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## “Photographic Weather”: A Posthumanist Approach to Western Survey Photography

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Picture taking in those days was not the simple matter of today, with our prepared films and plates and hand cameras. The pioneer photographer of that time had to be something of a chemist as well as an artist, and a mechanic also. He had to carry with him a kind of laboratory with many chemicals, trays, glasses, and other apparatus, for each plate must be prepared on the spot for every exposure.”

—William Henry Jackson,  
*The Pioneer Photographer*

Each part of the process . . . could be recalcitrant, resistant, perverse.

—Joel Snyder,  
*One/Many*



Fig. 1. William Henry Jackson, *The Three Tetons. Lincoln County, Wyoming, 1872*. Albumen print from plate glass negative, 4 x 5 in. National Archives Department of the Interior, General Land Office, US Geological and Geographic Survey of the Territories

In his second summer as part of [Ferdinand V. Hayden’s U.S. Geological Survey](#), William Henry Jackson made an impressive photograph of the three tallest peaks in the Teton Range, *The Three Tetons. Lincoln County, Wyoming* (fig. 1). Many of the formal aspects of this image draw on pre-photographic landscape traditions to structure the viewer’s response to the awesome scene: the orientation and the proportions of rock to sky enhance the peaks’ vertical thrust. The empty expanse between the highly detailed foreground and the more softly-toned mountains in the background adds another indication of the impressive scale of this range. And the absence of any signs of human presence give the picture a barren sublimity. In its evocation of awe, this photograph exemplifies what Peter Bacon Hales has called Jackson’s “igneous propaganda” for the “ideology of the Western landscape.”<sup>1</sup>

Much of great value has been said about how the use of landscape conventions in pictures like Jackson’s *Three Tetons* advanced the interests of white corporate and governmental patrons invested in westward expansion and natural resource extraction. But to engage fully with what survey photographs can teach us, we might turn away from shots that deliver transcendent aesthetic experiences to ones that thematize photographic practice in challenging environmental contexts. Another of Jackson’s photographs, made at the same time, titled by its maker *Photographing in High Places, Lincoln County, Wyoming*, does just that (fig. 2).



Fig. 2. William Henry Jackson, *Photographing in High Places, Lincoln County, Wyoming*, 1872. Albumen print from plate glass negative, 4 x 5 in. National Archives Department of the Interior, General Land Office, US Geological and Geographic Survey of the Territories

This photograph is [one of the many](#) Jackson made of his gear during his time with the Hayden Survey, several of which show the mules charged with carrying his kit into the mountains or the photographer’s assistants helping him set up shots. In this picture, Jackson and one assistant, Charly Campbell, are preparing a glass plate to be used as a negative, perhaps the very negative with which I started, as the Three Tetons are visible from the same point of view in the background of this shot. When discussing such pictures, scholars (as did Jackson himself) often focus on the photographer’s ability to overcome material obstacles and create pictures that demonstrate successful technical achievement.<sup>2</sup> The array of equipment in this picture indexes challenges facing survey photographers that photo historians have frequently noted. Martha Sandweiss, for example, stresses the photographer’s need to manage a range of supplies, including, among other things, parts of the camera, glass plates, chemicals and solutions needed for preparing and developing

negatives, and tools necessary for cleaning, measuring, filtering, processing, storing, and transporting them—a kit that weighed well above one hundred pounds.<sup>3</sup> However, we might see *Photographing in High Places* as illustrating the distribution of responsibility for picture making beyond the photographer himself. People and animals (up to four of each during his time with the geological survey) were essential not only to the transportation of his equipment but even, as *Photographing in High Places* demonstrates, to occasionally operating the camera during a shot. (Jackson noted that his packer removed and replaced the lens cap so this picture could come into being.)<sup>4</sup> These human and non-human assistants not only helped produce Jackson’s pictures, but they also delimited his work—as, for example, when he was prevented from taking pictures because the terrain prevented access to a prime vantage point, mules wandered into situations that resulted in the loss or damage of supplies, or he had to wait for days for “photographic weather.”<sup>5</sup>

For my re-reading of American photographs, I would like to shift attention away from the photographer alone to the interaction between a human picture maker and a picture-making apparatus, by which I mean all of the helpers, equipment and environmental conditions that were essential in the production of survey photographs. Using primary documents, including nineteenth-century publications and the photographs themselves, I will discuss how these factors contributed to and also delimited the production of survey photographs, focusing on Jackson’s work with the Hayden Survey in 1871 and 1872. To do this, I will bring into discussion pictures that do not only offer transparent views of the world in front of the lens but also include visual information that points to the impact of the material worlds surrounding the photographer, inside the camera, and on the surface of negatives and prints.

This work is grounded in [new materialism](#), and particularly material feminist theory, in its call for an exploration of the active role played by materials and things in structuring the worlds in which humans and non-humans interact.<sup>6</sup> Material feminism offers a richer, more accurate record of how early photographs of the American West were produced by illuminating the active roles that equipment, chemistry, weather, and other non-human factors played in making pictures. This approach has been called “posthumanist” in that it destabilizes the tradition of making a clear distinction between human actors and the things with or upon which humans act. As Karen Barad explains, a posthumanist perspective “calls into question the givenness of the differential categories of ‘human’ and ‘nonhuman,’ examining practices through which these differential boundaries are stabilized and destabilized.”<sup>7</sup>

In the case of survey photographs, this approach can help us meditate on the instability of boundaries between the surveying team (traditionally conceived as actors engaged constructing “the West” through acts of measurement, documentation, and interpretation) and the environment (traditionally conceived as a passive object, even victim, of human action) and instead see in the photographs evidence of the ongoing, unfolding entanglement of “nature” and “culture.” By focusing on the instability of this boundary, I return to a common idea that the meaning of a photograph is not determined by only one party engaged in its production, nor is it fixed. I do this in the interest of imagining alternative relationships between Americans and the environment to ones structured by exploitation and violence. As Stacy Alaimo and Susan Hekman have argued, material feminist practice is “more conducive to human and nonhuman flourishing” than anthropocentric criticism.<sup>8</sup> Paying attention to these things does not deny the history of natural resource exploitation and the accompanying dispossession of Indigenous peoples wrought by Americans in the

West. However, moving away from what Donna Haraway has called “human exceptionalism” may allow us to see this devastation as less inevitable and more precarious than scholarship has so far allowed and, as a result, perhaps help make space for envisioning less oppressive forms of human/nonhuman engagement.<sup>9</sup>

### Reading American Photographs the First Time

As this special section is geared toward sharing new approaches to American photographs, it is useful to understand the important but, I would argue, incomplete work that has come before. Scholars have brought out vital information about how federal agencies and other entities involved in developing the West used photography to facilitate the incorporation of newly acquired territory. As both descriptive records and aesthetic compositions, photographs were included in governmental reports, shared with legislators and business leaders, exhibited at fairs and exhibitions, and circulated through engraved copies in publications, communicating ideas about the natural and aesthetic resources of the region to a broad public audience. This work has been essential to understanding how photographs were used to pass laws, create policy, and cultivate financial and popular support for railroads, mining companies, and national parks, among other things.

Important studies of survey photographers have explored how they managed the tensions of creating pictures that met their own aesthetic and commercial needs and that also supported the agendas of the government officials with whom they worked. As Alan Trachtenberg, Martha Sandweiss, and Robin Kelsey, among others, have noted, photographers accompanied survey teams less because of the contributions their pictures might make as records of scientific data than for the understanding of the value the photographs would have to promote and legitimize ongoing survey work, especially when they were accompanied by texts that linked the images to broader narratives of national expansion. For Trachtenberg, following the semiotic image theory of Roland Barthes, captions serve to present a place as possessable: “A named view is one that has been seen, known, and thereby already possessed.”<sup>10</sup> While these authors acknowledged the “trying conditions” and “slow, cumbersome equipment” that plagued early photographers, they present human beings as the producers of photographs.<sup>11</sup>

The visual rhetoric of ownership and control is embedded in the formal qualities of landscape imagery, a genre W. J. T. Mitchell has identified as “the dreamwork of imperialism.”<sup>12</sup> Albert Boime has identified the elevated point of view and panoramic backgrounds that typify mid-nineteenth century American landscape painting as inviting a “magisterial gaze” that advanced the goal of Manifest Destiny. Significantly, Boime suggests that survey photographers incorporated the same visual formula.<sup>13</sup> This claim is unsurprising, given the fact that many of the photographers, including Jackson and Watkins, had direct experience working alongside landscape painters.

Trachtenberg and Nancy Anderson have focused on a related landscape convention prevalent in photographs that depict photographers and surveyors at work taking measurements, making notes and setting up equipment. In addition to promoting survey work generally, such pictures call particular attention to the power of photography. As Trachtenberg puts it, in an essay on Timothy O’Sullivan, the photographer’s work involves an “instantaneous transformation of raw perception into a picture, a two-dimensional illusion of three-dimensional space in which something worth seeing can be seen.”<sup>14</sup> These

scholars have demonstrated how the visual strategies used by survey photographers objectified land not only as property but also as a natural resource to be economically developed. Hales has characterized survey visuality similarly, saying that in Jackson’s photographs “sight, the activity of looking, became both precedent and substitute for other forms of acquisition.”<sup>15</sup>

Subsequent writing on survey images has deepened our understanding of how different survey photographers approached their work and how their patrons’ nationalist interests intersected with other social positions. Robin Kelsey and Martin Berger add important dimensions to the understanding of the roles played by the image makers in shaping how their photographs were received within a larger context of American expansion, focusing less on the act of acquisition itself than the ways in which their formal choices reveal the entanglement of scientific exploration with ideas about race, gender, and labor.<sup>16</sup> These scholars have contributed greatly to the understanding of how human beings used visual depiction to facilitate the economic and political incorporation of new spaces in the service of dominant American interests. As Berger explains, photographs used the paired formats of distanced overviews and detailed close-ups of specific geological features to conceptualize land as quantifiable and consumable in ways that supported the interests of white settlers. Kelsey also relates picture making with quantification, emphasizing how illustrations in survey reports sit on the page alongside other kinds of data in ways that thematize the surveyors’ control of their subject.

This scholarship has not avoided mention of the physical and material challenges faced by Western photographers, but it has generally treated the natural environment as the passive object of the artists’ representational labor. For example, Kelsey’s more recent work has drawn ecological considerations into view by exploring what he calls “the ecology of the photograph” within the Anthropocene. In particular, he is interested in the socially and environmentally destructive impact of the sourcing and disposing of photographic chemicals. My work is related to his, but I am interested in how expanding the focus beyond human action alone might shift the kinds of stories we can tell and the futures we can envision.<sup>17</sup>

I want to build on this work that illuminates photography’s embeddedness in a range of human discourses about the landscape by thinking through what survey photographs tell us about the nonhuman as an active participant in the making of pictures. As I have suggested, the pictures themselves bear witness to this. So do photographers’ accounts of their work in the field.

### **Photographic Materialities**

A feminist materialism approach invites us to return to nineteenth-century photography for records of the agency of non-humans. We can find abundant evidence of this in early publications about the medium. Paying attention to this involves another re-reading, as scholars and teachers working in the history of photography have tended to focus on primary sources that emphasize the social impact of the new medium—the essays of Oliver Wendell Holmes or Charles Baudelaire, for example—rather than dig through the confusing panoply of advice on chemical formulas and equipment hacks that fill the pages of nineteenth-century photographic manuals and periodicals and figure prominently in lectures presented to photographic societies (with notable exceptions, including Katherine



Mintie’s contribution to this In the Round).<sup>18</sup> But there are rewards for scholars willing to dig into these publications, as this recovery of an insider discussion of an emerging medium gives insight into the nature of photography as a technological phenomenon requiring expertise and experimentation and deepens our understanding of how the making of photographs was more than a representational problem. Accounts of failures, adjustments and happy accidents in early photographic literature tell a story that proposes anything but human mastery over the material worlds before their lenses and within their chemical baths. Material feminism allows us to see these accounts as records of the engagement of human and nonhuman agents, a collaboration without which photographs could not have come into existence.

In the pages of *The Philadelphia Photographer*, [\*Anthony’s Photographic Bulletin\*](#), and the *British Journal of Photography*, which were widely read in the United States, writers repeatedly describe their struggles with photographic equipment, the uncooperative nature of weather or terrain, and the inconsistent reliability of chemicals and solutions. Dark tents, cameras, and plate holders could have light leaks that ruined negatives; collodion could go bad; chemicals had inconsistent purity and preparation.<sup>19</sup> Moreover, conditions at the site being documented could derail even the most skilled photographer’s ability to make a good negative, forcing photographers to postpone their work or scramble to make adjustments to their solutions and timings. And the lack of available water or the pH of the water found in the field could prevent a photographer from undertaking work.<sup>20</sup> For example, one contributor to the *Philadelphia Photographer* noted that his fieldwork in the mountains was stymied by wind that “blew so hard that it was almost impossible to hold the camera anywhere.” He would get the focus and then, while fetching the plate from the sensitizing bath, the wind would topple his tripod.<sup>21</sup> Temperature, humidity, barometric pressure, altitude, and the presence of gaseous and particulate pollutants (fairly common in nineteenth-century cities) or dust all impacted photographic equipment and solutions, inviting the use of thermometers, barometers, and hygrometers and the promotion of processes designed to address issues that arose. In the month that Jackson set out with the Hayden Survey, *The Philadelphia Photographer* ran an ad for a toning solution that could keep printing paper from being discolored due to hot and humid weather.<sup>22</sup> Discussing the impact of the weather on the time needed for chemicals to set, one writer advised: “It becomes us, then, to watch carefully the changes that affect our work, and apply the *right* remedy, instead of proceeding with measures that will only make matters worse.”<sup>23</sup> Illustrating the engagement between the human and the nonhuman that extended across each step of the process of making photographs, this photographer, when watching the weather change and then adjusting in response, did not simply impose his conception on the world but was also constrained by it.

Another material world that impacted the photographer’s work was the one that existed within the chemical solutions used to sensitize, develop, and fix negatives and prints. In *The British Journal of Photography*, one author described a fiasco in which his developing solution dissolved his gutta-percha negative holder, and another related frustrating attempts to find a successful formula for a printing bath (one caused streaks; another dissolved the albumen coating on the printing paper; and a third produced “terribly mottled prints.”)<sup>24</sup> The fact that photographers of the 1860s and 1870s were dependent on chemicals that had varying freshness and strength, on imperfect equipment, and on supplies that were often shipped great distances meant that the breakdown of one or more components of the job was to be expected.



Fig. 3. William Henry Jackson, *Photographing in High Places*, Lincoln County, Wyoming, 1872 (detail of fig. 2)

Jackson’s photographs of his gear invite broad consideration of how his pictures were collectively produced, taking us beyond a concern with human assistants and pack animals into Jackson’s need for inanimate materials and equipment to also work correctly through unpredictable physical conditions. A detail of *Photographing in High Places* (fig. 3) shows Jackson mixing chemicals, presumably preparing his collodion—the thick, syrupy mixture produced by soaking guncotton in alcohol and ether mixed with potassium iodide—that needed to be poured onto and evenly distributed across the surface of an absolutely clean glass plate to make a good negative. This step was followed by the sensitizing of the collodion by dipping it in a silver nitrate bath inside a light-proof space (in this case, the small tent shown next to the two men) and the transportation of the negative, while still wet, in a similarly darkened holder to the camera. In addition to the two glass jars being manipulated by the photographer, the image shows an open case of glass plates, a tray with another jar and a funnel laid on top, an open box of paper (possibly the blotting paper that Jackson wet and wrapped around the negatives so they did not dry out in the summer heat before they could be loaded onto the back of the camera), and another case, on the top of which are several camera lenses, including a double lens that could be loaded on top of his camera to produce a stereographic negative.

Taking into consideration Joel Snyder’s observation (quoted in this essay’s epigraph) that the unpredictable nature of both materials and equipment could undermine or derail survey photographers, we can find multiple unsettling details in this picture.<sup>25</sup> The dark tent and jumble of equipment are clustered together in a small space, taking advantage of the relative shelter provided by a vertical face of splintering rock in the exposed location. Charly’s hands seem to be stabilizing the tent and holding the flap open, perhaps against the winds that frequently blow on mountain peaks, impacting equipment and demanding adjustments in chemistry and timings. The case of glass plates sits on the uneven surface of a rock, casting a shadow that hints at the box’s potential to wobble and perhaps even fall, putting its valuable contents—Jackson’s negatives—at risk. The composition itself, framed from an angle that makes the foreground seem to slope downhill from the men, enhances this sense of precarity.

One of the most obvious (and widely discussed) indexes of this reality in survey photographs are the blank skies that seem incongruous with the highly detailed landscapes pictured below them. The nature of the sensitizing chemicals used on plate-glass negatives meant that blue light was exposed more quickly than other colors; in order to get a rich image of the foreground, the photographers sacrificed the ability to capture clouds. This is reflected in both of the Tetons images. But other material constraints also contributed to these pictures and, indeed, all nineteenth-century photographs—and contemporary ones, too. Jackson’s autobiographies discuss waiting out rain, wind, or clouds and the adjustments he made to regular practice when weather was hot (which could cause the albumen coating on printing paper to crack) or too cold (making the collodion too thick to spread evenly over the plate), and the need to melt snow over a shovel heated in a campfire in order to get water for washing his plates, which themselves needed to be laboriously cleaned to make them free of the dust and smoke that filled campsites.<sup>26</sup>

While Jackson’s accounts of his work in Yellowstone are only available in versions he revised and published decades after he wrote them, contemporary accounts from nineteenth-century expeditionary photographers reinforce the idea of the need to collaborate with material conditions in the work. The correspondence of British photographer Samuel Bourne, written during his travels in India in 1868, offers a meaningful corollary to Jackson’s experience in the American West. Although he was already an experienced photographer, Bourne became frustrated by the appearance of what he called “red spots and measles” when he tried to make prints from his negatives. His description of his response to this problem illustrates the frustrating trial and error that faced photographers who could not immediately diagnose the source of something gone wrong:

I tried every experiment I could think of—the silver solution of all strengths from 50 to 140 grains—all times of floating from one minute to six, alkaline, and acid with different kinds of acid, with and without the addition of alcohol—all methods of toning, except the old hypo and gold, to which I have long since bidden an eternal farewell; but nothing would cure those blessed spots.

Bourne was never able to find a solution through experimentation. However, when after a time the weather turned rainy, he noticed that the problem disappeared. As he confesses, “It never occurred to me that the heat and dryness had anything to do with the character of my prints.” After this accidental discovery, he increased the humidity in which his albumenized paper was stored prior to making prints.<sup>27</sup>

Bourne’s language is worth noting; the terminology of “red spots” and “measles” gives the photograph a kind of corporeal existence, as if what appeared in the prints was a sign of disease. Photographers of the time frequently characterize their chemicals, negatives, and prints in biological or meteorological terms, noting their “health” and complaining about “blisters,” erupting “volcanoes,” and “fog.”<sup>28</sup> This linguistic trope emphasizes the fact that the materials with which photographers worked were mutable, and it invites consideration of the fact that photographers engaged in ongoing, constantly shifting negotiations with those materials in the production of images. Decentering the human, we might see the photographers’ engagements with this mutability less from the standpoint of solving problems than that of interacting parts within an assemblage composed of the photographer, his equipment and photographic chemicals, the terrain, and the ever-shifting circumstances of climate and weather.





Fig. 4. William Henry Jackson, *Crater of Old Faithful*. Yellowstone National Park, 1872. Albumen print from plate-glass negative, 3 1/2 x 7 in. National Archives Department of the Interior, General Land Office, US Geological and Geographic Survey of the Territories

In addition to looking to autobiographical statements, posthumanist criticism can be directed to photographs themselves as evidence of the collaboration between the photographer and the material circumstances of the photograph's creation. Jackson's photographs of Yellowstone region from 1871 and 1872 offer an ideal subject for this kind of analysis, because he had to constantly contend with changing material conditions due not only to its highly varied rough terrain but also the [changeability of landscape features due to geothermal activity](#). An untrimmed stereographic print of the Crater of Old Faithful offers an index of the contributions made by Jackson's photographic apparatus (fig. 4). Stereoviews consist of two images taken at a 3 1/2-inch horizontal distance from one another, which, when seen through a special viewer, recreate the impression of depth created by the body's binocular vision. Jackson had a double-lens camera front (seen in *Photographing in High Places*) that made the two exposures simultaneously. Although the photographer set up his camera, pointed it toward the crater, and prepared the negative as described above, this print, as with all photographs, includes details that were outside of the maker's control. The lens both delimited and constrained what we see; it has allowed for the sharpest focus at the center of the view, with the corners capturing less detail and less light. In addition, there is an area at the center of the outside margin of the right-hand stereo image that is brighter and hazier than the corresponding area, suggesting either a flaw in this lens or a small light leak in that side of the camera. When preparing a stereographic print for sale, Jackson would likely have trimmed these disruptions to the illusionism of the photographs out. But this print, made from one of the original negatives deposited with the Records of the US Geological Survey at the National Archives, retains these details.

Photographs, which by their very nature index operations of light and chemistry in excess of what a photographer intentionally controls, offer an exemplary opportunity to consider the nature of what Barad has theorized as *intra-action*. Barad replaces the idea of interaction, in which two separate entities with the potential to act come together, with the idea that the ability to act emerges from the entanglement of entities within a particular context.<sup>29</sup> Barad has explained that “intra-actions are constraining but not determining” and that phenomena can only come into being under social “conditions of intelligibility.”<sup>30</sup> Barad uses Nils Bohr's research into quantum physics as an example of how what is intelligible is

produced through intra-action, explaining that his act of measuring atomic energy created that energy by describing it through the properties his equipment could record, or “enact[ing] what matters and what is excluded from mattering.”<sup>31</sup> In the case of landscape photography, we might find examples of intra-action in the constraints in what cameras and chemistry can do on windy mountaintops, in cultural constraints such as the survey’s demands on the photographer and what was considered a meaningful photographic subject, and in the ways these appear differently with each negative and again with each print.

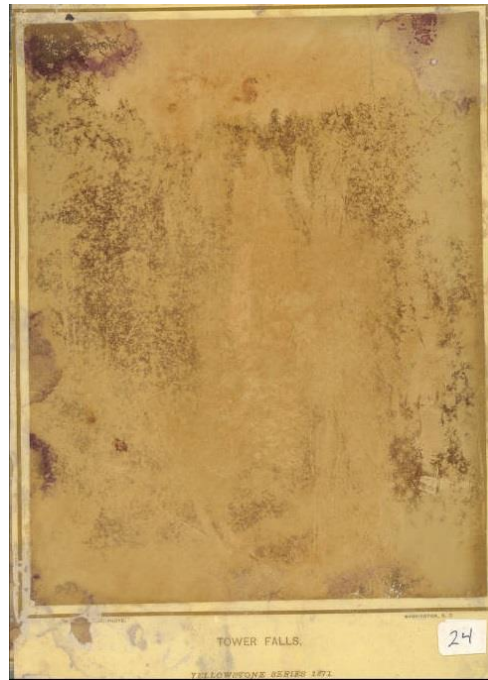


Fig. 5. William Henry Jackson, *Tower Falls*, 1871. Albumen print from plate glass negative, 8 5/8 x 6 11/16 in. Courtesy L. Tom Perry Special Collections, Harold B. Lee Library, Brigham Young University, Provo, UT

Central to Barad’s argument is the fact that “there is an important sense in which practices of knowing cannot be fully claimed as human practices, not simply because we use non-human elements in our practices, but because knowing is a matter of part of the world making itself intelligible to another part.”<sup>32</sup> How might photo history understand what the collaboration of photographer and all the material circumstances of his work made intelligible in an albumen print in the collection of the Brigham Young University (BYU) Library, made from a negative produced by Jackson (fig. 5)? The cataloguer has noted, skeptically: “Image is not clear enough to describe. It is purported to be of Tower Falls in Yellowstone National Park.”<sup>33</sup> As the cataloguer indicates, the passages of dark and light in this picture do not give us an illusionistic rendering of a scene but instead dissolve into an abstract composition that is not fully contained within the edges of the photographic paper but bleeds onto the cardboard mount. Jackson made at least five photographs of Tower Falls in the summer of 1871, and this might be a print from [one of those negatives](#).<sup>34</sup> Jackson later described making pictures of Tower Falls as his “biggest photographic problem of the year.”<sup>35</sup> He explained that this was because shooting from below the falls required setting his camera up at the bottom of a narrow canyon covered with thick growth that was too

steep for his pack mule to navigate. As a result, Jackson carried his cameras down and set up the shots (on this trip he brought two cameras: his stereo camera and a larger 6 1/2 x 8 1/2 view camera), leaving his dark tent and equipment above. What this meant is that for every view he had to climb to the top of the canyon, prepare a glass plate, carry it and his plate holder to the bottom, ensuring that it stayed wet and did not get exposed to light or break—facilitated by pressing wet blotting paper to the negative and then wrapping the holder in a wet towel and surrounding the entire package with a wet towel and dark cloth—make the picture, carry the negative back up, continuing to preserve it from light and keep it from drying, and develop and fix the negative in his dark tent. Jackson estimated that in general it took forty-five minutes to make a photograph; he described this group taking “a full half day,” which suggests each round trip took considerably longer.

The damage visible in the BYU print is probably not the result of something that occurred in making the negative; presumably any plates that were mis-prepared or mishandled in the field would have been discarded. Instead, what we see (or don't see) is likely a combination of faulty printing and how the print was stored. Fading is common in albumen prints; this tendency could be mitigated by toning the print with gold, but, as Reilly explains, “There were many reasons [fading might occur]: individual processing variations, chemicals were impure and not standardized, and paper quality was not uniform.”<sup>36</sup> This print may have been improperly fixed or poorly toned, perhaps due to problems with the chemical bath or an inadequate adjustment of printing processes in response to temperature or humidity. The darkest areas on this image occur at the margins of the print, where stain-like shapes index exposure to moisture, in what is called “foxing.” Foxing is a general term that refers to a variety of stains and areas of discoloration that appear on paper that appear to indicate a reaction to high humidity, fungal growth, or the impact of trace chemicals in the paper or the materials with which it has been coated.<sup>37</sup> What is represented in this picture that purports to show Tower Falls is not so much the governmental/scientific/aesthetic control over territory made manifest through visual representation, as earlier scholarship would have it, but intra-actions between materials—water, paper, metal, egg white, light, and more—that exceed and delimit human control.

### **Agency, Survey Photography, Photo History**

Materialist feminism reminds us that the things that come together to make a survey photograph are co-constitutive and that the process was always unfolding and subject to change. This insight allows us to think through not only how photographs and the ideologies they have served were made, but also how they might be unmade or reconstituted. Much of the earlier art historical interpretation of American survey photography grew out of the ethical and political positions of the 1980s and 1990s. The dominant approach to interpreting American survey photographs often shows an environmentalist perspective, as it critiques the human exploitation of natural resources. However, as new materialist scholars have explained, critical positions that continually reinscribe a divide between nature and culture are problematic because of their privileging of the human.<sup>38</sup>

How can adopting a material feminist understanding help reshape how we understand photographs like Jackson's? I would argue that seeing photographs as intra-actions does not require rejecting earlier arguments about the political nature of the making and viewing of survey photographs. However, it characterizes the authority of those who made and commissioned them as both incomplete and impermanent. Phenomena are embedded

within dynamic relationships between the material and the discursive. In Jackson’s case, the constraints on the intelligibility of the phenomena that are his photographs include conventions of landscape representation, scientific exploration, and Western expansion. Each photograph achieved its intelligibility in the 1870s because of those constraints, and yet, as I have argued, each was also co-created by the material of the world outside of and within the camera, and on the surface of the print. Moreover, the materiality has endured in unfixed states—negatives and prints fade or become worn or damaged with use.<sup>39</sup> Significantly, nineteenth-century accounts of expeditionary photography, including Jackson’s own records, call attention to the entanglement of human and non-human forces in the production and circulation of these photographs.

Posthumanism offers a powerful tool that helps shift our discussions of the past in ways that can serve the present. Addressing current ecological crises requires shifting how we tell stories about the material world and challenging accounts that objectify the West as the promising resource for, or passive victim of, human activity. Material feminism provides tools to create knowledge through the simultaneous engagement with multiple planes of inquiry, including discursive, material, ethical, and political ones. Donna Haraway has called this kind of work “situated knowledge.” As she argues, situated knowledges can produce “a more adequate, richer, better account of a world, in order to live in it well and in critical, reflexive relation to our own as well as others’ practices of domination and the unequal parts of privilege and oppression that make up all positions.”<sup>40</sup>

The desire to live well in a world that has witnessed US Western expansion and the legacy of environmental destruction that stemmed from it calls upon us to shift away from critical frameworks that perpetuate a conceptual division between “nature” and “culture.” As an art historian, my critical work is oriented toward photography, which has played a vital role in making the West intelligible. As I have begun to explore here and elsewhere, the pictures themselves offer up other ways of knowing.<sup>41</sup> Recovering the agential nature of photographs and photographic processes recovers histories of intra-action between the human and non-human that, in giving us a richer, less anthropocentric understanding of the past, clear space for the critical work necessary to explore more ethical understandings of our shared future. As Barad has explained, intra-activity leaves the future “radically open at every turn.”<sup>42</sup>

## Notes

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<sup>1</sup> Peter Bacon Hales, *William Henry Jackson and the Transformation of the American Landscape* (Philadelphia: Temple University Press, 1988), 39, 56.

<sup>2</sup> As my first epigraph illustrates, Jackson pointed to the skills needed to execute field photography in terms that celebrated his own accomplishments.

<sup>3</sup> Martha A. Sandweiss, *Print the Legend: Photography and the American West* (New Haven: Yale University Press, 2002), 127.

<sup>4</sup> William Henry Jackson, *Time Exposure: The Autobiography of William Henry Jackson* (New York: G. P. Putnam’s sons, 1940), 200.

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- <sup>5</sup> William Henry Jackson, *William Henry Jackson’s “The Pioneer Photographer” Compiled, Edited, and Annotated by Bob Blair; with Original Text from the 1929 Edition by William Henry Jackson in Collaboration with Howard R. Driggs* (Santa Fe: Museum of New Mexico Press, 2005), 108, 103.
- <sup>6</sup> There are many anthologies devoted to aspects of New Materialism. One good introduction is *New Materialisms: Ontology, Agency, and Politics*, ed. by Diana Coole and Samantha Frost (Durham, NC: Duke University Press, 2010). For an overview of Material Feminism, see Stacy Alaimo and Susan Hekman, eds. *Material Feminisms* (Bloomington: Indiana University Press, 2008).
- <sup>7</sup> Karen Barad, “Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter,” in *Material Feminisms*, 124.
- <sup>8</sup> Stacy Alaimo and Susan Hekman, “Introduction: Emerging Models of Materiality in Feminist Theory,” in *Material Feminisms*, 7.
- <sup>9</sup> Donna Haraway, *When Species Meet* (Minneapolis: University of Minnesota Press, 2008), 244.
- <sup>10</sup> Alan Trachtenberg, *Reading American Photographs: Images as History, Mathew Brady to Walker Evans* (New York: Noonday Press, 1989), 125.
- <sup>11</sup> Sandweiss, *Print the Legend*; Trachtenberg, *Reading American Photographs*, 72.
- <sup>12</sup> W. J. T. Mitchell, ed., “Imperial Landscape,” in *Landscape and Power* (Chicago: University of Chicago Press, 2002), 10.
- <sup>13</sup> Albert Boime, *The Magisterial Gaze: Manifest Destiny and American Landscape Painting, c. 1830–65* (Washington, DC: Smithsonian Institution Press, 1991), 151.
- <sup>14</sup> Trachtenberg, *Reading American Photographs*, 131. See also Nancy K. Anderson, “‘The Kiss of Enterprise’: The Western Landscape as Symbol and Resource,” in *The West as America: Reinterpreting Images of the Frontier, 1820–1920*, ed. William H. Truettner (Washington, DC: National Museum of American Art, 1991), 237–84.
- <sup>15</sup> Hales, *William Henry Jackson*, 69.
- <sup>16</sup> Martin A. Berger, *Sight Unseen : Whiteness and American Visual Culture* (Berkeley: University of California Press, 2005), 43-80, and Robin Kelsey, *Archive Style: Photographs & Illustrations for U.S. Surveys, 1850–1890* (Berkeley: University of California Press, 2007), 75–142.
- <sup>17</sup> Kelsey, “Photography and the Ecological Imagination,” in *Nature’s Nation: American Art and Environment*, ed. Karl Kusserow and Alan C. Braddock (New Haven: Yale University Press, 2018), 399. See also Kelsey, “Notes from the Field: Materiality,” *Art Bulletin* 95, no. 1 (March 2013): 21–23.
- <sup>18</sup> Katherine Mintie, “Material Matters: The Transatlantic Trade in Photographic Materials during the Nineteenth Century,” *Panorama: Journal of the Association of Historians of American Art* 6, no. 2 (Fall 2020), <https://doi.org/10.24926/24716839.10597>.
- <sup>19</sup> Joel Snyder, *One/Many: Western American Survey Photographs by Bell and O’Sullivan* (Chicago: The David and Alfred Smart Museum of Art, the University of Chicago, 2006), 76–77.
- <sup>20</sup> Sandweiss, *Print the Legend*, 170, and Snyder *One/Many*, 77. Both mention photographs that did not get made because the local water was too alkaline.
- <sup>21</sup> A. F. Clough, “Winter on a Mountain (cont.),” *Philadelphia Photographer* 7, no. 81 (September 1, 1870): 326.
- <sup>22</sup> “Attention Photographers!!” advertisement, *The Philadelphia Photographer* 8, no. 91 (July 1, 1871): 247.
- <sup>23</sup> R. J. Chute, “Things New and Old: Chemicals in Cold Weather,” *The Philadelphia Photographer* 10, no. 119 (November 1, 1873): 526. Emphasis original.



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- <sup>24</sup> “Liverpool Amateur Photographic Association,” *The British Journal of Photography* 9, no. 207 (February 1, 1864): 14. H. Cooper, “Printing,” *The British Journal of Photography* 9, no. 207 (February 1, 1864): 6.
- <sup>25</sup> Jackson, *William Henry Jackson’s “The Pioneer Photographer,”* 43.
- <sup>26</sup> Jackson, *William Henry Jackson’s “The Pioneer Photographer,”* 137, 82.
- <sup>27</sup> Samuel Bourne, “Photography in the East,” *British Journal of Photography* 10, no. 193 (July 1, 1863): 315.
- <sup>28</sup> These terms appear frequently in nineteenth-century photography journals and manuals. See, for example, Mathew Carey Lea, *A Manual of Photography* (Philadelphia: Benerman & Wilson, 1868). For a longer discussion of this issue, see Elizabeth Hutchinson, “Conjuring in the Fog: Eadweard Muybridge on the California Coast,” in Rachael de Lue, ed., *Picturing*, vol. 1 of the Terra Foundation Perspectives In American Art series (Chicago: University of Chicago Press, 2016), 114–47.
- <sup>29</sup> Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham: Duke University Press, 2006), 141. Barad’s approach shares features with actor-network theory and object-oriented ontology, but her commitment to the ongoing importance of discursivity may leave her less vulnerable to critiques of new materialism that see it as an evacuation of the political. See, for example, Severin Fowles, “The Perfect Subject (Postcolonial Object Studies),” *Journal of Material Culture* 21, no. 1 (March 2016): 9–27.
- <sup>30</sup> Barad, “Posthumanist Performativity,” 143; Barad, *Meeting the Universe*, 199.
- <sup>31</sup> Barad, “Posthumanist Performativity,” 148.
- <sup>32</sup> Barad, “Posthumanist Performativity,” 147.
- <sup>33</sup> *Tower Falls*, c. 1871, Brigham Young University Library digital collections, accessed July 24, 2020, <https://contentdm.lib.byu.edu/digital/collection/Jackson/id/2219>.
- <sup>34</sup> *Tower Falls, near Yellowstone River*, 1872, National Archives, <https://catalog.archives.gov/id/517663>.
- <sup>35</sup> Jackson, *Time Exposure*, 199.
- <sup>36</sup> James M. Reilly, *Care and Identification of 19th Century Photographic Prints*, Eastman Kodak Publication No. G-25, 1986, 122. See also James M. Reilly et al, “Image Structure and Deterioration in Albumen Prints.” *Photographic Science and Engineering* 28, no. 4 (July/August 1884): 166–71.
- <sup>37</sup> “Foxing,” Wikipedia, accessed July 24, 2020, <https://en.wikipedia.org/wiki/Foxing>.
- <sup>38</sup> The investigation of the boundaries between the human and non/human is central to the work of Donna Haraway, as, for example, in her *When Species Meet*. See also Timothy Morton, *Ecology without Nature: Rethinking Environmental Aesthetics* (Cambridge: Harvard University Press, 2007). For an earlier articulation of this concept that has been much cited in American art writing, see William Cronon, “The Trouble with Wilderness: or, Getting Back to the Wrong Nature,” in *Uncommon Ground: Rethinking the Human Place in Nature*, ed. William Cronon (New York: Norton, 1995), 69–90.
- <sup>39</sup> Elizabeth Hutchinson, “They Might Be Giants: Galen Clark, Carleton Watkins and the Big Tree,” *October* 109 (Summer 2004): 47–63.
- <sup>40</sup> Donna Haraway, “Otherworldly Conversation, Terran Topic, Local Terms,” in Alaimo and Hekman, *Material Feminisms*, 579.
- <sup>41</sup> See Elizabeth Hutchinson, “Conjuring in the Fog,” 114–147 and Hutchinson, “Getting Soaked at Yellowstone: Photography and the Making of the Tourist Landscape” in Shannon Egan and Marthe Fjellstad, eds. *Across the West, Toward the North* (Provo: Brigham Young University Press, forthcoming).
- <sup>42</sup> Barad, “Posthumanist Performativity,” 143.