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RIVER OF SHADOWS
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EADWEARD MUYBRIDGE AND THE TECHNOLOGICAL WILD WEST

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In the spring of 1872 a man photographed a horse. The resulting photograph does not survive, but from this first encounter of a camera-bearing man with a fast-moving horse sprang a series of increasingly successful experiments that produced thousands of extant images. The photographs are well known, but they are most significant as the bridge to a new art that would transform the world. By the end of the 1870s, these experiments had led to the photographer’s invention of the essentials of motion-picture technology. He had captured aspects of motion whose speed had made them as invisible as the moons of Jupiter before the telescope, and he had found a way to set them back in motion. It was as though he had grasped time itself, made it stand still, and then made it run again, over and over. Time was at his command as it had never been at anyone’s before. A new world had opened up for science, for art, for entertainment, for consciousness, and an old world had retreated farther.

The man was Edward James Muybridge of San Francisco, already renowned for his photographs of the West. In the eight years of his motion-study experiments in California, he also became a father, a murderer, and a widower, invented a clock, patented two photographic innovations, achieved international renown as an artist and a scientist, and completed four other major photographic projects. These other projects are also about time: about the seasonal and geological time of landscape, about the difference between the time that the camera sees and the eye sees, about a war between two societies with radically different beliefs about time and space, about the passage of a midsummer day’s sunlight across a city in turmoil. The experience of time was itself changing dramatically during Muybridge’s seventy-four years, hardly ever more dramatically than in the 1870s. In that decade the newly invented telephone and phonograph were added to photography, telegraphy, and the railroad as instruments for “annihilating time and space.” The big corporations were spreading their grasp across wider spaces and into more subtle interstices of everyday life. The Indian wars were reaching their climax and their turning point. The modern world, the world we live in, began then, and Muybridge helped launch it.

Muybridge produced more successful high-speed photographs than anyone had before. His 1878 camera shutters were a triumph of engineering that made reliable exposures of a fraction of a second for the first time, a speed...
at which extremely rapid motion could be captured in focus rather than recorded as blurs. The photographs were also a triumph of chemistry, which made the film “fast” enough to record so brief an instant. They froze motion so that the legs of a trotting or galloping horse, then a leaping man, and eventually the movements of lions, doves, dancing women, water spilling, artists drawing, could be depicted as a sequence of still images. At the same time, Muybridge improved upon the zoetrope, a small device invented in 1834 that makes a series of spinning images seen through a slot appear to be a single image in motion. His zoopraxiscope, as he called it, projected versions of his motion studies on a screen: moving pictures, pictures of motion. It was the first time photographs had dissected and reanimated actual motion, and it was the foundation of cinema, which emerged tentatively in 1889, in full force in France and the United States by 1895. Motion pictures proper were invented by others, but no matter which way the medium’s genealogy is traced, it comes straight back to Muybridge. And motion pictures changed the relationship to time farther; they made it possible to step in the same river twice, to see not just images but events that had happened in other times and other places, almost to stop living where you were and start living in other places or other times. Movies became a huge industry, became how people envisioned themselves and the world, defined what they desired and what was desirable. The Russian film director Andrei Tarkovsky thought that time itself, “time lost or spent or not yet had,” was what people desired and fed upon in the films that have become a collective dreamworld inhabited by multitudes. It all began with photographs of a horse in California.

Occident, the horse that Muybridge photographed in 1872, was one of the fastest trotting horses in the country. At that time trotting races were a national passion, and the great trotters were more celebrated than horses that ran their races. Occident belonged to Leland Stanford, who had brought speed to the country in a far more dramatic way, as one of the four masterminds of the transcontinental railroad completed three years earlier. Once, the North American continent had taken months to cross, and the passage was arduous and perilous. In the decade before the railroad the time had been whittled down to six or seven grueling weeks, barring accidents. With the completion of the railroad those three thousand miles of desert, mountain, prairie, and forest could be comfortably crossed in under a week. No space so vast had ever been shrunk so dramatically. The transcontinental railroad changed the scale of the earth itself, diminishing the time it took to circumnavigate the globe. Walt Whitman hailed it as the long-dreamed-of “Passage to India.”

The railroad had utterly transformed its builders too, into multimillionaires, buyers of estates, commissioners of paintings and photographs, corrupters of politicians, controllers of much of California, managers of one of the most powerful monopolies this country has ever seen. Stanford was the president of their company, the Central Pacific Railroad, and its most visible figure. Governor, senator, thief on a grand scale, he also became a philanthropist on a grand scale with the establishment of Stanford University on the grounds of his vast country estate forty miles south of San Francisco, the site where Muybridge perfected his motion-study technology in the late 1870s. His sponsorship of Muybridge was his first venture into scientific research for its own sake. Stanford University carried and carries on this venture with a hybrid of commercial and pure research that continues to change the world. Like other immensely powerful men, Stanford affected the world indirectly. In person he seems to have been ponderous and a little dull, a respectable effect he may have cultivated, but his impact was, to use a term of the time, electrifying. Spatial changes on a continental scale, technological innovations, influences on national policy and the national economy, the thousands of men who worked for him, the vast edifices and institutions that arose under his direction, and the countless lives he affected are his real expression. His support and encouragement of Muybridge is not the least of these impersonal effects.

In the spring of 1872, a man photographed a horse. Stanford commissioned the photographs in the hope that they would solve a debate about whether a trotting horse ever has all four feet off the ground at a time. Muybridge’s first photographs gave an affirmative answer to that minor scientific question, but by later in the decade he realized that the project had broader possibilities and got Stanford to underwrite his development of them. He told an associate he was going to “revolutionize photography” with the technique he developed, and he did. The story of what Muybridge accomplished with Stanford’s support is a peculiarly California story. Much has been written about the artistic and literary modernism that was born in Paris, but only high culture was born
there, though that high culture was a response to the pervasive alienations and liberations brought by industrialization. Another part of the modern world came from California, and this part was and is an amalgamation of technology, entertainment, and what gets called lifestyle that became part of everyday life for more and more people around the world and a form of industrialization itself. Perhaps because California has no past—no past, at least, that it is willing to remember—it has always been peculiarly adept at trailblazing the future. We live in the future launched there.

If one wanted to find an absolute beginning point, a creation story, for California’s two greatest transformations of the world, these experiments with horse and camera would be it. Out of these first lost snapshots eventually came a world-changing industry, and out of the many places where movies are made, one particular place: Hollywood. The man who owned the horse and sponsored the project believed in the union of science and business and founded the university that much later generated another industry identified, like Hollywood, by its central place: Silicon Valley. Hollywood and Silicon Valley became, long after these men died, the two industries California is most identified with, the two that changed the world. They changed it, are changing it, from a world of places and materials to a world of representations and information, a world of vastly greater reach and less solid grounding. Muybridge’s life before those eight years of the California motion studies was a preparation for that phenomenal productivity; his life afterward only polished, promoted, and enlarged upon what he had accomplished in those years. This book is about those years that followed upon that encounter between photographer and racehorse and about that man who seems in retrospect like a bullet shot through a book. His trajectory ripped through all the central stories of his time—the relationship to the natural world and the industrialization of the human world, the Indian wars, the new technologies and their impact on perception and consciousness. He is the man who split the second, as dramatic and far-reaching an action as the splitting of the atom.

Muybridge was forty-two when he began the motion studies, and he had been traveling toward this achievement down a circuitous path. He had been born Edward James Muggeridge on a street in Kingston-upon-Thames paralleling the banks of the Thames, not far upriver from London, on April 9, 1830. An ancient market town, Kingston had a millennium earlier been the place where seven Saxon kings of England were crowned. The lump of sandstone said to be their coronation stone was, with great ceremony, rescued from its long role as a mounting block and raised on a pedestal in the center of town in 1850. On the pedestal below this molar-shaped stone were carved the names of those kings, including two Eadweards. Though Muybridge wouldn’t change his first name to Eadweard until his visit to England in 1882, he likely derived it from this monument (he changed his surname twice, to Muygridge in the 1850s and to Muybridge in the 1860s).

His own birthplace and childhood home was a row house only a few dozen feet away from the coronation stone, on the other side of one of the oldest surviving road bridges in Britain, a twelfth-century bridge across a small tributary of the Thames on which locals liked to idle and gossip. At the time, the town’s buildings and pace of life seemed hardly changed over centuries: the mayor walked to church amid a procession every Sunday, the market square bustled, a night watchman patrolled the streets, locals got their water from the town pump and their beer from the many public houses. Muybridge’s father, John Muggeridge, was a merchant dealing in grain and coal, and the ground floor of the family home had a wide entrance for horses and wagons to come through with their loads. John and Susan Muggeridge and their four sons lived above, in compact rooms whose back windows looked out onto the broad Thames itself, and some of the family business must have been conducted by barge. Like Stanford, Muybridge was born into a quiet commercial family in a provincial town, and like Stanford had he stayed where he was he might have lived and died having made hardly a ripple in history. It was California that set them free to become more influential than they could have imagined. Or California and the changing world around them, for their fame was achieved by taking hold of those changes and pushing them farther. The year of Muybridge’s birth and the years of his childhood saw a set of inventions and discoveries that set the stage for his own.

John Muggeridge died in 1843, and like her mother before her Susan Muggeridge took over her husband’s business and seems to have run it successfully, for in 1845 the corn and coal business was listed in her name.
Muybridge’s grandfather Edward Smith had died when his wife, Susannah Norman Smith, was pregnant with her ninth child. She assumed command of his flourishing barge business and ran it successfully until she passed it on to her older sons, and she presided regally over her large family and larger workforce for decades afterward. When Susannah Smith died at a great age in 1870, she owned more than a dozen houses and considerable other property, though the barge business with its stables of powerful horses seems to have unraveled. Barges had transformed the transport of goods in England before railroads arrived, and the manmade canals built in the late eighteenth and early nineteenth century to accommodate them had transformed the English landscape. Before, most communities had relied largely on local materials for building supplies, provisions, and other materials. Roads were bad and sometimes dangerous, horses were expensive, and each village and town lived in a kind of isolation hard to imagine now. Most people who wanted to get somewhere walked, and many lived and died having never gone farther than a day’s walk from home. By the early nineteenth century a carefully coordinated stagecoach system with horses changed every dozen miles or so brought traveling speeds up to ten miles an hour for those who could afford its exorbitant charges, and the coaches seemed reckless and godlike in their swiftness.

Goods moved on barges along canals dug into the landscape, and the barges themselves were a slow-moving business. Muybridge’s cousin Maybanke Susannah Anderson recalled that when their grandfather Edward Smith “drove in his gig to London, to buy wheat or coal, he took under the seat of his gig, a carrier pigeon, and in his pocket a quill or two, and when he bought a cargo, he wrote on a small piece of paper the number of barges he needed, put the paper in the quill, tied it under the wing of the pigeon and set it free. Someone watching for the bird’s arrival unfastened the quill, took the message to the barges, and they started.” Pigeons were the fastest communications technology; horses were the fastest transportation technology; the barges moved at the speed of the river or the pace of the horses that pulled them along the canals. Nature itself was the limit of speed: humans could only harness water, wind, birds, beasts. Born into this almost medievally slow world, the impatient, ambitious, inventive Muybridge would leave it and link himself instead to the fastest and newest technologies of the day. But that world was already being transformed profoundly.

On September 15, 1830, less than six months after Muybridge’s birth, the first passenger railroad opened. The celebrated young actress Fanny Kemble had been given a preview of the Manchester and Liverpool Railroad that August. In a letter to a friend she exclaimed, “The engine . . . set off at its utmost speed, thirty-five miles an hour, swifter than a bird flies (for they tried the experiment with a snipe). You cannot conceive what that sensation of cutting the air was; the motion is as smooth as possible too. I could have either read or written; and as it was, I stood up, and with my bonnet off ‘drank the air before me.’ . . . When I closed my eyes this sensation of flying was quite delightful, and strange beyond description.” Thirty-five miles an hour was nearly as fast as the fastest horse, and unlike a gallop, it could be sustained almost indefinitely. It was a dizzying speed. Passengers found the landscape out the train windows was blurred, impossible to contemplate, erased by speeds that would now seem a slow crawl to us. Those who watched the trains approach sometimes thought they were physically getting larger, because the perceptual change in a large object approaching at that speed was an unprecedented phenomenon. Ulysses S. Grant remembered riding on one of the early railroads in Pennsylvania in 1839 with the same amazement that most early travelers recorded: “We traveled at least eighteen miles an hour when at full speed, and made the whole distance averaging as much as twelve miles an hour. This seemed like annihilating space.” If distance was measured in time, then the world had suddenly begun to shrink; places connected by railroads were, for all practical purposes, several times closer to each other than they ever had been.

At the railroad’s official opening, Kemble returned to ride with her mother, who was “frightened to death” of “a situation which appeared to her to threaten with instant annihilation herself and all her traveling companions.” That celebration of a thousand passengers and almost a million onlookers along the route was interrupted by an actual annihilation, the death of the progressive Tory politician William Huskisson. At a stop to take on water for the steam engines, Huskisson got out to stretch and was hit by an oncoming train. It is hard to imagine today the reflexes and responses that made it impossible to step away from a noisy locomotive going perhaps thirty miles an hour, but
Huskisson could not. His leg was run over and crushed. Though the duke of Wellington applied a tourniquet to prevent him from bleeding to death on the spot, he died that evening. In Manchester the duke, who had been the hero of the battle of Waterloo and was now the prime minister preventing the democratization of voting, was greeted with angry cries of “Remember Peterloo.” The railroad cars had to retreat hastily. It was no coincidence that the first railroad linked two of the Industrial Revolution’s primary sites or that the Manchester workers linked the duke and the new technology to the 1819 Peterloo massacre of workers demanding reform. Industrial workers saw the new market economy as bleak and brutal, and they launched a powerful reform movement in the 1830s to gain a voice in it. The agricultural economy was as grim: the Captain Swing riots in the south of England that season of the first passenger railroad’s opening protested starvation wages and wrecked reaping machines. An old order had vanished, to be replaced not by a new one but by turbulence and continual change.

Long afterward, Kemble called this railroad “the first mesh of that amazing iron net which now covers the whole surface of England and all the civilized portions of the earth.” The Industrial Revolution preceded railroads, but railroads magnified its effects and possibilities unfathomably, and these roaring, puffing machines came to seem that revolution incarnate. Often compared to dragons, they devoured coal and iron in unprecedented quantities, spreading mines and mills wherever they went. In the United States, they ran on wood, and whole forests were fed into their boilers, as though the landscape itself were being devoured by speed. Railroads made possible the consolidation of industries and the industrialization of traditional activities. The fast, cheap transport of goods meant that a town could be given over to shoe-making or beer-making, a whole region to cattle raising or wheat growing, and people grew used to depending upon commodities that seemed to come from nowhere. The New England philosopher Ralph Waldo Emerson opined in 1844, “Not only is distance annihilated, but when, as now, the locomotive and the steamboat, like enormous shuttles, shoot every day across the thousand various threads of national descent and employment, and bind them fast in one web, an hourly assimilation goes forward and there is no danger that local peculiarities and hostilities should be preserved.” He saw the network of railroads undoing the local character of every place and approved of the erasure. People were being drawn out of their small familiar worlds into one more free, less personal, in which the associations that once attached to each person, place, and object came undone. It was a leap forward of extraordinary liberation and equal alienation.

Grant and Emerson were sounding variations on one of the stock phrases of the day, “the annihilation of time and space,” which was applied over and over to railroads and other new technologies. “Annihilating time and space” is what most new technologies aspire to do: technology regards the very terms of our bodily existence as burdensome. Annihilating time and space most directly means accelerating communications and transportation. The domestication of the horse and the invention of the wheel sped up the rate and volume of transit; the invention of writing made it possible for stories to reach farther across time and space than their tellers and stay more stable than memory; and new communications, reproduction, and transportation technologies only continue the process. What distinguishes a technological world is that the terms of nature are obscured; one need not live quite in the present or the local.

Between the time of the Roman Empire and the dawn of the industrial age, wheel-drawn transportation, roads, and ships were improved, but only the printing press made a major alteration in means. Afterward, the devices for such annihilation poured forth faster and faster, as though inventiveness and impatience had sped and multiplied too. Nothing annihilated more dramatically than railroads. As people and goods traveled more frequently and farther, experience was standardized. Distance had always been roughly measurable in time, the stable time of human or equine locomotion, but the railroad transformed those equations, shortening the time and thereby seeming to decrease the distance. The world began to shrink, and local differences to dissipate. People could go much farther because places were not, in terms of time, so far apart, nor was travel so expensive. Distance was relative; a technological infrastructure could shrink it spectacularly. Early in the twentieth century, when Albert Einstein reached for metaphors to explain his theory of relativity, he repeatedly seized upon the image of a train running across the landscape, a train whose passengers were experiencing time differently than those on the ground.

Railroads transformed the experience of nature, and they transformed the
landscape itself. Kemble had been amazed by the cuttings, tunnels and viaducts that leveled the route of the Manchester and Liverpool Railroad, raising the train far above and dropping it below the surface of the earth. "I felt as if no fairy tale was ever half so wonderful as what I saw," she said. Amateur geologists found a rich resource in the railroad cuttings that laid bare Britain’s rock and fossils. Geology was the key science of the Victorian era, as physics was of the modern era and perhaps genetics is today, and in that era geology texts sometimes outsold popular novels. One such book was Charles Lyell’s Principles of Geology, whose first volume was published the year of Muybridge’s birth and Kemble’s ride. Geologists had begun to debate the age of the earth. Bible scholars asserted that the earth was only about six thousand years old. Its rocks suggested a far greater age to those who studied them, but they did not agree among themselves how old. Catastrophists argued for a comparatively young earth in which forces far more violent than those presently at work had wrenched and welded its topography, and some still claimed Noah’s flood had placed aquatic fossils in the heights. The uniformitarians believed that earthquakes, volcanoes, erosion, and other forces still at work must have gradually shaped the earth, and it must be far more ancient than had ever been imagined. Lyell had gone to Sicily to study Mount Etna and concluded that its massive cone was the result of aeons of small eruptions, and that cone sat atop relatively young rocks. His uniformitarian Principles portrayed an earth whose age was in the millions of years.

The railroad shrank space through the speed of its motion. Geology expanded time through the slowness of its processes and the profundity of its changes. When they subscribed to the old biblical scale of time, human beings seem to have marched as confidently as elephants, sure they were center stage in a drama whose beginning and end were near at hand and whose set changes were slight. In the new industrial and scientific sense of time, they swarmed and darted like insects, quick but uncertain of their place in a cavalcade of unimaginable length. Expelled from the cozy millenia of biblical time, Lyell’s wide audience found itself on a vast plateau of millions of years of geological time. As his colleague George Poulette Scrope put it in 1829, “The periods which to our narrow apprehension . . . appear of incalculable duration, are in all probability but trifles in the calendar of Nature. It is Geology that, above all other sciences, makes us acquainted with this important though humiliating fact . . . . The leading idea which is present in all our researches, and which accompanies every fresh observation, the sound to which the student of Nature seems continually echoed from every part of her works, is—Time! Time! Time!” It was geology, specifically Lyell’s book that he took with him on the Beagle’s sail around the world from 1831 to 1836, that would lead Charles Darwin to his theory of evolution, and that theory would further transform the place of human beings on the stage of life, more distant from God and closer to the other species. Muybridge, by photographing human beings as “animals in motion” among other animals, took a Darwinian stance.

At the far end of the decade of the railroad’s arrival came a third great transformer of time: photography. The Industrial Revolution is most often represented by the bleak textile mills of the British Midlands. But the same steam engines that drove the factories drove the railroads, and though railroads required mines and manufactories, they themselves produced exhilarating effects. Photography is equally a technology of its time, but it generated few such impositions on the landscape or on workers; it was an artisan’s technology (though photographic factories came into existence by the late nineteenth century, and every version of the medium has involved toxic chemicals, starting with mercury and cyanide). It did not impose itself on the world but interpreted it, transporting appearance as the railroad transported matter. As a technology, it requires a very different argument about effects and merits than the heavy-duty icons of the Industrial Revolution. For if railroads and photography had one thing in common, it is that they brought the world closer for those who rode or looked. While the dull, repetitive toil of the factories seemed like slavery, these technologies often seemed liberatory.

The brothers Nicéphore and Claude Niepce had begun working on the chemistry of photography in the teens, as had Louis-Jacques-Mandé Daguerre in the 1820s, while the Englishman William Henry Fox Talbot took up the challenge in 1833. Just as the date that counts for the railroad is not that of the invention of the steam engine or the railroad track or the locomotives hauling coal in remote mines, but the date that railroads began to transform public experience, so photography was nothing but a desire, a few premature
announcements, and a few faint images before January 7, 1839. That day, Da-
guerre publicly announced his invention of the photographic method he called
daguerreotypy, prompting Talbot to rush to announce his own breakthrough
later that January. (In much the same way, the American painter Samuel F. B.
Morse and the Englishmen William Fothergill Cooke and Charles Wheatstone
invented electric telegraphy at virtually the same time in the early 1840s, and
Darwin overcame his long reluctance to announce his conclusions about evo-
lution when Alfred Russell Wallace announced similar conclusions in 1858.)

Photography was in the air. The hope of making images mechanically rath-
ergy, and the images were small and elusive. The mirrored surface that at one
angle showed the image at another showed the viewer looking at the image;
it seemed phantasmagorical in a way paper prints would not. Compared to
painting, early photography was astonishingly fast, but it required exposures
from dozens of seconds to several minutes. Morse, who was in Paris the spring
of Daguerre’s announcement, wrote back to New York of the new invention,
“Objects moving are not impressed. The Boulevard, so constantly filled with
a moving throng of pedestrians and carriages, was perfectly solitary, except
for an individual who was having his boots brushed. His feet were compelled,
of course, to be stationary for some time, one being on the box of the boot-
black and the other on the ground. Consequently his boots and legs were well
defined, but he is without body or head, because these were in motion.” This
man having his shoes polished and the blurry bootblack were the first human
beings photographed, and it is eerie to look at them apparently alone, but re-
ally surrounded by scores who vanished into speed. Photography was faster
than painting, but it could only portray the slow world or the still world. People
sat for their portraits with braces to hold their heads steady, and in those old
portraits fidgeting children are often a blur. Landscapes were photographed
on windless days when the leaves wouldn’t move and the water was smooth.
The bustling nineteenth century had to come to a halt for the camera, until
Muybridge and his motion studies.

Even so, photography was a profound transformation of the world it entered.
Before, every face, every place, every event, had been unique, seen only once
and then lost forever among the changes of age, light, time. The past existed
only in memory and interpretation, and the world beyond one’s own experience
was mostly stories. The rich could commission paintings, the less rich could
buy prints, but a photograph reproduced its subject with an immediacy and
accuracy art made by hand lacked, and by the 1850s it offered the possibility
of mass reproductions, images for everyone. Every photograph was a piece of evidence
from the event itself, a material witness. The youthful face of a beloved could
be looked at decades after age or death or separation had removed that face,
could be possessed like an object. Daguerreotypes, which were soon sold
in elaborately molded cases with cut-velvet linings facing the image that sat
within, were alluring objects. Soon countless thousands were lining up to possess images of themselves, their families, their dead children, to own the past. Most daguerreotypes reached out in time to make familiar faces permanent possessions; it was only when the later photographic processes arrived on the scene that photography extended its grasp in space as it had in time. The images piled up, and photography became an industry too. The world was growing larger and more complicated, and photography was both an agent of this enlargement and a device for trying to sort it all out, to own it, to make it manageable. Photography had frozen the river of time, but a torrent of photographs began to pour from the photography studios into homes, pockets, albums, photographs of pyramids, empresses, streets, poets, cathedrals, trees, actors.

Five years after photography, one more technology, telegraphy, arrived to transform time. Telegraph messages traveled almost instantly as electrical impulses over the wires, a technology that telephones and the Internet would only elaborate. “This is indeed the annihilation of space,” the Philadelphia Ledger exclaimed over the first long-distance telegram in the United States. Many of the early telegraphic lines followed the railroad tracks, and they replaced the railroad as the fastest communications technology. News, words, data, were dematerialized and almost instantaneous wherever the telegraph wires were strung. The distance between places that had once been mea-sured at ten miles an hour or less was wavering, drawing closer, almost dissolving. Karl Marx took up that catchphrase of the day when he wrote, “Capital must on the one side strive to tear down every spatial barrier to intercourse, i.e., to exchange, and conquer the whole earth for its market. It strives on the other hand to annihilate this space with time, i.e., to reduce to a minimum the time spent in motion from one place to another.” In other words, the more capitalism shrinks space and speeds up time, the more it can profit. In Marx’s view, capitalism itself was the engine of the annihilation of time and space, the locomotive its tangible form, and time and space were being annihilated to increase profits. This led to the formation of ever-vaster fortunes and the first modern corporations, even the stock markets whose first major stocks were railroad shares. Capitalism, stocks, corporations, transformed the labor of workers and the materials of the world into that abstraction profit. Labor and materials were themselves abstracted as the one went into the factory to become a series of simple repetitive gestures rather than an authorship of objects, and the objects themselves came to be bought and used by people more and more remote from the process of their making. But these changes also transformed the way everyone touched by the technologies perceived time and space. To use railroad terms, the engine of this cultural and perceptual change was economic.

Before the new technologies and ideas, time was a river in which human beings were immersed, moving steadily on the current, never faster than the speeds of nature—of currents, of wind, of muscles. Trains liberated them from the flow of the river, or isolated them from it. Photography appears on this scene as though someone had found a way to freeze the water of passing time; appearances that were once as fluid as water running through one’s fingers became solid objects. Through the nineteenth century, as Darwin worked out his theories about literal evolution, it is as though consciousness evolved from something utterly immersed in this river to something that clambered onto land. There the atmosphere was thinner, the view was farther, and no current forced these mutating Victorians to move at a set pace—but no water bore them up and carried them along either. And there was no going back. The art of the hand had been replaced by the machinery of the camera; the travel of the foot, human or equine, had been replaced by the pistons of the locomotive; bodies themselves were becoming insulated from nature by machinery and manufactured goods; and memory had been augmented and partly replaced by photography, that freezing eye whose gaze soon reached the corners of the world. Appearances were permanent, information was instantaneous, travel exceeded the fastest speed of bird, beast, and man. It was no longer a natural world in the sense it always had been, and human beings were no longer contained within nature.

Time itself had been of a different texture, a different pace, in the world Muybridge was born into. It had not yet become a scarce commodity to be mea-sured out in ever smaller increments as clocks acquired second hands, as watches became more affordable mass-market commodities, as exacting schedules began to intrude into more and more activities. Only prayer had been precisely scheduled in the old society, and church bells had been the primary source of time measurement. In the preindustrial world, most work
was agricultural, and the time of the year mattered more, the time of day less. Work was done according to task and available light, and tasks varied from season to season. People worked for themselves or worked with masters who were, for better or worse, more than employers. The new age, with its factories and mobilities, its industrial scale, was to be impersonal as nothing had been before. Tightly enforced schedules came in with the factories whose owners sought to calibrate human labor to machine labor, the machine labor that was speeding up the production of goods, thereby speeding up the raking in of profits, the consumption of raw materials, and on and on—a runaway train of consumption driving production driving consumption. It was these factories and railroads that made knowing the exact time important, that launched the modern world of schedules and bustle. Goods increased in abundance as, for example, Manchester mills generated cheap cotton fabric, but time was becoming scarcer—literally so for workers putting in fourteen-hour days at the mills and slaves growing cotton on the other side of the Atlantic, apparently so for those in the rush of the growing cities, the greater variety of experiences, publications, images, the hectic greed of that era.

The railroad, the photograph, the telegraph, were technologies for being elsewhere in time and space, for pushing away the here and now. They made the vast expanses not so vast, the passage of time not quite so unrelenting. They were celebrated for the very real powers and pleasures they supplied, the real isolations and inconveniences they undid. But there were doubts too about what Thomas Carlyle in 1829 called the Mechanical Age, and the literature of the time is full of it. Hans Christian Andersen’s 1844 tale “The Nightingale” compared the drab, in-de-pen-dent-minded real nightingale with its bejeweled mechanical imitation, which sang the same waltz over and over. The court music master approved of the machine’s predictability: “For you must perceive, my chief lord and emperor, that with a real nightingale we can never tell what is going to be sung, but with this bird every-thing is settled. It can be opened and explained, so that people may understand how the waltzes are formed, and why one note follows upon another.” But it is the mechanical nightingale that grinds to a halt and finally fails the dying emperor because there is no one to wind it up. The live nightingale returns to sing the emperor back to life, out of an affection beyond the abilities of a machine. In a similar vein, Nathaniel Hawthorne’s grimly comic short story of 1846, “The Celestial Railroad,” sent a group of pilgrims by railroad across the landscape of the great spiritual allegory The Pilgrim’s Progress. The harsh terrain John Bunyan’s Pilgrim had trod on foot sped by pleasantly, but the train ended up in hell rather than paradise. The old world, Hawthorne seemed to argue, was arduous, but it knew where it was going, and it went the slow, sure way. Machines made life easier, faster, more predictable, but they led away from an integrity that people missed from the beginning. It is said that on the first day of fighting in Paris’s July Revolution of 1830, the clocks in the towers were fired on simultaneously and independently from several points. The destruction of machinery would be a hallmark of resistance to industrial regimentation and industrial time up through the nationwide railroad riots of 1877, which involved Stanford and, less directly, Muybridge.

Each event and thought itself must have been experienced at a radically different pace—what was slow then was slower than we could now tolerate, slower than we could pay attention to; while the speed of our own lives would have gone by them like the blur of speed before Muybridge’s images or been as invisible as the passersby in that first photograph of the Parisian boulevard Morse described. Distance had a profundity that cannot be imagined now: a relative who had moved a hundred or a thousand miles away often seemed to have dropped over the horizon, never to be seen again, and travel for its own sake was rare. In some psychological and spiritual way, we became a different species operating at a different pace, as though tortoises became mayflies. We see much they did not, and can never see as they did. In 1860, George Eliot mourned the transformation of time with an aside in a novel: “Ingenious philos-ophers tell you, perhaps, that the great work of the steam-engine is to create leisure for mankind. Do not believe them; it only creates a vacuum for eager thought to rush in. Even idleness is eager now—eager for amusement, prone to excursion-trains, art-museums, periodical literature, and exciting novels; prone even to scientific theorizing and cursory peeps through microscopes.”

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mourned leisure, the essayist and judge Oliver Wendell Holmes exulted over the way photographs of the material world seemed to eclipse their subjects: “Form is henceforth divorced from matter. In fact, matter as a visible object is of no great use any longer, except as the mould on which form is shaped. Give us a few negatives of a thing worth seeing, taken from different points of view, and that is all we want of it. Pull it down or burn it up, if you please. . . . Matter in large masses must always be fixed and dear; form is cheap and transportable. We have got the fruit of creation now, and need not trouble ourselves with the core.” In Holmes’s account, this dematerialization was liberatory. “Everything that is solid dissolves into air,” said Marx of that uncertain era, and Holmes thought that dissolving into air was wonderful, that his generation would rise up like birds into that thinner medium, with a new freedom to see the whole glorious nineteenth-century world as a bird in flight might see it, as small pictures of things far away.

Photographic reproduction would make the world’s images and experiences as available as the Manchester mills made cotton fabric. It’s not hard to see ahead from Holmes’s vision of the photographic revolution to cable television with its torrents of nature documentaries and news reports, comedies and advertisements, but behind it lay the hunger and ignorance of a world where images and information were scarce. One way to describe this transformation of the world whose great accelerations came in the 1830s, the 1870s, and the age of the computer is as increasing abstraction. Those carried along on technology’s currents were less connected to local places, to the earth itself, to the limitations of the body and biology, to the malleability of memory and imagination. They were moving into a world where places were being homogenized, where a network of machines and the corporations behind them were dispelling the independence of wilderness, of remoteness, of local culture, a world that was experienced more and more as information and images. It was as though they sacrificed the near to gain the far.

There was no simple dichotomy, however, between nature’s pace and the railroad, between images and the natural realm of the senses. It was not long before railroad lines were being built to take people into the landscape for scenic excursions and cameras were being used to make landscape photographs. It is as though the Victorians were striving to recover the sense of place they had lost when their lives accelerated, when they became disembodied. They craved landscape and nature with an anxious intensity no one has had before or since, though they pursued it in new ways: with microscopes and rock hammers, with guidebooks and cameras, with railroad excursions and collections of specimens. They filled their houses with pictures of places, but even the close-ups were often as not of places far away. The ideal landscape seemed formed of a wholeness that was no longer theirs. They looked for this wholeness as a place, and so mostly do we. These histories suggest nature was equally a kind of time or a pace, the pace of a person walking, of water flowing in a river, of seasons, of time told from the sky rather than electrical signals. Natural meant not where you were but how you moved through it, and a woman drifting across London on foot could attain certain harmonies not available to those speeding across the prairie on the express train. But the Victorian age had launched a juggernaut, and slowing down was the single thing hardest to do.

This is the paradox of Muybridge’s work. He was using his state-of-the-art equipment to feed that ravenous appetite for place, for time, for bodies. He had turned his back on the slow world of his grandfather’s barges and pigeons to embrace the new railroad and photographic technology, and with electricity and chemistry he made the latter faster than ever before. But his work is largely a collection of striking still images of the settlements and wilderness of the West through the mid-1870s, then an avalanche of images of bodies, the bodies of horses, then men, then women, children, camels, lions, vultures, reenacting their most familiar gestures. His inventive technology was depicting the place and the bodies that seemed ever more alienated by technological change, as though what had been lost as direct experience could be, just as Holmes dreamed, recovered as imagery. The speed of Muybridge’s invention allowed real motions to be recovered at their own pace, though watching them meant stepping out of one’s own time. If the experience that was vanishing can be summed up as a person standing alone in a landscape, then photography and, subsequently, film would offer images of that experience. The very essence of that solitary experience in the landscape, however, was its immediacy, its situation in a resonant here and now, while representations are always about there and then, a substitute, a reminder. Yet Muybridge spent much of his adulthood in some version of that experience, photographing the
landscape for the market.

In the spring of 1872 a man photographed a horse. With the motion studies that resulted it was as though he were returning bodies themselves to those who craved them—not bodies as they might daily be experienced, bodies as sensations of gravity, fatigue, strength, pleasure, but bodies become weightless images, bodies dissected and reconstructed by light and machine and fantasy. The movements of horses dismayed artists and amused members of the public when Muybridge's instantaneous photographs revealed them as much more complex and ungainly than the rocking-horse gallopers in paintings. Then he offered his audience of scientists, artists, dignitaries, and connoisseurs the whole world of everyday gesture back. Those gestures—a gymnast turning a somersault in midair, a nude pouring water—were unfamiliar and eerie stopped because they showed what had always been present but never seen. Set into motion, they were uncanny another way when they undid the familiar distinction between representations, which did not move, and life that did. Through the new technologies—the train to the landscape, the camera to the spectacle—the Victorians were trying to find their way back, but where they had lost the old familiar things they recovered exotic new ones. What they had lost was solid; what they gained was made out of air. That exotic new world of images speeding by would become the true home of those who spent their Saturdays watching images beamed across the darkness of the movie theater, then their evenings watching images beamed through the atmosphere and brought home into a box like a camera obscura or a crystal ball, then their waking hours surfing the Internet wired like the old telegraph system. Muybridge was a doorway, a pivot between that old world and ours, and to follow him is to follow the choices that got us here.
I remember sitting in the darkness of movie theaters, a space that to a child seemed almost religious: so many people gathered together hushed to share the same thing, something more vivid than anything but life and more dramatic than ordinary life. In those days it usually seemed to be western movies: horses galloping across deserts and wagon trains circling up on prairies. Every so often I would look up to watch the beam of light through the darkness above instead of the story on the screen. The light flickered, broke into several beams that corresponded to the action on the screen, and made it clear that the movie wasn’t only a story but a medium, a roiling stream of light in the darkness. Up above in the projection booth would have been a stream of celluloid rushing by at the rate of a foot a second, making one of those western movies a trail of photographs miles long. The river of light and shadow and the trail of film had an origin, a source in those galloping horses and western landscapes, and it came back to that place, though the place was transformed. My city is Muybridge’s city, and the places he haunted during his crucial years I often walk, and at night I see in the windows I pass by that same strange flickering light, this time the blue light of television in dim rooms.

When I went looking for Muybridge, I found him everywhere. A lot of artists have paid explicit homage to him, and he is visible in their work as a source of both specific images and general ideas. He is there in equestrian drawings by Edgar Degas; in photographs and paintings by Thomas Eakins; in many paintings of his motion-study figures by the British artist Francis Bacon; in the photographic work Muybridge II by the minimalist Sol LeWitt, who for more than four decades has been exploring serial imagery, a subject initially inspired by the motion studies; in Philip Glass’s opera The Photographer, which dramatizes incidents from Muybridge’s life and turns the motion studies into choreography; in the San Francisco panorama of Mark Klett, made by rephotographing the earlier artist’s vista, and in Klett’s subsequent panoramas showing what he learned there; in the Vegetable Locomotion series of photographs that are Hollis Frampton’s and Marion Faller’s fond parodies of the motion studies. Motion-study sequences are a standard mode of depicting an event now, from the famous images of the first atomic bomb detonating to champion golfers...
demonstrating their swing in sports magazines. Web sites and advertisements have of late appropriated and paid homage to the motion studies, and the science-fiction movie The Matrix modeled its fight sequences after the stop-start action of the motion studies, using multiple cameras to achieve what is now a standard special-effects technique.

But if Muybridge was at the root, the zero point, the dawn of moving pictures, then he is everywhere as the ghost at the end of those trails of photographs rushing by, beamed across the world as television, dreamed across the world as the shared content of contemporary life, present not only as specific images but as several media. Muybridge is often called the “father” of something, the father of motion pictures usually, and Jane and Leland Stanford said the children of California would become their children. Here parentage works as a metaphor, for children become things their parents cannot imagine and can at best claim partial credit for, and yet they go into the unknown carrying the indelible traces of their parentage. A history streams forward from the events of the 1870s, one that sometimes seems like a relay race, a torch-passing, a game of telephone: something is transmitted, but it changes with every transmission, every carrier. The places themselves seem to tell the story best.

Flora Muybridge is buried behind the United Artists Multiplex Cinema in Colma, California. In many California coastal Indian theologies, souls travel west over the Pacific after death, and west of nineteenth-century San Francisco was a quartet of large cemeteries, a city of the dead. Flora was among the San Franciscans who were buried there from the 1860s until the turn of the twentieth century, when the expanding city decided there was no longer room for its past and banned burials. A few decades later, city workers began to exhume the bodies so that the graveyards, which had grown wild and weedy, could be recycled into real estate. The dead were sent a dozen or so miles south to Colma, the cemetery city that is now also a city of big-box stores on the San Francisco peninsula, and their tombstones were recycled as landfill and building material. The exact location of Flora’s remains is inked in an old ledger book at the Greenlawn Cemetery, but she is buried with hundreds of others in a scruffy field behind United Artists marked only by a single marble monument rising from the weeds. Surrounded by chain-link fence, the plot is bordered on its other sides by the better-tended graves of those who were actually buried there when they died, by a hulking Home Depot store, and by a road across which chain stores and fast-food restaurants stand. San Francisco had done what it could to erase its Ohlone Indian past, to wipe out some of its hills and bays, to cannibalize itself as building succeeded building even before the 1906 earthquake and fire took out most of the central city. It has been a transient place whose identity keeps shifting, though it always kept alive a certain kind of freedom, a certain kind of experimentalism, the freedom and the greed of the gold rush and the people who kept coming here to become something else, a freedom that sometimes seems to depend on the ability to erase and re-inscribe meaning at will.

In 1872 the writer Helen Hunt Jackson came to California, where she admired little but the landscape and Muybridge’s photographs of it. Later that decade she heard some Omaha and Ponca Indians from the plains on a speaking tour talk about the injustice they had experienced, and after years of dabbling and skepticism she found her calling. In 1881 she wrote a scathing report on Indian policy that failed to rock the world. Georgia O’Keeffe once said she painted her flowers big so that people would look at them, and Jackson rewrote her history melodramatically so that people would read it. She returned to California, and she set Ramona, her 1884 novel of racial injustice, in the southern part of the state, where the Spanish influence still could be seen in ruined missions and vast ranchos. She built Ramona out of vivid evocations of real places and accounts of real brutalities by Yankees against the native population. Sitten as so many would be by the romantic ruin of the Franciscan missions, she left out their domineering intolerance and focused on the way the romance of Ramona and Alessandro is blighted by the greedy cruelty of the Yankees: the couple loses successive homes and a child, and finally Alessandro loses his mind. The book became a huge best seller, though it seemed to lead not to reform but to nostalgia, for in its celebration of Spanish California it gave the southern part of the state the identity it had sought as it grew into an empire. Ramona became southern California’s false memory, a backward glance touched with a sunset glow that softened the contrary and contrived details.

In 1905, a year after Muybridge died, two decades after Jackson published her best-seller, an actor who called himself Lawrence Griffith came to Los Angeles playing Alessandro in a stage version of Ramona, and there he too fell in
love with the ruinous missions and romantic atmosphere. His acting career was never a distinguished one, and not long after his tour he stooped to acting in films at the Edison Studios in the Bronx, in those early days when stage actors regarded the movies as shameful. Movies were then short, simple, and silent flickers at the Nickelodeon, sought out mostly by the poor. Edison had gone into motion pictures, and though he was uninterested in the artistic possibilities and kept a tight hold on the budgets, his former chief cameraman, Edwin S. Porter, had already revolutionized the medium with The Great Train Robbery, the movie that told a more complex story with more sophisticated techniques of representing time and simultaneous events. The young Griffith moved from acting to directing, since it was both more lucrative and more anonymous, and he directed hundreds of films for the Biograph Company in New York in those days when movies were made in a day or a few days and New York and Chicago were the capitals of moviemaking.

But in the winter of 1910 Griffith brought his troupe of about thirty actors and technicians to southern California. A few other companies had already tried California, which had three great advantages. One was the golden light that never seemed to run out, day after day, month after month. Another was the landscape, or rather the landscapes. Within a few hours of the city of Los Angeles were deserts, grasslands, forests, mountains, seashores, orange groves, and farms, as well as architecture of every imaginable type: southern California looked like everywhere and anywhere for the movies. A third was proximity to Mexico and distance from the Motion Pictures Patent Company, which attempted to control the entire industry with patents on cameras, control of film stock, and detectives and thugs to enforce their powers. In a pinch, a film company could cross the border, and southern California became the capital of independent moviemaking. Cheap land helped, and so did, less directly, the lack of an established society. In New York the movies were theater's illegitimate child; in California they became Hollywood, an aristocracy of glamour that conquered the world.

By the time he settled in California, the director was using his real name, D. W. Griffith, and he was making the new medium of film supple, subtle, and evocative as it had never been before. A technical and formal prodigy, he had new ideas about lighting, about close-ups and distance shots, about staging and special effects, and especially about editing—intercutting, cutting to details or pulling away, dissolves and fadeouts. He almost singlehandedly established the vocabulary of filmmaking. But all this was in the service of storytelling, and he told stories visually as no one ever had before. The first film he shot in California was The Thread of Destiny, a romantic tale about an orphan girl raised at one of the missions that had captivated him years before. The second to last on that first excursion to the West was Ramona, with Mary Pickford in the title role.

The relay race became a boomerang: the Sephardic Jew David Belasco was the great impresario of the San Francisco theater from the 1860s until his migration to New York in the 1890s, where he became a national figure, but his protégé Cecil B. De Mille came out to California in 1913 and began making westerns and overwrought epics that served cinema as Belasco had served theater. “Hollywood,” the minor place that became shorthand for the global phenomenon of American movies, was hatched. Almost from the beginning, from Porter, from Griffith, from De Mille, the movies were obsessed with the West, that fiction of authenticity, that fantasy of gritty reality. The fluidity of identity that had always been a hallmark of the American West finally came home to roost and to feather its nest in Hollywood, for the medium of cinema encouraged it as nothing else had. The West was both the location of an industry and the subject of the fantasies it distributed around the world, fantasies about cowboys and pure heroines, Indian raids and charging cavalry, an improved national past as Ramona was a regional past. Hollywood was the capital of an industry as Chicago was of meatpacking, Detroit of automobiles, New York of clothes, but the product was imagination, dreams, fantasies. Later, the two world wars sapped the strength of the European film industry and gave Hollywood the economic preeminence it still holds today.

In 1907 an estimated two million people a day attended the nickelodeons that had sprung up by the thousand in cities and towns, sitting in the darkness where they were transported to the somewhere else that within a decade would almost always be southern California in one guise or another. Later, movie houses became more luxurious and larger; they were called palaces, dream palaces, dreamland, movieland; they were island republics in which people sat alone together in the dark and let the visions enter them, became possessed
by movies, lived somewhere they could never otherwise visit: the past, the future, places more glamorous, dramatic, dangerous than everyday life. The whole world dwelt in Hollywood, and Hollywood was the whole world and no place at all. D. W. Griffith was able to re-create the Civil War in southern California for his epochal 1915 masterpiece, Birth of a Nation, and then to build Babylon on Sunset Boulevard for Intolerance, his attempt to exculpate himself from the rank racism of Birth of a Nation, a racism that justified itself with a fantastic rewriting of history. Babylon crumbled on that thoroughfare for years.

“Hollywood is afflicted with total amnesia,” one of its writers declared, “a complete group blackout and loss of recall when it comes to anything that happened more than twenty-four hours ago.” And the movies themselves made fictions out of history, made up a South and a West that never existed, specialized at various junctures in westerns that turned a place into a genre that could be made anywhere, that prompted the sense of self of generations of American men, even politicians, that even generated a president who remembered as reality things that had only happened in movies. And from movies women learned how to look, how to love, how important looking and loving were. A lot of the early movies were lost forever when they were recycled for the silver nitrate in the film stock or left to decay, for the nitrate film was flammable and prone to disintegration. The people too were invented and erased quickly, stars burned out, directors were eclipsed, scandals ended careers, everyone changed their names so that the Ellis Island richness of the place was smoothed over into something reeking of the Mayflower. But the movies themselves made and remade history. Birth of a Nation fostered a resurgence of the Klan and its racial terrorism. And Hollywood movies became a huge industry themselves, grossing $8 billion in the second year of the new millennium. (That the actual locale named Hollywood has, in Mike Davis’s words, “gone from picturesque dilapidation to hyperviolent slum” in recent decades means only that this place name still corresponds to a region and an industry, but not to an actual place.)

In 1919 Griffith joined forces with Hollywood’s biggest stars, Mary Pickford, Douglas Fairbanks, and Charlie Chaplin, to form an independent distribution company, United Artists. Mary Pickford was the first movie star, and the stars became hybrid beings, an amalgam of the characters they played and the carefully controlled public images they maintained. Pickford, “America’s Sweetheart” with her sausage curls, was really the smart businesswoman Gladys Smith; Chaplin was an English vaudeville comic who had, while touring Los Angeles, been recruited to movies by Mack Sennett, another early director there; Fairbanks, who reigned with Pickford as Hollywood’s first royalty, had started out as Douglas E. Ulman. “The lunatics have taken charge of the asylum,” said one film executive in a condemnation so lively it later became the refrain of a pop song, but United Artists thrived. A railroad administrator, Oscar Price, became the company’s first president, and UA produced some of Hollywood’s best movies even after the Transamerica Corporation bought it in 1967, the year UA released the trio of spaghetti westerns that made Clint Eastwood a major star.

Transamerica, a financial services corporation, was headquartered in San Francisco, and the year after it acquired United Artists, it began constructing, on the site where the Monkey Block had been, the pyramidal Transamerica Building, the most recognizable landmark on the downtown city skyline. The Monkey Block was the first four-story building west of the Mississippi when it was built in 1852. As a financial center it dominated Montgomery Street for years and had been part of Muybridge’s commercial milieu, but by the twentieth century it had become artists’ studios before it was demolished. The site was reborn as a financial center: business and bohemia have always switched off like that in San Francisco. United Artists still thrives as a subsidiary of MGM, and the Transamerica Building now belongs to a Dutch conglomerate. Flora was originally buried near where the big Coronet single-screen movie theater now stands on Geary Boulevard. Had she lived seventy years instead of twenty-four, she could have seen the slightly seedy thespian milieu she celebrated in her photograph album and loved through Larkyns hybridize with her husband’s innovations into a multimillion-dollar industry that ruled the world, or at least its dreams and desires, the industry that plays nightly next door to her unmarked grave.

Somewhere in Colma not far from Flora are the remains of Wyatt Earp, who was alternately a lawman and outlaw in his Arizona youth, the youth that Henry Fonda, Ronald Reagan, James Garner, and Kevin Costner romanticized in the movies. Earp himself lived long enough to become a movie consultant after he married a San Francisco actress, for there was no real gap between the
Wild West and its cinematic representation. Movies had to come back west, because no place else had the fluidity and freedom they needed to evolve, to dominate, to become that light that flickers everywhere like a new celestial body, the starlight of Hollywood. One western is still waiting to be made: the movie about an Englishman who became a rugged outdoorsman, an explorer, a murderer, an inventor, and the fastest photographer in the West, the western movie that would have been about the genesis of both medium and genre in the strangely malleable moments of the 1870s.

In the 1970s and 1980s, European and Eastern cultural theorists—Umberto Eco, Jean Baudrillard, Fredric Jameson—in invade California, which they described as the capital of postmodernism, as the place where the future had arrived. Had they spent as much time reading the region’s history as they did staring out car windows and watching TV, they would have found that theme parks and drive-by shootings, rogue cops and actor politicians, amnesia and fluidly changing identities, were nothing new. They were western heritage. The West was a place where latent possibilities emerged like mutations, where Muggeridge became Muybridge and Stanford became a grand thief and patron and Norton an emperor and Griffith a genius and Pickford America’s Sweetheart, the place where the dead lie unmarked behind the movie theater.

CAPTAIN JACK IN PLATO’S CAVE
One brisk spring day, I went to the Lava Beds and was surprised that nothing I’d read evoked the terrain around it, too open for forest though it was scattered with pines, too lush for desert, too sparse for grassland, a meeting of many regions, many forces. The Lava Beds, the starkly stony area within this terrain, became Lava Beds National Monument in 1925; Captain Jack was right that nobody would want the land for practical purposes. The Park Service sells a walking-tour map of the Lava Beds that lets viewers wind through the labyrinth and the events of 1873 there according to the numbers. I was a modern tourist that day, I drove a car that let me traverse great distances in comfort and solitude and seventy miles an hour, I carried recorded music to, as we say, pass the time, a laptop computer to sort out and record my thoughts, I had the electronic money of a credit card to take care of whatever needs arose. On my way to the Lava Beds, I looked at Schonchin Ridge and the site where Captain Jack killed General Canby, and I walked the long loop through the Lava Beds trying to imagine the war and the strangeness of being stranded in the center of your world, within sight of the lake, the creation story, and the snowy cone of Mount Shasta. I tried to imagine a vanished sense of time and place that must have made this region utterly different for the Modocs who fought to stay here. More profound even than the changes in the landscape are the changes in our relation to it.

Tule Lake has been mostly drained for rice fields, and what remains of it is a rectilinear body of water that doesn’t suggest much of this place from which the creator first hauled mud to make the world. The center of the world that used to be a peninsula jutting into the water now stands in a dry agricultural landscape, up a road that passes the cylindrical metal silos of the Newlands Grain Collective, a new fortress of agribusiness facing off the old lava fortress. The outcropping with its petroglyphs and swallows seems lost in its new surroundings, for its meaning came from a context that has been erased, but the petroglyphs still stand enigmatic and evocative above the dust that used to be water. I saw the Lava Beds, I saw the center of the world, I looked at my watch and saw that there was a lot of daylight left. Looking at my atlas, I saw that the Tule Lake Internment Camp was just down the road and decided to go. There was something irresistibly perplexing about these landmarks lined up in a row: battlefield, birthplace, prison, the first for a local war, the last for a world war. I turned off the main highway and drove past the small hamlet looking for a ghost town like the camps I’d visited before, but the road rolled by under my wheels, and there was nothing but agricultural land out the window. Coming back, I realized I hadn’t accepted the evidence of my eyes: the high ranch gate and barbed wire around the camp, which was a portion of the camp.

The prison built to hold the Japanese Americans who wouldn’t swear loyalty to the United States during the Second World War was still inhabited, though it was debatable what kind of prisoners were within. More than a dozen of the original wooden barracks were still there in the same grid formation, painted pink, green, brown, augmented by trailers, wrecked cars, and toys in the dust. Someone had put up barbed wire around the petroglyphs, but no one had taken down the barbed wire around the camp. I drove up and down, frightened that this place I had expected to be part of the past was in the present, won-
dering what poverty keeps a prison without guards inhabited, seeing no sign of life that weekday afternoon until I noticed two little girls in bright clothes, a blond one in pink, a brown-haired one in red, in front of a doorway. The back road was named Captain Jack, as though the history of Japanese internment and modern poverty were truly linked to the last stand of the Modocs, and when I turned off Captain Jack to drive back up one of the side roads, I saw a figure holding a broom come out of the house where the girls were playing in the dust. Up close she looked to be in her midteens but also looked pregnant under her big T-shirt. I stopped my car and asked her to confirm that I was in Tule Lake Internment Camp. It was obvious that it was, but I was dumbfounded. And I couldn’t ask her what it’s like to live in a prison, so I asked her what it was like living in this place. “It’s nice,” she said wanly, her small features still blank. The little girls waved as I left. Later, the photographer Masumi Hayashi, who was born in another of these camps and has made panoramic portraits of all of them, told me that a former prisoner from Tule Lake told her that Shasta’s resemblance to Japan’s celebrated Mount Fuji was all that made the place tolerable. What had been the center of the Modoc world had been the bitter edge of it for the internees, but what it was for the current inhabitants I couldn’t guess.

I drove away stunned and stopped a few miles up the road at a Forest Service office. I wanted someone to tell me how the lake could have vanished, how the prison could be inhabited, what this landscape meant. The garrulous older woman behind the desk was glad to see me, but she didn’t want to talk about what I wanted to talk about. There was a monument to the camp back there, but I’d missed it, she said, and she didn’t seem to think there was anything peculiar about the fully inhabited but unguarded historic prison. What she really wanted to talk about was the fact that Lieutenant Sulu in Star Trek was born there and has made panoramic portraits of all of them, told me that a former prisoner from Tule Lake told her that Shasta’s resemblance to Japan’s celebrated Mount Fuji was all that made the place tolerable. What had been the center of the Modoc world had been the bitter edge of it for the internees, but what it was for the current inhabitants I couldn’t guess.

It took exactly a century, 1867 to 1967, to go from Muybridge’s return to California as a photographer to Star Trek’s launch as a television series. You could call it the journey from Captain Jack’s cave to Plato’s cave. Captain Jack’s cave is a real place. It was the center of my exploration of the landscape of Modoc County, an angled pit of lava in which the Modoc leader also known as Kientpoos, his two wives, and his children lived during the siege of 1873. It could not have been a comfortable home, though it was warmer and dryer than what lay outside, and it seems fitting that Jack’s attachment to the earth ended with him living in the earth itself, a womb, a grave, an ancient exhalation of molten stone become home. In Muybridge’s photographs it looks like the mouth or the eye of the land, a pit full of dark awareness.

Plato’s allegory of the cave has often been used to describe cinema and television. “Imagine an underground chamber like a cave, with a long entrance open to the daylight and as wide as the cave. In this chamber are men who have been prisoners there since they were children,” it begins. “Some way off, behind and higher up, a fire is burning, and between the fire and the prisoners and above them runs a road in front of which a curtain-wall has been built, like the screen at puppet shows.” The prisoners of the cave see nothing of what takes place outside the cave, know nothing of the light, color, and dimensionality of the outside world. They see shadows on a screen, and Socrates, who is Plato’s own shadow-self, asks, “Would they not assume that the shadows they saw were the real things?” Plato assumes that when they, like Dorothy in The Wizard of Oz, see what is behind the curtain, they will grow disillusioned with it, find representation limited as sensory experience and as truth.

He was wrong, for watchers in the cave of representation are free to come and go, and they keep coming back; they fill the multiplexes and keep in business the dozens of television stations beaming from satellites and the thousands of video-rental stores around the country. The Modocs had stories, stories that sprang from the land and brought them back to it, but the Ghost Dance they danced to defeat time always seems cinematic to me, a movie run backward, the dead revived. They wanted to escape from time, but only so they could stay in place. Plato objected to the cave dwellers because they relied on the false testimony of the senses, but life in the cave seems disturbing now because it is disembodied, disconnected, a realm of two-dimensional shadows.
in the dark. Rather than being too reliant on the world of the senses, it is not reliant enough. Not absolute truth—after all, there is the Weather Channel—but engagement is missing.

Enterprise, that catchword of Victorian capitalism, has become a spaceship. If the premise of the Star Trek series resembles anything, it resembles the geological surveys of the nineteenth century, which were military missions seeking to know rather than to fight, missions with scientists, information gatherers, and faith in the rationality of their culture, missions that understood that knowledge is power. Star Trek takes place on a “final frontier” that links the show to the frontier of the American West, though the otherness of Native and Chinese westerners is supplied by genuine extraterrestrials. Earth has been left far behind, and time itself has become almost optional, for there is instantaneous spatial travel—“beam me up, Scotty”—of individual bodies and “warp speed” travel through outermost space and even, in one of the Star Trek movies, travel back in time. The darkness of outer space suggests that Plato’s dark cave now fills the universe, that the annihilation of time and space is complete, both in the premise of the show and in the desires of the watchers sitting at home watching electrons and image fragments turn into a transporting story.

The western movies themselves were always anchored in a sense of place and a passion for it, a passion that was more the filmmakers’ than the protagonists, as the camera panned riders across deserts, zoomed in on houses swallowed up in the prairie, followed herds across rivers. The desire for the real lives on, if nowhere else, in representations in which Web sites and cell phones are marketed with pictures of rock climbers and shepherds with their flocks. Another way to think of Plato’s cave is as a condition in which people live entirely in representation and interior space, in a universe constructed by humans, ultimately inside the imaginations of those who came before, an operation that suggests nesting Russian dolls and a certain crampedness of the imagination after a few generations. Muybridge’s work teetered between these two conditions, between the no place of the whited-out Palo Alto racetrack and the black-walled Philadelphia studio and the brilliant description of place in all his other work, from Guatemala to Alaska. He gave up place for the laboratory of motion, and it is from this relinquishment that he produced the bare bones of cinema. We are still teetering too, between Captain Jack’s cave and Plato’s cave.

MUYBRIDGE’S BIRTHPLACE

The house in which Muybridge was born and raised also hosted his parents’ grain and coal business, a holdover from the preindustrial order of things when work and home were seldom separate. One of his biographers who went to visit it in 1971 found that the building on High Street still sold “sea-borne house coal.” But when I went there at the beginning of the twenty-first century, it was a computer store. That is to say, Muybridge’s English birthplace is now an outpost of Silicon Valley, where silicon chips and the cheap, compact computers they make possible were conceived, where the acceleration and democratization of everyday life took a huge leap forward, the Silicon Valley that sprang, so to speak, from the loins of Stanford University, which itself came out of those eight thousand acres and the Stanfords’ bereavement and their vision of what Californiacould be and what the world should be. Muybridge’s birthplace so far away is now a shell stuffed with California, and for that matter this book was written on a computer created by one set of Stanford University spinoffs headquartered in that place, printed out on a printer manufactured by another, and researched in part via a search engine made by a third. If the world is Hollywood and Hollywood is the world in terms of the pervasive presence of its entertainment in the global imagination, then in another even more pervasive sense, the world is Silicon Valley, the source of much of the electronics and communications technology that have changed the pace, expectations, and practices of everyday life.

This time the transmissions seem less like a game of telephone or a relay race than a list of begats, a great chain of patriarchs spreading out into the world, the Abrahams who are fathers of multitudes of programmers, engineers, hackers, Web site designers, and on and on, an industry of millions, and like the Biblical begats it is a list of fathers and sons, unless you count Jane Stanford in as the Eve to Stanford’s technocratic Adam in the oak-shaded Eden of the Palo Alto estate. For Stanford hired Jordan, and Jordan hired Lewis Terman (the eugenicist who created the Stanford-Binet test to quantify intelligence), and Terman’s son Frederick took a degree in chemistry at Stanford, studied further in the East, but came back to run a laboratory in the new field of radio communications on campus, the field that became electronics. And though
this Terman did not beget David Packard or William Hewlett, he beget Hewlett-Packard when he brought his two former students back to Palo Alto to start their own electronics firm. Walt Disney, a young entertainment entrepreneur who'd worked with United Artists, placed the first order with Hewlett-Packard, for audio oscillators to use on the animated film Fantasia, and soon after they were servicing the war industry. The products of Silicon Valley would be used by the public, by the entertainment industry, and by the military, making a sort of military-industrial-entertainment complex evident in the location of Lackheed and other high-technology war makers in the valley as well as the ever more technologically sophisticated special effects of Hollywood and those new hybrid genres such as video games (and war American-style is a lot like video games, while Top Gun, a ride named after a movie about military technology, is one of the main attractions in the Silicon Valley amusement park Paramount's Great America). Silicon Valley makes entertainment and war seem like one enterprise designed to control populations via the channeling of electrons through circuits, however divergent the details of their deployment.

The university and commercial technology kept feeding each other. In 1951, the Stanford Industrial Park opened, and Hewlett-Packard and a branch of Eastman Kodak moved in (and when French prime minister Charles de Gaulle visited California a decade later, he asked to see two sites: Disneyland and Stanford Research Park). Hewlett-Packard’s founders gave more than $300 million to Stanford University, much of it plowed back into engineering programs that generated yet more technical prodigies who founded many more companies in the place that in 1971 became known as Silicon Valley. From this university at the center of this valley have come further generations of entrepreneurial technocrats who struck it stunningly rich, among them former Stanford professor Jim Clark of Silicon Valley Graphics and Netscape and former Stanford students Jerry Yang and David Filo who started Yahoo! to navigate the burgeoning chaos of the Internet. Sometime in the 1990s, the former Stanford students Jerry Yang and David Filo who started Yahoo! to navigate the burgeoning chaos of the Internet. Sometime in the 1990s, the Stanford professor Jim Clark of Silicon Valley Graphics and Netscape and former Stanford students Jerry Yang and David Filo who started Yahoo! to navigate the burgeoning chaos of the Internet. Sometime in the 1990s, the founder of Apple Computer emerged from a university club of computer amateurs who met regularly in the accelerator's auditorium.

The other side of Sand Hill Road looks far more familiar, though what happens there is at least as strange. On this north side is a long series of nondescript office buildings with mansard roofs and a lot of glass, created when the manager of Stanford University’s land developments decided to strike out on his own. Around the time that the place was named Silicon Valley, the first venture-capital offices went in, and this side of Sand Hill Road is the capital of technologically focused venture capitalism, the men who bankroll the acceleration of everyday life and new technologies, the Montgomery Block of its day. The film critic David Denby ventured afield to investigate the new technologies that were being bankrolled by Sand Hill’s venture capitalists and concluded, “The revolution will end by changing the nature of time itself, thereby altering the way we live, work, seek pleasure, and gather together. We shall achieve simultaneity, ending the gap between desire and fulfillment; we shall no longer wait.” Denby does not embrace this future in which those who are not hooked up to the accelerating technologies become irrelevancies and points out that the utopian visions of the valley are undermined by how unlivable it is, with its manic work schedules, gridlocked traffic, astronomical housing costs, pernicious social problems. The premise of the efficiency and convenience of every technology is that it will save time, though as Stanford himself remarked, “if you could limit man’s wants it might be called ‘labor saving,’ but as there are no limits to his wants, the machinery really increases the power of production.”
That production is now dematerialized too. Because machines streamline the production of material goods from apples to automobiles, more and more first-world labor is concentrated in the production and management of information, the virtual substance running through all those satellites and cables. This is the promise behind the windows of Muybridge’s birthplace, with their displays of software and hardware.

The Modoc center of the world was the center of a world a few hundred miles across, and just as the world once had an infinite number of local times, so it had countless centers—what we mean by a world rather than the world. Greenwich Time, the prime meridian down the river from Muybridge’s birthplace, was the first attempt to make a world into the whole earth, though it was an abstruse effort noticed mostly by astronomers, nautical navigators, and the makers of schedules. California is the first center of the world that is coextensive with the planet, but it is the center of displacement, distraction, and a kind of transcendental disembodiment, as well as endless images of bodies, from Hollywood and even from the capital of the porn industry a few dozen miles north in the San Fernando Valley (and the huge online porn market). Which means that most of us do not live at the center of the world but look toward it, a center that, as Pascal once remarked, is everywhere and nowhere.

Now when I walk in downtown San Francisco, where Muybridge walked and photographed, it sometimes seems that all the tourists are videotaping and all the locals are talking on cell phones. That is to say, the tourists will only experience the place later; the locals have entered a disembodied private space in public, a space they share with those who are not there and that shuts out those who are. The stores that line the streets are, wistevery passing year, more and more likely to be outlets of international chains, so that this place becomes more and more indistinguishable from countless others. The pace at which people walk is unchanged, but signs, lights, music, machines, all turn the street into a dazzle of distractions. At the end of the twentieth century, Silicon Valley invaded San Francisco. South Park, where the Muybridges lived early in their marriage and Flora met Harry Larkyns, was nicknamed Multimedia Gulch as it changed from a quiet Filipino community to a buzzing, upscale center of networking, dot-com offices, and of the magazine Wired, which preaches the gospel of salvation through gadgets and accelerations. The whole South of Market area where Muybridge had long resided became the global capital of this new industry of online information and commerce, financed more often than not by the venture capitalists down the peninsula. But the venture capitalists there had financed other technologies too.

Mission Bay at the south end of South of Market was a real bay that had in the nineteenth century become a landfill and on the cusp of the twentieth the Southern Pacific train yard. At the end of the twentieth century ground was broken, ground that had been water, to build a huge biotechnology facility, for Stanford and Silicon Valley and Venture Capital Row had involved themselves with the microcosm of genes as well as the macrocosm of communications networks. The Catellus Corporation, a spinoff of Southern Pacific, is the real estate agency managing the transformation. It also represents SP’s transformation from the nineteenth-century transmission of people and materials to the present-day transmission and manipulation of the microcosmic, of electrons and genes. The Central Pacific and the Southern Pacific were always about reach, about extending technology into new arenas to gain wealth and power, and genetic engineering extends the human reach into the genetic code of all life. The multimedia explosion, like Silicon Valley, was compared again and again to the gold rush, for the frenzy, the rush into the unknown, the uncertainty with which the daring could become billionaires or flops, the generation of huge new supplies of wealth and a brave new world to spend it in. Sometimes those who made the comparison remembered the dark side of the gold rush, the extermination of the Indians and the evisceration of the mother-lode landscape, the greed and the stampedes. A bust followed the boom, but the changes are here to stay. The world seems run from Silicon Valley now, run by engineers whose decisions affect all of us, those engineers whose constant question is never why, but only how.

Not all the stories are so unsettling, though. Mark Hopkins’s Nob Hill house, from which Muybridge photographed his great 360-degree panoramas, was given by his heir to the San Francisco Art Association, which had been headquartered on Pine Street when Muybridge was a member and sometimes a resident. (Up there where the Big Four once dwelt in splendor, the site of Hopkins’s house is now the Mark Hopkins Hotel, next to the Stanford Arms Hotel, the Huntington Intercontinental Hotel, and the Crocker Parking Garage.) Out
of the Hopkins-housed Art Association grew two institutions, the San Francisco Museum of Modern Art and the San Francisco Art Institute. The two institutions, one the second museum of modern art and the other for a while one of the preeminent art schools in the country, did much to foster a continuing cultural life on the West Coast. San Francisco was the center of several significant art movements from the 1940s on, but it never stopped being the capital of photography: the pictorialist movement that was soft-focus both literally and intellectually only really came to an end with the founding of the f64 group in San Francisco in 1932 by Imogen Cunningham, Edward Weston, Ansel Adams, and a few others, and Adams taught for years at the Art Institute. By then it was housed not on Nob but on Russian Hill, the other high point of San Francisco’s central saddleback, a few blocks from where Philo T. Farnsworth invented television with the help of a loan from Crocker Bank, another Big Four spinoff.

In the 1970s the Art Institute’s president found, behind the couch in the school library, a number of Muybridge’s Yosemite mammoth plates, doubtless a legacy of the Hopkins era, and he sold them to buy the school’s first video cameras for what became the influential Performance/Video department. Many students emerged from that department to make a mark, but two pieces by the professors who have been there almost from the beginning stick in my mind: Douglas Hall’s The Terrible Uncertainty of the Thing Described, which with a Tesla coil throwing bolts of lightning and several video monitors replicates the disturbing sublimity of violent weather, and Paul Kos’s Chartres Bleu, in which a tall stack of video monitors in the approximate form of a window in that Gothic cathedral display in accelerated time the changing light pouring through the stained glass, a piece that is like Hall’s both ironic and iconic about the old world behind us, the pace and power of celestial forces we feel more seldom now. It is a study of the motion of the sun akin in some way to the panorama’s study of the movement of light across the city, a test of whether the luminous spirituality of another age can come to us through electronic media. It suggests too that the technologies that surround us can be yoked to the service of the slow, the contemplative, the beautiful, as well as to the usual jumble of advertisement and information; it is the window one would want in Plato’s Cave.

Muaybridge pursued the transformation of bodies and places into representations, representations that in some ways fed that unslaked desire for landscape, geography, beauty, embodiment, and the life of the senses, but Stanford, who hammered the Golden Spike, pursued the annihilation of time and space without mercy, without misgivings, without deference to what might be lost, and this might be the difference between Hollywood and Silicon Valley. Hollywood would become the center of the world of movies, while Silicon Valley is the center of the world of information technology, and in the way these two institutions dominate the world one can say California is the center of the contemporary world, but of a world in which time and space have been annihilated, a world that is in some obscure way so disembodied, dislocated, and dematerialized that the very idea of a center is perplexing.

Muaybridge and Stanford died far too soon to have any inkling of the high-speed world of electronic communication and information processing, but their own pursuits and desires prefigured it and laid some of the groundwork. This too is inscribed in the landscape. Stanford pursued speed in its most evident nineteenth-century forms: railroads and racehorses. Muaybridge refined speed from a material to a visual phenomenon with the most high-speed photographs of his time. His birthplace, the house that is now a computer store, once dealt in grain grown locally and brought in on horse-drawn carts; his grandfather in the same town had moved at a predictable pace through a world in which human beings and their voices and knowledge were no faster than the animals and water and wind that surrounded them. There are infinite ways to measure what has been gained and what has been lost, and only one clear thing: the world is utterly changed.