, like a dissembler who weaves a tangled web of lies and eventually trips himself up, is likely to be caught by some subtle, overlooked inconsistency.

To illustrate the application of this principle of absolute coherence, let us examine the famous photograph that, the original caption claimed, was taken by the astronaut Neil Armstrong on July 20, 1969, and that shows fellow astronaut Edwin Aldrin walking on the surface of the moon (figure 3.10). The claim that man's first moon walk took place on this date, in the manner depicted, is extremely plausible, since the picture is sharp and clear—including a reflection of the photographer in Aldrin's visor—and since there are no detectable inconsistencies with the well-known facts of the first moon voyage. This picture convinced the world. Two decades later, in Fall 1989, *Time* magazine concluded a special issue on "150 Years of Photojournalism" with "a picture of something that never took place . . . produced on a computer screen." This picture, made from Armstrong's famous shot, shows seven space-suited astronauts apparently walking on the surface of the moon (figure 3.11). If we are at first persuaded to believe this evidence of our eyes, we can quickly be dissuaded by considerations of internal coherence: it is easy to miss at a casual glance, but close examination reveals an inconsistency in the reflections. Each visor shows the image of just one other astronaut, not the several that we would expect.

Relationship to Visual Discourses

If an image seems internally coherent, we can then ask whether the facts it purports to present are plausible—whether they seem consistent with other facts that, independently of the image in question, we believe to be true. (This is a procedure that has been given considerable attention, in a different context, by philosophers of history. [\[31\]](#)) The approach is nicely suggested by William Hogarth's famous satire on the incompetent perspectivist (figure 3.12). We can read this well enough as a depiction of a three-dimensional scene, but we laugh because doing so forces us to accept some implausible and amusing assumptions about the size and orientation of figures, architectural elements, fishing rods, and so on.

Our capacity to evaluate plausibility is not, however, conferred simply by built-in common sense. It is—as discourse theorists of various stamps will be quick to argue—constructed by our positioning within discourses (which direct our attention and set boundaries on what counts as evidence and knowledge) and

constrained by limits on our stores of relevant facts. One person's vivid, compelling, important piece of visual evidence may be another's factoid, irrelevant fragment of trivia, misleadingly constructed propaganda, or aberrant result of observational error. Plausibility is relative to an ideological framework and an existing knowledge structure.

Consider, for example, the reception of spacecraft images. When we first saw pictures of the far side of the moon--something on which humankind had never set eyes before--we could cross-check them only against what we knew of the front of the moon: there was nothing else to compare them with. And when close-up photographs of the rocky surface of Mars were first published in 1976, we simply *had* to believe them: since none of us had ever been close to the surface of Mars, we had virtually no relevant knowledge against which to cross-check them. At best, we could make comparisons with barren, rocky deserts on Earth.

A clever deceiver can take advantage of such ignorance. For example, after the Chernobyl nuclear power plant explosion, a video clip of an Italian cement factory was passed off to American television networks (NBC and ABC) as being footage of the damaged reactor. [32] The images initially seemed plausible enough, since few people had any idea of what a Soviet nuclear reactor might look like. Similarly, when a 4,000-year-old mummy was discovered in an Alpine glacier in 1991, an Austrian newspaper published what it claimed to be a CAT scan of the mummy's brain--demonstrating, according to the accompanying article, that this prehistoric man had been epileptic. [33] This was a fairly safe ploy: expertise in the interpretation of CAT scans of mummies is not widespread. But the image was later shown to be that of the thorax of an unummified twentieth-century man, published upside down.

An image which is proffered to support a surprising or extravagant claim, but which presents few confirmable specifics, invites suspicion. This difficulty arises with the photographs that Robert E. Peary produced to support the controversial claim that his expedition reached the North Pole on April 6, 1909. They merely show team members in a featureless landscape of ice hillocks and might have been taken anywhere in the snowy wilderness (figure 3.13). But we do know with certainty one fact about the Pole at the moment at which Peary claimed to have exposed the film--the altitude of the sun and we can check the cast shadows in the photographs for consistency with this. The National Geographic Society has analyzed the shadow angles and has concluded that they are indeed consistent with Peary's claim. [34] Skeptics, however, suggest that the margin of error in measurements of shadow angles is sufficiently great to make them worthless as confirming evidence.

Sometimes the visual evidence presented by an image supports alternative assertions, and we must decide which is the more plausible. Where the propaganda value of an image is at stake, the issue may become hotly contested. Consider, for instance, the famous photograph by Robert Capa shown in figure 3.14. It was published in *Vu* in 1936, then in *Life* in 1937 with the caption "Robert Capa's camera catches a Spanish soldier the instant he is dropped by a bullet through the head in front of Cordoba." The visual evidence seems consistent with belief that this the caption is truthful. But Phillip Knightley has pointed out, in *The First Casualty*, that the evidence would be equally consistent with a different and much less affecting caption, such as "A militiaman slips and falls while training for action." [35] In evaluating the truth of this photograph we need to ask not only whether the visual evidence that it presents supports the caption, but also whether the caption can more plausibly be reconciled with the facts, as we know them, of Robert Capa's career and of the Spanish Civil War than with the less dramatic alternative. Knightley carried out an investigation of this issue. He asked first about the circumstances in which the picture was taken. When and where did Capa take it? Who is the man? Since the terrain is unspecific and the face is blurred, the image itself does not provide many clues.

Knightley talked to Cornell Capa (the photographer's brother) and to professional associates such as Cartier-Bresson; none of them was able to provide specific details. Finally, he concluded that the photograph "turns out to be not the clear and simple statement of fact that it at first sight appears."

Other famous war photographs have been subjected to the same sort of scrutiny. Alexander Gardner's image of a dead "rebel sharpshooter" at the Battle of Gettysburg (figure 3.15) was shown to have been staged: a dead body, which had earlier been photographed elsewhere as that of a "Union sharpshooter," was

dragged into the scene and arranged as in a still life. [36] Joe Rosenthal's shot of four marines planting the flag at Iwo Jima (figure 3.16) has seemed implausible to many observers because it is so rhetorically charged that it looks as if it must have been posed--and indeed this turns out to have been the case. [37] It is histrionics, not history. Seeking to reduce the impact of Huynh Cong Ut's picture of a terrified, naked little girl fleeing from a napalm attack in Vietnam (figure 3.17), General William Westmoreland cynically proposed that her burns were caused by "a hibachi accident." [38]

In general, if an image follows the conventions of photography and seems internally coherent, if the visual evidence that it presents supports the caption, and if we can confirm that this visual evidence is consistent with other things that we accept as knowledge within the framework of the relevant discourse, then we feel justified in the attitude that seeing is believing. But failure to satisfy any one of these requirements motivates suspicion. We dismiss supermarket tabloid photographs purporting to show the immortal King of Rock and Roll wolfing fries at McDonald's in Kansas City, no matter how compelling the likeness, because we cannot reconcile them with abundant, sober evidence that Elvis expired long ago. (Of course, the publications we sneak glances at in the eight-items-or-less checkout lane do not expect to be taken too seriously: the outrageous implausibility of their claims--both verbal and visual--is part of the fun.) An image of a cement factory can pass for an image of a nuclear reactor just so long as we do not have any knowledge of nuclear reactors against which to cross-check it, but the more we know about reactors the less plausible it will seem. We become skeptical of Peary's purported North Pole pictures and Capa's "moment of death" image because much less dramatic captions than those proposed by the authors can be suggested and seem to fit the visual evidence equally well. But General Westmoreland's contemptible quip failed to discredit the fleeing child image in the eyes of the public because this heartbreaking picture is detailed, internally coherent, and far more plausibly described by the original caption than by the alternative he attempted to supply.

Provenance

Finally, in addition to examining an image for internal coherence and considering whether it can stand up to cross-checking against what we know of a situation, we might ask for evidence that it is an authentic record--just as we might question whether a contract or will is genuine. Was it produced at the time and place claimed, by means of a process guaranteeing fidelity, by the person identified as its originator? [39] Is the originator trustworthy and authoritative? How did the image come to be presented to us? Are there suspicious gaps in its history?

In July 1991, for example, a photograph supposedly showing three lost Vietnam War fliers stirred an emotional debate in Washington (figure 3.18). [40] The families of the men that it apparently portrayed adamantly maintained that it was authentic. Some government officials, on the other hand, suggested that it might have been a hoax perpetrated by bounty hunters. There was some argument about coherence and plausibility, and *The New York Times* reported: Pentagon officials note that the three fliers look unusually well nourished for having been held in captivity for more than two decades. Some photography experts say the head of the man standing in the middle is out of proportion, suggesting that his picture was taken separately from those of the other men. Other analysts have noted that the cryptic sign held up by the men appears to have been photocopied and pasted on the picture. But most discussion focused on the question of whether the image had a verifiable provenance that could establish its authenticity. Its history, according to *The New York Times*, was as follows: The Pentagon originally received the photo by fax machine last November from a naturalized American of Cambodian descent living in Los Angeles. A Defense Intelligence Agency official provided Colonel Robinson's daughter, Shelby Robinson Quast, with the name of the man who transmitted the photograph. A friend of her family said that Mrs. Quast met with the man and that he gave her two contacts to locate in Cambodia and a handwritten note demanding \$2 million for two of the three men. Mrs. Quast flew to Phnom Penh to track down the two contacts. She found one, who maintained he took the photograph when he was a prison guard. [41] So the claim of authenticity was based on identification of a photographer (the mysterious man in Phnom Penh), a time and place of exposure ("when he was a prison guard"), and a chain of transmission.

To find evidence for or against this claim, the US government sent a ten-member Pentagon team to Thailand to "find out the circumstances under which the photograph was supposedly carried across the Thai border

into Cambodia." Soon after, a Pentagon report suggested that the provenance was suspicious and that the authenticity of the photograph was therefore doubtful: "One principal source of the photograph lies in a ring of Cambodian opportunists led by a well-known and admitted fabricator of P.O.W.-M.I.A. information," it claimed. [42] Pentagon investigators suggested that the photograph may have had the same source as some known fakes that were produced by manipulating pictures found in Soviet magazines. [43] Sufficient doubt was created for *The New York Times* to report, "Last summer, copies of a photograph purporting to show three captive American pilots were circulated, but U.S. authorities, after studying them, decided they were not valid." Eventually, Defense Department officials produced a convincing original--a 1923 photograph of three Soviet farmers that had been published in the December 1989 Khmer-language issue of a magazine called *Soviet Union*. [44] Apparently the original had been cropped, the features of the farmers had been disguised by addition of Stalinesque moustaches, and the banner lauding collective farming had been replaced by a cryptic placard indicating captivity. False anchorage of the purported chain of transmission had been demonstrated, so this photograph completely lost whatever initial credibility it may have had.

A really bold liar (particularly one who can exploit some mantle of authority) can simply appropriate legitimate pictures to false narratives by providing them with fake provenances--much as confidence tricksters equip themselves with fake biographies. One of Ronald Reagan's more egregious falsehoods was his claim to have been one of the Signal Corps photographers who filmed the Nazi death camps. The horrifying pictures certainly exist, and Reagan told Israeli Prime Minister Shamir that he had kept a copy of them for himself in order to be able to prove that six million Jews had been exterminated. But the provenance that Reagan supplied was a completely spurious, self-serving fabrication: in fact, he never left the States in World War II. [45]

Originals and Copies

As framed above, the question of authenticity suggests that images are unique, that they are produced by individuals, and that there is a fundamental difference between originals and copies. We might ask, for example, whether a particular sketch was an original Rembrandt or merely a copy, whether a particular Polaroid print was an authentic David Hockney, or whether a particular Signal Corps death camp photograph was really by Ronald Reagan. Where we can distinguish clearly between originals and copies we usually value the originals far more highly--both for their aura as relics of a particular human hand and for their superior status as direct rather than secondary evidence.

But the conditions for distinguishing between originals and copies do not hold in all the cases of interest to us here, and this raises some perplexities. Photographs, for example, have negatives and multiple prints. Is the negative the original? Is each print an original? Who is the author of a print made from the negative of some long-dead photographer? [46] Are Polaroid prints more truly "originals" than prints from negatives? What are we to make of photographs of photographs? [47] Sherrie Levine pointedly raised these questions when she photographed a well-known photograph by Walker Evans, then signed and exhibited the resulting print. And Brett Weston dramatized the issues by burning his negatives on his eightieth birthday--declaring that only he could print them in the way that he intended and that he did not want somebody else to make prints after his death. [48]

Digital images seem even more problematic, since they do not even have unique negatives. An image file may be copied endlessly, and the copy is distinguishable from the original only by its date since there is no loss of quality. Unlimited numbers of displays and prints may be made from each copy, and displays may be fleeting like musical performances rather than permanent like paintings. The original image file may be destroyed within a short time of its creation, but many of its descendents may live on. In some cases, digital images are not captured but synthesized by application of rendering procedures to geometric data. Is the geometric database, then, the original? What if different rendering procedures are applied to the same geometric database? Does each application of a new rendering procedure produce a new original work of art? Is the rendering procedure really the original (as one might argue that the recipe rather than the individual dish is the original work of culinary art)?

A famous incident in the history of computer graphics has dramatized these questions. In the very early

days of three-dimensional computer graphics, a beautiful digital model of a teapot was produced at the University of Utah. Copies of this model have since found their way to computer-graphics laboratories throughout the world, and dozens of very different rendering procedures have been applied to it to produce thousands of variant teapot images--smooth teapots and rough teapots, transparent ones and reflective ones, metal, stone, wooden, fleshy, and furry ones. At one SIGGRAPH computer-graphics conference there was even a teapot-rendering competition.

In his magisterial *Languages of Art* Nelson Goodman has introduced some technical distinctions that clarify the problem of differentiating appropriately between originals and copies.^[49] First, he distinguishes between one-stage and two-stage arts. Production of a pencil sketch or a Polaroid print is a one-stage process. But production of music is often a two-stage process: composition followed by performance. Many images are also produced in two stages: plates are etched then printed, photographic negatives are exposed and developed then printed, and digital images are encoded then displayed. In a two-stage process, the work is often divided among different individuals: a pianist may perform a work composed by somebody long dead, a photographer may print an archived negative produced by some forgotten predecessor, and a computer hacker may generate a display from an image file of anonymous origin that was read from some distant bulletin board.

Secondly, Goodman distinguishes between autographic and allographic arts. Painting, for example, is autographic, but scored music is allographic. The essential difference is that a musical work is specified in some definite notation system, whereas a painting is not. The musical score can be copied exactly, character by character, and any correct copy is as much a genuine instance of the work as any other. In effect, Goodman suggests, the fact that a work "is in a definite notation, consisting of certain signs or characters that are to be combined by concatenation, provides the means for distinguishing the properties constitutive of the work from all contingent properties--that is, for fixing the required features and the limits of permissible variation in each." But in painting, where the work is not specified in such a notation system, "none of the pictorial properties--none of the properties the picture has as such--is distinguished as constitutive; no such feature can be dismissed as contingent, and no deviation as insignificant." ^[50] A copy of a score need not, then, be the product of the composer's own hand in order to qualify as a genuine instance of a work, but a painting can be a genuine work only if it is actually an object made by the purported artist. If it is the work of some other hand, it is a forgery.

Autographic works such as paintings or videotapes consist of analog information: they cannot be copied exactly, and repeated copying always introduces noise and degradation. But the specification of an allographic work consists of digital information: one copy (of a musical score, of the script of a play, of an image file) is as good as another. Notice, incidentally, that two-stage works are frequently, but not necessarily, allographic: an etching plate or photographic negative consists of analog information, cannot be copied exactly or used to make precisely identical prints, and does not specify the constitutive properties of the work in the rigorous way that a script or score does. ^[51]

Allographic works can be instantiated limitlessly (but the concept of instantiation does not apply to autographic works--they are unique): a musical work is instantiated in a performance that faithfully follows the score, a play is instantiated in a performance that faithfully follows the script, and a digital image is instantiated in a display or print that faithfully follows the tones or colors specified in the image file. Instances of the same work can vary (sometimes widely) in their contingent properties but must display the required features in order to count as instances. Thus musical and theatrical performers are free, to some extent, to interpret a work--and, indeed, we may place a high value on unusual and innovative interpretations that reveal hitherto unsuspected dimensions of the work. Similarly, a computer may mechanically interpret a work in different ways, using different algorithms and devices, to produce significantly differing instances.

Digital images, then, are two-stage, allographic, mechanically instantiated works. We can take a display or print to be a true record if the image-capture process was an automatic one, if the image file that was used is an exact copy of the one that was originally captured, and if a correct interpretation algorithm has been applied. When these conditions can be shown to hold, we can place at least as much confidence in the image as in an unretouched photograph--perhaps more, since copying does not produce noise and degradation and

since interpretation algorithms are less beholden to human intentions than the darkroom processes used by photographers. But it is usually extremely difficult, in practice, to demonstrate that the conditions do hold, since electronic recording media are made to be reused, and there is simply no equivalent of the permanently archived, physically unique photographic negative. Image files are ephemeral, can be copied and transmitted virtually instantly, and cannot be examined (as photographic negatives can) for physical evidence of tampering. The only difference between an original file and a copy is in the tag recording time and date of creation--and that can easily be changed. Image files therefore leave no trail, and it is often impossible to establish with certainty the provenance of a digital image.

Mutation and Closure

Traditionally, musical scores, literary texts, and other specifications of allographic works have had final, definitive, printed versions. The act of publication is an act of closure. You can modify a printed score or text by hand, but this produces a new (if unoriginal) work, not a redefinition of the existing finished work. Where scores or texts are corrupted in some way, scholars often expend considerable effort in attempting to recover definitive versions. But there is no corresponding act of closure for an image file. In general, computer files are open to modification at any time, and mutant versions proliferate rapidly and endlessly. Scholars can often trace back through a family tree of editions or manuscripts to recover an original, definitive version, but the lineage of an image file is usually untraceable, and there may be no way to determine whether it is a freshly captured, unmanipulated record or a mutation of a mutation that has passed through many unknown hands. So we must abandon the traditional conception of an art world populated by stable, enduring, finished works and replace it with one that recognizes continual mutation and proliferation of variants--much as with oral epic poetry. [52] Notions of individual authorial responsibility for image content, authorial determination of meaning, and authorial prestige are correspondingly diminished.

Furthermore, the traditional distinction between producers and consumers of images evaporates. A scientist interpreting a digital image may, for example, apply transformations to the digital data in order to bring out features and relationships of interest, then store the result in a new image file. The reading becomes a new work, with perhaps as much or more claim to our interest and attention as the original. We might best regard digital images, then, neither as ritual objects (as religious paintings have served) nor as objects of mass consumption (as photographs and printed images are in Walter Benjamin's celebrated analysis [53]), but as fragments of information that circulate in the high-speed networks now ringing the globe and that can be received, transformed, and recombined like DNA to produce new intellectual structures having their own dynamics and value. [54] (Text fragments manipulated by word processors and digital sound samples manipulated by computer music systems have a similar character.) If mechanical image reproduction substituted exhibition value for cult value as Benjamin claimed, digital imaging further substitutes a new kind of use value--input value, the capacity to be manipulated by computer--for exhibition value. The age of digital replication is superseding the age of mechanical reproduction.

The cultural production system now emphasizes processability. The digital structures that are produced and consumed do not just refer to each other, they are actually made from each other, so that they form mirror mazes of interpictoriality hooked to the external physical world (at relatively few points) by moments of image capture. Images do not just mirror the world directly, as they once seemed to do, but reflect traces (perhaps tinted or distorted) of other images. That loss of the external referent, and the growing self-referentiality of symbol systems, which has so preoccupied poststructuralist theory, are here escalated to a new level. Logical associations of images in databases and computer networks become more crucial to the construal of reality than physical relationships of objects in space. Digital imaging now constructs subjects in cyberspace. [55]

Image Ethics Redefined

As digital images have become increasingly important items of exchange in the worldwide electronic-information economy and as traditional conceptions of image truth, authenticity, and originality have consequently been challenged, ethical and legal dilemmas have emerged. Many of the traditions,

standards, and laws developed in the predigital era seem inadequate when they are extended to the new situations created by the new technology.

Since the development of printing, for example, the concepts of "fixing" and "publication" of definite "works" have played key roles in copyright law. There was a basic assumption that production of copies either as pieces of handiwork or as industrial commodities--was a difficult and expensive process and that copies were valuable material artifacts existing in limited numbers. The US Copyright Act of 1909 was typical: it gave protection to intellectual and artistic works--such as books and photographs--that were "published with notice." The more up-to-date provisions of the Berne Convention dispense with the idea of formal publication as the starting point for copyright protection and extend it to works that are merely "fixed in some tangible medium of expression." But the speed and informality of digital image production, the practical difficulties of distinguishing between "draft" and "published" versions and between originals and copies, the existence of digital images in forms that are not eye-readable, their ease of duplication, their mutability and lack of closure, their tendency to proliferate limitless variants, and their unconventional channels of distribution conspire to make them very difficult to pin down in this way. [56] There is an erosion of traditional boundaries between artist or photographer, editor, archivist, publisher, republisher, and viewer. And digital images do not necessarily come embedded in manufactured material substrates, like texts in books and musical performances on records: often, you can just download them from a database. In multiple and sometimes subtle ways they resist treatment as privately owned material commodities.

The traditional concept of a derivative work--as exemplified by translations of books, films based on novels, paintings made from photographs, and the like--is also under challenge. As we have seen, a digital image file is made to be processed--to be transformed into something else--and any file is the potential progenitor of an endless sequence of descendents. It seems far from straightforward to specify the distinctions between outputs from image-processing operations that are trivially different from the inputs, outputs that contain sufficient original content to be classified as distinct but derivative works, and outputs that are most reasonably regarded as genuinely original productions. How does this practical reality affect whatever moral and legal rights a photographer, graphic artist, or film director may have to control the production of derivative works and to prevent undesirable transformations? And when should image-processed derivatives themselves be entitled to copyright protection?

In 1986 the purchase of the MGM film library by the television entrepreneur Ted Turner raised the issues of film protection in dramatic fashion. Turner announced his intention to apply digital colorization to one hundred old feature films and commented: "The last time I checked, I owned those films. I can do anything I want with them." Many prominent directors and cinephiles protested against the colorization of black-and-white film "classics," and the Directors Guild of America called it "cultural butchery." [57] In 1991 *Star Wars* director George Lucas suggested that colorization was only, in fact, the tip of the iceberg:

The agonies filmmakers have suffered as their work is chopped, tinted and compressed are nothing compared to what technology has in store.... Unless the United States achieves uniformity with the rest of the world in the protection of our motion picture creations, we may live to see them recast with stars we never directed, uttering dialogue we never wrote, all in support of goals and masters we never imagined we would serve.[58]

However rights to reproduce digital images and produce derivative works from them are established and protected, the question of what these rights are worth and how they should be transferred remains. Marxist analysts are disconcerted to note that the labor theory of value is not much help here; photographers, stock agencies, and museum directors wonder what to charge for rights and how to collect their money. Photographers, for example, have traditionally retained economic control of images by keeping the negatives and selling prints, but this strategy becomes impossible when images are archived and distributed as files of digital information. Should image CDs, then, be treated like stock-photo catalogues, with users required to purchase separately the reproduction rights to any of their contents, or should such CDs become direct sources of immediately reproducible images? Should electronic reproduction rights be sold like print rights? If they are, there are some difficult pricing and contractual issues to resolve. Since electronic images are disseminated in different ways and in different quantities from print images, for example, it can be argued

that rights should be priced on some different basis. And controls that museums have traditionally exerted over the quality and distribution of print reproductions become much more difficult to enforce with electronic reproductions.

If a digital image does have value to a collector, how can this be preserved? Paintings are unique and often appreciate in value, print runs are limited, and photographers can destroy their negatives to prevent the production of further prints that might devalue the ones already in existence. But, since digital image files can be replicated endlessly and prints can be made mechanically whenever desired, there is no act equivalent to burning the negative or breaking the mold: any copy of the image file will serve as well as any other as the source for further copies.

When does processing or manipulation add value to an image? It might well be argued, for example, that colorization of film adds value. What about enhancement of a poor-quality image by sharpening, or smoothing of a portrait to make it more flattering? If value is added, who is entitled to claim recompense for this?

Where does an image actually reside? The network distribution of digital images can make it difficult to determine image locations--unlike the case of, say, paintings that reside in museums. Images can exist as multiple, geographically distributed identical copies, and these copies can be moved around as in a gigantic, extremely high-speed shell game. Networks frequently cross boundaries of legal jurisdiction, potentially putting image copies beyond the statutory reach of law-enforcement and regulatory agencies. [\[59\]](#) This creates policing problems. Political censors will find it increasingly difficult to prevent the infiltration of their territories by seditious or otherwise unwelcome images, pornography will be harder to control, and the subjects of visual libel may not have any effective way to prevent the dissemination of offending images.

And what is fair use of a digital image? It is generally accepted that a scholar may copy short portions of a published text into his or her notes and subsequently use those excerpts in new works of criticism, comment, news reporting, teaching, and so on. Can that same scholar select part of an electronically distributed digital image and use desktop-publishing software to paste it into a page layout? If so, how much of the image can fairly be reused in this way? Surely it is unethical, and in many cases a violation of copyright, to reuse a complete image without appropriate permission. Just as clearly, though, it would be absurd to complain about copying the value of a single pixel from an image (or a single sound from a musical performance)--it's just a number. At what intermediate point can we reasonably draw the line? What if a pattern or texture is extracted and reused in production of a computer-synthesized perspective rendering of a building? What about a dramatic sky extracted from an Edward Weston landscape photograph and reused in a new landscape composite? Where does visual plagiarism begin? Graphic artists will have to evolve norms governing fair use of digital imagery analogous to the traditions and conventions that govern the quotation, recombination, and paraphrase of fragments of text.

Finally, how should the rights of photographic subjects be defined and enforced, and are established ways of compensating subjects still adequate? [\[60\]](#) Does a model's signed release of an image extend to the use of that image in an electronic "clip art" collection and to its endless transformation and recombination to produce new images? How should releases be written, and how should a model be paid for this sort of use? And what limits are there to electronic transformation of photographic images to produce unflattering caricatures or scenes that show recognizable individuals in a discreditable light? The photograph's air of reality makes a difference here: a digitally manipulated photograph showing a prominent politician in a compromising or damaging situation has a very different effect from that of a drawn cartoon showing exactly the same thing. In the 1990 Massachusetts gubernatorial election campaign, for example, the candidate John Silber was videotaped in a particularly offensive outburst against working mothers, whereupon his opponent quickly produced an effective television spot from this footage--manipulated to make Silber seem particularly menacing by showing him enlarged and slightly distorted. [\[61\]](#)

For photojournalists, as we have seen, the ethical issues dramatically present themselves as ones of creative control, individual and institutional responsibility for image content, and formulation of codes of conduct. Are press photographers to be reduced to little more than fleshy bipods--mobile supports for image-capture

devices that send streams of pictures back to an editor's desk, where the crucial selection and framing decisions are made? Who controls the tonal and color qualities of an image--photographer, photo editor, or computergraphics technician in the production department? When does a succession of small and apparently innocent manipulations add up to significant deception? How can this gradual degradation of evidential value be controlled? Who guarantees the integrity of a news photograph, and who checks whether an image of doubtful provenance might be a tendentious fabrication? When a digital image is the product of many hands, how should the image credit be written? And, if that image deceives or defames, who bears ultimate moral and legal responsibility?

As these signs of ethical and legal strain show, the digital image is emerging as a new kind of token--differing fundamentally from both photographs and paintings--in communicative and economic exchanges. It demands new rules for structuring those exchanges.

Devaluation

The painter, the photographer, and the digital imager have different social and cultural roles to play. A painter, firstly, is traditionally seen as an artificer, a patient maker, an urbanized craftsperson who transmutes formless raw materials into images. We naturally use the language of personal intention--reference, comment, expression, irony, conviction, truthfulness, and deception--to describe this process. There seems a comfortable fit with the Aristotelian conception of a fabricator, impelled by an anticipatory idea, who imposes form on matter.

But photography evokes predatory metaphors: a picture is "taken," the photographer operates in a ruthlessly competitive economy of image hunting and gathering. Photographs are trophies--won by skill and cunning and luck, by being in the right place at the right time, and by knowing how to aim and when to shoot. [\[62\]](#) Form is out there to be discovered, then impressed on matter by means of a swift, automatic process.

Long ago, Oliver Wendell Holmes fancifully described what he took to be the capitalist political economy of the photographic image (in the specialized form that particularly interested him--the stereograph). [\[63\]](#) He first imagined expeditions of visual conquest and plunder:

There is only one Colosseum or Pantheon; but how many millions of potential negatives have they shed--representatives of billions of pictures--since they were erected! Matter in large masses must always be fixed and dear; form is cheap and transportable. We have got the fruit of creation now, and need not trouble ourselves with the core. Every conceivable object of Nature and Art will soon scale off its surface for us. Men will hunt all curious, beautiful, grand objects, as they hunt the cattle in South America, for their skins, and leave the carcasses as of little worth.

Then he spoke of photographs as cognitive cold cash, the value of which was defined by reference to a kind of gold standard of nature:

Again, we must have special stereographic collections, just as we have professional and other special libraries. And, as a means of facilitating the formation of public and private stereographic collections, there must be arranged a comprehensive system of exchanges, so that there may grow up something like a universal currency of these bank-notes, or promises to pay in solid substance, which the sun has engraved for the great Bank of Nature.

Since Marx, of course (and more directly to the point, since Althusser on ideological apparatuses), many have greeted the idea of such buccaneering enterprises with far less enthusiasm. Susan Sontag, for one, has seen panoptic photographic production as a potentially sinister ally of the late-capitalist state:

A capitalist society requires a culture based on images. It needs to furnish vast amounts of entertainment in order to stimulate buying and anesthetize the injuries of class, race, and sex. And it needs to gather unlimited amounts of information, the better to exploit natural resources,

increase productivity, keep order, make war, give jobs to bureaucrats. The camera's twin capacities, to subjectivize reality and to objectify it, ideally serve these needs and strengthen them. Cameras define reality in the two ways essential to the workings of an advanced industrial society: as a spectacle (for masses) and as an object of surveillance (for rulers). The production of images also furnishes a ruling ideology. Social change is replaced by a change in images. The freedom to consume a plurality of images and goods is equated with freedom itself. The narrowing of free political choice to free economic consumption requires the unlimited production and consumption of images. [\[64\]](#)

Digital imaging has upped the ante in the debate defined by the formulations of Holmes and Sontag. Now there is a new, postindustrial economy of images, with superimposed processes of gathering and stockpiling raw materials, extraction, manufacture, assembly, distribution, and consumption. Perhaps the most striking illustration of this new economy is provided by the EROS Data Center near Bismarck, North Dakota. More than six million satellite and other aerial images have been stockpiled there for distribution to the public. Satellites continue to scan the earth and send images of its changing surface back, causing the stock to grow at a rate of twenty thousand per month. These ceaselessly shed skins are computer processed, for various purposes, by mineral prospectors, weather forecasters, urban planners, archaeologists, military-intelligence gatherers, and many others. [\[65\]](#) The entire surface of the earth has become a continuously unfolding spectacle and an object of unending, fine-grained surveillance.

In the digital image economy, form has become even cheaper and more swiftly transportable than Holmes could ever have imagined. Furthermore, the connection of images to solid substance has become tenuous. The currency of the great bank of nature has left the gold standard: images are no longer guaranteed as visual truth--or even as signifiers with stable meaning and value--and we endlessly print more of them.