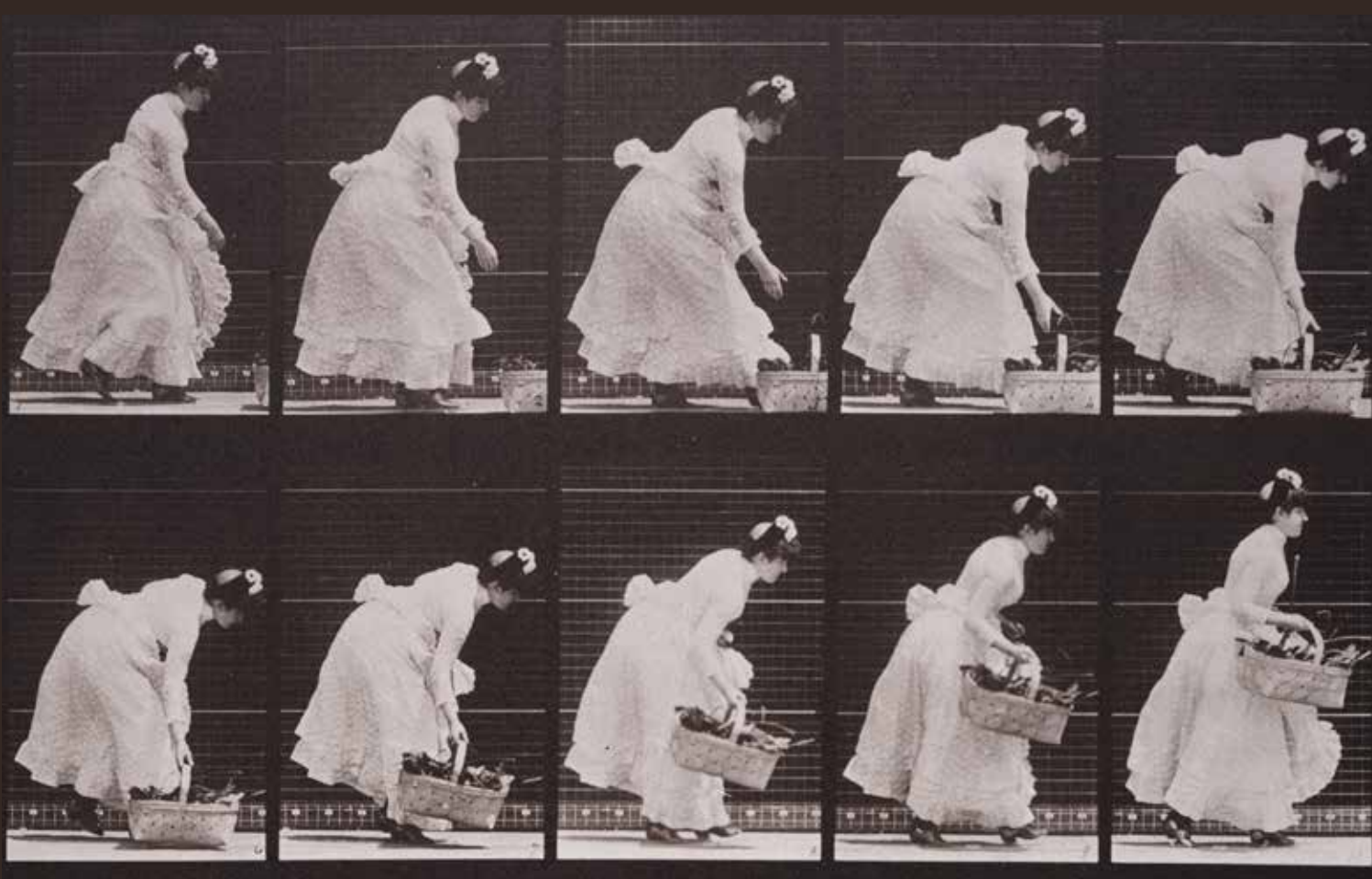
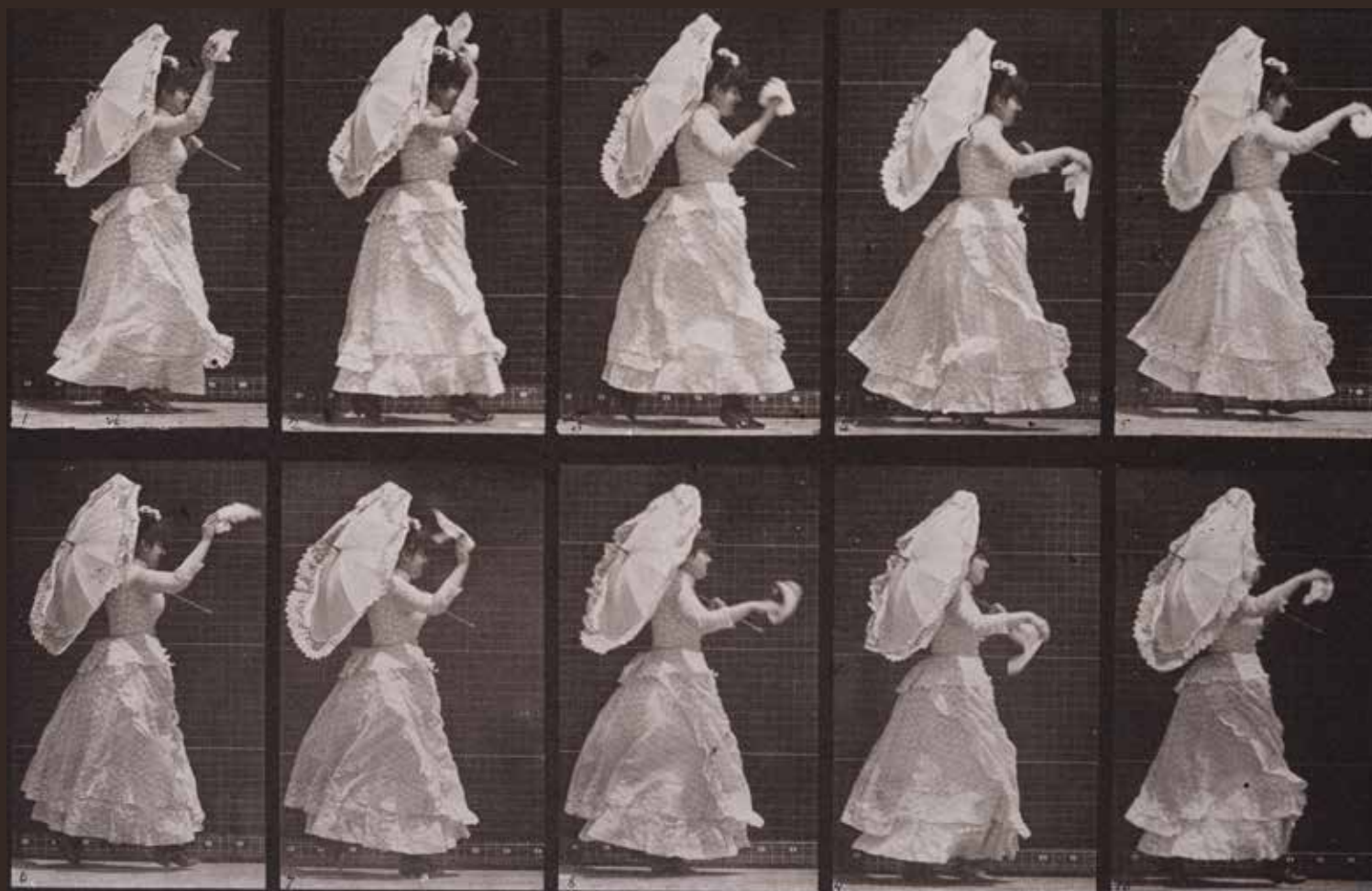
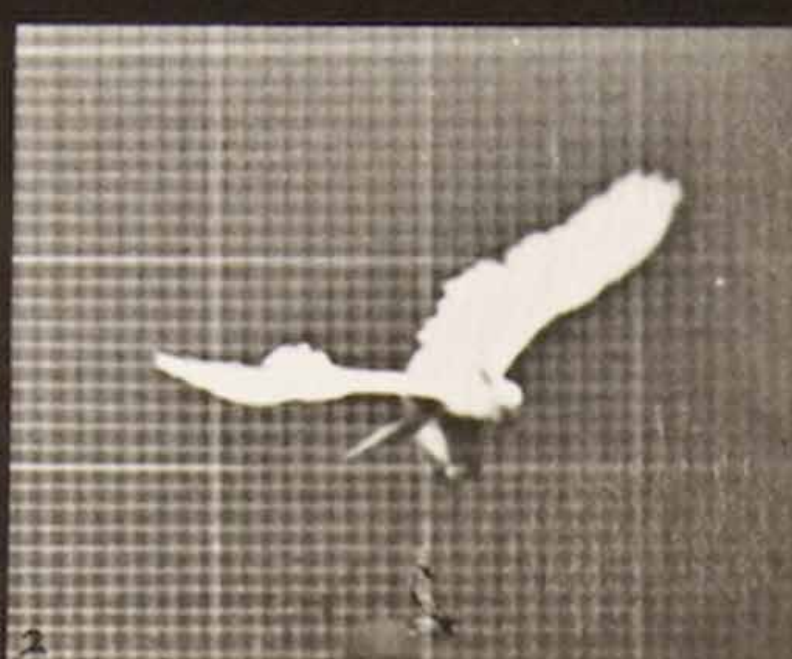


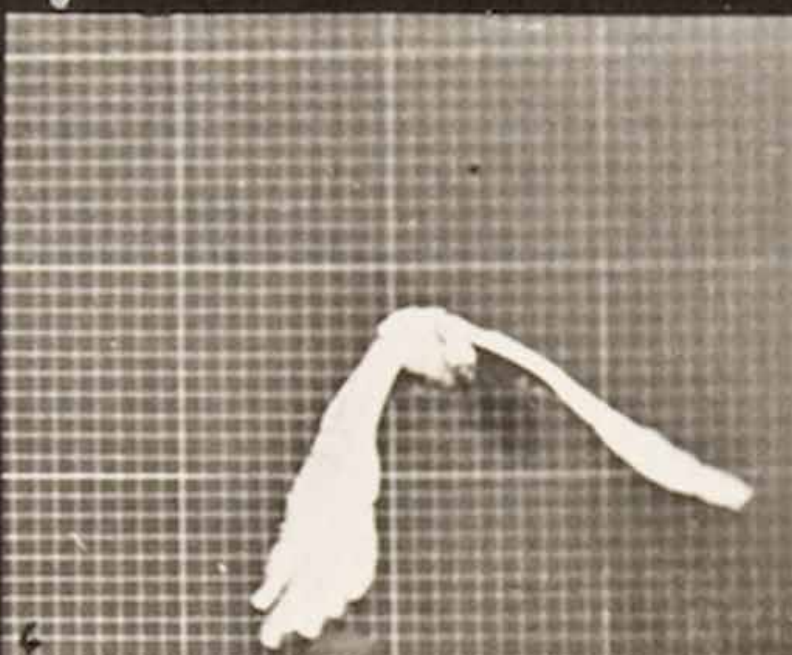
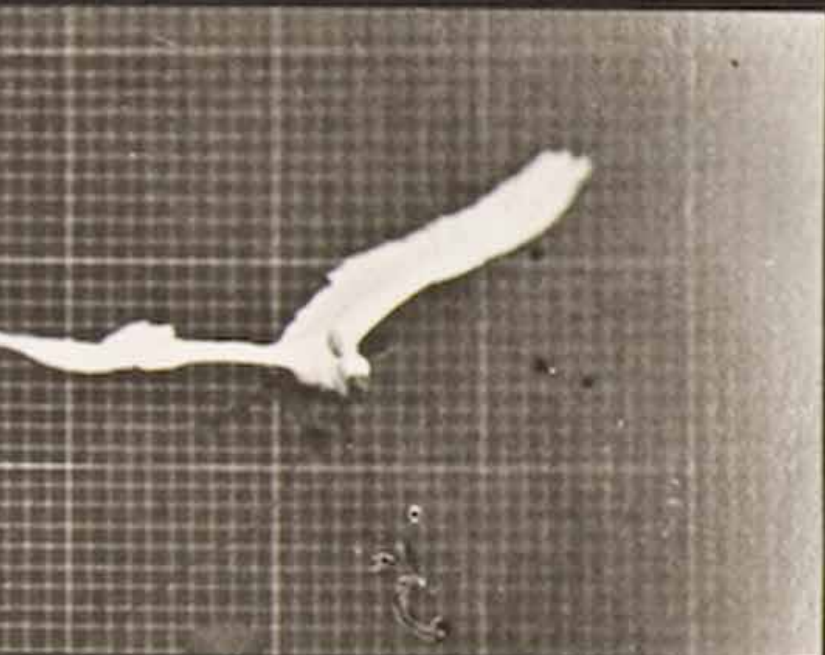


DISSECTING LOCOMOTION

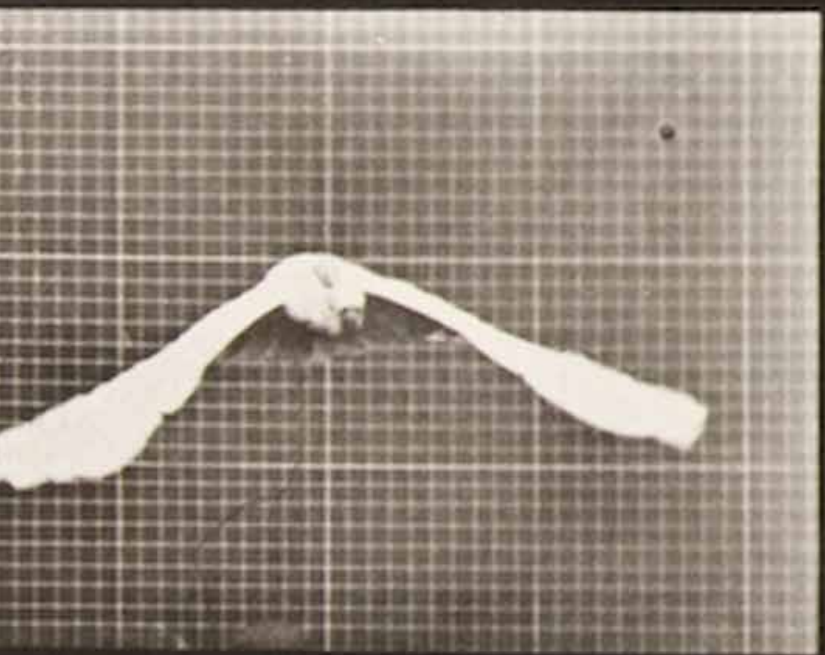




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DISSECTING LOCOMOTION

FEBRUARY 20-APRIL 4, 2026

Curated by

Anna Radigan

Lena Rimmer

Abigail Allport

Under the Direction of Elizabeth Lee

THE TROUT GALLERY

THE ART MUSEUM OF DICKINSON COLLEGE

CARLISLE, PENNSYLVANIA



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ACKNOWLEDGMENTS

The art history senior seminar at Dickinson College is a unique opportunity for advanced art history undergraduate students to assume the responsibilities of professional curators. Each fall semester, students in the seminar conduct in-depth research, write, and then revise (across multiple drafts), a scholarly essay for the exhibition catalogue. Simultaneously, they organize an accompanying exhibition that will be seen by faculty, staff, and students across campus and by the Carlisle community and beyond. It is an ambitious undertaking made even more challenging by a start-to-finish timeline of less than fifteen weeks.

Often the senior exhibition features the work of a little known or understudied artist. This year, however, students researched Eadweard Muybridge (1830–1904), one of the most famous photographers of the nineteenth century. Thanks to a donation from Philadelphia lawyer Samuel Moyerman (1893–1966), The Trout Gallery owns more than one hundred plates from Muybridge’s pioneering photographic project, *Animal Locomotion*, which was completed at the University of Pennsylvania in 1887. *Dissecting Locomotion* is only the second Trout Gallery exhibition devoted exclusively to Muybridge’s work. The first, *The Art and Science of Eadweard Muybridge*, from 1985, featured an exhibition catalogue with essays by Dickinson faculty, although art history students contributed to the research and writing of the catalogue as well as to the planning for the exhibition. Forty years later, the Art & Art History program at Dickinson has evolved to put students at the center of this process, immersing them fully in the daunting but exciting challenge of holding the curatorial reins for their capstone seminar.

The strong support of The Trout Gallery staff and other campus colleagues is what make this endeavor possible. First and foremost, we are grateful to Shannon Egan, Director of the Trout Gallery, who visited our class regularly and helped us think through countless aspects of the show. Her expertise and insights were invaluable throughout the seminar. Dr. Egan also kindly introduced us to Ron Perisho, a collector of photography, who deserves special thanks for allowing us to borrow several photographs, including works by Berenice Abbott and Harold Edgerton as well as other Muybridge materials in support of our exhibition. We sincerely appreciate his kindness, deep knowledge, and generosity. His contribution allows us to tell a deeper, more fully contextualized story about Muybridge’s work and the intersection of photography with art and science. Heather Flaherty, Curator of Education, has made us much smarter about audience, and how to communicate our key ideas through wall text. She is sharing our work on Muybridge with campus and community groups throughout the run of the exhibition. We are grateful to James Bowman, Registrar and Exhibition Designer, for guiding us through the complexities of exhibition design, and for his patience in helping us work through multiple iterations of our organization and layout. We also appreciate the work of Jolene Gregor, Mila Elash, and Sue Russell in Visitor Services for welcoming guests to the exhibition. Mila is also the tech wizard behind the moving images on display in the exhibition.

Beyond The Trout Gallery, we are grateful to Jim Gerencser, Associate Dean for Archives and Special Collections, for helping us to connect Muybridge’s story with Dickinson’s nineteenth-century natural science professor, Charles Francis Himes (1838–1918), class of 1855, who was also an avid photographer. We learned how Muybridge made photographs—and even made some of our own—thanks to a workshop with Visiting Lecturer Andy Bale using a mammoth plate camera and dark room chemistry. A note of thanks to the entire Art & Art History faculty whose instruction over the last four years has built the knowledge and skills seniors bring to their capstone experience. Finally, we thank Krista Hanley from the Print Center and Skyler Ellsworth from Marketing & Communications for their hard work in producing the catalogue itself. We are fortunate to have their expertise on campus. ■

Elizabeth Lee
Professor, Department of Art & Art History



INTRODUCTION

ELIZABETH LEE

While Eadweard Muybridge's early photographic interests focused on the Western landscape, his career took a definitive turn when he began making motion study photographs for Leland Stanford, the former California governor and wealthy railroad industrialist who was also a passionate horse breeder. The earliest of these featured Stanford's trotter, Occident, at a racetrack in Sacramento, but by the late 1870s, he began developing a stock farm at his country estate in Palo Alto, the future site of Stanford University. Here, Muybridge, with the help of local engineers, built a track with a series of twelve cameras equipped with electrical shutters that could take a dozen sequential photographs of a running horse in less than half a second. Muybridge continued to refine this technology, which he patented in 1879, and it became the blueprint for the method he fully realized with *Animal Locomotion* in Philadelphia several years later. Before leaving California, however, he brought athletes from the San Francisco Olympic Club to Stanford's track to photograph them turning somersaults, fencing, and boxing. He also began documenting gaits of non-human animals around this time, including dogs, goats, deer, and pigs. Thus, the seeds of what would become *Animal Locomotion* were already in place well before he arrived in Philadelphia. As writer Rebecca Solnit puts it, Muybridge's work following the California motion studies "only polished, promoted, and enlarged upon what he had accomplished in those years."¹

News of Muybridge's accomplishments appeared in the popular press in the United States and abroad, but the photographs themselves were slow to circulate. He collected more than two hundred albumen prints from wet-plate collodion negatives in a handmade volume, *The Attitudes of Animals in Motion* (1881), but these were primarily intended for Stanford and only a handful of copies exist. In the fall of 1881, Muybridge initiated a promotional tour, giving illustrated talks in England and France, including the Paris studio of the painter Jean-Louis Ernest Meissonier, where, as Muybridge put it, "many of the most eminent men in art and science and letters in Europe were present."² While the revelations of these photographs were widely celebrated, they were also critiqued. Sculptor Auguste Rodin, for example, questioned the value of photographs which "lie" given that "in reality time does not stop," and the artist's task is to record what the eye actually sees.³ In part to address such criticism, Muybridge created a viewing device, which he named the zoopraxiscope, which projected light onto a spinning illustrated disk, creating the impression of a fluid image. The reanimation of his sequential photographs into cinematic motion helped to make his studies more compelling for his audiences, and certainly more entertaining. These animated lectures had another goal as well. As Muybridge explained, they were "for the purpose of inducing some wealthy gentlemen (to whom I have letters of introduction) to provide the necessary funds for pursuing and indeed *completing* the investigation of animal locomotion" begun in California.⁴

Muybridge's hopes for a European sponsor to support his work were cut short with the February 1882 publication of *The Horse in Motion*, a book written by physician J.D.P. Stillman and published by Stanford. Muybridge knew the book was in production but was shocked to learn his name did not appear on the title page, and that his photographs had been turned into drawings and illustrations, thus completely undermining their documentary value and throwing the significance of his motion studies into question. Muybridge sued Stanford for \$50,000 in damages and filed another lawsuit against the publisher but lost both cases. He returned to the United States in June 1882 without having secured funds to continue his work.

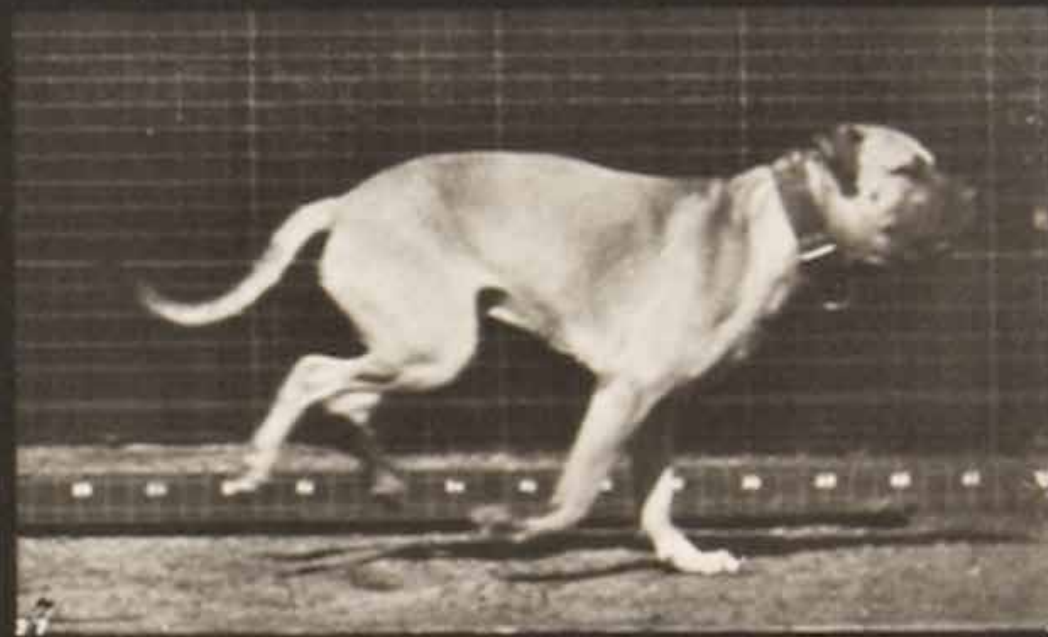
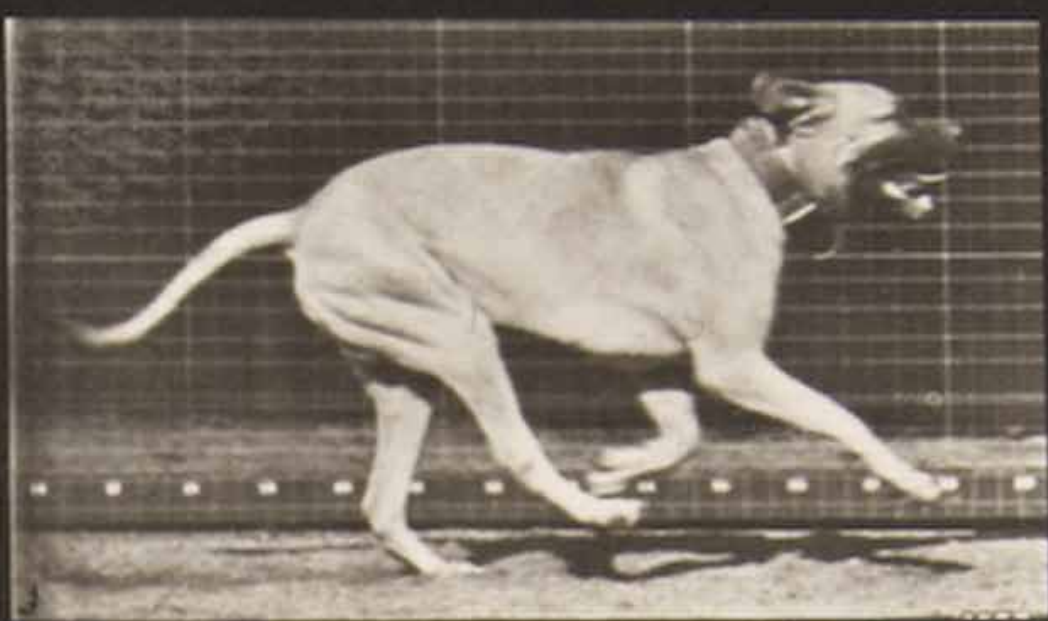
Two months later, as Muybridge continued his tour in the United States, Philadelphia civil engineer, educator, and philanthropist Fairman Rogers attended one of his lectures in Newport, Rhode Island. Rogers was already familiar with Muybridge's motion photography and, as director at the Pennsylvania Academy of the Fine Arts (PAFA), saw the potential for artists to benefit from his studies. Aided, perhaps, by painter Thomas Eakins,

who had an ongoing correspondence with Muybridge, Rogers brought the photographer to Philadelphia for a series of lectures at PAFA in February 1883. By August, there was a formal arrangement in place thanks in large part to the University of Pennsylvania's new Provost, William Pepper, who took great interest in Muybridge's work, considering his ambitious photographic project a model of what the modern research university could accomplish. When *Animal Locomotion* was published in 1887, Pepper wrote with confidence and pride that "the work will undoubtedly be of lasting service to art and science."⁵

A great deal has been written about Muybridge since that time, yet the student curators for *Dissecting Locomotion* still found unique vantage points to highlight in their research. Anna Radigan offers historical perspective on Muybridge's career, connecting his early Western landscapes with the later motion studies. As she notes, even in his initial forays into photography, Muybridge was drawn to moving aspects of the landscape, such as waterfalls and clouds, curious to know what the camera could reveal about these ephemeral aspects of nature. Radigan also discusses the "philosophical toys" Muybridge's contemporaries utilized to experience photography with special attention to his own invention, the zoopraxiscope, a clear antecedent to the film projector. Lena Rimmer addresses the emphasis in *Animal Locomotion* on athletes—who are featured in more than a quarter of the plates—by addressing the late-nineteenth-century national interest in physical culture and the rise of competitive sports on college campuses, including Penn. Her research shows that Muybridge's models were often highly accomplished athletes who embodied an emerging ideal of masculine fitness. Finally, Abigail Allport turns our attention to race, acknowledging that despite the many types of motion on view in *Animal Locomotion*, the human subjects are almost exclusively white. Given that Muybridge's photographic language draws from the conventions of nineteenth-century anthropology, among other racially-charged social sciences, she demonstrates how our understanding shifts when the race of these bodies—across differences of gender, class, and ability—are made visibly white. Together these essays offer important insights into one of the nineteenth century's most important and influential photographic projects. ■

-
- 1 Rebecca Solnit, *River of Shadows: Eadweard Muybridge and the Technological Wild West* (New York: Penguin Books, 2003), 6.
 - 2 Sarah Gordon, *Indecent Exposures: Eadweard Muybridge's Animal Locomotion Nudes* (New Haven, CT: Yale University Press, 2015), 29.
 - 3 Francoise Forster-Hahn, "Marey, Muybridge and Meissonier: The Study of Movement in Science and Art," in Anita Ventura Mozley, *Eadweard Muybridge: The Stanford Years, 1872–1882* (Palo Alto, CT: Stanford University, 1972), 105.
 - 4 Gordon, *Indecent Exposures*, 30.
 - 5 *Animal Locomotion: The Muybridge Work at the University of Pennsylvania, the Method and the Result* (Philadelphia: JB Lippincott Co., 1888; reprint New York: Arno Press, 1973), 6.

Essays



TIME AFTER TIME: EADWEARD MUYBRIDGE'S ARTISTIC AND CINEMATIC VISION

ANNA RADIGAN

In the fall of 1867, a man photographed a flowing stream in Yosemite Valley, California. It was here that the early pioneer of motion photography, Eadweard Muybridge, used his camera to go beyond documentation to capture water flowing through a landscape. His early landscape photographs reveal his interest in temporality, the relationship between an existing subject and time. Five years later, in 1872, Muybridge pursued the moving subject with images of Occident, the famous trotter owned by the wealthy railroad industrialist Leland Stanford. Muybridge continued to investigate and strengthen his studies of temporality by inventing optical devices and instruments to view his photographs. In this way, he contributed to the early history of cinematography. *Animal Locomotion*, which was completed at the University of Pennsylvania in 1887, marks the culmination of a twenty-year career of scientific exploration and artistic achievement. This essay focuses on the early years of the artist's career to show how Muybridge laid the foundations for his later accomplishments in developing the moving picture and anticipating film effects in cinematography.

Muybridge, Landscape Photographer

Eadweard James Muggeridge was born in 1830 in Kingston upon Thames in southwest London, and would later make a name for himself in photography as Eadweard Muybridge. He began his career at the London Printing & Publishing Company. In 1851, he became an agent for Johnson, Fry & Company, where he worked with book sales and distribution in their Boston, New York, and Philadelphia offices.¹ In his mid-twenties, Muybridge moved to the United States, settling in San Francisco, where he opened a bookstore and began travelling throughout California to reach local markets in the development and industrialization of the state.² At this time, Muybridge

became enthralled with photography based on the views he witnessed during his travels.³ After a coach accident in 1860 that left Muybridge with severe head and vision injuries, he returned to England and received medical treatment from Sir William Gull, who encouraged Muybridge to find a profession working in nature to aid in his recovery.⁴

Muybridge turned his attention to photographing the American West. The western landscape had attracted photographers from as early as the California Gold Rush in the late 1840s, and it continued to expand and develop as a fine art.⁵ Landscape photography, as a movement within photography, was comprised of travelers, professional photographers, hobbyists, geologists, and artists for whom nature took on greater significance in the context of industrialization. Photographic images became a means of capturing uncharted landscapes and mapping new geographies but were also a key factor in aesthetic experimentation with the visual effects of the sun and water on varied terrains in aesthetic experimentation.⁶ In the spring of 1867, Muybridge boarded a river steamboat to go from San Francisco to Stockton, California, and beyond, moving deeper into the natural world.⁷ It was along these paths that he made some of his first stereographs of the "Big Trees" and clouds of the Calaveras Grove as well as various sites in Yosemite Valley.⁸ Muybridge experimented and chemically engineered methods of reproducing visual effects in a tent with a portable darkroom, which he named the "Flying Studio." He championed the wet-plate collodion technique in which a chemically soaked and sensitized plate is placed in the camera and exposed to light through a lens. Shortly after exposure, the plate is developed with a chemical solution and then fixed, washed, and varnished to create a photographic negative. He produced approximately five hundred wet glass-plate negatives of Yosemite Valley in 1867 alone, and ultimately made around two thousand Western photographs across a five-year period.⁹

OPPOSITE: Eadweard Muybridge, *Animal Locomotion* plate 707 (detail), 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.91.

Temporal Effects and Natural Phenomena



Figure 1. Eadweard J. Muybridge, *A Study of Clouds*, 1868–1871. Albumen silver print, Lone Mountain College Collection of Stereographs by Eadweard Muybridge, Bancroft Library, University of California, Berkeley.

In *A Study of Clouds*, from around 1870, Muybridge created two side-by-side photographic images known as a stereograph (fig. 1), which is meant to be viewed through a stereoscope, an optical viewing instrument that relies on both eyes to create an illusion of three-dimensionality. This produces the perception of spatial depth, giving the viewer a sense of immersion in the sky, sun, and moving clouds.¹⁰ There is no horizon or subject other than the clouds to situate the viewer, who becomes fully absorbed in this floating world. The ability to capture the fleeting forms of clouds, which are neither solid nor stable, is one of the examples of how Muybridge studied motion before *Animal Locomotion*. Across the stereograph, there is a “temporal effect” which continues in the progression of the image from left to right, giving the clouds a sense of temporality, or existence in the atmosphere over time.¹¹ It is through these effects created by the stereograph and stereoscope that the viewer becomes transported to another environment, similar to how audiences in a movie theater experience a different sense of place.

An interest in clouds and “transient aspects of nature—moonlight, mist, shadows, reflections, broken light, and rainbow effects” is partly what makes Muybridge’s work distinctive, according to the art historian Robert Haas.¹² (He even invented a special camera called the “sky-shade” which permitted short exposures of the sky while allowing long exposures of the landscape at two different shutter speeds.¹³) His early stereographs placed Muybridge on the map of landscape photography amongst others such

as Charles L. Weed and Carleton E. Watkins. Like these photographers, Muybridge also worked in the medium of mammoth plates, requiring the same wet-plate collodion process as the stereograph, but in a 17-inch by 21-inch format. Weed was the first to photograph Yosemite Valley in June 1859, making him one of the earliest pioneers of landscape photography, although Watkins soon eclipsed Weed’s reputation.¹⁴ Watkins was known for his serene, and almost literal landscape photographs, which distinguished them from Muybridge’s style, characterized by dramatic, painterly, and uncanny effects.¹⁵ Muybridge punctuated his photographs

with chaos, creating discombobulating environments with uneven compositions, and discomforting space. He considering himself an expressionistic landscape photographer. In addition, his eccentric personality and drive to experiment beyond traditional forms of photography made his artistic approach distinctive. Some of these qualities can be seen in Muybridge’s mammoth plate, *Wildcat Falls, Yosemite Valley*, from 1872, where the flow of water creates a mist that runs from the center to the foreground of the image (fig. 2). Hard, jagged rocks frame the water, which by contrast unfolds in a soft, atmospheric cascade. The water is dynamic and cuts through the landscape, transforming an otherwise still scene with its movement. We can almost hear it pass through the rocks, a torrent of motion which Muybridge’s camera captures in time.



Figure 2. Eadweard Muybridge, *Wildcat Falls, Valley of the Yosemite*, 1872. Albumen print, 16 x 22 in. (40.6 x 55.9 cm), Ron Perisho Collection.

Everything in Motion: The Zoopraxiscope & *Animal Locomotion*

In 1872, through the Bradley & Rulofson studio, Muybridge published a series of mammoth-plate photographs of the Yosemite Valley and Sierra Nevada to great critical acclaim.¹⁶ Amidst his growing fame, he received an unexpected commission from Leland Stanford to capture his horse, Occident, who around this time tied the record for the world's fastest trotter. Muybridge worked to capture Occident in motion while also continuing his photographic work in Yosemite. Stanford, who in addition to racing horses also bred them, wanted the camera to resolve a question that the human eye could not: whether all four legs of a galloping horse came off the ground at once as part of his interest in understanding animal mechanics. Although the original 1872 images of Occident are lost, Muybridge continued his experiment and in 1878–1879 published the first photographs of the running horse in the album *The Attitudes of Animals in Motion*.

While his photographs *stopped* motion so that the human eye could comprehend the exact placement and sequence of the horse's legs, Muybridge was also interested in *reanimating* movement using optical devices that would further demonstrate the truth of his experiments. These were inspired by the “philosophical toys” in Leland Stanford's collection, including the zoetrope and a phenakistoscope.¹⁷ The zoetrope is an optical toy that creates an illusion of movement through the slits of a spinning cylinder with a series of still images inside. The phenakistoscope worked similarly but relied on a rounded mirror in the center of the barrel to reflect the images on these strips. In 1878, Muybridge constructed the first prototype of what he called a “zoopraxiscope,” which literally means “animal action viewing device,” and consisted of a projecting lantern, rotating disks with printed images from his own photographs, a rapid shutter crank to spin the rotating discs, and a wooden frame to stabilize the interior mechanisms (fig. 3). The cranking device rotated two discs at the same time, in different directions, to create a stroboscopic effect when projected with a light from behind. The disks



Figure 3. Eadweard Muybridge, Zoopraxiscope and disc, c. 1879. Mixed media, c. 85 x 45 x 58 cm, Kingston Heritage Service, London.



Figure 4. Eadweard Muybridge, “Mule Bucking and Kicking,” 1893. Zoopraxiscope glass disc, 12.4 inches, Kingston Heritage Service, London. https://commons.wikimedia.org/wiki/File:Zoopraxiscope_16485u.jpg

themselves were more likely to be glass with painted silhouettes to reveal the silhouette in motion when projected (fig. 4). The projection allowed a group of individuals to view the image in motion, rather than one person at a time.

These devices relied on the phenomenon of “persistence of vision” in which the mind holds on to an image after it has disappeared.¹⁸ When images of the horse are projected in a fast repetition, the human eye synthesizes each singular image to create an illusion of a flowing, animated picture—what would soon be understood as a cinematic experience. Muybridge spent the late 1870s and early 1880s travelling in Europe and the United States to lecture and present his motion photographs using the zoopraxiscope. The exposure of his project during

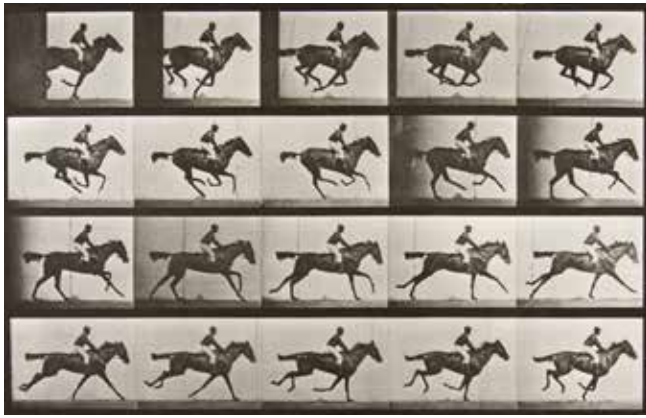


Figure 5. Eadweard Muybridge, *Animal Locomotion* plate 627, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.76.

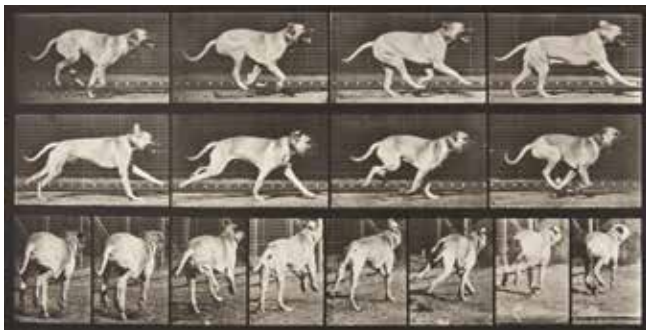


Figure 6. Eadweard Muybridge, *Animal Locomotion* plate 707, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.91.

these travels ultimately brought him to the attention of the University of Pennsylvania, where he produced *Animal Locomotion*, which consisted of 781 plates.¹⁹

For example, Plate 627 shows a galloping horse and rider in a grid that moves from left to right in a five-by-four grid sequence (fig. 5). The legs of the horse noticeably change from one frame to the next. In the second frame, three of the horse's legs lift off the ground followed by all four in the subsequent frame. When a disc with a painted replica of the plate is placed in the zoopraxiscope, the lines blur together, and it is easy to imagine the horse coming to life.²⁰ Other cinematic effects in Muybridge's stop-motion photography can be seen in Plate 707, featuring a dog in motion (fig. 6). The dog is pictured in profile in the top two rows, while the bottom row shows the same animal from the rear, mirroring an investigation of three-dimensionality and "tracking shots" that would later be seen in cinema.²¹ Two sets of cameras in Muybridge's studio capture this effect.

According to photography curator Anita Mozley, the zoopraxiscope "remained the only commercially demonstrated motion-picture projector in America for over a decade until Thomas Edison exhibited his projecting apparatus, the Vitascope, in 1895."²² It was initially intended to reanimate Muybridge's serial photographs, but it had a much greater impact than this fact alone would suggest.²³ Both as a photographer who pushed the limits of stop-motion photography, and as an inventor of the zoopraxiscope, Muybridge bridged the revolution from nineteenth-century still photography to modern day cinema. ■

Endnotes

- 1 Robert Barlett Haas, "Eadweard Muybridge, 1830–1904," in Anita Ventura Mozley, ed, *Eadweard Muybridge: The Stanford Years, 1872-1882* (Stanford, CA: Stanford University Department of Art and Architecture, 1973), 11.
- 2 Haas, *The Stanford Years*, 11.
- 3 Haas, *The Stanford Years*, 12.
- 4 Haas, *The Stanford Years*, 10.
- 5 Phillip Prodger, *Time Stands Still: Muybridge and the Instantaneous Photography Movement* (Iris and B. Gerald Cantor Center for Visual Arts at Stanford University in association with Oxford University Press, New York, 2003), 4.
- 6 Tim Davis, "Photography and Landscape Studies," *Landscape Journal* 8, no. 1 (1989): 1.
- 7 Robert Bartlett Haas, *Muybridge: Man in Motion* (Berkeley: University of California Press, 1977), 16.
- 8 Haas, *Man in Motion*, 16.
- 9 Haas, *The Stanford Years*, 13.
- 10 Brooke Belisle, "The Dimensional Image: Overlaps in Stereoscopic, Cinematic, and Digital Depth," *Film Criticism* 37/38, no. 3/1 (fall/spring 2013): 118.
- 11 Belisle, "The Dimensional Image," 126.
- 12 Haas, *Man in Motion*, 19.
- 13 Haas, *Stanford Years*, 29.
- 14 Haas, *Man in Motion*, 15–16.
- 15 Anita Ventura Mozley, "Photographs by Muybridge, 1872–1880," in Anita Ventura Mozley, ed, *Eadweard Muybridge: The Stanford Years, 1872-1882* (Stanford, CA: Stanford University Department of Art and Architecture, 1973): 46.
- 16 Haas, *Man in Motion*, 44.
- 17 Haas, *The Stanford Years*, 25.
- 18 Rebecca Solnit, *River of Shadows: Eadweard Muybridge and the Technological Wild West* (New York: Penguin Books, 2003), 200.
- 19 Haas, *Man in Motion*, 96.
- 20 Lawrence, Amy. "Counterfeit Motion: The Animated Films of Eadweard Muybridge." *Film Quarterly* 57, no. 2 (Winter 2003–2004), 20.
- 21 Belisle, "The Dimensional Image," 118.
- 22 Haas, *The Stanford Years*, 26.
- 23 Prodger, *Time Stands Still*, 16.



PENN ATHLETES ON DISPLAY

LENA RIMMER

In 1883, the photographer Eadweard Muybridge arrived on the campus of the University of Pennsylvania to conduct his *Animal Locomotion* project. Utilizing elements of both art and science, Muybridge set out to create a series of stop-motion photographs on an unprecedented scale. Not only was he able to achieve this, but through the inclusion of male student athletes from the University of Pennsylvania (hereafter referred to as Penn) in tandem with other models, Muybridge's project dovetailed with the emergence of a new era of physical culture in the United States. Physical culture refers to the study of human movement and, in this essay, specifically within the context of sport, physical education, and fitness. Throughout *Animal Locomotion*, male athletes were photographed performing simple actions like walking or participating in sports such as rowing, baseball, boxing, fencing, wrestling, cricket, running, track and field, football, and more. Across 781 plates, athletes appear in over 200 photographs, and thus comprise roughly a quarter of the entire project. In his depictions of athletes, Muybridge both references an art historical tradition and establishes a hierarchy within the *Animal Locomotion* series that elevates sports and the fit body. In doing so, his project not only reflects a growing physical culture movement in the late nineteenth-century, but also participates in promoting the athletic body as a new cultural ideal.

The Project Begins

In the 1880s, Muybridge traveled around the United States and Europe giving lectures about his California motion photography projects using his invented photograph viewing device, the zoopraxiscope. Muybridge intended for these lectures to present his advancements in photography and to entice new sponsors to fund future research on animal motion photography. Fairman Rodgers, a horseman, engineer, and former University of Pennsylvania trustee, saw

Muybridge's lecture in Providence, Rhode Island, and invited him to Philadelphia.¹ (Rodgers would later serve on the Muybridge Commission for *Animal Locomotion*.) On his visit to Philadelphia, in February 1883, Muybridge met Dr. William Pepper, a graduate of Penn's medical school who joined the faculty and in 1881 became Provost. Pepper played a pivotal role in the transformation of Penn's campus, which included overseeing the beginnings of the Athletics Association as well as the Departments of Physical Education and Physical Culture.² Pepper invited Muybridge to continue his work in motion photography at Penn with this emerging culture of sports and physical education in mind. Muybridge's studio was located at the intersection between 36th and Pine, across the street from both the Penn's athletic grounds and its new veterinary school (fig. 1).³ He also had access to medical patients from the

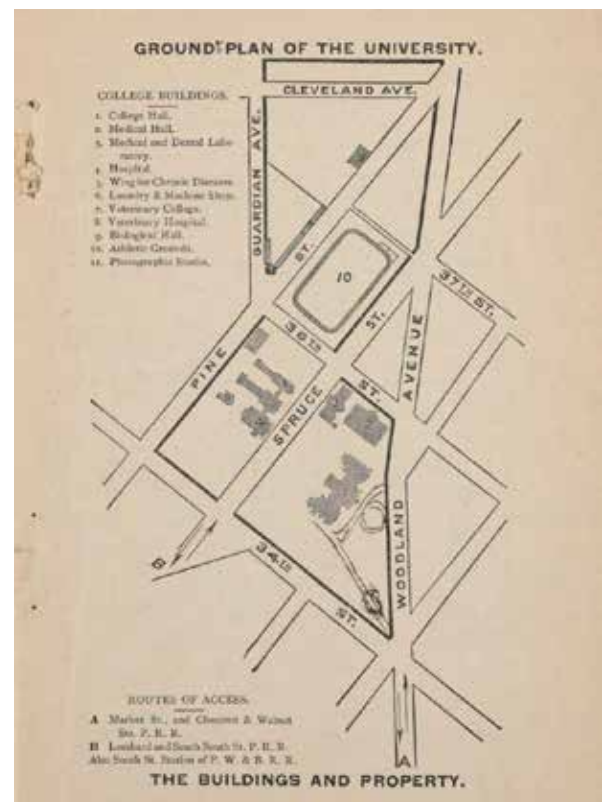


Figure 1. "Ground Plan of the University," 1885. *University of Pennsylvania: Catalogue and Announcements 1885-86* (Philadelphia: University of Pennsylvania, 1885), 5. <https://archives.upenn.edu/digitized-resources/docs-pubs/catalogues/catalogue-1885-86>

OPPOSITE: Eadweard Muybridge, *Animal Locomotion* plate 273 (detail), 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.15.

Hospital of the University of Pennsylvania and to animals from the Zoological Society of Philadelphia, both of which were established in 1874.⁴ It was an arrangement well suited to one of the most ambitions and technologically sophisticated photographers of the time.

Starting for a Run

Muybridge categorized the *Animal Locomotion* plates by similarity of action: they are grouped by walking, then running, then walking on inclines, then jumping, and so on. The first fifty-eight plates in the series contain various depictions of figures walking. Plate 59, described in the *Prospectus* as ‘Starting for a Run,’⁵ initiates a series of plates depicting running (fig. 2). Muybridge published a prospectus in 1887 to describe the content of *Animal Locomotion*, his research process, including the rate at which frames were shot, and also to market the project. Although he did not publicize the identities of his models, some have been identified, especially the Penn athletes. Percy C. Madeira is the model for Plate 59, “Starting for a Run,” and Plate 60, “Running at a Half-mile Gait,” and other plates.⁶ Separate from his presence as a model, Madeira was the 1884 amateur one-mile American champion and also excelled in high-jump, long-jump, and hurdles, among other physical activities.⁷

Plate 59 is the only one of its kind in *Animal Locomotion*. It shows a progression from stillness to motion, from a stationary position to a run. No other plate depicts the beginning of motion in this way; elsewhere, models are either already moving or not

performing consecutive motion to the extent that Madeira is here. Movement in this plate is depicted in three rows: the first two contain a total of six profile images, and the third contains twelve head-on shots to show Madeira’s physical progression over the sequence. While walking figures stand upright, the runner is bent in a diagonal, leading with his head and using his legs to propel him forward. In the first three frames of the top row, his body remains in a still position with his legs staggered and arms outstretched in opposite directions. In the fourth frame, he begins his motion. His right leg begins moving forward, and his arms move towards each other, resulting in an even more severe diagonal. There is a rapid progression of movement through the next seven frames so that in the course of a dozen frames, the viewer sees the breakdown of a runner’s movement with a degree of detail previously impossible for the human eye to perceive.

The Rise of Sport

At the same time Muybridge was producing *Animal Locomotion*, a larger cultural movement towards sports and exercise was unfolding, especially on college campuses. The physical culture movement focused on strengthening men who had fallen victim to the debilitating effects of modern urban life, including neurasthenia, or nervous exhaustion.⁸ The rise of organized sports helped compensate for the more sedentary nature of professional life and also for the need among certain classes to fill newfound leisure time.⁹ American college campuses offered the perfect environment for the development of programs in physical education and health which was considered a natural accompaniment to intellectual and moral growth. Already in the late nineteenth-century, there was a concern with students overworking themselves. Exercise and sports allowed them to still appear productive, and made them less susceptible to intellectual burnout.¹⁰ Harvard, Princeton, and Yale Universities were big players in early intercollegiate sports, and in 1894, Penn built Franklin Field, giving it a major role in the emerging world of college athletics.¹¹ The rise of sports in the United States was part of a broader international phenomenon with the modern Olympics making its return in 1896. Hundreds

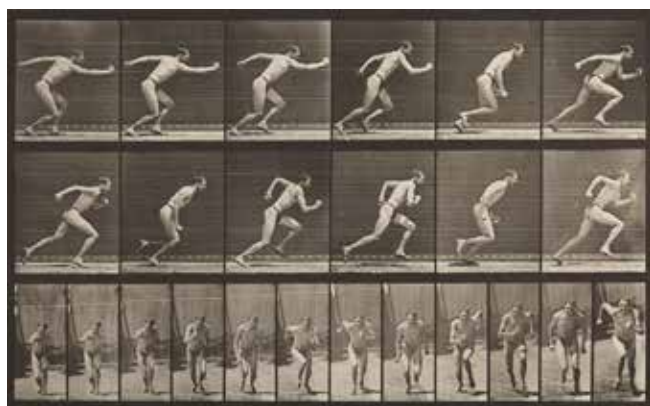


Figure 2. Eadweard Muybridge. *Animal Locomotion* plate 59, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). Courtesy of the Pennsylvania Academy of the Fine Arts, Philadelphia, Archives.

of male athletes from more than fourteen different nations represented over forty competitions at an event now considered the ultimate global gathering in athleticism and sports.

The presence of Penn athletes in *Animal Locomotion* served a clear purpose. These men were professional or record-holding athletes, the best of the best.¹² As current students or recent alumni in the medical or engineering school, they were also intellectually impressive. For example, Thomas Love Latta played baseball at Penn from 1883 to 1887, and led his team through several undefeated seasons.

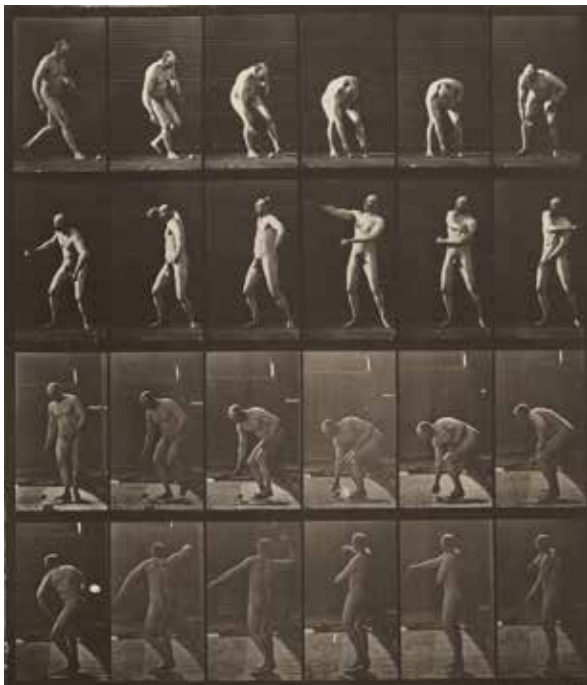


Figure 3. Eadweard Muybridge. *Animal Locomotion* plate 302, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). Courtesy of the Pennsylvania Academy of the Fine Arts, Philadelphia, Archives.

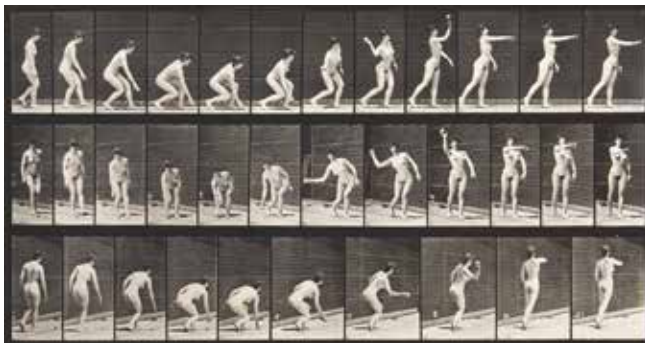


Figure 4. Eadweard Muybridge. *Animal Locomotion* plate 303, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.24.

After graduation, he became a contractor and civil engineer, embodying the mix of physical and intellectual success that colleges and universities were trying to integrate through sports.¹³ During his time at Penn, Latta modeled with a baseball for *Animal Locomotion*.

Gender and Sports

The strength and athleticism of male models like Madeira and Latta becomes even clearer in contrast to the female models who appeared in *Animal Locomotion*. At the time, Penn was an all-male institution, so Muybridge needed to look beyond the campus for female models. They appear in scenes that were generally not athletic, but instead were shown in domestic contexts. As art historian Sarah Gordon observes, *Animal Locomotion* is built around a subtle social and evolutionary hierarchy with elite athletes first, followed by laborers and workmen, who tend to be clothed, and, finally, women who have no special skills or attributes. In his *Prospectus*, Muybridge describes the female models as being “from all classes of society” and he identifies them simply by their marital status and physical measurements.¹⁴ In some plates, women are depicted in absurd situations, hitting each other with brooms, undressing each other, smoking cigarettes, and in other poses which would seem to contribute little to the scientific study of movement.

Women even carry themselves differently when depicted doing the same actions as male models. For example, plate 302 features a male Penn athlete, perhaps Latta, though it is hard to be sure, in “Picking up a ball and throwing it” (fig. 3). Plates 303 through 306 are also each described as “Picking up a ball and throwing it” and feature a nude or semi-nude female model (fig. 4). The Penn athlete is formatted differently from the female models: he is pictured from two different angles over twelve frames, creating a clearly defined view of his action. Meanwhile, the woman in plate 303 is shown in three rows of twelve frames from three separate angles, each angle in a different row. The middle row, which shows the action head-on, highlights the disparities in the athleticism between the male and female models. The woman picks up the ball while bending her knees

at an angle that looks awkward and uncomfortable, while the Penn athlete appears smooth and rehearsed. None of the female figures in this category enjoy a similar degree of ease of motion. Their clear lack of athleticism serves to underscore the skills of their male counterparts.

Muybridge as Athlete

Throughout *Animal Locomotion*, male athletes exhibit their physical abilities and fitness through the



Figure 5. Eadweard Muybridge, *Animal Locomotion* plate 519, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.45.

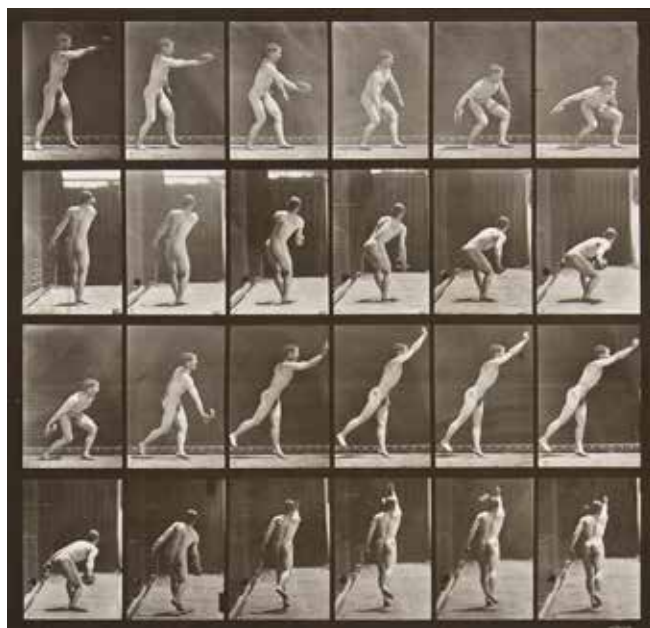


Figure 6. Eadweard Muybridge, *Animal Locomotion* plate 307, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.25.

demonstration of their respective sports. Muybridge himself is unofficially included as a self-described “ex-athlete, aged about 60,” mimicking many of the same actions as the Penn athletes and other sportsmen. This connection appears earlier in his career, in San Francisco, where he both participated in many athletic clubs and photographed bodybuilders; perhaps Muybridge was attempting to enter himself into one of his categories of the models.¹⁵ He also identified with the Penn athletes and other male models in *Animal Locomotion*, and is present in five plates (489, 490, 491, 519, 521). His actions span from using tools such as axes and shovels like the workmen in one series to hurling a discus like the Penn athletes. He also is shown in more simple acts like walking, sitting, and standing, ascending and descending stairs, and using a watering can.

In the plates where Muybridge is exhibiting athletic feats, there is a matching plate of a younger athlete elsewhere in the series performing the same action. In other instances, where plates depicting identical or similar action are next to each other, there is a grouping of men running, another of men hitting baseball bats, and another of men using tools. Muybridge’s self-portraits are grouped by themselves, briefly interrupted by other plates but remaining relatively close to one another. These plates are unusual in several aspects. Firstly, they portray Muybridge, the artist who produced the entire project, which adds to their importance. Secondly, they contain many disjointed actions, moreso than any other plates in the series. In plate 519 (fig. 5) Muybridge is depicted in four rows. The top two show him hurling a discus, and the bottom two show him ascending a set of stairs and then simply walking. In plate 307 (fig. 6) an athlete throws a metal discus, also in four rows. This sequence is broken up into two separate vantage points (rows 1 and 3 showing the side profile of the athlete and rows 2 and 4 showing the back). There are similarities in their movements but distinctions in their form. The athlete has obvious skill and demonstrates a natural progression of movement. This is

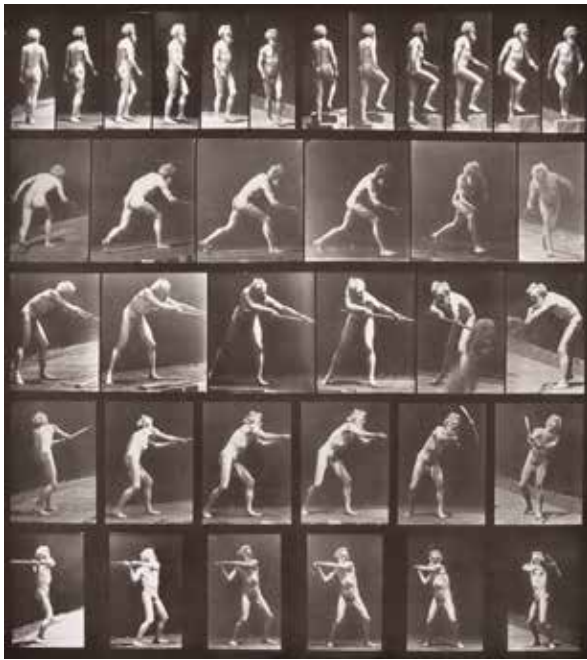


Figure 7. Eadweard Muybridge, *Animal Locomotion* plate 521, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.46.



Figure 8. Benjamin J. Falk, [Eugen Sandow, full-length portrait, standing, leaning on column, facing left, wearing wrestling leotard, Roman sandals, and six-point star pendant], 1894. Photograph, Library of Congress. <https://www.loc.gov/pictures/item/90715315/>

in contrast to the plates featuring Muybridge in which there appear to be missing frames and there is a more disconnected sequence of action. No other plates in the series depict such different and unrelated movements within the same plate. Plate 521 (fig. 7) is a good example as it shows Muybridge ascending stairs in one row, then throwing a discus, using a shovel, and using an axe in the following four rows. For the most part, these actions put the photographer's musculature and strength on display. As he noted in the *Prospectus*, Muybridge was in his sixties when these photographs were made and was perhaps trying to affirm his own vitality as someone well past his athletic prime.

Athletic Idealization

Eugen Sandow was a highly visible and popular figure in the physical culture movement (fig. 8). He was a bodybuilder and strongman who was promoted as the "perfect man" on account of his ideal form and physical strength.¹⁶ Sandow had been a sickly child, and he believed that with the right regimen of physical fitness anyone could achieve health and strength.¹⁷ He promoted this message through photographs, live performances, and books on health and fitness.¹⁸ He also served as an artist's model, posing for sculptors, painters, and photographers.¹⁹ Sandow based his stage name on his birth mother's last name, Sandov, while "Eugen" was a play on eugenics, meant to evoke the idea that he achieved the idealized male forms of the ancient Greeks and Romans.²⁰ In this respect, his message certainly resonated with the nineteenth-century pseudo-sciences concerned with articulating racial difference as discussed by Abigail Allport in her essay from this volume. Sandow frequently posed with props that connect him to the classical past. In fig. 8, he is shown with a fig leaf covering his genitals while standing next to a fluted column and wearing gladiator sandals intended to associate him with ancient Greece and Rome.

The idea of an athlete representing the culmination of human perfection originates in the 5th century BCE Greece, where athletes were depicted in the same idealized way as warriors or deities would have been.²¹ Representations of the athletic body at this time were focused on a mathematically calculated

proportion embodied in idealized figures such as Polykleitos's *Doryphoros* (Spear Bearer), 450 BCE, and Myron's *Discobolus* (Discus Thrower), 450 BCE. The focus on the movement and musculature of the athletes transcends the "real," giving the figures a deity-like idealization.²² Athletic competitions in ancient Greece began as religious festivals in honor of different gods.²³ In the nineteenth-century, the religious connection was gone, but the ideal of the athletic bodies reemerge and was clearly celebrated in *Animal Locomotion*.

Conclusion

Animal Locomotion represents an intersection of science, art, and the modern physical culture movement. The athletes featured in more than a quarter of the plates draw attention to the growing interest during nineteenth-century America in physical fitness and a wide variety of sports. The Penn athletes are not idealized in the same way as a figure like Sandow, but their athleticism stands out when compared to the female models in the project, who appear far weaker and less physically capable in line with dominant ideas about gender at the time. Muybridge's presence in the project reveals the artist's own interest in being part of the culture of physical fitness that his photographs help to document. In the end, *Animal Locomotion* not only advanced the study of human and animal motion but also immortalized a cultural redefinition of the male body as a site of fitness and athleticism. ■

Endnotes

- 1 Sarah Gordon, *Indecent Exposures: Eadweard Muybridge's Animal Locomotion Nudes* (New Haven, CT: Yale University Press, 2015), 30.
- 2 Gordon, *Indecent Exposures*, 81.
- 3 Joseph-James Ahern, "Muybridge's Photography Studio," *Unique at Penn* (blog), October 10, 2024. <https://uniqueatpenn.wordpress.com/2024/10/10/muybridges-photography-studio>
- 4 Mary D McConaghy and Michael T Woods, "Penn Athletics in the 19th Century," online exhibition, University of Pennsylvania, University Archives and Record Center, 2019. <https://archives.upenn.edu/exhibits/penn-history/19th-century-athletics>
- 5 Eadweard Muybridge, *Animal Locomotion: Prospectus and Catalogue of Plates* (Philadelphia: J.B. Lippincott Co., 1887), iv.
- 6 Elspeth H. Brown, "Racialising the Virile Body: Eadweard Muybridge's Locomotion Studies 1883–1887," *Gender & History* 17, no. 3 (November 2005): 643.
- 7 Brown, "Racialising the Virile Body," 643.
- 8 Gordon, *Indecent Exposures*, 81.
- 9 John Rickards Betts, "The Technological Revolution and the Rise of Sport, 1850–1900," *The Mississippi Valley Historical Review* 40, no. 2 (September 1953): 232.
- 10 McConaghy and Woods, *Penn Athletics in the 19th Century*.
- 11 McConaghy and Woods, *Penn Athletics in the 19th Century*.
- 12 Muybridge, *Prospectus and Catalogue of Plates*, 12.
- 13 "Thomas Love Latta 1865–1961," Penn People, online exhibition, University of Pennsylvania, University Archives and Record Center. <https://archives.upenn.edu/exhibits/penn-people/biography/thomas-love-latta>
- 14 Gordon, *Indecent Exposures*, 70–71.
- 15 Robert Bartlett Hass, *Muybridge: Man in Motion* (Berkeley, CA: University of California Press, 1976), 8.
- 16 Bret E. Carroll, *American Masculinities: A Historical Encyclopedia*. (Thousand Oaks, CA: Sage Publications, 2003), 403.
- 17 Aaron Wood, "Eugen Sandow: Performing New Masculinities," *Eidos: A Journal for Philosophy of Culture* 5, no. 4 (2022): 24.
- 18 Carroll, *American Masculinities*, 403.
- 19 Wood, *Eugen Sandow*, 25.
- 20 Wood, *Eugen Sandow*, 24.
- 21 Charles Heiko Stocking, "Greek Ideal as Hyperreal: Greco-Roman Sculpture and the Athletic Male Body," *Arion: A Journal of Humanities and the Classics* 21, no. 3 (Winter 2014): 46–47.
- 22 Stocking, "Greek Ideal as Hyperreal," 51.
- 23 Richard D. Mandell, *The First Modern Olympics* (Berkeley, CA: University of California Press, 1976), 1.



OVEREXPOSED: EXAMINING *ANIMAL LOCOMOTION* AS AN ETHNOGRAPHY OF WHITE ABLE-BODIEDNESS

ABIGAIL ALLPORT

In the image, the nude young man's stride is immortalized in time (fig. 1). His left leg moves forward, bent at the knee, strong, and powerfully leading the rest of his body. His right leg, pointed behind him and toes just lifted off ground, propels his body forward. His left arm swings behind him while his right arm leads, bent in a strong hook. His clenched fists radiate discipline, power, and control. As the frames roll towards the right and the action unfolds, the young man leaps across the ground in a swift gait, running with a polished, controlled form. The first two rows of the photographic plate are side views of his stride and showcase the muscles, taut and relaxed, as they power his athletic body through space and time. In the third row, we see a view from behind as the young man runs away, so fast that his heels knock against the back of his thighs. Despite the sepia tone of the frames, the man's body is undeniably in its prime. Young, smooth skin with deep, refined muscles and a strong frame, shapely limbs, even a full head of hair with a moustache—all markers not only of his athleticism, but of his identity. The most invisible factor of the young man is the fact that even in the grainy photographs, he is absolutely, without a doubt, white.

The image, plate 63 from Eadweard Muybridge's *Animal Locomotion*, is one of more than two hundred plates from the project that feature young and healthy individuals of obviously Caucasian background performing a variety of tasks and exercises before the camera. *Animal Locomotion* aimed to document the various movements of people and animals from multiple points of view at the same time and in several consecutive frames to ascertain the specifics of how bodies moved. Muybridge hoped the series of

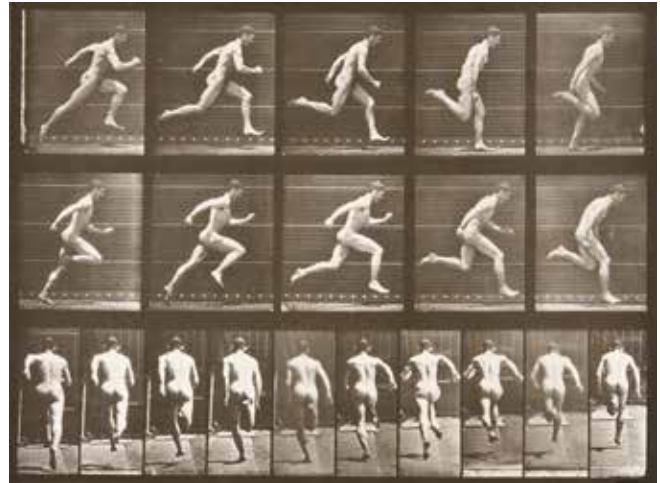


Figure 1. Eadweard Muybridge, *Animal Locomotion* plate 63, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.3.

photographs would prove invaluable to both scientists and artists alike,¹ but the initial reception of the series was a disappointment and failed to generate the attention he hoped.² The various subjects of the photographs include animals from the University of Pennsylvania Veterinary School and the Philadelphia Zoological Garden, ranging from dogs and birds to monkeys and lions. However, the images of the *other* animals—the human animals—lead to a much more intriguing interpretation given Muybridge's choice of models. Virtually every human model depicted in *Animal Locomotion* is white, with the exception of an unidentified Black jockey in plates 626 and 627 (fig. 2), and a Black mixed-race boxer, Ben Bailey, featured in plate 6 of the series.³ Previous scholarship surrounding the topic of race in Muybridge's *Animal Locomotion* photographs has highlighted the lack of racial diversity within the chosen models. However, the almost exclusive inclusion of the white body within this photographic project most strongly—and most subtly—invites analysis of the institution and status of racial whiteness.

OPPOSITE: Eadweard Muybridge, *Animal Locomotion* plate 63 (detail), 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.3.

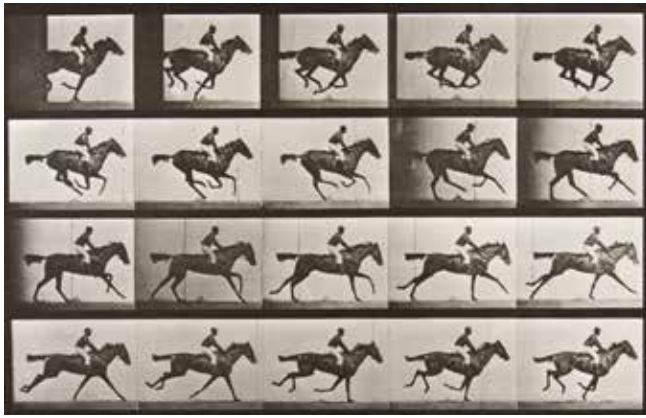


Figure 2. Eadweard Muybridge, *Animal Locomotion* 627, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.76.

What stands out in the photographs of white men, women, and children, of young white male athletes, and of disabled or diseased white bodies suffering from various maladies, is the invisible fact of their whiteness and the construction of a corporeal narrative that sustains ideas of cultural superiority. Drawing upon the so-called “ethnological” photography projects of his contemporaries, including John Lamprey and Thomas Huxley,⁴ upon conceptions of white body-centric ideology,⁵ including gendered activity and performance, ideas of disability and health, and upon the scientific and aesthetic value of white bodies, Muybridge created an investigation of whiteness as a distinct group, physically and culturally. In essence, he used nineteenth-century anthropological concepts and conventions of photography to produce a comprehensive visual ethnography of whiteness. In addition, the specific use of medical patients as models in contrast to young athletes from the University of Pennsylvania demonstrates the study and illustration of ability and disability as a marker of difference.

Nineteenth-Century Ethnographic Study and Science as a Marker of Racial Difference

The conceptualization for *Animal Locomotion* came out of Muybridge’s work with Leland Stanford in California starting in the early 1870s. Under Stanford’s patronage, Muybridge photographed horses in an attempt to concretely prove ideas about motion, namely that during a horse’s gallop all four

legs left the ground simultaneously. Stanford later published Muybridge’s images without crediting the photographer, which led to a lengthy court battle that brought their working relationship to an end. In 1883, Muybridge moved under the University of Pennsylvania’s patronage to continue his photographic studies, considering the audience for this new project to be “the Art Connoisseur, the Scientist, the Artist, and the Student of Art or of Nature.”⁶ Those who could afford to purchase 100 hand-selected plates for \$100, or the entire set of 781 plates for \$600⁷, would theoretically use the photographs to study ideas of motion and movement, gain a greater understanding of anatomy, create artworks of the human and animal subjects without the need for live models, and appreciate images informed by other scholarly fields, including art history, anthropology, and zoology.

The visual language of *Animal Locomotion* finds its origins in anthropological studies from the nineteenth-century. Following the publication of Charles Darwin’s *On the Origin of Species* in 1859, developers of pseudoscience sought to catalogue and prove racial and ethnic difference through physical characteristics and cultural practice.⁸ This included traveling to countries in the Global South to document non-white individuals⁹ and bringing non-European individuals, either forcibly or consensually, to Euro-centric countries for study. This latter scenario was often exemplified in the cases of human zoos and other ethnological exhibitions. For instance, the 1904 St. Louis World’s Fair featured Indigenous peoples taken from their homelands in newly-acquired United States territories and displayed in “primitive” enclosures to be viewed by visitors.¹⁰ Muybridge was no stranger to the practice of the ethnographic photography which grew out of these practices. In 1875, he traveled to Panama, Guatemala, and Mexico to document landscapes and scenes of contemporary life for the Pacific Mail Steamship Company. The resulting photographs are clinical in their detachment from the Central American subjects, who appear as anonymous objects before the camera’s lens. *Coffee Harvesting at San Isidro* (fig. 3), for example, captures Guatemalans who are interrupted by

the photographer as they go about their work. Several figures make direct eye contact with the camera, staring down the viewer—and, presumably, Muybridge in the act of photographing them.

Other pseudo-anthropological tools included the practice of anthropometry, which went hand in hand with the practice of photography. Anthropometry is defined by the Oxford English Dictionary as “the measurement of the human body in order to determine its average dimensions and proportions, at different ages and in different populations.”¹¹ Anthropometry’s significance resides in the various quasi-scientific conceptions it created about the subjects being measured.¹² In the context of nineteenth-century ethnological studies, it was



Figure 3. Eadward Muybridge, *Coffee Harvesting at San Isidro—elevation 1000 feet, Guatemala, 1875*, published 1877. Albumen silver print, image: 5 3/8 x 9 1/4 in. (13.7 x 23.5 cm). Smithsonian American Art Museum, Gift of Jeffrey A. Lichtenberg in honor of his parents Laura and Harold Lichtenberg, 1999.97.36.

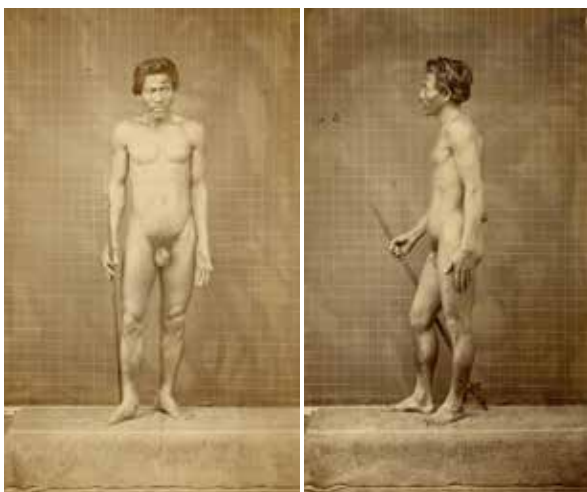


Figure 4. John Lamprey, A twenty-five-year-old man, probably from Ternate, photographed as an example of a ‘Malagasy Male,’ c. 1868–69. L: Albumen print, 7 x 4 3/4 in. (18 x 12 cm) mounted on card 11 x 8 1/2 in. (28 x 21.5 cm). R: Albumen print, 6 1/4 x 3 3/4 in. (16 x 9.5 cm) mounted on card 11 x 8 1/2 in. (28 x 21.5 cm). Courtesy of the Royal Anthropological Institute, 400_002116 and 400_002117.

an often-cited tool to prove racial difference on a variety of levels,¹³ namely through the recorded measurements which would in turn give empirical evidence for scientific racism. In order to measure and catalogue the bodies of non-white persons for supposed scientific study, photography was often utilized as a technology that could verify its findings. Anthropometric photographs have certain compositional hallmarks: most notably the use of a gridded background with white lines against a black backdrop, and the documentation of subjects in the nude and from multiple angles so as to provide a comprehensive understanding of the body.¹⁴

The gridded background of these types of photographs was originally used by John Lamprey in a photographic series for the Royal Anthropological Institute of Great Britain and Ireland, around 1868 (fig. 4).¹⁵ Within the framework of these anthropometric photographs, the subject of the photograph—a nude figure of non-Eurocentric heritage—is completely stripped down, literally and figuratively. The vulnerability of being photographed naked, without any barrier between the individual and the camera, completely objectifies the subject and takes away their autonomy and agency, reducing the person to a body, a specimen, as in Lamprey’s *Malagasy Male*. Historian Elspeth Brown notes that within this type of image, the subjects do not look into the camera, choosing to look away or ignore it entirely.¹⁶ Brown comments that “the power relations of looking that structure such photographs imply a nineteenth-century white viewer allowed to enact the colonizing gaze without risking the confrontational gesture of the colonial subject’s ‘looking back.’”¹⁷ Ultimately, the ethnographic photograph implies a subject and a viewer, with the understanding that the subject in front of the camera is a Black or brown body and a colonized body, and the viewer behind the camera is a white body in the act of watching.

Whiteness Studies and White Body-Centrism

The field of whiteness studies within the context of the United States seeks to understand the identity, life experience, and racial and social formation of those who consider themselves to have white bodies. Sociologists and scholars of racial studies

Michael Omi and Howard Winant describe how “through a complex process of selection, human physical characteristics...become the basis to justify or reinforce social differentiation” leading to racialization, or, “the extension of racial meaning to a previously racially unclassified relationship, social practice, or group.”¹⁸ The process of racialization affects how individuals identify difference physically between themselves and others, and therefore, creates social ideologies about those differences. For those who are “raced” as non-white, racialization may have a negative context, and for those “raced” white, it may hold a positive or privileged one. Within the context of racialization, the concept of “whiteness” or “white identity” stands out because of its difference to the racialization of other groups. Historically, whiteness has been seen as the standard or “the ‘top’ classification of the socially constructed and hierarchically arranged racial categories” and typically involves “implicitly and explicitly upholding racism and white supremacy” as a central identifier.¹⁹ The differentiation between those considered white and those considered non-white hinges on the deviation from standards of “whiteness,” which author and whiteness scholar Robin DiAngelo defines as

a term to capture all of the dynamics that go into being defined and/or perceived as white and that create or reinforce white people as inherently superior through society’s norms, traditions, and institutions. Whiteness grants material and psychological advantages (white privilege) that are often invisible and taken for granted by whites.²⁰

The model of the nineteenth-century “ethnographical study” highlights stark contrasts, between whiteness and “otherness” (non-whiteness), reinforcing ideas of white supremacy, or, in DeAngelo’s words, “the all-encompassing centrality and assumed superiority of people defined and perceived as white.”²¹ The use of photography to “prove” racial difference through images of the body supports the idea that certain bodies are superior to others and is indicative of “white-body supremacy.”²² The portrayal of bodies through media such as photography has the potential to elevate or demote the subject, depending on the context. The context of these anthropometric photographs is undeniably

one that subjugates non-white bodies by reducing them to a specimen-like quality.

Muybridge’s Ethnological Explorations

Returning to Muybridge’s *Animal Locomotion*, viewers can identify the gridded background in almost every plate, especially those which portray humans, but occasionally those which depict animals as well. By choosing to represent his human subjects with this gridded background, Muybridge, either intentionally or unwittingly, linked *Animal Locomotion* to a lineage of racist anthropometric and ethnographic picture studies. As Brown points out, “Lamprey’s anthropometric grid shows up for the first time in American photography in Muybridge’s University of Pennsylvania project,” which strongly suggests that “a racialized narrative informed the project.”²³ This is further supported by the fact that members of the Muybridge Commission, formed to monitor Muybridge’s projects and output at the University, were Penn faculty involved in studies of anthropometry and ethnographic “science.”²⁴ However, unlike the direct messaging of comparative racial difference that the photographs of Lamprey portray, Muybridge’s *Animal Locomotion* flips the pictorial and compositional conventions of these images on their head by making the subject of the photographs a white body.

Within Lamprey’s photographs, the individuals appear static and posed, thus reinforcing ideas of extinction, of preserving subjects forever in a moment of colonization and subjugation, and, most importantly, of marking subjects as a “thing” of the past. Their frozen stance, forever immortalized within the gridded photograph, relegates them to a passivity in their own disparagement. In contrast, the white bodies in Muybridge’s *Animal Locomotion* are active, both literally and figuratively. These subjects move forward in time and space, as one frame gives ways to the action of the next. The recorded dynamism of their bodies not only conveys their vitality, it firmly situates them as future-oriented individuals within the medium of a cutting-edge technological development designed to capture motion.

The idea of scientifically studying a white body in terms of action and movement contrasted with the idea of proving racial difference. On the one hand, images of the white body could be compared with non-white bodies to prove that racial differences and racial superiority did indeed exist, but on the other hand, the portrayal of the white body within the original context of Lamprey's model would denigrate the subject. Muybridge's adaptation of Lamprey's model set *Animal Locomotion* on a separate path from ethnological and anthropometric images of the nineteenth-century which depict their models as static and frozen in the past. Within the context of nineteenth-century whiteness, *Animal Locomotion* serves as a subtle re-affirmation that the white race is active, evolving, and "on the move."

Male Models and the White Patriarchal Corporeal Ideal

The choice of models and the posing of Muybridge's models had much to do with the athletic prowess they exude from behind the lens. For his male models, Muybridge recruited students from the University of Pennsylvania, many of whom were student-athletes engaged in activities such as "baseball, cricket, track, football, rowing, and cycling."²⁵ As students at an elite university, they were also part of a high socioeconomic class, typically pursuing prestigious fields such as medicine and mechanical engineering in their studies. Additionally, many of the models were accomplished athletes, some with record-holding achievements. These young white men, confident in their bodies, masculinity, and racial superiority, do not appear stripped down or vulnerable as Lamprey's subjects do. They hardly seem to notice the camera (fig. 1, fig. 5) as they go about their sports in the nude.

The young men, who were themselves models of physical health, represent more than just their individual success when considering their whiteness. As Brown points out, an "evenly developed, trained white male body emerged as an ideal type for enervated middle-class professional men during the 1880s."²⁶ These model athletes exemplify the values of their university, their country, and their race as a whole, thus fulfilling a propagandistic role in

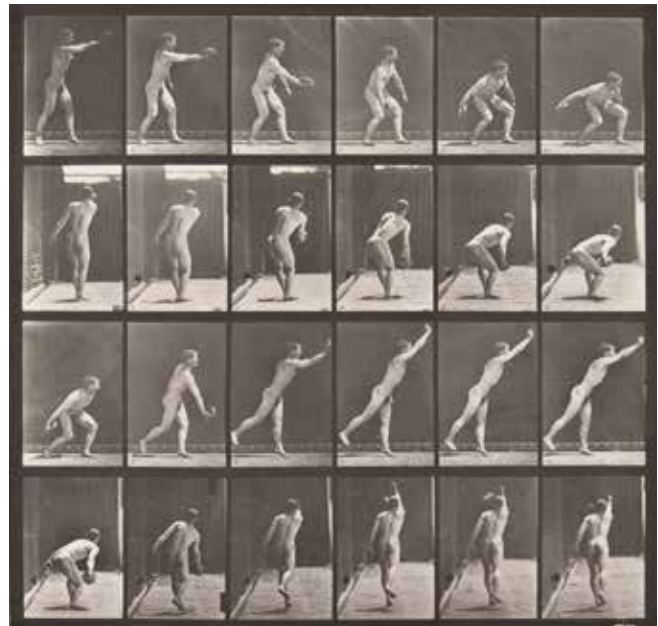


Figure 5. Eadweard Muybridge, *Animal Locomotion* plate, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.109.

disseminating ideas of white-body supremacy. While they have had varying levels of ability and capability, their activity sets them in a realm apart from the disabled or medical patients in *Animal Locomotion*, despite the fact that they, too, possess white bodies.

Disabled Patients within The White Ideal of Able-Bodied-ness

Muybridge did not originally plan to include disabled or otherwise "abnormal" bodies within the *Animal Locomotion* project, but did so at the request of Dr. Francis X. Dercum, a neurology professor at the University of Pennsylvania interested in recording the gait of patients with "nervous diseases."²⁷ Dercum saw the potential of using Muybridge's photographs documenting motion for instructional purposes, and proposed to use disabled models or patients with degenerative diseases in the project. These models were patients from the University of Pennsylvania Hospital and the Philadelphia General Hospital and were used to demonstrate deviations from "standard" or "desirable" white bodies. The ideal white body is young, strong, and attractive—categories that many of the models of *Animal Locomotion* conform to in one way or another. However, these "abnormal" bodies—who were labeled as such by Muybridge in volume eight of *Animal Locomotion*—differed greatly

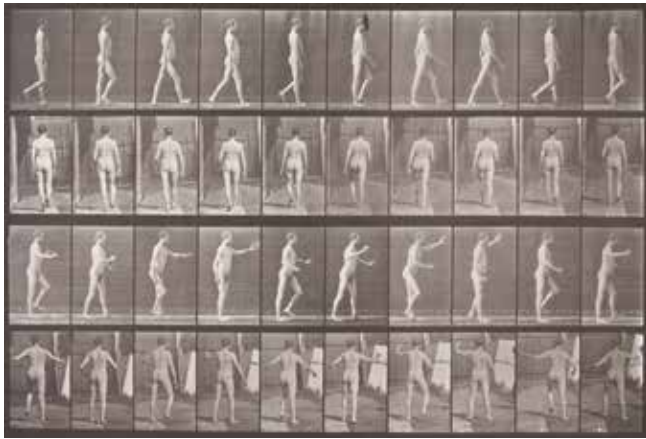


Figure 6. Eadweard Muybridge, *Animal Locomotion* plate 550, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.57.

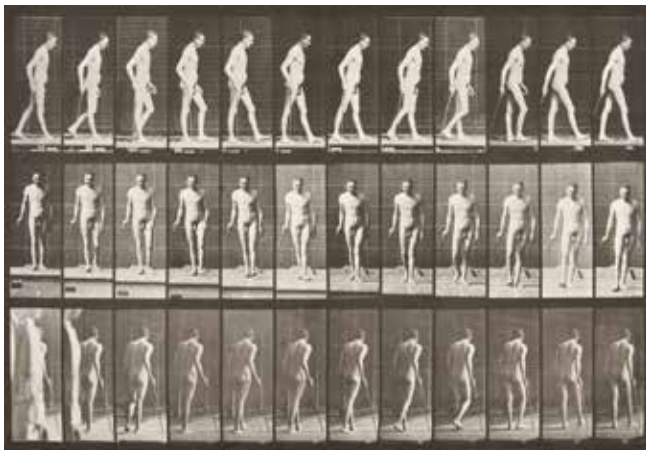


Figure 7. Eadweard Muybridge, *Animal Locomotion* plate 559, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.62.

from the bodies that otherwise appear in the project. Dercum later published an analysis of the plates featuring these patients and described in detail how their movement departed radically from the student-athletes and other models photographed by Muybridge.²⁸

In contrast to the healthy athletes in other plates, two plates of disabled white men, both in the action of walking, provide an alternative view of a white male body in motion. Plate 550 (fig. 6) shows a man of about middle age, who in the first and second rows walks with a straight back and shoulders upright. The man's steps are small, and instead of leading the steps with a heel or a toe, he leads each step with the entire foot, placing it down and picking it up in stiff, awkward motions. In the third and fourth rows, the man is shown again, walking, this time with his

hands splayed in front of him wildly, as if grasping before him for a mobility aid or trying to keep his balance. The difference even in the man's travel between rows of the plate shows a dramatic inconsistency in his mobility. In his *Prospectus and Catalogue of Plates*, Muybridge describes the man as follows: "locomotor ataxia; walking; A, arms down; B, arms up."²⁹ *Locomotor Ataxia* in the late nineteenth-century was referred to as *tabes dorsalis* and was identified as "a rare neurodegenerative disease caused by an infection with *Treponema pallidum* subspecies *pallidum*—the bacterium responsible for sexually transmitted syphilis."³⁰ Given the age of this patient and the obvious degeneration of his motor skills as seen in the plates, it can be inferred that the disease has been present within his body for a while. The irony that a disease which is commonly transmitted sexually has reduced this individual to an antithesis of the white male sexual ideal cannot be overlooked within the context of a project that privileges virile athletic men. Visually, however, the syphilitic patient is portrayed as aesthetically "abnormal" and "undesirable" on account of his posture and movements. In contrast to the running athlete (fig. 1), this man's swayed back, protruding stomach, and lack of muscle definition speak to a state of unhealth that, while possibly hidden under clothing, was undeniable when seen in the nude. The evident wobble of his steps, with careful thought in each attempt to stay upright, will never catch up to the sure-footed and swift gait of the running athlete.

Plate 559 (fig. 7) features another middle-aged white man with slightly hunched shoulders walking with the aid of a cane. The cane is carried in his right hand and heavily supports his weight as he moves forward. Muybridge describes this plate as "disseminated sclerosis; walking with cane."³¹ *Disseminated sclerosis*, known more commonly as *multiple sclerosis*, is another degenerative disease which can affect an individual's ability to function, specifically causing difficulty with balance, limiting movement, even leading to paralysis, in addition to weakness or pain throughout the body.³² In this plate, we thus see another white man who faces the deterioration of his body and therefore the breakdown of his identification with



Figure 8. Eadweard Muybridge, *Animal Locomotion* plate 519, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.45.

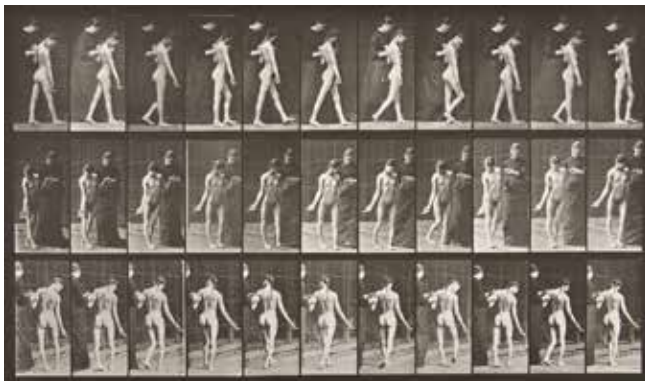


Figure 9. Eadweard Muybridge, *Animal Locomotion* plate 519, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.51.



Figure 10. Eadweard Muybridge, *Animal Locomotion* plate 538, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.49.



Figure 11. Eadweard Muybridge, *Animal Locomotion* plate 479, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.40.

the corporeal ideal. The weight of the disease is clearly communicated in the effort it takes for him to move, which viewers can track across the three rows of the plate. He is also set apart through his use of a cane, which literally prevents him from pursuing the athletic feats—such as throwing a ball or rowing—that appear elsewhere in *Animal Locomotion*. The use of the cane also creates a strong contrast to plate 519 (fig. 8), wherein the model is Muybridge himself, walking confidently (on the bottom row) with a straight back and swinging arms. The sclerosis patient, in the first row of Plate 559 (fig. 7), takes much smaller strides, his chest leaning forward and his steps careful. Unlike Muybridge, his arms remain by his sides and hardly move to propel him forward or support his balance. Perhaps most interesting of all, Muybridge's gaze in Plate 519 is squarely set on something beyond the last frame; his head is upright as he looks out ahead while he walks. For the sclerosis patient, in contrast, every step is an effort. His gaze is trained intensely on the ground before him, measuring each miniscule step as he walks, scanning the ground before him for obstacles. In terms of an “ideal” white man, one who actively and confidently engages with the world around him, the sclerosis patient fails where Muybridge succeeds.

In Plate 541 (fig. 9), a young woman and another sclerosis patient,³³ is guided across the camera's pathway by a female assistant in dark clothing. This patient's gait is even more “abnormal,” as her legs bow out and her steps are choppy, landing on the outside edge of her foot as they make contact with the ground. Dercum described this patient as having a “leg which is at one instant rigid and extended is at the next instant flexed,”³⁴ perhaps signaling the muscle spasms common in sclerosis patients. Much like the man with the cane, this young woman uses the assistant as a mobility aid. The assistant's dark clothing allows her to blend into the background, fading into the set, while the paleness of the young patient's skin, the distortion of her movements, and her utter nakedness are highlighted. As this patient progresses through the frames, she looks from side to side, scanning the ground beneath

her, looking back up to her assistant, and otherwise taking care that she remains balanced and upright. Unlike the man with the cane, who is hunched at the shoulders, this young woman walks with her back swayed and her chest protruding. In the second row of Plate 541, the camera's view of the front of her body reveals such strain from this position that her muscles are tense and the lines of her stomach are clearly visible. Perhaps her condition is more advanced than that of the man with the cane, but for both of them, each step is a momentous effort, even with the help of their mobility aids.

A last example, a child amputee in Plate 538 (fig. 10) stands directly in contrast to the image of a healthy child in Plate 479 (fig. 11). Returning to theories about whiteness, DiAngelo remarks that in a white body-centric society, individuals, "receive the message that people with disabilities [are] less valuable...that their lives [are] defined by suffering and limitation."³⁵ The amputee child certainly aims to contradict that statement, as he uses his arm to propel his body forward, to lift himself into a chair, and to lower himself to the ground. The movements are swift and familiar and highlight his independence and development of self-sufficiency. In contrast, the "normal" child stares at someone behind the camera as if searching for direction or confirmation. This child's movements are not nearly as familiar and practiced. Ironically, lowering oneself to a seated position—a process so natural for a child at play and moving about in the world—is easier for the disabled child, as shown in the third row of Plate 538 (fig. 10), than for the younger child in Plate 479 (fig. 11). For those whose corporeal reality does not subscribe to a "norm" of ability, this contrast speaks to the adaptation made to alter realities of movement, even at such a young age.

Muybridge himself stepped before the camera to showcase his physical strength and prowess as noted above (fig. 8). He described himself in the *Prospectus and Catalogue of Plates* as "an ex-athlete, aged about 60" and even in his 60s seems to have considered himself to be capable and able-bodied.³⁶ In fact, in 1860, decades before the execution and production of *Animal Locomotion*, Muybridge was involved in a serious stagecoach accident while traveling across the United States. By his own account, he had no

memory of what had occurred and only recalled waking up some days later.³⁷ As a result of the incident, Muybridge is thought to have sustained some sort of injury or trauma to his brain, which can, in some individuals, cause changes to mood, making them less aware of social cues, prone to outbursts, or more eccentric and erratic—all traits which would later be recorded as describing Muybridge's behavior.³⁸ Psychologist Arthur Shimamura posits that the injury could be categorized specifically as one of the orbitofrontal cortex. Damage to this part of the brain is associated with trouble in emotional regulation, risk-taking behavior,³⁹ and occasionally obsessive-compulsive behavior, traits possibly related to Muybridge's frantic and feverish creative periods.⁴⁰ When put in perspective with the context of mental health and the white ideal of a healthy man, it is obvious Muybridge himself would have had a "disability"—one that certified him as "insane" during his murder trial for the death of his wife's lover, Harry Larkyns.⁴¹ Around the studio, he was also known to be "peculiar" and to have an unkempt appearance.⁴² In Plate 519 (fig. 8), Muybridge throws a discus, climbs stairs, and confidently strides across the frame, copying the actions of athletes in previous plates. The inclusion of his self-portrait in the *Animal Locomotion* series, as well as his decision not to include any descriptors of his neurological impairments alongside his plates, highlights his subscription to an ideal of white masculinity that conceptualizes perfection as health, strength, and youth—and himself as an integral part of upholding and performing that perfection.

Conclusion

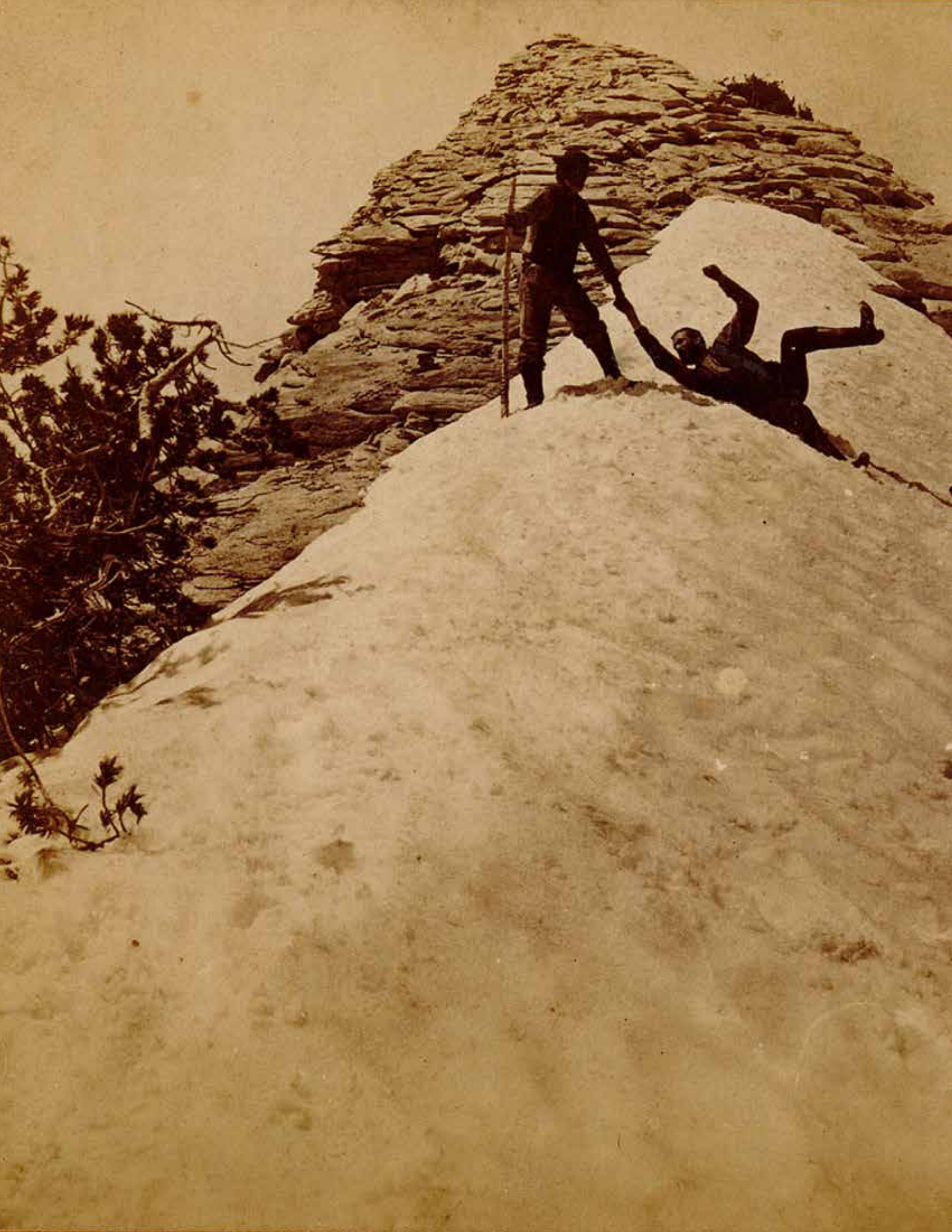
By examining the white body through an ethnographic lens, Eadweard Muybridge created a project which gave a comprehensive view of how white bodies are conceived of and racialized separate from non-white bodies, even though this was never one of the project's stated goals. In its portrayal of white bodies and embodied race, *Animal Locomotion* utilizes compositional and thematic inspiration from racial pseudoscientific ideas which originated in the nineteenth century. Instead of focusing on highlighting somatic differences of a non-white "other," as was typically the case in ethnographic studies, Muybridge's project focuses on the unmarked, unraced race—whiteness. In doing so,

Animal Locomotion complicates how we understand whiteness. By featuring a diversity of white bodies, it portrays both desirability and undesirability through its able-bodied and disabled models. It clearly communicates that even within the categorization of “white” there exists a hierarchy of bodies, some of which are normed, and some of which are othered. The invisible commonality of race is not the only determinant in how they are perceived. ■

Endnotes

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- 5 Resmaa Menakem, *My Grandmother's Hands: Racialized Trauma and the Pathway to Mending Our Hearts and Bodies* (Las Vegas, NV: Central Recovery Press, 2017), xix.
- 6 Eadweard Muybridge, *Animal Locomotion: Announcement and Subscription Form* (Philadelphia, PA: J.B. Lippincott Co, 1887), 1.
- 7 Gordon, *Indecent Exposures*, 61-2.
- 8 Gordon, *Indecent Exposures*, 61-2.
- 9 Solnit, *River of Shadows*, 148. Gordon, *Indecent Exposures*, 63-5.
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- 12 Brown, "Racialising the Virile Body," 631-32. Gordon, *Indecent Exposures*, 62.
- 13 Brown, "Racialising the Virile Body," 632.
- 14 Gordon, *Indecent Exposures*, 64.
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- 19 Robin DiAngelo. *What Does It Mean to Be White? Developing White Racial Literacy*, rev. edition (New York: Peter Lang Press, 2016), 101.
- 20 DiAngelo, *What Does It Mean*, 103.
- 21 DiAngelo, *What Does It Mean*, 146.
- 22 Menakem, *My Grandmother's Hands*, xvii.
- 23 Brown, "Racialising the Virile Body," 634.
- 24 Brown, "Racialising the Virile Body," 639-640.
- 25 Brown, "Racialising the Virile Body," 643.
- 26 Brown, "Racialising the Virile Body," 645.
- 27 Francis X. Dercum, "A Study of Some Normal and Abnormal Movements Photographed By Muybridge," in *Animal Locomotion: The Muybridge Work at the University of Pennsylvania: The Method and the Result* (Philadelphia, PA: J. B. Lippincott Co., 1888), 103.
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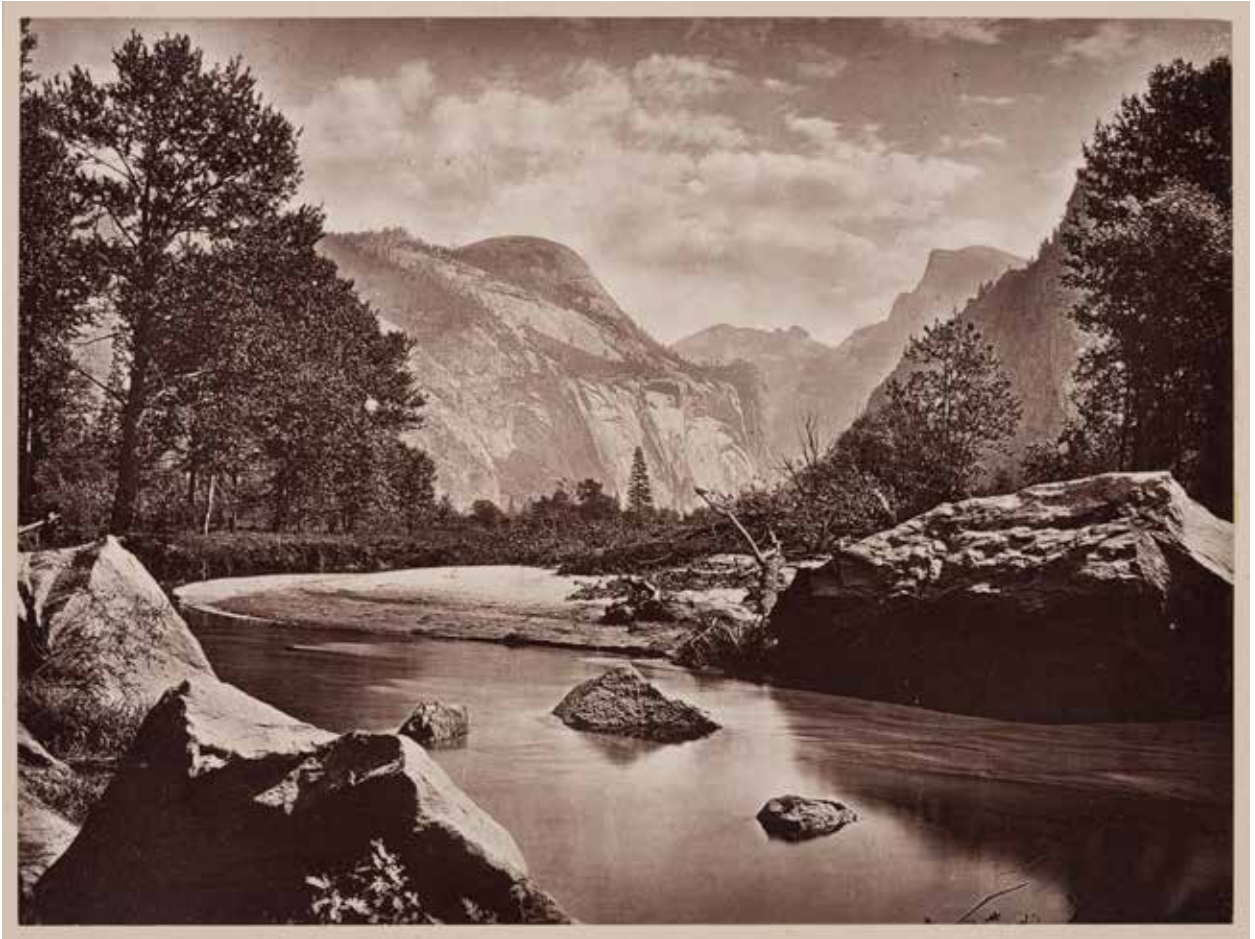
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- 34 Dercum, "Normal and Abnormal Movements," 120.
- 35 DiAngelo, *What Does It Mean*, 51.
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- 39 Shimamura, "Muybridge in Motion," 342, 347.
- 40 Shimamura, "Muybridge in Motion," 349.
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Catalogue



Eadweard Muybridge, *Wildcat Falls, Valley of the Yosemite*, 1872.
Albumen print, 16 x 22 in. (40.6 x 55.9 cm), Ron Perisho Collection.



Eadweard Muybridge, *On the Merced, Yosemite Valley, California*, 1872.
Albumen print, 5 x 6.25 in. (12.7 x 15.9 cm), Ron Perisho Collection.



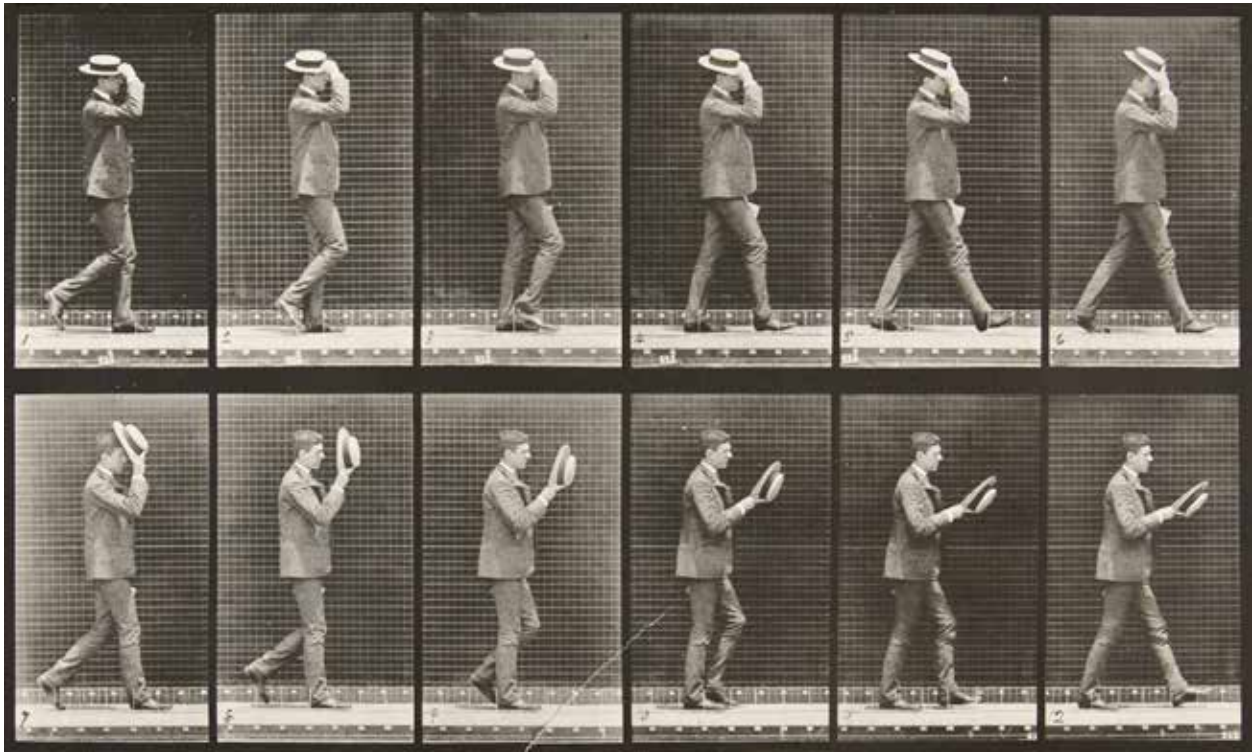
Eadweard
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c. 1871. Albumen
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x 7 in. (8.9 x 17.8
cm), Ron Perisho
Collection.



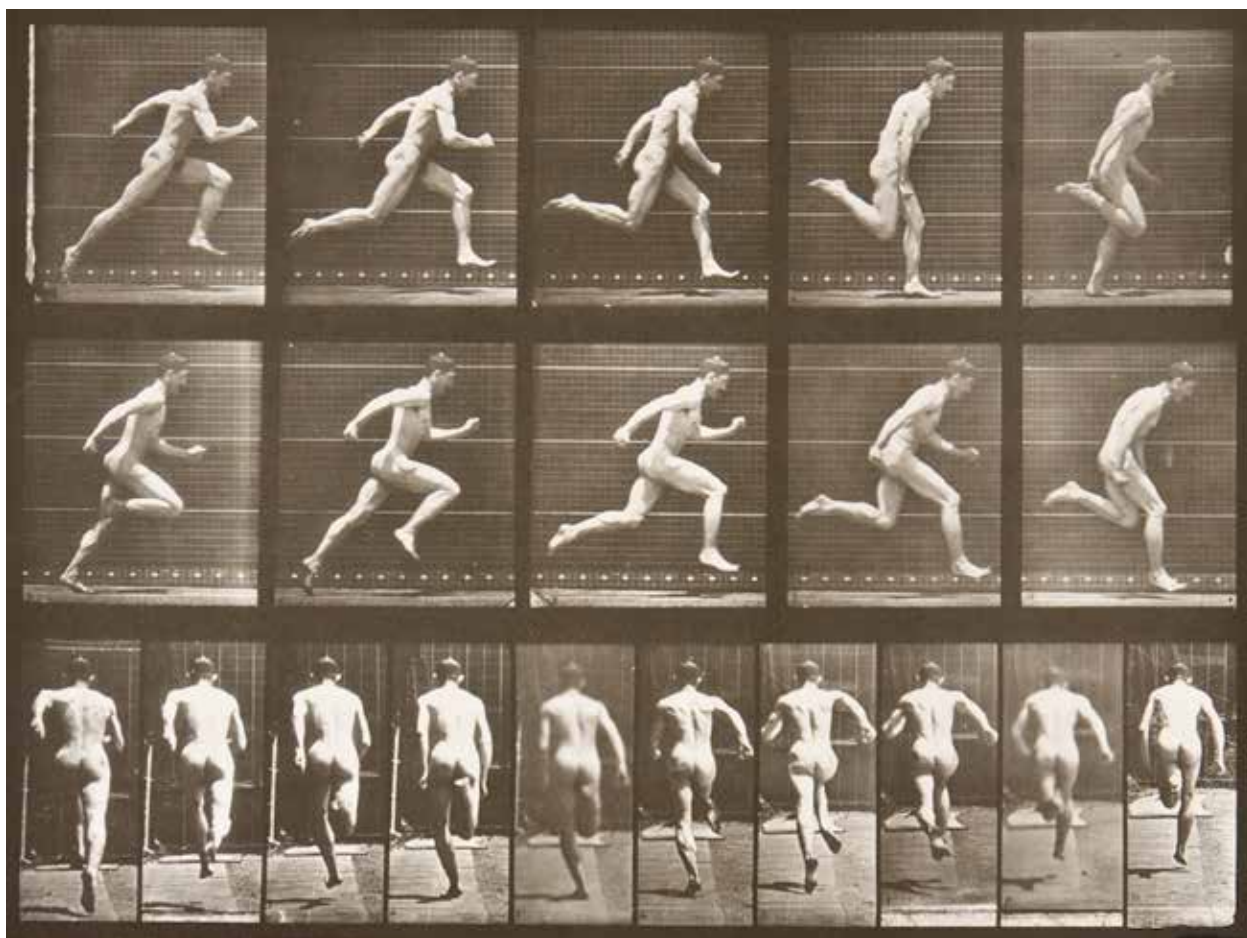
Eadweard
Muybridge, *Pulpit
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Echo Canyon [sic],
looking west*, c.
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cm), Ron Perisho
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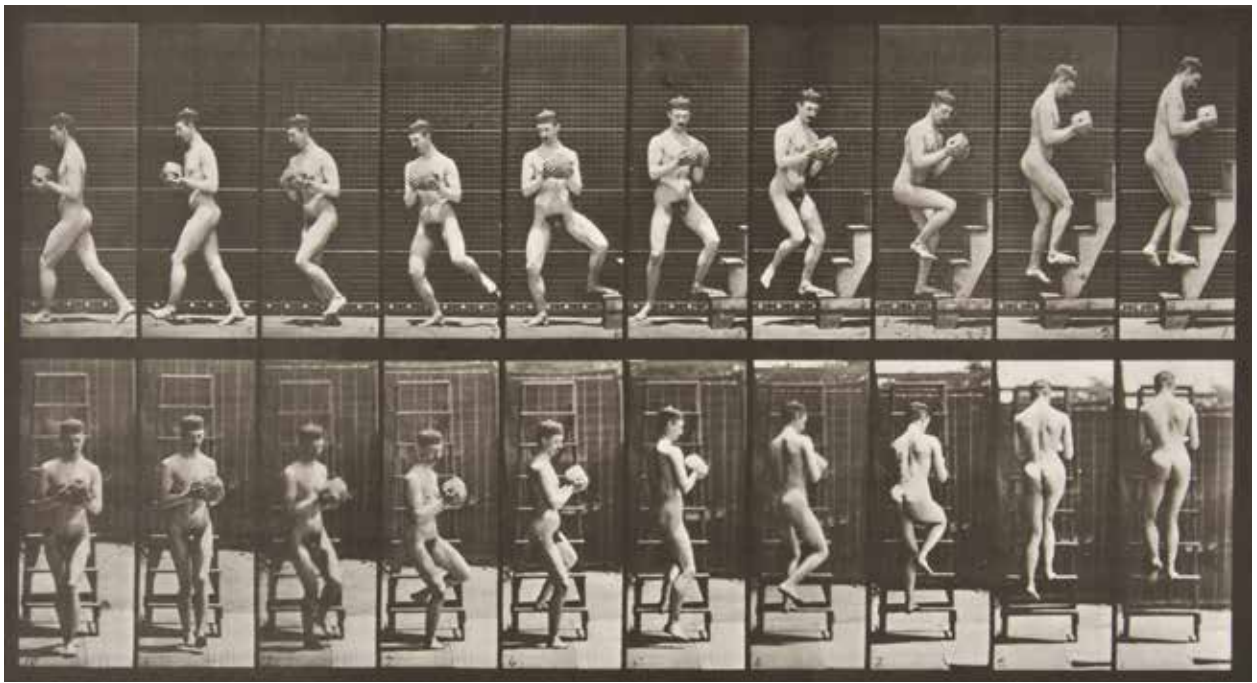
Eadweard
Muybridge,
*The Descent of
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7 in. (10.2 x 17.8
cm), Ron Perisho
Collection.



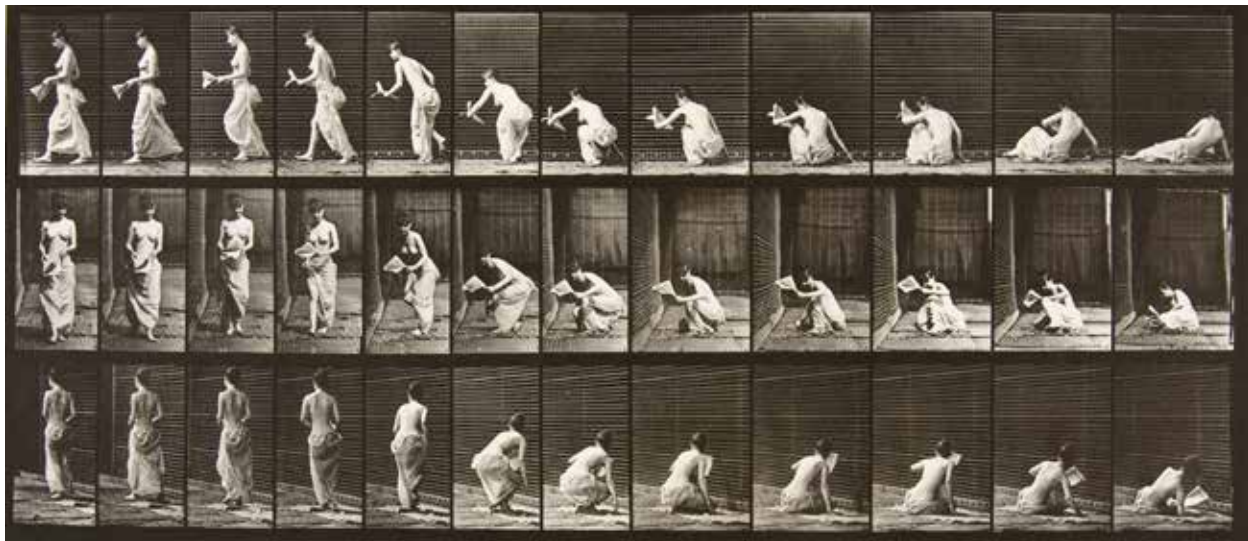
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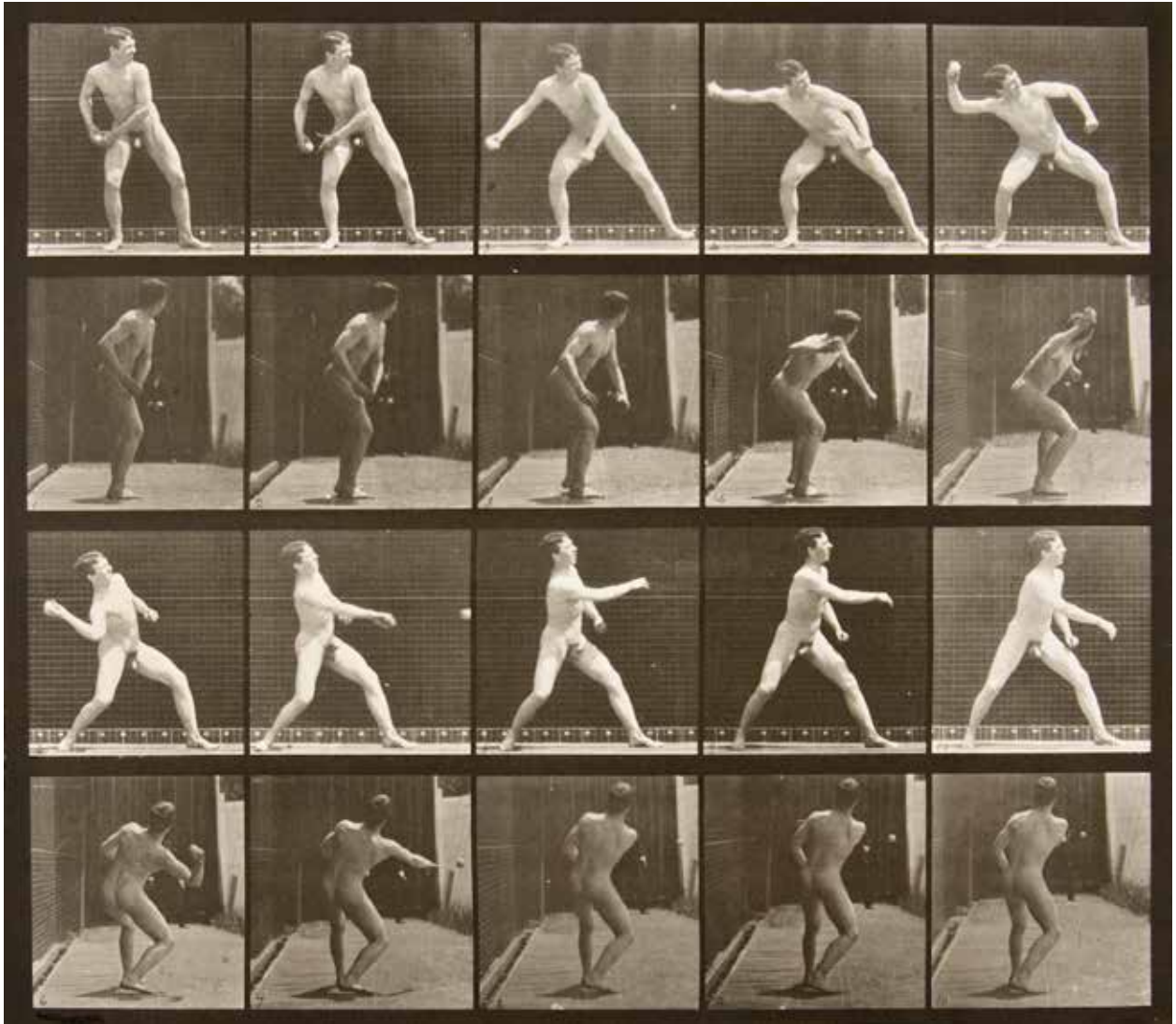
Eadweard Muybridge, *Animal Locomotion* plate 63, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.3



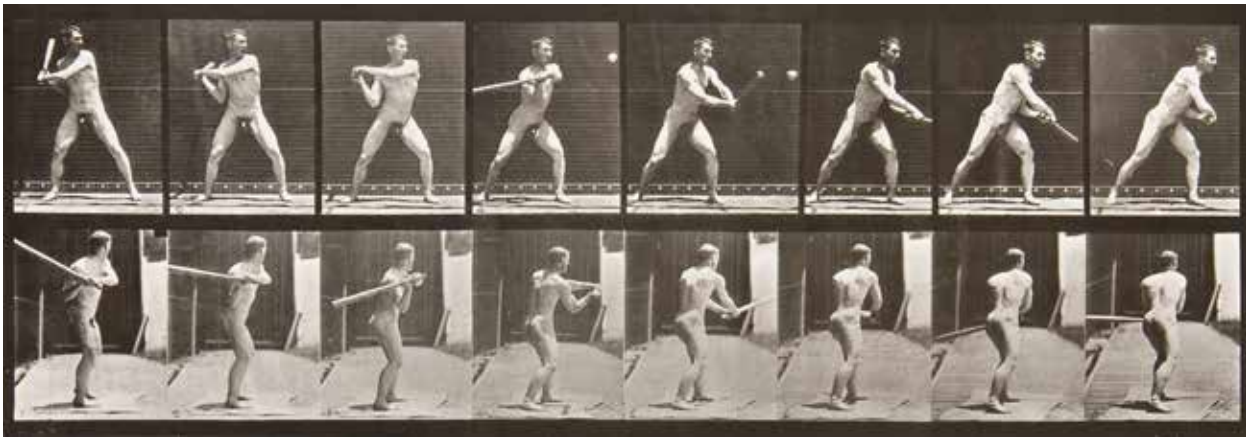
Eadweard Muybridge, *Animal Locomotion* plate 151, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.6



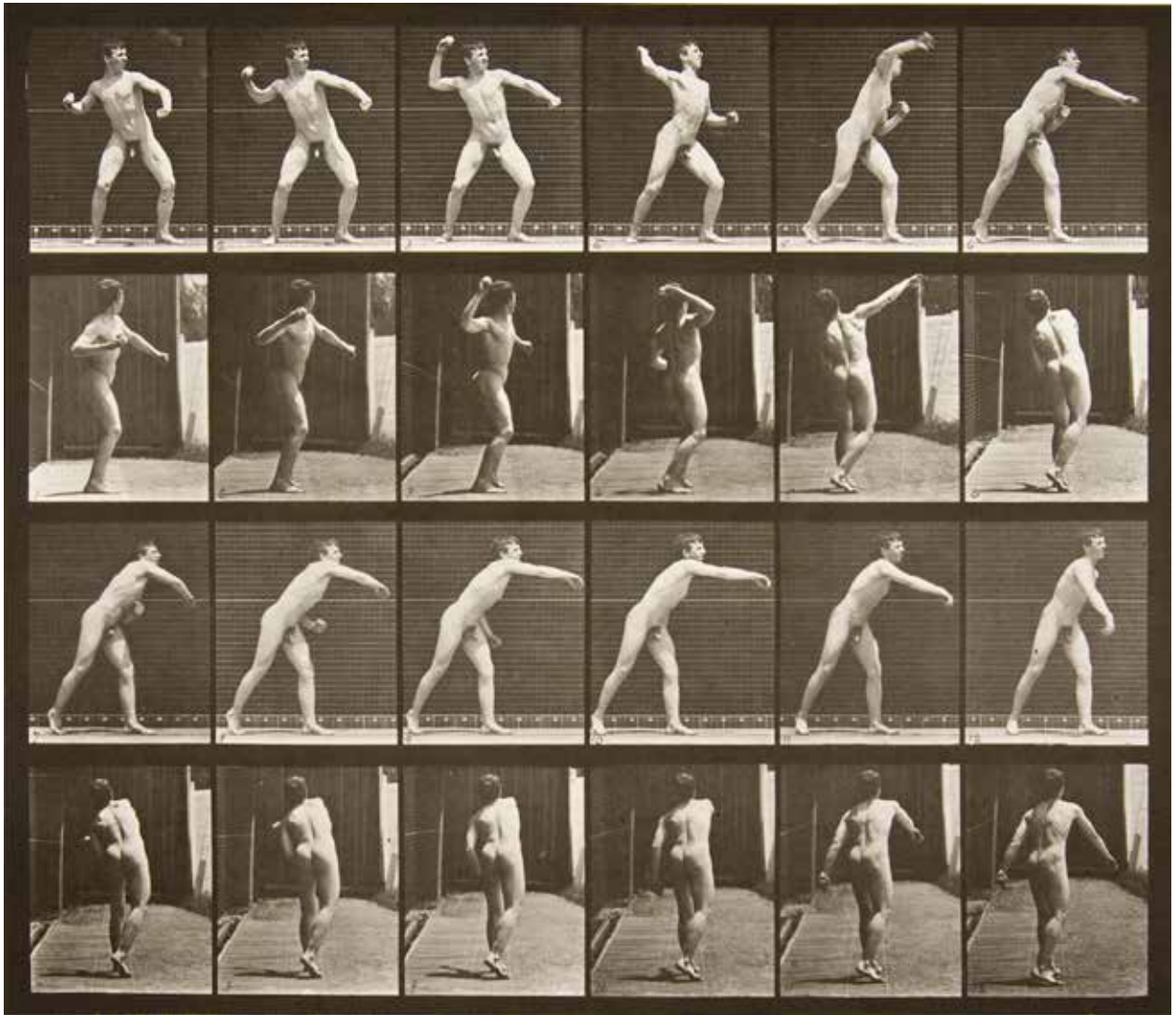
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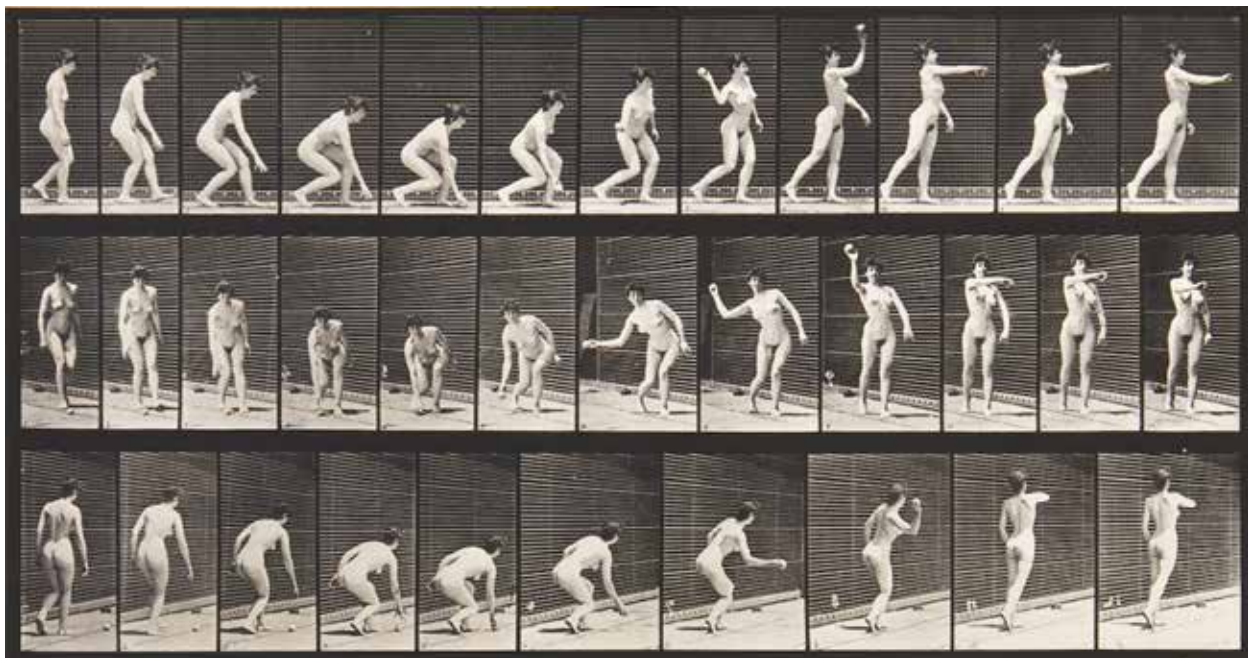
Eadweard Muybridge, *Animal Locomotion* plate 273, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.15



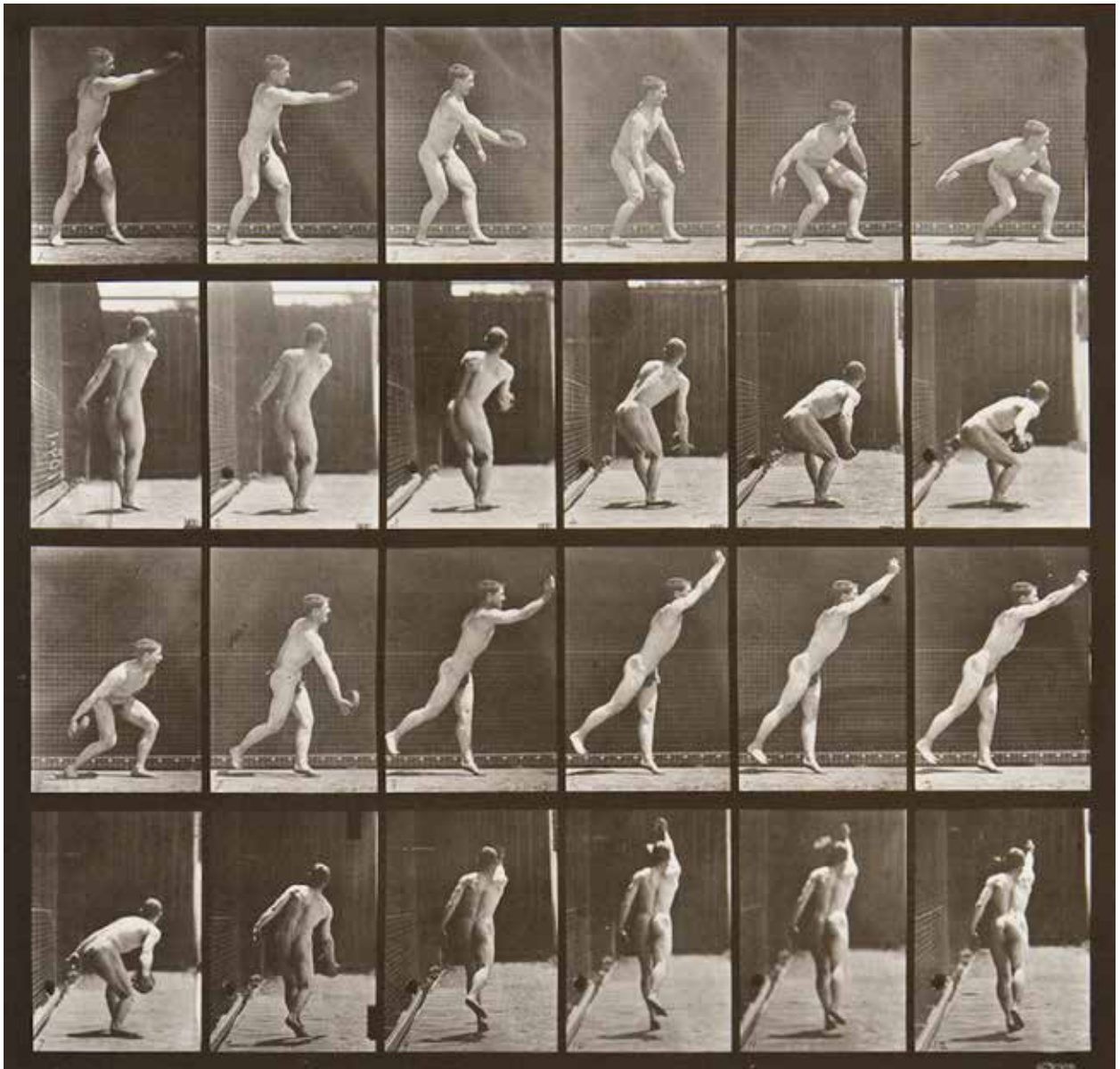
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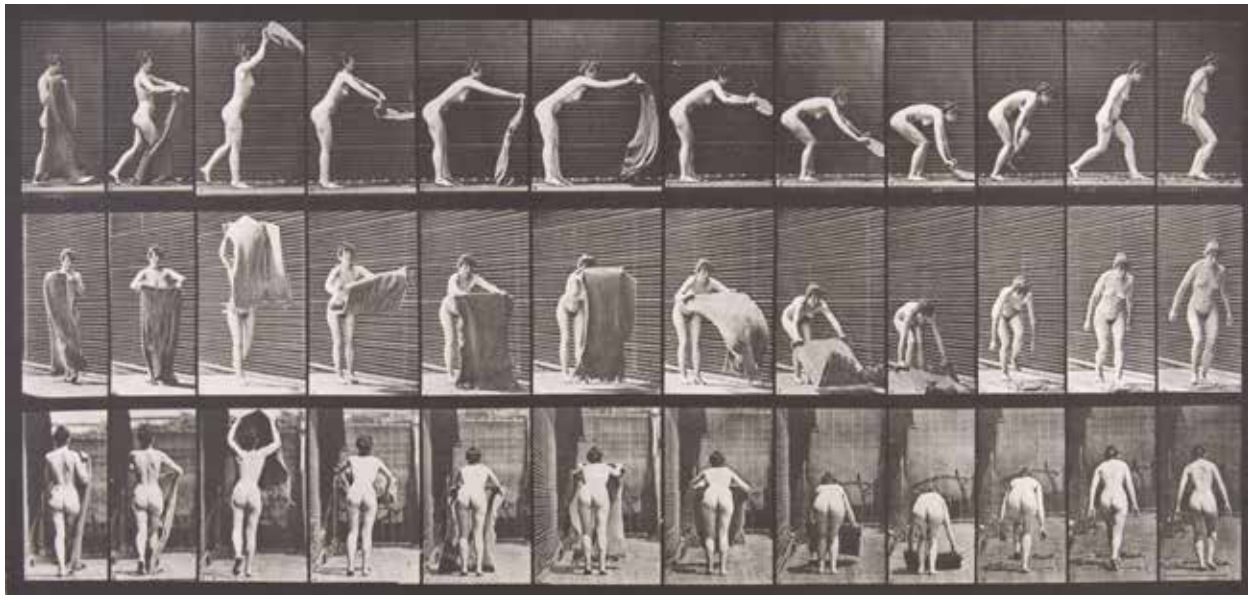
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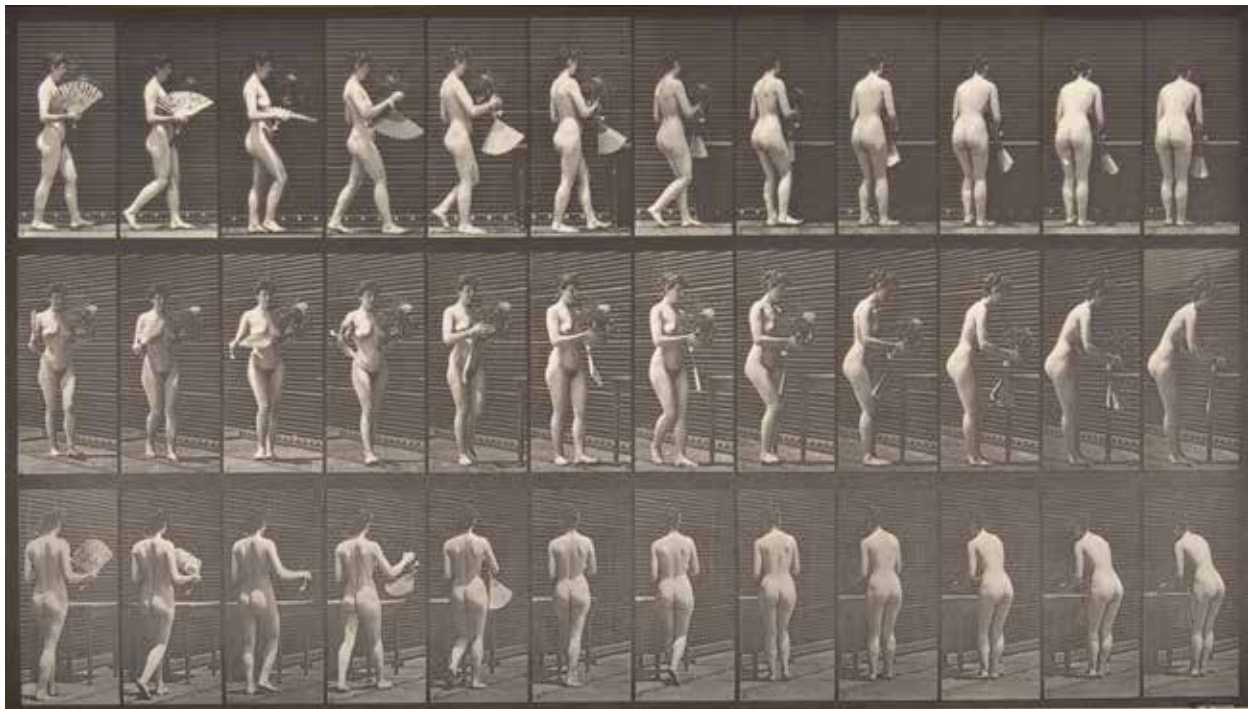
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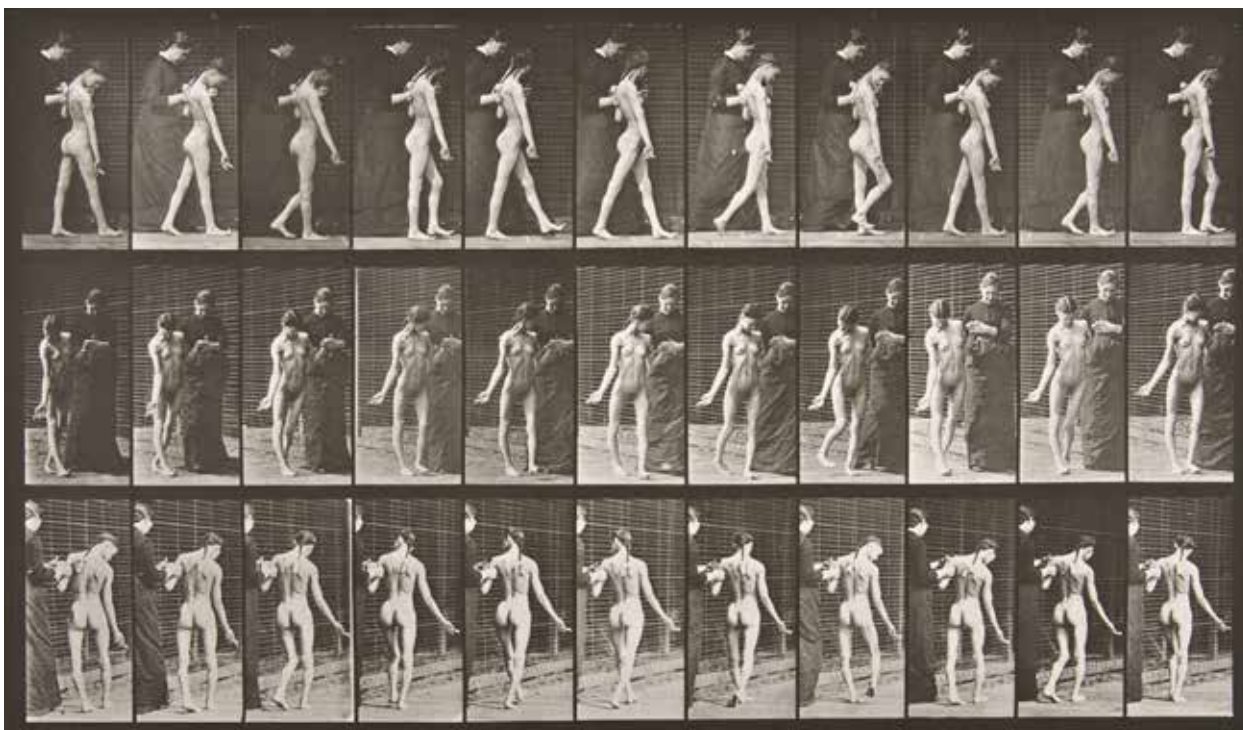
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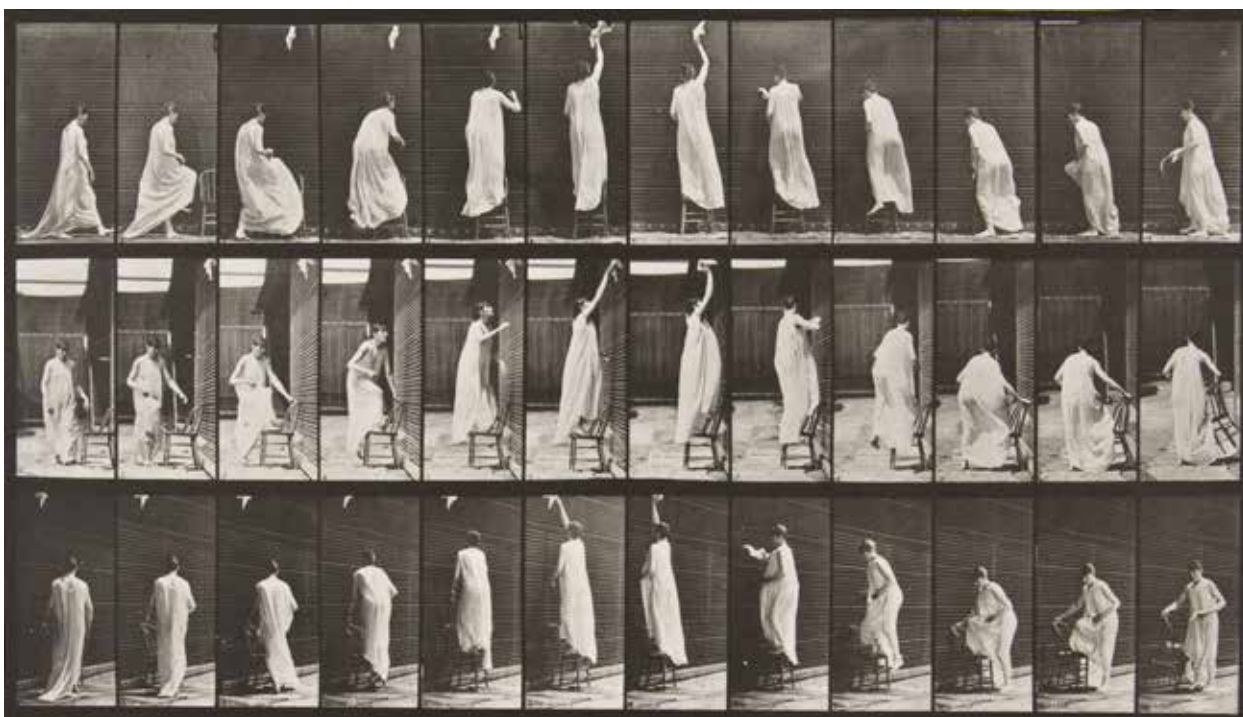
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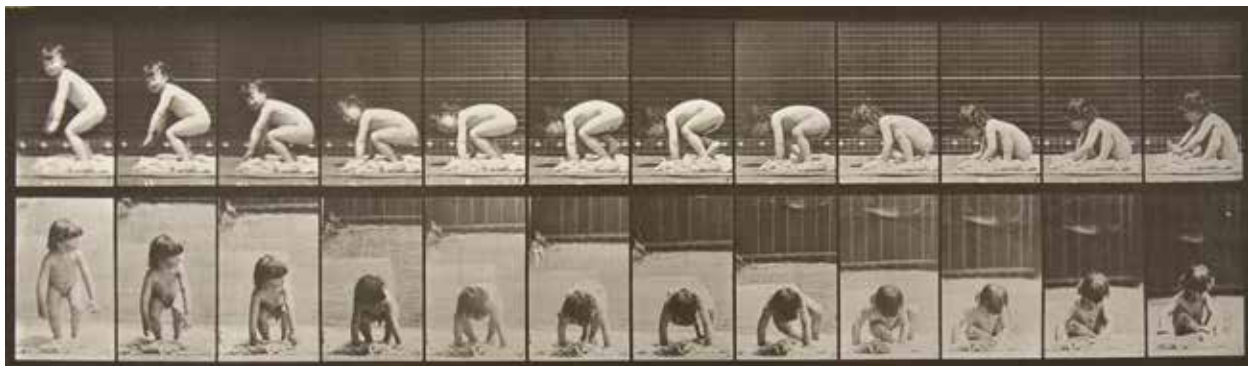
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Eadweard Muybridge, *Animal Locomotion* plate 451, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.51



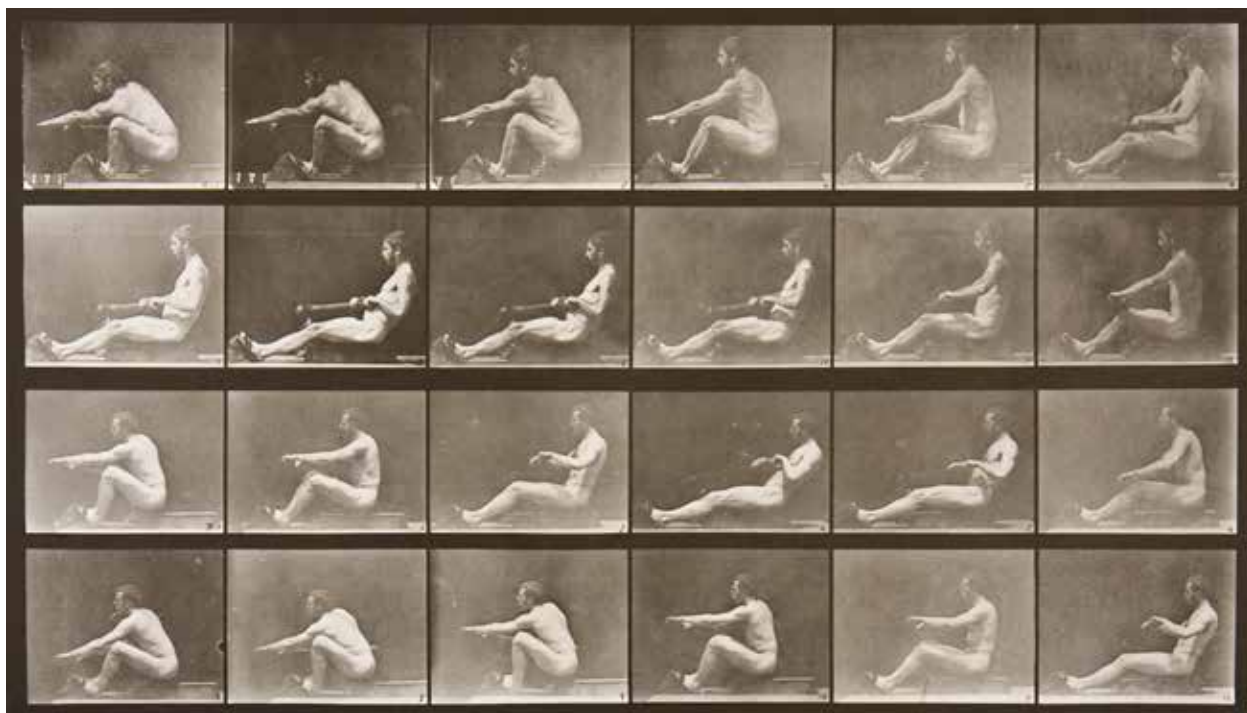
Eadweard Muybridge, *Animal Locomotion* plate 459, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.38



Eadweard Muybridge, *Animal Locomotion* plate 479, 1887. Collotype,
19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.40



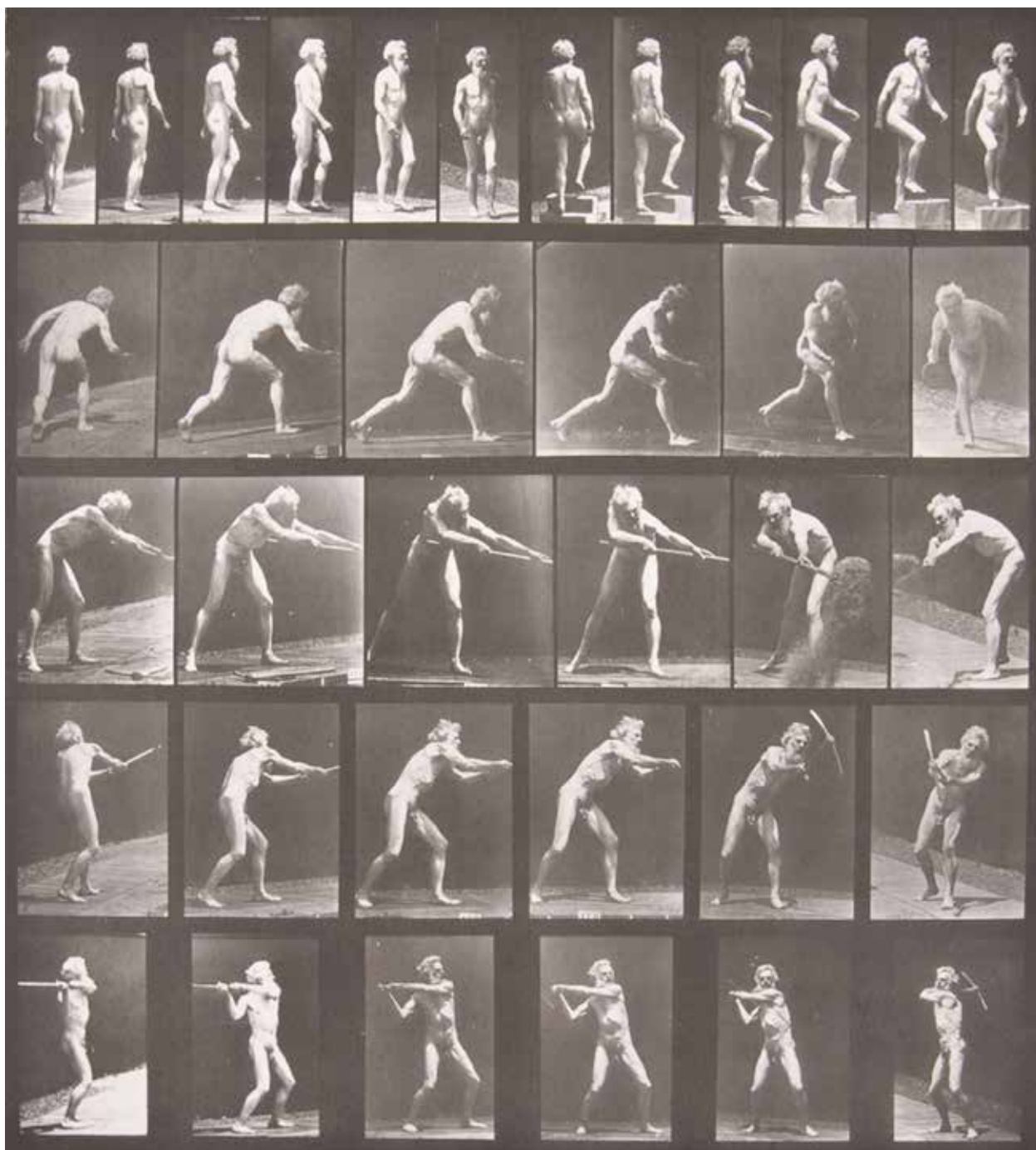
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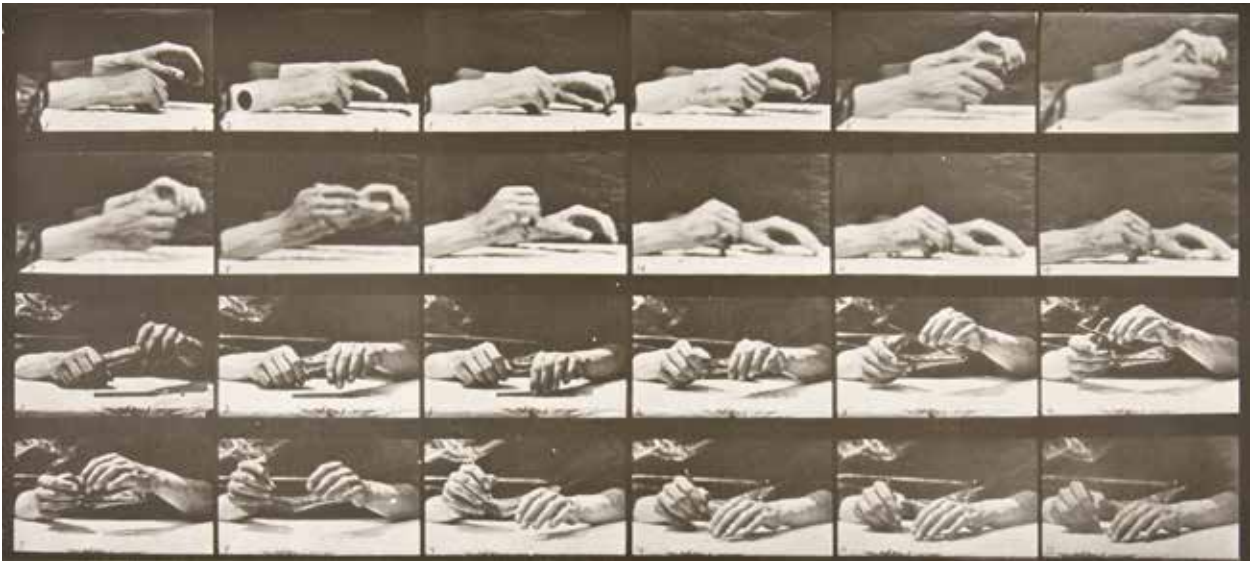
Eadweard Muybridge, *Animal Locomotion* plate 492, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.43



Eadweard Muybridge, *Animal Locomotion* plate 519, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.45



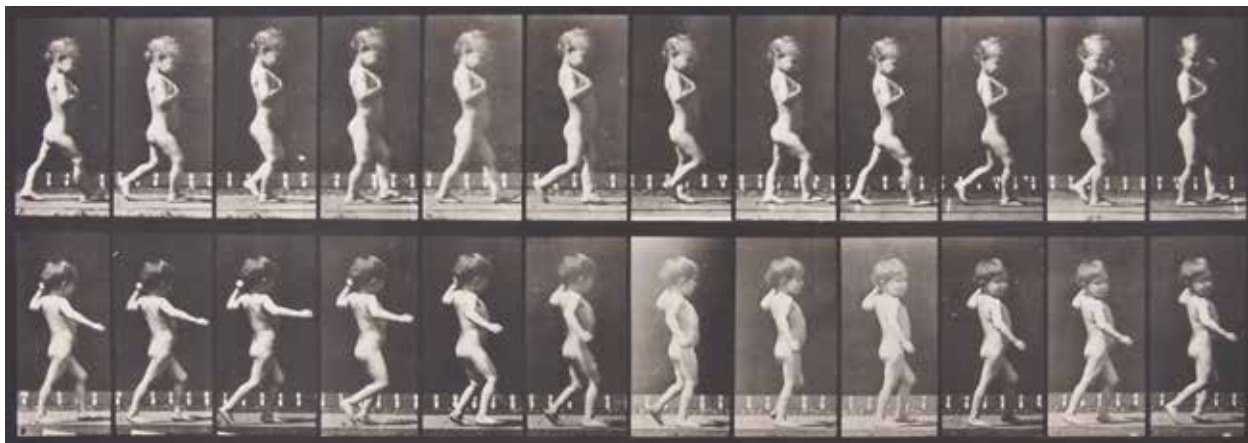
Eadweard Muybridge, *Animal Locomotion* plate 521, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.46



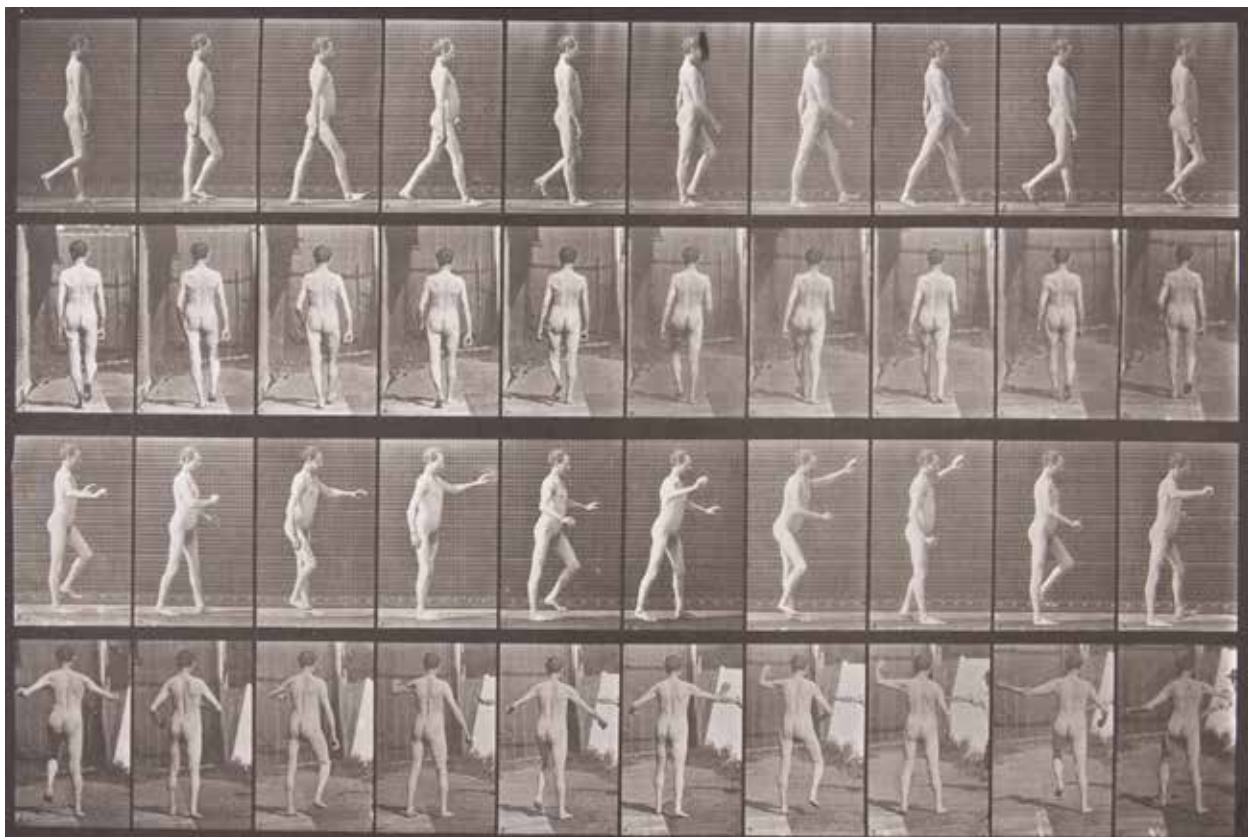
Eadweard Muybridge, *Animal Locomotion* plate 536, 1887. Collotype,
19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.48



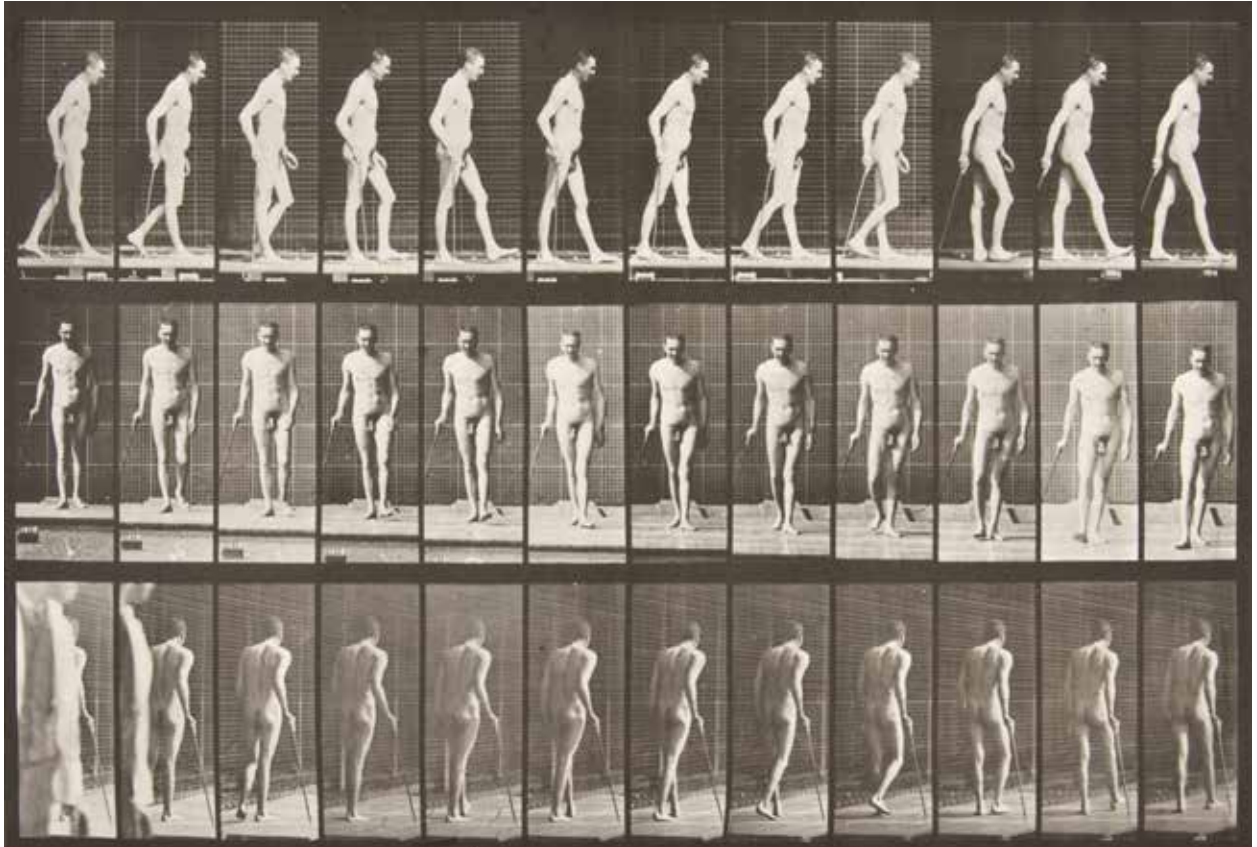
Eadweard Muybridge, *Animal Locomotion* plate 538, 1887. Collotype,
19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.49



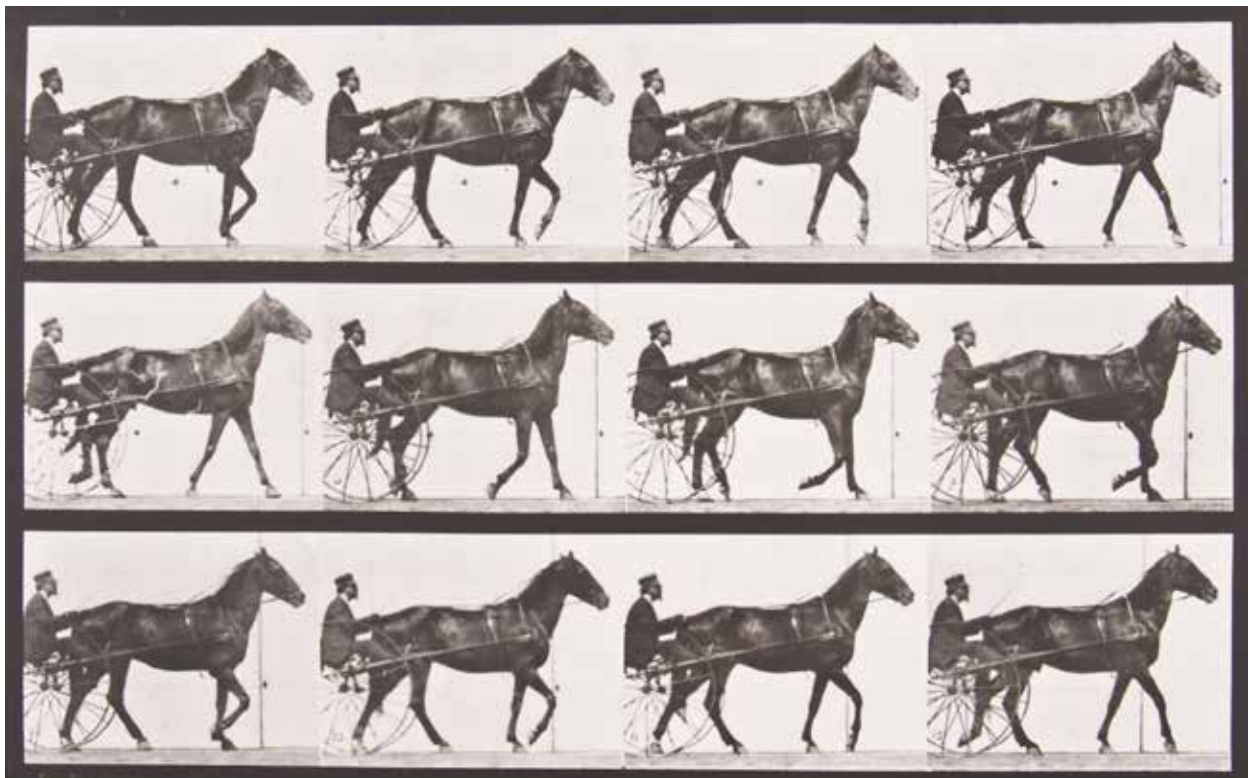
Eadweard Muybridge, *Animal Locomotion* plate 540, 1887. Collotype,
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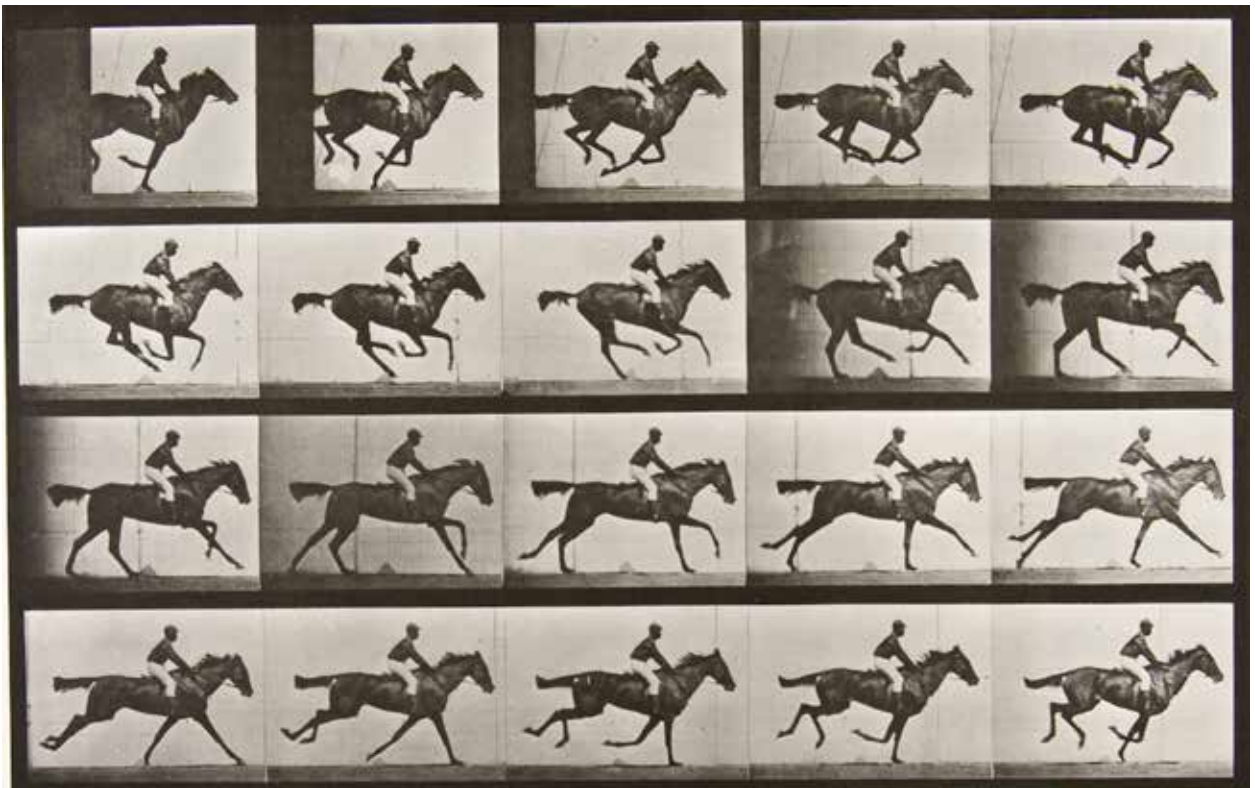
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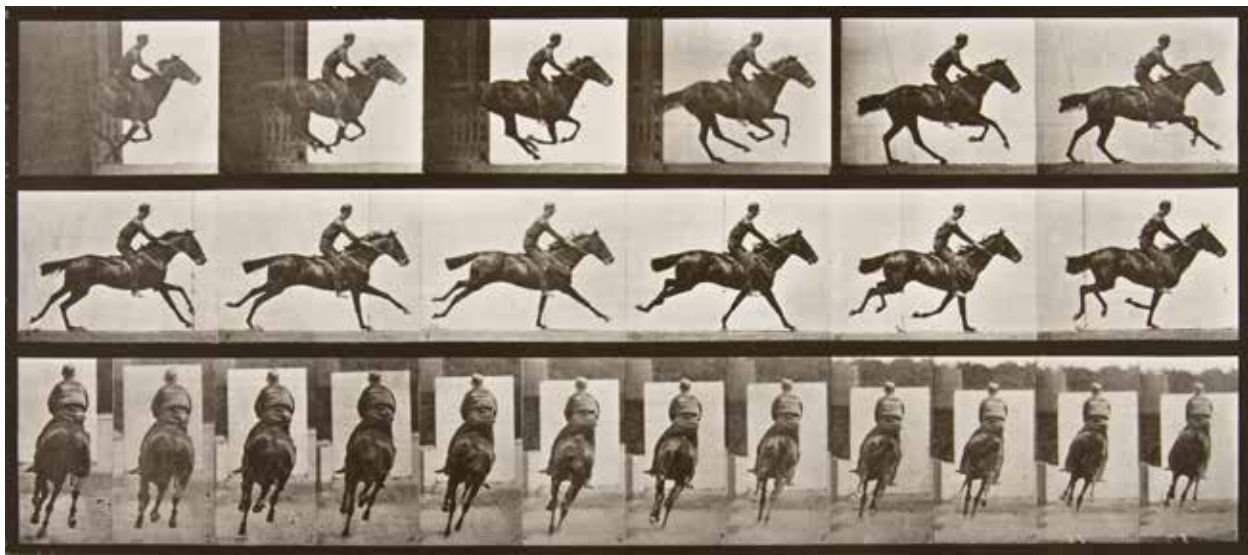
Eadweard Muybridge, *Animal Locomotion* plate 559, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.62



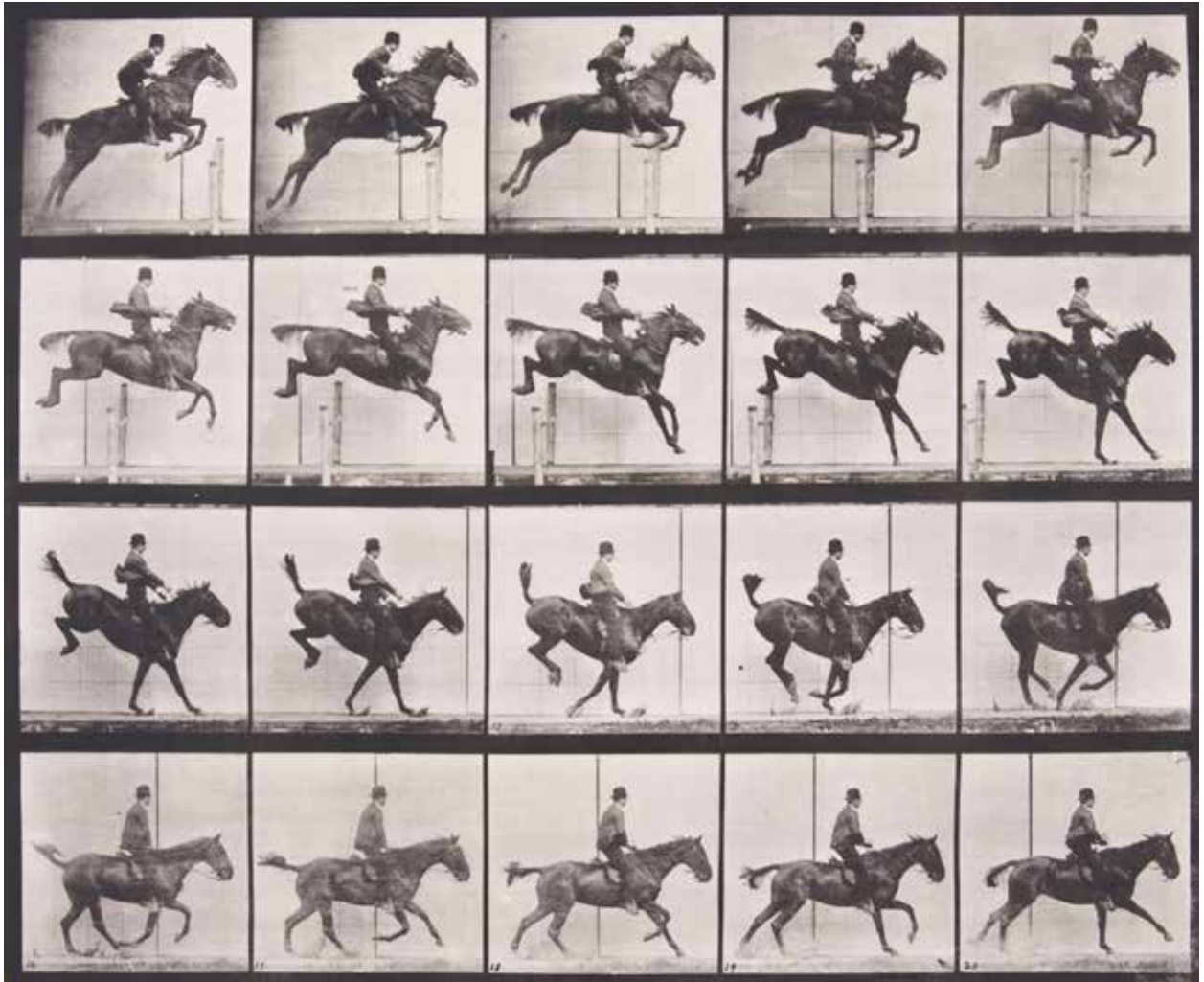
Eadweard Muybridge, *Animal Locomotion* plate 588, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.65



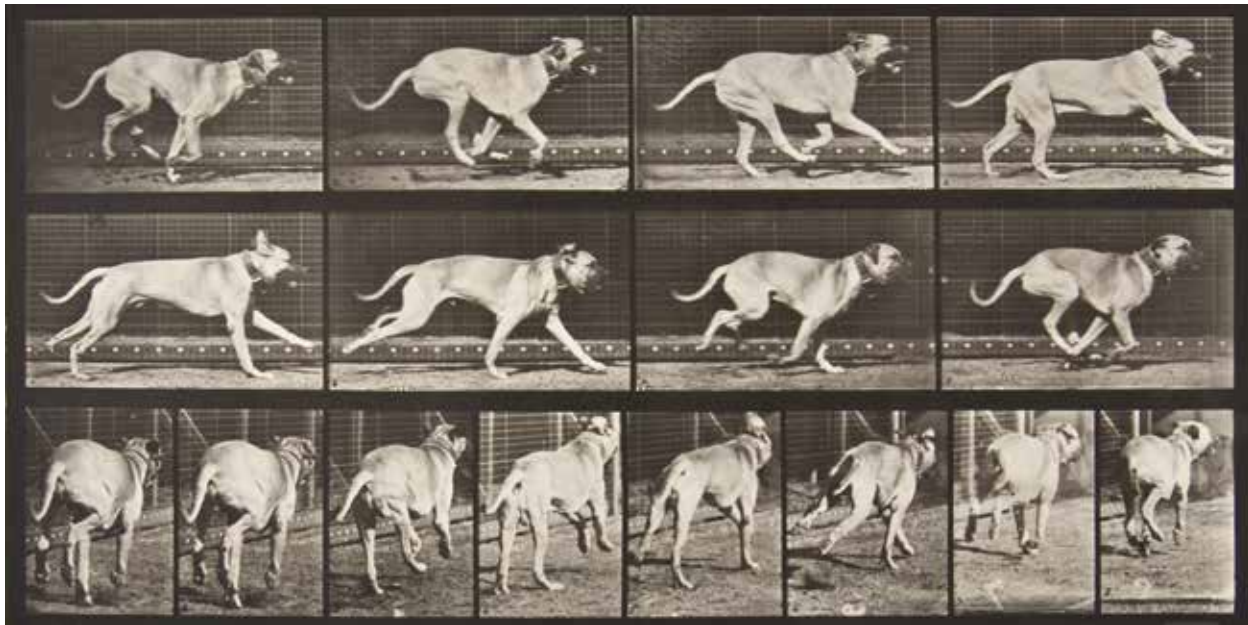
Eadweard Muybridge, *Animal Locomotion* plate 627, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.76



Eadweard Muybridge, *Animal Locomotion* plate 633, 1887. Collotype,
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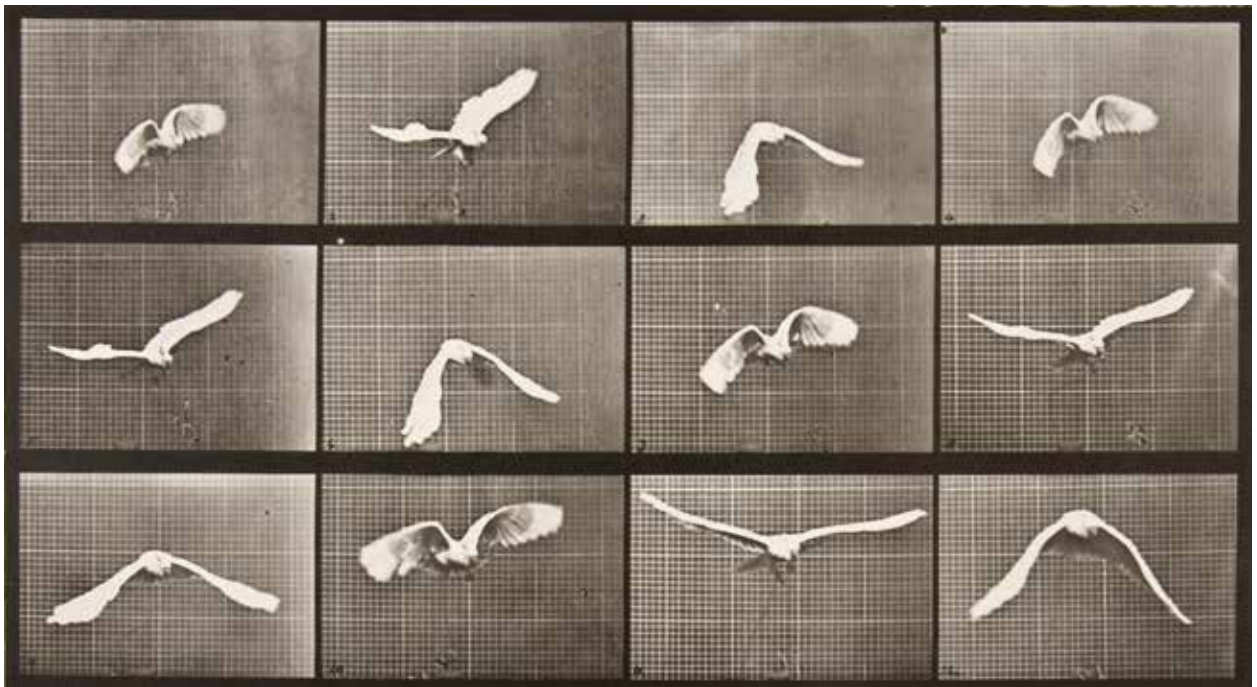
Eadweard Muybridge, *Animal Locomotion* plate 637, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.79



Eadweard Muybridge, *Animal Locomotion* plate 707, 1887. Collotype,
19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.91



Eadweard Muybridge, *Animal Locomotion* plate 750, 1887. Collotype,
19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.102



Eadweard Muybridge, *Animal Locomotion* plate 762, 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.104



The Art and Science of Photography: Himes, Edgerton, and Abbott

These photographs are included in the exhibition to demonstrate how photographers in the late nineteenth and twentieth century expanded the intersections between photography and science.

Charles Francis Himes (1838–1918), Dickinson College class of 1855, developed a profound interest in photography beginning in 1858. In addition to his career as professor of natural sciences at Dickinson College, he studied and taught varied photographic processes. Although he considered himself an amateur photographer, he experimented with new chemical and material techniques and published his thoughts on the history, science, and art of photography. Photographs of the solar eclipse and students actively engaged in scientific work illustrate his commitment to advancing photography at Dickinson College. A contemporary of Eadweard Muybridge, Himes would have been familiar with Muybridge's photographs and scientific accomplishments.

Berenice Abbott (1898–1911) and Harold Edgerton (1903–1990) continued Eadweard Muybridge's legacy by furthering the use of photography as a scientific tool to reveal phenomena the human eye could not see, developing new technologies to capture motion in ever-finer detail. Through their work at MIT, they pioneered photographic techniques with high-speed flashes and stroboscopic photography to document objects and bodies in motion.



Charles Francis Himes (Dickinson College Class of 1855), *View of the solar eclipse, Ottumwa, Iowa, August 7, 1869*. Glass plate negative. Archives and Special Collections, Waidner-Spahr Library, Dickinson College, Gift of Mary Himes Vale and Sarah Vale Rush, PC 2000.1, folder 434n.



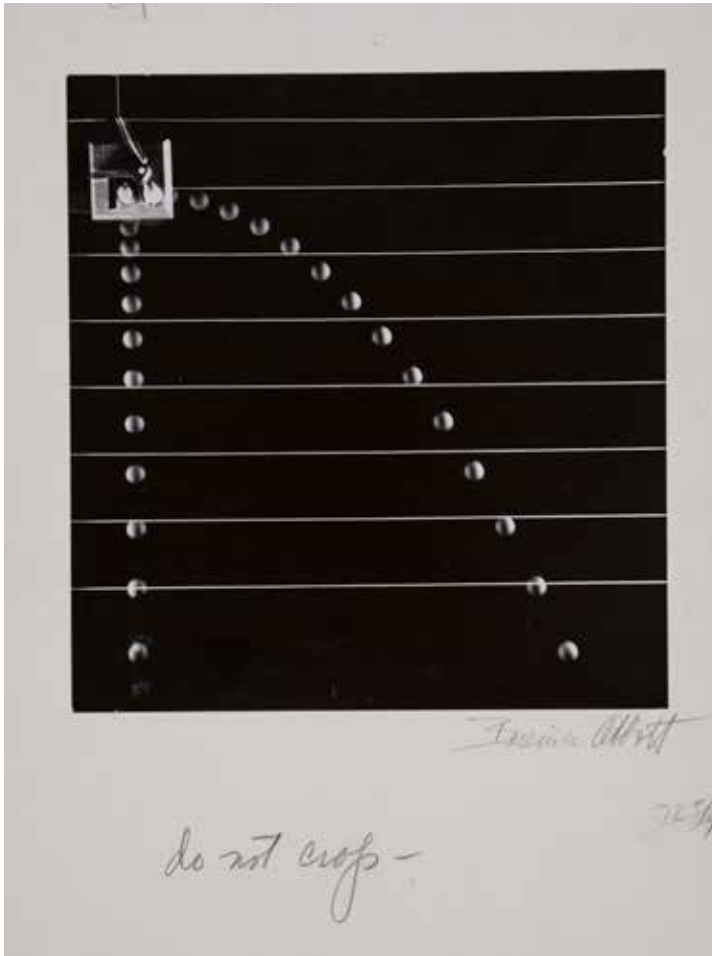
Charles Francis Himes (Dickinson College Class of 1855), *Female students performing science experiment, Tome Hall, Dickinson College, 1889*. Glass plate negative. Archives and Special Collections, Waidner-Spahr Library, Dickinson College, Gift of Mary Himes Vale and Sarah Vale Rush, PC 2000.1, folder 81n.



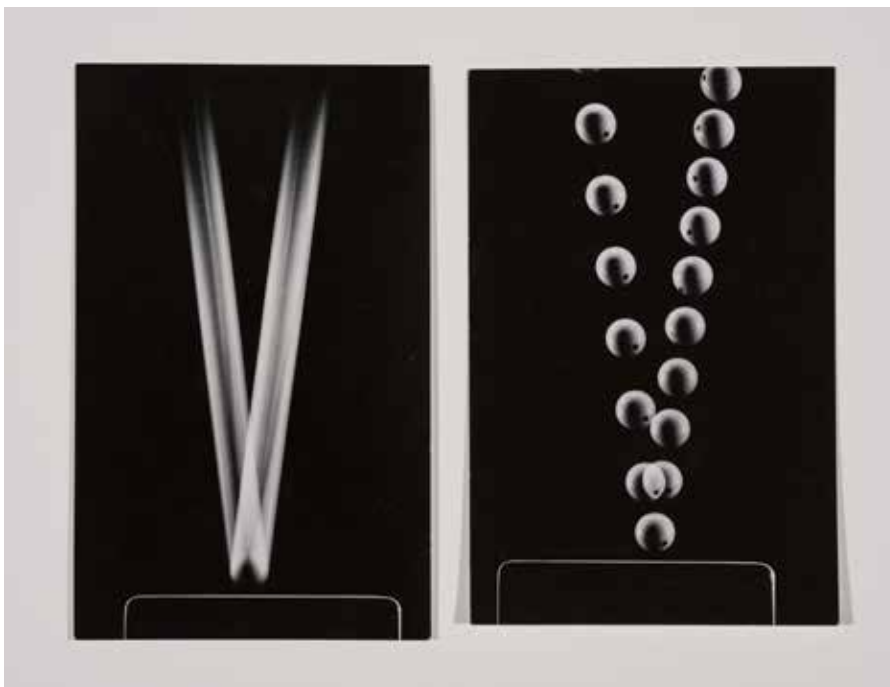
Charles Francis Himes (Dickinson College Class of 1855), *Photographing the solar eclipse, Virginia Beach, Virginia, May 28, 1900*. Photographic print. Archives and Special Collections, Waidner-Spahr Library, Dickinson College, Gift of Mary Himes Vale and Sarah Vale Rush, PC 2000.1, folder 274.



Harold Edgerton,
Moving Skip Rope,
1952. Gelatin silver
print, 20 × 23 7/8 in.
(50.8 × 60.6 cm). Ron
Perisho Collection.



Berenice Abbott, *Golf Balls Released Simultaneously*, c. 1958–61. Gelatin silver print, 6 1/5 × 5 3/5 in. (15.7 × 14.2 cm). Ron Perisho Collection. © Estate of Berenice Abbott.



Berenice Abbott, *Time Exposure of a Bouncing Steel Ball* (left) and *Strobe Photograph of a Bouncing Steel Ball* (right), c. 1958–61. Gelatin silver prints, 4.2 × 2.5 in. (10.7 × 6.6 cm) (each) Ron Perisho Collection. © Estate of Berenice Abbott.

DISSECTING LOCOMOTION

February 20–April 4, 2026

The Trout Gallery, The Art Museum of Dickinson College

www.troutgallery.org

Published by The Trout Gallery, Dickinson College, Carlisle, Pennsylvania 17013

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ISBN 979-8-9869735-5-5

Design Krista Hanley & Skylar Ellsworth

Photography Andy Bale

Printing Colortech, Lebanon, PA

Printed in the United States.

This publication was produced in part through the generous support of the Ruth Trout Endowment at Dickinson College.

Cover: Eadweard Muybridge, *Animal Locomotion* plate 438 (detail), 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.41.

Inside front and back cover: Eadweard Muybridge, *Animal Locomotion* plate 762 (detail), 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.104.

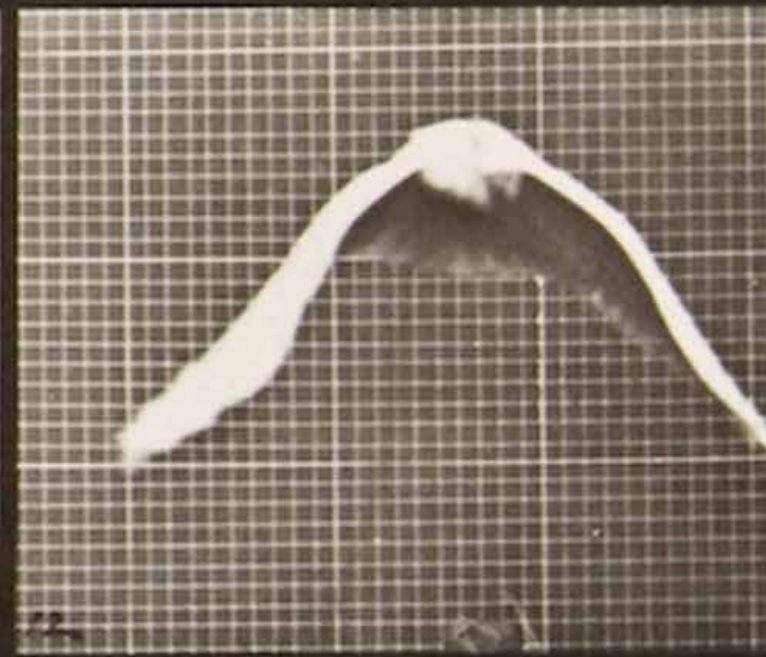
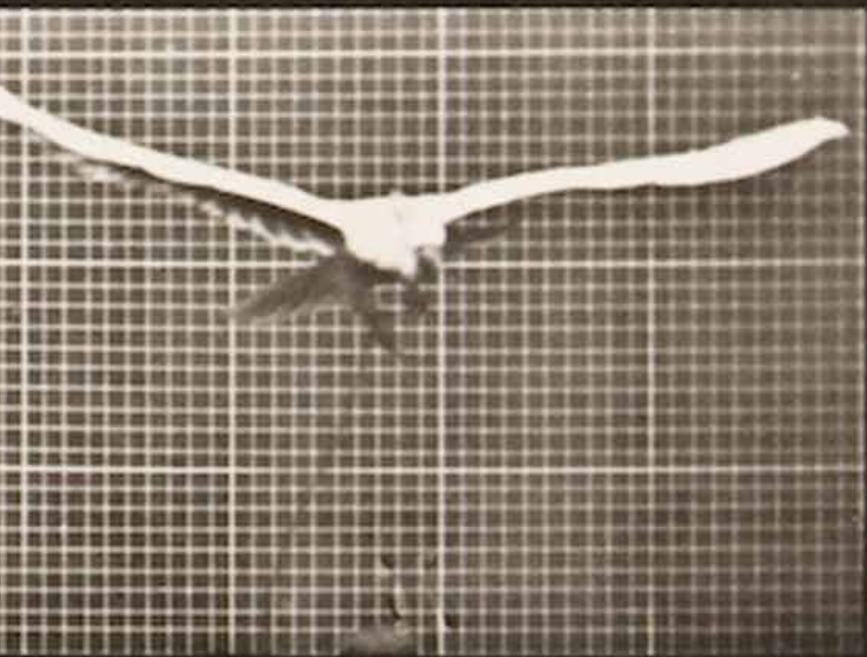
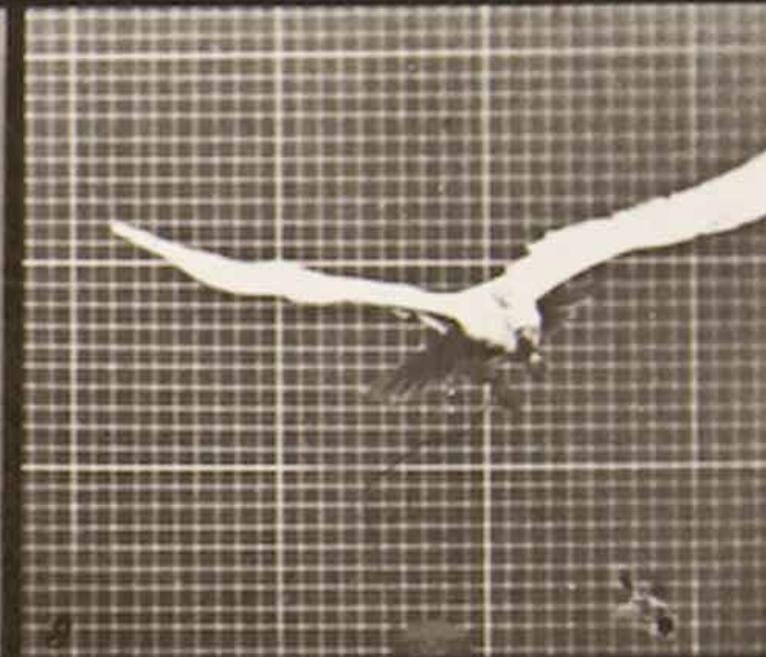
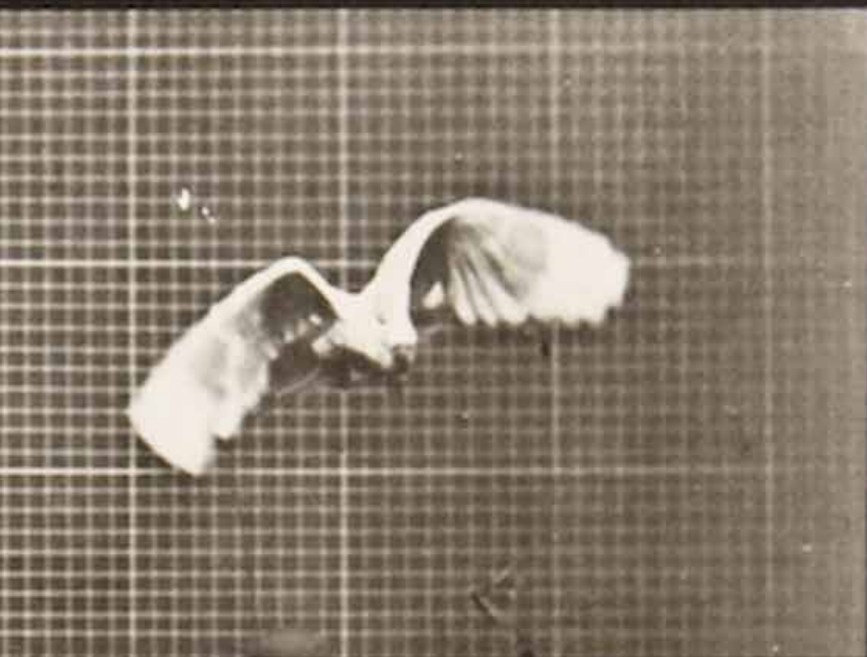
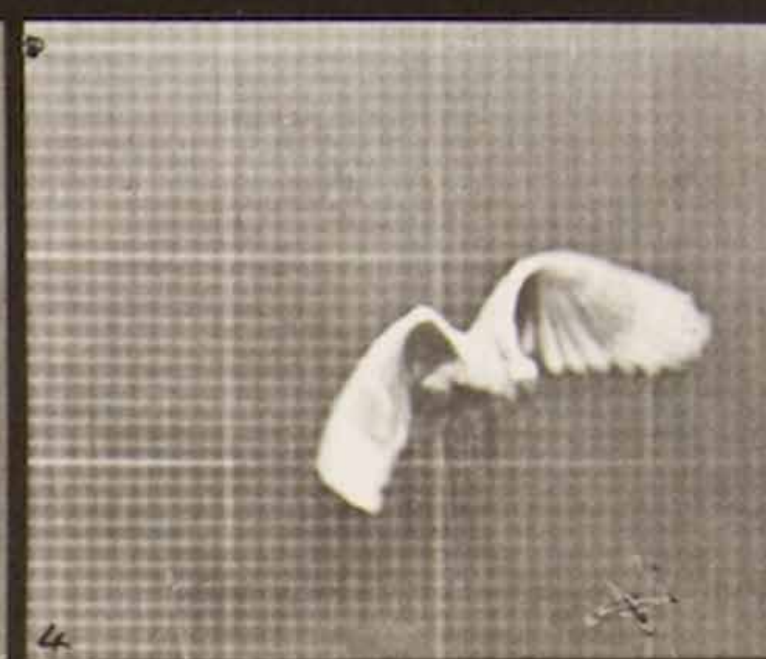
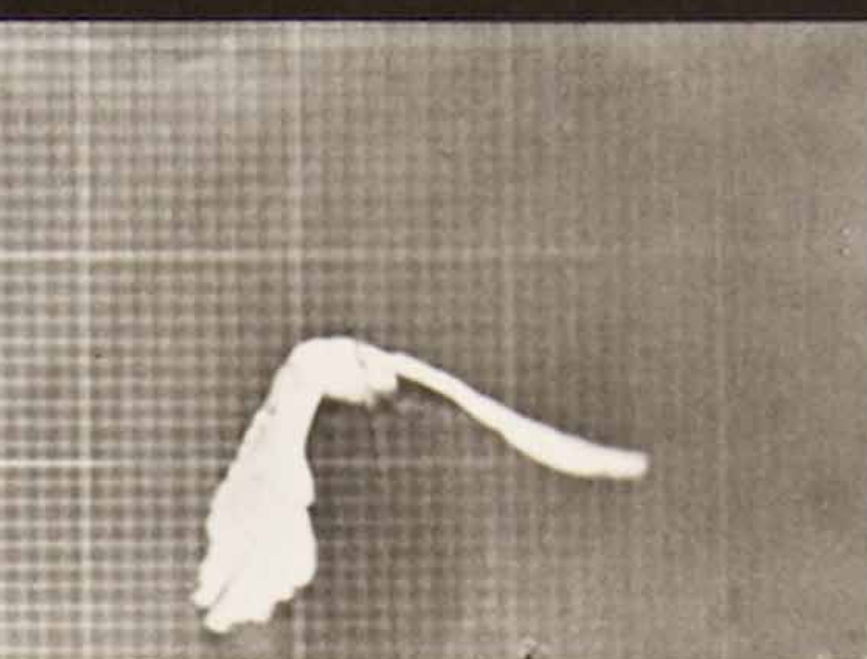
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Acknowledgments: Eadweard Muybridge, *Animal Locomotion* plate 536 (detail), 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.48.

Introduction: Eadweard Muybridge, *Animal Locomotion* plate 637 (detail), 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.79.

Catalogue: Eadweard Muybridge, *The Descent of Clouds' Rest* (detail), c. 1870. Albumen stereo print, 4 x 7 in. (10.2 x 17.8 cm). Ron Perisho Collection.

Back cover: Eadweard Muybridge, *Animal Locomotion* plate 521 (detail), 1887. Collotype, 19 x 24 in. (48.3 x 61 cm). The Trout Gallery, Gift of Samuel Moyerman, 1987.4.46.





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