Chapter 3

WATER IN THE CAMERA

IN 1989, Jeff Wall published a short essay called "Photography and Liquid Intelligence." Like most of the other writings that we return to again and again, it is full of seemingly unresolvable contradictions. These contradictions radiate out from the notion of "liquid intelligence," which links terms that are hard to think together and whose locus keeps shifting. Sometimes Wall attributes this intelligence to liquids, sometimes he situates it within chemical photography, and sometimes he imputes it to nature, the world, or even the cosmos. He distinguishes it at every point in his argument from another kind of intelligence: "optical" or "technological" intelligence. But this concept is also unstable, and he adopts a different attitude toward it in the second half of the essay than he does in the first.[1]

Wall begins "Photography and Liquid Intelligence" with one of his own works, *Milk* (1984). In the lower right corner of the light box, an apparently indigent man sits on the pavement in front of a red brick wall. The wall fills most of the right side of the picture, and part of the left. There is an inexplicable gap between it and the next building, where weeds are collecting. This building is a hodgepodge of materials and architectural signifiers, all of which feel strangely truncated, and none of which has any discernible function or meaning. It combines a narrow strip of fake bricks with a large window framed in black metal, and a patch of stucco wall. The window connotes "shop," but what its glass reveals of the interior—a small door opening onto a staircase—suggests that it is a residential building. This is form at its most arbitrary.

The man's left hand is clenched, and his left arm—whose angularity rhymes with the horizontal pattern of the brick—is rigid with anger. He looks to the right, and his left knee is also turned in this direction, but his right knee points in the other direction. He holds a milk carton in a brown paper bag in his right hand, out of which milk erupts. Since this is one of Wall's most "psychological" works, one is sorely tempted to read the liquid symptomatically—to interpret it as a signifier of the man's rage against the social order from which he is excluded,

Figure 39/Colorplate 8. Jeff Wall, *Milk*, 1984. Transparency in light box. Courtesy of the artist.

and his body's double directionality as the manifestation of an internal division. The light box, though, is named after the milk, not the man, and Wall also focuses on the milk in his 1989 essay. He associates it with lability and incalculability, and he opposes it to "form," rather than to society or a psychic entity.

"In *Milk*, as in some of my other pictures, an important part is played by complicated natural forms," Wall writes. "The explosion of the milk from its container takes a shape which is not really describable or characterizable, but which provokes many associations. A natural form, with its unpredictable contours, is an expression of infinitesimal metamorphoses of quality."[2] This is the first instantiation of the concept invoked in the title, and Wall invites us to interpret it both literally and metaphorically: as a quality that liquids have and also as the fluidity of what we imagine to be solid forms. Photography is based on a dramatically different kind of movement, he declares: the mechanical opening and closing of the shutter. This movement gives it a "substratum of instantaneity."[3]

The passage I have just summarized could have been lifted directly out of Bergson's *Creative Evolution*, and it seems the perfect segue to one of the philosopher's primary claims: the claim that since photography brings everything to a halt, it is incapable of registering these metamorphoses.[4] Wall, however, heads off in another direction. He argues that the camera's instantaneity permits it to "see" much more quickly than we do—almost as fast as liquids metamorphose. This makes it the ideal medium for representing this movement. The fact that it does so in such a "dry" and "glassed-in" way is also an advantage rather than a disadvantage, since it shows us that photography is an "institution," remote from nature.[5] By immobilizing the movement whose properties it renders visible, photography demonstrates that its intelligence is "ocular," not "liquid." And the glass needs to be there, because you "certainly don't want any water in your camera."[6]

Later in the same paragraph, Wall reshuffles the deck. Chemical photography relies on water and other fluids, he now argues, and these fluids connect it to "very ancient production-processes" from "the origins of techne"—processes like washing, bleaching, and dissolving, that have not emerged "from the mineral and vegetable worlds."[7] They also give it a liquid as well as an ocular intelligence. Photography's liquid intelligence makes it unpredictable and uncontrollable, and hence hard to "rationalize." Computation liberates the dry part of the medium from this unhappy alliance by eliminating liquids "from the immediate production-process."[8]

There are echoes of Heidegger in this argument,[9] and they become more pronounced as Wall proceeds. Technology may be the vehicle through which we purge photography of liquidity, he argues, but the intelligence behind this evacuation is human. The goal of the exercise is also dispiritingly familiar: separation from and conquest of the world. "Th[e] expansion of the dry part of photography I see metaphorically as a kind of hubris of the orthodox technological intelligence which, secured behind a barrier of perfectly engineered glass, surveys natural forms in its famous cool manner," Wall writes. And this look may not be as "cool" as it appears to be. Human vision becomes "ballistic" when it is "augmented by glass."[10] It is now the world that needs protection, not the camera.

At first glance, this argument meshes perfectly with the narrative I have been recounting. In the first chapter of its history, photography's intelligence was entirely liquid. A continuous stream of evanescent images entered the darkened space of the camera obscura from outside, dynamically analogizing its equally labile source, and encouraging the viewer to "energize" the world by corresponding with it both psychically and aesthetically. This liquidity washed away all of the distinctions on which modern subjectivity depends,

and rendered certain knowledge impossible, so seventeenth-century man attempted to "ocularize" the camera obscura by substituting mental representations for the perceptual world, and transforming the camera obscura into a device for arresting its image stream.

Most of the latter devices were incorporated into tables and desks, at which the viewer sat, and on which he drew. Although they encouraged him to see himself as the source of the resulting image, they did not attribute the stream of images on which he based his drawing to his look. The camera obscura also mediated his encounter with the world. He was consequently still at the mercy of the device's liquid intelligence. But in 1694, Robert Hooke designed an optical camera obscura that fit over the head of its user and moved when he did, as if it were a part of his body. The figure in the illustrative etching of this device draws on the screen "through" which he surveys the world, in a seemingly unmediated way. The "ballistic" and "projectile" qualities that Wall associates with the "glassed-in" look are communicated through its shape, and its user towers over the landscape in which he stands, his head in the celestial light. "I see, I draw, I conquer" is the etching's implied caption.

And what was only a dream in 1694 is now a reality. "Woolgathering Freudians" may worry about "the allusions to firearms and warfare that permeate the terminology of photography," as Todd Gustavson remarks in his history of the camera,[11] but the rest of us happily "load" our camera, "aim" at what we want to "capture," and "shoot." And since our cameras are digital, and we process them on our computers, everything is calculable. Soon there will be no more darkrooms or developing labs, and photography will be completely dry.[12] However, it wasn't until the 1880s that the verb "to take" decisively replaced the verb "to receive" and "shoot" became a synonym for "take." It was also only through the industrialization of chemical photography that this shift occurred. Most of the terms through which we conceptualize the medium were manufactured for us, just like our equipment and material.

Figure 40. Engraving from Robert Hooke, *Philosophical Experiments and Observations*, 1727.

THE OCULARIZATION of chemical photography began—as one would expect—with the camera. Daguerre designed the apparatus for which his process called, and signed a contract with his brother-in-law Alphonse Giroux to manufacture and sell it. The device, which was similar to the one he himself used, was a fixed-bed, double-box camera, which the operator focused by sliding the rear box into the slightly larger front box. Twenty-five percent of the profits from this enterprise went to him, and his name was used to market the camera and undercut competitors. Giroux attached a plaque to the device that read: "No apparatus is guaranteed if it does not bear the signature of M. Daguerre and the seal of M. Giroux."[13]

To make the camera more attractive, Giroux sold it with a kit containing everything else that an operator would need to make a daguerreotype: polished plate, spirit lamp, mercury box, box for iodizing, chemicals, and buff stick. He also equipped it with a landscape-type lens, presumably so that he could patent it as a new design, and others followed suit. In 1841, N. P. Lerebours added a simple shutter to a camera of similar design, in 1843 Charles Chevalier hinged the sides of the boxes, allowing the camera to be folded up, in 1845 another French manufacturer created a camera with a three-box focusing system, and in 1851 W. & W. H. Lewis designed a camera with an internal bellows that was transportable and that permitted the operator to change the focus and alter the perspective.[14]

Figure 41. Giroux daguerreotype camera, 1839. Courtesy of the George Eastman House, International Museum of Photography and Film.

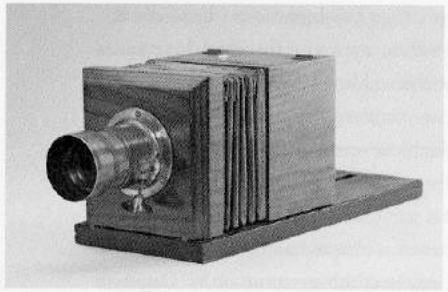

Figure 42. Lewis daguerreotype camera (quarter plate), ca. 1851. Courtesy of the George Eastman House, International Museum of Photography and Film.

These innovations made the camera easier to use, but they did nothing to conceal the distance between the operator's look and the camera lens. Not only were the lens and the viewfinder at opposite ends of the device, but focusing the lens and exposing the photographic plate were manifestly separate events. The photographer also had only limited control over the first, and none over the second. In order to bring the image that would later emerge into conformity with the one he wanted to "obtain," or even to have some sense of the one that he was likely to receive, he was obliged to open the camera shutter, slide a ground-glass plate into the frame designed for the photographic plate, look at the image that appeared on it, and adjust the lens until it came into focus. Because of the amount of light in the camera, this image was faint, so focusing it required a lot of guesswork. In order to expose the photographic plate, the photographer had to remove the ground glass, close the shutter, slide the plate into the frame, and reopen the shutter long enough for the image to be received. And once the photographic plate was in place, he was unable to see what was happening inside the camera.

Between 1858 and 1862, three cameras were created that should have made it easier for the operator to believe that he was "in control." In 1861 Thomas Sutton designed and patented a single-lens reflex plate camera, which narrowed the gap between focusing and exposure.[15] A mirror was positioned between the lens and the photographic plate, which reflected the luminous image stream entering the camera to the viewfinder, obviating the need to replace the ground glass with the photographic plate prior to exposure, and giving the operator a much better sense of what the camera would be "seeing." After focusing the lens, he raised the mirror with a manual lever so that the photographic exposure could occur.

In 1858, Thomas Skaife created a small camera with a lens so fast that it could register slow-moving objects. He modeled it on a gun, and named it the "Pistolgraph." People also perceived it as a weapon; Skaife was "nearly arrested" when he directed it at Queen Victoria—and cameras were by then a familiar part of the cultural landscape.[16] The Pistolgraph couldn't be "fired from the hip," since it required a tripod, but in 1862 the French company A. Briois began manufacturing

Figure 43. Pistolgraph by Thomas Skaife, London, ca. 1859. Courtesy of the George Eastman House, International Museum of Photography and Film.

a gun-shaped camera that was designed to be handheld: Thompson's Revolver Camera.[17] Like the Colt revolver,[18] on which it was modeled, Thompson's Revolver Camera had a rotating cylinder that allowed its user to "shoot" multiple times before "reloading."

Surprisingly, though, Sutton's single-lens reflex camera never went into production, and there is a dearth of information about it, suggesting that it didn't appeal to the popular imagination.[19] There was also little interest in the gun-shaped cameras; the Pistolgraph wasn't reproduced, and only one hundred issues of Thompson's Revolver Camera were manufactured.[20] These devices didn't catch on, I believe, because the other aspects of chemical photography were still so "wet"—literally as well as metaphorically. The medium's practitioners experimented with a dizzying number of chemicals and foods in their attempt to find substances sensitive enough to receive the photographic image "expeditiously." The season, the weather, and the time of day all complicated this search, because what worked in one set of conditions often failed to work in another, and often for reasons that were difficult to understand. "Whene'er the wind is in the East, / Use twice the seconds at the least," wrote a midcentury wit. "And if the East incline to the North, / Take not the wretched sitter forth. / Come cloud electric, or of hail, / Then every picture's sure to fail, / But with light zephyrs from the West, / In scarce five seconds 'tis imprest" / And if the West incline to South, / In three you have eyes, nose and mouth."[21]

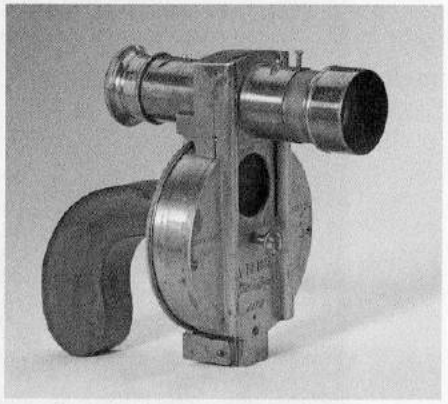

Figure 44. Thompson's Revolver Camera, ca. 1862. Courtesy of the George Eastman House, International Museum of Photography and Film.

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"Poetics Photographics"

There are several similar passages in Lady Eastlake's 1857 essay, in one of which she observes that photography is "too profoundly interlocked with the deep things of Nature to be entirely unlocked by any given method," and in another of which she concludes that the "subtle agenc[y]" on which the photographer depends will "never be taught implicitly to obey."[22]

Photography's practitioners also searched long and hard for a substance potent enough to retain the images that appeared on their recipient plates. After so many of the calotypes in *The Pencil of Nature* vanished, photographers started using albumen paper, but these prints were also unreliable. In 1855 the Royal Photographic Society of London created a Fading Committee to address the problem.[23] And since the daguerreotype was one of a kind, and Talbot's positive prints so varied, photographers were no closer to reaching the third and most important of Niépce's goals: reproduction.

In 1851, Frederick Scott Archer introduced the collodion wet plate, which required only a few seconds of exposure and which produced a sharply delineated negative on a glass plate, from which many nearly identical positive prints could be made. It was a complicated process, though, with many steps, all of which had to be performed within ten minutes, before the chemicals dried. After polishing the plate, the photographer coated it with a solution of collodion, ether, alcohol, potassium iodine, and nitrated cellulose, making sure that it was evenly distributed. He then sensitized the plate by dipping it in a bath of silver nitrate, and placed it in the camera. The silver nitrate solution often dripped, resulting in stains and chemical buildup on his equipment, and the

Figure 45. Illustration from Gaston Tissandier, *A History and Handbook of Photography*, 1877.

chemicals with which he coated the plate eventually clogged the silver nitrate solution, causing the process to fail. If he wanted to work outside a studio, he had to travel with a darkroom and bottled chemicals.[24]

And this was only the beginning of the photographer's travails and tribulations. Oliver Wendell Holmes provides a detailed account of every stage of the wet-plate process in "Doings of the Sunbeam," and it shows that the development of the negative was as suspenseful in 1863 as it was in 1840. "We open [the camera] and find our milky-surfaced glass plate looking exactly as it did when we placed it in the shield," Holmes writes. ". . . We pour on the solution. There is no change at first . . . What if there were no picture there? Stop! What is that change of color beginning at the edge . . . ? It is a border, like that round the picture and then dawns the outline of a head."[25] The rest of the image slowly emerges, but then begins to disappear. Not until it has been washed in water, re-treated several times with the developing solution, rewashed, "plunged" into a "bath" of hyposulphite of soda, washed yet again, dried, and varnished is the negative fully there. Making positive prints from this negative was—as Holmes demonstrates—every bit as messy, laborious, and unpredictable.[26]

The liquid intelligence of photography also expressed itself in another way in the 1850s and 1860s: one that encroached on human vision. In the early 1830s, Charles Wheatstone and Sir David Brewster, who had already written extensively about the afterimage and other optical "illusions," began investigating the physiological bases of another retinal peculiarity: binocular disparity. Those of us who have two eyes see something slightly different with each of them, in two dimensions. Our brain ascribes these differences to depth, and fuses the two images together. Consequently, instead of perceiving two flat images, we generally perceive one three-dimensional image.[27]

Binocular disparity serves a crucial spatial function: it allows us to experience the "thickness" of the world. However, its discovery compounded the challenges that Kepler's notion of the retinal image had posed to earlier thinkers.[28] Not only is this image inverted and laterally reversed, but there are *two* of them, and they are not identical. And not merely are we unable to see these images in the guise in which they are received, but we do not see them *at all*, because an internal agency combines them, over which we have no control.

In 1838, Wheatstone created an optical device that exploited this blind spot: the stereoscope. He used mirrors to deliver reflections of slightly different images to each of the viewer's eyes, demonstrating that we also read difference as depth when the perceptual objects are flat.[29] This had even more dramatic implications for human vision, as Laura Burd Schiavo notes in an excellent 2003 essay.[30] By "creating a situation in which we 'see' that which is

not really there, the stereoscope insinuated an arbitrary relationship between stimulus and sensation," she writes. It also denaturalized the system of perspective, which is predicated on a "single, ideal eye" and which assumes there to be "a direct correlation between the object and the retinal image."[31]

In 1849, Brewster invented the first lens-based stereoscope, in 1851 Jules Duboscq began making stereographic daguerreotypes, and in 1854, George Swan Nottage founded the London Stereoscopic Company for the production and sale of stereoscopes. Within two years, the Gernsheims report, "the stereoscope was in use in all parts of the world, and it was estimated that this firm alone, which then offered 10,000 stereoscopic slides, had already sold half a million instruments." By 1858, the number of available slides had increased to 100,000. The London Stereoscopic Company's motto was "No home without a stereoscope."[32] It might seem odd that a device that was used to demonstrate the unreliability of human vision should have become so popular, but most midcentury commentators saw it as an "instrument"—a tool "for furnishing visual truths,"[33] or for facilitating visual pleasure. "Nothing better displays the beauties and marvels of Photographic Art," an American commentator wrote in 1858.[34]

For some midcentury commentators, the stereoscope was also photography's "employer." "In every part of the globe" photographers are busily "taking binocular pictures for the instrument," Brewster enthused in *The Stereoscope*.[35] Others believed that the stereoscope answered to man, just as photography answered to it. "If in the order of things the cheap popular toy which the stereoscope now represents was necessary for the use of man," Lady Eastlake declared, "the photograph was first necessary for the service of the stereoscope."[36] Promoters of stereoscopes and stereo cards took this last argument

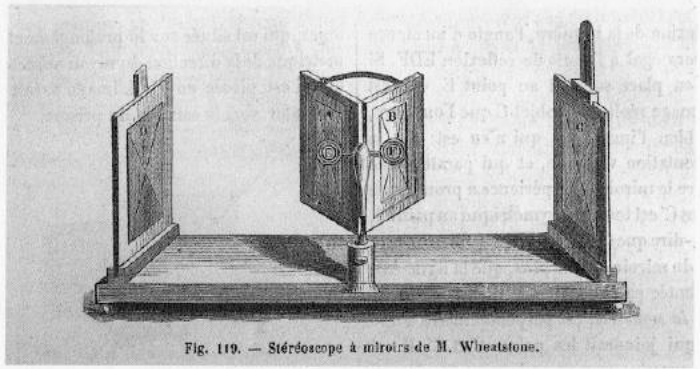

Figure 46. Illustration from Louis Figuier, *Les Merveilles de la Science*, 1869. Courtesy of the Max Planck Institute for the History of Science, Berlin.

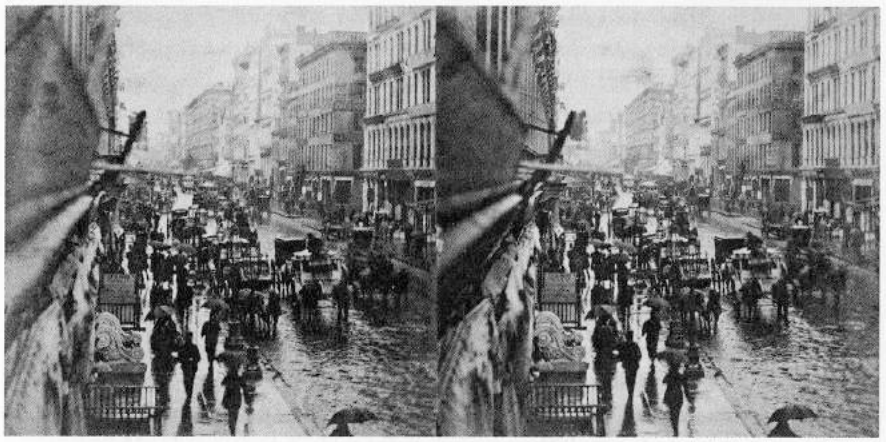

Figure 47. Unknown photographer, *Stereoscopic view of Broadway, New York City*, ca. 1860. Albumen print stereocard. Courtesy of the National Media Museum/SSPL.

one step further. Not only does the stereoscope serve man, and photography the stereoscope, they declared, but the photographer also serves the viewer. Cameramen traverse "lands and seas," cross "rivers and valleys," and ascend "rocks and mountains with their heavy and cumbrous photographic baggage" for "our gratification and instruction"—so that we may "have the advantage" of examining stereoscopic images by our fireplace, without being exposed to "the fatigue, the privation, and risks" of these "daring and enterprising artists," Antoine Claudet wrote in 1860.[37]

However, not everyone subordinated photography to the stereoscope, and the stereoscope to the human look. For John Ellis, photography and stereography were a couple, and one in which there was—surprisingly—no power differential; in 1856, he wrote that they were "indissolubly joined for their mutual advantage" or "dignification."[38] Holmes also emphasized the closeness of this relationship. In 1861 he designed a simple, handheld stereoscope for photographic stereo cards that was widely adopted,

Figure 48. Holmes stereocard viewer. Courtesy Wikimedia Commons.

and that did nothing to conceal the fact that they contain two non-identical images. He also wrote three essays about the stereoscope, which are full of information about and reflections on photography. In the first—"The Stereoscope and the Stereograph" (1859)—he provides an extended account of the differences between a negative and a positive print. In the second—"Sun-Painting and Sun-Sculpture" (1861)—he takes us on a "stereoscopic trip across the Atlantic" through a series of detailed descriptions of photographically-based stereoscopic images. And in the third—"Doings of the Sunbeam" (1863)—he provides the extended account of the collodion wet plate from which I quoted earlier.

In "The Stereoscope and the Stereograph," Holmes also mobilizes all of the tropes that Talbot and other early writers associate with the calotype and daguerreotype, and reaffirms their saving power. We "owe" the "creations of our new art" to the "sun itself," he writes, who is "a master of chiaroscuro," and "the first of colorists."[39] Its illumination permits man to "paint his miniature" simply by "looking at a blank tablet," and "a multitudinous wilderness of forest foliage" to stamp itself "so faithfully and minutely" on that surface that every leaf is "perfect."[40] Unlike man-made pictures, which show only what the artist has seen, a "perfect photograph" is "absolutely inexhaustible." There are "as many beauties lurking [in it], unobserved, as there are flowers that blush unseen in forests and meadows."[41]

Photographs also teach us to see analogically. "[A] point which must have struck everybody who has studied photographic portraits is the family likeness that shows itself through a wide connection," Holmes writes in "Doings of the Sunbeam." "We notice it more readily than in life . . . There is something in the face that corresponds to *tone* in the voice . . . and this kind of resemblance . . . we may observe, though the features are unlike."[42] Finally, photographs challenge our belief in stable forms. "Flitting moods which have escaped one pencil of sunbeams are caught by another," Holmes observes in "Sun-Painting and Sun-Sculpture." "Each new picture gives us a new aspect of our friend; we find he had not one face, but many."[43]

Photography should consequently fill us with "inconceivable wonder," as it did its first viewers, Holmes argues, but it has become "such an everyday matter" that "we forget its miraculous nature."[44] Stereography shows us that photography is a "divine gift"[45] in two ways—through the stereo card, which I will discuss here, and through the stereoscopic image, which I will discuss in the next chapter. Holmes refers to the two side-by-side photographs on a stereo card as "twin pictures," and attributes a disclosive power to them: the power to reveal the similarities that structure our world. "Among the accidents

of life, as delineated in the stereograph, there is one that rarely fails," he writes in "The Stereoscope and the Stereograph, ". . . wherever man lives, you will find the *clothes-line* . . . How it brings the people who sleep under that house before us to see their sheets drying on that fence!"[46]

The slight differences that distinguish one photograph on a stereo card from the other also show us that beings are as mobile and evanescent as the camera obscura's image stream. "It is common to find an object in one of the twin pictures which we miss in the other . . . ," Holmes observes in "The Stereoscope and the Stereograph." "In the lovely glass stereograph of the Lake of Brienz, on the left-hand side, a vaguely hinted female figure stands by the margin of the fair water: on the other side of the picture she is not seen. This is life; we seem to see her come and go . . . Here is the Fountain of the Ogre, at Berne. In the right picture two women are chatting, with arms akimbo, over its basin . . . on the left side there is but one woman, and you may see the blur where the other is melting into thin air as she fades forever from your eyes."[47]

All of the stereo cards that Holmes mentions feature water—a pool, a basin, a fountain, a lake—and most of them also include women. The women stand by the water or lean over it, and eventually they become as fluid as it is, and course through his thoughts, in a striking instantiation of liquid intelligence. "All the longings, passions, experiences, possibilities of womanhood animate that gliding shadow which has flitted through our consciousness," he writes, "nameless,

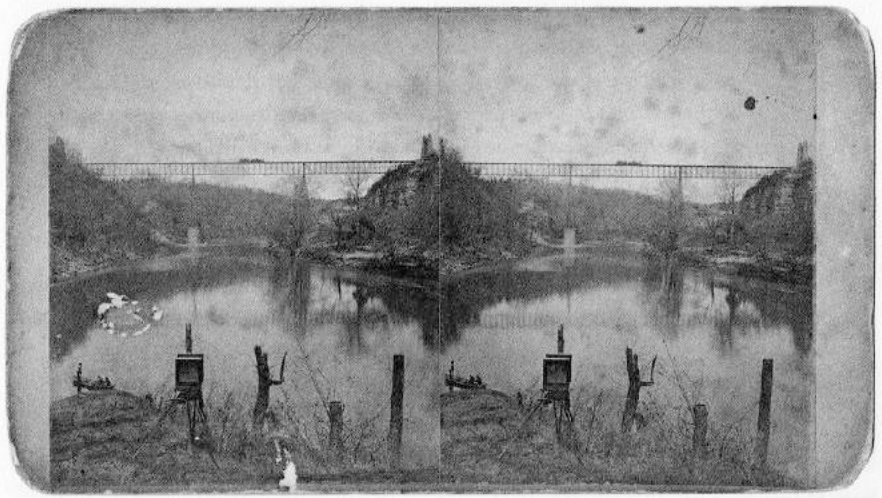

Figure 49. James Mullen, *Kentucky River Bridge. Finished Bridge from Mouth of Dix River.* 1877. Albumen print stereocard. Courtesy of the Archives and Special Collections, University of Louisville.

dateless, featureless, yet more profoundly real than the sharpest of portraits traced by a human hand."[48]

Although Holmes usually refers to the two photographs on a stereo card as "pictures," he sometimes calls them "views."[49] As we have already seen, when users of the optical camera obscura began thinking of themselves as "takers" rather than "receivers" of the world's luminous self-portraits, they also talked about "views"; that was what they "took." The word was important for Niépce as well; he repeatedly tried to extract an image from his camera obscura that corresponded to what he saw when he looked out of his workroom window. And sometimes he says "*point of view*," thereby embedding his optic within what he was attempting to photograph. When Holmes refers to the two photographs on a stereo card as "views," he attests to the impossibility of this project. Even if we were the only spectator in the world, there would always be at least two views, and at least two points of view.

One of the reasons the stereoscope was so easily domesticated is that it is a device for *viewing* these "views," rather than for *making* them. It consequently evades the thorny issue of agency. The stereoscope's user may have been forced to acknowledge his own binocularity, but nothing prevented him from attributing what he saw to the photographer's look. The latter was not so fortunate. Some of the "twin pictures" on nineteenth-century stereo cards were produced with a single-lens camera; the two photographs were made consecutively, with slightly different camera setups, or carved out of the same negative, through artful framing. Most of these photographs, though, were created with a stereo camera. Unlike a conventional camera, which has monocular "vision," which is hard to align with the human look, the stereo camera "sees" binocularly, and is all too easy to align with the human look. I say "all too easy" because as two contemporaneous essays show, the stereo camera cannot be reconciled with the Cartesian dream.

Figure 50. Jamin stereo camera. Courtesy of the George Eastman House, International Museum of Photography and Film.

In September 1869, *Harper's New Monthly Magazine* published an essay by Austin Abbott called "The Eye and the Camera."[50] The human look cannot be compared to an "ordinary camera," Abbott argues there, since we have two eyes, and it has a "single eye."[51] If we want an optical device that resembles human vision, we must turn to a different kind of camera: the *stereo* camera. The caps that fit over the "two round

tubes in front" that contain the lenses are like our eyelids, and the diaphragm that regulates the side of the aperture is like our pupils, which expand and contract "according to the degree of light."[52] This "double instrument" makes "two pictures at the same instant that differ from each other just as the images received by one eye differ from those received by the other in an observer standing at the same place." This is not a flattering comparison, to say the least; instead of humanizing the camera, it mechanizes the human look. The analogical "fit" is also so tight that it would be impossible for anyone using the stereo camera to deny that his vision is "two-sided." And since being binocular means not just receiving two slightly different retinal images, but also not being able to perceive either of them, the stereo photographer could not even claim that he is "in charge" of what he sees, let alone what his camera registers. In both cases, all that he could really purport to be is a "viewer."

The September 1869 issue of *Harper's New Monthly Magazine* also contains another essay about photography, which speaks directly to this point. The essay, which is called "Photographs from the High Rockies," was written by John Samson, who accompanied Timothy O'Sullivan on his High Rockies expedition. Since it recounts the story of that expedition, the "photographer" to whom Samson refers is presumably O'Sullivan, who worked with both a conventional camera and a stereo camera. As Rosalind Krauss notes, the word "view" figures prominently in "Photographs from the High Rockies," but its meaning keeps shifting.[53] Sometimes a view is something that the photographer "takes," at other times it is something that he "makes," or "works up," and in one astonishing passage, it is something that he "views." "In speaking of the Humboldt and Carson sinks," this passage reads, "our photographer remarks: 'It was a pretty location to work in, and *viewing* there was as pleasant as could be desired.'"[54]

IN 1860, the French scientist J. M. Taupenot began experimenting with collodion dry plate.[55] His exposures were extremely slow—six times the length of the collodion wet plate—but in 1864, B. J. Sayce and William Blanchard Bolton cut this time in half, and other "improvements" followed. In 1871, Richard Leach Maddox replaced the collodion with gelatin, allowing the plates to be sensitized in advance and developed later, and in 1878 gelatin dry plates began to be industrially produced. Photographers no longer had to travel with a darkroom and chemicals, prepare their own plates, or wait for the gradual development of an image.[56]

The single-lens reflex camera also returned in a new guise in the 1880s. It was called the "Monocular Duplex," and it was marketed as an extension of the photographer's look. The camera "enables the Operator to see the picture

non-inverted, and the full size of the plate the very instant of making the exposure," one advertisement proclaimed. It dispenses with all of the extraneous "impediments" that have prevented this "fascinating amusement" from realizing its full potential, a second declared. E. W. Smith issued another promise through the camera's name: the promise that it would allow the viewer to see "double" with a single eye, instead of "single" with two eyes, as stereoscopy had mandated—to preside over both stages of the photographic event, without undergoing an internal division. And by describing the Monocular Duplex as an "Artist Camera," the advertisements also bestowed another power on the viewer—one that recalls the purpose for which Hooke designed his 1694 camera obscura.

The ocularization of chemical photography reached its zenith in 1888, when George Eastman began manufacturing dry, transparent, flexible, photographic film and released the first Kodak camera. He marketed the camera under the slogan "You Press the Button, We Do the Rest." The last word in this slogan covered a lot of things. The camera was "fitted with a rectilinear fixed-focus lens" that gave a "sharp definition of everything beyond 8 ft," and it had only "one speed and a fixed stop." It arrived "loaded" with enough film for one hundred exposures, and when they had all been used it was sent back to Eastman with the film still in it so that the negatives could be processed, printed, and mounted. The camera was reloaded, and returned to the owner with the prints.[57]

Figure 51. Newspaper advertisement for Smith's Monocular Duplex Camera, 1886.

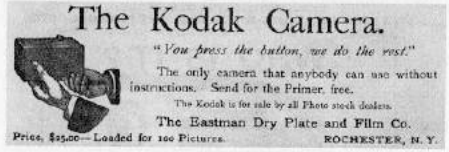

Figure 52. Newspaper advertisement for the Kodak camera, 1889.

The ostensible purpose of these innovations was to make the camera a more democratic apparatus—one available to amateur as well as professional photographers. "Today photography has been reduced to a cycle of three simple operations," the "primer" proclaimed. "1. Pull the String. 2. Turn the Key. 3. Press the Button. This is the essence of photography and the greatest improvement of them all; for where the practice of the art was formerly confined to those who could give it

study and time and room, it is now feasible for *every body*." And because "the mechanical act of taking the picture . . . is divorced from all the chemical manipulations of preparing and finishing pictures which only experts can perform," anyone of "ordinary intelligence" can "learn to take good pictures in ten minutes."[58]

But by reducing photography to three predefined steps, George Eastman substituted the Kodak system for the "pencil of nature." By releasing the photographer from "the chemical steps of the process," he also sealed off photography's liquid intelligence. Finally, by printing as well as developing the negative at the factory, Eastman created the illusion that the photographs that arrived in the mail were the exact positive equivalents of the negatives that were in the camera when it was shipped off—that the governing principle of photography is "sameness."

Figure 53. Newspaper advertisement for the Kodak camera, 1888.

IN THE CONCLUDING sentences of "Photography and Liquid Intelligence," Wall offers yet another account of the latter concept. This time he associates it with a number of human qualities—thought, intention, agency, the capacity to look back—but locates it outside us. Wall presents this part of his argument through an extended analogy: "In Andrei Tarkovsky's film *Solaris*, some scientists are studying an oceanic planet. Their techniques are typically scientific. But the ocean itself is an intelligence which is studying them in turn. It experiments on the experimenters. . . . I think this was a very precise metaphor for, among other things, the interrelation between liquid intelligence and optical intelligence in photography. In photography, the liquids study us, even from a great distance."[59]

Initially this external site appears to be chemical photography, but the last sentence suggests that it is much "bigger." So does the expansive nature of the analogy; the signifier (the oceanic planet) radially exceeds what it is supposed to signify (the fluids in chemical photography). And immediately before

Figure 54/Colorplate 9. Andrei Tarkovsky, *Solaris*, 1972 (film still).

declaring *Solaris* to be "a very precise metaphor" for the relationship "between liquid intelligence and optical intelligence in photography," Wall differentiates the oceanic planet from the vehicle through which it communicates with the scientists. The ocean experiments on the experimenters through images, he writes—by returning their memories to them "in the form of hallucinations,

Figure 55/Colorplate 9. Andrei Tarkovsky, *Solaris*, 1972 (film still).

perfect in every detail." It shows the scientists people from their past so that they will relate to these people again, "maybe in a new way."

Like Tarkovsky's scientists, we have secured ourselves "behind a barrier of perfectly engineered glass," so that we can "study" an oceanic planet without getting "wet." This planet is as "intelligent" as the one in *Solaris*, and it also communicates with us through images. Like the hallucinations in Tarkovsky's film, these images are ontological calling cards: a summons to relationality. This oceanic planet, however, is our world, and it is through photography—rather than hallucinations—that it speaks to us.

71. Joan Fontcuberta, "Archive Noise," Artist Statement, www.fontcuberta.com.

72. Ibid.

73. Joan Fontcuberta, "Googlegrams," Artist Statement, www.fontcuberta.com.

74. I am of course paraphrasing a famous passage from Benjamin's "On the Concept of History" (390).

CHAPTER 3

1. Jeff Wall, "Photography and Liquid Intelligence," in *Jeff Wall: Selected Essays and Interviews*, ed. Peter Galassi (New York: Museum of Modern Art, 2007), 109–110.

2. Ibid., 109.

3. Ibid.

4. In *Creative Evolution*, Henri Bergson repeatedly likens the instantaneity and fixity of human perception to a "snapshot." See *Creative Evolution*, 302, 273, 306. When we want to perceive movement, Bergson argues, we string these snapshots together like a roll of film, and switch on a mental projector (306).

5. Wall, "Photography and Liquid Intelligence," 109.

6. Ibid.

7. Ibid.

8. Ibid., 110.

9. I am thinking here of two essays: Martin Heidegger, "The Question Concerning Technology," and "The Age of the World Picture," in Heidegger, *The Question Concerning Technology and Other Essays*, 3–35 and 115–154, respectively.

10. Wall, "Photography and Liquid Intelligence," 110.

11. Todd Gustavson, *Camera: A History of Photography from Daguerreotype to Digital* (New York: Sterling Publishing Co., 2009), 101.

12. As George Baker puts it in "Black Mirror," "We know—or feel like we know—that we have lost . . . the labor of photography that was its chemistry, its noisome liquids and its baths. The optical now reigns supreme (indeed we face a triumphalism of 'camerawork' that ties the entire history of photography, analogue or digital, to 'lens-based' aesthetic alone)." See Baker, "Black Mirror," in *Paul Sietsma*, ed. Christopher Bedford (Columbus: Wexner Center for the Arts, Ohio State University, 2013), 4.

13. Gustavson, *Camera*, 9, and Gernsheim and Gernsheim, *L. J. M. Daguerre*, 96–97 and 112–113.

14. Gustavson, *Camera*, 10–11, 13, 15, 16. This is only a cursory account of each of these devices, and only a partial list of the cameras designed between 1839 and 1851.

15. Gernsheim and Gernsheim, *The History of Photography*, 415. Although Sutton was a well-known figure in his day—he was the author of *A Dictionary of Photography* and a number of other books about photography, the editor for eleven years of *Photographic Notes*, and the inventor of the first wide-angle panoramic camera—we have little information about his single-reflex camera.

16. Gernsheim and Gernsheim, *The History of Photography*, 260; Gustavson, *Camera*, 30–31.

17. Gustavson, *Camera*, 30–31, 78.

18. This information comes from the website of the National Media Museum in Bradford, UK, which has a Revolver Camera in its collection. The Colt revolver's

chamber could be fired six times, and the Thompson Revolver Camera's four times. See "Thompson Revolver Camera: Photographic Technology" (Bradford: National Media Museum), http://www.nationalmediamuseum.org.uk/Collection/Photography/PhotographicTechnology/CollectionItem.aspx?id=1991-5101.

19. Gernsheim and Gernsheim, *The History of Photography*, 415.

20. "Thompson Revolver Camera," http://www.nationalmediamuseum.org.uk/Collection/Photography/PhotographicTechnology/CollectionItem.aspx?id=1991-5101.

21. "Poetus Photographicus," *The Photographic Journal* (February 21, 1854): 210. Quoted by Gernsheim and Gernsheim, *The History of Photography*, 231.

22. Lady Eastlake, "Photography," in *Classic Essays on Photography*, 55.

23. Gernsheim and Gernsheim, *The History of Photography*, 335–336.

24. Hirsch, *Seizing the Light*, 72–73.

25. Holmes, "Doings of the Sunbeam," 5.

26. Ibid., 5–6.

27. David Falk, Dieter Brill, and David Stork, eds., *Seeing the Light: Optics in Nature, Photography, Color, Vision, and Holography* (Hoboken: John Wiley and Sons, 1988), 210–219; Nicholas J. Wade and Michael T. Swanston, *Visual Perception: An Introduction* (East Sussex: Psychology Press, 2013), 207–209.

28. I discuss these challenges in chapter 1.

29. Wade and Swanston, *Visual Perception*, 204–207.

30. Laura Burd Schiavo, "From Phantom Image to Perfect Vision: Physiological Optics, Commercial Photography, and the Popularization of the Stereoscope," in *New Media: 1740–1915*, ed. Lisa Gitelman and Geoffrey B. Pingree (Cambridge: MIT Press, 2003), 113–138.

31. Ibid., 116.

32. Gernsheim and Gernsheim, *The History of Photography*, 256–257.

33. Schiavo, "From Phantom Image to Perfect Vision," 127.

34. Edward W. Earle, ed., *Points of View: The Stereograph in America—A Cultural History* (Rochester: Visual Studies Workshop Press, 1979), 32.

35. Sir David Brewster, *The Stereoscope: Its History, Theory, and Construction* (London: John Murray, 1856), 36.

36. Lady Eastlake, "Photography," in *Classic Essays on Photography*, 53.

37. Antoine Claudet, "Photography in its Relation to the Fine Arts," *The Photographic Journal* 6 (June 15, 1860), 266.

38. James Ellis, *Progress of Photography, Collodion, the Stereoscope* (London: Bell and Daldy, 1856), 50. Quoted by Schiavo, "From Phantom Image to Perfect Vision," 119.

39. Holmes, "The Stereoscope and the Stereograph," 739.

40. Ibid., 744.

41. Ibid.

42. Holmes, "Doings of the Sunbeam," 10.

43. Oliver Wendell Holmes, "Sun-Painting and Sun-Sculpture," *The Atlantic Monthly* 8, no. 45 (July 1861), 14.

44. Holmes, "The Stereoscope and the Stereograph," 738.

45. Holmes, "Sun-Painting and Sun-Sculpture," 16.

46. Homes, "The Stereoscope and the Stereograph," 743, 746.

47. Ibid., 745.

48. Ibid.

49. See, for instance, ibid., 742.

50. Austin Abbott, "The Eye and the Camera," *Harper's New Monthly Magazine* 39 (1869): 476–482.

51. Ibid., 480.

52. Ibid., 481.

53. See Rosalind E. Krauss, "Photography's Discursive Spaces," in *The Originality of the Avant-Garde and Other Modernist Myths* (Cambridge: MIT Press, 1988), 138–141. Krauss focuses on the naturalization of the stereoscopic "view," the way it becomes embedded in the landscape.

54. John Samson, "Photographs from the High Rockies," *Harper's New Monthly Magazine* 34 (1869): 471.

55. Taupenot's dry-plate process wasn't the first, but it was the most popular (Gernsheim and Gernsheim, *The History of Photography*, 322–325).

56. Ibid., 325–332.

57. Ibid., 422–425, and Hirsch, *Seizing the Light*, 172–173.

58. Gernsheim and Gernsheim, *The History of Photography*, 413–414.

59. Wall, "Photography and Liquid Intelligence," 110.

CHAPTER 4

1. Fox Talbot uses all three words in "A Brief Historical Sketch of the Invention of the Art," in *The Pencil of Nature*.

2. See, for instance, Daguerre, "Daguerreotype," in *Classic Essays on Photography*, 11–13; Poe, "The Daguerreotype," in *Classic Essays on Photography*, 37–38; and Holmes, "The Stereoscope and the Stereograph," 739–748.

3. Brewster, "Photogenic Drawing, or Drawing with the Agency of Light," 330 and 344. See Batchen, *Burning with Desire*, 64, on the long list of possibilities pondered by Niépce.

4. Lady Eastlake, "Photography," in *Classic Essays on Photography*, 65.

5. Ibid., 41.

6. Ibid., 65.

7. *Oxford English Dictionary Online*, s.v. "Chiasmus," accessed December 2013, http://oxforddictionaries.com/definition/english/chiasmus?q=chiasmus.

8. Falk, Brill, and Stork, *Seeing the Light*, 182.

9. I am drawing here on the last chapter of Maurice Merleau-Ponty's *The Visible and the Invisible*, trans. Alphonso Lingis (Evanston: Northwestern University Press, 1968), especially 137–139.

10. Ibid., 138.

11. Ibid., 139.

12. Emile Benveniste, "Subjectivity in Language," in *Problems in General Linguistics*, trans. Mary Elizabeth Meek (Coral Gables: University of Florida Press, 1971), 224–225.

13. Martin Buber, *I and Thou*, trans. Walter Kaufmann (New York: Simon and Schuster, 1970), 84.

14. Kemp, *The Science of Art*, 189.